US Army Corps of Engineers ®
Northwestern Division

Missouri River Basin
Water Management Division

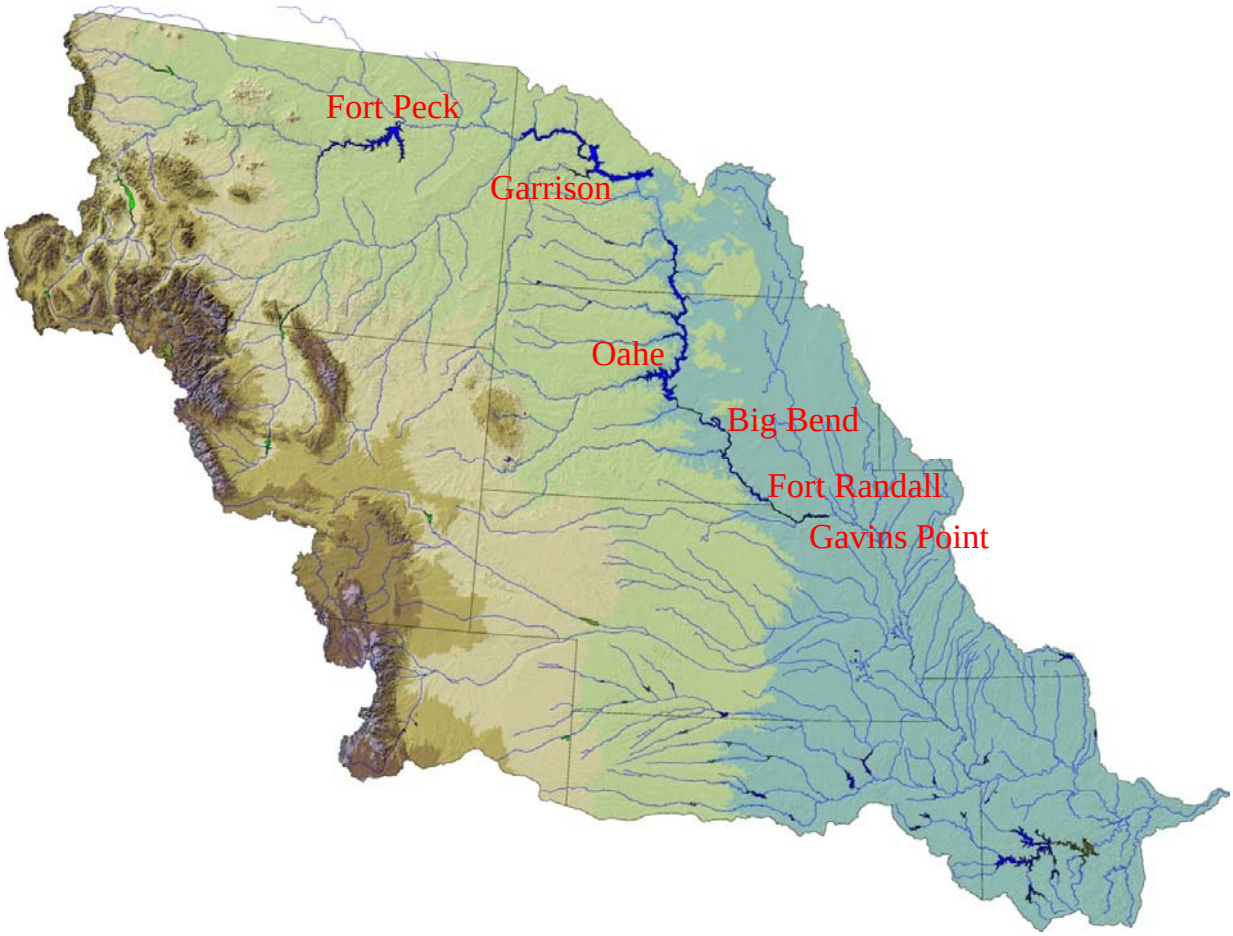
Final

AOP

2017-2018

Missouri River Mainstem System

2017-2018 Annual Operating Plan



Annual Operating Plan Process
65 Years Serving the Missouri River Basin

December 2017

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, NORTHWESTERN DIVISION
PO BOX 2870
PORTLAND OR 97208-2870

December 15, 2017

Division Commander

Dear Stakeholders and Concerned Citizens,

This Annual Operating Plan (AOP) presents the Corps of Engineers' regulation of the Missouri River Mainstem Reservoir System through December 2018. The information in this AOP is based upon water management guidelines designed to meet the reservoir regulation objectives of the 2006 Missouri River Master Water Control Manual (Master Manual). Management of the reservoir system is provided by my staff at the Missouri River Basin Water Management Division, Northwestern Division, U.S. Army Corps of Engineers, located in Omaha, Nebraska.

The AOP presents plans for the regulation of the reservoir system under widely varying water supply conditions. The AOP is not intended to be a forecast for the coming year; rather the guidelines included in the Master Manual are applied to computer simulations of the reservoir system regulation assuming five statistically derived inflow scenarios based on an analysis of water supply records from 1898 to 2011. This approach provides a good range of water management simulation for dry, average, and wet conditions. The AOP provides a framework for the development of detailed monthly, weekly, and daily regulation schedules for the mainstem reservoir system's six individual dams during the upcoming year to serve its Congressionally-authorized project purposes.

A draft of this AOP was made available to the public in September 2017. Five public meetings were held across the basin in mid-October. As part of continued communication, monthly conference calls will be conducted by the Corps beginning in January 2018 with Federal, state, county and local officials, Tribes, emergency management officials, independent experts and the press to discuss conditions on the ground and current Corps' reservoir release plans and forecasts.

Runoff into the Missouri River basin was slightly above average in 2017. Increased releases through the fall and higher than normal winter releases will ensure the reservoir system will have all flood storage available to start the 2018 runoff season. We realize that the benefits provided by the reservoir system are vitally important to the Nation and the people that live and work in the Basin. We believe that the continued implementation of the Master Manual, and more specifically this AOP, will result in an appropriate balance of benefits provided to all of the people who rely on the reservoir system. Thank you for your interest in the regulation of the mainstem reservoir system.

Sincerely,

Scott A. Spellmon
Major General, US Army
Division Commander

MISSOURI RIVER MAINSTEM RESERVOIR SYSTEM

Annual Operating Plan
2017 - 2018

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ABBREVIATIONS

AOP	-	annual operating plan
ACHP	-	Advisory Council on Historic Preservation
AF	-	acre-feet
B	-	Billion
BiOp	-	Biological Opinion
BOR	-	Bureau of Reclamation
cfs	-	cubic feet per second
Corps	-	Corps of Engineers
CY	-	calendar year (January 1 to December 31)
elev	-	elevation
ESA	-	Endangered Species Act
ft	-	feet
FTT	-	Flow-to-Target
FY	-	fiscal year (October 1 to September 30)
GWh	-	gigawatt hour
ISAP	-	Independent Science Advisory Panel
KAF	-	1,000 acre-feet
kcfs	-	1,000 cubic feet per second
kW	-	kilowatt
kWh	-	kilowatt hour
MAF	-	million acre-feet
MRNRC	-	Missouri River Natural Resources Committee
MRBWMD	-	Missouri River Basin Water Management Division
msl	-	mean sea level
MW	-	megawatt
MWh	-	megawatt hour
NEPA	-	National Environmental Policy Act
plover	-	piping plover
PA	-	Programmatic Agreement
P-S MBP	-	Pick-Sloan Missouri Basin Program
RCC	-	Reservoir Control Center
RM	-	river mile
RPA	-	Reasonable and Prudent Alternative
SHPO	-	State Historic Preservation Officers
SR	-	Steady Release
System	-	Missouri River Mainstem System
tern	-	interior least tern
T&E	-	Threatened and Endangered
THPO	-	Tribal Historic Preservation Officers
USFWS	-	United States Fish and Wildlife Service
WY	-	water year
yr	-	year

DEFINITION OF TERMS

Acre-foot (AF, ac-ft) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or 325,850 gallons.

Cubic foot per second (cfs) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to approximately 7.48 gallons per second or 448.8 gallons per minute. The volume of water represented by a flow of 1 cubic foot per second for 24 hours is equivalent to 86,400 cubic feet, approximately 1.983 acre-feet, or 646,272 gallons.

Discharge is the volume of water (or more broadly, volume of fluid plus suspended sediment) that passes a given point within a given period of time.

Drainage area of a stream at a specific location is that area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the river above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise noted.

Drainage basin is a part of the surface of the earth that is occupied by drainage system, which consists of a surface stream or body of impounded surface water together with all tributary surface streams and bodies of impounded water.

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of hydrologic data are obtained.

Runoff in inches shows the depth to which the drainage area would be covered if all the runoff for a given time period were uniformly distributed on it.

Streamflow is the discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than "runoff" as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

MISSOURI RIVER MAINSTEM RESERVOIR SYSTEM

Annual Operating Plan
2017 – 2018

I. FOREWORD

This Annual Operating Plan (AOP) presents pertinent information and plans for regulating the Missouri River Mainstem Reservoir System (System) through December 2018 under widely varying water supply conditions. It provides a framework for the development of detailed monthly, weekly, and daily regulation schedules for the System's six individual projects during the coming year to serve the Congressionally authorized project purposes; to fulfill the Corps' responsibilities to Native American Tribes; and to comply with environmental laws, including the Endangered Species Act (ESA). Regulation of the System is directed by the Missouri River Basin Water Management Division (MRBWMD), Northwestern Division, U. S. Army Corps of Engineers (Corps) located in Omaha, Nebraska. A map of the Missouri River basin is shown on ***Plate 1*** and the summary of engineering data for the six individual mainstem projects and System is shown on ***Plate 2***.

It is important to note that the AOP is not intended to be a forecast for the coming year; rather it examines a range of potential runoff scenarios which span 80 percent of the historic record. There is still a 10 percent chance that runoff will be higher than shown in the AOP and a 10 percent chance that it will be lower. The studies included in the AOP provide an array of reservoir levels and releases that may be expected under the various runoff scenarios. Actual real-time regulation of the System is accomplished using the best information and tools available and is adjusted to respond to changing conditions on the ground. As the runoff season unfolds, there is a possibility that real-time regulation plans will indicate runoff volumes, reservoir levels and releases outside those anticipated in this report. Should that occur, the Corps will appreciably increase its communication and outreach efforts to convey that information to stakeholders throughout the basin so that other Federal, state and local agencies, Tribes, communities, and local residents can take appropriate actions.

This plan may require adjustments such as when substantial departures from expected runoff occur; to meet emergencies including short-term intrasystem adjustments to protect human health and safety, to maintain minimum river or reservoir levels to keep intakes operational during periods of extended drought, and to prevent loss of historic and cultural properties; or to meet the provisions of applicable laws, including the ESA. These adjustments would be made to the extent possible after evaluating impacts to all System uses, would generally be short-term in nature, and would continue only until the issue is resolved.

This document provides the plan for future regulation of the System. Other documents that may be of interest include the "System Description and Regulation" report dated November 2007 or the "Summary of Actual 2016 Regulation," dated June 2017. Both reports are currently available at the "Reports and Publications" link on our website at: **www.nwd-mr.usace.army.mil/rcc**, or you may contact the Missouri River Basin Water Management Division at 1616 Capitol Avenue, Suite 365, Omaha, Nebraska 68102-4909, phone (402) 996-3841 for copies. The "Summary of Actual 2017 Regulation" will be available at the same site in late spring or early summer of 2018.

II. BACKGROUND AND AOP PROCESS

Beginning in 1953, projected System reservoir regulation for the year ahead was developed annually as a basis for advance coordination with the various interested Federal, state, and local agencies and private citizens. Also beginning in 1953, a coordinating committee was organized to make recommendations on each upcoming year's System regulation. The Coordinating Committee on Missouri River Mainstem Reservoir Operations held meetings semiannually until 1981 and provided recommendations to the Corps. In 1982, the Committee was dissolved because it did not conform to the provisions of the Federal Advisory Committee Act. Since 1982, to continue providing a forum for public participation, one or more open public meetings are held semiannually in the spring and fall. The fall public meetings are conducted to take public input on the draft AOP, which typically is published in mid-September each year. The spring meetings are conducted to update the public on the current hydrologic conditions and projected System regulation for the remainder of the year as it relates to implementing the final AOP.

Under the terms of Stipulation 18 of the March 2004 "Programmatic Agreement for the Operation and Management of the Missouri River Main Stem System for Compliance with the National Historic Preservation Act, as amended" (PA) the Corps has agreed to consult/meet with the affected Tribes and Tribal Historic Preservation Officers (THPOs), State Historic Preservation Officers (SHPOs), the Advisory Council on Historic Preservation (ACHP) and other parties on the draft AOP. The purpose of this consultation/meeting is to determine whether operational changes are likely to cause changes to the nature, location or severity of adverse effects to historic properties or to the types of historic properties affected and whether amendments to the Corps Cultural Resources Management Plans and Five-Year Plan are warranted in order to better address such effects to historic properties. During 2006 the Corps worked with the affected Tribes to establish processes for consultation on AOPs under 36 CFR Part 800, the PA, and Executive Order 13175. The process consists of a series of informational meetings with the Tribes and/or government-to-government consultation with Tribes, as requested. A letter dated September 14, 2017 was sent to the Tribes offering consultation on the 2017-2018 AOP. Meeting times and locations of

the five fall public meetings were also provided. Separate meetings will be scheduled for all Tribes requesting government-to-government consultation. All tribes, whether signatory to the PA or not, may request government-to-government consultation on this and all future AOPs. In addition, the Tribes have reserved water rights to the Missouri River and its major tributaries. In no way does this AOP attempt to define, regulate or quantify water rights or any other rights that the Tribes are entitled to by law or treaty.

The 2017 spring public meetings were held at the following locations and dates: April 11 at Smithville, Missouri and Council Bluffs, Iowa; April 12 at Fort Peck, Montana and Bismarck, North Dakota. The meeting scheduled for April 13 in Pierre, South Dakota was canceled due to inclement weather. The meeting was re-scheduled as a basin-wide conference call held on April 18. The attendees were given an update regarding the outlook for 2017 runoff and projected System regulation for the remainder of 2017. Five fall public meetings on the draft 2017-2018 AOP were held at the following locations: October 17 in Smithville, Missouri and Nebraska City, Nebraska; October 18 in Fort Peck, Montana and Bismarck, North Dakota; and October 19 in Pierre, South Dakota. In the spring of 2018, public meetings will be held to discuss the basin's hydrologic conditions and the effects those conditions are expected to have on the implementation of the final 2017-2018 AOP.

III. MAINSTEM MASTER MANUAL AND ESA CONSULTATIONS

The System is comprised of six dam and reservoir projects authorized by the Rivers and Harbors Act of 1935 and the Flood Control Act of 1944. Section 9 of the 1944 Flood Control Act authorized the System to be operated for the purposes of flood control, navigation, irrigation, hydropower, water supply, water quality control, recreation and fish and wildlife. In addition, operation of the System must also comply with other applicable Federal statutory and regulatory requirements, including the ESA. The System is regulated using guidelines published in the Master Manual. The Master Manual presents the water control plan and operational objectives for the integrated regulation of the System. Annual water management plans (Annual Operating Plans) are prepared each year, based on the water control criteria contained in the Master Manual, in order to describe potential reservoir regulation of the System for the current operating year under a variety of runoff conditions.

First published in 1960 and subsequently revised during the 1970s, the Master Manual was revised in March 2004 to include more stringent drought conservation measures. A 2000 Biological Opinion issued by the U. S. Fish and Wildlife Service (USFWS), while the Corps was revising the Master Manual, concluded that the operation and regulation of the System would jeopardize the continued existence of three endangered or threatened species: the pallid sturgeon, the interior least tern and the piping plover. In 2003 the USFWS amended the BiOp (2003 Amended BiOp) and

provided a Reasonable and Prudent Alternative (RPA) to avoid jeopardy to the endangered pallid sturgeon that included a provision for the Corps to develop a plan to implement a bimodal spring pulse from Gavins Point Dam. Working with the USFWS, Tribes, states and basin stakeholders, the Corps developed technical criteria for the bimodal spring pulse releases. In March 2006 the Master Manual was revised to include technical criteria for a spring pulse. Neither the 2004 Master Manual, nor the 2006 revisions to the Master Manual, changed the volume of storage in the System reserved for flood risk reduction or the basic principles of how that storage is regulated. The Corps does not store water in the reservoirs specifically for the endangered species and the Master Manual storage allocations were not altered to facilitate the spring pulses. In years when water is released for endangered species reservoir storage levels are not adjusted.

Current regulation of the System in accordance with the Master Manual to serve authorized project purposes is dependent on successful implementation of the 2003 Amended BiOp. The Missouri River Recovery Program (MRRP), together with the MRBWMD, works to ensure implementation of the following BiOp elements: habitat construction including emergent sandbar habitat and shallow water habitat, flow modifications, propagation/hatchery support, research, monitoring and evaluation, and adaptive management. Simply put, the Corps must comply with environmental laws including the ESA, and the MRRP is the vehicle used to accomplish this. This AOP identifies flow modifications at Garrison, Fort Randall and Gavins Point for the benefit of the endangered interior least tern (tern) and the threatened piping plover (plover) while maintaining flood control and navigation as primary authorized purposes.

On November 30, 2011 the MRRP Independent Science Advisory Panel (ISAP) released its Final Report on Spring Pulses and Adaptive Management. This report, commissioned by the Missouri River Recovery Implementation Committee (MRRIC), evaluated the Gavins Point spring pulses that have been implemented to date in regards to the biological outcomes the USFWS sought in the 2003 Amended BiOp. The ISAP concluded that spring pulses as currently implemented are not accomplishing their intended outcomes and provided recommendations towards achieving a new management paradigm for the Missouri River.

Since the release of that report, the Corps and USFWS, in coordination with MRRIC, have been aggressively pursuing completing the recommendations laid out by the ISAP. At the center of this effort is the development of a Missouri River Recovery Management Plan/EIS that will establish an overarching adaptive management process for implementation of Corps actions required to avoid jeopardizing all of the listed species in the Missouri River basin. The draft EIS was released for public comment in December 2016 with a final EIS expected in fall 2018. Since the Corps is consulting with the USFWS as this plan is being developed about what management actions are required, the agencies believe it is prudent to forego a spring pulse during the 2018

Missouri River operating season and that this suspension is not likely to have an adverse effect on the listed species.

Additional information on other efforts undertaken through the MRRP to meet the requirements of the 2003 Amended BiOp can be found in the Annual Report on the Biological Opinion which can be found on the "MRRP Documents" page of the MRRP website at: www.moriverrecovery.org. The ISAP report is also available at this website.

IV. ONGOING COORDINATION, STUDIES AND REPORTS

As committed to following the 2011 Flood, the Corps communicated more broadly and frequently in 2017 by holding monthly conference calls from January to July with Federal, state, county and local officials, Tribes, emergency management officials, independent experts and the media to discuss conditions on the ground and the current release plans and forecasts. Recordings of the conference calls were made available to the public. Outreach calls will be re-initiated in January 2018 or as needed if basin and/or weather conditions change dramatically.

The Corps continues to update a number of technical reports used in the regulation of the reservoir system. The "Long-Term Runoff Forecasting" report was completed earlier this year. An additional report that is expected to be initiated in the next year includes an analysis of releases needed to support navigation.

The Corps continues to collaborate with other Federal, state and local agencies and our field offices to improve runoff forecasts, particularly as it relates to plains snowpack. This will require a collaborative effort to improve both data collection (i.e. plains snowpack water equivalent, soil moisture and frost depth) and hydrologic modeling. In 2013 a proposal for the Missouri River basin plains snow and basin condition network was prepared by subject matter experts from various Federal and State agencies. This proposal outlined timelines, costs, and agency responsibilities. The 2014 Water Resources and Reform Development Act (WRRDA 2014, Section 4003a) included authorization, but not funding, for the establishment of the basin monitoring network. Implementation guidance was provided in October 2015, which stated that activities under Section 4003(a) may not be undertaken until funds are specifically appropriated for such purpose. The Water Resources Development Act of 2016 (WRDA 2016, Section 1179a) amended WRRDA 2014, Section 4003a, and established the Corps as the lead agency for snowpack and drought monitoring in the upper Missouri River basin. The Government Accountability Office (GAO) submitted a report to Congress in June 2015 stating that the progress has been limited, primarily due to lack of funding.

The Water Management office continues to participate in a variety of regional and national climate change teams. The National Oceanic and Atmospheric Administration (NOAA) also collaborated with the Corps and other agencies on a three-part study. The first part was a climate attribution effort focusing on the 2011 event. The second part of the study was an assessment of the skill and reliability of predictions of seasonal climate and the ability to predict rapid transitions of cycles from wet to dry and dry to wet. In July 2016, NOAA and the University of Colorado's Cooperative Institute for Research in Environmental Sciences completed the third part of the study, "Climate Assessment Report: Causes for Hydrologic Extremes in the Upper Missouri River Basin." All three reports are available at https://www.drought.gov/drought/dews/missouri-river-basin/reports-assessments-and-outlooks.

V. FUTURE RUNOFF: AUGUST 2017 - DECEMBER 2018

Runoff into the six System reservoirs is typically low and relatively stable during the August through February period. The August 1 calendar year runoff forecast is used as input to the basic reservoir regulation simulation (Basic) in the AOP studies for the period August 2017 through February 2018. The August 1 runoff forecast for 2017 was 27.9 million acre-feet (MAF). Two other runoff scenarios based on the August 1 runoff forecast were developed for the same period. These are the Upper Basic (wetter than forecast) and Lower Basic (drier than forecast) simulations. The Upper and Lower Basic simulations are based on a percentage of the Basic runoff. The adjusted Upper and Lower Basic values for each month and reach are shown as percentages in ***Tables I*** and ***II***. The percentages shown are used for the August through February period in the AOP simulations. These percentages are also used in the regularly updated monthly reservoir simulations. The report detailing the computation of these runoff factors was posted to the Corps' website in January 2015.

TABLE I
UPPER BASIC RUNOFF PERCENTAGES

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fort Peck	120	120	135	145	135	145	145	130	120	120	120	120
Garrison	120	120	135	145	135	145	145	130	120	120	120	120
Oahe	140	140	150	155	155	145	140	135	135	135	135	135
Fort Randall	140	140	150	155	155	145	140	135	135	135	135	135
Gavins Point	140	140	150	155	155	145	140	135	135	135	135	135
Sioux City	140	140	150	155	155	145	140	135	135	135	135	135

TABLE II
LOWER BASIC RUNOFF PERCENTAGES

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Fort Peck	80	75	65	65	70	65	65	70	75	80	80	80
Garrison	80	75	65	65	70	65	65	70	75	80	80	80
Oahe	75	75	55	50	50	50	55	65	75	75	75	75
Fort Randall	75	75	55	50	50	50	55	65	75	75	75	75
Gavins Point	75	75	55	50	50	50	55	65	75	75	75	75
Sioux City	75	75	55	50	50	50	55	65	75	75	75	75

Simulations for the March 1, 2018 to February 28, 2019 time period use five statistically derived runoff scenarios based on an analysis of historic water supply. The report detailing the development of these runoff scenarios, "Runoff Volumes for Annual Operating Plan Studies", was updated in August 2013 to include five additional years of runoff data that now extends from 1898 to 2011. In addition to the five runoff scenarios, the updated analysis added two runoff scenarios, one each at the upper and lower end, to span 96 percent of the historic record. Using statistically derived runoff scenarios for the AOP provides a good range of simulation for dry, average, and wet conditions, and eliminates the need to forecast future precipitation months in advance. As noted in the second NOAA study (see Chapter IV), for the lead times (one to six months) and times of year of interest (January-February-March and April-May-June) in the Missouri River basin, there is no useful skill and reliability of precipitation forecasts. Real-time regulation of the System is based on all available and relevant hydrometerological information including, but not limited to, observed runoff volumes, National Weather Service short- and long-range outlooks, plains and mountain snow water equivalent data, observed base flows, soil moisture, and soil frost depths.

The five statistically derived runoffs used in the AOP are identified as the Upper Decile, Upper Quartile, Median, Lower Quartile and Lower Decile runoff conditions. Upper Decile runoff (34.5 MAF) has a 1 in 10 chance of being exceeded, Upper Quartile runoff (30.6 MAF) has a 1 in 4 chance of being exceeded, and Median runoff (24.6 MAF) has a 1 in 2 chance of being exceeded. Lower Quartile runoff (19.3 MAF) has a 1 in 4 chance of the occurrence of less runoff, and Lower Decile runoff (16.1 MAF) has a 1 in 10 chance of the occurrence of less runoff. There is still a 20 percent chance that a runoff condition may occur that has not been simulated; i.e., a 10 percent chance runoff could be lower than Lower Decile and a 10 percent chance runoff could be greater than Upper Decile.

The two additional runoff volumes included in the updated "Runoff Volumes for Annual Operating Plan Studies" report are the 2 percent and 98 percent exceedance levels. Annual runoff at the 2 percent exceedance (40.1 MAF) has a 1 in 50 chance of being exceeded; the 98 percent exceedance (11.4 MAF) has a 1 in 50 chance of the occurrence of less runoff. Although these runoff volumes were not included as

scenarios in this year's AOP, additional monthly studies could be performed based on these runoff volumes, or any prior year's runoff volume and distribution, as the 2018 runoff season unfolds should the runoff forecast exceed the Upper Decile runoff scenario or be lower than the Lower Decile runoff.

The Upper Decile and Upper Quartile simulations extend from the end of the Upper Basic simulation through February 2019. Likewise, the Median simulation extends from the end of the Basic simulation, and the Lower Quartile and Lower Decile simulations extend from the end of the Lower Basic simulation through February 2019.

The estimated natural flow at Sioux City, the corresponding post-1949 water use effects, and the net flow available above Sioux City are shown in ***Table III,*** where water supply conditions are quantified for the period August 2017 through February 2019. The natural water supply for calendar year (CY) 2016 totaled 24.1 MAF.

TABLE III
NATURAL AND NET RUNOFF AT SIOUX CITY
(Volumes in 1,000 Acre-Feet)

	Natural 1/	Post-1949 Depletions	Net 2/
August 2017 through February 2018 (Basic Runoff Scenario)			
Basic	6,800	800	7,600
Upper Basic	8,600	800	9,400
Lower Basic	5,200	400	5,600
Runoff Year March 2018 through February 2019 (Statistical Analysis of Past Records)			
Upper Decile	34,500	-3,000	31,500
Upper Quartile	30,600	-2,800	27,800
Median	24,600	-2,900	21,700
Lower Quartile	19,300	-2,800	16,500
Lower Decile	16,100	-2,700	13,400

1/ The word "Natural" is used to designate runoff adjusted to the 1949 level of basin development, except that regulation and evaporation effects of the Fort Peck reservoir have also been eliminated during its period of regulation prior to 1949.

2/ The word "Net" represents the total runoff after deduction of the post-1949 irrigation, upstream storage, and other use effects.

VI. ANNUAL OPERATING PLAN FOR 2017-2018

A. General. The anticipated regulation described in this AOP is designed to meet the regulation objectives presented in the current Master Manual. While some aspects of System and individual project regulation are clearly defined by technical criteria in the Master Manual, for example navigation service level and season length, others such as minimum releases for irrigation and water supply in the reaches between the reservoirs are based on regulation experience and may be adjusted as needed to respond to changing conditions. Consideration has been given to all of the authorized project purposes, to historic and cultural resources and to the needs of threatened and endangered (T&E) species. The "System Description and Regulation" report provides a concise summary of the primary aspects of System regulation and should be referred to for further information. For ease of use, a summary of the frequently used technical criteria included in the Master Manual is presented on ***Plate 3.***

The plan relies on a wealth of regulation experience. Reservoir regulation experience available for preparation of the 2017-2018 AOP includes 13 years of regulation at Fort Peck (1940) as the sole Mainstem project, plus 64 years of System experience as Fort Randall (1953), Garrison (1955), Gavins Point (1955), Oahe (1962), and Big Bend (1964) were brought progressively into System regulation. This regulation experience includes lessons learned during two major droughts of six and eight years (1987-1992 and 2000–2007) that have occurred since the System filled in 1967. It also includes the high runoff period 1993–1999 during which five of the seven years experienced runoff greater than Upper Quartile including the previous record runoff of 49.0 MAF in 1997, and the record runoff of 61.0 MAF in 2011. In addition to the long period of actual System reservoir regulation experience, many background regulation studies for the completed System are available for reference.

B. 2017-2018 AOP Simulations. Reservoir simulations for the Upper Basic, Basic, and Lower Basic runoff scenarios, which span the period of August 2017 through February 2018, are shown in the final section of this AOP as studies 1 through 3. AOP simulations for the five statistically derived runoff scenarios, which span the period of March 2018 through February 2019 are shown in the final section of this AOP as studies 4 through 8. As previously stated, the simulations use five statistically derived runoff scenarios and reflect 80 percent of the historic annual runoff volumes (between Upper Decile and Lower Decile). The simulations provide information for planning purposes on a range of future reservoir levels and release rates, and are not meant to represent a particular forecast. The simulations shown use a monthly time-step, and thus do not provide the level of detail necessary to address specific flood control regulations. Detailed routing of specific flood flows is accomplished using daily and hourly time-step models which incorporate real-time information including observed precipitation, and these situations are handled individually during real-time regulation.

The AOP studies, in summary, provide the following: the full flood control capacity of the reservoir system will be available at the start of the runoff season; use of the Exclusive Flood Control Zone is not anticipated under any of the five runoff scenarios covered in the AOP; full service flow support for all runoff scenarios to start the navigation season; full service flow support for Median and above runoff scenarios after the July 1 System storage check and reduced flow support for Lower Quartile and Lower Decile runoff; a full length navigation season for all runoff scenarios; near normal winter releases for Median runoff, minimum winter releases for Lower Quartile and Lower Decile runoff, and above normal winter releases for Upper Decile and Upper Quartile runoff; a steady release-flow to target regulation during the tern and plover nesting season for Median and below runoff and nearly steady releases for Upper Decile and Upper Quartile runoff with flood water evacuation; emphasis on Garrison for steady to rising reservoir levels during the forage fish spawn; and reservoir releases and pool levels sufficient to keep all intakes operational under all runoff scenarios. Water conservation measures may be implemented if runoff conditions indicate that it would be appropriate including cycling releases from Gavins Point during the early part of the nesting season, only supporting flow targets in reaches being used by commercial navigation, and utilization of the Kansas River projects authorized for Missouri River navigation flow support. Additional details about the studies are provided in the following paragraphs. Results of the simulations are shown in ***Plate 4*** and ***Plate 5*** for the System storage and the Fort Peck, Garrison and Oahe pool elevations.

Under all runoff scenarios modeled for the AOP, the full flood control capacity of the System is available at the start of the 2018 runoff season. In addition, under the Lower Basic simulation, system storage will begin the runoff season below the base of the Annual Flood Control and Multiple Use Zone. Although the March 1 and May 1 System storage is above the Gavins Point spring pulse precludes of 40.0 MAF, as discussed in Chapter III, spring pulses will not be conducted in 2018. The Corps will continue to work closely with the USFWS to ensure the AOP will meet the intent of the 2003 Amended BiOp and comply with the ESA.

The March 15 and July 1 System storage checks were used to determine the level of flow support for navigation and other downstream purposes as well as the navigation season length in 2018. Full service navigation flows or more are provided for Median and above runoff throughout the navigation season. Service levels for Lower Quartile and Lower Decile start the season at full service, and drop slightly following the July 1 System storage check (see ***Plate 3***). Application of the July 1 System storage check indicated that a full length navigation season would be provided for all five runoff conditions, with the upper two runoff scenarios including a 10-day extension to the navigation season. Upper Quartile and Upper Decile simulations reach the desired 56.1 MAF System storage level on March 1, 2019. Storage is below the base of the Annual Flood Control and Multiple Use Zone for Median and lower runoff conditions.

For modeling purposes in this AOP, the Steady Release – Flow-to-Target (SR-FTT) regulation scenario for Gavins Point is shown during the 2018 tern and plover nesting season for Median and lower runoff conditions. For these simulations, the monthly average May release used in the simulations was determined by using the long-term average May release (see ***Plate 3***), based on the service level, for the first third of the month, followed by the July table values for the remainder of the month to reflect a steady release regulation at the start of the nesting season. The modeled June release was set equal to the long-term average release for July (see ***Plate 3***) based on the service level for the first half of the navigation season. The long-term average releases (see ***Plate 3***) were used for July and August to indicate flowing to target. The Upper Decile and Upper Quartile runoff simulations follow the Master Manual, with much above normal runoff requiring release increases mid-year to evacuate flood water from the reservoirs. Although these modeled Gavins Point releases represent the best estimate of required releases during 2018, actual releases will be based on hydrologic conditions and the availability of habitat at that time. To the extent reasonably possible, measures to minimize incidental take of the protected species will be utilized. These may include not meeting flow targets in reaches without commercial navigation and utilizing the Kansas River tributary reservoirs for navigation flow support when appropriate. It may also be necessary to cycle releases for flood control regulation during the T&E species' nesting season or for water conservation if drought conditions develop.

The long-term average Gavins Point releases to meet target flows were used in the AOP studies for navigation support during the spring and fall months with the exception of Upper Decile and Upper Quartile. Under these runoff scenarios, releases were based on flood water evacuation. Based on the September 1 storage checks and flood evacuation criteria, modeled Gavins Point winter releases range from 17,000 cfs to 20,000 cfs during the 2017-2018 winter season and range from 12,500 cfs to 20,000 cfs during the 2018-2019 winter season depending on the runoff scenario. Gavins Point releases will be increased to meet downstream water supply requirements in critical reaches, to the extent reasonably possible, if downstream incremental runoff is low.

The Gavins Point releases shown in this and previous AOPs are estimates based on historic averages and experience. Adjustments are made as necessary in real-time based on hydrologic conditions.

Intrasystem releases are adjusted to best serve the multiple purposes of the projects with special emphasis placed on regulation for non-listed fisheries starting in early April and for T&E bird species beginning in early May and continuing through August. As part of the overall plan to rotate emphasis among the upper three reservoirs during low runoff years, Garrison is scheduled to be favored during the 2018 forage fish spawn while also attempting to maintain rising water levels at Fort Peck and Oahe. The Median, Upper Quartile, and Upper Decile simulations show that it is

possible to provide steady-to-rising pool levels in each of the three large upper reservoirs during the spring forage fish spawn period. Insufficient runoff is available in the Lower Quartile and Lower Decile simulations to keep all three reservoirs rising. In the Lower Quartile and Lower Decile simulations, the Fort Peck and Garrison reservoir levels decline slightly in April but rise in May. The Oahe reservoir level declines in April and May in the Lower Quartile and Lower Decile runoff simulations.

Intrasystem releases are also adjusted so that the upper three reservoirs are shown in a balanced condition each year on March 1, the approximate start of the runoff season. This balancing is computed based on the percent of storage in the respective Carryover Multiple Use Zones.

Actual System regulation from January 1 through July 31, 2017 and the simulated regulating plans for each project through CY 2018 using the five runoff scenarios described on Page 4 are presented on ***Plate 6*** through ***Plate 11***, inclusive. Big Bend regulation is omitted since storage at that project is relatively constant and average monthly releases are essentially the same as those at Oahe. These plates also show, on a condensed scale, actual regulation since 1953.

Plate 12 illustrates Fort Peck, Garrison, Oahe, and Gavins Point actual releases (Regulated Flow) as well as the Missouri River flows that would have resulted if the reservoirs were not in place (Unregulated Flow) during the period January 2016 through July 2017. ***Plate 13*** presents past and simulated gross average monthly power generation and gross peaking capability for the System.

C. <u>Regulation Plan for the Balance of the 2017 Navigation Season and Fall of 2017.</u> The regulation of the System for the period of August through November 2017 is presented in the following paragraphs.

<u>Fort Peck</u>. Releases averaged about 10,000 cfs through mid-September and were then lowered to 6,000 cfs as irrigation ceased. Releases were held near that level through the end of November. The Fort Peck pool slowly declined through the fall, ending the month of November at 2236.0 feet or 2.9 feet below the August 1 elevation of 2238.9 feet.

<u>Garrison</u>. A steady release was made from Garrison near the end of August so that a water surface profile could be performed in the reach downstream of Garrison. The threatened least terns and endangered piping plovers were fledged by that time and hydropower peaking restrictions for the birds were discontinued. Releases were maintained near 33,000 cfs through early September, then decreased to 20,000 cfs and held steady through early October. This provided a window of time for satellite imagery to be taken in the reach downstream of Garrison. Releases were then lowered to 15,000 cfs and held steady through the end of November. The Garrison pool steadily

dropped through September before slowing down and nearly leveling off during October and November. The reservoir ended November at 1841.8 feet or 4.4 feet below the August 1 elevation of 1846.2 feet.

Oahe. The reservoir started the month of August at elevation 1610.2 feet. Releases averaged 29,700 cfs in August and 25,100 cfs in September in support of navigation and to evacuate the annual flood control pool. Releases were reduced to 17,500 cfs in October and 22,400 cfs in November, respectively to accommodate the fall drawdown of the Fort Randall pool and to continue evacuation of stored water. At the end of November, the Oahe pool was at elevation 1608.3 feet or 1.9 feet below the August 1 elevation.

Big Bend. Releases generally parallel those from Oahe. The Big Bend pool generally fluctuates between 1420.0 feet msl and 1421.0 feet msl for weekly cycling during high power load periods.

Fort Randall. Releases averaged 29,400 cfs in August, 30,000 cfs in September, and 26,300 cfs in October to back up the releases from Gavins Point. The fall pool drawdown of Fort Randall started after Labor Day in early September and was completed at the beginning of December. Releases were reduced after the navigation season ended to the level required to back up Gavins Point winter releases.

Gavins Point. Releases were scheduled to support downstream full service flows in reaches with scheduled commercial navigation throughout the 2017 navigation season. A full length navigation season, plus a 10-day extension, was provided in accordance with the technical criteria for the July 1 System storage check presented in the Master Manual. In accordance with the Master Manual, during years of greater than normal water supply, the navigation season is extended as both an additional evacuation measure and to provide an increased benefit to navigation while striving to reach the base of the Annual Flood Control and Multiple Use Zone by March 1 the following season. The closing dates for the commercial navigation season ranged from December 2 at Sioux City, Iowa to December 11 at the mouth near St. Louis, Missouri. Releases were reduced beginning on December 4, working toward the target winter release. The Gavins Point pool level will be raised 1.5 feet to elevation 1207.5 feet msl in the fall. The pool level will remain near that elevation during the winter months.

D. Regulation Plan for Winter 2017-2018. The regulation of the System presented in the following paragraphs is based on the previously discussed AOP simulations. Actual real-time regulation of the System is adjusted to respond to changing conditions on the ground. The latest long-term reservoir regulation forecasts, which are updated monthly, can be found on the Corps' website. The September 1 System storage check is used to determine the winter release rate from Gavins Point. A winter release of 12,000 cfs is scheduled if System storage is less than 55.0 MAF on September 1; 17,000 cfs is

scheduled when System storage is above 58.0 MAF; and the release is prorated for System storages between 55.0 and 58.0 MAF. A modification to the winter release rate from Gavins Point dam may occur when the evacuation of System flood control storage cannot be accomplished by providing a full-service navigation season with a 10-day extension of the navigation season. With an excess annual water supply, the winter season Gavins Point release may be scheduled at a rate of up to 25,000 cfs to continue to evacuate the remaining excess water in System flood control storage. Based on the studies included in this AOP, the scheduled winter System release for 2017-2018 will be at least 17,000 cfs. Under the Upper Basic forecast releases are set at 20,000 cfs. It is anticipated that this year's winter release will be adequate to complete evacuation of stored flood waters and serve all downstream water intakes. Water supply is discussed in more detail in Chapter VII, Section B.

Fort Peck. Releases are expected to average 8,000 cfs in December and 9,000 cfs in January and February to serve winter power loads and to help balance System storage. The Fort Peck pool level is expected to decline about 1.3 feet from December through February to near elevation 2234.0 feet by March 1. At the beginning of March, the Fort Peck pool will be at the base of its Annual Flood Control and Multiple Use Zone.

Garrison. Releases are scheduled to average 19,000 cfs in December increasing to 22,500 cfs for January and February to serve winter power loads and to help balance System storage. Releases will be held steady or lowered, most likely in December, to prevent ice-induced flooding at the time of freeze-in and then gradually increased as river conditions permit. These temporary reductions in the releases may be scheduled to prevent exceedance of a 13-foot stage at the Missouri River at Bismarck streamgaging station. The Bismarck flood stage is 14.5 feet. Water Management staff will coordinate closely with other Federal, state and local agencies during periods of freeze-in and ice-out to reduce flood risk and ensure communities and local residents are aware of the rapidly changing conditions and are prepared to take appropriate actions. The Garrison pool level will decline 3.9 feet from elevation 1841.4 feet at the end of November to near elevation 1837.5 feet by March 1, the base of its Annual Flood Control and Multiple Use Zone.

Oahe. Releases for the winter season will provide backup for the Fort Randall and Gavins Point releases as well as refill the recapture space available in the Fort Randall reservoir consistent with anticipated winter power loads. Monthly average releases may vary substantially with fluctuations in power loads occasioned by weather conditions but, in general, are expected to average between 19,300 cfs and 22,000 cfs. Daily and hourly releases will vary widely to best meet power loads. Peak hourly and minimum hourly releases, as well as daily energy generation, will be constrained to prevent urban flooding in the Pierre and Fort Pierre areas if severe ice conditions develop downstream of Oahe Dam. This potential reduction is coordinated with the Western Area Power Administration (Western). The Oahe pool level is expected to

slowly decline from 1607.3 feet at the end of November to 1607.0 feet at the end of December, hold steady through January before rising to 1607.5 feet by the end of February, the base of its Annual Flood Control and Multiple Use Zone.

Big Bend. The Big Bend pool level will be maintained in the normal 1420.0 feet to 1421.0 feet range during the winter.

Fort Randall. Releases will average about 16,500 cfs during the winter season to support Gavins Point winter releases. The Fort Randall pool level is expected to rise from its fall drawdown elevation of near 1337.5 feet at the end of November or early December to near elevation 1350.0 feet, the seasonal base of flood control, by March 1. However, if the plains snowpack flood potential downstream of Oahe Dam is lower than normal, the Fort Randall pool level will be raised to near 1353.0 feet by March 1. It is likely that a pool level as high as 1355.0 feet could be reached by the end of March if spring runoff has commenced. The Fort Randall pool level above the White River delta near Chamberlain, South Dakota will remain at a higher elevation than the pool level below the delta from early October through December, due to the damming effect of this delta area.

Gavins Point. Gavins Point winter releases are discussed in the first paragraph of this section. The Gavins Point pool level will be near elevation 1207.5 feet until late February when it will be lowered to elevation 1206.0 feet to create additional capacity to store spring runoff.

System storage for all runoff conditions will range between 54.1 and 56.1 MAF by the beginning of next year's runoff season, approximately March 1, 2018. The base of the Annual Flood Control and Multiple Use Zone is 56.1 MAF.

E. Regulation During the 2018 Navigation Season. All five runoff scenarios modeled for this year's AOP follow the technical criteria presented in the current Master Manual for downstream flow support. Beginning in mid-March, Gavins Point releases will be gradually increased to provide navigation flow support at the mouth of the Missouri near St. Louis, Missouri by April 1, 2018, the normal navigation season opening date. The corresponding dates at upstream locations are Sioux City, March 23; Omaha, March 25; Nebraska City, March 26; and Kansas City, March 28. However, if during the 2018 navigation season there is no commercial navigation scheduled to use the upper reaches of the navigation channel, MRBWMD will consider not providing navigation flow support in those reaches to conserve water in the System, reduce flood risk, and/or minimize incidental take of the protected species during the nesting season.

Navigation flow support for the 2018 season will be determined by actual System storage on March 15 and July 1. Runoff scenarios modeled indicate full service flow

support at the start of the 2018 navigation season for all runoff conditions. Following the July 1 System storage check, full service would be provided for Median and above runoff scenarios. The service level would be 1,200 cfs below full service for Lower Quartile runoff and 2,400 cfs below full service for Lower Decile runoff. The normal 8-month navigation season is provided for Median runoff scenarios and below as shown in ***Table IV***. A 10-day extension to the navigation season is provided for the upper two runoff scenarios.

TABLE IV
NAVIGATION SERVICE SUPPORT
FOR THE 2018 SEASON

	Runoff Scenario (MAF)	System Storage March 15 (MAF)	System Storage July 1 (MAF)	Flow Level Above or Below Full Service (cfs) Spring	Flow Level Above or Below Full Service (cfs) Summer/Fall	Season Shortening (Days)
U.D.	34.5	57.4	64.0	0	+19,000	0*
U.Q.	30.6	57.2	63.1	0	+12,000	0*
Med.	24.6	57.0	60.7	0	0	0
L.Q.	19.3	54.6	55.7	0	-1,200	0
L.D.	16.1	54.6	54.4	0	-2,400	0

*Includes 10-day extension for Upper Quartile and Upper Decile.

As previously stated, the modeled regulation for the 2018 nesting season below Gavins Point is SR-FTT. When the SR-FTT release scenario is used, the initial steady release, which has ranged from 24,000 cfs to 33,000 cfs over the last several years, will be based on hydrologic conditions and the availability of habitat at that time. Model runs included in this AOP have a Gavins Point release which is higher during the last 20 days of May to keep birds from nesting at low elevations. Gavins Point releases will be adjusted to meet downstream targets as tributary flows recede, but ideally the initial steady release will be sufficient to meet downstream targets until the majority of the birds have nested. The purpose of this regulation is to continue to meet the project purposes while minimizing the loss of nesting T&E species. A Gavins Point peaking cycle of two days down and one day up may be used for flood control regulation or to conserve water in the upper three reservoirs, if required. Gavins Point releases for the Upper Decile and Upper Quartile runoff simulations are much above normal to evacuate flood water from the reservoirs. Releases from Garrison and Fort Randall will follow repetitive daily patterns from early May, at the beginning of the T&E species' nesting season, to the end of the nesting season in late August. In addition to the intra-day pattern, Fort Randall releases may also be cycled with two days of lower releases and one day of higher releases during the early part of the nesting season to maintain release flexibility in that reach while minimizing the potential for take. If higher daily

releases are required later in the nesting season, the daily peaking pattern may be adjusted, reduced or eliminated resulting in a steady release to avoid increased stages at downstream nesting sites.

Gavins Point releases may be quite variable during the 2018 navigation season but are expected to range from 26,000 to 51,000 cfs under the five modeled runoff scenarios. Release reductions necessary to minimize downstream flooding are not reflected in the monthly averages shown in the simulations but will be implemented as conditions warrant. Reductions in System releases to integrate the use of downstream Missouri River flow support from the designated Kansas River projects (Milford, Tuttle Creek and Perry) authorized to provide Missouri River navigation flow support have not been modeled since they are based on downstream hydrologic conditions. However, this storage will be utilized to the extent possible as a water conservation measure, or to minimize incidental take of protected species during the nesting season if conditions indicate it is prudent to do so. Simulated storages and releases for the System and individual reservoirs within the System are shown on ***Plate 6*** through ***Plate 11.*** As experienced in 2011, runoff above or below simulated levels can occur and result in releases beyond those modeled for the AOP. As previously stated, should that occur, the Corps will increase its efforts to convey that information throughout the basin so that state, Tribal, and local agencies, communities, and local residents can take appropriate action.

F. <u>Regulation Activities for T&E Species and Fish Propagation Enhancement.</u> The ability to provide steady-to-rising pool levels in the upper three reservoirs in low runoff years is very dependent on the volume, timing, and distribution of runoff. The reservoir regulation simulations presented in this AOP for the Upper Decile, Upper Quartile, and Median runoff scenarios show that steady-to-rising pool levels would occur during the spring fish spawn period for the upper three reservoirs. As part of the overall plan to rotate emphasis among the upper three reservoirs during low runoff years, Garrison is scheduled to be favored during the 2018 forage fish spawn if runoff is below the Median runoff scenario. This will be accomplished by setting releases at Fort Peck and Garrison at a level that would attempt to maintain a rising Garrison pool, but no less than the minimum required for downstream water supply requirements, including irrigation. These adjustments may be restricted when the terns and plovers begin nesting in May. The studies show that Garrison pool levels drop in April for both the Lower Quartile and Lower Decile runoff scenarios but then rise from May through June for both runoff scenarios. Fort Peck pool levels also drop in April for both lower runoff scenarios but then rise from May through June. Oahe pool levels fall during the April through June period for both the Lower Quartile and Lower Decile runoff scenarios. If drought conditions develop, emphasis during the fish spawn will be rotated among the upper three reservoirs and may also be adjusted to be opportunistic in regard to runoff potential. The upper three reservoirs will be managed to benefit

forage fish to the extent reasonably possible, while continuing to serve the other Congressionally authorized project purposes.

Fort Peck. The repetitive daily pattern of releases from Fort Peck has not been implemented since the 2004 tern and plover nesting season. This adaptive management decision was made based on data collected during previous nesting seasons. In recent years, birds in this reach have nested on available high elevation habitat, and thus were not expected to be impacted by the potential range of releases from Fort Peck during the summer. Releases during the 2018 nesting season will not be restricted by the repetitive daily pattern unless habitat conditions or nesting patterns warrant a change.

If high tributary flows enter the Missouri River below the project during the nesting season, hourly releases will generally be lowered to no less than 3,000 cfs in order to keep traditional riverine fish-rearing areas continuously inundated, while helping to lower river stages at downstream nesting sites. In rare instances releases below 3,000 cfs may be scheduled for flood damage reduction. April releases are expected to be adequate for trout spawning below the project.

Maintaining a rising Fort Peck pool level will be dependent upon the daily inflow pattern to the reservoir. The reservoir rises in April and May for Median and above runoff scenarios, but declines slightly in April under both lower runoff scenarios.

Garrison. As in previous years, releases from Garrison will follow a repetitive daily pattern during the T&E nesting season to limit peak stages below the project for nesting birds. Releases are scheduled to be 1,000 cfs lower in July and early August than the June releases to enhance conditions for the fledging of chicks. High elevation nesting habitat is expected to be sufficient below Garrison Dam during the 2018 nesting season.

During 2018, coldwater habitat in Garrison should be adequate for all runoff scenarios. Coldwater habitat will continue to be monitored during the year and adjustments will be considered if conditions warrant.

A steady-to-rising pool at Garrison during the fish spawn in April and May will be dependent upon the daily inflow pattern to the reservoir. The reservoir rises in April and May for Median and above runoff scenarios, but declines in April before rising in May under both lower runoff scenarios.

Oahe. Releases in the spring and summer will back up those from Gavins Point. The pool level should be steady to rising in the spring during the fish spawn for Median and above runoff scenarios. Under the Lower Quartile and Lower Decile runoff scenarios, the Oahe pool would decline in April and May, dropping 2.0 and 2.7 feet, respectively.

Fort Randall. To the extent reasonably possible, Fort Randall will be regulated to provide for a pool elevation near 1355.0 feet during the fish spawn period, provided water can be supplied from other reservoirs for downstream uses. The pool will not be drawn down below elevation 1337.5 feet in the fall to ensure adequate supply for water intakes. As a measure to minimize take while maintaining the flexibility to increase releases during the nesting season, hourly releases from Fort Randall will follow a repetitive daily pattern to limit peak stages below the project for nesting birds. Daily average flows may be increased every third day to preserve the capability of increasing releases later in the summer with little or no incidental take if drier downstream conditions occur. If higher daily releases are required later in the nesting season, the daily peaking pattern may be adjusted, reduced or eliminated resulting in a steady release to avoid increased stages at downstream nesting sites. Periods of zero release will be minimized to the extent reasonably possible during the nesting season given daily average releases, real-time hydrologic conditions, and System generating constraints as defined in coordination with Western.

Gavins Point. As detailed in Section III of this report, the Corps does not plan to implement the bimodal spring pulse from Gavins Point for the benefit of the endangered pallid sturgeon under any runoff scenarios in 2018.

While less habitat is available than the previous few years, it is anticipated that a sufficient amount of habitat to provide for successful nesting will be available at elevations above the planned release rates for all runoff conditions. This expectation is based on the high elevation habitat resulting from the record releases in 2011 and the resultant habitat observed yet in 2017. Releases from Gavins Point may follow the flow-to-target (FTT) release scenario or the SR-FTT scenario. The FTT scenario limits releases from Gavins Point to those needed to meet downstream targets. The actual release scenario will be evaluated when birds begin nesting in early May. If monitoring determines that nests are likely to be initiated at a lower elevation which would be inundated later in the summer, a SR-FTT release scenario may be implemented. A full description of these release scenarios can be found in the Master Manual. Actual releases will be based on hydrologic conditions and the availability of habitat at that time.

All reasonable measures to minimize the loss of nesting T&E bird species will be used. While not anticipated because of the quantity of high elevation habitat available, these measures include, but are not limited to, a relatively high initial steady release during the peak of nest initiation, the use of the three designated Kansas River basin reservoirs for Missouri River navigation flow support, moving nests to higher ground, and monitoring nest fledge dates to determine if delaying an increase a few days might allow threatened chicks to fledge. The location of navigation tows and river conditions at intakes would also be monitored to determine if an increase could be temporarily

delayed without impact. Cycling releases every third day may be used to conserve water early in the nesting season if extremely dry conditions develop. In addition, cycling may be used during downstream flood control regulation.

The Gavins Point pool will be regulated near 1206.0 feet in the spring and early summer, with minor day-to-day variations due to incremental inflows between Fort Randall and Gavins Point resulting from rainfall runoff. Several factors can limit the ability to protect nests from inundation in the upper end of the Gavins Point pool. First, because there are greater numbers of T&E bird species nesting below Gavins Point, regulation to minimize incidental take usually involves restricting Gavins Point releases, which means that the Gavins Point pool can fluctuate significantly due to increased runoff from rainfall events. Second, rainfall runoff between Fort Randall and Gavins Point can result in relatively rapid pool rises because the Gavins Point project has a smaller storage capacity than the other System reservoirs. And third, the regulation of Gavins Point for downstream flood control may necessitate immediate release reductions to reduce downstream damage. When combined, all these factors make it difficult, and sometimes impossible, to prevent inundation of nests in the upper end of the Gavins Point reservoir. However, because of the quantity of habitat expected we do not anticipate a large number of nests being inundated. The pool will be increased to elevation 1207.5 feet late in August or early September when it is determined that there are no terns or plovers nesting along the reservoir.

G. <u>Regulation Activities for Historic and Cultural Properties.</u> As acknowledged in the 2004 Programmatic Agreement (PA) for the Operation and Management of the Missouri River Main Stem System, wave action and fluctuation in the level of the reservoirs results in erosion along the banks of the reservoirs. The Corps will work with the Tribes utilizing 36 CFR Part 800 and the PA to address the exposure of historic and cultural sites. The objective of a programmatic agreement is to deal "…with the potential adverse effects of complex projects or multiple undertakings…" The PA objective was to collaboratively develop a preservation program that would avoid, minimize and/or mitigate adverse effects along the System reservoirs. All tribes, whether signatory to the PA or not, may request government-to-government consultation on the regulation of the System and the resulting effect on historic and cultural properties and other resources.

Pool levels at the upper three reservoirs will likely be near normal or slightly below normal in 2018 but will vary depending on runoff conditions. Continuing exposure of cultural sites along the shoreline is still possible. Actions to avoid, minimize or mitigate adverse impacts and expected results of the actions are covered under Chapter VII of this AOP. ***Plate 16*** shows the locations of the Tribal Reservations.

<u>Fort Peck</u>. Depending on runoff in the Missouri River basin, System regulation during 2018 could result in a Fort Peck pool elevation variation from a high of 2243 feet

msl to a low of 2220 feet msl. This is based on the Upper and Lower Decile runoff scenarios (see ***Plate 8*** and the studies included at the end of this report). Based on a review of existing information, approximately 13 known sites could be affected during this period.

Garrison. Based on the Upper and Lower Decile runoff scenarios (see ***Plate 9*** and the studies included at the end of this report), Garrison pool elevations could range between 1847 and 1826 feet msl during 2018. Based on a review of existing information, approximately 52 known sites could be affected during this period.

Oahe. At the Oahe reservoir, the System regulation under the Upper and Lower Decile runoff scenarios could result in pool elevations ranging from 1616 to 1592 feet msl (see ***Plate 10*** and the studies included at the end of this report). Based on a review of existing information, approximately 197 known sites could be affected during this period.

Big Bend. System regulation will be adjusted to maintain the Big Bend pool level in the normal 1420 to 1421 feet msl range during 2018. Short-term increases above 1421 due to local rainfall may also occur. Based on a review of existing information, no known sites will be affected during this period.

Fort Randall. As part of the normal System regulation, the Fort Randall pool elevations will vary between 1350 and 1355 feet msl during the spring and summer of 2018 (see ***Plate 11*** and the studies included at the end of this report). Short-term increases above 1355 feet msl due to local rainfall may occur. The annual fall drawdown of the reservoir to elevation 1337.5 feet msl will begin prior to the close of the navigation season and will be accomplished by early December. The reservoir will then be refilled during the winter to elevation 1350 feet msl. Based on a review of existing information, approximately 22 known sites could be affected during this period.

Gavins Point. System regulation will be adjusted to maintain the Gavins Point pool level in the normal 1206 to 1207.5 feet msl range during 2018. Short-term increases above 1207.5 feet msl may occur due to local rainfall. Based on a review of existing information, one known site could be affected during this period.

VII. SUMMARY OF RESULTS EXPECTED IN 2018

With regulation of the System in accordance with the 2017-2018 AOP outlined in the preceding pages, the following results can be expected. ***Table V*** summarizes the critical decision points throughout the year for all runoff conditions.

Table V
Summary of 2017-2018 AOP Studies

Decision Points	2018 Runoff Condition				
	Upper Decile	Upper Quartile	Median	Lower Quartile	Lower Decile
March 1 System Storage March 23-31 GP Release	56.1 MAF 26.7 kcfs	56.1 MAF 26.7 kcfs	56.1 MAF 26.7 kcfs	54.1 MAF 29.8 kcfs	54.1 MAF 29.8 kcfs
March 15 System Storage Spring Service Level	57.4 MAF Full service	57.2 MAF Full service	57.0 MAF Full service	54.6 MAF Full service	54.6 MAF Full service
May 1 System Storage May Early/Late May Avg GP Release	60.1 MAF Not applicable 36.0 kcfs	59.5 MAF 28.0/31.6 kcfs 29.9 kcfs	57.9 MAF 28.0/31.6 kcfs 29.9 kcfs	54.4 MAF 31.3/34.3 kcfs 32.8 kcfs	54.1 MAF 31.3/34.3 kcfs 32.8 kcfs
Fish Spawn Rise (Apr-Jun) FTPK Pool Elev Change GARR Pool Elev Change OAHE Pool Elev Change	 +7.1 feet +6.8 feet +5.1 feet	 +6.4 feet +5.7 feet +5.3 feet	 +4.5 feet +5.0 feet +2.1 feet	 +2.5 feet +3.6 feet -2.3 feet	 +0.4 feet +2.6 feet -3.7 feet
July 1 System Storage Sum-Fall Service Level (kcfs) Nav Season Length	64.0 MAF Full Service 10 Day extension	63.1 MAF Full Service 10 Day extension	60.7 MAF Full Service 0 Days shortening	55.7 MAF 1.2 kcfs blw Full Service 0 Days shortening	54.4 MAF 2.4 kcfs blw Full Service 0 Days shortening
September 1 System Storage Winter 2018-19 GP Release	61.9 MAF 20.0 kcfs	61.3 MAF 20.0 kcfs	59.2 MAF 17.0 kcfs	53.1 MAF 12.5 kcfs	51.0 MAF 12.5 kcfs
February 28 System Storage End-Year Pool Balance Percent Pool	56.1 MAF Balanced 100%	56.1 MAF Balanced 100%	55.6 MAF Balanced 99%	48.9 MAF Balanced 87%	46.7 MAF Balanced 83%

A. Flood Control. Flood control is the only authorized project purpose that requires the availability of empty storage space rather than impounded water. Actual flood events, especially those that are a result of rainfall runoff, are difficult to predict with much advance notice; therefore, detailed routing of specific major flood flows is accomplished when floods occur. There is a recurring pattern of high-risk flood periods during each year: a season when snowmelt, ice jams, and protracted heavy rains will almost surely occur with or without generating consequent floods; and a season when these situations are less likely and the flood threat is correspondingly low. The high-risk flood season begins about March 1 and extends through the summer. As a consequence, regulation of the System throughout the fall and winter months is predicated on the achievement of a March 1 System storage level at or below the base of the Annual Flood Control and Multiple Use Zone. All runoff scenarios studied for this AOP will begin the March 1, 2018 runoff season with System storage at or below the desired 56.1 MAF base of the Annual Flood Control and Multiple Use Zone. Therefore, the entire System flood control storage of 16.3 MAF, (11.6 MAF in the Annual Flood Control and Multiple Use Zone and 4.7 MAF in Exclusive Flood Control Zone) will be available to store runoff. Under the Lower Basic runoff scenario, an additional 2.0 MAF of the Carryover Multiple Purpose Zone will be available to store runoff.

To the extent practical, the System is regulated to prevent damaging flows in the river reaches between and below the Mainstem dams. In 2018, the full capacity of the System will be available to capture a significant volume of runoff originating from the upper basin and meter it out over an extended period of time at a rate that does not contribute to flooding in the river reaches between and below the reservoirs. Additionally, the reservoir system will have the capacity to reduce releases and hold back water during periods of high runoff below the System to reduce peak stages and discharges on the lower river. The ability to significantly reduce peak stages on the lower river diminishes at locations further downstream due to the large uncontrolled drainage area and travel time from the dam.

The base of the Exclusive Flood Control Zone defines the maximum level of storage that will be accumulated for purposes other than flood control. When the Exclusive Flood Control Zone at a particular reservoir is encroached upon, the control of subsequent flood inflows becomes the dominant factor. During such periods, releases may substantially exceed the powerplant release capacity with the evacuation rate of any project dependent upon existing flood conditions, the potential for further inflows, and conditions of other reservoirs in the System. Maximum release rates at such times are based upon the Master Manual flood control criteria, the flood control status of the System, and the critical need to preserve the integrity of the dams. Detailed information regarding the adjustments of releases for flood control evacuation and downstream flood control constraints can be found in Chapter 7 of the Master Manual.

Due to release limitations imposed by the formation of downstream ice cover, a major portion of the required flood control space must be evacuated prior to the winter season. Higher releases may be made on occasions when the downstream channel conditions permit. If plains and/or mountain snowpack accumulations are much above normal during the winter of 2017-2018, and studies indicate that available storage in the Carryover Multiple Use Zone as well as the Annual Flood Control and Multiple Use Zone will be fully utilized, releases may be adjusted to the extent reasonably possible to evacuate water from the reservoir system early in the runoff season. High releases during the late winter and early spring periods may exacerbate localized flooding if coincident with plains snowmelt or spring rains, and may also contribute to significant ice jam flooding. Therefore, if higher than normal releases are indicated, local conditions will need to be closely monitored. In addition, all 2018 runoff that is stored in the flood control zones will be evacuated prior to the start of the 2019 runoff season.

B. <u>Water Supply and Water Quality Control</u>. Water supply problems at intakes located in the river reaches both between and below the Mainstem dams and in the reservoirs are related primarily to intake elevations or river access rather than inadequate water supply. In emergency situations, short-term adjustments to protect human health and safety would be considered to keep intakes operational.

Low reservoir levels during the 2000-2007 drought contributed to both intake access and water quality problems for intakes on Garrison and Oahe reservoirs, including several Tribal intakes. A return to more normal reservoir elevations has eliminated concern over many of these intakes. If the drought conditions return, reservoir pool levels and releases may decline renewing the potential for intake access and water quality problems at both river and reservoir intakes. Under the Lower Decile runoff scenario, minimum reservoir levels in 2018 would be at least 20 feet higher than the record lows set in the 2000-2007 drought. Although not below the critical shut-down elevations for any intake, a return to lower reservoir levels would require extra monitoring to ensure the continued operation of the intakes.

Winter releases are determined based on the September 1 System storage check. The winter season extends from December through February and flows are provided during this time to support the Congressionally authorized project purposes of hydropower production and downstream water supply and water quality. Per the Master Manual, if September 1 System storage is 55.0 MAF or less, the winter release from Gavins Point will be 12,000 cfs. Planned winter release rates of 12,000 cfs may be less than required for downstream water supply intakes without sufficient incremental tributary flows below the System. Should that occur, releases may need to be set higher to ensure that downstream water supply intakes are operable. In 2012-2013, winter releases were set at 14,000 cfs rather than 12,000 cfs due to channel degradation and low incremental tributary flows below the System. Improved tributary flows in future winters would facilitate releases reaching the target level of 12,000 cfs. While the

Master Manual indicates that the water control plan's purpose is to meet water supply requirements in river reaches downstream of the reservoirs to the extent reasonably possible, the Corps believes the minimum winter release of 12,000 cfs presented in the Master Manual represents a reasonable long-term goal for water intake operability and for owners to strive for as they make improvements to their facilities. A letter was sent to intake owners in the spring of 2013 informing them of the Master Manual criteria and encouraging them to take necessary action to ensure their intakes are able to operate at reduced release rates. Coordination with intake owners will continue prior to and during the low release periods. In addition, it may be necessary at times to temporarily increase Gavins Point releases to provide adequate downstream flows during periods when excessive river ice formation is forecast or if ice jams or blockages form which temporarily restrict flow. Based on past experiences, these events are expected to occur infrequently and be of short duration.

Based on the studies included in this AOP, the scheduled winter System release for 2017-2018 will range from 17,000 cfs to 20,000 cfs. As shown in ***Table V***, 2018-2019 winter releases of 20,000 cfs would be made for the Upper Decile and Upper Quartile runoff scenarios, 17,000 cfs for Median, and 12,500 cfs under Lower Quartile and Lower Decile runoff scenarios. The additional 500 cfs on Lower Quartile and Lower Decile reflects how the Corps, when conditions warrant, temporarily increases Gavins Point releases during extreme cold periods to inhibit the formation of ice jams in the lower river reach.

During non-navigation open water periods in the spring and fall the Master Manual includes System releases as low as 9,000 cfs as a water conservation measure provided that enough downstream tributary flow exists to allow for continued operation of downstream water intakes. If a non-navigation year would occur in the future, summer releases (May through August) could average around 18,000 cfs from the System. However, it should be noted that System releases will be set at levels that meet the operational requirements of water intakes to the extent reasonably possible. Problems have occurred at several downstream intakes in the past, however in all cases the problems have been associated with access to the river or reservoir rather than insufficient water supply. In addition, the low summer release rate would likely result in higher water temperatures in the river, which could impact a powerplant's ability to meet their thermal discharge permits. Again, it should be noted that System releases will be set at levels that allow the downstream powerplant to meet their thermal discharge permit requirements to the extent reasonably possible. This may mean that actual System releases in the hottest part of the summer period may be set well above the 18,000 cfs level. The Corps continues to encourage intake operators between and below the mainstem dams to make necessary modifications to their intakes to allow efficient operation over the widest possible range of hydrologic conditions. While the current level of System storage should allow adequate access for all intakes during the coming year, intake operators that have experienced difficulty with access during the

past drought years should continue to make adjustments to improve access and flexibility when drought returns to the basin.

C. Irrigation. Scheduled releases from the System reservoirs will be sufficient to meet the volumes of flow required for irrigation diversions from the Missouri River. Some access problems may be experienced, however, if Lower Quartile or Lower Decile runoff conditions return. Below Fort Peck, localized dredging may once again be required in the vicinity of irrigation intakes in order to maintain access to the water if releases are low next summer. Intake access problems are the responsibility of the intake owner and the Corps will not guarantee access, only that the supply of water in the Missouri River is adequate to meet this project purpose. Fort Peck releases may be adjusted during the irrigation season to provide more consistent flows at downstream locations as tributary flows vary. Tributary irrigation water usage is fully accounted for in the estimates of water supply.

D. Navigation. The anticipated service level and season length for all runoff conditions simulated are shown in ***Table V***. Service to navigation in 2018 from the beginning of the navigation season through the July 1 storage check will be at full service for all runoff scenarios. After the July 1 storage check, Median and higher runoff scenarios indicate at least full service to navigation. The July 1 storage check indicates 1,200 cfs below full service for the Lower Quartile runoff scenario and 2,400 cfs below full service for the Lower Decile runoff scenario. In addition, the Upper Decile and Upper Quartile runoff scenarios indicate a 10-day extension to the navigation season based on the July 1 storage check. Median and below runoff indicates a full length navigation season. Although the AOP simulations provide a comparison of typical flow support under varying runoff conditions, the actual rate of flow support for the 2018 navigation season will be based on actual System storage on March 15 and July 1, 2018.

E. Power. ***Table VI*** and ***Table VII*** indicate the estimated monthly System load requirements and hydropower supply of the Eastern Division, Pick-Sloan Missouri Basin Program (P-S MBP), from August 2017 through December 2018. Estimates of monthly peak demands and energy include customer requirements for firm, short-term firm, summer firm, peaking, and various other types of power sales, System losses, and the effects of diversity. Also included in the estimated requirements are deliveries of power to the Western Division, P-S MBP, to help meet its firm power commitments. Under the Median runoff scenario, annual generation in 2018 is estimated to be 9.7 million MWh, 104 percent of the 1967-2016 average.

TABLE VI
PEAKING CAPABILITY AND SALES
(1,000 kW at plant)

	Estimated Committed Sales*	Expected C of E Capability					Expected Bureau Capability**					Expected Total System Capability				
2017			U.B.	Basic	L.B.			U.B.	Basic	L.B.			U.B.	Basic	L.B.	
Aug	2200		2447	2445	2440			200	199	198			2647	2644	2638	
Sep	2020		2438	2437	2430			199	199	198			2637	2636	2628	
Oct	1878		2418	2419	2401			200	199	198			2618	2618	2599	
Nov	1985		2382	2383	2362			198	198	197			2580	2581	2559	
Dec	2212		2376	2381	2359			195	195	195			2571	2576	2554	
2018																
Jan	2125		2396	2399	2375			191	193	193			2587	2592	2568	
Feb	2109		2404	2404	2378			187	190	191			2591	2594	2569	
		U.D.	U.Q.	Med	L.Q.	L.D.	U.D.	U.Q.	Med	L.Q.	L.D.	U.D.	U.Q.	Med	L.Q.	L.D.
Mar	2045	2427	2421	2414	2382	2381	189	189	189	190	190	2616	2610	2603	2572	2571
Apr	1914	2449	2440	2420	2373	2369	185	185	188	190	190	2634	2625	2608	2563	2559
May	1881	2467	2457	2425	2369	2363	186	186	192	194	194	2653	2643	2617	2563	2557
Jun	2083	2486	2478	2451	2385	2370	199	199	199	197	197	2685	2677	2650	2582	2567
Jul	1801	2480	2474	2450	2375	2350	201	201	198	197	196	2681	2675	2648	2572	2546
Aug	2198	2461	2457	2434	2352	2325	199	200	197	196	195	2660	2657	2631	2548	2520
Sep	2017	2447	2446	2425	2343	2308	200	199	198	197	197	2647	2645	2623	2540	2505
Oct	1876	2420	2422	2407	2316	2286	201	199	199	198	198	2621	2621	2606	2514	2484
Nov	1983	2379	2383	2371	2278	2249	199	196	197	197	197	2578	2579	2568	2475	2446
Dec	2110	2336	2339	2333	2241	2211	195	192	194	195	195	2531	2531	2527	2436	2406

* Estimated sales, including system reserves. Power in addition to hydro production needed for these load requirements will be obtained from other power systems by interchange or purchase.
** Total output of Canyon Ferry and 1/2 of the output of Yellowtail powerplant.

TABLE VII
ENERGY GENERATION AND SALES
(Million kWh at plant)

	Estimated Committed Sales*	Expected C of E Generation					Expected Bureau Generation **					Expected Total System Generation				
2017			U.B.	Basic	L.B.			U.B.	Basic	L.B.			U.B.	Basic	L.B.	
Aug	860		1117	1077	1080			90	70	64			1207	1147	1143	
Sep	743		1104	952	906			79	66	56			1183	1018	962	
Oct	738		958	751	819			81	65	53			1039	815	872	
Nov	807		945	674	646			77	62	54			1022	736	699	
Dec	913		782	659	622			79	63	55			862	722	677	
2018																
Jan	928		788	735	688			79	66	55			867	801	743	
Feb	896		687	645	607			70	58	49			757	704	656	
		U.D.	U.Q.	Med	L.Q.	L.D.	U.D.	U.Q.	Med	L.Q.	L.D.	U.D.	U.Q.	Med	L.Q.	L.D.
Mar	814	647	662	620	657	664	76	76	67	57	57	723	737	687	714	721
Apr	767	764	707	744	818	817	108	108	81	49	49	871	814	825	866	866
May	718	1066	913	893	964	955	118	118	91	65	65	1184	1031	984	1029	1020
Jun	777	1263	1134	938	992	974	114	114	96	66	66	1377	1247	1035	1058	1041
Jul	847	1470	1325	1013	1039	988	118	100	80	60	59	1587	1425	1094	1099	1047
Aug	859	1471	1328	1051	1037	986	104	93	76	59	58	1575	1421	1127	1096	1044
Sep	744	1351	1197	921	848	866	86	85	71	57	55	1437	1282	992	905	921
Oct	739	1241	1065	766	807	715	85	85	72	57	54	1326	1149	838	864	769
Nov	807	1216	1048	671	636	607	80	80	71	54	54	1297	1128	742	690	661
Dec	913	842	809	660	544	542	83	81	73	56	56	925	890	733	600	597
CY TOT		12807	11662	9659	9635	9409	1119	1087	903	685	676	13925	12750	10561	10320	10086

* Estimated sales including system reserves and losses. Power in addition to hydro production needed for these load requirements will be obtained from other systems by interchange or purchase.
** Total output Canyon Ferry and 1/2 output of Yellowtail powerplant.

F. Recreation, Fish and Wildlife. The regulation of the System will continue to provide recreation and fish and wildlife opportunities in the project areas and along the Missouri River as well as other benefits of a managed system. Recreation access is expected to be near normal levels in 2018. If Lower Quartile or Lower Decile runoff were to occur in 2018, boat ramps that were lowered and low water ramps that were constructed during the two recent drought periods will provide adequate reservoir access. Special regulation adjustments incorporating specific objectives for these purposes will be made to the extent reasonably possible. Overall conditions should be favorable for the many visitors who enjoy the camping, boating, fishing, hunting, swimming, picnicking, and other recreational activities associated with the System reservoirs.

The effects of the simulated System regulation during 2018 on fish and wildlife are included in Chapter VI, Section F, entitled, "Regulation Activities for T&E Species and Fish Propagation Enhancement."

G. Historic and Cultural Properties. As mentioned in Chapter VI of this AOP, the regulation of the System during 2017 and 2018 will expose cultural sites due to erosion from the normal fluctuation of pool elevations. The Corps will work with the Tribes utilizing 36 CFR Part 800 and the PA to address the exposure of these sites. The objective of a programmatic agreement is to deal "…with the potential adverse effects of complex projects or multiple undertakings…" The PA objective was to collaboratively develop a preservation program that would avoid, minimize and/or mitigate the adverse effects of the System operation. All tribes, whether signatory to the PA or not, may request government-to-government consultation on the regulation of the System and the resulting effect on historic and cultural properties and other resources.

The planned preservation program for this AOP is outlined by multiple stipulations in the PA. One of the stipulations, or program components, is the Five-Year Plan. This plan outlines how the Corps will accomplish its responsibilities under the PA and the National Historic Preservation Act. The "Cultural Resource Program Final Five Year Plan, dated February 2012" (see http://www.nwo.usace.army.mil/Missions/CivilWorks/CulturalResources.aspx) is currently being implemented. The plan includes inventory, testing and evaluation, mitigation and other specific activities that will allow the Corps to avoid, minimize and/or mitigate the adverse effects to cultural sites on Corps lands within the System. Many of the actions listed in the plan are within the elevation ranges that will occur with the implementation of the Master Manual criteria in 2017 and 2018. Two critical components of the Five-Year Plan that are applicable to this AOP are monitoring and mitigation, which will be briefly discussed in the following paragraphs.

First, a collaboratively developed plan, entitled "Final Cultural Resource Monitoring Plan, dated June 2014" (see http://www.nwo.usace.army.mil/Missions/CivilWorks/CulturalResources.aspx) is in place. This monitoring plan outlines the sites that require monitoring and specifies a frequency for monitoring. The Corps is strategically monitoring sites, including those sites within the potential operating pool elevations, to document the effects of the implementation of the 2017-2018 AOP. Specific sites are identified in the draft Monitoring and Enforcement Plan for the monitoring team, comprised of Corps rangers and Tribal monitors, to visit and document impacts. This focused monitoring is resulting in more accurate data on the current impacts to sites along the river plus it is assisting with the identification of sites for mitigation. The most recent training for the monitoring teams was held in July 2014, and the most recent Archeological Resources Protection Act training was held in March of 2015.

Second, mitigation or protection of sites that are being adversely impacted continues. During the reporting period for the 2016 Annual Report by the Corps on the implementation of the Programmatic Agreement, 19 sites were either completed, started, or in the design phase. The annual report is available at http://www.nwo.usace.army.mil/Missions/CivilWorks/CulturalResources.aspx. In addition the Corps completed a contract to develop an erosion model that will compare modeling data against actual erosion data, collected by the monitoring team, to assist in the prioritization of sites for protection. Work on the erosion model was completed in June 2011.

Results expected from the proposed monitoring and mitigation actions include more accurate horizontal and vertical data on existing cultural sites, detailed impact data, proactive protection and preservation of sites. The effects of the simulated System regulation during 2017-2018 on cultural sites are included in the Chapter VI, section G., entitled, "Regulation Activities for Historic and Cultural Properties."

H. System Storage. If the August 1, 2017 Basic runoff forecast verifies, System storage will decline to 56.3 MAF by the end of 2017. This would be 22.4 MAF higher than the record low System storage of 33.9 MAF set on February 9, 2007 and 0.2 MAF more than the 2016 end-of-year storage of 56.1 MAF. This end-of-year storage is 3.5 MAF more than the 1967-2016 average. The lowest storage during the 1988-1992 drought was 40.8 MAF in January 1991, and the record low storage was set during the 2000-2007 drought at 33.9 MAF in February 2007. The end-of-year System storages have ranged from a maximum of 60.9 MAF in 1975 to the 2006 minimum of 34.4 MAF. Forecasted System storage on December 31, 2018 is presented in ***Table VIII*** for the runoff scenarios simulated.

TABLE VIII
ANTICIPATED DECEMBER 31, 2018 SYSTEM STORAGE

Water Supply Condition	Total (12/31/18)	Carryover Storage Remaining 1/	Unfilled Carryover Storage 2/	Total Change CY 2018
	(Volumes in 1,000 Acre-Feet)			
Upper Decile	56,300	38,500	0	200
Upper Quartile	56,500	38,500	0	400
Median	55,800	38,200	300	-500
Lower Quartile	49,000	31,400	7,100	-5,600
Lower Decile	46,800	29,200	9,300	-7,800

1/ Net usable storage above 17.6 MAF System minimum pool level established for power, recreation, irrigation diversions, and other purposes.

2/ System base of Annual Flood Control and Multiple Use Zone containing 56.1 MAF.

I. Summary of Water Use by Functions. Anticipated water use in CY 2017, under the regulation plan with the Basic forecast of water supply is shown in ***Table IX***. Under the reservoir regulation simulations in this AOP, estimated water use in CY 2018 also is shown in ***Table IX.*** Actual water use data for CY 2016 are included for information and comparison.

TABLE IX
MISSOURI RIVER MAINSTEM SYSTEM
WATER USE FOR CALENDAR YEARS 2016, 2017, AND 2018 ABOVE SIOUX CITY, IOWA
in Million Acre-Feet (MAF)

		CY 2016 Actual	CY 2017 Basic Simulation	Simulations for Calendar Year 2018 Upper Decile	Upper Quartile	Median	Lower Quartile	Lower Decile
Upstream Depletions	(1)							
Irrigation, Tributary Reservoir Evaporation & Other Uses		3.3	2.8					
Tributary Reservoir Storage Change		0.0	0.1					
Total Upstream Depletions		3.3	2.9	3.0	2.8	2.9	2.8	2.7
System Reservoir Evaporation	(2)	3.0	2.6	1.2	1.2	1.8	2.0	1.9
Sioux City Flows								
Navigation Season								
Unregulated Flood Inflows Between Gavins Point & Sioux City	(3)	0.0	0.0					
Navigation Service Requirement	(4)	13.4	16.7	16.8	16.5	15.9	16.0	15.3
Supplementary Releases								
T&E Species	(5)	0.9	0.5	0.3	0.3	0.3	0.3	0.3
Flood Evacuation	(6)	0.0	0.8	8.1	4.6	0.0	0.0	0.0
Non-navigation Season Flows		4.1	4.1	4.4	4.4	4.1	3.8	3.7
Flood Evacuation Releases	(7)	0.2	0.1	0.5	0.4	0.1	0.0	0.0
System Storage Change		-0.8	0.2	0.2	0.4	-0.5	-5.6	-7.8
Total		24.1	27.9	34.5	30.6	24.6	19.3	16.1
Project Releases								
Fort Peck		4.9	5.4	8.2	7.5	6.2	6.1	6.1
Garrison		12.4	16.8	21.0	19.1	16.6	15.5	14.7
Oahe		13.0	17.4	23.7	21.0	17.2	18.1	17.9
Big Bend		12.0	16.5	23.6	21.0	17.1	17.9	17.8
Fort Randall		13.6	17.9	25.0	22.1	17.8	18.2	17.9
Gavins Point		15.3	19.3	27.2	24.0	19.3	19.3	19.0

(1) Tributary uses above the 1949 level of development including agricultural depletions and tributary storage effects.
(2) Net evaporation is shown for 2018.
(3) Incremental inflows to reach which exceed those usable in support of navigation at the target level, even if Gavins Point releases were held to as low as 6,000 cfs.
(4) Estimated requirement for downstream water supply and water quality is approximately 6.0 MAF.
(5) Increased releases required for threatened and endangered species regulation.
(6) Includes flood control releases for flood control storage evacuation and releases used to extend the navigation season beyond the normal December 1 closing date at the mouth of the Missouri River.
(7) Releases for flood control storage evacuation in excess of a 17,000 cfs Gavins Point release.

VIII. TENTATIVE PROJECTION OF REGULATION THROUGH FEBRUARY 2024

The 5-year extensions to the AOP (March 2019 to February 2024) have been prepared to serve as a guide for the Western Area Power Administration's marketing activities and to provide data to allow basin interests to conduct long-term planning. Three runoff conditions are modeled in the extension studies: Median, Lower Quartile, and Lower Decile.

The full 16.3 MAF of flood control capacity or more would be available at the start of each runoff season. The navigation service level and season length criteria described in ***Plate 3*** were applied to the extensions. The March 15 and July 1 System storage checks shown in ***Plate 3*** were used to determine the flow support for navigation and other downstream uses and the navigation season length. A steady release – flow-to-target (SR-FTT) regulation with cycling in May was modeled during the T&E bird species' nesting season. The Gavins Point releases to meet navigation target flows, as shown in ***Plate 3*** and as computed by the March 15 and July 1 System storage checks, were used prior to and following the nesting season. The September 1 System storage check was used to determine the winter System release. Navigation service support and season length, March 1 reservoir unbalancing, end of year System storage, and the winter release rate for the extensions are shown on ***Table X***. The March and May spring pulses are currently on hold pending the outcome of the consultation with the USFWS on the management plan as discussed in Chapter III and were not included in the extension studies. The criteria considered as each year of the extensions was modeled are listed, along with the results, in ***Tables XI through XIII*** for the Median, Lower Quartile, and Lower Decile extension studies, respectively.

A. Median Runoff. Studies 9 through 13 present the results of simulating Median runoff (24.6 MAF) from March 2019 through February 2024. The March 1, 2019 System storage would be 55.5 MAF and would decrease to 53.3 MAF by March 1, 2024, 2.8 MAF below the desired March 1 storage of 56.1 MAF, the base of the annual flood control and multiple use pool. The navigation service level would range between full service to 100 cfs below full service for the study period of 2019 to 2023. Winter releases would range from 17,000 cfs in the winter of 2019-2020 to 14,200 cfs in winter 2023-2024. For the entire study period, the carryover multiple use storage in Fort Peck, Garrison, and Oahe was balanced on March 1 of each year.

TABLE X
NAVIGATION SERVICE SUPPORT, SPRING PULSES, UNBALANCING
AOP EXTENSION STUDIES

	2018	2019	2020	2021	2022
MEDIAN					
Annual Runoff Volume (MAF)	24.6	24.6	24.6	24.6	24.6
Spring Pulse					
March (kcfs)	N/A	N/A	N/A	N/A	N/A
May (kcfs)	N/A	N/A	N/A	N/A	N/A
Flow Level Below Full Service					
Spring (kcfs)	Full	Full	Full–0.2	Full-0.3	Full-0.4
Summer/Fall (kcfs)	Full	Full	Full	Full	Full
Season Length	8 months	8 months	8 months	8 months	8 months
Reservoir Unbalancing (ft)					
Fort Peck	0	0	0	0	0
Garrison	0	0	0	0	0
Oahe	0	0	0	0	0
Dec 31 Storage (MAF)	53.7	53.4	53.3	53.2	53.1
Winter Release (kcfs)	15.2	14.8	14.3	14.2	14.0
Special Information					
LOWER QUARTILE					
Annual Runoff Volume (MAF)	19.9	20.2	21.8	22.8	24.4
Spring Pulse					
March (kcfs)	N/A	N/A	N/A	N/A	N/A
May (kcfs)	N/A	N/A	N/A	N/A	N/A
Flow Level Below Full Service					
Spring (kcfs)	Full-6.0	Full-6.0	Full-6.0	Full-6.0	Full-6.0
Summer/Fall (kcfs)	Full-5.7	Full-6.0	Full-6.0	Full-6.0	Full-5.1
Season Length	8 mnths-4days	8 mnths-16days	8 mnths-18days	8 mnths-12days	8 mnths
Reservoir Unbalancing (ft)					
Fort Peck	0	0	0	0	0
Garrison	0	0	0	0	0
Oahe	0	0	0	0	0
Dec 31 Storage (MAF)	45.7	44.7	45.0	45.9	47.4
Winter Release (kcfs)	12.5	12.5	12.5	12.5	12.5
LOWER DECILE					
Annual Runoff Volume (MAF)	17.1	17.5	18.5	19.3	19.5
Spring Pulse					
March (kcfs)	N/A	N/A	N/A	N/A	N/A
May (kcfs)	N/A	N/A	N/A	N/A	N/A
Flow Level Below Full Service					
Spring (kcfs)	Full-6.0	Full-6.0	Full-6.0	Full-6.0	Full-6.0
Summer/Fall (kcfs)	Full-6.0	Full-6.0	Full-6.0	Full-6.0	Full-6.0
Season Length	8 mnths-26days	8 mnths-30days	8 mnths-30days	8 mnths-35 days	8 mnths-41days
Reservoir Unbalancing (ft)					
Fort Peck	0	0	0	0	0
Garrison	0	0	0	0	0
Oahe	0	0	0	0	0
Dec 31 Storage (MAF)	42.1	39.2	37.2	36.1	35.5
Winter Release (kcfs)	12.5	12.5	12.5	12.5	12.5

* Limited by Downstream Flood-Control Limits.
N/A – The March and May Spring Pulses are currently on hold. See Chapter III for more information.

Table XI

Median Extension Studies - Criteria Considered in the Modeling Process

Study Number			9	10	11	12	13
	Units	Criteria	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
March 1 Storage	MAF	40	53.9	53.7	53.5	53.4	53.3
- March Spring Pulse?	N/A		N/A	N/A	N/A	N/A	N/A
March 15 Storage	MAF	31/49/54.5	54.7	54.5	54.3	54.2	54.1
- Service Level	N/A or kcfs	No Sea/Min/Full Thresholds	Full	Full	Full - 0.2	Full - 0.3	Full - 0.4
- 3rd Period March GP Q	kcfs		26.7	26.7	26.5	26.4	26.3
- April Gavins Point Q	kcfs		26.7	26.7	26.5	26.4	26.3
May 1 Storage	MAF	40	55.6	55.4	55.2	55.1	55.0
- May Spring Pulse?	N/A		N/A	N/A	N/A	N/A	N/A
- Pulse Magnitude*	kcfs		N/A	N/A	N/A	N/A	N/A
- Gavins Point Cycling Qs	kcfs		28.0/31.6	28.0/31.6	27.8/31.4	27.7/31.3	27.6/31.2
- May Gavins Point Q	kcfs		29.9	29.9	29.6	29.5	29.4
- June Gavins Point Q	kcfs		31.6	31.6	31.4	31.3	31.2
July 1 Storage	MAF	50.5/57	58.5	58.3	58.1	58.0	57.9
- Service Level	N/A	Min/Full Thresholds	Full	Full	Full	Full	Full
- July Gavins Point Q	kcfs		31.6	31.6	31.6	31.6	31.6
- Aug Gavins Point Q	kcfs		33.2	33.2	33.2	33.2	33.2
- Sept Gavins Point Q	kcfs		32.6	32.6	32.6	32.6	32.6
July 1 Storage	MAF	36.5/41&46.8/51.5	58.5	58.3	58.1	58.0	57.9
- Season Length Shortening	days	61/31&31/0 Thresholds	0	0	0	0	0
- Oct Gavins Point Q	kcfs		32.0	32.0	32.0	32.0	32.0
- Nov Gavins Point Q	kcfs		27.7	27.7	27.7	27.7	27.7
September 1 Storage	MAF	55/58	56.9	56.7	56.4	56.3	56.2
- Winter Gavins Point Q	kcfs	12/17 Thresholds	15.2	14.8	14.3	14.2	14.0
End-of-Year Reservoir Storage (12/31)	MAF		53.7	53.4	53.3	53.2	53.1
- Percent Full	N/A		96%	95%	95%	95%	95%
Balance/Unbalance	N/A	Bal <2227/1827/1600 ft msl	Balanced	Balanced	Balanced	Balanced	Balanced
Fort Peck Rise 3/31-5/31	N/A		Yes	Yes	Yes	Yes	Yes
Garrison Rise 3/31-5/31	N/A		Yes	Yes	Yes	Yes	Yes
Oahe Rise 3/31-5/31	N/A		Yes	Yes	Yes	Yes	Yes
Favored Reservoir - Fish Spawn	N/A		GA	FP/OA	GA	FP/OA	GA

** Pulse magnitudes are the calculated magnitude per technical criteria and simulated magnitude due to the downstream flow limits*

N/A - The March and May Spring Pulses are currently on hold. See Chapter III for more information.

Table XII

Lower Quartile Extension Studies - Criteria Considered in the Modeling Process

Study Number			***14***	***15***	***16***	***17***	***18***
	Units	*Criteria*	***2018-2019***	***2019-2020***	***2020-2021***	***2021-2022***	***2022-2023***
March 1 Storage	*MAF*	*40*	47.9	45.9	44.8	45.2	46.1
- March Spring Pulse?	*N/A*		N/A	N/A	N/A	N/A	N/A
March 15 Storage	*MAF*	*31/49/54.5*	48.6	46.6	45.6	46.0	47.1
- Service Level	*N/A or kcfs*	*No Sea/Min/Full Thresholds*	Min Service	Min Service	Min Service	Min Service	Min Service
- 3rd Period March GP Q	*kcfs*		23.8	23.8	23.8	23.8	23.8
- April Gavins Point Q	*kcfs*		23.8	23.8	23.8	23.8	23.8
May 1 Storage	*MAF*	*40*	49.0	47.1	46.4	47.0	48.3
- May Spring Pulse?	*N/A*		N/A	N/A	N/A	N/A	N/A
*- Pulse Magnitude**	*kcfs*		N/A	N/A	N/A	N/A	N/A
- Gavins Point Cycling Qs	*kcfs*		25.3/28.3	25.3/28.3	25.3/28.3	25.3/28.3	25.3/28.3
- May Gavins Point Q	*kcfs*		26.8	26.8	26.8	26.8	26.8
- June Gavins Point Q	*kcfs*		28.3	28.3	28.3	28.3	28.3
July 1 Storage	*MAF*	*50.5/57*	50.8	49.0	48.7	49.6	51.5
- Service Level	*N/A*	*Min/Full Thresholds*	Full - 5.7	Min Service	Min Service	Min Service	Full - 5.1
- July Gavins Point Q	*kcfs*		28.6	28.3	28.3	28.3	29.2
- Aug Gavins Point Q	*kcfs*		28.3	28.0	28.0	28.0	28.9
- Sept Gavins Point Q	*kcfs*		27.8	27.5	27.5	27.5	28.4
July 1 Storage	*MAF*	*36.5/41&46.8/51.5*	50.8	49.0	48.7	49.6	51.5
- Season Length Shortening	*days*	*61/31&31/0 Thresholds*	4	16	18	12	0
- Oct Gavins Point Q	*kcfs*		27.4	27.1	27.1	27.1	28.0
- Nov Gavins Point Q	*kcfs*		20.9	13.4	12.4	15.6	23.2
September 1 Storage	*MAF*	*55/58*	48.8	47.1	47.1	48.1	50.0
- Winter Gavins Point Q	*kcfs*	*12/17 Thresholds*	12.5	12.5	12.5	12.5	12.5
End-of-Year Reservoir Storage (12/31)	*MAF*		45.7	44.7	45.0	45.9	47.4
- Percent Full	*N/A*		81%	80%	80%	82%	84%
Balance/Unbalance	*N/A*	*Bal <2227/1827/1600 ft msl*	Balance	Balance	Balance	Balance	Balance
Fort Peck Rise 3/31-5/31	*N/A*		Yes	Yes	Yes	Yes	Yes
Garrison Rise 3/31-5/31	*N/A*		Yes	Yes	Yes	Yes	Yes
Oahe Rise 3/31-5/31	*N/A*		No	Yes	Yes	Yes	Yes
Favored Reservoir - Fish Spawn	*N/A*		GA	FP/OA	GA	FP/OA	GA

** Pulse magnitudes are the calculated magnitude per technical criteria and simulated magnitude due to the downstream flow limits*

N/A - The March and May Spring Pulses are currently on hold. See Chapter III for more information.

Table XIII

Lower Decile Extension Studies - Criteria Considered in the Modeling Process

Study Number			19	20	21	22	23
	Units	Criteria	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
March 1 Storage	MAF	40	45.7	42.1	39.2	37.3	36.3
- March Spring Pulse?	N/A		N/A	N/A	N/A	N/A	N/A
March 15 Storage	MAF	31/49/54.5	46.3	42.8	39.9	38.1	37.1
- Service Level	N/A or kcfs	No Sea/Min/Full Thresholds	Min Service	Min Service	Min Service	Min Service	Min Service
- 3rd Period March GP Q	kcfs		23.8	23.8	23.8	23.8	23.8
- April Gavins Point Q	kcfs		23.8	23.8	23.8	23.8	23.8
May 1 Storage	MAF	40	46.5	43.1	40.4	38.6	37.6
- May Spring Pulse?	N/A		N/A	N/A	N/A	N/A	N/A
- Pulse Magnitude	kcfs		N/A	N/A	N/A	N/A	N/A
- Gavins Point Cycling Qs	kcfs		25.3/28.3	25.3/28.3	25.3/28.3	25.3/28.3	25.3/28.3
- May Gavins Point Q	kcfs		26.8	26.8	26.8	26.8	26.8
- June Gavins Point Q	kcfs		28.3	28.3	28.3	28.3	28.3
July 1 Storage	MAF	50.5/57	47.5	44.1	41.8	40.3	39.4
- Service Level	N/A	Min/Full Thresholds	Min Service	Min Service	Min Service	Min Service	Min Service
- July Gavins Point Q	kcfs		28.3	28.3	28.3	28.3	28.3
- Aug Gavins Point Q	kcfs		28.0	28.0	28.0	28.0	28.0
- Sept Gavins Point Q	kcfs		27.5	27.5	27.5	27.5	27.5
July 1 Storage	MAF	36.5/41&46.8/51.5	47.5	44.1	41.8	40.3	39.4
- Season Length Shortening	days	61/31&31/0 Thresholds	26	30	30	35	41
- Oct Gavins Point Q	kcfs		26.1	23.9	23.9	21.0	17.5
- Nov Gavins Point Q	kcfs		9.1	9.0	9.0	9.0	9.0
September 1 Storage	MAF	55/58	44.6	41.3	39.1	37.7	36.7
- Winter Gavins Point Q	kcfs	12/17 Thresholds	12.5	12.5	12.5	12.5	12.5
End-of-Year Reservoir Storage (12/31)	MAF		42.1	39.2	37.2	36.1	35.5
- Percent Full	N/A		75%	70%	66%	64%	63%
Balance/Unbalance	N/A	Bal <2227/1827/1600 ft msl	Balance	Balance	Balance	Balance	Balance
Fort Peck Rise 3/31-5/31	N/A		Yes	Yes	Yes	Yes	Yes
Garrison Rise 3/31-5/31	N/A		Yes	No	Yes	Yes	Yes
Oahe Rise 3/31-5/31	N/A		No	Yes	No	Yes	No
Favored Reservoir - Fish Spawn	N/A		GA	FP/OA	GA	FP/OA	GA

** Pulse magnitudes are the calculated magnitude per technical criteria and simulated magnitude due to the downstream flow limits*

N/A - The March and May Spring Pulses are currently on hold. See Chapter III for more information.

B. <u>Lower Quartile Runoff</u>. Studies 14 through 18 show the results of Lower Quartile runoff extensions. System storage on March 1, 2019 would be 48.9 MAF and decrease to 47.7 MAF by March 1, 2024. Navigation service levels would range between 5,000 cfs below full service to minimum service for the simulation period 2019 to 2023. The navigation season is shortened 0 days in 2019, 13 days in 2020, 16 days in 2021, 11days in 2022, and 0 days in 2023. A 12,500-cfs average winter release is shown for the entire study period. Under Lower Quartile runoff, the carryover multiple use storage in the upper three reservoirs would be balanced each March 1.

C. <u>Lower Decile Runoff</u>. Studies 19 through 23 show the results of Lower Decile runoff extensions. System storage would be 46.6 MAF on March 1, 2019 and gradually decrease to 35.9 MAF on March 1, 2024. Navigation service levels would be at minimum navigation service levels throughout the season for all extension years. The navigation season would be shortened 18 days in 2019, 30 days in 2020 and 2021, 31 days in 2022, and 40 days in 2023. The intrasystem storage is balanced each March 1 for the entire study period.

Plate 14 presents System storage, Gavins Point releases, and System peaking capability for Median, Lower Quartile, and Lower Decile runoff for the period 2019 through February 2024 Peak power, or peaking capability, is the amount of power available when all powerplants are operating at maximum.

Plate 15 presents reservoir pool elevations for Fort Peck, Garrison, Oahe, and Fort Randall for Median, Lower Quartile, and Lower Decile runoff for the period 2019 through February 2024.

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Missouri River Basin

U.S. ARMY ENGINEERS, NORTHWESTERN DIVISION
CORPS OF ENGINEERS, OMAHA, NEBRASKA
AUGUST 2011

PLATE 1. Missouri River Basin Map.

Summary of Engineering Data -- Missouri River Mainstem System

Item No.	Subject	Fort Peck Dam - Fort Peck Lake	Garrison Dam - Lake Sakakawea	Oahe Dam - Lake Oahe
1	Location of Dam	Near Glasgow, Montana	Near Garrison, ND	Near Pierre, SD
2	River Mile - 1960 Mileage	Mile 1771.5	Mile 1389.9	Mile 1072.3
3	Total & incremental drainage areas in square miles	57,500	181,400 (2) 123,900	243,490 (1) 62,090
4	Approximate length of full reservoir (in valley miles)	134, ending near Zortman, MT	178, ending near Trenton, ND	231, ending near Bismarck, ND
5	Shoreline in miles (3)	1520 (elevation 2234)	1340 (elevation 1837.5)	2250 (elevation 1607.5)
6	Average total & incremental inflow in cfs	10,200	25,600 15,400	28,900 3,300
7	Max. discharge of record near damsite in cfs	137,000 (June 1953)	348,000 (April 1952)	440,000 (April 1952)
8	Construction started - calendar yr.	1933	1946	1948
9	In operation (4) calendar yr.	1940	1955	1962
	Dam and Embankment			
10	Top of dam, elevation in feet msl	2280.5	1875	1660
11	Length of dam in feet	21,026 (excluding spillway)	11,300 (including spillway)	9,300 (excluding spillway)
12	Damming height in feet (5)	220	180	200
13	Maximum height in feet (5)	250.5	210	245
14	Max. base width, total & w/o berms in feet	3500, 2700	3400, 2050	3500, 1500
15	Abutment formations (under dam & embankment)	Bearpaw shale and glacial fill	Fort Union clay shale	Pierre shale
16	Type of fill	Hydraulic & rolled earth fill	Rolled earth filled	Rolled earth fill & shale berms
17	Fill quantity, cubic yards	125,628,000	66,500,000	55,000,000 & 37,000,000
18	Volume of concrete, cubic yards	1,200,000	1,500,000	1,045,000
19	Date of closure	24 June 1937	15 April 1953	3 August 1958
	Spillway Data			
20	Location	Right bank - remote	Left bank - adjacent	Right bank - remote
21	Crest elevation in feet msl	2225	1825	1596.5
22	Width (including piers) in feet	820 gated	1336 gated	456 gated
23	No., size and type of gates	16 - 40' x 25' vertical lift gates	28 - 40' x 29' Tainter	8 - 50' x 23.5' Tainter
24	Design discharge capacity, cfs	275,000 at elev 2253.3	827,000 at elev 1858.5	304,000 at elev 1644.4
25	Discharge capacity at maximum operating pool in cfs	230,000	660,000	80,000
	Reservoir Data (6)			
26	Max. operating pool elev. & area	2250 msl 245,000 acres	1854 msl 383,000 acres	1620 msl 386,000 acres
27	Max. normal op. pool elev. & area	2246 msl 240,000 acres	1850 msl 365,000 acres	1617 msl 362,000 acres
28	Base flood control elev & area	2234 msl 211,000 acres	1837.5 msl 308,000 acres	1607.5 msl 311,000 acres
29	Min. operating pool elev. & area	2160 msl 89,000 acres	1775 msl 125,000 acres	1540 msl 115,000 acres
	Storage allocation & capacity			
30	Exclusive flood control	2250-2246 971,000 a.f.	1854-1850 1,495,000 a.f.	1620-1617 1,107,000 a.f.
31	Flood control & multiple use	2246-2234 2,704,000 a.f.	1850-1837.5 4,211,000 a.f.	1617-1607.5 3,208,000 a.f.
32	Carryover multiple use	2234-2160 10,700,000 a.f.	1837.5-1775 12,951,000 a.f.	1607.5-1540 13,353,000 a.f.
33	Permanent	2160-2030 4,088,000 a.f.	1775-1673 4,794,000 a.f.	1540-1415 5,315,000 a.f.
34	Gross	2250-2030 18,463,000 a.f.	1854-1673 23,451,000 a.f.	1620-1415 22,983,000 a.f.
35	Reservoir filling initiated	November 1937	December 1953	August 1958
36	Initially reached min. operating pool	27 May 1942	7 August 1955	3 April 1962
37	Estimated annual sediment inflow	17,200 a.f./year 1073 yrs.	21,600 a.f./year 1,086 yrs.	14,800 a.f./year 1553 yrs.
	Outlet Works Data			
38	Location	Right bank	Right Bank	Right Bank
39	Number and size of conduits	2 - 24' 8" diameter (nos. 3 & 4)	1 - 26' dia. and 2 - 22' dia.	6 - 19.75' dia. upstream, 18.25' dia. downstream
40	Length of conduits in feet (8)	No. 3 - 6,615, No. 4 - 7,240	1529	3496 to 3659
41	No., size, and type of service gates	1 - 28' dia. cylindrical gate 6 ports, 7.6' x 8.5' high (net opening) in each control shaft	1 - 18' x 24.5' Tainter gate per conduit for fine regulation	1 - 13' x 22' per conduit, vertical lift, 4 cable suspension and 2 hydraulic suspension (fine regulation)
42	Entrance invert elevation (msl)	2095	1672	1425
43	Avg. discharge capacity per conduit & total	Elev. 2250 22,500 cfs - 45,000 cfs	Elev. 1854 30,400 cfs - 98,000 cfs	Elev. 1620 18,500 cfs - 111,000 cfs
44	Present tailwater elevation (ft msl)	2032-2036 5,000 - 35,000 cfs	1669-1677 15,000- 60,000 cfs	1422-1427 20,000-55,000 cfs
	Power Facilities and Data			
45	Avg. gross head available in feet (14)	194	161	174
46	Number and size of conduits	No. 1-24'8" dia., No. 2-22'4" dia.	5 - 29' dia., 25' penstocks	7 - 24' dia., imbedded penstocks
47	Length of conduits in feet (8)	No. 1 - 5,653, No. 2 - 6,355	1829	From 3,280 to 4,005
48	Surge tanks	PH#1: 3-40' dia., PH#2: 2-65' dia.	65' dia. - 2 per penstock	70' dia., 2 per penstock
49	No., type and speed of turbines	5 Francis, PH#1-2: 128.5 rpm, 1-164 rpm , PH#2-2: 128.6 rpm	5 Francis, 90 rpm	7 Francis, 100 rpm
50	Discharge cap. at rated head in cfs	PH#1, units 1&3 170', 2-140' 8,800 cfs, PH#2-4&5 170'-7,200 cfs	150' 41,000 cfs	185' 54,000 cfs
51	Generator nameplate rating in kW	1&3: 43,500; 2: 18,250; 4&5: 40,000	3 - 121,600, 2 - 109,250	112,290
52	Plant capacity in kW	185,250	583,300	786,030
53	Dependable capacity in kW (9)	181,000	388,000	534,000
54	Avg. annual energy, million kWh (12)	1,035	2,248	2,610
55	Initial generation, first and last unit	July 1943 - June 1961	January 1956 - October 1960	April 1962 - June 1963
56	Estimated cost September 1999 completed project (13)	$158,428,000	$305,274,000	$346,521,000

Summary of Engineering Data -- Missouri River Mainstem System

Big Bend Dam - Lake Sharpe	Fort Randall Dam - Lake Francis Case	Gavins Point Dam - Lewis & Clark Lake	Total	Item No.
21 miles upstream Chamberlain, SD	Near Lake Andes, SD	Near Yankton, SD		1
Mile 987.4	Mile 880.0	Mile 811.1		2
249,330 (1) 5,840	263,480 (1) 14,150	279,480 (1) 16,000		3
80, ending near Pierre, SD	107, ending at Big Bend Dam	25, ending near Niobrara, NE	755 miles	4
200 (elevation 1420)	540 (elevation 1350)	90 (elevation 1204.5)	5,940 miles	5
28,900	30,000 1,100	32,000 2,000		6
440,000 (April 1952)	447,000 (April 1952)	480,000 (April 1952)		7
1959	1946	1952		8
1964	1953	1955		9
1440	1395	1234		10
10,570 (including spillway)	10,700 (including spillway)	8,700 (including spillway)	71,596	11
78	140	45	863 feet	12
95	165	74		13
1200, 700	4300, 1250	850, 450		14
Pierre shale & Niobrara chalk	Niobrara chalk	Niobrara chalk & Carlile shale		15
Rolled earth, shale, chalk fill	Rolled earth fill & chalk berms	Rolled earth & chalk fill		16
17,000,000	28,000,000 & 22,000,000	7,000,000	358,128,000 cu. yds	17
540,000	961,000	308,000	5,554,000 cu. yds.	18
24 July 1963	20 July 1952	31 July 1955		19
Left bank - adjacent	Left bank - adjacent	Right bank - adjacent		20
1385	1346	1180		21
376 gated	1000 gated	664 gated		22
8 - 40' x 38' Tainter	21 - 40' x 29' Tainter	14 - 40' x 30' Tainter		23
390,000 at elev 1433.6	620,000 at elev 1379.3	584,000 at elev 1221.4		24
270,000	508,000	345,000		25
1423 msl 62,000 acres	1375 msl 102,000 acres	1210 msl 29,000 acres	1,206,000 acres	26
1422 msl 60,000 acres	1365 msl 94,000 acres	1208 msl 25,000 acres	1,146,000 acres	27
1420 msl 58,000 acres	1350 msl 76,000 acres	1204.5 msl 21,000 acres	984,000 acres	28
1415 msl 51,000 acres	1320 msl 36,000 acres	1204.5 msl 21,000 acres	437,000 acres	29
1423-1422 61,000 a.f.	1375-1365 986,000 a.f.	1210-1208 54,000 a.f.	4,674,000 a.f.	30
1422-1420 118,000 a.f.	1365-1350 1,306,000 a.f.	1208-1204.5 79,000 a.f.	11,626,000 a.f.	31
	1350-1320 1,532,000 a.f.		38,536,000 a.f.	32
1420-1345 1,631,000 a.f.	1320-1240 1,469,000 a.f.	1204.5-1160 295,000 a.f.	17,592,000 a.f.	33
1423-1345 1,810,000 a.f.	1375-1240 5,293,000 a.f.	1210-1160 428,000 a.f.	72,428,000 a.f.	34
November 1963	January 1953	August 1955		35
25 March 1964	24 November 1953	22 December 1955		36
3,445 a.f./year 525 yrs.	15,800 a.f./year 334 yrs.	2,700 a.f./year 159 yrs.	77,400	37
	Left Bank			38
None (7)	4 - 22' diameter	None (7)		39
	1013			40
	2 - 11' x 23' per conduit, vertical lift, cable suspension			41
1385 (11)	1229	1180 (11)		42
	Elev 1375			43
1351-1355(10) 25,000-100,000 cfs	32,000 cfs - 128,000 cfs 1228-1237 10,000-60,000 cfs	1153-1161 15,000-60,000 cfs		44
70	117	48	764 feet	45
None: direct intake	8 - 28' dia., 22' penstocks	None: direct intake		46
	1,074		55,083	47
None	59' dia, 2 per alternate penstock	None		48
8 Fixed blade, 81.8 rpm	8 Francis, 85.7 rpm	3 Kaplan, 75 rpm	36 units	49
67' 103,000 cfs	112' 44,500 cfs	48' 36,000 cfs		50
67,275 (15)	40,000	44,100		51
517,470	320,000	132,300	2,501,200 kw	52
497,000	293,000	74,000	1,967,000 kw	53
975	1,720	724	9,336 million kWh	54
October 1964 - July 1966	March 1954 - January 1956	September 1956 - January 1957	July 1943 - July 1966	55
$107,498,000	$199,066,000	$49,617,000	$1,166,404,000	56

Remarks

(1) Includes 4,280 square miles of non-contributing areas.
(2) Includes 1,350 square miles of non-contributing areas.
(3) With pool at base of flood control.
(4) Storage first available for regulation of flows.
(5) Damming height is height from low water to maximum operating pool. Maximum height is from average streambed to top of dam.
(6) Based on latest available storage data.
(7) River regulation is attained by flows over low-crested spillway and through turbines.
(8) Length from upstream face of outlet or to spiral case.
(9) Based on 8th year (1961) of drought drawdown (From study 8-83-1985).
(10) Affected by level of Lake Francis case. Applicable to pool at elevation 1350.
(11) Spillway crest.
(12) 1967-2016 Average
(13) Source: Annual Report on Civil Works Activities of the Corps of Engineers. Extract Report Fiscal Year 1999.
(14) Based on Study 8-83-1985
(15) 67,275 kW on per unit basis 64,684 kW on facility basis

Corps of Engineers, U.S. Army
Compiled by
Northwestern Division
Missouri River Region
August 2017

Plate 3
Summary of Master Manual Technical Criteria

NAVIGATION TARGET FLOWS

Location	Minimum Service (kcfs)	Full Service (kcfs)
Sioux City	25	31
Omaha	25	31
Nebraska City	31	37
Kansas City	35	41

RELATION OF SYSTEM STORAGE TO NAVIGATION SERVICE LEVEL

Date	System Storage (MAF)	Navigation Service Level
March 15	54.5 or more	35,000 cfs (full-service)
March 15	49.0 to 31	29,000 cfs (minimum-service)
March 15	31.0 or less	No navigation service
July 1	57.0 or more	35,000 cfs (full-service)
July 1	50.5 or less	29,000 cfs (minimum-service)

RELATION OF SYSTEM STORAGE TO NAVIGATION SEASON LENGTH

Date	System Storage (MAF)	Final Day of Navigation Support at Mouth of the Missouri River
July 1	51.5 or more	November 30 (8-month season)
July 1	46.8 through 41.0	October 31 (7-month season)
July 1	36.5 or less	September 30 (6-month season)

RELATION OF SYSTEM WINTER RELEASE TO SYSTEM STORAGE

September 1 System Storage (MAF)	Average Winter Release for Gavins Point
58.0 or more	17,000 cfs
55.0 or less	12,000 cfs

GAVINS POINT RELEASES NEEDED TO MEET TARGET FLOWS

1950 to 1996 Data (kcfs)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Median, Upper Quartile, Upper Decile Runoff								
Full Service	26.7	28.0	27.9	31.6	33.2	32.6	32.0	31.1
Minimum Service	20.7	22.0	21.9	25.6	27.2	26.6	26.0	25.1
Lower Quartile, Lower Decile Runoff								
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
Full Service	29.8	31.3	31.2	34.3	34.0	33.5	33.1	31.2
Minimum Service	23.8	25.3	25.2	28.3	28.0	27.5	27.1	25.2

RESERVOIR UNBALANCING SCHEDULE

	Fort Peck		Garrison		Oahe	
Year	*March 1*	*Rest of Year*	*March 1*	*Rest of Year*	*March 1*	*Rest of Year*
1	High	Float	Low	Hold Peak	Raise & hold during spawn	Float
2	Raise & hold during spawn	Float	High	Float	Low	Hold peak
3	Low	Hold peak	Raise & hold during spawn	Float	High	Float

Notes: **Float year:** Normal regulation, then unbalance 1 foot during low pool years or 3 feet when System storage is near 57.0 MAF on March 1.
Low year: Begin low, then hold peak the remainder of the year.
High year: Begin high, raise and hold pool during spawn, then float.

MRNRC RECOMMENDED RESERVOIR ELEVATION GUIDELINES FOR UNBALANCING

	Fort Peck	Garrison	Oahe
Implement unbalancing if March 1 pool is above this level.	2234 feet msl	1837.5 feet msl	1607.5 feet msl
Implement unbalancing if March 1 pool level is in this range **and** the pool is expected to raise more than 3 feet after March 1.	2227-2234 feet msl	1827-1837.5 feet msl	1600-1607.5 feet msl
Scheduling Criteria	Avoid pool level decline during spawn period which ranges from April 15 – May 30	Schedule after spawn period of April 20 – May 20	Schedule after spawn period of April 8 – May 15

Plate 3 (cont'd)
Summary of Master Manual Technical Criteria

TECHNICAL CRITERIA FOR SPRING PULSES FROM GAVINS POINT DAM

Criteria Applicable to Both the March and May Spring Pulses

Flood Control Constraints	No change from current levels

Criteria Applicable to the March Spring Pulse

Drought Preclude	40.0 MAF or below measured on March 1.
Drought Proration of Pulse Magnitude*	None, 5 kcfs added to navigation releases, but no greater than 35 kcfs.
Initiation of Pulse	Extend the stepped System release increases that precede the beginning of the navigation season.
Rate of Rise before Peak	Approximately 5 kcfs for 1 day.
Duration of Peak	Two days.
Rate of Fall after Peak	Drop over 5 days to navigation target release.

Criteria Applicable to Time Period Between the Bimodal Pulses

Release	Existing Master Manual Criteria

Criteria Applicable to the May Spring Pulse

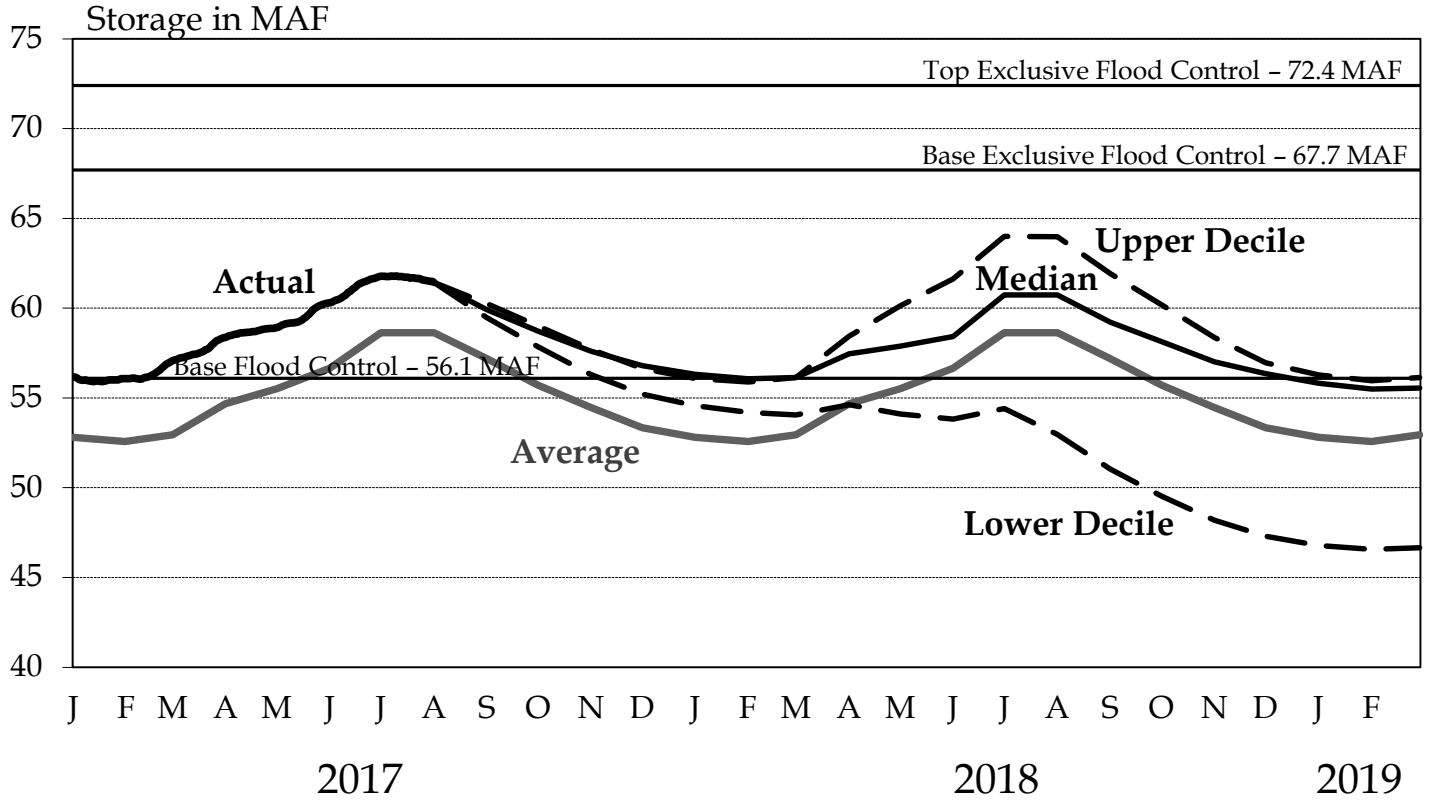
Drought Preclude	40.0 MAF or below measured on May 1.
Proration of Pulse Magnitude Based On System Storage*	Prorated from 16 kcfs based on a May 1 System Storage check; 100% at 54.5 MAF; straight line interpolation to 75% at 40.0 MAF.
Proration of Pulse Magnitude Based On Projected Runoff*	After the proration of the spring pulse magnitude for System Storage, the resultant magnitude would be further adjusted either up or down based on the May CY runoff forecast; 100% for Median; straight-line interpolation to 125% at Upper Quartile runoff; 125% for runoff above Upper Quartile; straight-line interpolation to 75% at Lower Quartile runoff; 75% for runoff below Lower Quartile.
Initiation of Pulse	Between May 1 to May 19, depending on Missouri River water temperature immediately below Gavins Point Dam. If possible, pulse will be initiated after the second daily occurrence of a 16 degree Celsius water temperature; however, the decision will be informed by the potential for 'take' of Threatened and Endangered bird species.
Rate of Rise before Peak	Approximately 6 kcfs per day.
Duration of Peak	Two days.
Rate of Fall after Peak	Approximately 30% drop over 2 days followed by a proportional reduction in releases back to the existing Master Manual criteria over an 8-day period.

Spring Pulse Downstream Flow Limits

Omaha	41,000 cfs
Nebraska City	47,000 cfs
Kansas City	71,000 cfs

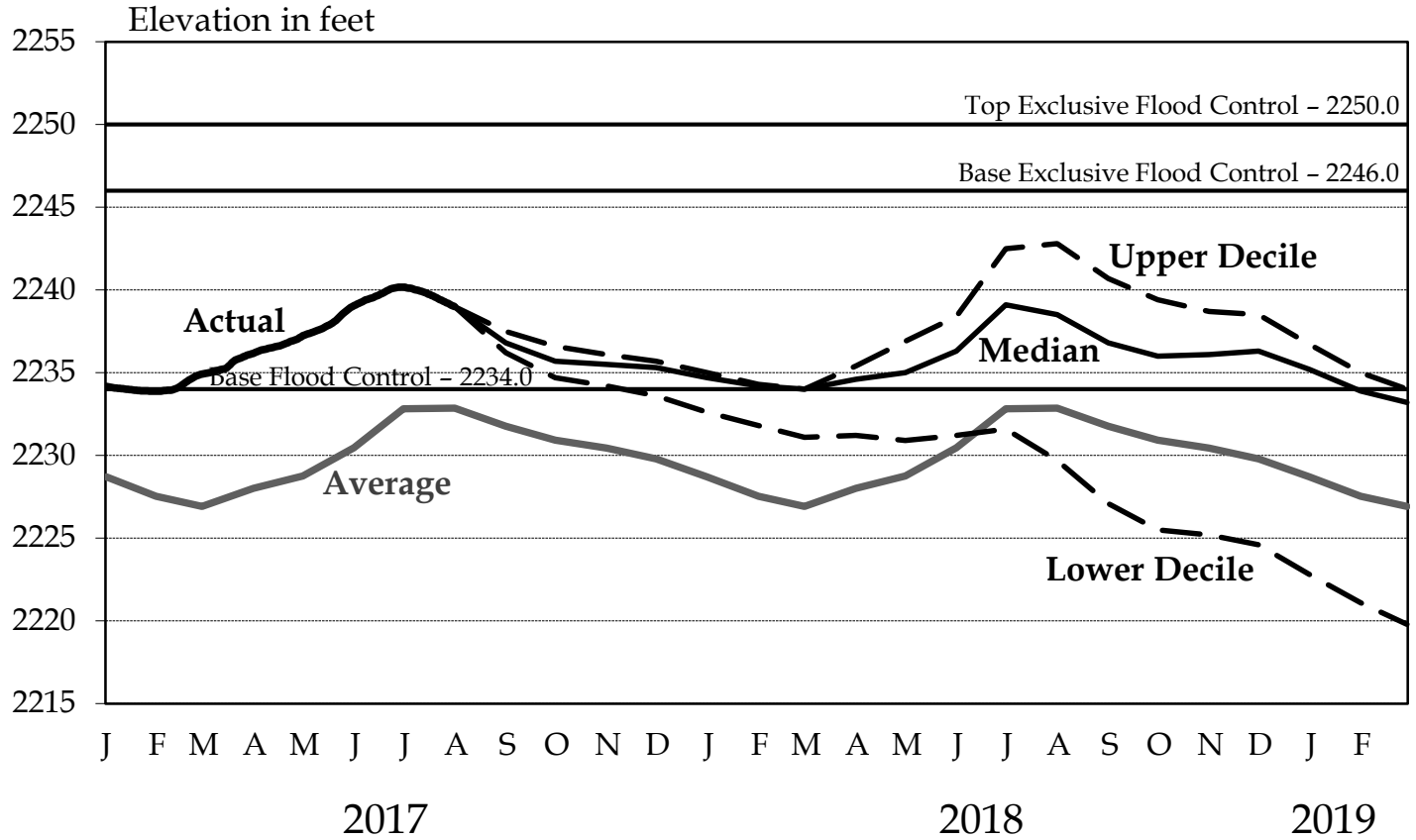
* Spring pulse magnitudes will be determined by taking the difference between pre-pulse Gavins Point releases and the peak pulse Missouri River flows measured just downstream of the mouth of the James River.

System Storage
2017-2018 AOP



Average 1967-2016

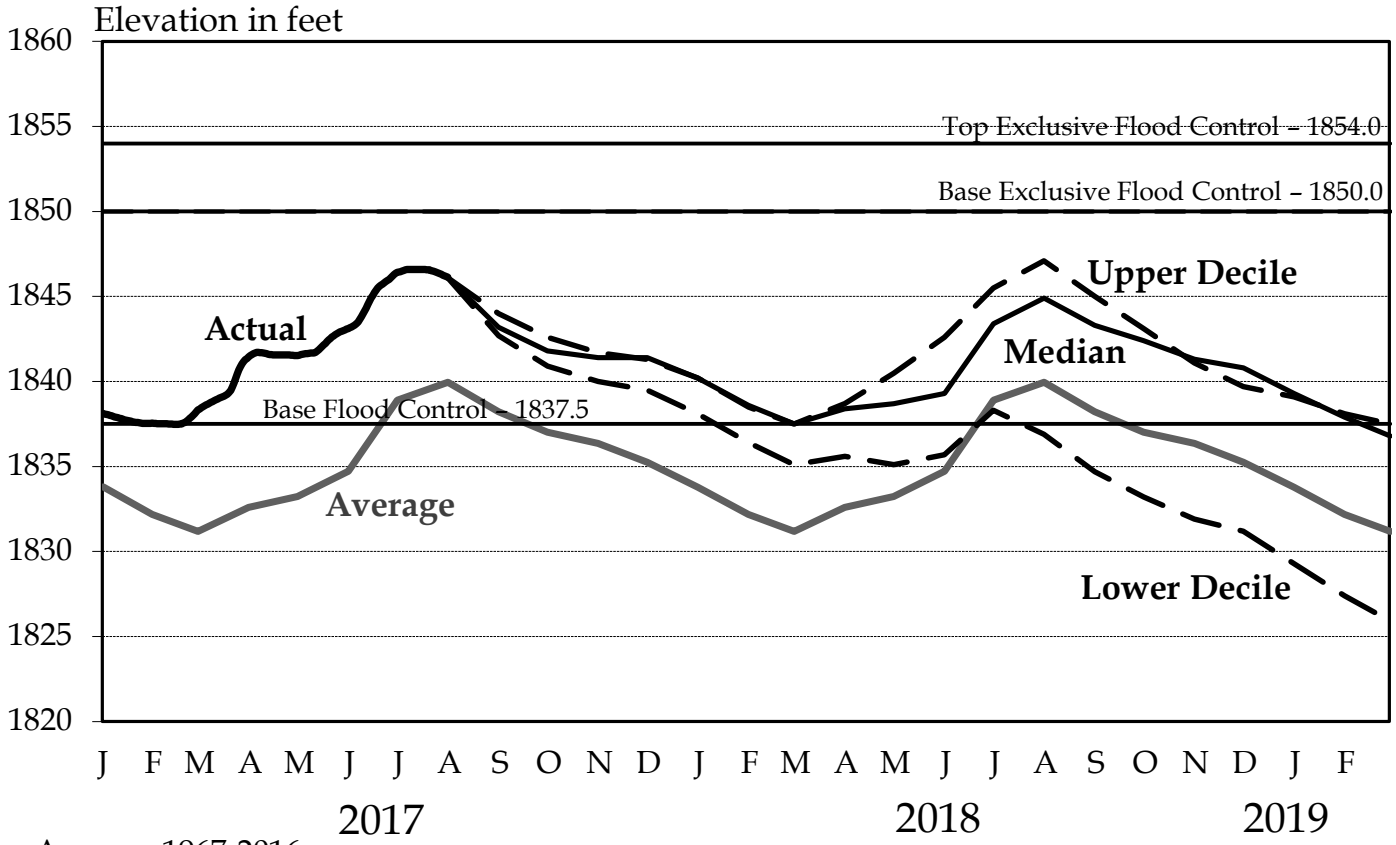
Fort Peck
2017-2018 AOP



Average 1967-2016

Garrison

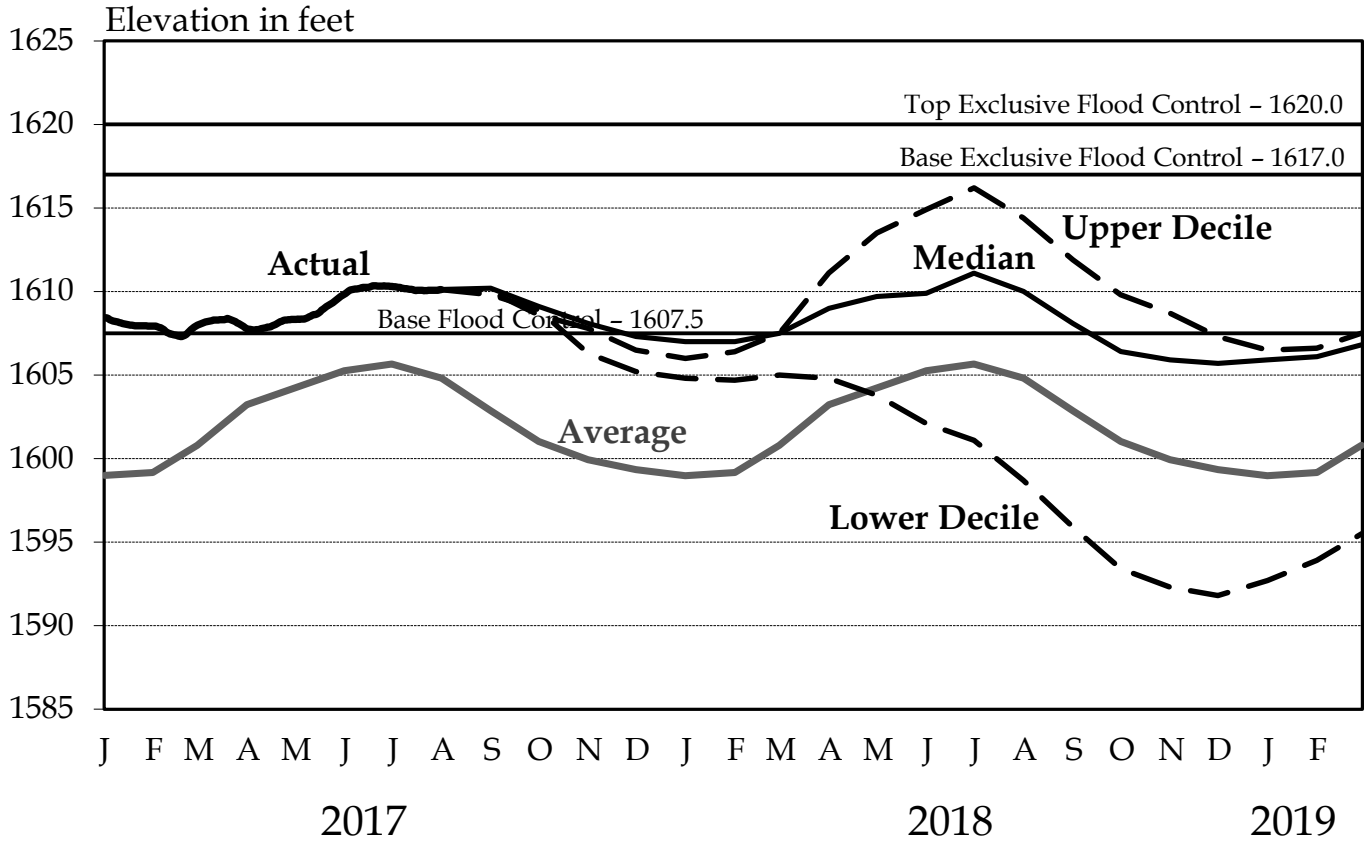
2017-2018 AOP



Average 1967-2016

Oahe

2017-2018 AOP



Average 1967-2016

System Storage

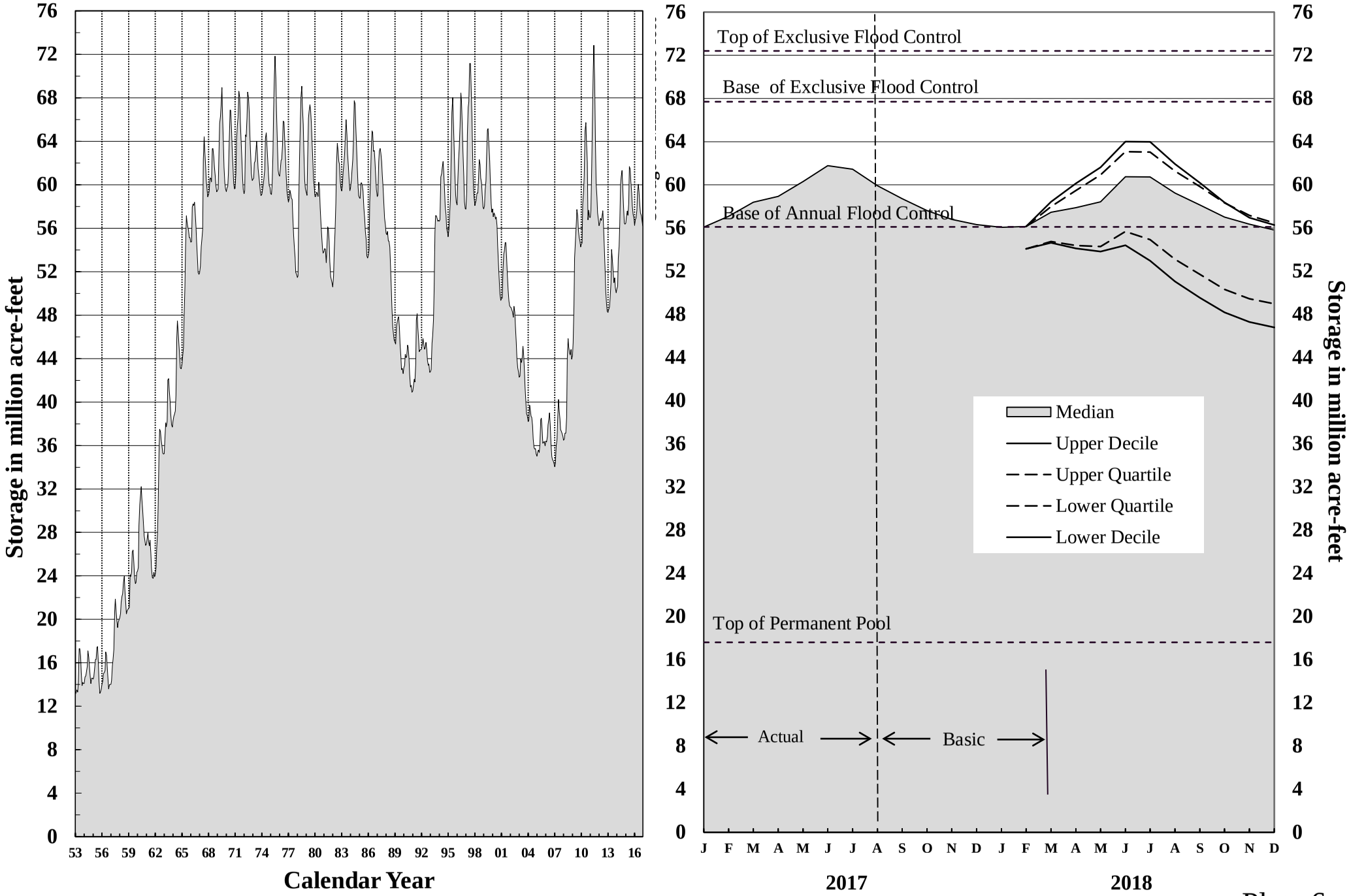


Plate 6

Gavins Point Releases

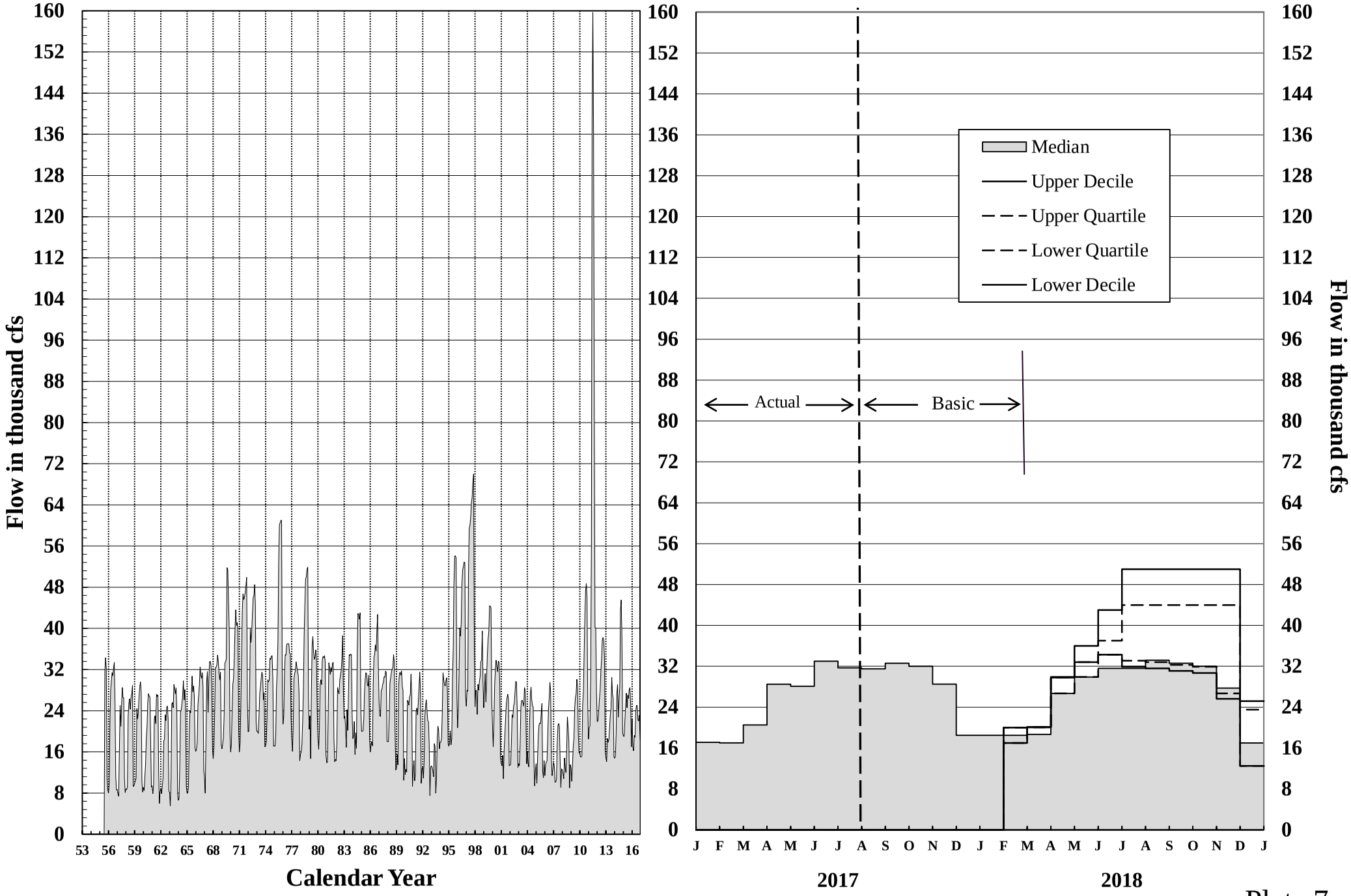
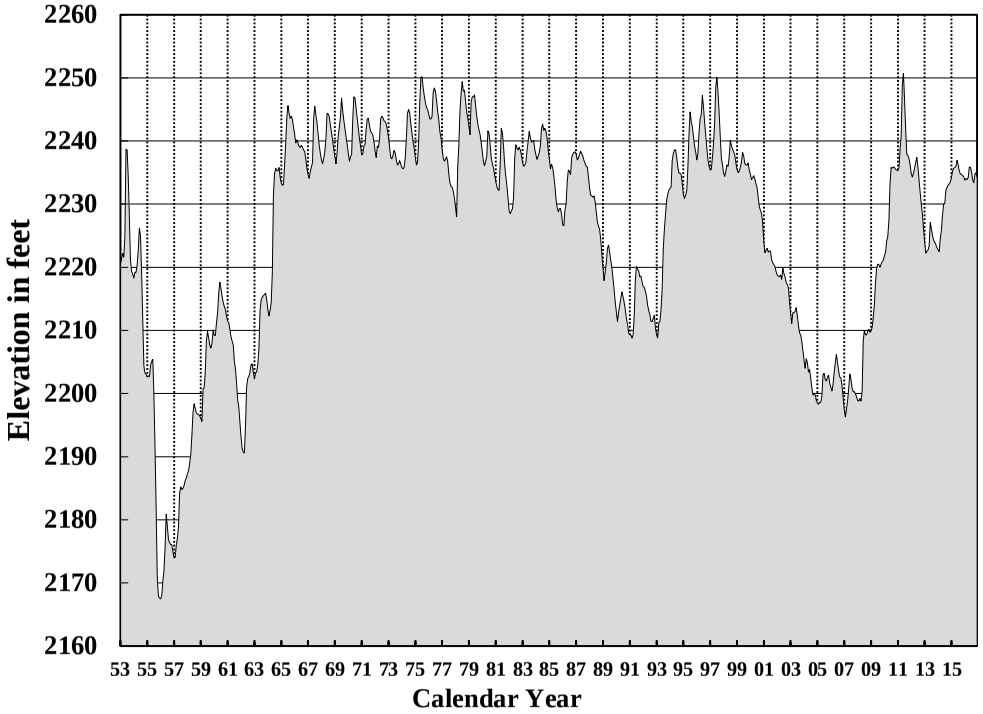
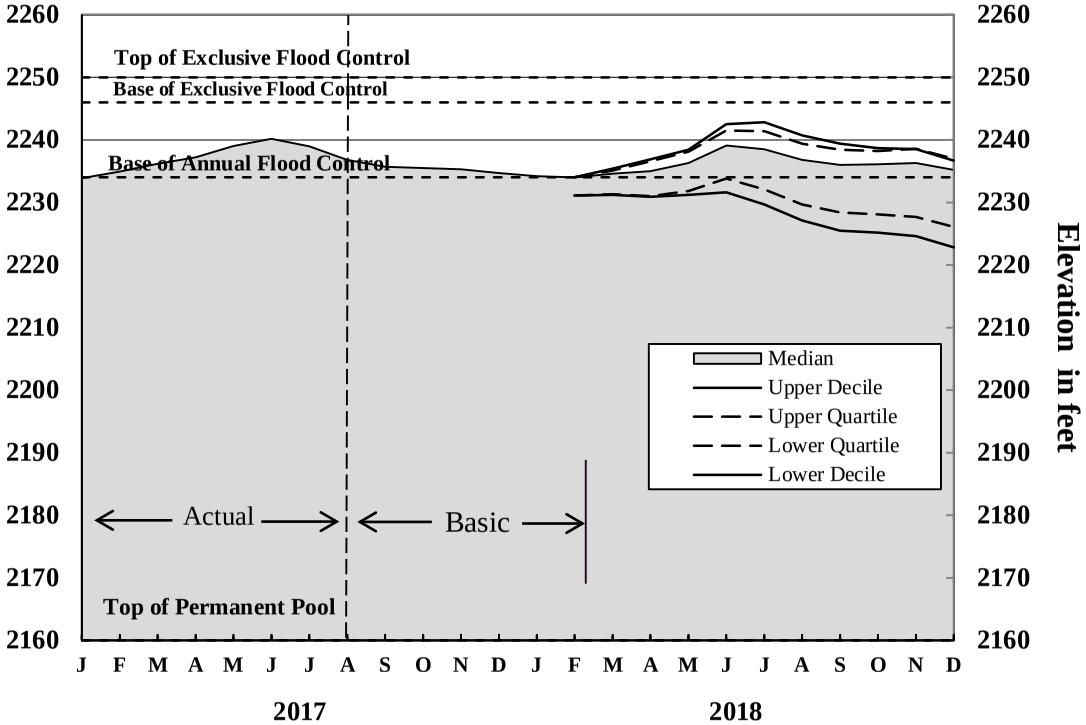


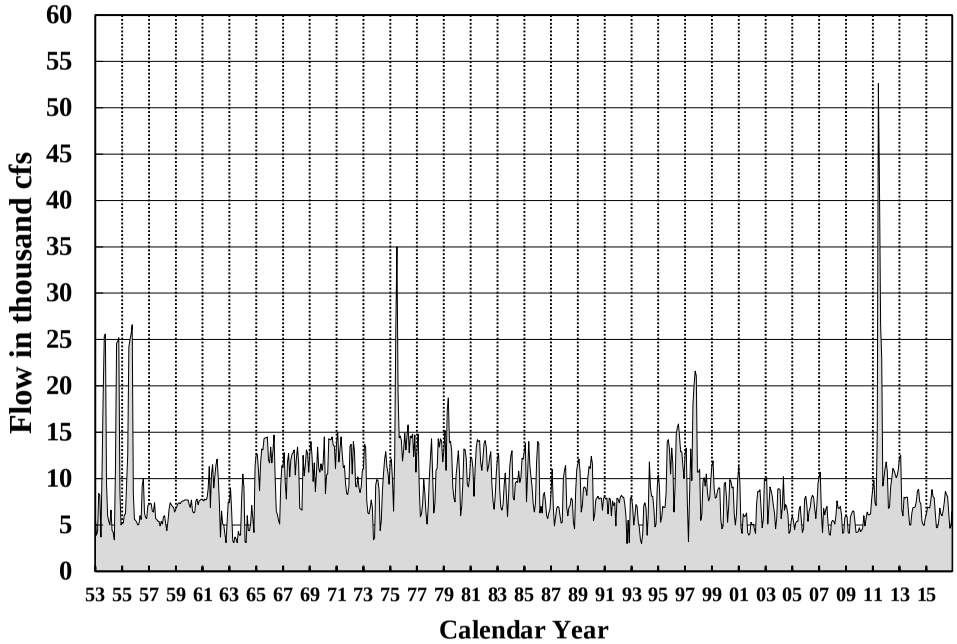
Plate 7

Fort Peck

Elevations and Releases







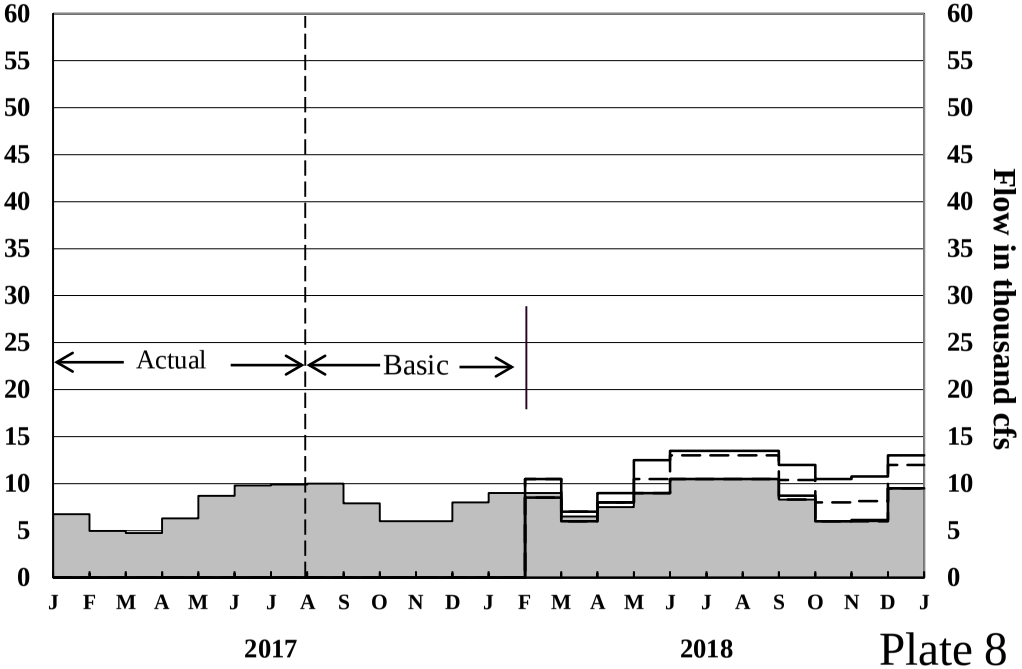


Plate 8

Garrison
Elevations and Releases

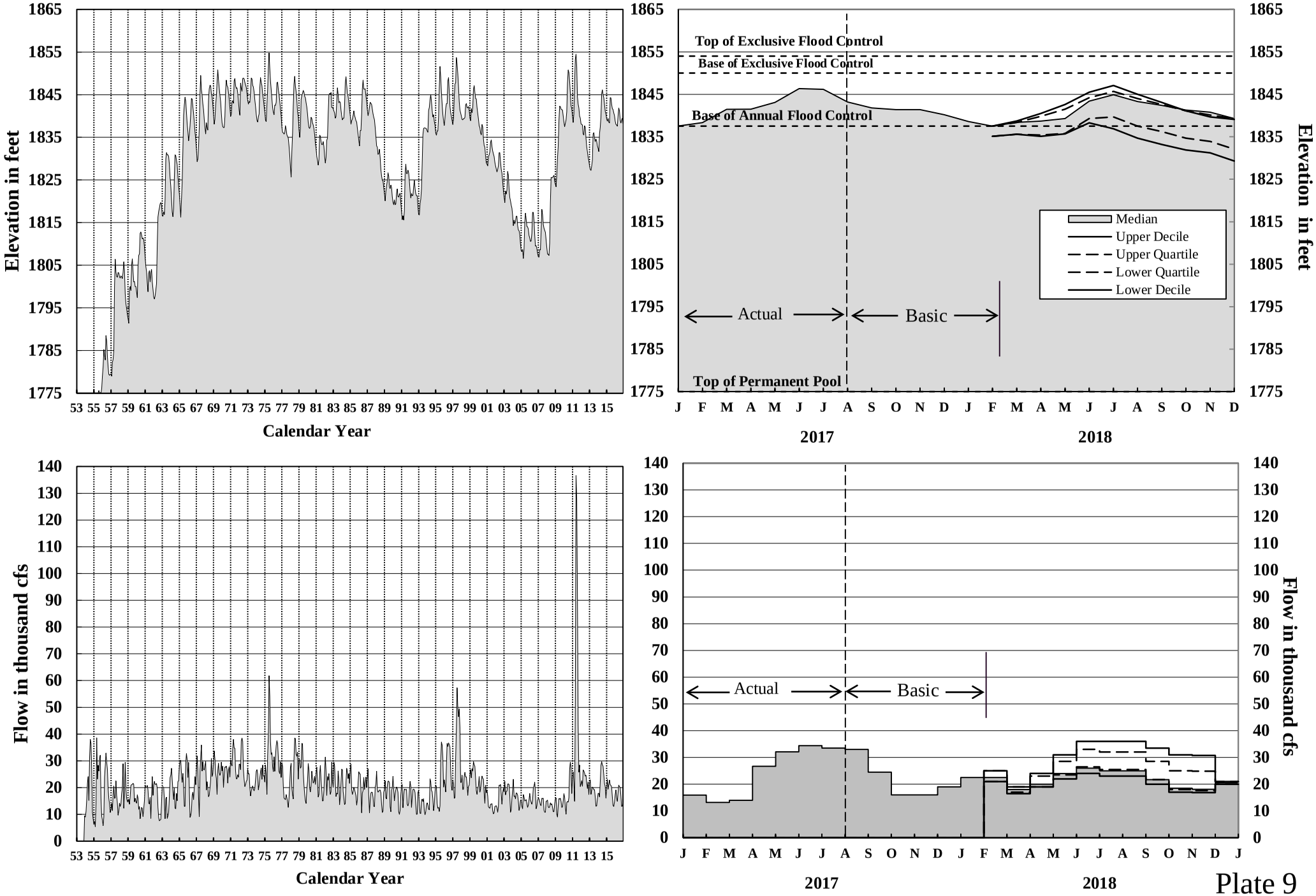
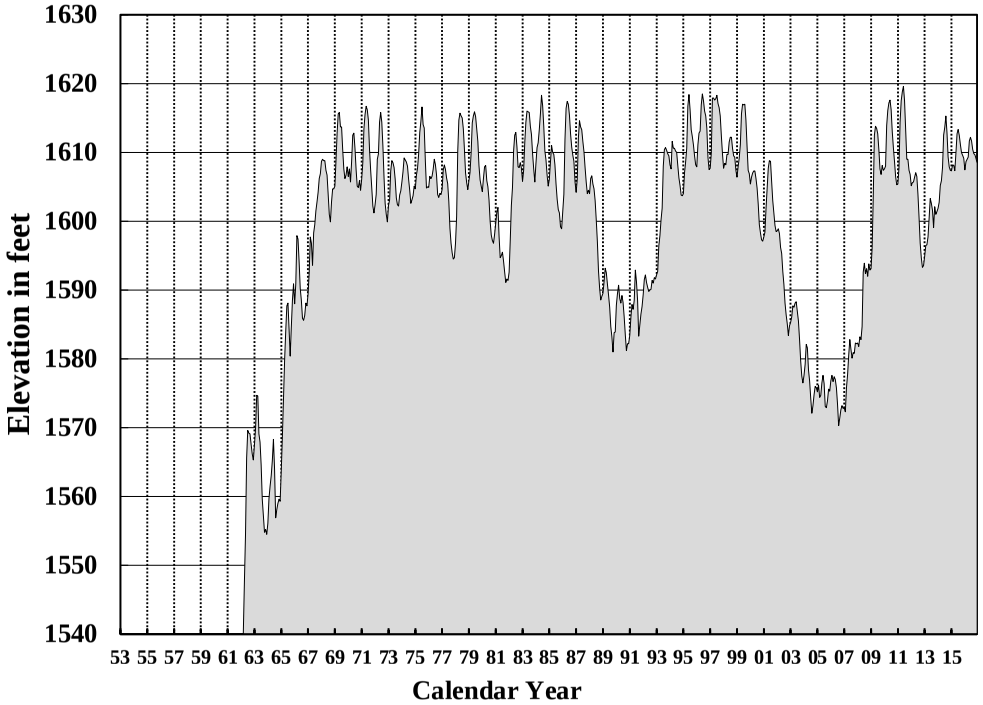
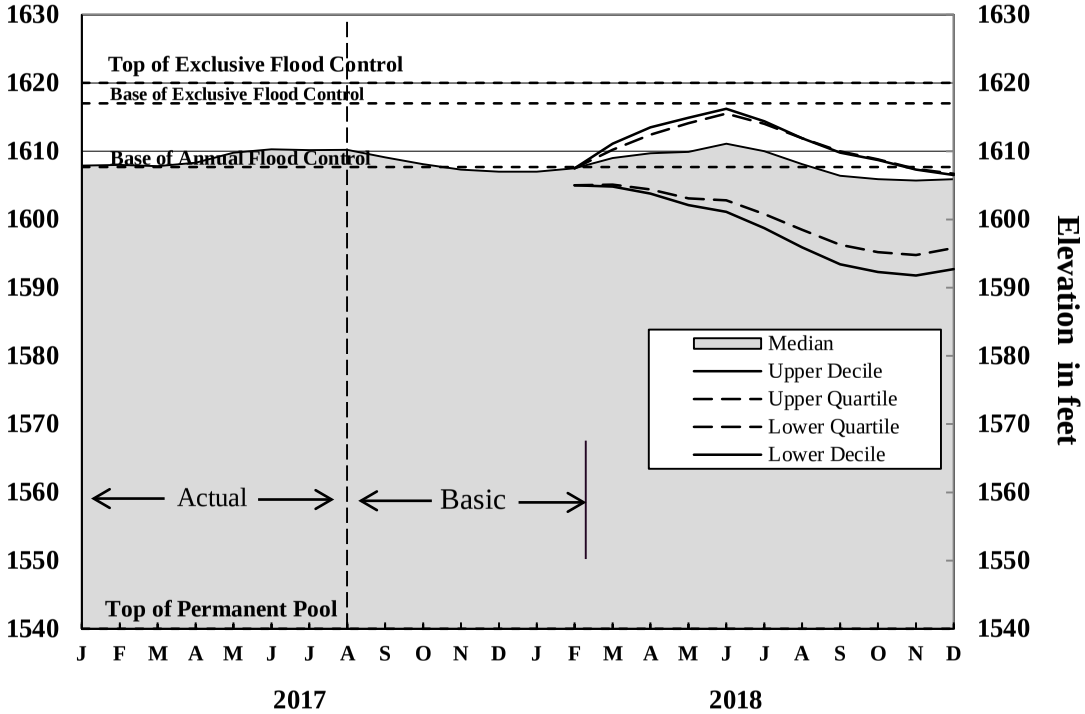


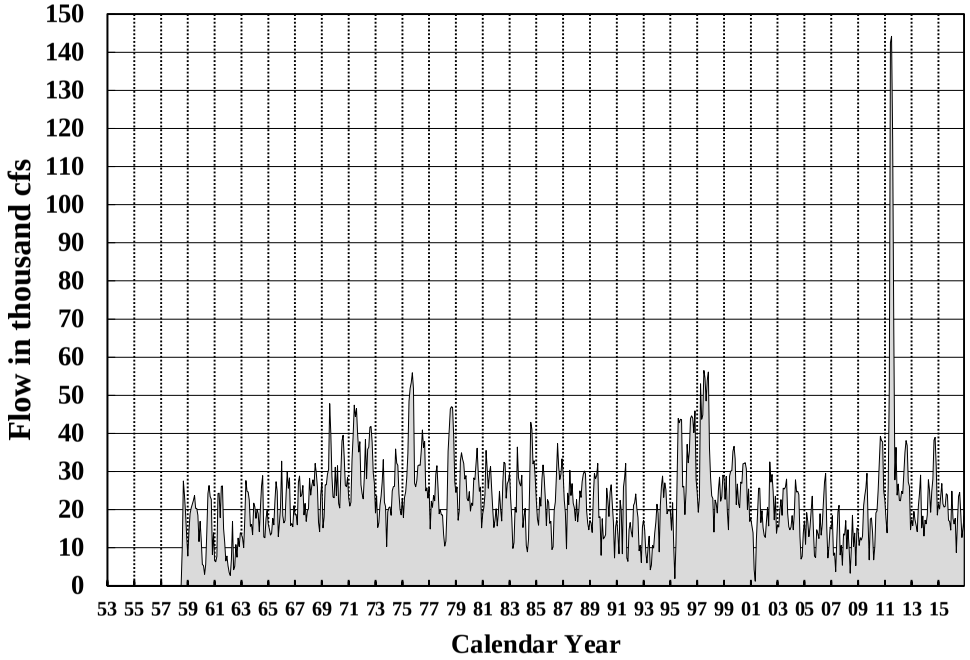
Plate 9

Oahe

Elevations and Releases







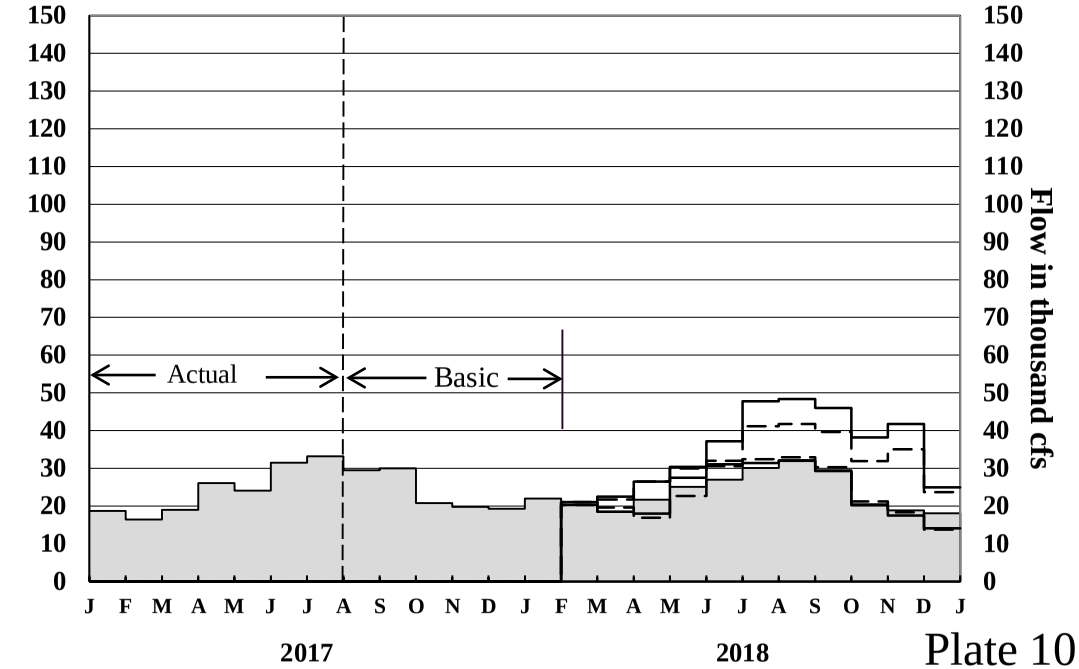
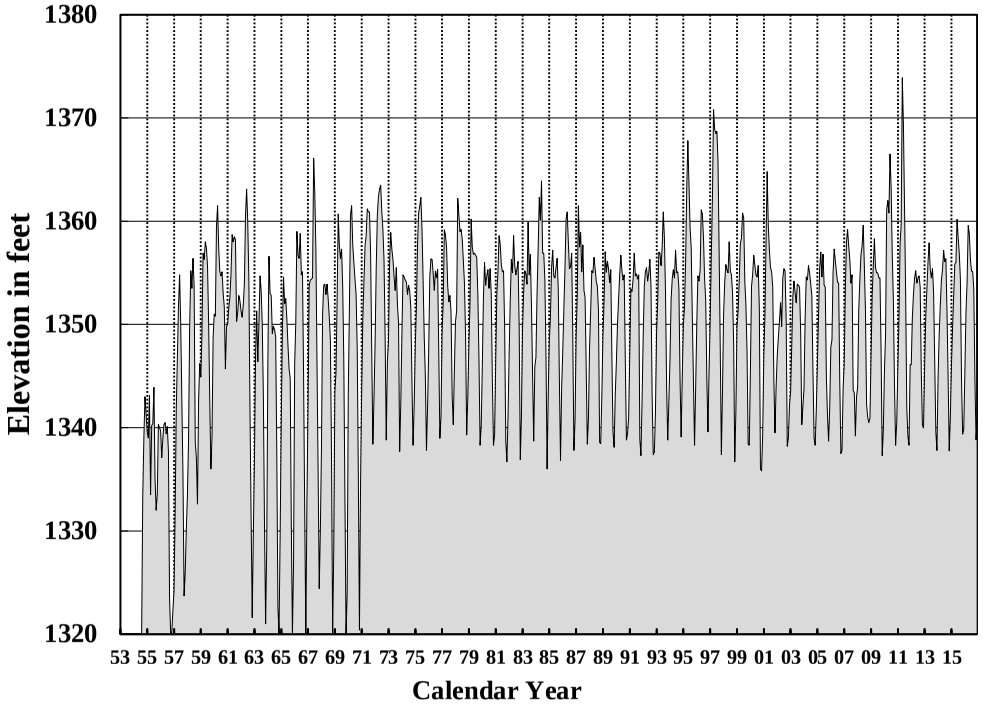
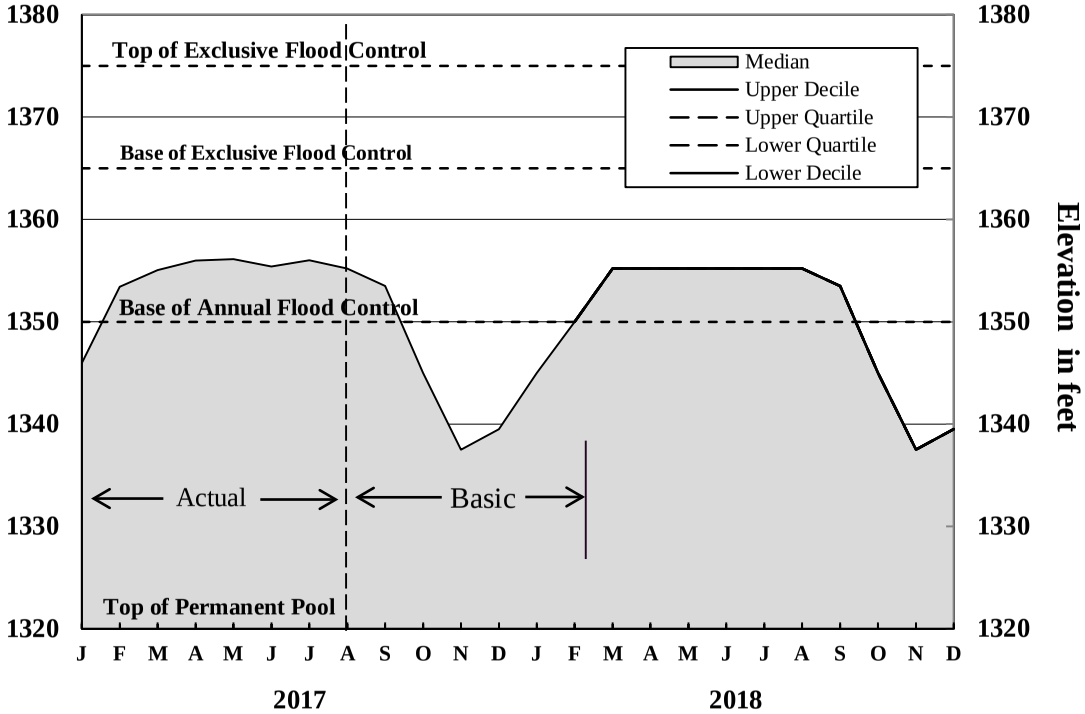
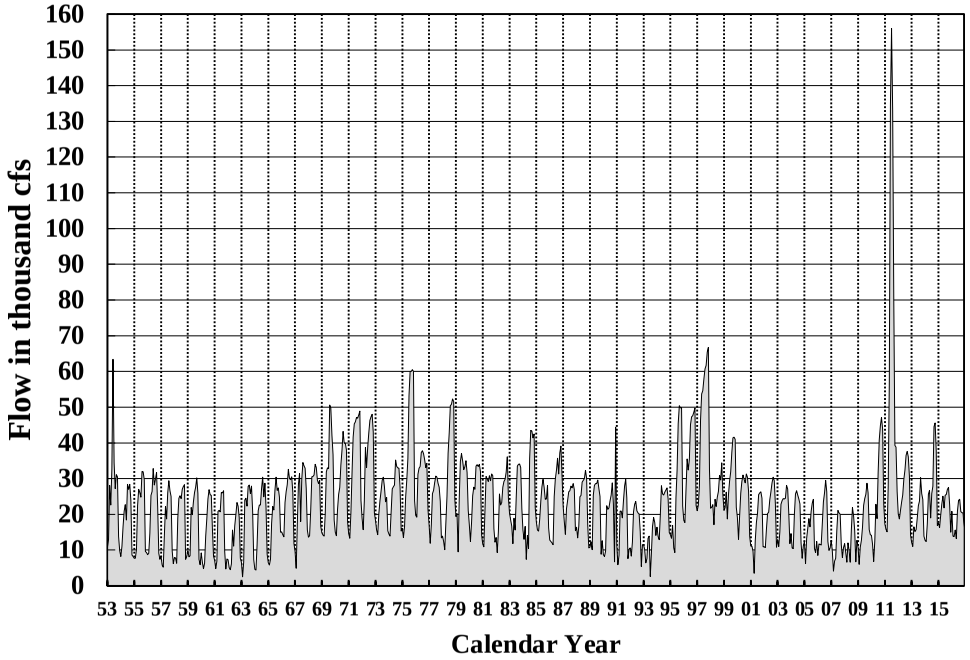


Plate 10

Fort Randall
Elevations and Releases







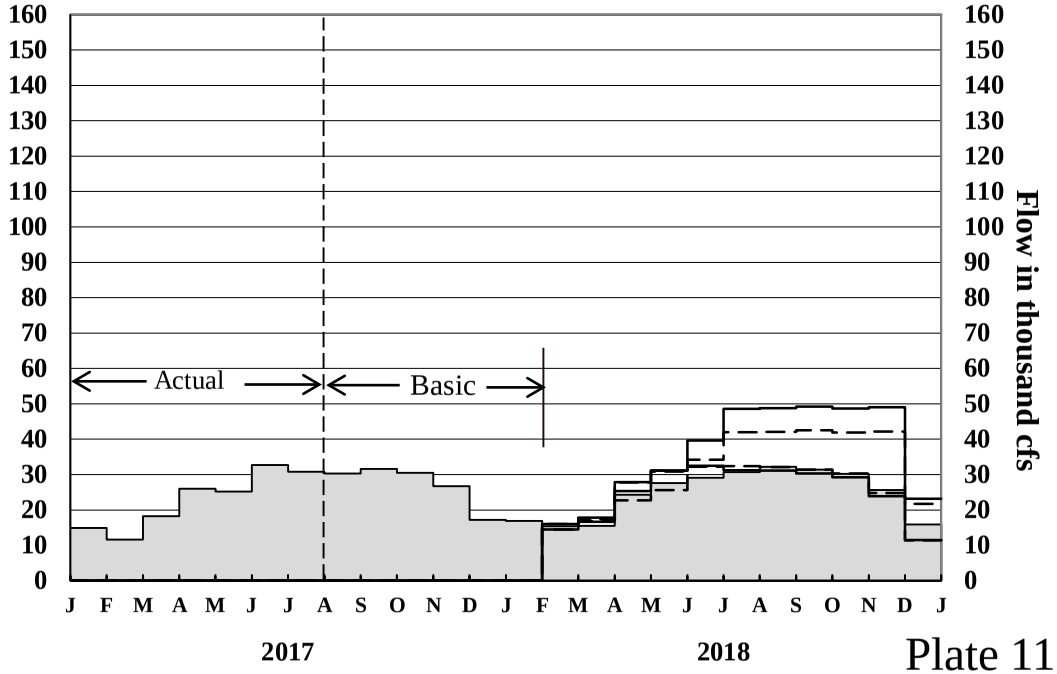
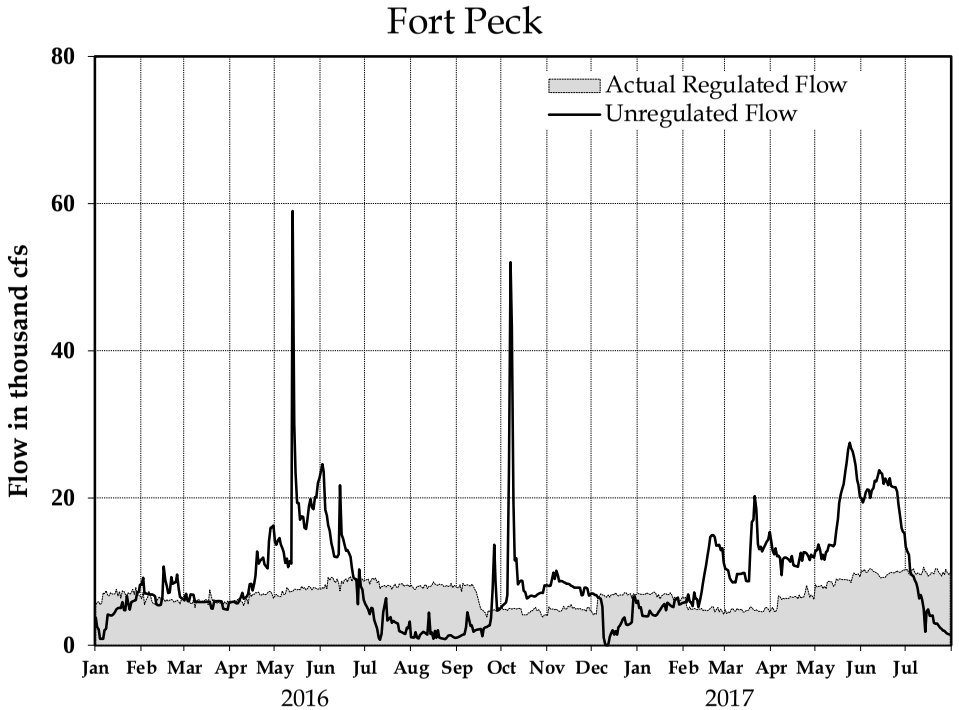
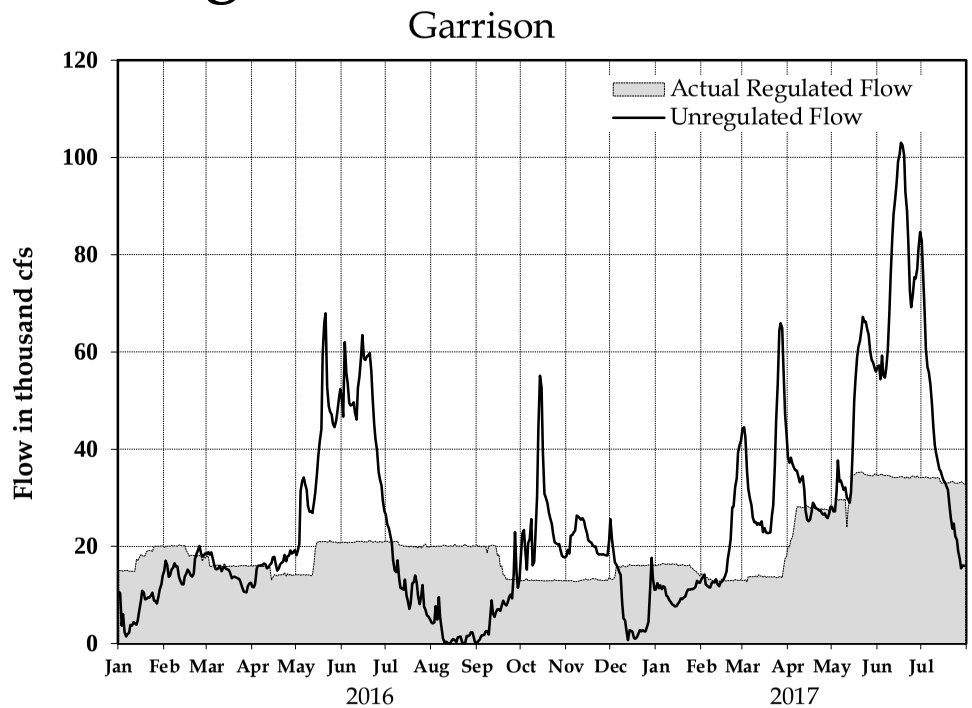
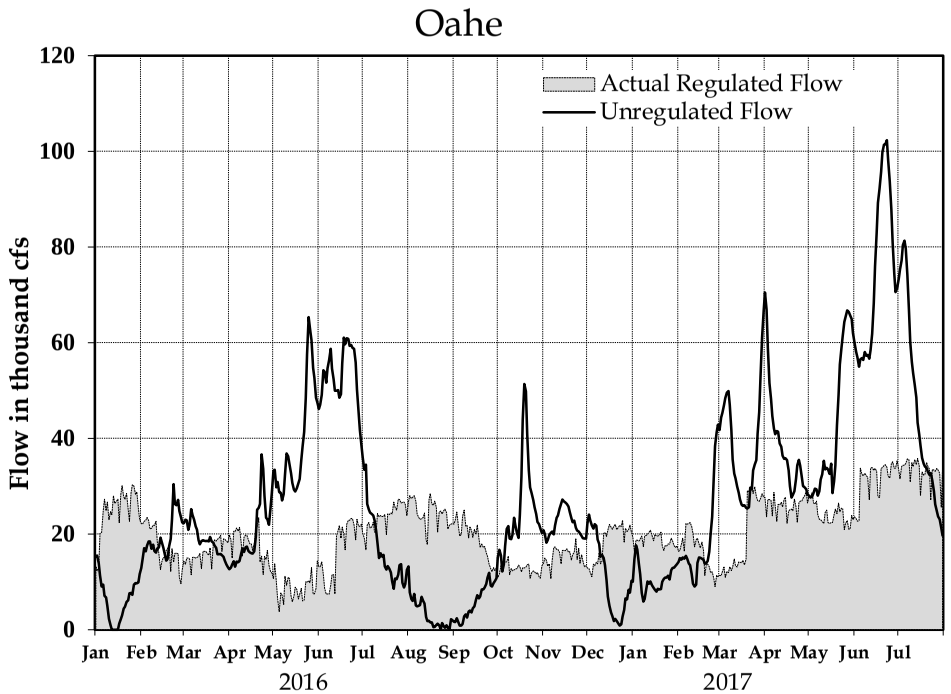


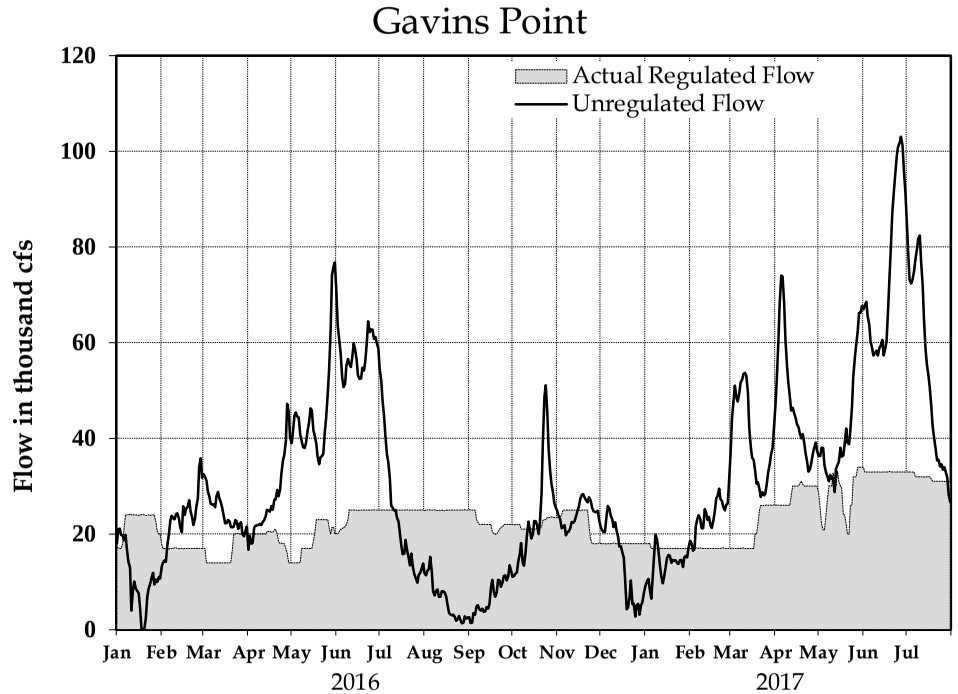
Plate 11

Reservoir Release and Unregulated Flow









System Gross Capability and Average Monthly Generation

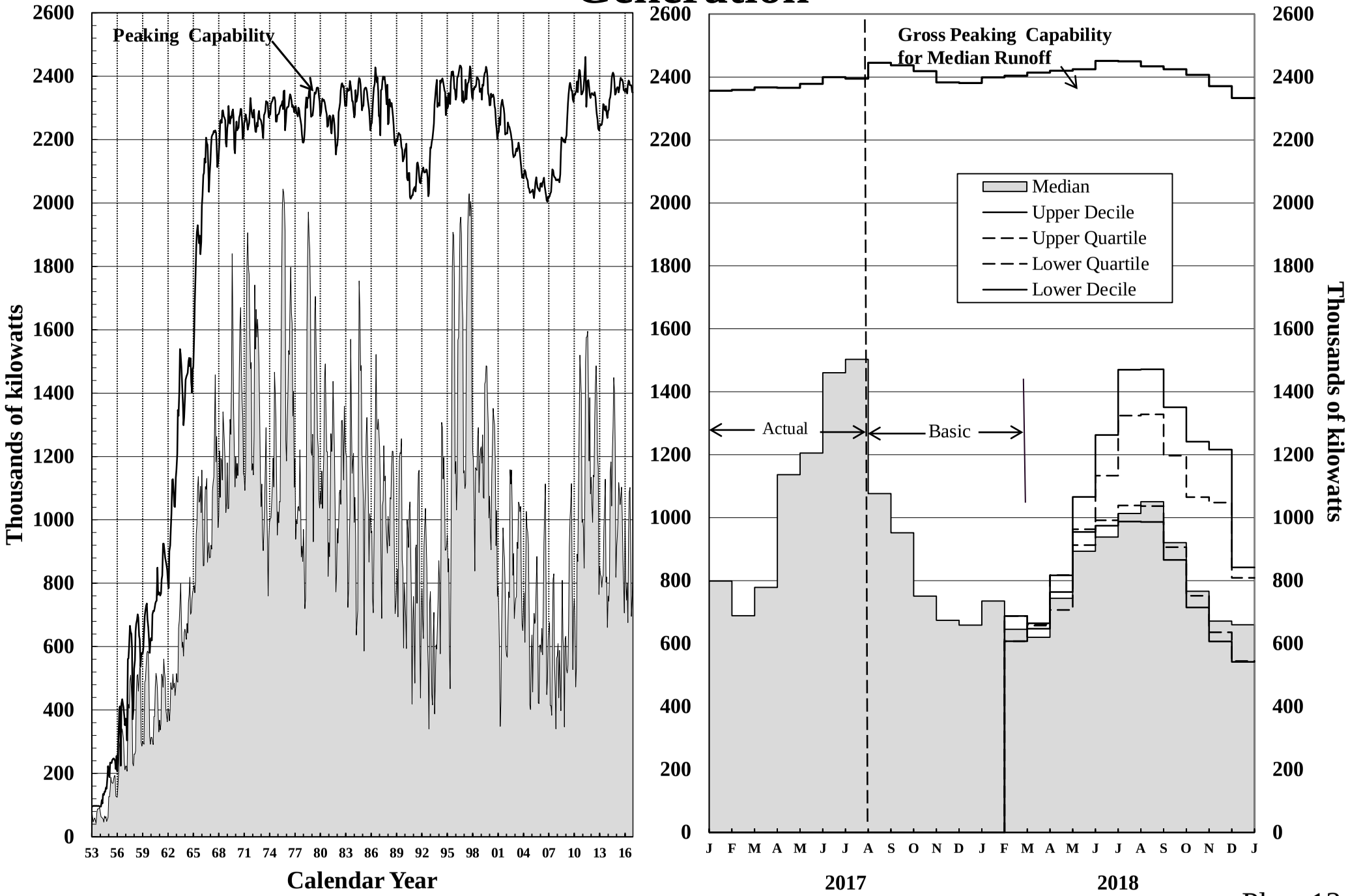


Plate 13

Tentative Five Year Extensions of 2017-2018 AOP

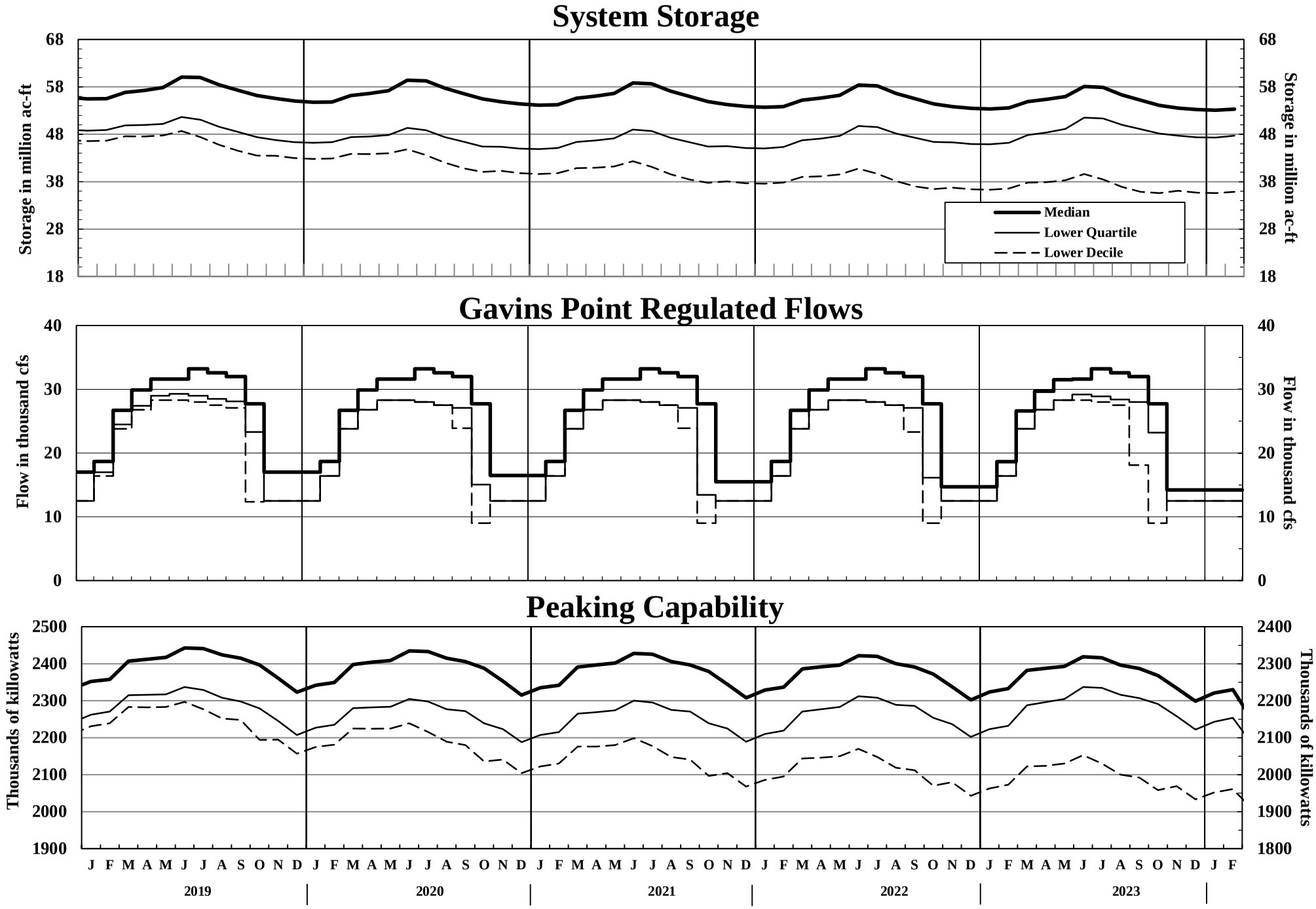


Plate 14

Tentative Five Year Extensions of 2017-2018 AOP

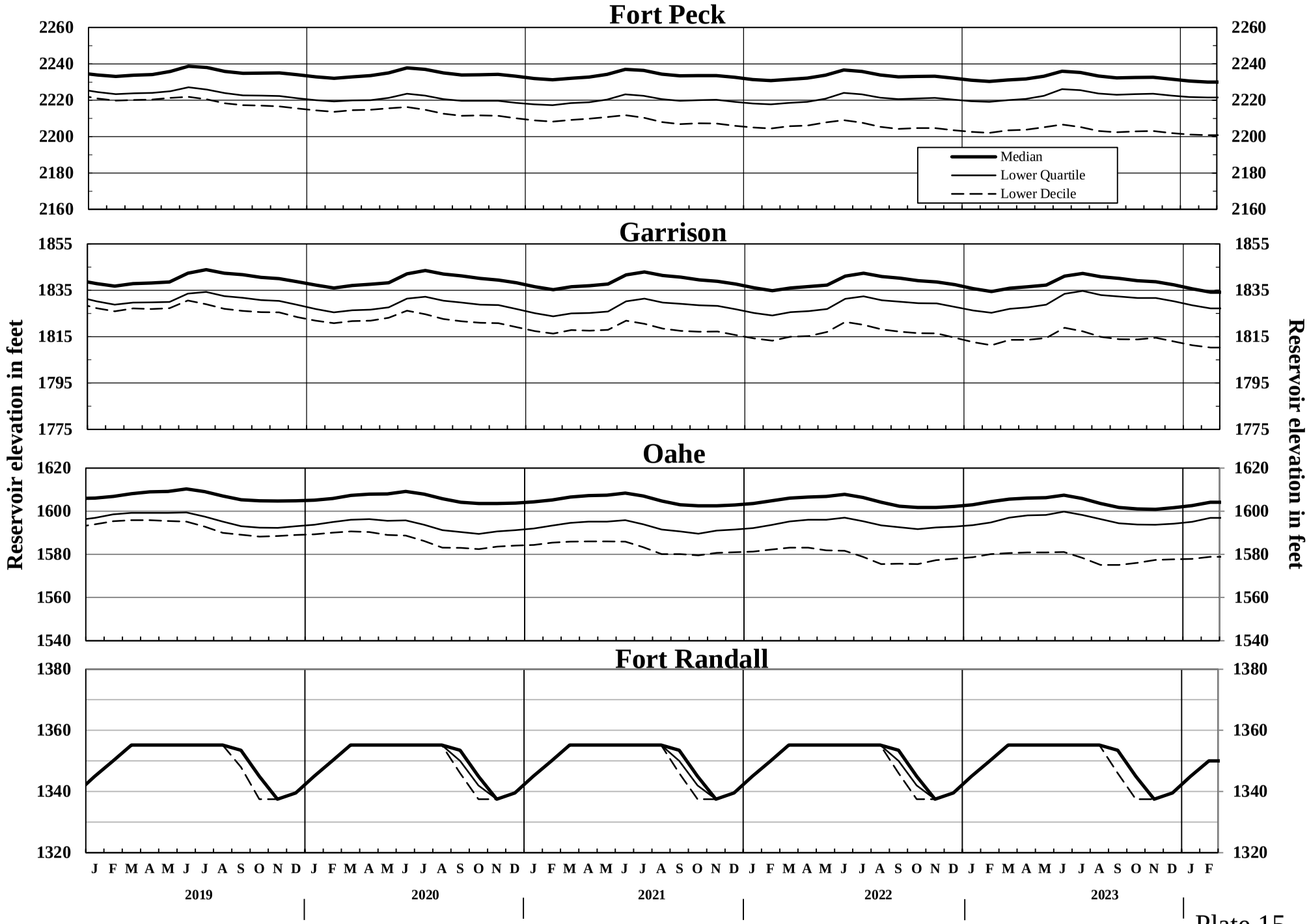


Plate 15

Tribal Lands of the Missouri River Basin

US Army Corps of Engineers ®

RESERVATIONS
1. Rocky Boy
2. Fort Belknap
3. Fort Peck
4. Fort Berthold
5. Turtle Mountain
6. Fort Totten
7. Red Lake
8. Nett Lake
9. White Earth
10. Leech Lake
11. Fond du Lac
12. Bad River
13. Lac Courte Oreilles
14. Lac du Flambeau
15. Crow
16. Northern Cheyenne
17. Standing Rock
18. Cheyenne River
19. Sisseton
20. Wind River
21. Pine RIdge
22. Rosebud
23. Lower Brule
24. Crow Creek
25. Yankton
26. Winnebago
27. Omaha
28. Potawatomi
29. Ute Mountain
30. Southern Ute
31. Flathead
32. Blackfeet
33. Santee
34. Flandreau
35. Iowa
36. Sac and Fox
37. Kickapoo

Plate 16

VALUES IN 1000 AF EXCEPT AS INDICATED

	31JUL17		2017							2018
	INI-SUM	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--										
NAT INFLOW	2106	260	250	300	160	75	85	300	313	363
DEPLETION	-598	32	-90	-121	-38	-18	-20	-122	-135	-87
EVAPORATION	431	89	110	96	43	20	23	50		
MOD INFLOW	2273	139	230	325	154	72	82	372	448	450
RELEASE	3357	615	471	369	179	83	95	492	553	500
STOR CHANGE	-1085	-476	-242	-44	-24	-11	-13	-120	-105	-50
STORAGE	15869.	15393	15151	15108	15083	15072	15059	14939	14834	14784
ELEV FTMSL	2239.0	2236.8	2235.7	2235.5	2235.4	2235.3	2235.3	2234.7	2234.2	2234.0
DISCH KCFS	9.900	10.0	7.9	6.0	6.0	6.0	6.0	8.0	9.0	9.0
POWER										
AVE POWER MW		138	109	82	82	82	82	109	123	123
PEAK POW MW		190	189	189	189	189	189	189	188	188
ENERGY GWH	555.7	102.4	78.2	61.1	29.6	13.8	15.8	81.3	91.2	82.3
--GARRISON--										
NAT INFLOW	2946	670	480	531	196	91	104	251	264	359
DEPLETION	-578	135	-147	-48	-138	-64	-74	-116	-78	-48
CHAN STOR	9	-1	20	19				-19	-10	
EVAPORATION	503	105	129	111	50	23	27	58		
REG INFLOW	6387	1044	990	855	462	216	246	782	886	907
RELEASE	9222	2029	1455	984	476	222	254	1168	1383	1250
STOR CHANGE	-2835	-985	-466	-129	-14	-7	-8	-387	-498	-343
STORAGE	20576.	19591	19125	18997	18983	18976	18968	18582	18084	17741
ELEV FTMSL	1846.1	1843.2	1841.8	1841.4	1841.4	1841.4	1841.4	1840.2	1838.6	1837.5
DISCH KCFS	33.500	33.0	24.5	16.0	16.0	16.0	16.0	19.0	22.5	22.5
POWER										
AVE POWER MW		423	311	203	203	203	203	240	281	279
PEAK POW MW		553	546	545	544	544	544	538	531	526
ENERGY GWH	1411.9	314.9	224.0	151.4	73.1	34.1	39.0	178.6	209.3	187.5
--OAHE--										
NAT INFLOW	359	55	80	55	28	13	15	4	13	97
DEPLETION	217	134	32	-13	1	0	0	14	19	30
CHAN STOR	42	2	33	33		0	0	-12	-14	
EVAPORATION	489	101	127	109	49	23	26	56		
REG INFLOW	8916	1851	1409	976	454	212	243	1091	1364	1317
RELEASE	9755	1813	1783	1281	588	310	280	1184	1352	1165
STOR CHANGE	-839	38	-373	-305	-134	-98	-37	-94	12	152
STORAGE	19503.	19541	19168	18863	18729	18632	18594	18501	18512	18664
ELEV FTMSL	1610.1	1610.2	1609.1	1608.1	1607.7	1607.4	1607.3	1607.0	1607.0	1607.5
DISCH KCFS	33.200	29.5	30.0	20.8	19.8	22.3	17.6	19.3	22.0	21.0
POWER										
AVE POWER MW		385	390	271	256	288	228	248	283	271
PEAK POW MW		722	716	711	709	707	706	705	705	708
ENERGY GWH	1530.2	286.4	280.9	201.4	92.1	48.4	43.8	184.8	210.6	181.8
--BIG BEND--										
EVAPORATION	99	20	25	22	10	5	5	12		
REG INFLOW	9656	1793	1757	1259	578	305	275	1173	1352	1165
RELEASE	9691	1828	1757	1259	578	305	275	1173	1352	1165
STORAGE	1666.	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.6	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	29.200	29.7	29.5	20.5	19.4	22.0	17.3	19.1	22.0	21.0
POWER										
AVE POWER MW		140	140	100	98	110	87	96	108	101
PEAK POW MW		509	517	538	538	538	538	538	538	529
ENERGY GWH	568.8	103.9	100.8	74.7	35.1	18.5	16.7	71.3	80.2	67.6
--FORT RANDALL--										
NAT INFLOW	119	10	15	2	1	0	1	6	29	55
DEPLETION	34	15	7	1	1	0	1	3	3	3
EVAPORATION	108	25	31	24	9	4	4	9		
REG INFLOW	9669	1797	1734	1236	569	301	271	1166	1378	1217
RELEASE	10164	1866	1878	1875	882	412	297	1059	1037	858
STOR CHANGE	-495	-69	-144	-639	-313	-111	-26	108	341	359
STORAGE	3494.	3425	3281	2641	2328	2217	2191	2299	2640	2999
ELEV FTMSL	1356.0	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	30.800	30.3	31.6	30.5	29.6	29.7	18.7	17.2	16.9	15.4
POWER										
AVE POWER MW		256	264	244	224	217	136	126	128	123
PEAK POW MW		356	350	319	296	287	285	294	319	339
ENERGY GWH	977.3	190.7	189.8	181.6	80.6	36.5	26.2	94.0	95.3	82.7
--GAVINS POINT--										
NAT INFLOW	703	90	90	100	50	23	27	90	101	132
DEPLETION	28	10	-5	2	5	2	3	10	1	
CHAN STOR	28	1	-2	2	2	0	20	3	1	3
EVAPORATION	32	6	8	7	3	2	2	4		
REG INFLOW	10836	1941	1963	1968	925	432	340	1137	1138	992
RELEASE	10844	1937	1940	1968	925	432	340	1137	1138	1027
STOR CHANGE	-8	4	23							-35
STORAGE	335.	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.3	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	31.700	31.5	32.6	32.0	31.1	31.1	21.4	18.5	18.5	18.5
POWER										
AVE POWER MW		105	109	108	106	106	75	65	65	65
PEAK POW MW		115	117	117	117	117	117	117	117	114
ENERGY GWH	448.6	78.3	78.3	80.6	38.3	17.9	14.5	48.6	48.6	43.6
--GAVINS POINT - SIOUX CITY--										
NAT INFLOW	603	125	100	85	40	19	21	60	52	101
DEPLETION	135	39	26	12	7	3	3	14	15	16
REGULATED FLOW AT SIOUX CITY										
KAF	11312	2023	2014	2041	959	447	357	1183	1175	1112
KCFS		32.9	33.8	33.2	32.2	32.2	22.5	19.2	19.1	20.0
--TOTAL--										
NAT INFLOW	6836	1210	1015	1073	474	221	253	711	772	1107
DEPLETION	-762	365	-177	-167	-163	-76	-87	-197	-175	-86
CHAN STOR	79	2	51	54	1	0	21	-29	-23	3
EVAPORATION	1662	347	431	370	165	76	87	188		
STORAGE	61443.	59920	58718	57602	57116	56890	56806	56314	56063	56146
SYSTEM POWER										
AVE POWER MW		1447	1322	1009	969	1007	812	885	988	960
PEAK POW MW		2445	2437	2419	2393	2383	2379	2381	2399	2404
ENERGY GWH	5492.5	1076.5	952.0	750.8	348.8	169.2	155.9	658.6	735.2	645.4
DAILY GWH		34.7	31.7	24.2	23.3	24.2	19.5	21.2	23.7	23.0
	INI-SUM	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

VALUES IN 1000 AF EXCEPT AS INDICATED

	31JUL17	2017								2018
	INI-SUM	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--										
NAT INFLOW	1628	182	188	240	128	60	68	240	250	272
DEPLETION	-376	60	-74	-76	-14	-7	-7	-91	-106	-61
EVAPORATION	533	111	137	118	53	25	28	61		
MOD INFLOW	1471	11	125	198	89	41	47	270	356	333
RELEASE	3157	615	446	307	149	69	84	492	523	472
STOR CHANGE	-1686	-604	-320	-110	-60	-28	-37	-222	-167	-139
STORAGE	15869.	15265	14945	14835	14775	14747	14710	14488	14322	14183
ELEV FTMSL	2239.0	2236.2	2234.7	2234.2	2233.9	2233.8	2233.6	2232.6	2231.8	2231.1
DISCH KCFS	9.900	10.0	7.5	5.0	5.0	5.0	5.3	8.0	8.5	8.5
POWER										
AVE POWER MW		138	102	68	68	68	72	109	115	115
PEAK POW MW		189	189	188	188	188	188	187	187	186
ENERGY GWH	520.3	102.3	73.8	50.8	24.6	11.5	13.9	80.8	85.6	77.1
--GARRISON--										
NAT INFLOW	2248	469	360	425	157	73	83	201	211	269
DEPLETION	-393	140	-128	-16	-122	-57	-65	-80	-43	-22
CHAN STOR	13	-1	24	24		0	-3	-27	-5	
EVAPORATION	624	132	161	138	62	29	33	70		
REG INFLOW	5187	811	797	635	365	171	197	676	772	763
RELEASE	8752	1968	1405	922	446	208	238	1107	1291	1166
STOR CHANGE	-3565	-1156	-608	-287	-81	-38	-41	-431	-520	-403
STORAGE	20576.	19420	18812	18524	18443	18405	18364	17933	17414	17011
ELEV FTMSL	1846.1	1842.7	1840.9	1840.0	1839.7	1839.6	1839.5	1838.1	1836.4	1835.1
DISCH KCFS	33.500	32.0	23.6	15.0	15.0	15.0	15.0	18.0	21.0	21.0
POWER										
AVE POWER MW		410	299	190	189	189	189	225	259	257
PEAK POW MW		551	542	538	536	536	535	529	521	515
ENERGY GWH	1330.4	305.1	215.6	141.0	68.0	31.7	36.2	167.2	192.9	172.6
--OAHE--										
NAT INFLOW	264	36	60	41	21	10	11	3	10	73
DEPLETION	217	134	32	-13	1	0	0	14	19	30
CHAN STOR	47	6	32	34				-12	-12	
EVAPORATION	605	127	158	135	59	27	31	67		
REG INFLOW	8242	1749	1307	875	407	190	218	1016	1270	1209
RELEASE	9834	1860	1598	1666	666	261	237	1125	1292	1129
STOR CHANGE	-1592	-112	-291	-791	-259	-71	-20	-109	-22	80
STORAGE	19503.	19391	19101	18310	18051	17980	17961	17852	17830	17911
ELEV FTMSL	1610.1	1609.8	1608.9	1606.3	1605.5	1605.3	1605.2	1604.8	1604.7	1605.0
DISCH KCFS	33.200	30.3	26.9	27.1	22.4	18.8	15.0	18.3	21.0	20.3
POWER										
AVE POWER MW		395	349	349	287	240	191	233	267	259
PEAK POW MW		720	715	702	697	696	696	694	693	695
ENERGY GWH	1531.8	293.5	251.6	260.0	103.2	40.3	36.7	173.6	198.9	174.0
--BIG BEND--										
EVAPORATION	123	25	31	28	12	6	7	14		
REG INFLOW	9711	1835	1567	1638	654	255	231	1111	1292	1129
RELEASE	9746	1870	1567	1638	654	255	231	1111	1292	1129
STORAGE	1666.	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.6	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	29.200	30.4	26.3	26.6	22.0	18.4	14.5	18.1	21.0	20.3
POWER										
AVE POWER MW		143	126	130	110	92	73	91	103	97
PEAK POW MW		509	529	538	538	538	538	538	538	529
ENERGY GWH	572.7	106.3	90.7	96.9	39.5	15.5	14.1	67.6	76.6	65.5
--FORT RANDALL--										
NAT INFLOW	90	7	11	2	1	0	1	5	22	41
DEPLETION	34	15	7	1	1	0	1	3	3	3
EVAPORATION	132	32	38	29	12	5	5	12		
REG INFLOW	9670	1831	1533	1610	642	250	226	1101	1311	1167
RELEASE	10165	1900	1957	1970	896	420	252	992	970	808
STOR CHANGE	-495	-69	-424	-359	-254	-170	-26	108	341	359
STORAGE	3494.	3425	3001	2641	2387	2217	2191	2299	2640	2999
ELEV FTMSL	1356.0	1355.2	1350.0	1345.0	1341.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	30.800	30.9	32.9	32.0	30.1	30.3	15.9	16.1	15.8	14.5
POWER										
AVE POWER MW		261	271	252	228	222	116	119	120	116
PEAK POW MW		356	339	319	301	287	285	294	319	339
ENERGY GWH	973.8	194.0	194.8	187.8	82.2	37.3	22.2	88.2	89.2	77.9
--GAVINS POINT--										
NAT INFLOW	520	59	68	75	38	18	20	68	76	99
DEPLETION	28	10	-5	2	5	2	3	10	1	
CHAN STOR	30	0	-4	2	4	0	27	-1	1	2
EVAPORATION	40	8	10	9	4	2	2	5		
REG INFLOW	10647	1941	2016	2035	928	433	294	1045	1045	909
RELEASE	10655	1937	1993	2035	928	433	294	1045	1045	944
STOR CHANGE	-8	4	23							-35
STORAGE	335.	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.3	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	31.700	31.5	33.5	33.1	31.2	31.2	18.5	17.0	17.0	17.0
POWER										
AVE POWER MW		105	111	111	107	107	65	60	60	60
PEAK POW MW		115	117	117	117	117	117	117	117	114
ENERGY GWH	438.9	78.3	79.8	82.5	38.3	17.9	12.5	44.7	44.7	40.1
--GAVINS POINT - SIOUX CITY--										
NAT INFLOW	440	81	75	64	30	14	16	45	39	76
DEPLETION	135	39	26	12	7	3	3	14	15	16
REGULATED FLOW AT SIOUX CITY										
KAF	10960	1979	2042	2087	952	444	306	1076	1069	1004
KCFS		32.2	34.3	33.9	32.0	32.0	19.3	17.5	17.4	18.1
--TOTAL--										
NAT INFLOW	5190	834	762	847	374	174	199	562	608	830
DEPLETION	-355	398	-142	-90	-123	-57	-66	-130	-111	-34
CHAN STOR	90	5	53	60	4	0	24	-40	-17	2
EVAPORATION	2057	434	535	457	203	94	106	230		
STORAGE	61443.	59471	57851	56303	55649	55343	55219	54565	54199	54061
SYSTEM POWER										
AVE POWER MW		1451	1259	1101	988	918	706	836	925	904
PEAK POW MW		2440	2430	2401	2377	2362	2359	2359	2375	2378
ENERGY GWH	5367.8	1079.5	906.3	819.0	355.8	154.2	135.6	622.2	688.0	607.2
DAILY GWH		34.8	30.2	26.4	23.7	22.0	17.0	20.1	22.2	21.7
	INI-SUM	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

VALUES IN 1000 AF EXCEPT AS INDICATED

	31JUL17	2017							2018	
	INI-SUM	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--										
NAT INFLOW	2554	338	300	360	192	90	102	360	376	436
DEPLETION	-606	-10	-124	-95	-31	-14	-17	-116	-121	-78
EVAPORATION	295	67	84	73	17	8	9	38		
MOD INFLOW	2865	281	340	382	206	96	110	438	497	514
RELEASE	3953	615	533	492	238	111	151	584	646	583
STOR CHANGE	-1088	-334	-193	-109	-32	-15	-41	-146	-149	-69
STORAGE	15869.	15535	15342	15233	15201	15185	15145	14999	14850	14781
ELEV FTMSL	2239.0	2237.5	2236.6	2236.1	2235.9	2235.9	2235.7	2235.0	2234.3	2234.0
DISCH KCFS	9.900	10.0	9.0	8.0	8.0	8.0	9.5	9.5	10.5	10.5
POWER										
AVE POWER MW		138	123	110	110	110	130	130	143	143
PEAK POW MW		190	190	189	189	189	189	189	188	188
ENERGY GWH	654.5	102.5	88.6	81.6	39.4	18.4	24.9	96.5	106.4	96.0
--GARRISON--										
NAT INFLOW	3580	871	576	637	235	109	125	301	295	431
DEPLETION	-614	107	-160	-43	-135	-63	-72	-116	-83	-50
CHAN STOR	-6	-1	10	9		0	-15		-10	
EVAPORATION	345	79	98	84	20	9	11	43		
REG INFLOW	7796	1298	1181	1097	587	274	322	958	1014	1064
RELEASE	10634	2029	1649	1383	669	305	349	1322	1537	1388
STOR CHANGE	-2838	-731	-468	-287	-82	-31	-27	-364	-523	-324
STORAGE	20576.	19845	19377	19091	19008	18977	18950	18586	18062	17738
ELEV FTMSL	1846.1	1844.0	1842.6	1841.7	1841.5	1841.4	1841.3	1840.2	1838.5	1837.5
DISCH KCFS	33.500	33.0	27.7	22.5	22.5	22.0	22.0	21.5	25.0	25.0
POWER										
AVE POWER MW		424	354	286	285	279	278	271	312	310
PEAK POW MW		555	550	546	545	544	544	539	531	526
ENERGY GWH	1627.8	315.6	254.6	212.8	102.6	46.8	53.5	201.8	232.2	208.0
--OAHE--										
NAT INFLOW	489	74	108	74	37	17	20	5	18	136
DEPLETION	217	134	32	-13	1	0	0	14	19	30
CHAN STOR	33	2	20	20		2		2	-14	
EVAPORATION	332	76	95	81	19	9	10	41		
REG INFLOW	10606	1895	1651	1410	687	316	358	1274	1522	1494
RELEASE	11448	1921	2118	1663	793	405	564	1425	1386	1173
STOR CHANGE	-842	-26	-467	-254	-106	-90	-206	-151	136	322
STORAGE	19503.	19477	19009	18756	18649	18560	18354	18203	18339	18661
ELEV FTMSL	1610.1	1610.0	1608.6	1607.8	1607.4	1607.2	1606.5	1606.0	1606.4	1607.5
DISCH KCFS	33.200	31.2	35.6	27.0	26.7	29.2	35.6	23.2	22.5	21.1
POWER										
AVE POWER MW		408	462	350	344	375	455	297	289	272
PEAK POW MW		721	714	709	707	706	702	700	702	708
ENERGY GWH	1789.0	303.2	332.5	260.3	123.8	63.1	87.4	220.9	215.0	182.7
--BIG BEND--										
EVAPORATION	67	15	19	17	4	2	2	9		
REG INFLOW	11381	1906	2099	1646	789	403	562	1416	1386	1173
RELEASE	11416	1941	2099	1646	789	403	562	1416	1386	1173
STORAGE	1666.	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.6	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	29.200	31.6	35.3	26.8	26.5	29.0	35.4	23.0	22.5	21.1
POWER										
AVE POWER MW		148	167	131	133	145	176	115	110	101
PEAK POW MW		509	517	538	538	538	538	538	538	529
ENERGY GWH	669.9	110.3	120.3	97.4	47.7	24.3	33.8	85.8	82.2	68.0
--FORT RANDALL--										
NAT INFLOW	166	14	20	3	2	1	1	8	41	77
DEPLETION	34	15	7	1	1	0	1	3	3	3
EVAPORATION	75	19	24	18	4	2	2	7		
REG INFLOW	11474	1921	2088	1630	786	402	560	1415	1424	1247
RELEASE	11968	1990	2233	2269	1099	513	586	1307	1083	888
STOR CHANGE	-494	-69	-144	-639	-313	-111	-26	109	341	359
STORAGE	3494.	3425	3281	2642	2328	2217	2192	2300	2641	3000
ELEV FTMSL	1356.0	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	30.800	32.4	37.5	36.9	36.9	36.9	36.9	21.3	17.6	16.0
POWER										
AVE POWER MW		273	312	294	277	266	262	156	134	127
PEAK POW MW		356	350	319	296	287	285	294	320	339
ENERGY GWH	1142.8	203.1	224.9	219.1	99.8	44.7	50.3	115.7	99.5	85.5
--GAVINS POINT--										
NAT INFLOW	962	122	122	135	68	32	36	122	141	185
DEPLETION	28	10	-5	2	5	2	3	10	1	
CHAN STOR	27	-3	-10	1	0	0	0	29	7	3
EVAPORATION	22	5	6	5	1	1	1	3		
REG INFLOW	12908	2095	2344	2398	1160	541	619	1445	1230	1076
RELEASE	12916	2091	2321	2398	1160	541	619	1445	1230	1111
STOR CHANGE	-8	4	23							-35
STORAGE	335.	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.3	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	31.700	34.0	39.0	39.0	39.0	39.0	39.0	23.5	20.0	20.0
POWER										
AVE POWER MW		111	116	117	117	117	117	83	71	70
PEAK POW MW		115	117	117	117	117	117	117	117	114
ENERGY GWH	497.4	82.4	83.3	86.8	42.0	19.6	22.4	61.5	52.5	47.0
--GAVINS POINT - SIOUX CITY--										
NAT INFLOW	822	169	135	115	54	25	29	81	73	141
DEPLETION	135	39	26	12	7	3	3	14	15	16
REGULATED FLOW AT SIOUX CITY										
KAF	13603	2221	2430	2501	1208	564	644	1512	1288	1236
KCFS		36.1	40.8	40.7	40.6	40.6	40.6	24.6	20.9	22.3
--TOTAL--										
NAT INFLOW	8573	1588	1261	1324	587	274	313	877	944	1406
DEPLETION	-806	295	-224	-136	-153	-71	-81	-191	-166	-79
CHAN STOR	54	-2	21	31	0	2	-15	32	-17	3
EVAPORATION	1136	262	325	279	65	30	34	141		
STORAGE	61443.	60252	59003	57714	57180	56933	56633	56081	55886	56138
SYSTEM POWER										
AVE POWER MW		1501	1534	1288	1265	1291	1419	1051	1059	1023
PEAK POW MW		2447	2438	2418	2392	2382	2375	2376	2396	2404
ENERGY GWH	6381.3	1117.1	1104.2	957.9	455.4	216.9	272.4	782.3	787.8	687.3
DAILY GWH		36.0	36.8	30.9	30.4	31.0	34.0	25.2	25.4	24.5
	INI-SUM	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 07:41:37 STUDY NO 4

VALUES IN 1000 AF EXCEPT AS INDICATED

28FEB18		2018											2019			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	9450	341	159	205	825	1400	2355	1205	440	385	480	288	134	153	350	310	420
DEPLETION	600	-17	-8	-10	-34	305	626	291	6	-114	-77	-29	-13	-15	-112	-117	-82
EVAPORATION	327							22	70	87	75	18	8	9	39		
MOD INFLOW	8523	358	167	215	859	1095	1729	892	364	412	482	298	139	159	423	427	502
RELEASE	8525	208	97	125	536	769	803	830	830	720	646	312	146	182	799	799	722
STOR CHANGE	-3	150	70	90	323	326	926	62	-466	-308	-163	-14	-7	-23	-376	-372	-220
STORAGE	14781.	14931	15001	15091	15414	15740	16666	16728	16262	15954	15790	15776	15770	15746	15370	14998	14778
ELEV FTMSL	2234.0	2234.7	2235.0	2235.4	2236.9	2238.4	2242.5	2242.8	2240.7	2239.4	2238.6	2238.6	2238.5	2238.4	2236.7	2235.0	2234.0
DISCH KCFS	10.500	7.0	7.0	7.0	9.0	12.5	13.5	13.5	13.5	12.1	10.5	10.5	10.5	11.5	13.0	13.0	13.0
POWER																	
AVE POWER MW		95	96	96	123	170	184	186	185	167	145	145	145	158	176	175	174
PEAK POW MW		188	189	189	190	191	194	194	192	192	191	191	191	191	190	189	188
ENERGY GWH	1406.7	34.4	16.1	20.7	88.8	126.5	132.4	138.1	137.6	119.9	107.8	52.1	24.3	30.4	130.8	130.0	116.8
--GARRISON--																	
NAT INFLOW	14000	530	247	318	1355	1840	3460	2715	835	570	645	248	116	132	260	315	415
DEPLETION	1122	3	2	2	-129	-7	1121	774	105	-145	-41	-140	-65	-75	-128	-94	-61
CHAN STOR	-25	35			-20	-34	-10			13	16			-10	-15		0
EVAPORATION	371							25	80	99	84	20	9	10	43		
REG INFLOW	21008	770	343	441	2000	2581	3133	2746	1480	1350	1263	680	317	369	1130	1208	1198
RELEASE	21013	565	264	339	1428	1906	2142	2214	2214	1989	1906	922	430	476	1291	1537	1388
STOR CHANGE	-5	204	79	102	572	675	990	532	-734	-639	-643	-242	-113	-107	-161	-329	-190
STORAGE	17738.	17942	18021	18123	18695	19370	20360	20892	20158	19519	18876	18634	18521	18414	18252	17924	17733
ELEV FTMSL	1837.5	1838.1	1838.4	1838.7	1840.5	1842.6	1845.5	1847.0	1844.9	1843.0	1841.1	1840.3	1840.0	1839.6	1839.1	1838.1	1837.5
DISCH KCFS	25.000	19.0	19.0	19.0	24.0	31.0	36.0	36.0	36.0	33.4	31.0	31.0	31.0	30.0	21.0	25.0	25.0
POWER																	
AVE POWER MW		236	236	237	300	391	460	465	464	427	392	389	388	375	263	311	309
PEAK POW MW		529	530	532	540	550	561	566	558	552	543	539	538	536	534	529	526
ENERGY GWH	3216.3	84.8	39.7	51.1	216.2	291.0	330.9	346.1	345.5	307.5	291.9	140.1	65.2	71.9	195.5	231.1	207.7
--OAHE--																	
NAT INFLOW	3900	569	265	341	510	390	710	310	125	185	145	118	55	63	15	10	90
DEPLETION	777	26	12	15	52	79	166	204	137	33	-13	1	0	0	14	20	31
CHAN STOR	3	24			-19	-26	-18			10	9			4	36	-16	
EVAPORATION	367							26	80	98	83	19	9	10	42		
REG INFLOW	23772	1132	517	665	1867	2191	2668	2293	2121	2053	1990	1020	476	532	1286	1511	1447
RELEASE	23777	521	282	338	1071	1693	2211	2937	2977	2735	2349	1155	573	757	1535	1460	1184
STOR CHANGE	-5	612	235	327	796	498	457	-644	-855	-682	-359	-135	-97	-225	-248	51	264
STORAGE	18661.	19273	19508	19835	20631	21130	21587	20943	20088	19406	19047	18912	18814	18590	18342	18392	18656
ELEV FTMSL	1607.5	1609.4	1610.1	1611.1	1613.5	1614.9	1616.2	1614.4	1611.9	1609.8	1608.7	1608.3	1608.0	1607.3	1606.4	1606.6	1607.5
DISCH KCFS	21.116	17.5	20.3	18.9	18.0	27.5	37.2	47.8	48.4	46.0	38.2	38.8	41.3	47.7	25.0	23.8	21.3
POWER																	
AVE POWER MW		227	265	249	238	367	497	634	634	599	495	501	532	608	321	305	275
PEAK POW MW		718	722	727	739	746	753	744	731	720	714	712	710	707	702	703	708
ENERGY GWH	3762.5	81.9	44.5	53.7	171.6	273.1	358.0	471.8	471.8	431.4	368.4	180.4	89.3	116.7	238.7	226.8	184.5
--BIG BEND--																	
EVAPORATION	72							5	15	19	17	4	2	2	9		
REG INFLOW	23705	521	282	338	1071	1693	2211	2933	2962	2716	2333	1151	572	755	1526	1460	1184
RELEASE	23705	521	282	338	1071	1693	2211	2933	2962	2716	2333	1151	572	755	1526	1460	1184
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	21.116	17.5	20.3	18.9	18.0	27.5	37.2	47.7	48.2	45.6	37.9	38.7	41.2	47.6	24.8	23.8	21.3
POWER																	
AVE POWER MW		83	95	89	84	129	174	223	225	216	184	192	204	234	124	116	102
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	1368.5	29.8	16.0	19.1	60.7	95.9	125.2	165.9	167.5	155.4	137.2	69.0	34.2	45.0	92.4	86.5	68.6
--FORT RANDALL--																	
NAT INFLOW	1500	150	70	90	440	230	155	80	70	100	40				15		60
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	80							6	19	24	18	4	2	2	7		
REG INFLOW	25046	669	351	427	1507	1914	2354	2989	2998	2786	2353	1146	570	752	1534	1457	1241
RELEASE	25046	388	207	427	1507	1914	2354	2989	2998	2930	2992	1459	681	778	1424	1116	882
STOR CHANGE	1	281	144		0		0	0	0	-144	-639	-313	-111	-26	109	341	359
STORAGE	3000.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2329	2218	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	15.984	13.1	14.9	23.9	25.3	31.1	39.6	48.6	48.8	49.2	48.7	49.1	49.0	49.0	23.2	18.2	15.9
POWER																	
AVE POWER MW		108	126	202	214	262	326	356	356	353	336	307	291	286	169	138	126
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	296	287	284	294	320	339
ENERGY GWH	2249.0	38.9	21.1	43.7	153.9	194.8	234.8	264.8	264.8	254.2	250.1	110.7	48.9	54.8	126.0	102.5	84.9
--GAVINS POINT--																	
NAT INFLOW	2250	111	52	67	280	330	245	205	165	130	150	65	30	35	90	105	190
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-2	6	-4	-17	-3	-11	-16	-17	0	-1	1	-1	0	0	48	9	4
EVAPORATION	23							1	5	6	5	1	1	1	3		
REG INFLOW	27157	506	256	477	1779	2214	2559	3136	3148	3058	3136	1517	708	809	1550	1230	1076
RELEASE	27157	506	256	477	1779	2214	2559	3136	3136	3035	3136	1517	708	809	1550	1230	1111
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	20.000	17.0	18.4	26.7	29.9	36.0	43.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	25.2	20.0	20.0
POWER																	
AVE POWER MW		59	64	91	101	114	113	112	113	115	115	115	115	115	79	70	69
PEAK POW MW		114	114	114	114	114	113	112	113	115	115	115	115	115	78	78	76
ENERGY GWH	865.8	21.2	10.7	19.7	72.5	84.8	81.6	83.1	83.7	82.5	85.8	41.5	19.4	22.1	58.6	52.0	46.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	3400	189	88	113	470	890	550	290	225	165	85	50	23	27	60	35	140
DEPLETION	286	7	3	4	24	37	32	41	39	26	12	7	3	4	15	15	16
REGULATED FLOW AT SIOUX CITY																	
KAF	30271	687	340	586	2225	3067	3077	3385	3322	3174	3209	1560	728	832	1595	1250	1235
KCFS		23.1	24.5	32.8	37.4	49.9	51.7	55.0	54.0	53.3	52.2	52.4	52.4	52.4	25.9	20.3	22.2
--TOTAL--																	
NAT INFLOW	34500	1890	882	1133	3880	5080	7475	4805	1860	1535	1545	768	358	409	790	775	1315
DEPLETION	2979	20	9	12	-78	442	1981	1367	312	-198	-116	-155	-72	-83	-198	-172	-93
CHAN STOR	-21	64	-4	-17	-41	-71	-44	-17	0	22	26	-1	0	-6	71	-7	4
EVAPORATION	1241							86	269	332	282	66	30	34	141		
STORAGE	56138.	57385	57913	58431	60123	61623	63996	63946	61903	60153	58348	57644	57316	56935	56258	55949	56126
SYSTEM POWER																	
AVE POWER MW		808	881	963	1061	1433	1754	1976	1977	1876	1668	1649	1675	1776	1132	1114	1055
PEAK POW MW		2418	2420	2427	2449	2467	2486	2480	2460	2446	2420	2391	2379	2371	2336	2356	2365
ENERGY GWH	12868.8	291.0	148.1	208.0	763.6	1066.1	1262.8	1469.8	1471.0	1350.9	1241.3	593.8	281.3	341.0	842.0	829.0	709.1
DAILY GWH		19.4	21.2	23.1	25.5	34.4	42.1	47.4	47.5	45.0	40.0	39.6	40.2	42.6	27.2	26.7	25.3
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 07:41:08 STUDY NO 5

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB18	2018												2019			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	8650	310	144	186	755	1285	2155	1105	405	350	440	263	123	140	320	285	385
DEPLETION	544	-17	-8	-10	-34	305	626	289	-6	-124	-97	-32	-15	-17	-117	-121	-78
EVAPORATION	324							22	69	85	74	18	8	9	39		
MOD INFLOW	7782	327	152	196	789	980	1529	794	342	389	463	277	129	148	398	406	463
RELEASE	7786	208	97	125	476	646	774	799	799	626	492	238	111	135	738	799	722
STOR CHANGE	-4	118	55	71	313	334	755	-5	-457	-237	-29	39	18	13	-339	-393	-259
STORAGE	14781.	14899	14955	15026	15339	15673	16428	16423	15966	15728	15699	15738	15756	15769	15429	15036	14777
ELEV FTMSL	2234.0	2234.5	2234.8	2235.1	2236.6	2238.1	2241.5	2241.4	2239.4	2238.4	2238.2	2238.4	2238.5	2238.5	2237.0	2235.2	2233.9
DISCH KCFS	10.500	7.0	7.0	7.0	8.0	10.5	13.0	13.0	13.0	10.5	8.0	8.0	8.0	8.5	12.0	13.0	13.0
POWER																	
AVE POWER MW		95	96	96	110	144	177	179	178	145	110	110	110	117	164	175	174
PEAK POW MW		188	189	189	190	191	193	193	192	191	191	191	191	191	190	189	188
ENERGY GWH	1286.4	34.4	16.1	20.7	78.9	107.3	127.7	132.8	132.3	104.5	82.1	39.7	18.5	22.5	122.0	130.1	116.8
--GARRISON--																	
NAT INFLOW	12750	482	225	289	1230	1675	3200	2475	760	520	555	215	100	115	235	295	380
DEPLETION	1031	3	2	2	-129	-7	1121	774	111	-174	-74	-147	-69	-78	-135	-100	-69
CHAN STOR	-25	35			-10	-25	-24			24	24		0	-5	-34	-10	0
EVAPORATION	368							25	79	98	84	20	9	10	43		
REG INFLOW	19112	721	320	412	1825	2303	2828	2475	1369	1246	1061	580	271	313	1031	1185	1171
RELEASE	19115	565	264	339	1369	1752	1964	1968	1968	1693	1537	744	347	389	1291	1537	1388
STOR CHANGE	-4	156	56	73	457	551	865	508	-598	-447	-476	-164	-76	-76	-260	-353	-217
STORAGE	17738.	17894	17950	18023	18479	19030	19895	20402	19804	19357	18881	18717	18641	18565	18304	17952	17734
ELEV FTMSL	1837.5	1838.0	1838.2	1838.4	1839.8	1841.5	1844.1	1845.6	1843.9	1842.5	1841.1	1840.6	1840.3	1840.1	1839.3	1838.2	1837.5
DISCH KCFS	25.000	19.0	19.0	19.0	23.0	28.5	33.0	32.0	32.0	28.5	25.0	25.0	25.0	24.5	21.0	25.0	25.0
POWER																	
AVE POWER MW		236	236	236	287	358	419	411	411	363	317	315	314	308	263	311	309
PEAK POW MW		528	529	530	537	545	556	561	555	550	543	541	539	538	534	529	526
ENERGY GWH	2918.9	84.8	39.7	51.1	206.7	266.5	301.8	305.8	305.6	261.2	235.7	113.4	52.8	59.1	195.9	231.3	207.7
--OAHE--																	
NAT INFLOW	3200	457	213	274	430	310	640	250	95	150	120	95	44	51	-10		80
DEPLETION	777	26	12	15	52	79	166	204	137	33	-13	1	0	0	14	20	31
CHAN STOR	1	24			-15	-21	-17	4		13	13			2	14	-16	
EVAPORATION	368							26	80	98	83	20	9	10	42		
REG INFLOW	21172	1021	465	598	1731	1963	2421	1991	1846	1726	1600	819	382	431	1239	1501	1437
RELEASE	21176	552	296	357	1005	1397	1904	2535	2571	2358	1964	954	480	650	1456	1479	1219
STOR CHANGE	-4	468	169	241	726	566	517	-543	-725	-632	-363	-135	-98	-219	-216	23	218
STORAGE	18661.	19129	19298	19540	20266	20832	21349	20805	20080	19447	19084	18949	18851	18632	18416	18439	18657
ELEV FTMSL	1607.5	1609.0	1609.5	1610.2	1612.4	1614.1	1615.5	1614.0	1611.9	1610.0	1608.8	1608.4	1608.1	1607.4	1606.7	1606.8	1607.5
DISCH KCFS	21.116	18.6	21.3	20.0	16.9	22.7	32.0	41.2	41.8	39.6	31.9	32.1	34.6	40.9	23.7	24.0	21.9
POWER																	
AVE POWER MW		241	278	261	223	302	427	549	551	518	415	415	446	526	305	309	283
PEAK POW MW		716	718	722	734	742	750	742	731	721	715	713	711	707	703	704	708
ENERGY GWH	3354.5	86.7	46.7	56.5	160.4	224.6	307.6	408.2	410.3	372.8	308.8	149.4	74.9	101.0	226.7	229.9	190.0
--BIG BEND--																	
EVAPORATION	72							5	15	19	17	4	2	2	9		
REG INFLOW	21104	552	296	357	1005	1397	1904	2530	2556	2340	1947	950	478	648	1447	1479	1219
RELEASE	21104	552	296	357	1005	1397	1904	2530	2556	2340	1947	950	478	648	1447	1479	1219
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	21.116	18.6	21.3	20.0	16.9	22.7	32.0	41.1	41.6	39.3	31.7	31.9	34.4	40.8	23.5	24.0	21.9
POWER																	
AVE POWER MW		88	100	94	79	106	150	192	194	186	154	159	171	202	118	118	105
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	1220.0	31.7	16.8	20.2	56.9	79.1	107.8	143.2	144.7	134.0	114.9	57.2	28.7	38.8	87.7	87.6	70.7
--FORT RANDALL--																	
NAT INFLOW	1200	123	58	74	350	185	140	75	65	75	10	-3	-1	-1	5	-5	50
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	80							6	19	24	18	4	2	2	7		
REG INFLOW	22145	674	353	430	1351	1573	2032	2581	2587	2384	1938	943	475	644	1444	1471	1266
RELEASE	22145	393	209	430	1351	1573	2032	2581	2587	2528	2577	1256	586	670	1335	1130	907
STOR CHANGE	1	281	144	0	0	0	0	0	0	-144	-639	-313	-111	-26	109	341	359
STORAGE	3000.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2329	2218	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	15.984	13.2	15.1	24.1	22.7	25.6	34.2	42.0	42.1	42.5	41.9	42.2	42.2	42.2	21.7	18.4	16.3
POWER																	
AVE POWER MW		109	127	203	192	216	287	336	337	336	319	297	284	280	159	139	130
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	296	288	285	294	320	339
ENERGY GWH	2107.4	39.4	21.4	43.9	138.2	160.6	206.5	250.2	250.5	241.8	237.0	106.9	47.8	53.7	118.2	103.7	87.4
--GAVINS POINT--																	
NAT INFLOW	2000	106	50	64	240	290	210	180	145	115	135	60	28	32	85	95	165
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-2	5	-4	-17	3	-6	-16	-15	0	-1	1	-1	0	0	38	6	4
EVAPORATION	23							1	5	6	5	1	1	1	3		
REG INFLOW	24005	506	256	477	1589	1839	2202	2705	2717	2641	2705	1309	611	698	1445	1230	1076
RELEASE	24005	506	256	477	1589	1839	2202	2705	2705	2618	2705	1309	611	698	1445	1230	1111
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	20.000	17.0	18.4	26.7	26.7	29.9	37.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	23.5	20.0	20.0
POWER																	
AVE POWER MW		59	64	91	91	101	114	113	114	115	116	116	116	116	78	70	69
PEAK POW MW		114	114	114	114	114	114	113	114	116	116	116	116	116	78	78	76
ENERGY GWH	853.0	21.2	10.7	19.7	65.6	74.9	82.2	84.1	84.8	82.9	86.3	41.8	19.5	22.3	58.4	52.0	46.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	2800	165	77	99	390	730	435	240	180	135	70	43	20	23	50	30	115
DEPLETION	286	7	3	4	24	37	32	41	39	26	12	7	3	4	15	15	16
REGULATED FLOW AT SIOUX CITY																	
KAF	26519	663	329	571	1955	2532	2605	2904	2846	2727	2763	1345	627	717	1480	1245	1210
KCFS		22.3	23.7	32.0	32.8	41.2	43.8	47.2	46.3	45.8	44.9	45.2	45.2	45.2	24.1	20.2	21.8
--TOTAL--																	
NAT INFLOW	30600	1643	766	985	3395	4475	6780	4325	1650	1345	1330	673	314	359	685	700	1175
DEPLETION	2832	20	9	12	-78	442	1981	1365	306	-237	-169	-166	-77	-88	-210	-182	-97
CHAN STOR	-24	64	-4	-17	-23	-51	-57	-11	0	36	39	-1	0	-3	19	-20	4
EVAPORATION	1235							85	266	329	282	66	30	35	142		
STORAGE	56138.	57162	57586	57971	59467	60918	63055	63014	61245	59806	58299	57726	57459	57151	56444	56061	56127
SYSTEM POWER																	
AVE POWER MW		828	900	982	981	1227	1575	1780	1785	1663	1431	1412	1442	1549	1087	1122	1070
PEAK POW MW		2414	2416	2421	2440	2457	2478	2474	2457	2445	2422	2394	2383	2376	2338	2358	2365
ENERGY GWH	11740.3	298.2	151.3	212.0	706.6	913.1	1133.7	1324.4	1328.2	1197.3	1064.8	508.4	242.3	297.3	808.9	834.6	719.3
DAILY GWH		19.9	21.6	23.6	23.6	29.5	37.8	42.7	42.8	39.9	34.3	33.9	34.6	37.2	26.1	26.9	25.7
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:34:33 STUDY NO 6

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB18	2018												2019			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	7200	227	106	136	560	1145	1830	840	365	290	385	205	96	109	295	260	350
DEPLETION	561	-25	-12	-15	14	314	603	295	-9	-135	-107	-31	-14	-17	-108	-120	-73
EVAPORATION	461							28	89	110	96	44	20	23	50		
MOD INFLOW	6178	252	118	151	546	831	1227	517	285	315	396	192	90	103	353	380	423
RELEASE	6355	193	90	116	446	553	625	646	646	501	369	179	83	95	584	646	583
STOR CHANGE	-177	59	27	35	100	278	602	-129	-360	-186	27	14	6	7	-231	-266	-160
STORAGE	14784.	14843	14870	14905	15005	15283	15885	15756	15396	15210	15236	15250	15257	15264	15033	14767	14607
ELEV FTMSL	2234.0	2234.3	2234.4	2234.6	2235.0	2236.3	2239.1	2238.5	2236.8	2236.0	2236.1	2236.2	2236.2	2236.2	2235.1	2233.9	2233.1
DISCH KCFS	9.000	6.5	6.5	6.5	7.5	9.0	10.5	10.5	10.5	8.4	6.0	6.0	6.0	6.0	9.5	10.5	10.5
POWER																	
AVE POWER MW		89	89	89	102	123	144	145	144	115	82	82	82	82	130	143	143
PEAK POW MW		188	188	188	189	190	191	191	190	189	189	189	189	189	189	188	187
ENERGY GWH	1052.8	31.9	14.9	19.2	73.7	91.6	104.0	107.8	107.4	83.1	61.2	29.6	13.8	15.8	96.7	106.4	95.8
--GARRISON--																	
NAT INFLOW	10900	479	223	287	780	1300	3120	2100	580	480	445	180	84	96	180	255	310
DEPLETION	1073	9	4	5	-56	155	868	701	131	-151	-51	-143	-67	-76	-119	-81	-57
CHAN STOR	-15	25	0	0	-10	-15	-15			20	23				-34	-10	
EVAPORATION	535							33	104	129	112	50	23	27	57		
REG INFLOW	15632	689	310	398	1272	1684	2862	2012	991	1023	777	451	211	241	792	972	950
RELEASE	15845	536	250	321	1190	1476	1547	1537	1537	1285	1138	550	257	270	1261	1414	1277
STOR CHANGE	-213	153	60	77	82	208	1315	475	-547	-262	-361	-99	-46	-29	-469	-442	-327
STORAGE	17741.	17894	17954	18031	18113	18321	19636	20110	19564	19302	18941	18842	18795	18766	18298	17855	17528
ELEV FTMSL	1837.5	1838.0	1838.2	1838.4	1838.7	1839.3	1843.4	1844.8	1843.2	1842.4	1841.3	1841.0	1840.8	1840.7	1839.3	1837.9	1836.8
DISCH KCFS	22.500	18.0	18.0	18.0	20.0	24.0	26.0	25.0	25.0	21.6	18.5	18.5	18.5	17.0	20.5	23.0	23.0
POWER																	
AVE POWER MW		223	224	224	249	299	329	321	320	275	235	234	234	215	258	286	284
PEAK POW MW		528	529	530	532	535	553	558	552	549	544	542	542	541	534	528	523
ENERGY GWH	2415.1	80.4	37.6	48.4	179.3	222.6	236.5	238.6	238.4	198.3	174.9	84.3	39.3	41.3	191.6	212.8	190.7
--OAHE--																	
NAT INFLOW	2300	259	121	155	405	220	625	170	70	95	45	45	21	24	-15	-10	70
DEPLETION	777	26	12	15	52	79	166	204	137	33	-13	1	0	0	14	20	31
CHAN STOR	-2	18			-8	-15	-8	4		13	12			6	-14	-10	0
EVAPORATION	505							32	99	121	104	47	22	25	54		
REG INFLOW	16862	787	359	461	1535	1601	1998	1475	1371	1239	1104	548	256	275	1163	1374	1316
RELEASE	17082	467	306	360	1293	1543	1609	1849	1983	1754	1263	587	309	227	1113	1315	1103
STOR CHANGE	-220	320	52	101	243	58	389	-374	-612	-515	-159	-39	-53	48	50	59	213
STORAGE	18664.	18984	19036	19137	19379	19438	19827	19453	18841	18326	18166	18127	18074	18122	18172	18231	18444
ELEV FTMSL	1607.5	1608.5	1608.7	1609.0	1609.7	1609.9	1611.1	1610.0	1608.1	1606.4	1605.9	1605.7	1605.6	1605.7	1605.7	1605.9	1606.1	1606.8
DISCH KCFS	20.973	15.7	22.1	20.2	21.7	25.1	27.0	30.1	32.2	29.5	20.5	19.7	22.3	14.3	18.1	21.4	19.9
POWER																	
AVE POWER MW		204	287	263	283	328	354	393	418	379	263	253	285	183	232	274	255
PEAK POW MW		713	714	716	720	721	727	721	711	702	699	698	698	698	699	700	704
ENERGY GWH	2675.1	73.3	48.1	56.7	203.9	243.7	254.9	292.6	311.1	272.9	196.0	90.9	47.8	35.2	172.5	203.8	171.5
--BIG BEND--																	
EVAPORATION	105							6	20	25	22	10	5	5	12		
REG INFLOW	16977	467	306	360	1293	1543	1609	1843	1963	1729	1241	577	305	222	1101	1315	1103
RELEASE	16977	467	306	360	1293	1543	1609	1843	1963	1729	1241	577	305	222	1101	1315	1103
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	20.973	15.7	22.1	20.2	21.7	25.1	27.0	30.0	31.9	29.1	20.2	19.4	21.9	14.0	17.9	21.4	19.9
POWER																	
AVE POWER MW		74	103	95	102	117	127	140	149	138	99	97	110	70	90	105	95
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	980.7	26.8	17.4	20.4	73.2	87.4	91.1	104.4	111.1	99.1	73.7	35.1	18.5	13.5	67.0	78.0	64.0
--FORT RANDALL--																	
NAT INFLOW	900	121	56	73	160	165	135	70	60	35		-5	-2	-3		-10	45
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	116							8	25	31	24	9	4	4	9		
REG INFLOW	17681	587	362	432	1449	1699	1732	1887	1982	1725	1216	562	298	215	1089	1302	1145
RELEASE	17680	304	218	432	1449	1699	1732	1887	1982	1869	1855	875	409	241	980	961	786
STOR CHANGE	2	282	144	0			0	0	0	-144	-639	-313	-111	-26	108	341	359
STORAGE	2999.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2329	2218	2192	2300	2641	3000
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	15.446	10.2	15.7	24.2	24.3	27.6	29.1	30.7	32.2	31.4	30.2	29.4	29.5	15.2	15.9	15.6	14.2
POWER																	
AVE POWER MW		85	133	204	206	233	245	258	271	262	242	222	215	111	117	119	113
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	296	287	285	294	320	339
ENERGY GWH	1746.1	30.5	22.3	44.2	148.1	173.3	176.5	192.1	201.7	188.9	179.7	79.9	36.2	21.3	87.2	88.4	75.9
--GAVINS POINT--																	
NAT INFLOW	1500	102	47	61	145	165	175	100	90	95	120	58	27	31	80	85	120
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	1	10	-11	-16	0	-6	-3	-3	-3	2	2	1	0	26	-1	1	3
EVAPORATION	34							2	6	8	7	3	2	2	4		
REG INFLOW	19034	417	255	477	1588	1839	1880	1943	2053	1963	1968	925	432	294	1045	1045	909
RELEASE	19034	417	255	477	1588	1839	1880	1943	2041	1940	1968	925	432	294	1045	1045	944
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	18.500	14.0	18.4	26.7	26.7	29.9	31.6	31.6	33.2	32.6	32.0	31.1	31.1	18.5	17.0	17.0	17.0
POWER																	
AVE POWER MW		49	64	91	91	101	105	105	109	109	108	106	106	65	60	60	60
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	779.7	17.6	10.7	19.7	65.6	74.9	75.3	77.8	80.9	78.3	80.6	38.3	17.9	12.5	44.7	44.7	40.1
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1800	162	76	97	280	345	190	165	130	110	60	30	14	16	25	25	75
DEPLETION	286	7	3	4	24	37	32	41	39	26	12	7	3	4	15	15	16
REGULATED FLOW AT SIOUX CITY																	
KAF	20548	571	328	570	1844	2147	2038	2067	2132	2024	2016	948	443	306	1055	1055	1003
KCFS		19.2	23.6	31.9	31.0	34.9	34.3	33.6	34.7	34.0	32.8	31.9	31.9	19.3	17.2	17.2	18.1
--TOTAL--																	
NAT INFLOW	24600	1350	630	810	2330	3340	6075	3445	1295	1105	1055	513	239	273	565	605	970
DEPLETION	2891	18	8	11	43	613	1705	1298	323	-225	-156	-160	-75	-85	-185	-162	-80
CHAN STOR	-15	53	-11	-16	-18	-37	-25	1	-3	35	38	1	0	33	-50	-19	3
EVAPORATION	1755							110	343	426	366	163	75	86	186		
STORAGE	56146.	56960	57243	57456	57881	58425	60731	60702	59196	58111	56979	56541	56337	56337	55795	55488	55537
SYSTEM POWER																	
AVE POWER MW		724	899	965	1033	1201	1303	1362	1412	1279	1030	995	1033	727	887	987	949
PEAK POW MW		2412	2411	2414	2420	2425	2451	2449	2433	2425	2406	2381	2371	2369	2333	2352	2358
ENERGY GWH	9649.4	260.5	151.0	208.5	743.8	893.4	938.4	1013.3	1050.6	920.6	766.1	358.1	173.5	139.7	659.8	734.1	638.0
DAILY GWH		17.4	21.6	23.2	24.8	28.8	31.3	32.7	33.9	30.7	24.7	23.9	24.8	17.5	21.3	23.7	22.8
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 10:05:11 STUDY NO 7

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB18 INI-SUM	2018 15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	2019 30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	5950	201	94	120	460	945	1510	645	290	240	320	168	78	89	240	240	310
DEPLETION	564	-2	-1	-1	54	226	473	308	25	-112	-99	-26	-12	-14	-91	-105	-60
EVAPORATION	528							33	103	127	110	50	23	26	57		
MOD INFLOW	4858	203	95	122	406	719	1037	304	162	225	309	143	67	77	274	345	370
RELEASE	6350	179	83	107	476	553	625	646	646	497	369	179	83	95	584	646	583
STOR CHANGE	-1492	24	11	15	-70	166	412	-342	-483	-271	-60	-35	-16	-19	-310	-301	-213
STORAGE	14183.	14207	14218	14233	14163	14328	14740	14399	13915	13644	13584	13549	13533	13514	13204	12904	12691
ELEV FTMSL	2231.1	2231.2	2231.2	2231.3	2231.0	2231.8	2233.8	2232.1	2229.7	2228.4	2228.1	2227.9	2227.8	2227.7	2226.1	2224.5	2223.4
DISCH KCFS	8.500	6.0	6.0	6.0	8.0	9.0	10.5	10.5	10.5	8.3	6.0	6.0	6.0	6.0	9.5	10.5	10.5
POWER																	
AVE POWER MW		81	81	81	108	121	142	142	141	112	80	80	80	80	126	139	138
PEAK POW MW		186	186	186	186	187	188	187	185	184	184	184	184	184	183	181	180
ENERGY GWH	1030.0	29.2	13.6	17.5	77.7	90.4	102.4	105.9	105.2	80.5	59.7	28.9	13.5	15.4	94.0	103.3	92.7
--GARRISON--																	
NAT INFLOW	9150	404	189	242	640	1150	2600	1700	475	395	395	160	75	85	150	210	280
DEPLETION	970	7	3	4	45	135	561	627	128	-141	-24	-123	-57	-65	-75	-37	-18
CHAN STOR	-21	25			-20	-10	-15			21	23				-35	-10	
EVAPORATION	616							39	121	149	128	57	27	30	65		
REG INFLOW	13894	601	269	345	1051	1558	2649	1680	872	905	683	404	189	216	709	882	881
RELEASE	15698	506	236	303	1131	1445	1577	1568	1568	1289	1107	536	250	262	1230	1414	1277
STOR CHANGE	-1804	95	33	42	-80	113	1072	112	-696	-384	-423	-132	-61	-46	-521	-532	-396
STORAGE	17011.	17106	17138	17180	17101	17214	18286	18398	17702	17318	16895	16763	16702	16655	16135	15603	15207
ELEV FTMSL	1835.1	1835.4	1835.5	1835.6	1835.4	1835.8	1839.2	1839.6	1837.4	1836.1	1834.7	1834.2	1834.0	1833.9	1832.1	1830.2	1828.8
DISCH KCFS	21.000	17.0	17.0	17.0	19.0	23.5	26.5	25.5	25.5	21.7	18.0	18.0	18.0	16.5	20.0	23.0	23.0
POWER																	
AVE POWER MW		208	208	208	232	287	327	318	317	266	220	219	218	200	240	273	270
PEAK POW MW		516	517	518	516	518	534	536	525	520	513	511	510	509	501	492	486
ENERGY GWH	2315.6	74.8	34.9	45.0	167.2	213.3	235.3	236.9	235.5	191.8	163.7	78.7	36.7	38.4	178.9	203.0	181.4
--OAHE--																	
NAT INFLOW	1350	177	82	106	285	130	315	110	50	55	15	13	6	7	-35	-15	50
DEPLETION	777	26	12	15	52	79	166	204	137	33	-13	1	0	0	14	20	31
CHAN STOR	-8	16			-8	-18	-12	4		17	16			7	-16	-13	0
EVAPORATION	547							35	108	132	112	50	23	27	59		
REG INFLOW	15716	673	306	394	1355	1478	1713	1443	1373	1195	1039	497	232	248	1106	1366	1296
RELEASE	17576	523	365	449	1577	1846	1820	1993	2022	1802	1306	627	242	222	850	1058	874
STOR CHANGE	-1860	150	-58	-55	-221	-368	-106	-550	-650	-607	-267	-130	-10	27	256	307	423
STORAGE	17911.	18061	18003	17947	17726	17357	17251	16701	16052	15445	15178	15048	15038	15064	15320	15628	16051
ELEV FTMSL	1605.0	1605.5	1605.3	1605.1	1604.4	1603.1	1602.8	1600.8	1598.5	1596.3	1595.2	1594.7	1594.7	1594.8	1595.8	1596.9	1598.5
DISCH KCFS	20.326	17.6	26.3	25.2	26.5	30.0	30.6	32.4	32.9	30.3	21.2	21.1	17.5	14.0	13.8	17.2	15.7
POWER																	
AVE POWER MW		225	335	321	337	379	384	404	405	369	257	254	210	169	167	209	193
PEAK POW MW		697	696	695	691	685	683	673	661	649	644	642	642	642	647	653	661
ENERGY GWH	2635.2	80.8	56.3	69.3	242.4	281.8	276.5	300.7	301.5	265.5	191.2	91.4	35.4	32.4	124.6	155.8	129.6
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	17445	523	365	449	1577	1846	1820	1985	1997	1771	1278	614	237	215	836	1058	874
RELEASE	17445	523	365	449	1577	1846	1820	1985	1997	1771	1278	614	237	215	836	1058	874
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	20.326	17.6	26.3	25.2	26.5	30.0	30.6	32.3	32.5	29.8	20.8	20.7	17.0	13.5	13.6	17.2	15.7
POWER																	
AVE POWER MW		83	123	118	124	140	143	151	152	141	102	103	86	68	69	85	75
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	1005.2	30.0	20.7	25.4	89.3	104.5	103.0	112.4	113.1	101.5	75.8	37.1	14.4	13.1	51.1	62.9	50.7
--FORT RANDALL--																	
NAT INFLOW	450	77	36	46	80	65	110	35	25		-20	-8	-4	-4	-10	-20	40
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	145							10	32	39	31	12	5	5	12		
REG INFLOW	17670	599	400	495	1653	1902	1918	1992	1976	1725	1226	594	228	206	811	1035	911
RELEASE	17668	317	256	495	1653	1902	1918	1992	1976	1869	1866	848	398	231	702	694	552
STOR CHANGE	2	282	144	0				0	0	-144	-639	-254	-170	-26	109	341	359
STORAGE	2999.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2388	2218	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1341.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	14.546	10.6	18.5	27.7	27.8	30.9	32.2	32.4	32.1	31.4	30.3	28.5	28.6	14.6	11.4	11.3	9.9
POWER																	
AVE POWER MW		88	155	234	234	260	271	272	270	262	243	216	211	107	84	86	79
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	301	287	285	294	319	339
ENERGY GWH	1752.9	31.7	26.1	50.5	168.6	193.6	195.1	202.6	201.0	188.9	180.8	77.9	35.4	20.5	62.7	64.1	53.4
--GAVINS POINT--																	
NAT INFLOW	1300	92	43	55	125	140	150	85	70	80	105	50	23	27	75	75	105
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	7	7	-15	-18	0	-6	-2	0	1	1	2	3	0	26	6	0	3
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	18820	417	284	533	1773	2017	2041	2035	2029	1945	1961	893	417	279	769	769	659
RELEASE	18820	417	284	533	1773	2017	2041	2035	2017	1922	1961	893	417	279	769	769	694
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	17.000	14.0	20.5	29.8	29.8	32.8	34.3	33.1	32.8	32.3	31.9	30.0	30.0	17.6	12.5	12.5	12.5
POWER																	
AVE POWER MW		49	71	100	100	107	111	108	108	108	108	104	104	62	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	764.1	17.6	11.9	21.7	72.3	79.8	79.6	80.3	80.2	77.9	80.5	37.3	17.4	11.9	33.0	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1100	121	56	73	145	185	115	100	80	65	35	23	11	12	10	20	50
DEPLETION	286	7	3	4	24	37	32	41	39	26	12	7	3	4	15	15	16
REGULATED FLOW AT SIOUX CITY																	
KAF	19634	530	337	601	1894	2165	2124	2094	2058	1961	1984	908	424	288	764	774	728
KCFS		17.8	24.3	33.7	31.8	35.2	35.7	34.1	33.5	33.0	32.3	30.5	30.5	18.1	12.4	12.6	13.1
--TOTAL--																	
NAT INFLOW	19300	1072	500	643	1735	2615	4800	2675	990	835	850	405	189	216	430	510	835
DEPLETION	2791	39	18	23	184	505	1268	1237	354	-192	-121	-135	-63	-72	-124	-103	-28
CHAN STOR	-21	49	-15	-18	-28	-35	-30	4	1	40	42	3	0	33	-45	-23	3
EVAPORATION	2009							127	396	489	417	185	86	97	211		
STORAGE	54061.	54613	54742	54743	54372	54283	55661	54881	53063	51680	50291	49741	49483	49419	48953	48769	48906
SYSTEM POWER																	
AVE POWER MW		734	973	1062	1135	1295	1378	1396	1393	1259	1010	976	909	686	732	836	800
PEAK POW MW		2382	2379	2379	2373	2369	2385	2375	2352	2338	2316	2293	2278	2276	2241	2262	2271
ENERGY GWH	9502.9	264.1	163.5	229.4	817.5	963.5	991.9	1038.8	1036.6	906.2	751.7	351.4	152.7	131.7	544.3	622.1	537.5
DAILY GWH		17.6	23.4	25.5	27.3	31.1	33.1	33.5	33.4	30.2	24.2	23.4	21.8	16.5	17.6	20.1	19.2
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 10:26:30 STUDY NO 8

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB18	2018												2019			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	5300	194	90	116	440	850	1180	595	260	230	310	145	68	77	220	230	295
DEPLETION	551	-2	-1	-1	37	235	481	286	32	-108	-100	-27	-12	-14	-92	-99	-64
EVAPORATION	510							32	100	122	106	48	22	25	55		
MOD INFLOW	4239	196	91	117	403	615	699	277	128	216	304	124	58	66	257	329	359
RELEASE	6386	179	83	107	476	553	625	646	646	524	369	179	83	103	584	646	583
STOR CHANGE	-2147	17	8	10	-73	62	74	-369	-517	-309	-65	-55	-26	-37	-327	-317	-224
STORAGE	14183.	14200	14208	14218	14145	14206	14280	13912	13394	13085	13020	12966	12940	12903	12576	12260	12036
ELEV FTMSL	2231.1	2231.2	2231.2	2231.2	2230.9	2231.2	2231.6	2229.7	2227.1	2225.5	2225.1	2224.9	2224.7	2224.5	2222.8	2221.0	2219.8
DISCH KCFS	8.500	6.0	6.0	6.0	8.0	9.0	10.5	10.5	10.5	8.8	6.0	6.0	6.0	6.5	9.5	10.5	10.5
POWER																	
AVE POWER MW		81	81	81	108	121	142	141	140	117	80	79	79	86	125	137	136
PEAK POW MW		186	186	186	186	186	186	185	184	182	182	182	182	181	180	178	177
ENERGY GWH	1027.5	29.2	13.6	17.5	77.7	90.3	102.0	105.1	104.4	84.3	59.2	28.6	13.3	16.5	92.8	101.7	91.3
--GARRISON--																	
NAT INFLOW	7400	382	178	229	580	1100	2165	935	325	215	385	150	70	80	140	195	270
DEPLETION	861	7	3	4	45	135	561	566	110	-146	-30	-126	-59	-67	-79	-42	-22
CHAN STOR	-21	25			-20	-10	-15			17	28			-5	-31	-10	
EVAPORATION	594							38	116	143	123	55	26	29	63		
REG INFLOW	12311	579	258	332	991	1508	2214	977	744	759	689	399	186	216	710	872	875
RELEASE	14906	491	229	295	1131	1353	1428	1414	1414	1182	1045	506	236	262	1230	1414	1277
STOR CHANGE	-2596	88	29	38	-140	156	786	-437	-670	-422	-356	-107	-50	-46	-520	-542	-402
STORAGE	17011.	17099	17128	17166	17027	17182	17968	17531	16861	16438	16082	15975	15925	15879	15359	14817	14415
ELEV FTMSL	1835.1	1835.4	1835.5	1835.6	1835.1	1835.6	1838.2	1836.8	1834.6	1833.1	1831.9	1831.5	1831.3	1831.2	1829.3	1827.3	1825.9
DISCH KCFS	21.000	16.5	16.5	16.5	19.0	22.0	24.0	23.0	23.0	19.9	17.0	17.0	17.0	16.5	20.0	23.0	23.0
POWER																	
AVE POWER MW		202	202	202	232	268	295	284	281	240	204	203	203	197	236	268	265
PEAK POW MW		516	517	517	515	518	530	523	512	506	500	498	498	497	488	479	472
ENERGY GWH	2172.7	72.6	33.9	43.6	167.1	199.6	212.6	211.4	209.0	172.9	151.9	73.1	34.1	37.8	175.8	199.3	178.0
--OAHE--																	
NAT INFLOW	1150	169	79	102	200	110	305	105	40	45	5	8	4	4	-45	-20	40
DEPLETION	777	26	12	15	52	79	166	204	137	33	-13	1	0	0	14	20	31
CHAN STOR	-9	18			-10	-12	-8	4		14	13			2	-16	-14	0
EVAPORATION	527							34	104	127	108	49	23	26	56		
REG INFLOW	14744	653	296	381	1268	1371	1559	1285	1213	1081	968	464	217	242	1098	1360	1286
RELEASE	17420	545	375	462	1576	1871	1850	1931	1969	1741	1242	537	287	214	867	1068	884
STOR CHANGE	-2676	108	-79	-82	-308	-500	-291	-646	-756	-660	-274	-73	-70	28	232	292	403
STORAGE	17911.	18018	17939	17858	17550	17050	16759	16113	15357	14697	14424	14350	14280	14308	14540	14832	15235
ELEV FTMSL	1605.0	1605.4	1605.1	1604.8	1603.8	1602.1	1601.1	1598.7	1595.9	1593.4	1592.3	1592.0	1591.7	1591.8	1592.7	1593.9	1595.4
DISCH KCFS	20.326	18.3	27.0	25.9	26.5	30.4	31.1	31.4	32.0	29.3	20.2	18.1	20.7	13.5	14.1	17.4	15.9
POWER																	
AVE POWER MW		234	344	329	336	382	387	388	390	351	241	215	245	160	168	208	192
PEAK POW MW		697	695	694	688	679	674	662	648	635	630	628	627	628	632	638	646
ENERGY GWH	2585.6	84.3	57.8	71.2	241.7	284.3	278.9	288.5	289.8	252.7	179.0	77.2	41.1	30.7	124.8	154.6	128.9
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	17288	545	375	462	1576	1871	1850	1923	1944	1709	1214	525	281	207	852	1068	884
RELEASE	17288	545	375	462	1576	1871	1850	1923	1944	1709	1214	525	281	207	852	1068	884
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	20.326	18.3	27.0	25.9	26.5	30.4	31.1	31.3	31.6	28.7	19.7	17.6	20.2	13.1	13.9	17.4	15.9
POWER																	
AVE POWER MW		87	126	121	124	142	145	146	148	136	97	89	102	66	70	85	76
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	996.3	31.3	21.2	26.2	89.3	106.0	104.7	108.9	110.1	98.0	72.1	32.0	17.1	12.7	52.0	63.5	51.3
--FORT RANDALL--																	
NAT INFLOW	350	68	32	41	85	50	95	25	15	-5	-25	-10	-5	-5	-20	-25	35
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	145							10	32	39	31	12	5	5	12		
REG INFLOW	17414	612	406	502	1657	1912	1933	1920	1912	1658	1158	502	271	197	818	1040	916
RELEASE	17412	330	262	502	1657	1912	1933	1920	1912	1802	1797	815	382	223	709	699	557
STOR CHANGE	2	282	144	0			0	0	0	-144	-639	-313	-111	-26	109	341	359
STORAGE	2999.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2329	2218	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	14.546	11.1	18.9	28.1	27.9	31.1	32.5	31.2	31.1	30.3	29.2	27.4	27.5	14.0	11.5	11.4	10.0
POWER																	
AVE POWER MW		92	159	237	235	262	273	263	262	253	234	207	202	103	85	87	80
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	296	287	285	294	319	339
ENERGY GWH	1727.6	33.0	26.7	51.2	169.0	194.7	196.6	195.5	194.7	182.3	174.2	74.6	33.9	19.7	63.2	64.6	53.9
--GAVINS POINT--																	
NAT INFLOW	1200	80	37	48	120	130	135	80	60	75	100	48	22	25	70	70	100
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	7	7	-15	-18	1	-6	-3	2	0	2	2	3	0	25	5	0	2
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	18463	417	284	533	1773	2017	2041	1961	1955	1874	1888	857	400	268	769	769	659
RELEASE	18463	417	284	533	1773	2017	2041	1961	1943	1851	1888	857	400	268	769	769	694
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	17.000	14.0	20.5	29.8	29.8	32.8	34.3	31.9	31.6	31.1	30.7	28.8	28.8	16.9	12.5	12.5	12.5
POWER																	
AVE POWER MW		49	71	100	100	107	111	105	105	105	105	101	101	60	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	754.0	17.6	11.9	21.7	72.3	79.8	79.6	78.3	78.2	75.9	78.4	36.3	16.9	11.5	33.0	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	700	87	41	52	90	120	65	70	40	30	30	18	8	9	5	15	20
DEPLETION	286	7	3	4	24	37	32	41	39	26	12	7	3	4	15	15	16
REGULATED FLOW AT SIOUX CITY																	
KAF	18877	496	322	580	1839	2100	2074	1990	1944	1855	1906	867	405	274	759	769	698
KCFS		16.7	23.2	32.5	30.9	34.2	34.9	32.4	31.6	31.2	31.0	29.2	29.2	17.3	12.3	12.5	12.6
--TOTAL--																	
NAT INFLOW	16100	980	457	588	1515	2360	3945	1810	740	590	805	358	167	191	370	465	760
DEPLETION	2669	39	18	23	167	514	1276	1154	343	-193	-128	-139	-65	-74	-129	-102	-36
CHAN STOR	-22	50	-15	-18	-30	-29	-26	7	0	33	44	3	0	23	-42	-24	2
EVAPORATION	1948							125	384	473	405	180	83	94	205		
STORAGE	54061.	54556	54658	54625	54104	53822	54390	52938	51007	49495	48161	47613	47356	47275	46769	46544	46644
SYSTEM POWER																	
AVE POWER MW		744	983	1071	1135	1283	1353	1328	1325	1203	961	894	931	671	728	829	793
PEAK POW MW		2381	2378	2377	2369	2363	2370	2349	2324	2308	2286	2260	2249	2246	2210	2231	2239
ENERGY GWH	9263.6	267.9	165.1	231.4	817.0	954.7	974.4	987.7	986.1	866.0	714.8	321.8	156.4	128.8	541.8	616.8	533.0
DAILY GWH		17.9	23.6	25.7	27.2	30.8	32.5	31.9	31.8	28.9	23.1	21.5	22.3	16.1	17.5	19.9	19.0
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:34:33 STUDY NO 9

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB19	2019												2020			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB
--FORT PECK--																	
NAT INFLOW	7200	227	106	136	560	1145	1830	840	365	290	385	205	96	109	295	260	350
DEPLETION	564	-15	-7	-9	44	277	565	291	44	-85	-106	-31	-14	-16	-129	-141	-104
EVAPORATION	456							28	88	109	95	43	20	23	50		
MOD INFLOW	6180	242	113	145	516	868	1265	521	233	266	396	192	90	103	374	401	454
RELEASE	6387	179	83	107	446	492	655	676	676	505	369	179	83	103	584	646	604
STOR CHANGE	-208	64	30	38	70	376	610	-156	-443	-240	27	14	6	-1	-210	-245	-150
STORAGE	14607.	14671	14701	14739	14809	15185	15795	15640	15196	14957	14984	14998	15004	15004	14794	14549	14399
ELEV FTMSL	2233.1	2233.4	2233.6	2233.8	2234.1	2235.9	2238.7	2238.0	2235.9	2234.8	2234.9	2235.0	2235.0	2235.0	2234.0	2232.9	2232.1
DISCH KCFS	10.500	6.0	6.0	6.0	7.5	8.0	11.0	11.0	11.0	8.5	6.0	6.0	6.0	6.5	9.5	10.5	10.5
POWER																	
AVE POWER MW		82	82	82	102	109	151	151	151	116	82	82	82	89	129	143	142
PEAK POW MW		188	188	188	188	189	191	191	189	189	189	189	189	189	188	187	187
ENERGY GWH	1055.4	29.4	13.7	17.6	73.5	81.3	108.7	112.7	112.3	83.6	61.0	29.5	13.8	17.1	96.3	106.0	98.9
--GARRISON--																	
NAT INFLOW	10900	479	223	287	780	1300	3120	2100	580	480	445	180	84	96	180	255	310
DEPLETION	1169	4	2	2	-74	151	977	763	132	-156	-57	-147	-68	-78	-126	-90	-66
CHAN STOR	0	45			-15	-5	-30			24	24			-5	-29	-10	
EVAPORATION	529							32	103	128	111	50	23	26	56		
REG INFLOW	15589	699	305	392	1285	1636	2768	1981	1022	1038	785	455	213	246	804	981	980
RELEASE	15843	506	236	303	1250	1476	1517	1506	1506	1277	1138	550	257	294	1230	1445	1352
STOR CHANGE	-254	193	69	89	36	160	1251	474	-485	-239	-353	-95	-44	-47	-425	-464	-372
STORAGE	17528.	17721	17790	17878	17914	18075	19325	19799	19315	19075	18722	18627	18583	18536	18110	17646	17274
ELEV FTMSL	1836.8	1837.4	1837.6	1837.9	1838.1	1838.6	1842.4	1843.9	1842.4	1841.7	1840.6	1840.3	1840.2	1840.0	1838.7	1837.2	1836.0
DISCH KCFS	23.000	17.0	17.0	17.0	21.0	24.0	25.5	24.5	24.5	21.5	18.5	18.5	18.5	18.5	20.0	23.5	23.5
POWER																	
AVE POWER MW		210	211	211	260	298	321	313	313	273	234	233	233	233	250	291	289
PEAK POW MW		526	527	528	529	531	549	555	549	546	541	539	539	538	532	525	519
ENERGY GWH	2404.1	75.7	35.4	45.6	187.5	221.6	230.8	232.7	232.7	196.3	174.3	84.0	39.1	44.7	186.2	216.5	200.8
--OAHE--																	
NAT INFLOW	2300	259	121	155	405	220	625	170	70	95	45	45	21	24	-15	-10	70
DEPLETION	789	26	12	15	53	80	169	208	141	33	-14	1	0	0	14	20	31
CHAN STOR	-2	24			-16	-12	-6	4		12	12				-6	-14	
EVAPORATION	496							32	97	119	102	46	21	25	53		
REG INFLOW	16856	763	345	443	1586	1604	1968	1441	1338	1232	1106	549	256	293	1141	1401	1391
RELEASE	17117	468	306	360	1293	1543	1609	1849	1983	1754	1263	587	309	227	1113	1315	1137
STOR CHANGE	-261	295	39	83	293	61	358	-409	-645	-522	-157	-38	-53	66	28	86	253
STORAGE	18444.	18739	18777	18860	19154	19215	19573	19164	18520	17998	17841	17803	17750	17816	17844	17930	18183
ELEV FTMSL	1606.8	1607.7	1607.9	1608.1	1609.0	1609.2	1610.3	1609.1	1607.0	1605.3	1604.8	1604.7	1604.5	1604.7	1604.8	1605.1	1605.9
DISCH KCFS	19.868	15.7	22.1	20.2	21.7	25.1	27.0	30.1	32.2	29.5	20.5	19.7	22.3	14.3	18.1	21.4	19.8
POWER																	
AVE POWER MW		203	285	261	282	326	353	392	416	377	262	251	283	182	231	272	253
PEAK POW MW		709	710	711	716	717	723	716	705	696	693	693	692	693	693	695	699
ENERGY GWH	2667.6	73.2	47.9	56.5	203.1	242.8	253.9	291.4	309.6	271.3	194.8	90.4	47.5	35.0	171.5	202.6	175.9
--BIG BEND--																	
EVAPORATION	105							6	20	25	22	10	5	5	12		
REG INFLOW	17012	468	306	360	1293	1543	1609	1843	1963	1729	1241	577	305	222	1101	1315	1137
RELEASE	17012	468	306	360	1293	1543	1609	1843	1963	1729	1241	577	305	222	1101	1315	1137
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	19.868	15.7	22.1	20.2	21.7	25.1	27.0	30.0	31.9	29.1	20.2	19.4	21.9	14.0	17.9	21.4	19.8
POWER																	
AVE POWER MW		75	103	95	102	117	127	140	149	138	99	97	110	70	90	105	95
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	982.7	26.8	17.4	20.4	73.2	87.4	91.1	104.4	111.1	99.1	73.7	35.1	18.5	13.5	67.0	78.0	66.0
--FORT RANDALL--																	
NAT INFLOW	900	121	56	73	160	165	135	70	60	35		-5	-2	-3		-10	45
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	116							8	25	31	24	9	4	4	9		
REG INFLOW	17716	588	362	432	1449	1699	1732	1887	1982	1725	1216	562	298	215	1089	1302	1179
RELEASE	17716	307	218	432	1449	1699	1732	1887	1982	1869	1855	875	409	241	980	961	820
STOR CHANGE	0	281	144					0	0	-144	-639	-313	-111	-26	108	341	359
STORAGE	3000.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2329	2218	2192	2300	2641	3000
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	14.160	10.3	15.7	24.2	24.3	27.6	29.1	30.7	32.2	31.4	30.2	29.4	29.5	15.2	15.9	15.6	14.3
POWER																	
AVE POWER MW		86	132	204	206	233	245	258	271	262	242	222	215	111	117	119	114
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	296	287	285	294	320	339
ENERGY GWH	1749.7	30.8	22.3	44.2	148.1	173.3	176.5	192.1	201.7	188.9	179.7	79.9	36.2	21.3	87.2	88.4	79.1
--GAVINS POINT--																	
NAT INFLOW	1500	102	47	61	145	165	175	100	90	95	120	58	27	31	80	85	120
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	7	-10	-16	0	-6	-3	-3	-3	2	2	1	0	26	-1	1	3
EVAPORATION	34							2	6	8	7	3	2	2	4		
REG INFLOW	19067	417	255	477	1588	1839	1880	1943	2053	1963	1968	925	432	294	1045	1045	943
RELEASE	19067	417	255	477	1588	1839	1880	1943	2041	1940	1968	925	432	294	1045	1045	978
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	17.000	14.0	18.4	26.7	26.7	29.9	31.6	31.6	33.2	32.6	32.0	31.1	31.1	18.5	17.0	17.0	17.0
POWER																	
AVE POWER MW		49	64	91	91	101	105	105	109	109	108	106	106	65	60	60	60
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	781.1	17.6	10.7	19.7	65.6	74.9	75.3	77.8	80.9	78.3	80.6	38.3	17.9	12.5	44.7	44.7	41.5
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1800	162	76	97	280	345	190	165	130	110	60	30	14	16	25	25	75
DEPLETION	291	8	4	5	25	37	33	41	40	26	12	7	3	4	15	16	16
REGULATED FLOW AT SIOUX CITY																	
KAF	20576	571	327	570	1843	2147	2037	2067	2131	2024	2016	948	443	306	1055	1054	1037
KCFS		19.2	23.6	31.9	31.0	34.9	34.2	33.6	34.7	34.0	32.8	31.9	31.9	19.3	17.2	17.1	18.0
--TOTAL--																	
NAT INFLOW	24600	1350	630	810	2330	3340	6075	3445	1295	1105	1055	513	239	273	565	605	970
DEPLETION	3007	23	11	14	57	573	1780	1360	382	-180	-162	-164	-76	-87	-213	-191	-120
CHAN STOR	-3	76	-10	-16	-31	-23	-38	1	-3	38	39	1	0	22	-37	-24	3
EVAPORATION	1736							109	340	421	362	161	75	85	184		
STORAGE	55537.	56370	56651	56861	57260	57857	60076	59987	58426	57304	56182	55750	55548	55540	55041	54759	54815
SYSTEM POWER																	
AVE POWER MW		704	877	944	1043	1184	1301	1359	1409	1275	1027	992	1030	751	878	990	952
PEAK POW MW		2404	2404	2407	2412	2417	2443	2441	2424	2415	2397	2372	2361	2360	2323	2342	2349
ENERGY GWH	9640.6	253.5	147.3	204.0	751.0	881.2	936.5	1011.1	1048.2	917.7	764.1	357.2	173.0	144.1	653.0	736.3	662.3
DAILY GWH		16.9	21.0	22.7	25.0	28.4	31.2	32.6	33.8	30.6	24.6	23.8	24.7	18.0	21.1	23.8	22.8
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB

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VALUES IN 1000 AF EXCEPT AS INDICATED

	29FEB20	2020												2021			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	7200	227	106	136	560	1145	1830	840	365	290	385	205	96	109	295	260	350
DEPLETION	555	-25	-12	-15	13	287	590	298	46	-87	-109	-32	-15	-17	-131	-143	-94
EVAPORATION	452							28	87	108	94	43	20	23	49		
MOD INFLOW	6193	253	118	152	547	858	1240	514	232	269	400	194	90	103	377	403	444
RELEASE	6356	179	83	107	417	523	655	676	676	502	369	179	83	95	584	646	583
STOR CHANGE	-163	74	35	44	130	335	585	-162	-444	-233	31	15	7	8	-207	-243	-139
STORAGE	14399.	14473	14508	14552	14683	15018	15603	15441	14997	14764	14794	14810	14817	14825	14617	14375	14236
ELEV FTMSL	2232.1	2232.5	2232.7	2232.9	2233.5	2235.1	2237.8	2237.0	2235.0	2233.9	2234.0	2234.1	2234.1	2234.2	2233.2	2232.0	2231.3
DISCH KCFS	10.500	6.0	6.0	6.0	7.0	8.5	11.0	11.0	11.0	8.4	6.0	6.0	6.0	6.0	9.5	10.5	10.5
POWER																	
AVE POWER MW		81	81	81	95	116	151	151	150	115	82	82	82	82	129	142	142
PEAK POW MW		187	187	187	188	189	190	190	189	188	188	188	188	188	188	187	186
ENERGY GWH	1047.6	29.3	13.7	17.6	68.5	86.1	108.5	112.4	111.9	82.7	60.8	29.4	13.7	15.7	96.1	105.8	95.3
--GARRISON--																	
NAT INFLOW	10900	479	223	287	780	1300	3120	2100	580	480	445	180	84	96	180	255	310
DEPLETION	1150	1	1	1	-92	144	981	779	137	-159	-62	-151	-70	-80	-128	-91	-61
CHAN STOR	0	45			-10	-15	-25			25	24				-34	-10	
EVAPORATION	526							32	102	127	110	49	23	26	56		
REG INFLOW	15580	701	306	394	1279	1664	2769	1965	1017	1038	790	460	215	245	802	982	954
RELEASE	15778	506	236	303	1131	1476	1517	1506	1506	1290	1168	565	264	301	1199	1476	1333
STOR CHANGE	-198	195	70	90	148	188	1251	459	-489	-252	-379	-105	-49	-56	-397	-494	-379
STORAGE	17274.	17469	17540	17630	17778	17966	19217	19676	19186	18935	18556	18451	18402	18346	17948	17454	17076
ELEV FTMSL	1836.0	1836.6	1836.8	1837.1	1837.6	1838.2	1842.1	1843.5	1842.0	1841.2	1840.1	1839.8	1839.6	1839.4	1838.2	1836.5	1835.3
DISCH KCFS	23.500	17.0	17.0	17.0	19.0	24.0	25.5	24.5	24.5	21.7	19.0	19.0	19.0	19.0	19.5	24.0	24.0
POWER																	
AVE POWER MW		209	210	210	235	297	320	312	312	275	240	239	238	238	243	296	293
PEAK POW MW		522	523	524	527	530	548	553	547	544	538	537	536	535	529	522	516
ENERGY GWH	2387.5	75.3	35.2	45.4	169.2	221.0	230.3	232.3	232.2	197.9	178.5	86.0	40.1	45.7	181.0	220.3	197.2
--OAHE--																	
NAT INFLOW	2300	259	121	155	405	220	625	170	70	95	45	45	21	24	-15	-10	70
DEPLETION	802	26	12	16	53	81	172	212	144	34	-14	1	0	0	14	20	31
CHAN STOR	-2	26			-8	-20	-6	4		11	11				-2	-19	
EVAPORATION	487							31	95	117	100	45	21	24	53		
REG INFLOW	16788	765	345	443	1475	1595	1964	1437	1337	1246	1138	564	263	301	1115	1427	1372
RELEASE	16992	468	306	360	1293	1543	1609	1849	1983	1754	1263	587	309	227	1081	1284	1076
STOR CHANGE	-204	297	38	83	182	52	355	-412	-646	-508	-125	-22	-46	74	34	143	296
STORAGE	18183.	18480	18518	18601	18783	18835	19190	18778	18133	17625	17499	17477	17431	17505	17539	17682	17979
ELEV FTMSL	1605.9	1606.9	1607.0	1607.3	1607.9	1608.0	1609.2	1607.9	1605.8	1604.1	1603.6	1603.5	1603.4	1603.6	1603.8	1604.3	1605.2
DISCH KCFS	19.772	15.7	22.1	20.2	21.7	25.1	27.0	30.1	32.2	29.5	20.5	19.7	22.3	14.3	17.6	20.9	19.4
POWER																	
AVE POWER MW		202	284	260	281	324	351	389	413	374	260	250	281	181	223	265	247
PEAK POW MW		705	705	707	710	711	717	710	699	690	687	687	686	687	688	691	696
ENERGY GWH	2633.0	72.8	47.7	56.2	202.1	241.4	252.4	289.6	307.5	269.5	193.5	89.8	47.3	34.8	165.7	196.9	165.7
--BIG BEND--																	
EVAPORATION	105							6	20	25	22	10	5	5	12		
REG INFLOW	16887	468	306	360	1293	1543	1609	1843	1963	1729	1241	577	305	222	1070	1284	1076
RELEASE	16887	468	306	360	1293	1543	1609	1843	1963	1729	1241	577	305	222	1070	1284	1076
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	19.772	15.7	22.1	20.2	21.7	25.1	27.0	30.0	31.9	29.1	20.2	19.4	21.9	14.0	17.4	20.9	19.4
POWER																	
AVE POWER MW		75	103	95	102	117	127	140	149	138	99	97	110	70	88	102	93
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	975.4	26.8	17.4	20.4	73.2	87.4	91.1	104.4	111.1	99.1	73.7	35.1	18.5	13.5	65.1	76.2	62.4
--FORT RANDALL--																	
NAT INFLOW	900	121	56	73	160	165	135	70	60	35		-5	-2	-3		-10	45
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	116							8	25	31	24	9	4	4	9		
REG INFLOW	17592	588	362	432	1449	1699	1732	1887	1982	1725	1216	562	298	215	1057	1271	1118
RELEASE	17592	307	218	432	1449	1699	1732	1887	1982	1869	1855	875	409	241	949	930	759
STOR CHANGE	0	281	144					0	0	-144	-639	-313	-111	-26	108	341	359
STORAGE	3000.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2329	2218	2192	2300	2641	3000
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	14.261	10.3	15.7	24.2	24.3	27.6	29.1	30.7	32.2	31.4	30.2	29.4	29.5	15.2	15.4	15.1	13.7
POWER																	
AVE POWER MW		85	132	204	206	233	245	258	271	262	242	222	215	111	113	115	109
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	296	287	285	294	320	339
ENERGY GWH	1738.2	30.8	22.3	44.2	148.1	173.3	176.5	192.1	201.7	188.9	179.7	79.9	36.2	21.3	84.4	85.6	73.2
--GAVINS POINT--																	
NAT INFLOW	1500	102	47	61	145	165	175	100	90	95	120	58	27	31	80	85	120
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	0	8	-10	-16	0	-6	-3	-3	-3	2	2	1	0	26	0	1	3
EVAPORATION	34							2	6	8	7	3	2	2	4		
REG INFLOW	18944	417	255	477	1588	1839	1880	1943	2053	1963	1968	925	432	294	1015	1015	881
RELEASE	18944	417	255	477	1588	1839	1880	1943	2041	1940	1968	925	432	294	1015	1015	916
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	17.000	14.0	18.4	26.7	26.7	29.9	31.6	31.6	33.2	32.6	32.0	31.1	31.1	18.5	16.5	16.5	16.5
POWER																	
AVE POWER MW		49	64	91	91	101	105	105	109	109	108	106	106	65	58	58	58
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	775.9	17.6	10.7	19.7	65.6	74.9	75.3	77.8	80.9	78.3	80.6	38.3	17.9	12.5	43.4	43.4	38.9
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1800	162	76	97	280	345	190	165	130	110	60	30	14	16	25	25	75
DEPLETION	293	8	4	5	25	37	33	41	40	27	13	7	3	4	15	16	16
REGULATED FLOW AT SIOUX CITY																	
KAF	20451	571	327	570	1843	2147	2037	2067	2131	2023	2015	948	443	306	1025	1024	975
KCFS		19.2	23.6	31.9	31.0	34.9	34.2	33.6	34.7	34.0	32.8	31.9	31.9	19.3	16.7	16.6	17.6
--TOTAL--																	
NAT INFLOW	24600	1350	630	810	2330	3340	6075	3445	1295	1105	1055	513	239	273	565	605	970
DEPLETION	2994	11	5	7	8	577	1812	1387	392	-183	-169	-169	-79	-90	-217	-194	-105
CHAN STOR	-2	79	-10	-16	-18	-41	-33	1	-3	38	37	1	0	27	-37	-28	3
EVAPORATION	1719							107	336	417	358	160	74	84	182		
STORAGE	54815.	55662	55949	56166	56626	57202	59394	59278	57711	56597	55485	55059	54860	54861	54399	54146	54248
SYSTEM POWER																	
AVE POWER MW		702	875	942	1009	1188	1297	1356	1405	1273	1031	996	1033	748	855	979	942
PEAK POW MW		2396	2395	2398	2404	2409	2435	2433	2415	2406	2388	2363	2353	2351	2315	2335	2342
ENERGY GWH	9557.5	252.6	146.9	203.5	726.6	884.1	934.2	1008.6	1045.3	916.5	766.8	358.5	173.6	143.6	635.8	728.2	632.7
DAILY GWH		16.8	21.0	22.6	24.2	28.5	31.1	32.5	33.7	30.6	24.7	23.9	24.8	18.0	20.5	23.5	22.6
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:34:33 STUDY NO 11

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB21		2021											2022			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	7200	227	106	136	560	1145	1830	840	365	290	385	205	96	109	295	260	350
DEPLETION	563	-26	-12	-16	12	288	594	305	50	-88	-111	-32	-15	-17	-132	-143	-94
EVAPORATION	450							28	87	108	94	42	20	23	49		
MOD INFLOW	6187	254	118	152	548	857	1236	507	228	270	402	195	91	104	378	403	444
RELEASE	6305	179	83	107	417	553	625	646	646	496	369	179	83	111	584	646	583
STOR CHANGE	-118	75	35	45	131	304	611	-138	-417	-225	33	16	7	-7	-206	-243	-139
STORAGE	14236.	14311	14346	14391	14522	14826	15437	15299	14881	14656	14689	14705	14713	14705	14499	14257	14118
ELEV FTMSL	2231.3	2231.7	2231.9	2232.1	2232.7	2234.2	2237.0	2236.4	2234.4	2233.4	2233.5	2233.6	2233.6	2233.6	2232.6	2231.4	2230.8
DISCH KCFS	10.500	6.0	6.0	6.0	7.0	9.0	10.5	10.5	10.5	8.3	6.0	6.0	6.0	7.0	9.5	10.5	10.5
POWER																	
AVE POWER MW		81	81	81	95	122	143	144	143	113	82	82	82	95	129	142	141
PEAK POW MW		187	187	187	187	188	190	190	188	188	188	188	188	188	187	186	186
ENERGY GWH	1037.1	29.2	13.6	17.6	68.3	91.0	103.3	107.1	106.7	81.6	60.7	29.4	13.7	18.3	95.9	105.6	95.1
--GARRISON--																	
NAT INFLOW	10900	479	223	287	780	1300	3120	2100	580	480	445	180	84	96	180	255	310
DEPLETION	1161	1	0	1	-92	143	991	795	143	-162	-67	-154	-72	-82	-130	-92	-62
CHAN STOR	0	45			-10	-20	-15			21	23			-10	-25	-10	
EVAPORATION	522							32	102	126	109	49	23	26	56		
REG INFLOW	15523	702	306	394	1279	1691	2739	1919	981	1033	795	464	217	254	814	983	955
RELEASE	15664	506	236	303	1131	1476	1488	1476	1476	1279	1168	565	264	289	1199	1476	1333
STOR CHANGE	-141	196	70	90	148	215	1251	443	-495	-247	-374	-102	-47	-35	-385	-493	-378
STORAGE	17076.	17272	17342	17432	17580	17795	19046	19489	18995	18748	18375	18273	18226	18190	17805	17312	16935
ELEV FTMSL	1835.3	1835.9	1836.2	1836.5	1837.0	1837.7	1841.6	1842.9	1841.4	1840.7	1839.5	1839.2	1839.0	1838.9	1837.7	1836.1	1834.8
DISCH KCFS	24.000	17.0	17.0	17.0	19.0	24.0	25.0	24.0	24.0	21.5	19.0	19.0	19.0	18.2	19.5	24.0	24.0
POWER																	
AVE POWER MW		208	209	209	234	296	313	305	305	272	239	238	238	228	243	295	293
PEAK POW MW		519	520	521	524	527	545	551	545	541	535	534	533	533	527	520	514
ENERGY GWH	2362.3	75.0	35.1	45.2	168.5	220.2	225.1	226.9	226.8	195.6	177.9	85.7	39.9	43.7	180.5	219.6	196.6
--OAHE--																	
NAT INFLOW	2300	259	121	155	405	220	625	170	70	95	45	45	21	24	-15	-10	70
DEPLETION	817	26	12	16	54	82	175	217	147	35	-15	1	0	0	14	21	32
CHAN STOR	0	28			-8	-20	-4	4		10	10			3	-5	-19	
EVAPORATION	480							31	94	115	99	45	21	24	52		
REG INFLOW	16667	767	345	443	1474	1594	1934	1402	1305	1234	1140	565	264	292	1113	1426	1371
RELEASE	16813	469	306	360	1293	1543	1609	1849	1983	1754	1263	587	309	227	1018	1223	1020
STOR CHANGE	-146	298	38	83	181	51	324	-447	-678	-520	-123	-22	-45	65	95	203	351
STORAGE	17979.	18277	18315	18398	18578	18629	18954	18507	17829	17309	17186	17164	17119	17184	17278	17482	17833
ELEV FTMSL	1605.2	1606.2	1606.4	1606.6	1607.2	1607.4	1608.4	1607.0	1604.7	1603.0	1602.5	1602.5	1602.3	1602.5	1602.9	1603.6	1604.8
DISCH KCFS	19.368	15.8	22.1	20.2	21.7	25.1	27.0	30.1	32.2	29.5	20.5	19.7	22.3	14.3	16.6	19.9	18.4
POWER																	
AVE POWER MW		202	283	259	280	323	349	388	411	372	259	248	280	180	209	251	233
PEAK POW MW		701	702	703	706	707	713	705	693	684	682	681	680	682	683	687	693
ENERGY GWH	2593.9	72.8	47.5	56.0	201.4	240.5	251.5	288.4	305.9	267.9	192.4	89.3	47.0	34.6	155.2	186.7	156.7
--BIG BEND--																	
EVAPORATION	105							6	20	25	22	10	5	5	12		
REG INFLOW	16708	469	306	360	1293	1543	1609	1843	1963	1729	1241	577	305	222	1006	1223	1020
RELEASE	16708	469	306	360	1293	1543	1609	1843	1963	1729	1241	577	305	222	1006	1223	1020
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	19.368	15.8	22.1	20.2	21.7	25.1	27.0	30.0	31.9	29.1	20.2	19.4	21.9	14.0	16.4	19.9	18.4
POWER																	
AVE POWER MW		75	103	95	102	117	127	140	149	138	99	97	110	70	82	98	88
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	964.9	26.9	17.3	20.4	73.2	87.4	91.1	104.4	111.1	99.1	73.7	35.1	18.5	13.5	61.3	72.6	59.2
--FORT RANDALL--																	
NAT INFLOW	900	121	56	73	160	165	135	70	60	35		-5	-2	-3		-10	45
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	116							8	25	31	24	9	4	4	9		
REG INFLOW	17413	589	362	432	1449	1699	1732	1887	1982	1725	1216	562	298	215	994	1210	1062
RELEASE	17413	308	218	432	1449	1699	1732	1887	1982	1869	1855	875	409	241	885	869	703
STOR CHANGE	0	281	144					0	0	-144	-639	-313	-111	-26	109	341	359
STORAGE	3000.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2329	2218	2192	2300	2641	3000
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	13.660	10.4	15.7	24.2	24.3	27.6	29.1	30.7	32.2	31.4	30.2	29.4	29.5	15.2	14.4	14.1	12.7
POWER																	
AVE POWER MW		86	132	204	206	233	245	258	271	262	242	222	215	111	106	108	101
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	296	287	285	294	320	339
ENERGY GWH	1721.8	30.9	22.2	44.2	148.1	173.3	176.5	192.1	201.7	188.9	179.7	79.9	36.2	21.3	78.8	80.0	67.9
--GAVINS POINT--																	
NAT INFLOW	1500	102	47	61	145	165	175	100	90	95	120	58	27	31	80	85	120
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	1	6	-10	-16	0	-6	-3	-3	-3	2	2	1	0	26	1	1	3
EVAPORATION	34							2	6	8	7	3	2	2	4		
REG INFLOW	18766	417	255	477	1588	1839	1880	1943	2053	1963	1968	925	432	294	953	953	826
RELEASE	18766	417	255	477	1588	1839	1880	1943	2041	1940	1968	925	432	294	953	953	861
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	16.500	14.0	18.4	26.7	26.7	29.9	31.6	31.6	33.2	32.6	32.0	31.1	31.1	18.5	15.5	15.5	15.5
POWER																	
AVE POWER MW		49	64	91	91	101	105	105	109	109	108	106	106	65	55	55	55
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	768.4	17.6	10.7	19.7	65.6	74.9	75.3	77.8	80.9	78.3	80.6	38.3	17.9	12.5	40.9	40.9	36.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1800	162	76	97	280	345	190	165	130	110	60	30	14	16	25	25	75
DEPLETION	295	8	4	5	25	38	33	42	40	27	13	7	3	4	15	16	16
REGULATED FLOW AT SIOUX CITY																	
KAF	20271	571	327	570	1843	2146	2037	2066	2131	2023	2015	948	443	306	963	962	920
KCFS		19.2	23.6	31.9	31.0	34.9	34.2	33.6	34.7	34.0	32.8	31.9	31.9	19.3	15.7	15.6	16.6
--TOTAL--																	
NAT INFLOW	24600	1350	630	810	2330	3340	6075	3445	1295	1105	1055	513	239	273	565	605	970
DEPLETION	3030	10	5	6	8	579	1829	1416	405	-186	-177	-173	-81	-92	-220	-194	-105
CHAN STOR	1	80	-10	-16	-18	-46	-22	1	-3	33	36	1	0	21	-29	-28	3
EVAPORATION	1705							107	333	414	356	158	73	84	181		
STORAGE	54248.	55098	55386	55604	56064	56633	58820	58678	57100	55988	54885	54464	54268	54265	53877	53685	53843
SYSTEM POWER																	
AVE POWER MW		701	872	940	1007	1193	1282	1340	1389	1266	1028	993	1031	750	823	948	911
PEAK POW MW		2389	2388	2391	2397	2402	2428	2426	2406	2397	2379	2354	2344	2342	2308	2329	2337
ENERGY GWH	9448.3	252.3	146.5	203.0	725.1	887.2	922.9	996.7	1033.1	911.6	765.0	357.6	173.1	143.9	612.6	705.4	612.1
DAILY GWH		16.8	20.9	22.6	24.2	28.6	30.8	32.2	33.3	30.4	24.7	23.8	24.7	18.0	19.8	22.8	21.9
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:34:33 STUDY NO 12

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB22		2022											2023			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	7200	227	106	136	560	1145	1830	840	365	290	385	205	96	109	295	260	350
DEPLETION	574	-26	-12	-16	12	289	599	312	55	-88	-113	-33	-15	-18	-133	-144	-95
EVAPORATION	447							28	86	107	93	42	20	23	49		
MOD INFLOW	6179	254	118	152	548	856	1231	500	224	271	405	196	91	104	379	404	445
RELEASE	6263	179	83	107	417	523	625	646	646	492	369	179	83	103	584	646	583
STOR CHANGE	-84	75	35	45	131	333	606	-145	-422	-221	36	17	8	1	-205	-242	-138
STORAGE	14118.	14193	14228	14273	14404	14738	15344	15199	14777	14556	14592	14609	14617	14618	14413	14172	14033
ELEV FTMSL	2230.8	2231.1	2231.3	2231.5	2232.2	2233.8	2236.6	2235.9	2233.9	2232.9	2233.1	2233.1	2233.2	2233.2	2232.2	2231.0	2230.3
DISCH KCFS	10.500	6.0	6.0	6.0	7.0	8.5	10.5	10.5	10.5	8.3	6.0	6.0	6.0	6.5	9.5	10.5	10.5
POWER																	
AVE POWER MW		81	81	81	95	115	143	144	143	112	82	82	82	88	129	142	141
PEAK POW MW		186	186	186	187	188	190	189	188	187	187	187	188	188	187	186	186
ENERGY GWH	1028.7	29.2	13.6	17.5	68.2	85.8	103.2	107.0	106.5	80.9	60.6	29.4	13.7	17.0	95.8	105.4	95.0
--GARRISON--																	
NAT INFLOW	10900	479	223	287	780	1300	3120	2100	580	480	445	180	84	96	180	255	310
DEPLETION	1176	1	1	1	-92	144	1001	811	148	-165	-71	-158	-74	-84	-132	-93	-62
CHAN STOR	0	45			-10	-15	-20			22	22			-5	-30	-10	
EVAPORATION	518							32	101	125	108	48	23	26	55		
REG INFLOW	15469	701	306	394	1279	1664	2724	1903	977	1033	799	468	218	253	811	984	955
RELEASE	15571	506	236	303	1101	1476	1488	1476	1476	1264	1138	550	257	294	1199	1476	1333
STOR CHANGE	-102	196	70	90	178	188	1236	427	-499	-230	-339	-82	-38	-41	-388	-492	-378
STORAGE	16935.	17130	17200	17290	17468	17656	18892	19319	18821	18590	18252	18169	18131	18090	17702	17210	16832
ELEV FTMSL	1834.8	1835.5	1835.7	1836.0	1836.6	1837.2	1841.1	1842.4	1840.9	1840.2	1839.1	1838.9	1838.7	1838.6	1837.4	1835.7	1834.5
DISCH KCFS	24.000	17.0	17.0	17.0	18.5	24.0	25.0	24.0	24.0	21.2	18.5	18.5	18.5	18.5	19.5	24.0	24.0
POWER																	
AVE POWER MW		208	208	209	227	295	312	304	304	268	232	231	231	231	242	295	292
PEAK POW MW		517	518	519	522	525	543	549	542	539	534	532	532	531	525	518	512
ENERGY GWH	2342.3	74.7	35.0	45.0	163.7	219.7	224.5	226.3	226.2	192.7	172.8	83.2	38.8	44.3	180.1	219.2	196.2
--OAHE--																	
NAT INFLOW	2300	259	121	155	405	220	625	170	70	95	45	45	21	24	-15	-10	70
DEPLETION	830	27	12	16	54	83	178	221	150	35	-15	1	0	0	15	21	32
CHAN STOR	0	29			-6	-22	-4	4		11	11				-4	-19	
EVAPORATION	475							30	93	114	98	44	21	24	51		
REG INFLOW	16566	767	344	443	1446	1591	1931	1398	1303	1221	1111	551	257	294	1113	1426	1371
RELEASE	16671	471	306	360	1293	1543	1609	1849	1983	1754	1263	587	309	227	967	1173	976
STOR CHANGE	-105	296	38	82	153	48	321	-451	-680	-533	-152	-36	-52	67	146	252	395
STORAGE	17833.	18128	18167	18249	18402	18450	18771	18321	17641	17108	16956	16919	16867	16934	17080	17332	17727
ELEV FTMSL	1604.8	1605.7	1605.9	1606.1	1606.6	1606.8	1607.8	1606.4	1604.1	1602.3	1601.7	1601.6	1601.4	1601.7	1602.2	1603.0	1604.4
DISCH KCFS	18.368	15.8	22.0	20.2	21.7	25.1	27.0	30.1	32.2	29.5	20.5	19.7	22.3	14.3	15.7	19.1	17.6
POWER																	
AVE POWER MW		202	282	259	279	322	348	386	410	371	258	247	278	179	197	240	223
PEAK POW MW		699	699	701	703	704	710	702	690	680	677	677	676	677	680	684	691
ENERGY GWH	2563.6	72.9	47.4	55.9	200.8	239.8	250.7	287.5	304.9	267.0	191.6	88.9	46.8	34.4	146.9	178.7	149.6
--BIG BEND--																	
EVAPORATION	105							6	20	25	22	10	5	5	12		
REG INFLOW	16566	471	306	360	1293	1543	1609	1843	1963	1729	1241	577	305	222	956	1173	976
RELEASE	16566	471	306	360	1293	1543	1609	1843	1963	1729	1241	577	305	222	956	1173	976
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	18.368	15.8	22.0	20.2	21.7	25.1	27.0	30.0	31.9	29.1	20.2	19.4	21.9	14.0	15.5	19.1	17.6
POWER																	
AVE POWER MW		75	103	95	102	117	127	140	149	138	99	97	110	70	78	94	84
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	956.5	27.0	17.3	20.4	73.2	87.4	91.1	104.4	111.1	99.1	73.7	35.1	18.5	13.5	58.3	69.7	56.6
--FORT RANDALL--																	
NAT INFLOW	900	121	56	73	160	165	135	70	60	35		-5	-2	-3		-10	45
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	116							8	25	31	24	9	4	4	9		
REG INFLOW	17271	591	362	432	1449	1699	1732	1887	1982	1725	1216	562	298	215	943	1160	1018
RELEASE	17270	310	218	432	1449	1699	1732	1887	1982	1869	1855	875	409	241	835	819	659
STOR CHANGE	0	281	144		0			0	0	-144	-639	-313	-111	-26	109	341	359
STORAGE	3000.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2329	2218	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	12.660	10.4	15.7	24.2	24.3	27.6	29.1	30.7	32.2	31.4	30.2	29.4	29.5	15.2	13.6	13.3	11.9
POWER																	
AVE POWER MW		86	132	204	206	233	245	258	271	262	242	222	215	111	100	102	95
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	296	287	285	294	320	339
ENERGY GWH	1708.8	31.1	22.2	44.2	148.1	173.3	176.5	192.1	201.7	188.9	179.7	79.9	36.2	21.3	74.4	75.5	63.7
--GAVINS POINT--																	
NAT INFLOW	1500	102	47	61	145	165	175	100	90	95	120	58	27	31	80	85	120
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	0	4	-10	-16	0	-6	-3	-3	-3	2	2	1	0	26	3	0	3
EVAPORATION	34							2	6	8	7	3	2	2	4		
REG INFLOW	18623	417	255	477	1588	1839	1880	1943	2053	1963	1968	925	432	294	904	904	781
RELEASE	18623	417	255	477	1588	1839	1880	1943	2041	1940	1968	925	432	294	904	904	816
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	15.500	14.0	18.4	26.7	26.7	29.9	31.6	31.6	33.2	32.6	32.0	31.1	31.1	18.5	14.7	14.7	14.7
POWER																	
AVE POWER MW		49	64	91	91	101	105	105	109	109	108	106	106	65	52	52	52
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	762.4	17.6	10.7	19.7	65.6	74.9	75.3	77.8	80.9	78.3	80.6	38.3	17.9	12.5	38.8	38.8	34.8
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1800	162	76	97	280	345	190	165	130	110	60	30	14	16	25	25	75
DEPLETION	297	8	4	5	25	38	33	42	41	27	13	7	3	4	15	16	17
REGULATED FLOW AT SIOUX CITY																	
KAF	20126	571	327	570	1843	2146	2037	2066	2130	2023	2015	948	443	306	914	913	874
KCFS		19.2	23.6	31.9	31.0	34.9	34.2	33.6	34.6	34.0	32.8	31.9	31.9	19.3	14.9	14.8	15.7
--TOTAL--																	
NAT INFLOW	24600	1350	630	810	2330	3340	6075	3445	1295	1105	1055	513	239	273	565	605	970
DEPLETION	3071	11	5	6	8	582	1847	1443	419	-189	-183	-178	-83	-95	-222	-196	-105
CHAN STOR	1	78	-10	-16	-16	-43	-27	1	-3	35	36	1	0	22	-31	-28	3
EVAPORATION	1695							106	331	411	353	157	73	83	180		
STORAGE	53843.	54690	54978	55195	55657	56227	58390	58221	56633	55528	54434	54019	53826	53827	53489	53349	53552
SYSTEM POWER																	
AVE POWER MW		701	870	939	999	1184	1280	1337	1386	1260	1020	985	1023	745	799	924	887
PEAK POW MW		2383	2383	2386	2392	2396	2422	2420	2400	2391	2372	2348	2338	2336	2302	2324	2333
ENERGY GWH	9362.2	252.5	146.2	202.7	719.5	880.8	921.3	995.1	1031.3	906.9	759.0	354.8	171.8	143.1	594.2	687.3	595.7
DAILY GWH		16.8	20.9	22.5	24.0	28.4	30.7	32.1	33.3	30.2	24.5	23.7	24.5	17.9	19.2	22.2	21.3
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 09:34:33 STUDY NO 13

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB23	2023												2024			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB
--FORT PECK--																	
NAT INFLOW	7200	227	106	136	560	1145	1830	840	365	290	385	205	96	109	295	260	350
DEPLETION	584	-26	-12	-16	12	290	603	319	60	-87	-113	-33	-15	-18	-132	-143	-105
EVAPORATION	444							27	86	106	93	42	20	22	48		
MOD INFLOW	6172	254	118	152	548	855	1227	494	219	271	405	196	91	105	379	403	455
RELEASE	6237	179	83	107	417	553	625	646	646	482	369	179	83	95	584	615	575
STOR CHANGE	-66	75	35	45	131	302	602	-152	-426	-212	36	18	8	9	-205	-212	-120
STORAGE	14033.	14109	14144	14189	14320	14622	15224	15072	14646	14434	14470	14488	14496	14505	14300	14088	13968
ELEV FTMSL	2230.3	2230.7	2230.9	2231.1	2231.7	2233.2	2236.0	2235.3	2233.3	2232.3	2232.5	2232.6	2232.6	2232.6	2231.6	2230.6	2230.0
DISCH KCFS	10.500	6.0	6.0	6.0	7.0	9.0	10.5	10.5	10.5	8.1	6.0	6.0	6.0	6.0	9.5	10.0	10.0
POWER																	
AVE POWER MW		81	81	81	95	122	143	144	143	110	81	81	81	81	128	135	134
PEAK POW MW		186	186	186	187	188	189	189	188	187	187	187	187	187	187	186	185
ENERGY GWH	1022.9	29.1	13.6	17.5	68.1	90.7	103.0	106.8	106.3	79.1	60.5	29.3	13.7	15.6	95.6	100.3	93.6
--GARRISON--																	
NAT INFLOW	10900	479	223	287	780	1300	3120	2100	580	480	445	180	84	96	180	255	310
DEPLETION	1190	2	1	1	-91	144	1011	827	154	-168	-76	-161	-75	-86	-132	-93	-68
CHAN STOR	5	45			-10	-20	-15			23	21				-35	-5	
EVAPORATION	518							32	101	125	108	48	23	26	55		
REG INFLOW	15435	701	306	393	1278	1689	2719	1887	971	1029	802	471	220	251	806	958	953
RELEASE	15516	476	222	286	1101	1476	1488	1476	1476	1253	1107	536	250	286	1230	1476	1381
STOR CHANGE	-82	225	84	108	177	214	1231	411	-505	-224	-304	-65	-30	-34	-423	-518	-427
STORAGE	16832.	17057	17141	17249	17426	17639	18871	19282	18777	18553	18248	18184	18154	18119	17696	17178	16751
ELEV FTMSL	1834.5	1835.2	1835.5	1835.9	1836.5	1837.2	1841.1	1842.3	1840.8	1840.1	1839.1	1838.9	1838.8	1838.7	1837.3	1835.6	1834.2
DISCH KCFS	24.000	16.0	16.0	16.0	18.5	24.0	25.0	24.0	24.0	21.1	18.0	18.0	18.0	18.0	20.0	24.0	24.0
POWER																	
AVE POWER MW		195	196	196	227	295	312	304	304	265	226	225	225	225	248	294	292
PEAK POW MW		516	517	519	521	525	543	549	541	538	534	533	532	532	525	517	511
ENERGY GWH	2332.8	70.3	32.9	42.4	163.6	219.5	224.4	226.2	226.0	190.9	168.1	81.0	37.8	43.1	184.7	219.1	202.9
--OAHE--																	
NAT INFLOW	2300	259	121	155	405	220	625	170	70	95	45	45	21	24	-15	-10	70
DEPLETION	845	27	12	16	55	84	181	226	153	36	-15	1	0	0	15	21	33
CHAN STOR	0	33	0	0	-10	-22	-4	4		12	13				-9	-17	
EVAPORATION	472							30	92	113	98	44	20	23	51		
REG INFLOW	16500	741	331	425	1441	1590	1928	1394	1300	1211	1082	536	250	286	1140	1428	1418
RELEASE	16584	473	306	358	1287	1530	1603	1849	1983	1754	1263	587	309	227	936	1143	976
STOR CHANGE	-85	269	25	67	154	59	324	-456	-682	-543	-181	-51	-59	59	205	285	441
STORAGE	17727.	17996	18021	18087	18241	18300	18624	18169	17487	16943	16763	16712	16653	16712	16917	17202	17643
ELEV FTMSL	1604.4	1605.3	1605.4	1605.6	1606.1	1606.3	1607.4	1605.9	1603.6	1601.7	1601.1	1600.9	1600.7	1600.9	1601.6	1602.6	1604.1
DISCH KCFS	17.568	15.9	22.0	20.1	21.6	24.9	26.9	30.1	32.2	29.5	20.5	19.7	22.3	14.3	15.2	18.6	17.0
POWER																	
AVE POWER MW		203	281	257	277	319	346	385	409	370	257	246	277	179	190	233	215
PEAK POW MW		696	697	698	700	702	707	699	687	677	674	673	672	673	677	682	690
ENERGY GWH	2543.0	72.9	47.2	55.4	199.3	237.2	249.2	286.7	304.0	266.2	190.9	88.6	46.6	34.3	141.6	173.6	149.4
--BIG BEND--																	
EVAPORATION	105							6	20	25	22	10	5	5	12		
REG INFLOW	16479	473	306	358	1287	1530	1603	1843	1963	1729	1241	577	305	222	924	1143	976
RELEASE	16479	473	306	358	1287	1530	1603	1843	1963	1729	1241	577	305	222	924	1143	976
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	17.568	15.9	22.0	20.1	21.6	24.9	26.9	30.0	31.9	29.1	20.2	19.4	21.9	14.0	15.0	18.6	17.0
POWER																	
AVE POWER MW		75	103	94	101	117	126	140	149	138	99	97	110	70	76	91	81
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	951.4	27.1	17.3	20.3	72.9	86.7	90.8	104.4	111.1	99.1	73.7	35.1	18.5	13.5	56.4	67.9	56.7
--FORT RANDALL--																	
NAT INFLOW	900	121	56	73	160	165	135	70	60	35		-5	-2	-3		-10	45
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	116							8	25	31	24	9	4	4	9		
REG INFLOW	17184	592	362	430	1443	1686	1726	1887	1982	1725	1216	562	298	215	912	1130	1018
RELEASE	17184	312	218	430	1443	1686	1726	1887	1982	1869	1855	875	409	241	803	789	659
STOR CHANGE	0	280	144	0	0		0	0	0	-144	-639	-313	-111	-26	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2329	2218	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	11.860	10.5	15.7	24.1	24.2	27.4	29.0	30.7	32.2	31.4	30.2	29.4	29.5	15.2	13.1	12.8	11.5
POWER																	
AVE POWER MW		87	132	204	205	231	244	258	271	262	242	222	215	111	96	98	92
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	296	287	285	294	319	339
ENERGY GWH	1700.8	31.3	22.2	44.0	147.5	172.0	176.0	192.1	201.7	188.9	179.7	79.9	36.2	21.3	71.6	72.7	63.7
--GAVINS POINT--																	
NAT INFLOW	1500	102	47	61	145	165	175	100	90	95	120	58	27	31	80	85	120
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	3	-10	-16	0	-6	-3	-3	-3	2	2	1	0	26	4	0	3
EVAPORATION	34							2	6	8	7	3	2	2	4		
REG INFLOW	18536	417	255	475	1583	1826	1874	1943	2053	1963	1968	925	432	294	873	873	782
RELEASE	18536	417	255	475	1583	1826	1874	1943	2041	1940	1968	925	432	294	873	873	817
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	14.700	14.0	18.4	26.6	26.6	29.7	31.5	31.6	33.2	32.6	32.0	31.1	31.1	18.5	14.2	14.2	14.2
POWER																	
AVE POWER MW		49	64	91	91	100	104	105	109	109	108	106	106	65	50	50	50
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	759.0	17.6	10.7	19.6	65.3	74.5	75.2	77.8	80.9	78.3	80.6	38.3	17.9	12.5	37.5	37.5	34.8
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1800	162	76	97	280	345	190	165	130	110	60	30	14	16	25	25	75
DEPLETION	301	8	4	5	26	38	33	42	41	28	13	8	4	4	16	16	17
REGULATED FLOW AT SIOUX CITY																	
KAF	20035	571	327	568	1837	2133	2031	2066	2130	2022	2015	948	442	306	882	882	875
KCFS		19.2	23.6	31.8	30.9	34.7	34.1	33.6	34.6	34.0	32.8	31.9	31.9	19.3	14.3	14.3	15.2
--TOTAL--																	
NAT INFLOW	24600	1350	630	810	2330	3340	6075	3445	1295	1105	1055	513	239	273	565	605	970
DEPLETION	3114	11	5	7	11	584	1864	1471	433	-189	-188	-180	-84	-96	-220	-195	-120
CHAN STOR	5	81	-10	-16	-20	-48	-22	1	-3	37	36	1	0	27	-39	-21	3
EVAPORATION	1688							105	330	409	352	157	73	83	179		
STORAGE	53552.	54401	54688	54908	55370	55944	58102	57905	56304	55204	54116	53705	53514	53522	53206	53103	53320
SYSTEM POWER																	
AVE POWER MW		690	857	922	995	1184	1276	1336	1385	1254	1013	978	1015	731	789	902	864
PEAK POW MW		2380	2379	2382	2388	2393	2419	2416	2396	2387	2368	2344	2334	2332	2299	2321	2330
ENERGY GWH	9310.0	248.3	144.0	199.2	716.7	880.6	918.5	994.1	1030.1	902.6	753.5	352.2	170.5	140.4	587.3	671.0	601.1
DAILY GWH		16.6	20.6	22.1	23.9	28.4	30.6	32.1	33.2	30.1	24.3	23.5	24.4	17.6	18.9	21.6	20.7
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB

TIME OF STUDY: 10:05:11 STUDY NO 14

VALUES IN 1000 AF EXCEPT AS INDICATED

28FEB19		2019											2020			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB
--FORT PECK--																	
NAT INFLOW	6100	206	96	123	472	969	1548	661	297	246	329	172	80	91	246	246	318
DEPLETION	517	-10	-5	-6	9	264	592	280	-6	-126	-112	-31	-14	-17	-104	-114	-83
EVAPORATION	494							31	95	118	103	46	22	25	54		
MOD INFLOW	5089	216	101	129	463	705	956	350	208	254	338	156	73	83	296	360	401
RELEASE	5824	179	83	107	417	523	565	584	584	463	369	179	83	95	523	553	518
STOR CHANGE	-735	37	17	22	46	182	391	-234	-377	-209	-31	-23	-10	-12	-226	-193	-117
STORAGE	12691.	12728	12745	12768	12814	12996	13387	13153	12777	12567	12537	12514	12504	12492	12265	12072	11955
ELEV FTMSL	2223.4	2223.6	2223.7	2223.8	2224.1	2225.0	2227.1	2225.9	2223.9	2222.7	2222.6	2222.4	2222.4	2222.3	2221.1	2220.0	2219.4
DISCH KCFS	10.500	6.0	6.0	6.0	7.0	8.5	9.5	9.5	9.5	7.8	6.0	6.0	6.0	6.0	8.5	9.0	9.0
POWER																	
AVE POWER MW		79	79	79	92	112	126	126	125	102	79	79	79	79	111	117	116
PEAK POW MW		181	181	181	181	182	184	183	181	180	180	180	180	179	178	177	177
ENERGY GWH	925.1	28.4	13.3	17.1	66.4	83.4	90.7	93.9	93.3	73.5	58.5	28.3	13.2	15.1	82.4	86.8	80.9
--GARRISON--																	
NAT INFLOW	9365	414	193	248	655	1177	2661	1740	486	403	404	164	77	87	154	215	287
DEPLETION	1313	23	11	14	21	177	815	730	122	-162	-54	-124	-58	-66	-76	-39	-21
CHAN STOR	15	46			-10	-15	-10			17	18				-26	-5	
EVAPORATION	582							36	113	140	122	55	25	29	62		
REG INFLOW	13309	615	265	341	1040	1507	2401	1558	835	905	723	412	192	220	665	802	826
RELEASE	14201	461	215	277	1012	1476	1369	1353	1353	1113	984	476	222	254	1138	1291	1208
STOR CHANGE	-891	154	50	65	29	32	1032	206	-517	-208	-260	-64	-30	-34	-473	-489	-382
STORAGE	15207.	15361	15411	15476	15504	15536	16568	16774	16257	16048	15788	15724	15694	15660	15187	14698	14315
ELEV FTMSL	1828.8	1829.3	1829.5	1829.7	1829.8	1830.0	1833.6	1834.3	1832.5	1831.8	1830.8	1830.6	1830.5	1830.4	1828.7	1826.9	1825.5
DISCH KCFS	23.000	15.5	15.5	15.5	17.0	24.0	23.0	22.0	22.0	18.7	16.0	16.0	16.0	16.0	18.5	21.0	21.0
POWER																	
AVE POWER MW		182	183	183	201	282	274	266	265	224	191	190	190	190	218	244	241
PEAK POW MW		488	489	490	491	491	508	511	503	500	495	494	494	493	485	477	470
ENERGY GWH	2034.0	65.6	30.7	39.5	144.4	210.0	197.3	197.8	197.1	161.2	142.0	68.4	31.9	36.4	162.0	181.5	168.0
--OAHE--																	
NAT INFLOW	1445	189	88	113	305	139	337	118	54	58	15	14	6	7	-37	-16	54
DEPLETION	789	26	12	15	53	80	169	208	141	33	-14	1	0	0	14	20	31
CHAN STOR	9	33			-6	-30	4	4		15	12		0	0	-12	-12	
EVAPORATION	524							34	103	126	108	49	23	26	57		
REG INFLOW	14341	657	292	375	1257	1504	1541	1233	1163	1028	917	440	206	235	1018	1244	1231
RELEASE	15259	457	326	343	1251	1505	1490	1757	1786	1575	1072	455	249	190	853	1058	893
STOR CHANGE	-918	201	-34	32	6	0	51	-524	-623	-548	-155	-14	-44	45	165	185	338
STORAGE	16051.	16251	16217	16249	16255	16254	16305	15781	15159	14611	14456	14442	14398	14444	14609	14794	15132
ELEV FTMSL	1598.5	1599.2	1599.1	1599.2	1599.2	1599.2	1599.4	1597.5	1595.2	1593.0	1592.4	1592.3	1592.2	1592.3	1593.0	1593.7	1595.0
DISCH KCFS	15.732	15.4	23.5	19.2	21.0	24.5	25.0	28.6	29.0	26.5	17.4	15.3	18.0	11.9	13.9	17.2	15.5
POWER																	
AVE POWER MW		190	289	237	260	302	309	350	352	317	208	182	213	142	166	206	187
PEAK POW MW		664	664	664	664	664	665	656	644	633	630	630	629	630	633	637	644
ENERGY GWH	2242.1	68.2	48.6	51.2	186.9	224.5	222.4	260.6	261.7	228.2	154.6	65.5	35.9	27.3	123.2	153.2	130.1
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	15128	457	326	343	1251	1505	1490	1749	1761	1544	1044	442	243	183	839	1058	893
RELEASE	15128	457	326	343	1251	1505	1490	1749	1761	1544	1044	442	243	183	839	1058	893
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	15.732	15.4	23.5	19.2	21.0	24.5	25.0	28.4	28.6	25.9	17.0	14.9	17.5	11.5	13.6	17.2	15.5
POWER																	
AVE POWER MW		73	110	90	98	115	117	133	134	123	83	75	88	58	69	85	74
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	873.0	26.2	18.5	19.4	70.9	85.2	84.4	99.1	99.7	88.5	62.1	27.0	14.8	11.2	51.2	62.9	51.8
--FORT RANDALL--																	
NAT INFLOW	494	85	40	51	88	71	121	38	27		-22	-8	-4	-4	-11	-22	44
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	145							10	32	39	31	12	5	5	12		
REG INFLOW	15398	541	365	393	1335	1567	1599	1759	1741	1497	991	421	234	173	813	1033	934
RELEASE	15398	260	221	393	1335	1567	1599	1759	1741	1642	1631	734	344	199	704	692	575
STOR CHANGE	0	280	144			0		0	0	-144	-640	-313	-110	-26	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2641	2328	2218	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1340.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	9.934	8.8	15.9	22.0	22.4	25.5	26.9	28.6	28.3	27.6	26.5	24.7	24.8	12.6	11.5	11.3	10.0
POWER																	
AVE POWER MW		73	134	186	190	215	227	241	239	231	213	187	182	92	84	86	80
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	296	287	285	294	319	339
ENERGY GWH	1528.1	26.2	22.5	40.2	136.6	160.0	163.2	179.3	177.5	166.3	158.4	67.3	30.6	17.7	62.8	63.9	55.6
--GAVINS POINT--																	
NAT INFLOW	1326	94	44	56	128	143	153	87	71	81	106	51	24	27	77	77	107
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	2	-14	-12	-1	-6	-3	-3	1	1	2	3	0	23	2	0	2
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	16566	357	251	438	1458	1685	1726	1802	1795	1719	1728	780	364	244	769	769	684
RELEASE	16566	357	251	438	1458	1685	1726	1802	1783	1696	1728	780	364	244	769	769	719
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	12.500	12.0	18.1	24.5	24.5	27.4	29.0	29.3	29.0	28.5	28.1	26.2	26.2	15.4	12.5	12.5	12.5
POWER																	
AVE POWER MW		42	63	84	84	93	99	99	99	99	98	92	92	55	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	692.1	15.1	10.5	18.1	60.4	69.5	70.9	73.8	73.6	71.1	73.2	33.1	15.4	10.5	33.0	33.0	30.7
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1170	129	60	77	154	197	122	106	85	70	37	24	11	13	11	21	53
DEPLETION	291	8	4	5	25	37	33	41	40	26	12	7	3	4	15	16	16
REGULATED FLOW AT SIOUX CITY																	
KAF	17445	478	308	510	1587	1845	1815	1867	1828	1740	1753	797	372	253	765	774	756
KCFS		16.1	22.2	28.6	26.7	30.0	30.5	30.4	29.7	29.2	28.5	26.8	26.8	16.0	12.4	12.6	13.1
--TOTAL--																	
NAT INFLOW	19900	1117	521	670	1802	2696	4942	2750	1020	858	869	416	194	222	440	521	863
DEPLETION	3104	47	22	28	117	586	1645	1316	322	-227	-165	-142	-66	-75	-138	-113	-54
CHAN STOR	23	81	-14	-12	-18	-52	-9	1	1	34	33	3	0	23	-35	-16	2
EVAPORATION	1918							120	375	465	400	178	82	94	203		
STORAGE	48906.	49579	49756	49875	49956	50170	51644	51092	49587	48501	47415	47001	46806	46780	46354	46199	46362
SYSTEM POWER																	
AVE POWER MW		638	857	859	924	1119	1151	1216	1214	1096	872	804	844	615	692	781	743
PEAK POW MW		2315	2313	2315	2316	2317	2337	2329	2308	2298	2279	2255	2245	2243	2207	2227	2235
ENERGY GWH	8294.4	229.7	144.1	185.6	665.6	832.6	828.9	904.5	903.0	788.9	648.7	289.5	141.8	118.2	514.8	581.4	517.1
DAILY GWH		15.3	20.6	20.6	22.2	26.9	27.6	29.2	29.1	26.3	20.9	19.3	20.3	14.8	16.6	18.8	17.8
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB

TIME OF STUDY: 10:05:11 STUDY NO 15

VALUES IN 1000 AF EXCEPT AS INDICATED

	29FEB20	2020												2021			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	6174	209	97	125	477	981	1567	669	301	249	331	174	81	93	249	249	322
DEPLETION	553	-16	-8	-10	20	274	600	286	9	-127	-115	-33	-15	-17	-105	-116	-74
EVAPORATION	482							30	92	116	101	46	21	24	52		
MOD INFLOW	5139	225	105	135	457	707	967	353	200	260	345	161	75	86	302	365	396
RELEASE	5504	179	83	107	417	492	536	553	553	432	338	164	76	87	492	523	472
STOR CHANGE	-365	47	22	28	40	215	431	-200	-354	-172	7	-3	-1	-1	-190	-158	-76
STORAGE	11955.	12002	12024	12051	12092	12307	12738	12538	12185	12013	12020	12017	12016	12015	11824	11666	11590
ELEV FTMSL	2219.4	2219.6	2219.7	2219.9	2220.1	2221.3	2223.6	2222.6	2220.6	2219.7	2219.7	2219.7	2219.7	2219.7	2218.6	2217.7	2217.3
DISCH KCFS	9.000	6.0	6.0	6.0	7.0	8.0	9.0	9.0	9.0	7.3	5.5	5.5	5.5	5.5	8.0	8.5	8.5
POWER																	
AVE POWER MW		78	78	78	91	104	118	118	117	94	71	71	71	71	103	109	109
PEAK POW MW		177	177	177	178	179	181	180	178	177	177	177	177	177	176	175	174
ENERGY GWH	862.6	27.9	13.0	16.8	65.2	77.2	84.7	87.8	87.2	67.7	53.0	25.6	12.0	13.7	76.7	81.1	73.0
--GARRISON--																	
NAT INFLOW	9470	418	195	251	662	1190	2691	1760	492	409	409	166	77	88	155	217	290
DEPLETION	1197	26	12	15	24	171	849	760	127	-165	-59	-150	-70	-80	-122	-84	-58
CHAN STOR	5	31			-10	-10	-10			18	18				-26	-5	
EVAPORATION	569							35	110	137	119	53	25	28	61		
REG INFLOW	13213	602	266	343	1044	1501	2367	1518	808	887	705	425	198	227	682	818	820
RELEASE	13656	461	215	277	1012	1230	1309	1291	1291	1092	953	461	215	254	1138	1291	1166
STOR CHANGE	-443	141	51	66	33	271	1058	227	-483	-205	-248	-36	-17	-27	-455	-473	-346
STORAGE	14315.	14457	14508	14574	14606	14877	15935	16162	15679	15474	15227	15191	15174	15147	14691	14219	13872
ELEV FTMSL	1825.5	1826.0	1826.2	1826.4	1826.6	1827.6	1831.4	1832.2	1830.5	1829.7	1828.8	1828.7	1828.6	1828.6	1826.9	1825.1	1823.8
DISCH KCFS	21.000	15.5	15.5	15.5	17.0	20.0	22.0	21.0	21.0	18.3	15.5	15.5	15.5	16.0	18.5	21.0	21.0
POWER																	
AVE POWER MW		178	179	179	196	231	258	250	250	217	182	182	182	187	215	241	239
PEAK POW MW		473	474	475	475	480	498	501	493	490	486	485	485	485	477	469	463
ENERGY GWH	1928.1	64.2	30.0	38.7	141.4	172.2	186.0	186.3	185.8	156.1	135.8	65.5	30.5	36.0	160.1	179.4	160.4
--OAHE--																	
NAT INFLOW	1494	196	91	117	315	144	349	122	55	61	17	14	7	7	-39	-17	55
DEPLETION	802	26	12	16	53	81	172	212	144	34	-14	1	0	0	14	20	31
CHAN STOR	0	25			-7	-13	-9	4		12	13			-2	-12	-12	
EVAPORATION	506							32	98	121	105	47	22	25	56		
REG INFLOW	13843	655	294	378	1267	1279	1477	1174	1105	1010	893	427	199	233	1017	1243	1190
RELEASE	14301	452	295	330	1205	1463	1442	1692	1721	1233	1096	350	95	141	863	1059	865
STOR CHANGE	-458	203	0	48	62	-184	35	-518	-616	-223	-203	78	105	93	154	184	326
STORAGE	15132.	15336	15336	15384	15446	15262	15297	14779	14163	13940	13736	13814	13919	14011	14165	14349	14674
ELEV FTMSL	1595.0	1595.8	1595.8	1596.0	1596.3	1595.6	1595.7	1593.7	1591.2	1590.3	1589.5	1589.8	1590.2	1590.6	1591.2	1592.0	1593.3
DISCH KCFS	15.519	15.2	21.2	18.5	20.2	23.8	24.2	27.5	28.0	20.7	17.8	11.8	6.8	8.9	14.0	17.2	15.6
POWER																	
AVE POWER MW		184	257	224	246	288	293	330	332	244	209	138	80	105	166	204	186
PEAK POW MW		647	647	648	650	646	647	637	625	620	616	618	620	622	625	628	635
ENERGY GWH	2067.2	66.2	43.2	48.5	176.9	214.3	210.9	245.9	247.0	175.7	155.6	49.7	13.5	20.1	123.4	151.8	124.7
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	14170	452	295	330	1205	1463	1442	1684	1696	1202	1068	337	89	134	849	1059	865
RELEASE	14170	452	295	330	1205	1463	1442	1684	1696	1202	1068	337	89	134	849	1059	865
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	15.519	15.2	21.2	18.5	20.2	23.8	24.2	27.4	27.6	20.2	17.4	11.3	6.4	8.4	13.8	17.2	15.6
POWER																	
AVE POWER MW		72	99	87	95	111	113	128	129	97	87	57	32	43	70	85	75
PEAK POW MW		517	509	509	509	509	509	509	509	529	538	538	538	538	538	538	529
ENERGY GWH	819.0	25.9	16.7	18.7	68.2	82.9	81.7	95.4	96.1	69.7	64.4	20.6	5.5	8.2	51.8	62.9	50.2
--FORT RANDALL--																	
NAT INFLOW	517	89	42	53	92	75	126	40	29		-24	-9	-4	-5	-11	-23	46
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	139							10	32	38	28	11	4	5	12		
REG INFLOW	14467	540	335	383	1293	1529	1556	1696	1679	1157	1015	317	80	124	823	1033	908
RELEASE	14467	259	191	383	1293	1529	1556	1696	1679	1581	1567	574	80	124	713	692	549
STOR CHANGE	0	280	144		0			0	0	-424	-552	-257	0	0	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	3001	2449	2192	2192	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1350.0	1342.0	1337.5	1337.5	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	9.991	8.7	13.8	21.4	21.7	24.9	26.2	27.6	27.3	26.6	25.5	19.3	5.8	7.8	11.6	11.3	9.9
POWER																	
AVE POWER MW		72	116	181	184	210	221	233	230	219	199	143	42	57	86	86	79
PEAK POW MW		350	356	356	356	356	356	356	356	339	305	285	285	285	294	319	339
ENERGY GWH	1432.7	26.0	19.6	39.2	132.3	156.2	158.9	173.0	171.3	158.0	148.1	51.5	7.1	11.0	63.7	63.9	53.1
--GAVINS POINT--																	
NAT INFLOW	1338	95	44	57	129	144	154	88	72	82	108	52	24	27	77	77	108
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	2	-10	-15	-1	-6	-2	-3	1	1	2	11	25	-4	-7	1	3
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	15648	357	226	425	1416	1648	1684	1740	1734	1659	1666	628	125	143	769	769	659
RELEASE	15648	357	226	425	1416	1648	1684	1740	1722	1636	1666	628	125	143	769	769	694
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	12.500	12.0	16.3	23.8	23.8	26.8	28.3	28.3	28.0	27.5	27.1	21.1	9.0	9.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		42	57	82	82	91	96	96	96	96	95	74	32	32	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	654.7	15.1	9.5	17.6	58.7	68.0	69.3	71.6	71.3	68.8	70.6	26.8	5.4	6.2	33.1	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1207	133	62	80	159	203	126	110	88	71	39	25	11	13	11	22	55
DEPLETION	293	8	4	5	25	37	33	41	40	27	13	7	3	4	15	16	16
REGULATED FLOW AT SIOUX CITY																	
KAF	16562	482	284	500	1550	1814	1777	1809	1770	1680	1692	645	133	152	765	775	733
KCFS		16.2	20.5	28.0	26.0	29.5	29.9	29.4	28.8	28.2	27.5	21.7	9.6	9.6	12.4	12.6	13.2
--TOTAL--																	
NAT INFLOW	20200	1139	531	683	1834	2737	5013	2789	1037	872	880	421	196	225	442	525	876
DEPLETION	3039	44	21	26	131	591	1690	1356	345	-229	-172	-169	-79	-90	-185	-160	-82
CHAN STOR	4	59	-10	-15	-18	-30	-22	2	1	32	34	11	26	-6	-45	-16	3
EVAPORATION	1869							116	364	453	389	173	81	92	200		
STORAGE	46362.	47033	47250	47392	47527	47829	49353	48863	47422	46421	45425	45206	45293	45357	44975	44869	45096
SYSTEM POWER																	
AVE POWER MW		626	786	831	893	1036	1099	1156	1154	967	843	666	440	495	684	769	731
PEAK POW MW		2279	2278	2280	2282	2284	2305	2298	2277	2272	2239	2220	2222	2223	2188	2207	2215
ENERGY GWH	7764.4	225.4	132.0	179.4	642.7	770.7	791.5	859.9	858.5	695.9	627.5	239.7	74.0	95.1	508.7	572.2	491.1
DAILY GWH		15.0	18.9	19.9	21.4	24.9	26.4	27.7	27.7	23.2	20.2	16.0	10.6	11.9	16.4	18.5	17.5
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 10:05:11 VALUES IN 1000 AF EXCEPT AS INDICATED STUDY NO 16

	28FEB21		2021											2022			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	6560	222	103	133	507	1042	1665	711	320	264	353	184	86	98	265	265	342
DEPLETION	564	-17	-8	-10	20	275	604	293	14	-128	-117	-33	-15	-18	-106	-116	-74
EVAPORATION	483							29	92	116	101	46	21	24	53		
MOD INFLOW	5513	239	111	143	487	767	1061	389	214	276	369	171	80	91	318	381	416
RELEASE	5448	149	69	89	387	492	536	553	553	438	307	149	69	79	523	553	500
STOR CHANGE	66	90	42	54	100	275	525	-165	-340	-162	62	22	10	12	-204	-172	-84
STORAGE	11590.	11680	11722	11776	11876	12151	12677	12512	12172	12010	12072	12094	12105	12117	11912	11740	11656
ELEV FTMSL	2217.3	2217.8	2218.1	2218.4	2218.9	2220.4	2223.3	2222.4	2220.6	2219.7	2220.0	2220.1	2220.2	2220.3	2219.1	2218.2	2217.7
DISCH KCFS	8.500	5.0	5.0	5.0	6.5	8.0	9.0	9.0	9.0	7.4	5.0	5.0	5.0	5.0	8.5	9.0	9.0
POWER																	
AVE POWER MW		64	64	64	84	103	117	118	117	95	65	65	65	65	110	116	115
PEAK POW MW		175	175	176	176	178	180	180	178	177	177	178	178	178	177	175	175
ENERGY GWH	852.9	23.1	10.8	13.9	60.2	76.9	84.5	87.7	87.1	68.7	48.2	23.3	10.9	12.5	81.7	86.0	77.4
--GARRISON--																	
NAT INFLOW	10016	442	206	265	701	1259	2846	1861	520	432	432	175	82	93	164	230	307
DEPLETION	1165	4	2	3	12	191	858	763	133	-168	-64	-153	-71	-81	-123	-84	-57
CHAN STOR	-5	37	0	0	-16	-16	-10			17	24		0	0	-36	-5	
EVAPORATION	565							35	109	136	118	53	25	28	61		
REG INFLOW	13728	624	274	352	1060	1544	2513	1617	831	919	710	423	197	226	713	862	864
RELEASE	13650	446	208	268	1012	1383	1309	1291	1291	1062	922	446	208	238	1107	1291	1166
STOR CHANGE	78	177	65	84	48	161	1204	326	-460	-143	-213	-23	-11	-12	-394	-429	-302
STORAGE	13872.	14050	14115	14199	14248	14409	15613	15938	15478	15335	15122	15099	15088	15076	14682	14253	13950
ELEV FTMSL	1823.8	1824.5	1824.7	1825.0	1825.2	1825.8	1830.2	1831.4	1829.7	1829.2	1828.5	1828.4	1828.3	1828.3	1826.8	1825.2	1824.1
DISCH KCFS	21.000	15.0	15.0	15.0	17.0	22.5	22.0	21.0	21.0	17.8	15.0	15.0	15.0	15.0	18.0	21.0	21.0
POWER																	
AVE POWER MW		171	171	172	195	257	256	249	248	210	176	176	176	176	209	241	239
PEAK POW MW		466	467	468	469	472	493	498	490	488	484	484	484	483	477	469	464
ENERGY GWH	1917.5	61.5	28.8	37.1	140.1	191.4	184.2	185.1	184.9	151.3	131.1	63.2	29.5	33.7	155.7	179.4	160.6
--OAHE--																	
NAT INFLOW	1767	231	108	139	373	170	412	144	65	72	21	17	8	9	-46	-20	65
DEPLETION	817	26	12	16	54	82	175	217	147	35	-15	1	0	0	14	21	32
CHAN STOR	0	28		0	-9	-25	2	4		15	13				-14	-14	
EVAPORATION	507							32	98	121	105	48	22	26	56		
REG INFLOW	14094	679	304	391	1322	1447	1548	1191	1111	993	867	415	193	221	977	1236	1199
RELEASE	14013	426	282	315	1176	1438	1402	1678	1710	1229	1096	248	102	139	862	1061	849
STOR CHANGE	81	253	22	76	146	9	146	-487	-599	-237	-229	167	92	82	115	175	351
STORAGE	14674.	14928	14950	15026	15172	15181	15326	14839	14241	14004	13775	13941	14033	14114	14229	14404	14755
ELEV FTMSL	1593.3	1594.3	1594.3	1594.6	1595.2	1595.2	1595.8	1593.9	1591.5	1590.6	1589.6	1590.3	1590.7	1591.0	1591.5	1592.2	1593.6
DISCH KCFS	15.569	14.3	20.3	17.6	19.8	23.4	23.6	27.3	27.8	20.7	17.8	8.3	7.3	8.8	14.0	17.3	15.3
POWER																	
AVE POWER MW		172	244	212	238	282	285	328	330	244	209	98	87	104	166	205	182
PEAK POW MW		640	640	642	644	645	647	638	626	621	617	620	622	624	626	629	636
ENERGY GWH	2024.4	61.8	41.0	45.8	171.5	209.9	205.0	244.1	245.8	175.4	155.8	35.4	14.6	20.0	123.5	152.3	122.6
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	13882	426	282	315	1176	1438	1402	1670	1685	1198	1068	236	96	133	848	1061	849
RELEASE	13882	426	282	315	1176	1438	1402	1670	1685	1198	1068	236	96	133	848	1061	849
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	15.569	14.3	20.3	17.6	19.8	23.4	23.6	27.2	27.4	20.1	17.4	7.9	6.9	8.4	13.8	17.3	15.3
POWER																	
AVE POWER MW		68	95	82	93	109	110	127	128	97	87	40	35	42	70	85	73
PEAK POW MW		517	509	509	509	509	509	509	509	529	538	538	538	538	538	538	529
ENERGY GWH	802.2	24.4	16.0	17.8	66.6	81.4	79.4	94.6	95.4	69.5	64.4	14.5	5.9	8.1	51.8	63.1	49.3
--FORT RANDALL--																	
NAT INFLOW	645	111	52	66	115	93	158	50	36		-29	-11	-5	-6	-14	-29	57
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	139							10	32	38	28	11	4	5	12		
REG INFLOW	14306	535	333	380	1287	1522	1548	1692	1675	1153	1010	213	86	121	819	1029	903
RELEASE	14306	255	189	380	1287	1522	1548	1692	1675	1577	1562	470	86	121	710	688	544
STOR CHANGE	0	280	144					0	0	-424	-552	-257	0	0	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	3001	2449	2192	2192	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1350.0	1342.0	1337.5	1337.5	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	9.879	8.6	13.6	21.3	21.6	24.8	26.0	27.5	27.2	26.5	25.4	15.8	6.2	7.7	11.5	11.2	9.8
POWER																	
AVE POWER MW		71	115	180	183	209	220	232	230	219	198	117	46	56	85	85	78
PEAK POW MW		350	356	356	356	356	356	356	356	339	305	285	285	285	294	319	339
ENERGY GWH	1418.0	25.6	19.4	38.9	131.7	155.5	158.1	172.6	170.9	157.6	147.6	42.3	7.7	10.8	63.3	63.5	52.6
--GAVINS POINT--																	
NAT INFLOW	1403	99	46	60	135	151	162	92	76	86	113	54	25	29	81	81	113
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	3	-10	-15	-1	-6	-2	-3	1	1	2	18	18	-3	-7	1	3
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	15553	357	226	425	1416	1648	1684	1740	1734	1659	1666	533	125	143	769	769	659
RELEASE	15553	357	226	425	1416	1648	1684	1740	1722	1636	1666	533	125	143	769	769	694
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	12.500	12.0	16.3	23.8	23.8	26.8	28.3	28.3	28.0	27.5	27.1	17.9	9.0	9.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		42	57	82	82	91	96	96	96	96	95	63	32	32	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	650.7	15.1	9.5	17.6	58.7	68.0	69.3	71.6	71.3	68.8	70.6	22.8	5.4	6.2	33.0	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1409	155	72	93	186	237	147	128	102	83	45	29	14	15	13	26	64
DEPLETION	295	8	4	5	25	38	33	42	40	27	13	7	3	4	15	16	16
REGULATED FLOW AT SIOUX CITY																	
KAF	16667	504	295	513	1577	1847	1798	1826	1784	1692	1698	555	135	154	767	779	742
KCFS		16.9	21.2	28.8	26.5	30.0	30.2	29.7	29.0	28.4	27.6	18.6	9.7	9.7	12.5	12.7	13.4
--TOTAL--																	
NAT INFLOW	21800	1260	588	756	2017	2952	5390	2986	1119	937	935	448	209	239	463	553	948
DEPLETION	3035	22	10	13	120	614	1706	1372	359	-232	-180	-172	-80	-92	-187	-159	-80
CHAN STOR	-7	67	-10	-15	-25	-46	-11	2	1	33	40	17	18	-3	-58	-19	3
EVAPORATION	1867							116	363	452	389	174	81	92	200		
STORAGE	45096.	45897	46170	46384	46679	47123	48999	48672	47286	46343	45410	45319	45411	45492	45117	45032	45320
SYSTEM POWER																	
AVE POWER MW		587	747	792	873	1053	1084	1150	1150	960	830	560	440	475	684	776	732
PEAK POW MW		2262	2262	2265	2269	2274	2300	2295	2275	2271	2239	2221	2223	2225	2189	2210	2219
ENERGY GWH	7665.8	211.5	125.5	171.1	628.9	783.1	780.6	855.8	855.3	691.2	617.7	201.4	73.9	91.2	509.0	577.4	492.2
DAILY GWH		14.1	17.9	19.0	21.0	25.3	26.0	27.6	27.6	23.0	19.9	13.4	10.6	11.4	16.4	18.6	17.6
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 10:05:11 STUDY NO 17

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB22 INI-SUM	15MAR	2022 22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	2023 30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	6794	229	107	138	525	1079	1724	736	331	275	365	192	89	102	274	274	354
DEPLETION	576	-17	-8	-10	20	276	609	301	18	-128	-119	-34	-16	-18	-107	-117	-75
EVAPORATION	486							30	93	116	102	46	21	25	53		
MOD INFLOW	5732	246	115	148	505	803	1115	405	220	287	382	179	84	95	328	391	429
RELEASE	5478	164	76	98	417	492	536	553	553	439	307	149	69	79	492	553	500
STOR CHANGE	254	83	39	50	88	311	579	-148	-333	-152	75	30	14	16	-164	-162	-71
STORAGE	11656.	11739	11777	11827	11915	12226	12806	12658	12324	12173	12248	12278	12292	12308	12144	11981	11911
ELEV FTMSL	2217.7	2218.1	2218.4	2218.6	2219.1	2220.9	2224.0	2223.2	2221.4	2220.6	2221.0	2221.1	2221.2	2221.3	2220.4	2219.5	2219.1
DISCH KCFS	9.000	5.5	5.5	5.5	7.0	8.0	9.0	9.0	9.0	7.4	5.0	5.0	5.0	5.0	8.0	9.0	9.0
POWER																	
AVE POWER MW		71	71	71	90	103	118	118	118	96	65	65	65	65	104	116	116
PEAK POW MW		175	176	176	177	178	181	180	179	178	178	178	179	179	178	177	177
ENERGY GWH	860.7	25.4	11.9	15.3	64.9	77.0	84.7	87.9	87.4	69.0	48.4	23.5	11.0	12.5	77.3	86.5	77.9
--GARRISON--																	
NAT INFLOW	10343	457	213	274	723	1300	2939	1922	537	447	446	181	84	97	170	237	316
DEPLETION	1171	5	2	3	27	184	861	773	132	-177	-74	-155	-72	-82	-121	-81	-55
CHAN STOR	0	37			-16	-10	-10			17	24		0	0	-31	-10	
EVAPORATION	572							35	110	138	120	54	25	29	62		
REG INFLOW	14078	652	287	369	1097	1597	2603	1667	848	942	732	430	201	230	690	861	871
RELEASE	13767	446	208	268	982	1353	1369	1353	1353	1104	922	446	208	249	1107	1261	1139
STOR CHANGE	311	206	79	101	115	245	1235	315	-505	-162	-190	-16	-7	-20	-416	-399	-268
STORAGE	13950.	14156	14235	14336	14451	14696	15930	16245	15740	15578	15388	15372	15365	15345	14929	14529	14262
ELEV FTMSL	1824.1	1824.9	1825.2	1825.6	1826.0	1826.9	1831.3	1832.4	1830.7	1830.1	1829.4	1829.4	1829.3	1829.3	1827.8	1826.3	1825.3
DISCH KCFS	21.000	15.0	15.0	15.0	16.5	22.0	23.0	22.0	22.0	18.5	15.0	15.0	15.0	15.7	18.0	20.5	20.5
POWER																	
AVE POWER MW		171	172	172	190	253	269	262	262	220	177	177	177	185	211	237	235
PEAK POW MW		468	469	471	473	477	498	503	494	492	489	488	488	488	481	474	469
ENERGY GWH	1946.3	61.6	28.9	37.2	136.6	188.4	193.9	195.2	194.8	158.1	131.8	63.6	29.7	35.5	156.6	176.4	158.0
--OAHE--																	
NAT INFLOW	1949	255	119	153	412	188	455	159	72	79	22	18	8	10	-51	-22	72
DEPLETION	830	27	12	16	54	83	178	221	150	35	-15	1	0	0	15	21	32
CHAN STOR	3	27		0	-7	-25	-4	4		16	16			-3	-11	-12	
EVAPORATION	517							32	100	124	107	48	23	26	57		
REG INFLOW	14371	702	315	405	1333	1433	1641	1263	1175	1039	868	415	194	229	974	1206	1179
RELEASE	14050	408	274	304	1158	1421	1377	1669	1703	1227	1096	416	93	141	862	1063	838
STOR CHANGE	321	294	41	101	175	12	264	-406	-528	-188	-228	0	101	89	111	143	341
STORAGE	14755.	15049	15090	15190	15366	15378	15642	15235	14707	14519	14292	14291	14393	14481	14593	14736	15077
ELEV FTMSL	1593.6	1594.7	1594.9	1595.3	1596.0	1596.0	1597.0	1595.4	1593.4	1592.6	1591.7	1591.7	1592.1	1592.5	1592.9	1593.5	1594.8
DISCH KCFS	15.280	13.7	19.8	17.0	19.5	23.1	23.1	27.1	27.7	20.6	17.8	14.0	6.7	8.9	14.0	17.3	15.1
POWER																	
AVE POWER MW		165	238	206	235	280	281	329	332	246	212	166	79	106	167	207	181
PEAK POW MW		642	643	645	648	648	653	646	635	632	627	627	629	631	633	636	643
ENERGY GWH	2044.1	59.4	40.0	44.4	169.5	208.2	202.4	244.6	247.1	177.1	157.6	59.7	13.3	20.3	124.5	153.8	121.9
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	13918	408	274	304	1158	1421	1377	1661	1678	1196	1068	403	87	134	848	1063	838
RELEASE	13918	408	274	304	1158	1421	1377	1661	1678	1196	1068	403	87	134	848	1063	838
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	15.280	13.7	19.8	17.0	19.5	23.1	23.1	27.0	27.3	20.1	17.4	13.6	6.2	8.4	13.8	17.3	15.1
POWER																	
AVE POWER MW		65	92	80	91	108	108	126	128	96	87	68	32	43	70	85	72
PEAK POW MW		517	509	509	509	509	509	509	509	529	538	538	538	538	538	538	529
ENERGY GWH	804.9	23.4	15.5	17.2	65.6	80.5	78.0	94.1	95.0	69.4	64.4	24.6	5.3	8.2	51.8	63.2	48.6
--FORT RANDALL--																	
NAT INFLOW	731	126	59	75	130	106	179	57	41	-1	-33	-12	-6	-6	-16	-33	65
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	139							10	32	38	28	11	4	5	12		
REG INFLOW	14430	533	332	379	1284	1518	1544	1690	1673	1150	1006	379	77	122	817	1027	900
RELEASE	14430	252	188	379	1284	1518	1544	1690	1673	1574	1558	637	77	122	708	686	541
STOR CHANGE	0	280	144			0		0	0	-424	-552	-257	0	0	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	3001	2449	2192	2192	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1350.0	1342.0	1337.5	1337.5	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	9.789	8.5	13.6	21.2	21.6	24.7	26.0	27.5	27.2	26.5	25.3	21.4	5.5	7.7	11.5	11.2	9.7
POWER																	
AVE POWER MW		70	115	179	182	208	219	232	229	218	198	158	41	56	85	85	78
PEAK POW MW		350	356	356	356	356	356	356	356	339	305	285	285	285	294	319	339
ENERGY GWH	1428.6	25.4	19.2	38.8	131.4	155.1	157.7	172.4	170.7	157.3	147.3	57.0	6.8	10.8	63.1	63.3	52.3
--GAVINS POINT--																	
NAT INFLOW	1440	102	47	61	138	155	166	94	78	89	117	56	26	30	83	83	116
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	3	-10	-15	-1	-6	-2	-3	1	1	2	7	29	-4	-7	1	3
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	15713	357	226	425	1416	1648	1684	1740	1734	1659	1666	690	128	143	769	769	659
RELEASE	15713	357	226	425	1416	1648	1684	1740	1722	1636	1666	690	128	143	769	769	694
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	12.500	12.0	16.3	23.8	23.8	26.8	28.3	28.3	28.0	27.5	27.1	23.2	9.2	9.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		42	57	82	82	91	96	96	96	96	95	82	33	32	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	657.4	15.1	9.5	17.6	58.7	68.0	69.3	71.6	71.3	68.8	70.6	29.4	5.5	6.2	33.1	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1543	170	79	102	203	260	161	140	112	91	50	32	15	17	14	28	70
DEPLETION	297	8	4	5	25	38	33	42	41	27	13	7	3	4	15	16	17
REGULATED FLOW AT SIOUX CITY																	
KAF	16959	519	302	522	1594	1870	1812	1838	1793	1700	1703	715	139	156	768	781	747
KCFS		17.4	21.7	29.3	26.8	30.4	30.5	29.9	29.2	28.6	27.7	24.0	10.0	9.8	12.5	12.7	13.5
--TOTAL--																	
NAT INFLOW	22800	1339	624	803	2131	3088	5624	3108	1171	980	967	466	217	248	474	567	993
DEPLETION	3068	24	11	14	135	609	1717	1394	366	-241	-192	-175	-81	-93	-185	-157	-78
CHAN STOR	2	67	-10	-15	-23	-41	-17	1	1	34	43	7	30	-7	-49	-21	3
EVAPORATION	1887							117	367	457	393	175	81	93	202		
STORAGE	45320.	46183	46485	46736	47115	47683	49761	49521	48166	47264	46369	46126	46234	46319	45959	45881	46208
SYSTEM POWER																	
AVE POWER MW		584	744	790	871	1045	1092	1164	1164	972	834	716	427	487	681	774	727
PEAK POW MW		2267	2267	2271	2277	2283	2312	2308	2289	2286	2254	2234	2236	2237	2202	2223	2232
ENERGY GWH	7742.0	210.4	125.0	170.6	626.8	777.2	786.1	866.0	866.3	699.5	620.1	257.8	71.7	93.5	506.4	576.2	488.4
DAILY GWH		14.0	17.9	19.0	20.9	25.1	26.2	27.9	27.9	23.3	20.0	17.2	10.2	11.7	16.3	18.6	17.4
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 10:05:11 STUDY NO 18

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB23	2023												2024			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB
--FORT PECK--																	
NAT INFLOW	7156	242	113	145	553	1137	1816	776	349	289	384	201	94	107	289	289	373
DEPLETION	586	-17	-8	-10	20	276	613	309	24	-127	-119	-34	-16	-18	-107	-116	-84
EVAPORATION	496							30	95	119	104	47	22	25	54		
MOD INFLOW	6074	258	121	155	533	861	1203	437	230	297	399	188	88	100	342	405	457
RELEASE	5642	179	83	107	417	523	536	553	553	432	338	164	76	87	523	553	518
STOR CHANGE	432	80	37	48	116	338	667	-117	-324	-135	61	24	11	13	-181	-148	-61
STORAGE	11911.	11991	12028	12076	12192	12530	13198	13081	12758	12623	12684	12708	12720	12733	12552	12403	12343
ELEV FTMSL	2219.1	2219.6	2219.8	2220.0	2220.7	2222.5	2226.1	2225.5	2223.7	2223.0	2223.4	2223.5	2223.5	2223.6	2222.6	2221.8	2221.5
DISCH KCFS	9.000	6.0	6.0	6.0	7.0	8.5	9.0	9.0	9.0	7.3	5.5	5.5	5.5	5.5	8.5	9.0	9.0
POWER																	
AVE POWER MW		78	78	78	91	111	119	119	119	95	72	72	72	72	111	117	117
PEAK POW MW		177	177	177	178	180	183	182	181	180	180	181	181	181	180	179	179
ENERGY GWH	894.4	27.9	13.0	16.8	65.3	82.4	85.4	88.8	88.3	68.7	53.8	26.1	12.2	13.9	82.9	87.4	81.6
--GARRISON--																	
NAT INFLOW	10840	479	223	287	758	1362	3080	2014	563	468	468	190	88	101	178	249	332
DEPLETION	1192	7	3	4	19	188	879	789	138	-180	-79	-158	-74	-84	-121	-81	-60
CHAN STOR	0	31			-10	-16	-5			18	18				-31	-5	
EVAPORATION	587							36	113	141	123	55	26	29	63		
REG INFLOW	14703	681	303	390	1145	1681	2731	1742	865	957	781	455	213	243	728	878	910
RELEASE	14180	446	208	268	982	1353	1398	1383	1383	1127	953	461	215	246	1138	1353	1265
STOR CHANGE	523	235	95	122	163	328	1333	359	-518	-170	-173	-6	-3	-3	-410	-474	-356
STORAGE	14262.	14497	14592	14714	14877	15205	16538	16897	16379	16209	16036	16031	16028	16025	15615	15140	14785
ELEV FTMSL	1825.3	1826.2	1826.5	1827.0	1827.6	1828.8	1833.5	1834.7	1832.9	1832.3	1831.7	1831.7	1831.7	1831.7	1830.2	1828.5	1827.2
DISCH KCFS	20.500	15.0	15.0	15.0	16.5	22.0	23.5	22.5	22.5	18.9	15.5	15.5	15.5	15.5	18.5	22.0	22.0
POWER																	
AVE POWER MW		173	173	174	192	256	279	272	272	227	186	185	185	185	220	258	256
PEAK POW MW		474	475	477	480	486	508	513	505	502	499	499	499	499	492	484	478
ENERGY GWH	2031.3	62.1	29.1	37.5	137.9	190.6	200.7	202.4	202.1	163.7	138.2	66.7	31.1	35.6	163.5	192.1	177.9
--OAHE--																	
NAT INFLOW	2260	296	138	177	477	218	527	184	84	92	25	21	10	11	-59	-25	84
DEPLETION	845	27	12	16	55	84	181	226	153	36	-15	1	0	0	15	21	33
CHAN STOR	-6	25		0	-7	-24	-7	4		16	16				-14	-16	
EVAPORATION	532							34	104	128	110	49	23	26	57		
REG INFLOW	15057	740	334	429	1397	1463	1738	1312	1210	1071	899	432	202	231	992	1291	1316
RELEASE	14518	378	261	286	1125	1394	1335	1711	1749	1558	1069	510	188	188	854	1066	844
STOR CHANGE	539	362	73	143	272	69	402	-400	-538	-487	-170	-78	14	42	139	225	472
STORAGE	15077.	15438	15512	15654	15927	15996	16398	15999	15460	14973	14803	14725	14738	14780	14919	15144	15616
ELEV FTMSL	1594.8	1596.2	1596.5	1597.0	1598.1	1598.3	1599.8	1598.3	1596.3	1594.4	1593.8	1593.5	1593.5	1593.7	1594.2	1595.1	1596.9
DISCH KCFS	15.081	12.7	18.8	16.0	18.9	22.7	22.4	27.8	28.4	26.2	17.4	17.2	13.5	11.9	13.9	17.3	14.7
POWER																	
AVE POWER MW		154	228	196	231	278	277	342	346	316	209	206	162	143	167	209	178
PEAK POW MW		649	651	653	658	660	667	660	650	640	637	636	636	637	640	644	653
ENERGY GWH	2136.2	55.5	38.3	42.3	166.5	206.8	199.1	254.7	257.7	227.4	155.3	74.0	27.3	27.4	124.1	155.5	124.2
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	14386	378	261	286	1125	1394	1335	1704	1724	1527	1041	498	182	182	839	1066	844
RELEASE	14386	378	261	286	1125	1394	1335	1704	1724	1527	1041	498	182	182	839	1066	844
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	15.081	12.7	18.8	16.0	18.9	22.7	22.4	27.7	28.0	25.7	16.9	16.7	13.1	11.5	13.6	17.3	14.7
POWER																	
AVE POWER MW		60	88	75	88	106	105	130	131	122	83	84	66	58	69	85	70
PEAK POW MW		517	509	509	509	509	509	509	509	517	538	538	538	538	538	538	529
ENERGY GWH	830.7	21.7	14.8	16.2	63.7	79.0	75.6	96.5	97.6	87.6	61.9	30.2	11.1	11.1	51.3	63.4	49.0
--FORT RANDALL--																	
NAT INFLOW	880	151	71	91	157	127	215	68	49		-39	-15	-7	-8	-20	-39	78
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	145							10	32	39	31	12	5	5	12		
REG INFLOW	15041	529	330	376	1278	1512	1538	1744	1726	1480	971	471	170	168	804	1024	919
RELEASE	15041	248	186	376	1278	1512	1538	1744	1726	1625	1610	725	340	194	696	683	560
STOR CHANGE	0	280	144	0				0	0	-144	-639	-254	-170	-26	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	3281	2642	2388	2218	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1353.5	1345.0	1341.0	1338.0	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	9.734	8.3	13.4	21.1	21.5	24.6	25.9	28.4	28.1	27.3	26.2	24.4	24.5	12.2	11.3	11.1	9.7
POWER																	
AVE POWER MW		69	113	178	182	208	218	239	237	229	210	185	181	90	83	85	78
PEAK POW MW		350	356	356	356	356	356	356	356	350	319	301	287	285	294	319	339
ENERGY GWH	1493.3	25.0	19.1	38.5	130.8	154.5	157.1	177.8	176.0	164.6	156.4	66.7	30.3	17.2	62.1	63.1	54.3
--GAVINS POINT--																	
NAT INFLOW	1494	106	49	63	144	161	172	98	80	92	121	58	27	31	86	86	121
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	3	-10	-15	-1	-6	-2	-5	1	1	2	3	0	23	2	0	3
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	16378	357	226	425	1416	1648	1684	1795	1789	1713	1722	777	362	243	769	769	684
RELEASE	16378	357	226	425	1416	1648	1684	1795	1777	1690	1722	777	362	243	769	769	719
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	12.500	12.0	16.3	23.8	23.8	26.8	28.3	29.2	28.9	28.4	28.0	26.1	26.1	15.3	12.5	12.5	12.5
POWER																	
AVE POWER MW		42	57	82	82	91	96	99	99	98	98	92	92	54	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	684.8	15.1	9.5	17.6	58.7	68.0	69.3	73.6	73.4	70.9	72.9	32.9	15.4	10.4	33.0	33.0	30.7
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1770	195	91	117	233	298	185	161	129	105	57	36	17	19	16	32	80
DEPLETION	301	8	4	5	26	38	33	42	41	28	13	8	4	4	16	16	17
REGULATED FLOW AT SIOUX CITY																	
KAF	17847	544	313	537	1623	1908	1836	1914	1865	1767	1766	805	376	258	769	785	782
KCFS		18.3	22.6	30.1	27.3	31.0	30.9	31.1	30.3	29.7	28.7	27.1	27.1	16.3	12.5	12.8	13.6
--TOTAL--																	
NAT INFLOW	24400	1467	684	880	2322	3303	5995	3301	1254	1046	1016	491	229	262	490	592	1068
DEPLETION	3118	26	12	15	129	614	1742	1423	381	-241	-197	-178	-83	-95	-184	-156	-91
CHAN STOR	-8	59	-10	-15	-18	-46	-14	0	1	35	36	3	0	23	-43	-21	3
EVAPORATION	1933							120	377	468	403	180	83	95	206		
STORAGE	46208.	47165	47514	47827	48379	49114	51517	51360	49992	49078	48158	47844	47697	47723	47379	47322	47702
SYSTEM POWER																	
AVE POWER MW		576	737	782	865	1050	1093	1201	1203	1087	858	824	759	602	695	799	744
PEAK POW MW		2282	2283	2288	2296	2305	2337	2335	2316	2307	2291	2271	2258	2257	2222	2243	2254
ENERGY GWH	8070.7	207.3	123.8	169.0	623.1	781.2	787.2	893.8	895.1	782.9	638.5	296.6	127.4	115.6	517.0	594.5	517.6
DAILY GWH		13.8	17.7	18.8	20.8	25.2	26.2	28.8	28.9	26.1	20.6	19.8	18.2	14.4	16.7	19.2	17.8
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB

TIME OF STUDY: 10:26:30 STUDY NO 19

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB19	2019												2020			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB
--FORT PECK--																	
NAT INFLOW	5518	202	94	121	458	885	1228	619	271	240	323	151	70	81	229	239	307
DEPLETION	530	-14	-7	-8	9	257	582	295	18	-125	-112	-31	-14	-16	-104	-115	-85
EVAPORATION	470							29	91	113	98	44	21	24	51		
MOD INFLOW	4518	216	101	129	449	628	646	295	162	252	337	137	64	73	282	354	392
RELEASE	5596	179	83	107	417	461	536	553	553	444	369	179	83	100	461	553	518
STOR CHANGE	-1078	37	17	22	32	167	110	-258	-391	-192	-32	-41	-19	-27	-179	-199	-126
STORAGE	12036.	12073	12090	12113	12145	12312	12423	12164	11773	11581	11549	11508	11489	11462	11283	11083	10958
ELEV FTMSL	2219.8	2220.0	2220.1	2220.2	2220.4	2221.3	2221.9	2220.5	2218.3	2217.3	2217.1	2216.8	2216.7	2216.6	2215.5	2214.4	2213.6
DISCH KCFS	10.500	6.0	6.0	6.0	7.0	7.5	9.0	9.0	9.0	7.5	6.0	6.0	6.0	6.3	7.5	9.0	9.0
POWER																	
AVE POWER MW		78	78	78	91	97	117	117	116	96	77	77	77	80	95	114	113
PEAK POW MW		177	178	178	178	179	179	178	176	174	174	174	174	173	172	171	170
ENERGY GWH	869.3	28.0	13.1	16.8	65.3	72.5	84.4	87.0	86.3	68.8	57.1	27.6	12.9	15.4	70.9	84.5	78.7
--GARRISON--																	
NAT INFLOW	7937	410	191	246	622	1180	2322	1003	349	230	413	161	75	86	150	209	290
DEPLETION	1202	20	9	12	31	109	701	715	132	-151	-36	-120	-56	-64	-64	-27	-11
CHAN STOR	16	47			-10	-5	-16			16	15			-3	-13	-16	
EVAPORATION	546							34	106	131	114	51	24	27	59		
REG INFLOW	11800	615	265	341	997	1527	2141	807	665	710	719	408	190	219	604	774	819
RELEASE	13107	417	194	250	1071	1414	1250	1230	1230	948	861	417	194	233	1138	1168	1093
STOR CHANGE	-1307	199	71	91	-74	113	891	-423	-565	-239	-141	-9	-4	-14	-534	-395	-274
STORAGE	14415.	14613	14684	14775	14701	14814	15705	15282	14717	14479	14337	14328	14324	14310	13777	13382	13108
ELEV FTMSL	1825.9	1826.6	1826.9	1827.2	1826.9	1827.3	1830.6	1829.0	1827.0	1826.1	1825.6	1825.5	1825.5	1825.5	1823.4	1821.9	1820.8
DISCH KCFS	23.000	14.0	14.0	14.0	18.0	23.0	21.0	20.0	20.0	15.9	14.0	14.0	14.0	14.7	18.5	19.0	19.0
POWER																	
AVE POWER MW		162	162	163	209	266	246	236	233	184	161	161	161	169	211	214	212
PEAK POW MW		476	477	478	477	479	494	487	477	473	471	471	470	470	461	454	449
ENERGY GWH	1826.8	58.2	27.3	35.1	150.1	197.7	177.0	175.3	173.2	132.6	120.0	57.9	27.0	32.4	156.6	158.9	147.3
--OAHE--																	
NAT INFLOW	1213	179	83	107	211	116	322	111	42	47	5	8	4	4	-47	-21	42
DEPLETION	789	26	12	15	53	80	169	208	141	33	-14	1	0	0	14	20	31
CHAN STOR	18	40			-18	-22	9	5		19	9			-3	-18	-2	
EVAPORATION	499							31	97	119	104	47	22	25	54		
REG INFLOW	13051	610	266	342	1211	1428	1412	1106	1034	862	786	377	176	209	1004	1125	1104
RELEASE	14400	481	308	347	1209	1494	1481	1711	1744	1093	994	439	109	141	879	1068	903
STOR CHANGE	-1349	129	-42	-5	2	-66	-69	-605	-710	-231	-209	-61	68	68	125	57	201
STORAGE	15235.	15364	15322	15317	15319	15253	15184	14579	13869	13637	13429	13368	13435	13503	13627	13684	13886
ELEV FTMSL	1595.4	1595.9	1595.8	1595.8	1595.8	1595.5	1595.2	1592.9	1590.0	1589.1	1588.2	1587.9	1588.2	1588.5	1589.0	1589.3	1590.1
DISCH KCFS	15.912	16.2	22.2	19.4	20.3	24.3	24.9	27.8	28.4	18.4	16.2	14.7	7.8	8.9	14.3	17.4	15.7
POWER																	
AVE POWER MW		196	268	236	246	294	300	333	334	215	188	171	91	104	167	203	184
PEAK POW MW		648	647	647	647	646	645	633	619	614	610	608	610	611	614	615	619
ENERGY GWH	2070.0	70.5	45.1	50.9	177.1	218.5	216.2	247.7	248.8	154.8	140.2	61.7	15.3	20.0	124.2	151.0	128.1
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	14269	481	308	347	1209	1494	1481	1703	1719	1062	967	426	103	135	865	1068	903
RELEASE	14269	481	308	347	1209	1494	1481	1703	1719	1062	967	426	103	135	865	1068	903
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	15.912	16.2	22.2	19.4	20.3	24.3	24.9	27.7	28.0	17.8	15.7	14.3	7.4	8.5	14.1	17.4	15.7
POWER																	
AVE POWER MW		77	104	91	95	114	116	130	131	87	79	72	38	43	71	85	75
PEAK POW MW		517	509	509	509	509	509	509	509	537	538	538	538	538	538	538	529
ENERGY GWH	826.0	27.6	17.4	19.7	68.5	84.6	83.9	96.4	97.4	62.3	58.9	26.0	6.3	8.3	52.8	63.5	52.4
--FORT RANDALL--																	
NAT INFLOW	380	74	34	44	92	54	103	27	16	-5	-27	-11	-5	-6	-22	-27	38
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	135							10	32	37	25	10	4	5	12		
REG INFLOW	14433	553	341	390	1297	1539	1572	1702	1689	1013	912	405	94	123	828	1038	938
RELEASE	14433	273	197	390	1297	1539	1572	1702	1689	1586	1572	405	94	123	719	697	579
STOR CHANGE	0	280	144	0	0			0	0	-573	-660	0	0	0	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	2852	2192	2192	2192	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1348.0	1337.5	1337.5	1337.5	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	10.024	9.2	14.2	21.9	21.8	25.0	26.4	27.7	27.5	26.7	25.6	13.6	6.7	7.8	11.7	11.3	10.1
POWER																	
AVE POWER MW		76	120	185	184	211	223	233	232	218	194	99	50	57	86	86	80
PEAK POW MW		350	356	356	356	356	356	356	356	332	284	285	285	285	294	319	339
ENERGY GWH	1424.6	27.4	20.2	39.9	132.7	157.2	160.4	173.6	172.3	157.1	144.3	35.8	8.3	11.0	64.1	64.3	56.0
--GAVINS POINT--																	
NAT INFLOW	1236	82	38	49	124	134	139	82	62	77	103	49	23	26	72	72	103
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	2	-10	-15	0	-6	-3	-2	0	2	2	22	13	-2	-7	1	2
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	15512	357	226	425	1416	1648	1684	1740	1734	1659	1666	467	125	143	769	769	684
RELEASE	15512	357	226	425	1416	1648	1684	1740	1722	1636	1666	467	125	143	769	769	719
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	12.500	12.0	16.3	23.8	23.8	26.8	28.3	28.3	28.0	27.5	27.1	15.7	9.0	9.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		42	57	82	82	91	96	96	96	96	95	56	32	32	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	649.0	15.1	9.5	17.6	58.7	68.0	69.3	71.6	71.3	68.8	70.6	20.0	5.4	6.2	33.0	33.0	30.7
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	816	102	47	61	105	140	76	82	46	35	35	21	10	11	6	17	23
DEPLETION	291	8	4	5	25	37	33	41	40	26	12	7	3	4	15	16	16
REGULATED FLOW AT SIOUX CITY																	
KAF	16037	451	270	482	1496	1751	1727	1781	1728	1645	1689	481	131	150	760	770	726
KCFS		15.2	19.4	27.0	25.1	28.5	29.0	29.0	28.1	27.7	27.5	16.2	9.5	9.5	12.4	12.5	12.6
--TOTAL--																	
NAT INFLOW	17100	1048	489	628	1612	2509	4190	1924	786	624	852	379	177	202	388	489	803
DEPLETION	3006	41	19	24	127	511	1521	1316	356	-215	-147	-137	-64	-73	-126	-102	-46
CHAN STOR	32	89	-10	-15	-28	-34	-9	2	0	37	26	22	13	-9	-39	-18	2
EVAPORATION	1823							115	357	442	378	168	79	90	195		
STORAGE	46644.	47289	47479	47587	47548	47761	48694	47408	45754	44542	43500	43389	43433	43460	42981	42785	42910
SYSTEM POWER																	
AVE POWER MW		630	789	833	906	1073	1099	1145	1142	895	795	636	448	485	674	746	709
PEAK POW MW		2283	2281	2283	2282	2283	2297	2277	2252	2248	2194	2193	2194	2195	2157	2175	2181
ENERGY GWH	7665.7	226.8	132.5	180.0	652.6	798.6	791.2	851.7	849.3	644.5	591.2	229.0	75.2	93.2	501.7	555.2	493.2
DAILY GWH		15.1	18.9	20.0	21.8	25.8	26.4	27.5	27.4	21.5	19.1	15.3	10.7	11.6	16.2	17.9	17.0
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB

TIME OF STUDY: 10:26:30 STUDY NO 20

VALUES IN 1000 AF EXCEPT AS INDICATED

	29FEB20	2020												2021			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	5601	205	95	123	465	898	1247	629	275	243	328	153	71	82	232	243	312
DEPLETION	554	-19	-9	-12	12	263	590	302	22	-125	-113	-31	-14	-17	-105	-115	-75
EVAPORATION	445							28	86	107	93	42	20	22	48		
MOD INFLOW	4602	224	105	134	453	635	657	299	167	261	348	142	66	76	289	358	387
RELEASE	5504	149	69	89	417	492	536	553	553	449	307	149	69	95	523	553	500
STOR CHANGE	-901	75	35	45	36	143	121	-254	-386	-187	41	-7	-3	-19	-234	-195	-113
STORAGE	10958.	11033	11068	11113	11150	11293	11414	11160	10774	10587	10628	10621	10618	10598	10364	10169	10056
ELEV FTMSL	2213.6	2214.1	2214.3	2214.6	2214.8	2215.6	2216.3	2214.8	2212.6	2211.4	2211.7	2211.6	2211.6	2211.5	2210.1	2208.9	2208.2
DISCH KCFS	9.000	5.0	5.0	5.0	7.0	8.0	9.0	9.0	9.0	7.5	5.0	5.0	5.0	6.0	8.5	9.0	9.0
POWER																	
AVE POWER MW		63	63	63	88	101	114	114	113	94	62	62	62	75	105	111	110
PEAK POW MW		170	171	171	171	172	173	171	168	167	167	167	167	167	165	164	163
ENERGY GWH	832.5	22.7	10.6	13.6	63.6	75.3	82.2	84.8	84.0	67.6	46.3	22.4	10.5	14.3	78.3	82.3	74.0
--GARRISON--																	
NAT INFLOW	8154	422	197	253	639	1212	2386	1030	358	236	424	166	77	88	154	215	298
DEPLETION	1374	31	15	19	41	218	841	713	119	-171	-59	-129	-60	-69	-77	-39	-19
CHAN STOR	0	43	0	0	-21	-11	-11			15	27		0	-11	-27	-5	
EVAPORATION	518							32	100	125	108	49	23	26	56		
REG INFLOW	11766	581	251	323	993	1475	2070	838	692	747	710	395	184	216	671	802	817
RELEASE	12855	446	208	268	952	1168	1250	1230	1230	1016	861	417	194	227	1107	1199	1083
STOR CHANGE	-1089	135	43	55	41	307	820	-392	-538	-269	-151	-22	-10	-11	-435	-397	-266
STORAGE	13108.	13243	13286	13341	13383	13690	14510	14118	13581	13311	13160	13138	13128	13117	12681	12284	12018
ELEV FTMSL	1820.8	1821.3	1821.5	1821.7	1821.9	1823.1	1826.2	1824.7	1822.6	1821.6	1821.0	1820.9	1820.9	1820.8	1819.1	1817.4	1816.3
DISCH KCFS	19.000	15.0	15.0	15.0	16.0	19.0	21.0	20.0	20.0	17.1	14.0	14.0	14.0	14.3	18.0	19.5	19.5
POWER																	
AVE POWER MW		167	168	168	179	213	239	229	226	191	156	156	156	159	199	213	210
PEAK POW MW		451	452	453	454	459	474	467	457	452	450	449	449	449	441	433	428
ENERGY GWH	1737.5	60.2	28.2	36.3	129.0	158.7	172.0	170.3	168.3	137.8	116.4	56.2	26.2	30.6	147.8	158.1	141.4
--OAHE--																	
NAT INFLOW	1239	182	85	109	215	118	329	113	44	49	5	8	4	4	-48	-22	43
DEPLETION	802	26	12	16	53	81	172	212	144	34	-14	1	0	0	14	20	31
CHAN STOR	-2	19		0	-5	-14	-10	5		15	15			-2	-19	-8	
EVAPORATION	461							29	89	110	96	43	20	23	51		
REG INFLOW	12829	622	281	362	1109	1191	1397	1106	1041	936	800	381	178	206	975	1150	1095
RELEASE	13950	477	306	345	1205	1491	1475	1709	1743	950	932	232	124	139	879	1068	876
STOR CHANGE	-1121	145	-25	17	-96	-300	-78	-602	-703	-15	-132	149	54	67	97	82	219
STORAGE	13886.	14030	14005	14022	13926	13626	13549	12946	12244	12229	12097	12246	12300	12366	12463	12545	12764
ELEV FTMSL	1590.1	1590.7	1590.6	1590.6	1590.3	1589.0	1588.7	1586.2	1583.1	1583.0	1582.4	1583.1	1583.3	1583.6	1584.1	1584.4	1585.4
DISCH KCFS	15.693	16.0	22.1	19.3	20.3	24.3	24.8	27.8	28.4	16.0	15.2	7.8	8.9	8.8	14.3	17.4	15.8
POWER																	
AVE POWER MW		189	259	227	238	283	288	320	321	180	171	88	101	100	162	197	180
PEAK POW MW		622	622	622	620	614	612	599	583	582	579	583	584	586	588	590	595
ENERGY GWH	1940.4	67.9	43.6	49.1	171.4	210.9	207.6	238.3	239.1	129.7	127.0	31.7	17.0	19.1	120.6	146.7	120.9
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	13819	477	306	345	1205	1491	1475	1701	1718	919	904	219	118	133	864	1068	876
RELEASE	13819	477	306	345	1205	1491	1475	1701	1718	919	904	219	118	133	864	1068	876
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	15.693	16.0	22.1	19.3	20.3	24.3	24.8	27.7	27.9	15.4	14.7	7.4	8.5	8.4	14.1	17.4	15.8
POWER																	
AVE POWER MW		76	103	90	95	114	116	129	131	76	74	37	43	42	71	85	76
PEAK POW MW		517	509	509	509	509	509	509	509	538	538	538	538	538	538	538	529
ENERGY GWH	799.7	27.3	17.3	19.5	68.3	84.5	83.5	96.3	97.3	54.5	55.2	13.5	7.3	8.1	52.8	63.5	50.8
--FORT RANDALL--																	
NAT INFLOW	393	76	35	46	95	56	107	28	17	-6	-28	-11	-5	-6	-22	-28	39
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	133							10	32	36	25	10	4	5	12		
REG INFLOW	13999	552	341	389	1296	1538	1570	1701	1689	870	850	199	108	121	827	1037	912
RELEASE	13999	271	197	389	1296	1538	1570	1701	1689	1585	1369	199	108	121	718	696	553
STOR CHANGE	0	280	144			0		0	0	-715	-518	0	0	0	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	2710	2192	2192	2192	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1346.0	1337.5	1337.5	1337.5	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	10.060	9.1	14.2	21.8	21.8	25.0	26.4	27.7	27.5	26.6	22.3	6.7	7.8	7.6	11.7	11.3	10.0
POWER																	
AVE POWER MW		76	120	184	184	211	223	233	232	216	168	49	57	56	86	86	80
PEAK POW MW		350	356	356	356	356	356	356	356	324	284	285	285	285	294	319	339
ENERGY GWH	1383.2	27.3	20.1	39.9	132.7	157.1	160.2	173.5	172.3	155.7	124.8	17.6	9.6	10.7	64.0	64.3	53.5
--GAVINS POINT--																	
NAT INFLOW	1249	83	39	50	125	135	141	83	62	78	104	50	23	26	73	73	104
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	2	-10	-15	0	-6	-3	-2	0	2	8	29	-2	0	-7	1	3
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	15091	357	226	425	1416	1648	1684	1740	1734	1659	1470	268	125	143	769	769	659
RELEASE	15091	357	226	425	1416	1648	1684	1740	1722	1636	1470	268	125	143	769	769	694
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	12.500	12.0	16.3	23.8	23.8	26.8	28.3	28.3	28.0	27.5	23.9	9.0	9.0	9.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		42	57	82	82	91	96	96	96	96	84	32	32	32	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	631.3	15.1	9.5	17.6	58.7	68.0	69.3	71.6	71.3	68.8	62.5	11.6	5.4	6.2	33.0	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	864	107	50	64	111	148	80	86	49	38	37	22	10	11	6	19	25
DEPLETION	293	8	4	5	25	37	33	41	40	27	13	7	3	4	15	16	16
REGULATED FLOW AT SIOUX CITY																	
KAF	15662	457	273	485	1502	1759	1731	1785	1731	1647	1494	282	132	151	760	772	703
KCFS		15.4	19.6	27.2	25.2	28.6	29.1	29.0	28.1	27.7	24.3	9.5	9.5	9.5	12.4	12.5	12.7
--TOTAL--																	
NAT INFLOW	17500	1075	502	645	1650	2567	4290	1969	805	638	870	387	180	206	395	500	821
DEPLETION	3217	47	22	28	140	627	1672	1325	350	-233	-170	-147	-68	-78	-140	-114	-44
CHAN STOR	-3	63	-10	-15	-26	-31	-23	2	0	32	50	30	-2	-12	-53	-12	3
EVAPORATION	1730							109	339	418	358	160	75	86	185		
STORAGE	42910.	43545	43742	43860	43842	43992	44856	43608	41993	40831	40070	40190	40230	40266	39803	39633	39798
SYSTEM POWER																	
AVE POWER MW		613	770	815	866	1014	1076	1122	1119	853	715	425	452	464	667	736	700
PEAK POW MW		2225	2224	2225	2224	2225	2239	2216	2189	2180	2136	2139	2140	2141	2104	2122	2130
ENERGY GWH	7324.7	220.6	129.3	176.0	623.7	754.4	774.8	834.8	832.2	614.0	532.1	153.0	75.9	89.1	496.5	547.9	470.2
DAILY GWH		14.7	18.5	19.6	20.8	24.3	25.8	26.9	26.8	20.5	17.2	10.2	10.8	11.1	16.0	17.7	16.8
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 10:26:30 VALUES IN 1000 AF EXCEPT AS INDICATED STUDY NO 21

	28FEB21	2021												2022			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	5800	212	99	127	482	930	1291	651	285	251	339	159	74	85	241	252	323
DEPLETION	565	-20	-9	-12	12	264	595	309	26	-125	-115	-32	-15	-17	-105	-116	-75
EVAPORATION	424							26	82	101	88	40	19	21	46		
MOD INFLOW	4811	232	108	139	470	666	696	316	177	275	366	150	70	80	300	368	398
RELEASE	5386	149	69	89	387	492	536	553	553	450	307	149	69	95	492	523	472
STOR CHANGE	-575	83	39	50	83	174	160	-238	-376	-176	58	2	1	-15	-192	-155	-74
STORAGE	10056.	10139	10178	10228	10311	10485	10646	10408	10032	9856	9914	9916	9916	9902	9710	9555	9481
ELEV FTMSL	2208.2	2208.7	2208.9	2209.2	2209.8	2210.8	2211.8	2210.4	2208.0	2206.9	2207.3	2207.3	2207.3	2207.2	2206.0	2205.0	2204.5
DISCH KCFS	9.000	5.0	5.0	5.0	6.5	8.0	9.0	9.0	9.0	7.6	5.0	5.0	5.0	6.0	8.0	8.5	8.5
POWER																	
AVE POWER MW		61	61	62	80	99	112	111	110	92	61	61	61	73	97	102	102
PEAK POW MW		164	164	164	165	166	167	166	163	161	162	162	162	162	160	159	158
ENERGY GWH	797.1	22.1	10.3	13.3	57.6	73.5	80.4	82.9	82.2	66.4	45.3	22.0	10.2	14.0	72.1	76.2	68.6
--GARRISON--																	
NAT INFLOW	8704	450	210	270	682	1294	2546	1100	382	253	453	177	82	94	165	229	318
DEPLETION	1176	26	12	16	45	205	851	723	118	-180	-70	-154	-72	-82	-122	-83	-58
CHAN STOR	6	43	0	0	-16	-16	-11			15	28		0	-11	-22	-5	
EVAPORATION	494							31	96	118	103	46	22	25	53		
REG INFLOW	12426	616	267	343	1008	1565	2220	900	722	780	755	432	202	236	704	829	848
RELEASE	13123	417	194	250	1071	1476	1250	1230	1230	1013	861	417	194	222	1076	1168	1055
STOR CHANGE	-697	199	73	93	-63	89	970	-330	-508	-233	-105	16	7	13	-372	-339	-207
STORAGE	12018.	12217	12290	12383	12320	12409	13379	13049	12541	12308	12202	12218	12226	12239	11867	11528	11321
ELEV FTMSL	1816.3	1817.1	1817.4	1817.8	1817.6	1817.9	1821.9	1820.5	1818.5	1817.5	1817.1	1817.1	1817.2	1817.2	1815.7	1814.2	1813.3
DISCH KCFS	19.500	14.0	14.0	14.0	18.0	24.0	21.0	20.0	20.0	17.0	14.0	14.0	14.0	14.0	17.5	19.0	19.0
POWER																	
AVE POWER MW		152	152	153	196	260	231	222	220	186	152	152	152	152	189	202	201
PEAK POW MW		432	433	435	434	436	454	448	438	434	431	432	432	432	425	418	415
ENERGY GWH	1725.0	54.6	25.6	32.9	140.9	193.5	166.6	165.5	163.6	133.6	113.2	54.7	25.5	29.2	140.3	150.6	134.9
--OAHE--																	
NAT INFLOW	1301	192	89	115	226	124	345	119	45	52	6	9	4	5	-51	-23	45
DEPLETION	817	26	12	16	54	82	175	217	147	35	-15	1	0	0	14	21	32
CHAN STOR	3	27			-20	-29	15	5		15	16				-18	-8	
EVAPORATION	441							28	85	105	91	41	19	22	49		
REG INFLOW	13169	609	272	349	1223	1488	1434	1109	1043	941	806	383	179	204	944	1117	1068
RELEASE	13889	469	302	340	1194	1482	1464	1705	1740	949	932	232	124	139	878	1068	870
STOR CHANGE	-720	140	-31	9	30	6	-29	-596	-698	-9	-126	151	54	65	66	49	199
STORAGE	12764.	12905	12874	12883	12913	12919	12889	12293	11596	11587	11461	11612	11666	11731	11797	11845	12044
ELEV FTMSL	1585.4	1586.0	1585.9	1585.9	1586.0	1586.0	1585.9	1583.3	1580.1	1580.1	1579.5	1580.2	1580.4	1580.7	1581.0	1581.3	1582.2
DISCH KCFS	15.768	15.8	21.8	19.0	20.1	24.1	24.6	27.7	28.3	16.0	15.2	7.8	8.9	8.8	14.3	17.4	15.7
POWER																	
AVE POWER MW		181	249	218	230	276	281	314	315	177	168	87	100	98	159	194	175
PEAK POW MW		598	597	597	598	598	598	584	567	567	564	568	569	570	572	573	578
ENERGY GWH	1894.8	65.0	41.9	47.1	165.5	205.3	202.6	233.8	234.5	127.3	124.7	31.2	16.7	18.8	118.4	144.0	117.8
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	13758	469	302	340	1194	1482	1464	1697	1715	918	904	220	118	133	864	1068	870
RELEASE	13758	469	302	340	1194	1482	1464	1697	1715	918	904	220	118	133	864	1068	870
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	15.768	15.8	21.8	19.0	20.1	24.1	24.6	27.6	27.9	15.4	14.7	7.4	8.5	8.4	14.1	17.4	15.7
POWER																	
AVE POWER MW		75	102	89	94	113	115	129	131	76	74	38	43	42	71	85	75
PEAK POW MW		517	509	509	509	509	509	509	509	538	538	538	538	538	538	538	529
ENERGY GWH	796.2	26.9	17.1	19.3	67.6	83.9	82.9	96.1	97.1	54.4	55.2	13.5	7.3	8.2	52.8	63.5	50.5
--FORT RANDALL--																	
NAT INFLOW	424	82	38	49	103	61	115	30	18	-7	-30	-12	-6	-6	-24	-30	42
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	133							10	32	36	25	10	4	5	12		
REG INFLOW	13969	550	340	389	1293	1534	1567	1699	1687	868	848	198	108	121	825	1035	909
RELEASE	13969	270	196	389	1293	1534	1567	1699	1687	1583	1367	198	108	121	716	694	550
STOR CHANGE	0	280	144	0		0		0	0	-715	-518	0	0	0	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	2710	2192	2192	2192	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1346.0	1337.5	1337.5	1337.5	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	9.952	9.1	14.1	21.8	21.7	24.9	26.3	27.6	27.4	26.6	22.2	6.7	7.8	7.6	11.6	11.3	9.9
POWER																	
AVE POWER MW		75	119	184	184	211	222	233	231	216	167	49	57	56	86	86	79
PEAK POW MW		350	356	356	356	356	356	356	356	324	284	285	285	285	294	319	339
ENERGY GWH	1380.3	27.1	20.0	39.8	132.3	156.7	159.9	173.3	172.1	155.5	124.6	17.6	9.6	10.7	63.9	64.1	53.2
--GAVINS POINT--																	
NAT INFLOW	1279	85	40	51	128	139	144	85	64	80	106	50	23	27	75	75	107
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	2	-10	-15	0	-6	-3	-2	0	2	8	29	-2	0	-7	1	3
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	15091	357	226	425	1416	1648	1684	1740	1734	1659	1470	268	125	143	769	769	659
RELEASE	15091	357	226	425	1416	1648	1684	1740	1722	1636	1470	268	125	143	769	769	694
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	12.500	12.0	16.3	23.8	23.8	26.8	28.3	28.3	28.0	27.5	23.9	9.0	9.0	9.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		42	57	82	82	91	96	96	96	96	84	32	32	32	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	631.3	15.1	9.5	17.6	58.7	68.0	69.3	71.6	71.3	68.8	62.5	11.6	5.4	6.2	33.0	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	992	123	58	74	128	170	92	99	57	42	43	25	12	13	7	21	28
DEPLETION	295	8	4	5	25	38	33	42	40	27	13	7	3	4	15	16	16
REGULATED FLOW AT SIOUX CITY																	
KAF	15788	473	280	495	1519	1780	1743	1797	1739	1651	1500	286	133	152	761	774	706
KCFS		15.9	20.2	27.7	25.5	28.9	29.3	29.2	28.3	27.8	24.4	9.6	9.6	9.6	12.4	12.6	12.7
--TOTAL--																	
NAT INFLOW	18500	1144	534	686	1749	2718	4533	2084	851	671	917	407	190	217	413	524	863
DEPLETION	3047	41	19	25	145	617	1690	1348	356	-241	-184	-172	-80	-92	-185	-158	-82
CHAN STOR	7	72	-10	-15	-36	-52	1	2	0	32	51	30	-2	-11	-48	-12	3
EVAPORATION	1665							105	327	402	344	154	72	82	179		
STORAGE	39798.	40500	40725	40877	40926	41196	42297	41133	39563	38453	37762	37931	37993	38056	37667	37563	37805
SYSTEM POWER																	
AVE POWER MW		585	740	787	865	1050	1058	1107	1103	842	706	418	445	454	646	714	676
PEAK POW MW		2175	2174	2176	2176	2180	2199	2177	2148	2141	2097	2101	2103	2104	2068	2086	2095
ENERGY GWH	7224.7	210.7	124.4	170.0	622.7	780.9	761.7	823.3	820.7	605.9	525.5	150.5	74.7	87.1	480.6	531.4	454.5
DAILY GWH		14.0	17.8	18.9	20.8	25.2	25.4	26.6	26.5	20.2	17.0	10.0	10.7	10.9	15.5	17.1	16.2
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 10:26:30 STUDY NO 22

VALUES IN 1000 AF EXCEPT AS INDICATED

	28FEB22	2022												2023			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB
--FORT PECK--																	
NAT INFLOW	5950	217	101	130	494	954	1325	668	292	258	348	163	76	87	247	258	331
DEPLETION	575	-20	-9	-12	12	265	599	316	30	-126	-117	-33	-15	-17	-106	-116	-76
EVAPORATION	412							26	79	98	86	39	18	21	45		
MOD INFLOW	4963	237	111	142	482	689	726	326	183	286	379	157	73	83	308	374	407
RELEASE	5325	149	69	89	417	430	506	553	553	451	307	149	69	95	492	523	472
STOR CHANGE	-362	88	41	53	65	259	220	-227	-371	-165	72	8	4	-12	-184	-149	-65
STORAGE	9481.	9569	9610	9663	9729	9987	10208	9981	9610	9445	9516	9524	9528	9516	9332	9184	9119
ELEV FTMSL	2204.5	2205.1	2205.4	2205.7	2206.1	2207.8	2209.1	2207.7	2205.4	2204.3	2204.7	2204.8	2204.8	2204.7	2203.5	2202.6	2202.1
DISCH KCFS	8.500	5.0	5.0	5.0	7.0	7.0	8.5	9.0	9.0	7.6	5.0	5.0	5.0	6.0	8.0	8.5	8.5
POWER																	
AVE POWER MW		60	60	60	85	85	104	110	109	91	60	60	60	72	96	101	101
PEAK POW MW		159	159	160	160	162	164	162	159	158	159	159	159	159	157	156	156
ENERGY GWH	777.0	21.7	10.1	13.1	60.9	63.3	74.8	81.8	81.1	65.5	44.7	21.7	10.1	13.9	71.2	75.2	67.7
--GARRISON--																	
NAT INFLOW	9150	473	221	284	717	1360	2677	1156	402	266	476	186	87	99	173	241	334
DEPLETION	1170	5	2	3	45	206	861	739	124	-183	-75	-155	-72	-82	-118	-78	-53
CHAN STOR	0	38	0	0	-22		-16	-5		15	28		0	-11	-22	-5	
EVAPORATION	490							31	95	118	102	46	21	25	52		
REG INFLOW	12815	655	287	370	1067	1584	2306	934	736	797	784	443	207	241	709	836	859
RELEASE	13253	446	208	268	1012	1168	1250	1230	1230	1044	922	446	208	254	1168	1261	1139
STOR CHANGE	-438	208	79	102	55	416	1056	-295	-493	-247	-138	-4	-2	-13	-460	-424	-279
STORAGE	11321.	11529	11609	11710	11766	12182	13238	12942	12449	12202	12064	12060	12059	12046	11586	11162	10883
ELEV FTMSL	1813.3	1814.2	1814.6	1815.0	1815.2	1817.0	1821.3	1820.1	1818.1	1817.1	1816.5	1816.5	1816.5	1816.4	1814.5	1812.6	1811.3
DISCH KCFS	19.000	15.0	15.0	15.0	17.0	19.0	21.0	20.0	20.0	17.5	15.0	15.0	15.0	16.0	19.0	20.5	20.5
POWER																	
AVE POWER MW		159	160	160	182	204	230	222	219	191	162	162	162	173	203	216	213
PEAK POW MW		418	420	422	423	431	451	446	436	431	429	429	429	429	419	412	407
ENERGY GWH	1726.8	57.2	26.8	34.6	130.7	151.8	165.7	164.9	163.1	137.2	120.8	58.3	27.2	33.1	151.1	160.7	143.4
--OAHE--																	
NAT INFLOW	1350	199	93	119	235	129	358	123	47	52	6	9	4	5	-53	-23	47
DEPLETION	830	27	12	16	54	83	178	221	150	35	-15	1	0	0	15	21	32
CHAN STOR	-7	20		0	-10	-10	-10	5		13	14			-5	-16	-8	
EVAPORATION	412							26	79	97	85	39	18	21	46		
REG INFLOW	13354	639	289	371	1182	1204	1419	1111	1048	977	872	416	194	232	1038	1209	1154
RELEASE	13806	463	299	336	1186	1477	1455	1701	1738	947	893	233	124	139	880	1069	866
STOR CHANGE	-451	176	-11	35	-3	-273	-35	-590	-691	30	-21	183	70	93	159	140	288
STORAGE	12044.	12220	12210	12244	12241	11968	11933	11343	10652	10682	10661	10843	10913	11006	11165	11305	11593
ELEV FTMSL	1582.2	1583.0	1582.9	1583.1	1583.1	1581.8	1581.7	1578.9	1575.5	1575.7	1575.5	1576.5	1576.8	1577.3	1578.0	1578.7	1580.1
DISCH KCFS	15.659	15.5	21.6	18.8	19.9	24.0	24.4	27.7	28.3	15.9	14.5	7.8	8.9	8.8	14.3	17.4	15.6
POWER																	
AVE POWER MW		175	243	212	224	269	273	305	306	172	157	85	97	96	156	191	172
PEAK POW MW		582	582	583	583	576	575	561	543	544	543	548	550	552	556	560	567
ENERGY GWH	1841.8	63.0	40.7	45.8	161.6	200.3	196.4	227.3	227.8	123.5	116.5	30.6	16.3	18.4	116.3	141.7	115.6
--BIG BEND--																	
EVAPORATION	131							8	25	31	28	12	6	7	14		
REG INFLOW	13675	463	299	336	1186	1477	1455	1693	1713	916	865	221	118	133	865	1069	866
RELEASE	13675	463	299	336	1186	1477	1455	1693	1713	916	865	221	118	133	865	1069	866
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	15.659	15.5	21.6	18.8	19.9	24.0	24.4	27.5	27.9	15.4	14.1	7.4	8.5	8.4	14.1	17.4	15.6
POWER																	
AVE POWER MW		74	101	88	93	112	114	129	130	75	71	38	43	42	71	85	75
PEAK POW MW		517	509	509	509	509	509	509	509	538	538	538	538	538	538	538	529
ENERGY GWH	791.3	26.5	17.0	19.1	67.2	83.7	82.4	95.9	97.0	54.3	52.8	13.6	7.2	8.1	52.8	63.5	50.3
--FORT RANDALL--																	
NAT INFLOW	450	87	41	52	109	64	122	32	19	-6	-31	-13	-6	-7	-26	-32	45
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	133							10	32	36	25	10	4	5	12		
REG INFLOW	13911	548	339	388	1291	1532	1565	1697	1686	867	808	198	107	120	824	1034	908
RELEASE	13911	268	195	388	1291	1532	1565	1697	1686	1582	1326	198	107	120	715	693	549
STOR CHANGE	0	280	144				0	0	0	-715	-518	0	0	0	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	2710	2192	2192	2192	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1346.0	1337.5	1337.5	1337.5	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	9.897	9.0	14.1	21.7	21.7	24.9	26.3	27.6	27.4	26.6	21.6	6.6	7.7	7.6	11.6	11.3	9.9
POWER																	
AVE POWER MW		75	119	184	184	210	222	233	231	216	163	49	57	55	86	86	79
PEAK POW MW		350	356	356	356	356	356	356	356	324	284	285	285	285	294	319	339
ENERGY GWH	1375.0	26.9	20.0	39.7	132.1	156.5	159.7	173.1	172.0	155.4	121.0	17.6	9.5	10.7	63.8	64.0	53.1
--GAVINS POINT--																	
NAT INFLOW	1300	87	40	52	130	141	146	87	65	81	108	52	24	27	76	76	108
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	2	-10	-15	0	-6	-3	-2	0	2	9	28	-2	0	-8	1	3
EVAPORATION	42							2	8	10	9	4	2	2	5		
REG INFLOW	15054	357	226	425	1416	1648	1684	1740	1734	1659	1433	268	125	143	769	769	659
RELEASE	15054	357	226	425	1416	1648	1684	1740	1722	1636	1433	268	125	143	769	769	694
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	12.500	12.0	16.3	23.8	23.8	26.8	28.3	28.3	28.0	27.5	23.3	9.0	9.0	9.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		42	57	82	82	91	96	96	96	96	82	32	32	32	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	629.8	15.1	9.5	17.6	58.7	68.0	69.3	71.6	71.3	68.8	60.9	11.6	5.4	6.2	33.0	33.0	29.6
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1100	137	64	82	141	189	102	110	63	55	39	28	13	15	8	24	31
DEPLETION	297	8	4	5	25	38	33	42	41	27	13	7	3	4	15	16	17
REGULATED FLOW AT SIOUX CITY																	
KAF	15857	486	287	503	1532	1799	1753	1808	1744	1664	1459	288	134	154	762	777	708
KCFS		16.3	20.6	28.2	25.7	29.3	29.5	29.4	28.4	28.0	23.7	9.7	9.7	9.7	12.4	12.6	12.8
--TOTAL--																	
NAT INFLOW	19300	1200	560	720	1826	2837	4730	2176	888	706	946	424	198	226	425	544	896
DEPLETION	3066	21	10	12	145	620	1707	1375	370	-245	-191	-174	-81	-93	-181	-153	-77
CHAN STOR	-8	60	-10	-15	-32	-16	-29	-3	0	30	50	28	-2	-16	-46	-13	3
EVAPORATION	1620							103	318	391	334	150	70	80	174		
STORAGE	37805.	38558	38812	39001	39119	39520	40761	39649	38106	37031	36426	36613	36685	36753	36378	36285	36553
SYSTEM POWER																	
AVE POWER MW		584	739	786	849	973	1039	1095	1092	840	695	426	451	470	656	723	684
PEAK POW MW		2142	2141	2144	2146	2150	2170	2148	2119	2112	2070	2076	2077	2080	2043	2063	2073
ENERGY GWH	7141.6	210.4	124.1	169.8	611.3	723.6	748.3	814.6	812.3	604.7	516.8	153.3	75.8	90.3	488.3	538.2	459.7
DAILY GWH		14.0	17.7	18.9	20.4	23.3	24.9	26.3	26.2	20.2	16.7	10.2	10.8	11.3	15.8	17.4	16.4
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	28FEB

TIME OF STUDY: 10:26:30 VALUES IN 1000 AF EXCEPT AS INDICATED STUDY NO 23

	28FEB23	2023												2024			
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB
--FORT PECK--																	
NAT INFLOW	6000	219	102	131	498	962	1336	674	294	260	352	164	77	87	249	260	334
DEPLETION	585	-20	-9	-12	12	265	603	324	36	-126	-117	-33	-15	-17	-106	-115	-85
EVAPORATION	376							25	78	96	84	24	11	13	44		
MOD INFLOW	5039	239	112	143	486	697	733	325	180	290	385	172	80	92	311	375	419
RELEASE	5234	149	69	89	417	492	506	523	523	402	307	149	69	95	492	492	460
STOR CHANGE	-194	90	42	54	69	205	227	-198	-342	-112	77	24	11	-3	-181	-117	-41
STORAGE	9119.	9209	9251	9305	9375	9580	9807	9609	9267	9155	9232	9256	9267	9263	9082	8965	8924
ELEV FTMSL	2202.1	2202.7	2203.0	2203.4	2203.8	2205.2	2206.6	2205.3	2203.1	2202.4	2202.9	2203.0	2203.1	2203.1	2201.9	2201.1	2200.8
DISCH KCFS	8.500	5.0	5.0	5.0	7.0	8.0	8.5	8.5	8.5	6.8	5.0	5.0	5.0	6.0	8.0	8.0	8.0
POWER																	
AVE POWER MW		59	60	60	84	96	103	103	102	80	60	60	60	72	95	94	94
PEAK POW MW		156	157	157	158	159	161	159	157	156	156	157	157	157	155	154	154
ENERGY GWH	755.8	21.4	10.0	12.9	60.2	71.4	73.9	76.4	75.7	57.9	44.3	21.5	10.0	13.7	70.6	70.3	65.6
--GARRISON--																	
NAT INFLOW	9222	477	222	286	723	1371	2698	1165	405	268	480	187	87	100	174	243	336
DEPLETION	1196	9	4	5	46	206	871	762	136	-180	-73	-160	-75	-85	-124	-83	-63
CHAN STOR	6	39	0	0	-22	-11	-5			19	19		0	-11	-22		
EVAPORATION	439							30	91	113	98	28	13	15	51		
REG INFLOW	12827	656	288	370	1072	1646	2327	896	700	756	782	468	218	254	717	818	859
RELEASE	13063	387	180	232	1071	1476	1279	1261	1261	998	799	387	180	214	1076	1168	1093
STOR CHANGE	-236	269	107	138	1	170	1048	-364	-560	-242	-18	81	38	40	-359	-350	-234
STORAGE	10883.	11151	11259	11396	11397	11567	12615	12251	11690	11448	11431	11512	11549	11589	11230	10880	10646
ELEV FTMSL	1811.3	1812.6	1813.0	1813.6	1813.6	1814.4	1818.8	1817.3	1814.9	1813.9	1813.8	1814.1	1814.3	1814.5	1812.9	1811.3	1810.3
DISCH KCFS	20.500	13.0	13.0	13.0	18.0	24.0	21.5	20.5	20.5	16.8	13.0	13.0	13.0	13.5	17.5	19.0	19.0
POWER																	
AVE POWER MW		136	137	137	190	253	231	223	220	178	138	138	138	144	185	198	196
PEAK POW MW		412	413	416	416	419	440	432	421	417	417	418	419	420	413	407	402
ENERGY GWH	1676.2	49.0	23.0	29.7	136.9	188.4	166.6	165.9	163.6	128.4	102.6	49.7	23.2	27.6	137.6	147.5	136.6
--OAHE--																	
NAT INFLOW	1381	203	95	122	240	132	366	126	48	55	6	9	4	5	-54	-24	48
DEPLETION	845	27	12	16	55	84	181	226	153	36	-15	1	0	0	15	21	33
CHAN STOR	9	39	0	0	-26	-31	13	5		20	20		0	-3	-21	-8	
EVAPORATION	382							26	79	97	85	25	12	13	46		
REG INFLOW	13226	602	263	338	1230	1493	1477	1140	1077	941	756	371	173	203	940	1115	1108
RELEASE	13469	459	298	334	1181	1474	1450	1700	1737	946	565	234	118	134	881	1070	889
STOR CHANGE	-243	143	-35	4	49	19	28	-560	-660	-5	191	137	54	69	59	45	219
STORAGE	11593.	11736	11701	11705	11754	11773	11800	11240	10580	10574	10765	10902	10956	11025	11084	11130	11349
ELEV FTMSL	1580.1	1580.8	1580.6	1580.6	1580.9	1580.9	1581.1	1578.4	1575.1	1575.1	1576.1	1576.8	1577.0	1577.4	1577.7	1577.9	1578.9
DISCH KCFS	15.587	15.4	21.4	18.7	19.8	24.0	24.4	27.6	28.3	15.9	9.2	7.9	8.5	8.4	14.3	17.4	15.4
POWER																	
AVE POWER MW		171	238	208	220	266	271	304	305	171	99	85	93	92	156	190	169
PEAK POW MW		571	570	570	571	571	572	558	541	541	546	550	551	553	554	555	561
ENERGY GWH	1788.0	61.7	40.0	44.9	158.7	198.0	194.8	226.4	227.1	123.0	73.8	30.8	15.6	17.7	116.3	141.3	117.9
--BIG BEND--																	
EVAPORATION	122							8	25	31	28	8	4	4	14		
REG INFLOW	13348	459	298	334	1181	1474	1450	1692	1712	915	537	226	115	130	866	1070	889
RELEASE	13348	459	298	334	1181	1474	1450	1692	1712	915	537	226	115	130	866	1070	889
STORAGE	1631.	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631	1631
ELEV FTMSL	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0	1420.0
DISCH KCFS	15.587	15.4	21.4	18.7	19.8	24.0	24.4	27.5	27.9	15.4	8.7	7.6	8.3	8.2	14.1	17.4	15.4
POWER																	
AVE POWER MW		73	100	88	93	112	114	129	130	75	44	39	42	41	71	85	74
PEAK POW MW		517	509	509	509	509	509	509	509	538	538	538	538	538	538	538	529
ENERGY GWH	771.5	26.3	16.9	18.9	66.9	83.5	82.1	95.8	97.0	54.2	32.9	13.9	7.0	8.0	52.9	63.6	51.6
--FORT RANDALL--																	
NAT INFLOW	465	90	42	54	113	66	126	33	20	-6	-32	-14	-6	-7	-27	-33	46
DEPLETION	80	1	1	1	4	9	12	18	15	7	1	1	0	1	3	3	3
EVAPORATION	126							10	32	36	25	6	3	3	12		
REG INFLOW	13604	548	339	387	1290	1531	1564	1697	1686	866	478	206	105	119	824	1034	932
RELEASE	13604	268	195	387	1290	1531	1564	1697	1686	1581	996	206	105	119	715	693	573
STOR CHANGE	0	280	144		0	0		0	0	-715	-518	0	0	0	109	341	359
STORAGE	3001.	3281	3425	3425	3425	3425	3425	3425	3425	2710	2192	2192	2192	2192	2301	2642	3001
ELEV FTMSL	1350.0	1353.5	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1355.2	1346.0	1337.5	1337.5	1337.5	1337.5	1339.5	1345.0	1350.0
DISCH KCFS	9.879	9.0	14.0	21.7	21.7	24.9	26.3	27.6	27.4	26.6	16.2	6.9	7.6	7.5	11.6	11.3	10.0
POWER																	
AVE POWER MW		75	119	184	183	210	222	233	231	216	123	51	56	55	86	86	80
PEAK POW MW		350	356	356	356	356	356	356	356	324	284	285	285	285	294	319	339
ENERGY GWH	1347.4	26.9	19.9	39.6	132.0	156.4	159.6	173.1	172.0	155.3	91.2	18.3	9.3	10.5	63.8	64.0	55.4
--GAVINS POINT--																	
NAT INFLOW	1309	87	41	52	131	142	147	87	65	82	109	53	25	28	76	76	109
DEPLETION	114	0	0	0	5	19	24	39	10	-5	2	5	2	3	10	1	
CHAN STOR	-1	2	-10	-15	0	-6	-3	-3	0	2	19	17	-1	0	-8	1	2
EVAPORATION	39							2	8	10	9	3	1	1	5		
REG INFLOW	14759	357	226	425	1416	1648	1684	1740	1734	1659	1113	268	125	143	769	769	684
RELEASE	14759	357	226	425	1416	1648	1684	1740	1722	1636	1113	268	125	143	769	769	719
STOR CHANGE									12	23							-35
STORAGE	327.	327	327	327	327	327	327	327	339	362	362	362	362	362	362	362	327
ELEV FTMSL	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.0	1206.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1207.5	1206.0
DISCH KCFS	12.500	12.0	16.3	23.8	23.8	26.8	28.3	28.3	28.0	27.5	18.1	9.0	9.0	9.0	12.5	12.5	12.5
POWER																	
AVE POWER MW		42	57	82	82	91	96	96	96	96	64	32	32	32	44	44	44
PEAK POW MW		114	114	114	114	114	114	114	115	117	117	117	117	117	78	78	76
ENERGY GWH	617.5	15.1	9.5	17.6	58.7	68.0	69.3	71.6	71.3	68.8	47.6	11.6	5.4	6.2	33.0	33.0	30.7
--GAVINS POINT - SIOUX CITY--																	
NAT INFLOW	1123	140	65	84	144	193	104	112	64	49	48	28	13	15	8	24	32
DEPLETION	301	8	4	5	26	38	33	42	41	28	13	8	4	4	16	16	17
REGULATED FLOW AT SIOUX CITY																	
KAF	15581	489	288	504	1534	1803	1755	1810	1745	1657	1148	288	135	154	761	777	734
KCFS		16.4	20.7	28.3	25.8	29.3	29.5	29.4	28.4	27.9	18.7	9.7	9.7	9.7	12.4	12.6	12.8
--TOTAL--																	
NAT INFLOW	19500	1216	567	729	1849	2866	4777	2197	896	708	963	427	199	228	426	546	905
DEPLETION	3121	24	11	15	148	621	1724	1411	391	-240	-189	-179	-83	-95	-186	-157	-95
CHAN STOR	11	79	-10	-15	-48	-48	5	3	0	41	57	17	-1	-13	-51	-7	2
EVAPORATION	1483							101	312	383	329	93	44	50	172		
STORAGE	36553.	37335	37593	37789	37909	38303	39605	38483	36932	35880	35613	35854	35957	36063	35691	35610	35878
SYSTEM POWER																	
AVE POWER MW		557	710	758	852	1029	1037	1088	1084	816	527	405	421	436	637	699	658
PEAK POW MW		2120	2119	2122	2124	2130	2153	2130	2100	2092	2058	2064	2066	2069	2033	2052	2061
ENERGY GWH	6956.5	200.5	119.3	163.7	613.5	765.7	746.3	809.2	806.7	587.5	392.5	145.7	70.7	83.7	474.3	519.7	457.7
DAILY GWH		13.4	17.0	18.2	20.4	24.7	24.9	26.1	26.0	19.6	12.7	9.7	10.1	10.5	15.3	16.8	15.8
	INI-SUM	15MAR	22MAR	31MAR	30APR	31MAY	30JUN	31JUL	31AUG	30SEP	31OCT	15NOV	22NOV	30NOV	31DEC	31JAN	29FEB