No. 108, Original

IN THE

Supreme Court of the United States

STATE OF NEBRASKA,

Plaintiff,

v.

STATE OF WYOMING, ET AL,

Defendants.

PROPOSED JOINT SETTLEMENT

OCTOBER 12, 2001

Owen Olpin
Special Master

Accompanying the Final Report of the Special Master

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In The

SUPREME COURT OF THE UNITED STATES

October Term, 2000

BEFORE THE HONORABLE OWEN OLPIN
SPECIAL MASTER

STATE OF NEBRASKA,

Plaintiff,

v.

STATE OF WYOMING,

Defendant.

FINAL SETTLEMENT STIPULATION

The States of Nebraska, Wyoming, and Colorado, the United States and Basin Electric Power Cooperative hereby enter this Final Settlement Stipulation:

I. General

A. Nebraska, Wyoming, Colorado, and the United States agree to modification and supplementation of the North Platte Decree, 325 U.S. 665 (1945), as modified 345 U.S. 981 (1953). The Modified Decree is attached as Appendix A (Modified Decree). A redline/strikeout version of the North Platte Decree showing the modifications is attached as Appendix B.

B. The parties to this Final Settlement Stipulation also agree to undertake certain other obligations set forth in this stipulation. By consenting to this stipulation, Colorado is not admitting that any measures to be undertaken by any other party would be reasonable or appropriate within Colorado.

C. Upon the Courts approval and adoption of this stipulation and entry of the Modified Decree, all claims of any party to this case against another party arising prior to the date of the Courts approval of this stipulation and entry of the Modified Decree shall be dismissed with prejudice.

D. Claims for which leave to file was or could have been sought in this case with respect to activities or conditions occurring before the effective date of this stipulation are hereby waived and forever barred, except as a possible affirmative defense in a future proceeding. With respect to activities and conditions occurring after the date of such

dismissal, the dismissal will not preclude a party from seeking enforcement of the provisions of the Modified Decree or from seeking equitable relief to modify this stipulation or the Modified Decree pursuant to Paragraph XIII of the Modified Decree. By agreeing to the dismissal with prejudice of the claims, counterclaims and cross-claims in this case, a party does not waive or prejudice any right that it otherwise would have to assert in a future action any legal theory or position that it asserted in this case with respect to activities or conditions occurring after the date of such dismissal.

E. This Final Settlement Stipulation and the Modified Decree shall not affect the apportionment between the States of Wyoming and Colorado of the waters of the Laramie River down to and including the Wheatland Project. The only existing limitation in the Modified Decree on Wyoming's use of the Laramie River is provided in paragraph II(d) of the Modified Decree.

F. The parties have previously entered into stipulations resolving specific claims in this case. The following stipulations are attached hereto and by this reference are incorporated into this Final Settlement Stipulation:

1. Amendment of the 1953 Order to Provide for Use of Glendo Storage Water (Appendix C);

2. Procedures for 1945 Decree Paragraph II(b) [now paragraph II(e) of the Modified Decree] Storage Accounting (Appendix D); and

3. Stipulation Among the State of Wyoming, The State of Nebraska, and the United States Relating to the Allocation of Water During Periods of Shortage (Appendix E).

G. The parties previously entered into a stipulation (Amendment of the 1953 Order to Provide for the Modification of Pathfinder Reservoir filed on September 10, 1997) providing for the modification of Pathfinder Dam. Pursuant to this Final Settlement Stipulation, the parties have amended the 1997 stipulation to provide for the modification of Pathfinder Dam. The amended stipulation, attached as Appendix F is hereby incorporated into this Final Settlement Stipulation and replaces the 1997 stipulation.

H. The parties previously entered into a stipulation (Amendment of the 1953 Order Paragraph V, River Carriage Losses filed on September 10, 1997) providing for revision of the river carriage losses. Pursuant to this Final Settlement Stipulation, the parties have included the river carriage losses in Exhibit 9 to the North Platte Decree Committee Charter and revised paragraph V of the Modified Decree accordingly. Therefore, the parties hereby withdraw the 1997 stipulation filed with the Special Master.

II. North Platte Decree Committee

The North Platte Decree Committee (NPDC) is hereby created by the States of Nebraska, Wyoming, and Colorado, and the United States of America effective upon the Court's approval and adoption of this Final Settlement Stipulation and entry of the Modified Decree. The North Platte Decree Committee shall operate in accordance with the North Platte Decree Committee Charter (Charter) attached as Appendix G. Attached to the Charter as Exhibits 4 through 15 are administrative procedures that are hereby approved and adopted to monitor, administer, and implement the Modified Decree and this Final Settlement Stipulation. The North Platte Decree Committee may modify the procedures which are attached to the Charter and referenced elsewhere in this Final Settlement Stipulation. The parties agree that failure of the North Platte Decree Committee, or the parties to the North Platte Decree Committee, to act upon, resolve or agree on a matter that has been submitted to the North Platte Decree Committee shall not preclude a party from seeking leave of the Court to bring an action pursuant to Paragraph XIII of the Modified Decree. The states of Nebraska, Wyoming, and Colorado, and the United States of America may modify the Charter by unanimous agreement consistent with this Final Settlement Stipulation and the Modified Decree.

III. Allocation Year Administration

During allocation years, pursuant to the procedure attached to the North Platte Decree Committee Charter as Exhibit 5, Wyoming will implement the following water rights administration:

A. With respect to water rights administration upstream of Pathfinder Reservoir, before May 1, when the Bureau has advised the other parties that the current water year is likely to be an allocation year, as defined in Appendix E, the Bureau shall be deemed to have placed a priority call for Pathfinder Reservoir, excluding the Pathfinder Modification Project, without the need to formally request such a call. Consistent with applicable state law, the Wyoming State Engineer shall determine whether the call is valid and warrants the regulation of water rights upstream of Pathfinder Reservoir. If the Wyoming State Engineer determines that the call is not valid or that regulation of upstream water rights is not warranted, he/she shall so notify the Bureau and the North Platte Decree Committee in writing and describe the basis for that determination. However, the Wyoming State Engineer's refusal to honor such a call cannot be based upon the provisions of the Modified Decree or this Final Settlement Stipulation other than the provisions of the procedure attached to the Charter as Exhibit 5. In all other circumstances, the call will be applied by the Wyoming State Engineer to discontinue diversions under water rights junior to Pathfinder Reservoir and to limit diversions under water rights senior to Pathfinder Reservoir to one cubic foot per second per seventy acres.

B. With respect to water rights administration along the mainstem of the North Platte River

and the tributaries between Pathfinder Dam and Guernsey Reservoir, before May 1, when the Bureau has advised the other parties that the current water year is likely to be an allocation year, as defined in Appendix E, the Bureau shall be deemed to have placed a priority call for the Inland Lakes (April only), Guernsey, and Glendo storage rights, without the need to formally request such a call. Consistent with applicable state law, the Wyoming State Engineer shall determine whether the call is valid and warrants the regulation of water rights upstream of the calling water right. If the Wyoming State Engineer determines that the call is not valid or that regulation of upstream water rights is not warranted, he/she shall so notify the Bureau and the North Platte Decree Committee in writing and describe the basis for that determination. However, the Wyoming State Engineer's refusal to honor such a call cannot be based upon the provisions of the Modified Decree or this Final Settlement Stipulation other than the provisions of the procedure attached to the Charter as Exhibit 5. In all other circumstances, the call will be applied by the Wyoming State Engineer to discontinue diversions under junior water rights and to limit diversions under senior water rights to one cubic foot per second per seventy acres, with the exception that if Guernsey Reservoir has filled and Glendo Reservoir has not filled, water rights with priorities senior to March 1, 1945 will be allowed to divert up to two cubic feet per second per seventy acres.

C. After May 1, in an allocation year, Wyoming will limit the cumulative irrigation diversions from the mainstem of the North Platte River between Pathfinder Dam and Guernsey Reservoir to 6,600 acre-feet per two week period.

IV. Adjudications

A. Within five years of the final court approval of this stipulation, pursuant to Wyoming law, Wyoming will adjudicate the following:

1. All unadjudicated groundwater permits for irrigation wells hydrologically connected to the North Platte River or its tributaries above Guernsey Reservoir;

2. All unadjudicated surface water permits for irrigation purposes that divert from tributaries and drains that lie within the area bounded by Whalen Diversion Dam on the west, the Ft. Laramie Canal on the south, the Interstate Canal on the north, and the state line on the east, excluding the drainage basins of the Laramie River and Horse Creek;

3. All existing unadjudicated groundwater permits for irrigation wells within the area bounded by Whalen Diversion Dam on the West, 300 feet south of the Ft. Laramie Canal on the south, one mile north of the Interstate Canal on the north and extending downstream to the state line on the east; and

4. All unadjudicated groundwater permits for irrigation wells hydrologically connected to the Laramie River or its tributaries downstream of Wheatland Tunnel #2, exclusive of the Wheatland Irrigation District.

B. All groundwater permits for irrigation wells within the area bounded by Whalen Diversion Dam on the west, 300 feet south of the Ft. Laramie Canal on the south, one mile north of the Interstate Canal on the north and extending downstream to the state line on the east permitted after final court approval of this stipulation shall be adjudicated under Wyoming law within ten years after permitting.

V. Administration

A. Upon any occurrence of "negative natural flow at Orin", as defined in Exhibit 7 to the Charter, the Wyoming State Engineer will administer water rights or take other action as necessary to eliminate the negative natural flow at Orin.

This administration will be implemented pursuant to the procedure attached to the Charter as Exhibit 7.

B. The flow releases that are to be delivered at the mouth of the Laramie River for the months of May through September made from Grayrocks Reservoir pursuant to the Agreement of Settlement and Compromise dated December 4, 1978 shall be protected

administratively by the State of Wyoming to ensure their delivery to the North Platte River. From May through September such releases will be subject to administration and accounting as natural flow. Wyoming will administer the Grayrocks Reservoir water rights and other water rights associated with the Laramie River Power Station pursuant to the Water Administration of the Lower Laramie River System Relating to Basin Electric Power Cooperative's Water Rights, attached to the Charter as Exhibit 3. Said Exhibit 3 cannot be modified without the consent of the North Platte Decree Committee and Basin Electric.

C. Consistent with paragraph XII(a) of the Modified Decree, nothing in this Final Settlement Stipulation or the procedures attached to the Charter shall prevent any water right holder from requesting a priority call on the North Platte River.

VI. Acquisition of Rights

A. Within three years of the final court approval of this stipulation, Wyoming will acquire the rights pertaining to the development of the Corn Creek Irrigation Project and cancel all water rights and water supply obligations of Basin Electric Power Cooperative under its agreement entitled "Contract" dated July 24, 1974, as amended by "Contract Amendment No. 1," dated April 6, 1982, with the Corn Creek Irrigation District.

B. Within three years of the final court approval of this stipulation, Wyoming will acquire the water rights and facilities associated with the Goshen Irrigation District pump station (further described in Permit No. 4883 Enl.). Wyoming will seek a change of use and change of point of diversion under state law to the confluence of the Laramie River and the North Platte River, subject to the following conditions:

1. The use would be limited to supplementing natural flow to meet demand in the Whalen to Tri-State reach of the North Platte River;

2. The maximum seasonal volume for the new use at the new point of diversion will be 2,500 acre feet per year; and

3. The flow releases that are to be delivered at the mouth of the Laramie River for the months of May through September made from Grayrocks Reservoir pursuant to the Agreement of Settlement and Compromise dated December 4, 1978 will not be diminished by such change of use or change of point of diversion.

VII. Acreage in the Kendrick Project

The Kendrick Project was found feasible by the Secretary of the Interior on August 27, 1935, and approved by the President on August 30, 1935, under terms of section 4 of the Act of June 25, 1910 (36 Stat. 836), and subsection B of section 4 of the Act of December 5, 1924 (43 Stat. 702). Subsection B of

section 4 of the Act of December 5, 1924, provided that the project would be constructed in two units of 35,000 acres and 31,000 acres respectively. The construction of the second unit of 31,000 acres was to be deferred, however, until the results of conservation and legal utilization of water were ascertained.

Pursuant to the Act of September 4, 1957 (Public Law 85-283, 71 Stat. 608) and the Amendatory Contract between the United States of America and the Casper-Alcova Irrigation District, no more than 35,000 acres of land in the First Unit of the Kendrick Project may be irrigated. The right to the use of the major works of the Kendrick Project for the Second Unit remains suspended until (a) a determination has been made that an adequate water supply is available for the irrigation of lands of the Second Unit under water permits for the Kendrick Project issued by the State of Wyoming, (b) the Casper-Alcova Irrigation District has undertaken the obligation to repay a proportionate share of the construction costs of project works, and (c) works for the delivery and distribution of water for the lands of the Second Unit have been constructed.

The United States will provide notice to the states of Nebraska, Wyoming and Colorado no less than twelve months in advance of taking any of the above steps. The irrigated acreage under the Kendrick Project must remain within the Kendrick Project.

VIII. Additional Reporting

A. Wyoming will report to the North Platte Decree Committee water right applications and associated water use of irrigation wells permitted after January 1, 2001 within the

boundaries of Wheatland Irrigation District. The obligation in this paragraph will be implemented pursuant to procedures attached to the Charter as Exhibit 13.

B. Wyoming will report to the North Platte Decree Committee all municipal, industrial and export water right applications and petitions for water right changes of use within the Wyoming North Platte River basin, excluding the area upstream of Wheatland Tunnel #2 on the Laramie River and excluding those uses defined as de minimis in paragraph XII(f) of the Modified Decree. The obligation in this paragraph will be implemented pursuant to procedures attached to the Charter as Exhibit 14.

C. Wyoming will report to the North Platte Decree Committee all water right applications for construction of new dams or enlargements of existing dams with a proposed reservoir capacity for storage of water originating in the North Platte River basin of greater than twenty acre-feet and ground water recharge projects within the Wyoming North Platte River basin, excluding the Laramie River basin upstream of Wheatland Tunnel #2. The obligation in this paragraph will be implemented pursuant to procedures attached to the Charter as Exhibit 15.

D. The NPDC will develop procedures to monitor water use in the area between Guernsey Dam and the Whalen Diversion Dam.

IX. Approval, Adoption and Modification of Procedures

The procedures attached to the Charter as exhibits 4 through 15 are hereby approved and adopted. Such procedures may be modified from time to time by the North Platte Decree Committee if the modifications are consistent with this stipulation and the Modified Decree.

X. Entirety of Agreement

This Final Settlement Stipulation and appendices thereto, the Modified Decree, the Charter with exhibits, and the Joint Motion for Approval of Stipulation, Modification of Decree and Dismissal With Prejudice, together constitute the entire agreement among the parties hereto. No previous representations, inducements, promises or agreements, oral or otherwise, among the parties not contained in the documents identified in this paragraph or made in compliance with the requirements and obligations contained in the documents identified in this paragraph shall be of any force or effect. Nothing in this paragraph shall be construed as preventing the States of Nebraska, Wyoming, and Colorado and the United States of America from modifying the Charter as provided in paragraph II of this Final Settlement Stipulation. Nothing in this paragraph shall be construed as preventing the North Platte Decree Committee from modifying administrative procedures as provided in Article V. of the Charter.

THE STATE OF NEBRASKA

/s/ Mike Johanns
Mike Johanns, Governor States

THE STATE OF WYOMING

/s/ Jim Geringer
Jim Geringer, Governor

THE UNITED STATES OF AMERICA

/s/ Barbara D. Underwood
Barbara D. Underwood,
Action Solicitor General

THE STATE OF NEBRASKA

/s/ Don Stenberg — April 4, 2001
Don Stenberg, Attorney General — Date

/s/ Richard Simms — March 26, 2001
Richard Simms, Counsel of Record — Date

THE STATE OF WYOMING

/s/ Gay V. Woodhouse — March 13, 2001
Gay V. Woodhouse, Attorney General — Date

/s/ Thomas J. Davidson — March 13, 2001
Thomas J. Davidson, Counsel of Record — Date

THE STATE OF COLORADO

/s/ Ken Salazar — 4/3/2001
Ken Salazar, Attorney General — Date

/s/ Wendy C. Weiss — April 3, 2001
Wendy C. Weiss, Counsel of Record — Date

THE UNITED STATES OF AMERICA

/s/ Andrew F. Walch — April 3, 2001
Andrew F. Walch, Counsel of Record — Date

BASIN ELECTRIC POWER COOPERATIVE
Project Manager for the Missouri Basin Power Project

/s/ Richmond F. Allan _____ March 14, 2001
Richmond F. Allan, Counsel of Record Date

/s/ Claire Olson _____ March 14, 2001
Claire Olson, General Counsel Date

Attachments

Appendix A	Modified North Platte Decree
Appendix B	Redline/strikeout Version of the North Platte Decree
Appendix C	Amendment of the 1953 Order to Provide for Use of Glendo Storage Water
Appendix D	Procedures for 1945 Decree Paragraph II(b) [now paragraph II(e) of the Modified Decree] Storage Accounting
Appendix E	Stipulation Among the State of Wyoming, The State of Nebraska, and the United States Relating to the Allocation of Water During Periods of Shortage
Appendix F	Amendment of the 1953 Order to Provide for the Modification of Pathfinder Reservoir
Appendix G	North Platte Decree Committee Charter

Appendix A

Modified North Platte Decree

NEBRASKA

v.

WYOMING et al

No. 108, Original

MODIFIED DECREE

[Entered on October 8, 1945, *Nebraska v. Wyoming*, 325 U.S. 589, 665 (1945), modified and supplemented on June 15, 1953, *Nebraska v. Wyoming*, 345 U.S. 981 (1953), and further modified _____, 2001, ____ U.S. ____ (2001)]

This Court equitably apportioned the North Platte River among the States of Colorado, Wyoming, and Nebraska in 1945. *Nebraska v. Wyoming*, 325 U.S. 589, 665 (1945). The Decree was amended pursuant to a stipulation and joint motion of the parties in 1953. *Nebraska v. Wyoming*, 345 U.S. 981 (1953). In 1986, the State of Nebraska filed suit against the State of Wyoming. In 1987, Wyoming filed counterclaims against Nebraska. This Court resolved certain issues on cross-motions for summary judgment in 1993. *Nebraska v. Wyoming*, 507 U.S. 584 (1993). In 1995, this Court granted in part and denied in part Nebraska's motion to amend its petition, and granted in part and denied in part Wyoming's motion to amend its counterclaims and to file cross-claims against the United States. *Nebraska v. Wyoming*, 515 U.S. 1 (1995). The parties have agreed upon this Court's entry of this Modified Decree to a dismissal with prejudice of all claims, counterclaims, and cross-claims for which leave to file was or could have been sought in this case.

The parties to this cause having filed a Final Settlement Stipulation dated March 13, 2001, which includes the parties' agreement to create the North Platte Decree Committee to assist them in monitoring, administering, and implementing this Modified Decree, and a Joint Motion for Approval of Stipulation, Modification of Decree and Dismissal with Prejudice, and the Court being fully advised:

IT IS ORDERED:

That the Final Settlement Stipulation dated March 13, 2001, is hereby approved and adopted;

That all claims, counterclaims, and cross-claims for which leave to file was or could have been sought in this case are hereby dismissed with prejudice; and

That the Decree of October 8, 1945, as amended on June 15, 1953, is hereby modified as follows:

I. The State of Colorado, its officers, attorneys, agents and employees, be and they are hereby severally enjoined:

(a) From diverting or permitting the diversion of water from the North Platte River and its tributaries for the irrigation of more than a total of 145,000 acres of land in Jackson County, Colorado, during any one irrigation season;

(b) From storing or permitting the storage of more than a total amount of 17,000 acre feet of water for irrigation purposes from the North Platte River and its tributaries in Jackson County, Colorado, between October 1 of any year and September 30 of the following year;

(c) From exporting out of the basin of the North Platte River and its tributaries in Jackson County, Colorado, to any other stream basin or basins more than 60,000 acre feet of water in any period of ten consecutive years reckoned in continuing progressive series beginning with October 1, 1945.

II. The State of Wyoming, its officers, attorneys, agents and employees, be and they are hereby severally enjoined:

(a) From diverting or permitting the diversion of water for irrigation from the North Platte River and its tributaries, including water from hydrologically connected groundwater wells, upstream of Pathfinder Dam for the consumption in any period of ten consecutive years reckoned in continuing progressive series, of more than the largest amount of water consumed for irrigation from such sources in any ten consecutive year period between 1952 and 1999, inclusive. This injunction becomes effective the first full calendar year after the date of entry of this Modified Decree. The consumptive use of irrigation water in this area to be counted under this injunction shall include the following:

(1) Water consumed for irrigation purposes on lands irrigated with surface water diversions of natural flow;

(2) Water consumed for irrigation purposes on lands irrigated with water stored pursuant to paragraph II(e);

(3) Water consumed for irrigation purposes on lands irrigated by water from hydrologically connected groundwater wells;

(4) Water consumed for purposes other than irrigation under water rights transferred since October 8, 1945 from an irrigation use to another use;

The largest amount of water consumed for irrigation from such sources in any ten consecutive year period between 1952 and 1999 inclusive, has been determined by the parties pursuant to a methodology and procedures approved and adopted in the Final Settlement Stipulation to be 1,280,000 acre feet. For the purpose of determining compliance with this injunction, the amount of water consumed for irrigation from such sources shall be determined by the same methodology and procedures. After ten years of administration, accounting and reporting under this injunction, the methodology and the ten consecutive year limit will be reviewed by the North Platte Decree Committee pursuant to procedures approved and adopted in the Final Settlement Stipulation to determine if there is a better methodology for calculating the largest amount of water consumed for irrigation in such ten consecutive year period and for determining compliance. In making such calculation, any acreage historically reported by the Wyoming State Engineer as irrigated by direct flow surface water or stored water or as transfers, between 1952 and 1999 inclusive, and used in the existing methodology, shall not be changed. In addition, the other acreage used in the existing methodology shall not be changed unless the North Platte Decree Committee agrees that such change results in a more accurate determination of acres actually irrigated between 1952 and 1999 inclusive. In any new methodology, to determine compliance with the consumptive use limit, the acreage above Pathfinder Dam, when combined with the acreage between Pathfinder Dam and Guernsey Reservoir, cannot exceed the 226,000 acreage limitation pursuant to paragraph II(c). If Nebraska, Wyoming and the United

States agree on a new methodology and a new limit, they shall notify the Court and this paragraph will be modified accordingly. As provided in paragraph XIII, absent agreement on a new methodology and a new limit, Nebraska, Wyoming, or the United States may seek recourse to the Court to resolve these issues.

(b) From diverting or permitting the diversion of water for irrigation from the North Platte River and its tributaries, including water from hydrologically connected groundwater wells, between Pathfinder Dam and Guernsey Reservoir for the consumption in any period of ten consecutive years reckoned in continuing progressive series, exclusive of the Kendrick Project, of more than the largest amount of water consumed for irrigation from such sources in any ten consecutive year period between 1952 and 1999, inclusive. This injunction becomes effective the first full calendar year after the entry of this Modified Decree. The consumptive use of irrigation water in this area to be counted under this injunction shall include the following:

(1) Water consumed for irrigation purposes on lands irrigated with surface water diversions of natural flow;

(2) Water consumed for irrigation purposes on lands irrigated with water stored in reservoirs that store water from the tributaries between Pathfinder Dam and Guernsey Reservoir;

(3) Water consumed for irrigation purposes on lands irrigated by water from hydrologically connected groundwater wells;

(4) Water consumed for purposes other than irrigation with water rights transferred since October 8, 1945 from an irrigation use to another use;

The largest amount of water consumed for irrigation from such sources in any ten consecutive year period between 1952 and 1999 inclusive, has been determined by the parties pursuant to a methodology and procedures approved and adopted in the Final Settlement Stipulation to be 890,000 acre feet. For the purpose of determining compliance with this injunction, the amount of water consumed for irrigation from such sources shall be determined by the same methodology and procedures. After ten years of administration, accounting and reporting under this injunction, the methodology and the ten consecutive year limit will be reviewed by the North Platte Decree Committee pursuant to procedures approved and adopted in the Final Settlement Stipulation to determine if there is a better methodology for calculating the largest amount of water consumed for irrigation in such ten consecutive year period and for determining compliance. In making such calculation, any acreage historically reported by the Wyoming State Engineer as irrigated by direct flow surface water or stored water or as transfers, between 1952 and 1999 inclusive, and used in the existing methodology, shall not be changed. In addition, the other acreage used in the existing methodology shall not be changed unless the North Platte Decree Committee agrees that such change results in a more accurate determination of acres actually irrigated between 1952 and 1999 inclusive. In any new methodology, to determine compliance with the consumptive use limit, the acreage above Pathfinder Dam, when combined with the acreage between Pathfinder Dam and Guernsey Reservoir, cannot exceed the 226,000 acreage limitation pursuant to paragraph II(c). If Nebraska, Wyoming and the United States agree on a new methodology and a new limit, they

shall notify the Court and this paragraph will be modified accordingly. As provided in paragraph XIII, absent agreement on a new methodology and a new limit, Nebraska, Wyoming, or the United States may seek recourse to the Court to resolve these issues.

(c) From diverting or permitting the diversion of water from the North Platte River and its tributaries, including water from hydrologically connected groundwater wells, upstream of Guernsey Reservoir for the intentional irrigation of more than a total of 226,000 acres of land in Wyoming during any one irrigation season, exclusive of the Kendrick Project. The acres in this area to be counted under this injunction shall include the following, provided that an intentionally irrigated acre that receives water from more than one source shall be counted only once:

(1) Acres irrigated by surface water diversions of natural flow;

(2) Acres irrigated by water stored pursuant to paragraph II(e);

(3) Acres irrigated by water stored in reservoirs that store water from the tributaries between Pathfinder Dam and Guernsey Reservoir;

(4) Acres irrigated with water from hydrologically connected groundwater wells;

(5) The equivalent of the acres found by order of the Wyoming State Board of Control to have been historically irrigated and that formed the basis for the transfer of water rights where water rights on the North Platte River upstream of Guernsey Reservoir or the tributaries upstream of Pathfinder Dam are transferred after

October 8, 1945, from an irrigation use to another use; provided, however, that the amount of acres counted for a given year may be reduced proportionately to the extent that the actual diversion and use of water under the transferred water right during that year are less than the total diversion and use allowed by the order approving such transfer;

(6) The equivalent of the acres found by order of the Wyoming State Board of Control to have been historically irrigated and that formed the basis for the transfer of water rights where water rights on the tributaries entering the North Platte River between Pathfinder Dam and Guernsey Reservoir are transferred after January 1, 2001, from an irrigation use to another use; provided, however, that the amount of acres counted for a given year may be reduced proportionately to the extent that the actual diversion and use of water under the transferred water right during that year are less than the total diversion and use allowed by the order approving such transfer;

Ten years after the entry of this Modified Decree, the provision that enjoins Wyoming from intentionally irrigating more than 226,000 acres upstream of Guernsey Reservoir will be replaced with two injunctions, one that limits the number of acres that can be irrigated above Pathfinder Dam and one that limits the number of acres that can be irrigated between Pathfinder Dam and Guernsey Reservoir. Wyoming has the discretion to designate the irrigated acreage limitation above Pathfinder Dam and the irrigated acreage limitation between Pathfinder Dam and Guernsey Reservoir, so long as the total irrigated acreage limitation does not exceed 226,000 acres. After Wyoming makes such designation, Nebraska, Wyoming and the United States will so notify the Court and the Modified Decree will be modified accordingly.

(d) From diverting or permitting the diversion of water from the Laramie River and its tributaries, including water from hydrologically connected groundwater wells, downstream of the Wheatland Irrigation District's Tunnel No. 2, exclusive of the area within the Wheatland Irrigation District, for the intentional irrigation of more than a total of 39,000 acres of land in Wyoming during any one irrigation season. The acres in this area to be counted under this injunction shall include the following, provided that an intentionally irrigated acre that receives water from more than one source shall be counted only once:

(1) Acres irrigated by surface water diversions of natural flow;

(2) Acres irrigated by stored irrigation water released from a reservoir;

(3) Acres irrigated with water from hydrologically connected groundwater wells;

(4) The equivalent of the acres found by order of the Wyoming State Board of Control to have been historically irrigated and that formed the basis for the transfer of water rights where water rights are transferred after January 1, 2001, from an irrigation use that is subject to the limitations of this paragraph II(d) to another use; provided, however, that the amount of acres counted for a given year may be reduced proportionately to the extent that the actual diversion and use of water under the transferred water right during that year are less than the total diversion and use allowed by the order approving such transfer;

(e) From storing or permitting the storage of more than a total amount of 18,000 acre feet of water for irrigation purposes from the North Platte River and its

tributaries above Pathfinder Reservoir between October 1 of any year and September 30 of the following year, exclusive of Seminoe Reservoir.

III. The State of Wyoming, its officers, attorneys, agents and employees, be and they are hereby severally enjoined from storing or permitting the storage of water in Pathfinder, Guernsey, Seminoe, Alcova and Glendo Reservoirs and the Inland Lakes otherwise than in accordance with the relative storage rights, as among themselves, of such reservoirs, which are hereby defined and fixed as follows:

First, Pathfinder Reservoir;
Second, Inland Lakes with the same priority date as Pathfinder Reservoir;
Third, Guernsey Reservoir;
Fourth, Seminoe Reservoir;
Fifth, Alcova Reservoir; and
Sixth, Glendo Reservoir;

Provided, however, that water accruing in priority to the storage right of a reservoir listed above, and water accruing to the Glendo Reservoir reregulating space pursuant to paragraph XVII(g), may be physically stored in, released from, or exchanged with another reservoir so long as the water is accounted in accordance with the foregoing rule of priority and only when such storage, release, or exchange will not materially interfere with the administration of water for irrigation purposes according to the priority decreed for the French Canal and the State Line Canals. Further, in accordance with the opinion of this Court dated April 20, 1993 (507 U.S. 584) the United States has the right to divert 46,000 acre feet of water during the non-irrigation season months of October, November and April for storage in the Inland Lakes. Historically, pursuant to annual agreements

entered in the discretion of the parties, such diversions have occurred at a rate not exceeding 910 cubic feet per second from gains accruing to the river downstream of Alcova Reservoir. This right shall be administered in accordance with procedures to be reviewed and adopted annually by the North Platte Decree Committee.

IV. The State of Wyoming, its officers, attorneys, agents and employees, be and they are hereby severally enjoined from storing or permitting the storage of water in Pathfinder, Guernsey, Seminoe, Alcova and Glendo Reservoirs, and from the diversion of natural flow water through the Casper Canal for the Kendrick Project between and including May 1 and September 30 of each year otherwise than in accordance with the rule of priority in relation to the appropriations of the Nebraska lands supplied by the French Canal and by the State Line Canals, which said Nebraska appropriations are hereby adjudged to be senior to said five reservoirs and said Casper Canal, and which said Nebraska appropriations are hereby identified and defined, and their diversion limitations in second feet and seasonal limitations in acre feet fixed as follows:

Lands	Canal	Limitation in Sec. Feet	Seasonal Limitation in Acre Feet
Tract of 1,025 acres	French	15	2,227
Mitchell Irrigation District	Mitchell	195	35,000
Gering Irrigation District	Gering	193	36,000
Farmers Irrigation District	Tri-State	748	183,050
Ramshorn Irrigation District	Ramshorn	14	3,000

This paragraph limits the extent to which these canals may stop the federal reservoirs from storing water and the Casper Canal from diverting natural flow water. It does not place any absolute ceilings or other restrictions on the quantities of water that these canals may actually divert. *Nebraska v. Wyoming*, 507 U.S. 584, 603 (1993); *see also Nebraska v. Wyoming*, 515 U.S. 1, 10 (1995).

V. The natural flow in the Guernsey Dam to Tri-State Dam section between and including May 1 and September 30 of each year, including the contribution of Spring Creek, be and the same hereby is apportioned between Wyoming and Nebraska on the basis of twenty-five per cent to Wyoming and seventy-five per cent to Nebraska, with the right granted Nebraska to designate from time to time the portion of its share which shall be delivered into the Interstate, Fort Laramie, French and Mitchell Canals for use on the Nebraska lands served by these canals. The natural flow in a portion of certain tributaries and drains as defined in paragraph V(a) shall also be included in the natural flow apportioned by this paragraph. The State of Nebraska, its officers, attorneys, agents, and employees, and the State of Wyoming, its officers, attorneys, agents, and employees, are hereby enjoined and restrained from diversion or use contrary to this apportionment, provided that in the apportionment of water in this section the flow for each day, until ascertainable, shall be assumed to be the same as that of the preceding day, as shown by the measurements and computations for that day. Provided further that:

(a) Diversions under surface water rights for irrigation purposes from those parts of the tributaries and drains to the North Platte River that lie within the area bounded by Whalen Diversion Dam on the west, the Ft. Laramie Canal on the south, the Interstate Canal on the

north, and the Wyoming-Nebraska state line on the east, excluding the drainage basins of the Laramie River and Horse Creek, shall be administered and accounted as diversions of natural flow for the purposes of the foregoing percentage apportionment, unless the depletions to the North Platte River resulting from such diversions are replaced. The amount of such depletions, and the method for their replacement in the ordinary course of administration, shall be determined and implemented pursuant to procedures that have been approved and adopted in the Final Settlement Stipulation.

(b) Diversions for irrigation purposes from wells with water right priorities between October 8,1945, and including December 31, 2000, located within the area bounded by Whalen Diversion Dam on the west, 300 feet south of the Ft. Laramie Canal on the south, one mile north of the Interstate Canal on the north, and the Wyoming-Nebraska state line on the east, shall be regulated as follows: To the extent the pumping of such wells results in depletions to the North Platte River between Whalen Diversion Dam and the state line or to the portions of tributaries described in paragraph V(a) between May 1 and September 30, such depletions shall be replaced or the pumping shall be regulated to prevent such depletions, unless such depletions occur when the natural flow in the Guernsey Dam to Tri-State Diversion Dam reach exceeds irrigation demands in that reach. The amount of such depletions, and the method for their replacement in the ordinary course of administration shall be determined and implemented pursuant to procedures that have been approved and adopted in the Final Settlement Stipulation.

(c) Diversions for irrigation purposes from wells with water right priorities after December 31, 2000, located within the area bounded by Whalen Diversion

Dam on the west, 300 feet south of the Ft. Laramie Canal on the south, one mile north of the Interstate Canal on the north, and the Wyoming-Nebraska state line on the east, shall be regulated or subject to depletion replacement pursuant to procedures that have been approved and adopted in the Final Settlement Stipulation.

(d) The river carriage and reservoir loss calculations established in the Decree of October 8, 1945, have been replaced with administrative procedures attached to the North Platte Decree Committee Charter. These procedures may be modified from time to time by the North Platte Decree Committee.

VI. This Modified Decree is intended to and does deal with and apportion only the natural flow of the North Platte River. Storage water shall not be affected by this Modified Decree, and the owners of rights therein shall be permitted to distribute the same in accordance with any lawful contracts which they may have entered into or may in the future enter into without interference because of this Modified Decree.

VII. Such additional gauging stations and measuring devices at or near the Wyoming-Nebraska state line, if any, as may be necessary for making any apportionment herein decreed, shall be constructed and maintained at the joint and equal expense of Wyoming and Nebraska to the extent that the costs thereof are not paid by others.

VIII. The State of Wyoming, its officers, attorneys, agents and employees be and they are hereby severally enjoined from diverting or permitting the diversion of water from the North Platte River or its tributaries at or above Alcova Reservoir in lieu of or in exchange for return flow

water from the Kendrick Project reaching the North Platte River below Alcova Reservoir.

IX. The State of Wyoming and the State of Colorado be and they hereby are each required to prepare and maintain complete and accurate records of the total area of land irrigated and the storage and exportation of the water of the North Platte River and its tributaries within those portions of their respective jurisdictions covered by the provisions of paragraphs I, II(c), II(d), and II(e). The State of Wyoming is also required to prepare and maintain complete and accurate records of the total consumption of irrigation water in the portion of its jurisdiction covered by paragraphs II(a) and II(b). The record keeping and reporting required of the State of Wyoming by this paragraph shall be implemented in accordance with procedures that have been approved and adopted in the Final Settlement Stipulation. The records required by this paragraph shall be available for inspection at all reasonable times; provided, however, that such records shall not be required in reference to the water uses permitted by paragraphs X and XII(f).

X. This Modified Decree shall not affect or restrict the use or diversion of water from the North Platte River and its tributaries in Colorado or Wyoming for ordinary and usual domestic, municipal and stock watering purposes and consumption.

XI. For the purposes of this Modified Decree:

(a) "Season" or "seasonal" refers to the irrigation season, May 1 to September 30, inclusive;

(b) The term "storage water" as applied to releases from reservoirs owned and operated by the United States is defined as any water which is released from

reservoirs for use on lands under canals having storage contracts in addition to the water which is discharged through those reservoirs to meet natural flow uses permitted by this Modified Decree;

(c) "Natural flow water" shall be taken as referring to all water in the stream except storage water;

(d) Return flows from the Kendrick Project shall be deemed to be "natural flow water" when they have reached the North Platte River, subject to the same diversion and use as any other natural flow in the stream;

(e) "Hydrologically connected groundwater wells" are defined in procedures attached to the North Platte Decree Committee Charter as Exhibits 4, 6, and 12 approved and adopted in the Final Settlement Stipulation. The North Platte Decree Committee may modify such definition in accordance with the Final Settlement Stipulation.

XII. This Modified Decree shall not affect:

(a) The relative rights of water users within any one of the States who are parties to this suit except as may be otherwise specifically provided herein;

(b) Such claims as the United States has to storage water under Wyoming law nor will the Modified Decree in any way interfere with the ownership and operation by the United States of the various federal storage and power plants, works and facilities;

(c) The use or disposition of any additional supply or supplies of water that may be imported into the basin of the North Platte River from the water shed

of an entirely separate stream or the return flow from any such supply or supplies;

(d) The apportionment heretofore made by this Court between the States of Wyoming and Colorado of the waters of the Laramie River, a tributary of the North Platte River, down to and including the Wheatland Project. The waters of the Laramie River below the Wheatland Project are not apportioned by this Modified Decree. The only existing limitation in this Modified Decree on Wyoming's use of the Laramie River is provided in paragraph II(d);

(e) The apportionment made by the compact between the States of Nebraska and Colorado, apportioning the water of the South Platte River;

(f) Water diverted for de minimis uses, defined as:

(1) Ponds with capacities of twenty acre feet or less for purposes other than irrigated agriculture;

(2) Wells with capacities less than or equal to twenty-five gallons per minute for a single project for purposes other than irrigated agriculture; and

(3) Miscellaneous uses that withdraw or divert less than fifty acre feet per year for a single project other than stock watering, domestic or irrigated agriculture.

XIII. Any of the parties may apply at the foot of this Modified Decree for its amendment or for further relief. Any dispute related to compliance or administration shall be submitted to and addressed by the North Platte Decree Committee before a party may seek leave of the Court to

bring such dispute before the Court. The Court retains jurisdiction of this suit for the purpose of any order, direction, or modification of the decree, or any supplementary decree, that may at any time be deemed proper in relation to the subject matter in controversy. Further, the Court retains jurisdiction, upon proper showing, to adjudicate all matters for which authority or responsibility is granted to the North Platte Decree Committee by this Modified Decree or the Final Settlement Stipulation. Matters with reference to which further relief may hereafter be sought shall include, but shall not be limited to, the following:

(a) The question of the applicability and effect of the Act of August 9, 1937 (50 Stat. 564, 595-596) upon the rights of Colorado and its water users;

(b) The question of the effect upon the rights of upstream areas of the construction or threatened construction in downstream areas of any projects not now existing or recognized in this Modified Decree;

(c) The question of the effect of the construction or threatened construction of storage capacity not now existing on tributaries entering the North Platte River between Pathfinder Reservoir and Guernsey Reservoir;

(d) The question of the right to divert at or above the headgate of the Casper Canal any water in lieu of, or in exchange for, any water developed by artificial drainage to the river of sump areas on the Kendrick Project;

(e) Any question relating to the joint operation of Pathfinder, Guernsey, Seminoe, Alcova and Glendo Reservoirs whenever changed conditions make such joint operation possible;

(f) Any change in conditions making modification of the Modified Decree or the granting of further relief necessary or appropriate;

(g) Failure of the North Platte Decree Committee, or the parties to the North Platte Decree Committee, to act upon, resolve or agree on a matter that has been submitted to the North Platte Decree Committee.

XIV. The costs in the original cause were apportioned and paid pursuant to previous order of this Court. The costs in the present cause and the payment of the fees and expenses of the Special Master have been apportioned and paid according to previous orders of this Court with which the parties agree and the Court hereby confirms.

XV. The clerk of this Court shall transmit to the Governors and Attorneys General of the States of Colorado, Wyoming, and Nebraska, the Solicitor General of the United States of America, and Basin Electric Power Cooperative, copies of this Modified Decree duly authenticated under the seal of this Court.

XVI. Whatever claims or defenses the parties or any of them may have in respect to the application, interpretation or construction of the Act of August 9, 1937 (50 Stat. 564, 595-596) shall be determined without prejudice to any party arising because of any development of the Kendrick Project occurring subsequent to October 1, 1951.

XVII. The following provisions are effective for the operation of Glendo Dam and Reservoir:

(a) The operation of the Glendo Project shall not impose any demand on areas at or above Seminoe Reservoir which will prejudice any rights that the States of Colorado or Wyoming might have to secure a modification of the Modified Decree permitting an expansion of water uses in the natural basin of the North Platte River in Colorado or above Seminoe Reservoir in Wyoming.

(b) The operation of Glendo Reservoir shall not affect the regime of the natural flow of the North Platte River except that not more than 40,000 acre feet of the natural flow of the North Platte River and its tributaries which cannot be stored in upstream reservoirs under the provisions of this Modified Decree may be stored in Glendo Reservoir during any water year for disposition by the United States under contracts, in addition to evaporation losses on such storage, and further, the amount of water that may be held in storage at any one time for disposition by the United States under contracts, including carryover storage, shall never exceed 100,000 acre feet. Such storage water shall be disposed of in accordance with contracts executed or to be hereafter executed, in compliance with federal law, and may be used for any beneficial purpose in Nebraska within the Platte River basin to the extent of 25,000 acre feet annually and for any beneficial purpose in Wyoming within the Platte River basin to the extent of 15,000 acre feet annually. The above limitation on the amount of storage of natural flow does not apply: 1) to flood water which may be temporarily stored in any capacity allocated for flood control in Glendo Reservoir; 2) to water originally stored in Pathfinder Reservoir which may be temporarily re-stored in Glendo Reservoir after its release from Pathfinder and before its delivery pursuant to contract; 3) to Inland Lakes account water temporarily stored in accordance with this Court's Order of April 20, 1993; 4) to water which may be impounded behind Glendo Dam, as provided in the Bureau

of Reclamation Definite Plan Report for the Glendo Unit, Wyoming, dated December 1952, as revised through December 1959 (Glendo Definite Plan Report) for the purpose of creating a head for the development of water power; or 5) to water in Glendo Reservoir used for the purposes described in paragraph XVII(g).

(c) Each State may substitute or supplement quantities of storage water obtained under other contractual arrangements with Glendo Reservoir storage supplies. Subject to contractual arrangements with the United States Bureau of Reclamation, including any required compliance with the Endangered Species Act, 16 U.S.C. § 1531 et seq. and the National Environmental Policy Act, 42 U.S.C. § 4321 et seq., each State shall also enjoy unrestricted use of its respective storage allocation in Glendo Reservoir, so long as the use is below Glendo Reservoir and within the Platte River basin.

(d) Glendo Reservoir storage water may be consumptively used in Wyoming by exchange or other means, upstream of Glendo Reservoir under the terms of this paragraph. For every two acre feet of Glendo storage water diverted upstream of Glendo Reservoir pursuant to such an exchange, all of which may be fully consumed, an additional acre foot of Wyoming's Glendo storage allocation shall be contracted at the same time for storage and release from Glendo Reservoir and passed through Guernsey Reservoir to the North Platte River. Except as may be modified in accordance with paragraph XVII(e), or by agreement of the parties, such additional water shall be released from the reservoir at the same time and at a rate proportionate to the diversion of the water contracted for use upstream from Glendo Reservoir during the irrigation season. During the non-irrigation season, due to operational constraints of the outlets at Guernsey Reservoir, such additional water will be

held in the Glendo account and released prior to the first of May as may be operationally practical. Except as provided in paragraph XVII(e), once released, such additional water shall be considered natural flow water for purposes of the 75/25 apportionment specified in paragraph V.

(e) If the valid exercise or enforcement of federal law or authority requires Wyoming or a water user within Wyoming to cause the release of a portion of Wyoming's Glendo allocation for environmental purposes downstream of Glendo Reservoir, the additional water contracted and released under paragraph XVII(d) may be dedicated to and used for that purpose. Any water released pursuant to such requirement shall not be considered natural flow but shall be administered and protected as storage water in accordance with state law within both Wyoming and Nebraska until used for its intended purposes.

(f) Storage water in Glendo Reservoir from either State's allocation may be used for fish and wildlife purposes downstream of Glendo Reservoir under contractual arrangements with the United States Bureau of Reclamation, subject to approval of Wyoming for contracts for water from Wyoming's storage allocation and subject to approval of Nebraska for contracts for water from Nebraska's storage allocation. Any water released pursuant to such agreement shall not be considered natural flow but shall be administered and protected as storage water in accordance with state law within both Wyoming and Nebraska until used for its intended purposes.

(g) The United States Bureau of Reclamation has the discretion to hold water in Glendo Reservoir in excess of the limitations stated in paragraph XVII(b) in accordance with the operation of the reregulation space in Glendo Reservoir under Permit No. 5998 Res. and

Certificate of Construction of Reservoir, as clarified by Order of the Wyoming State Board of Control dated November 29, 2000. Such water may be used, subject to federal law, for the following purposes:

(1) to replace water that passed the Wyoming-Nebraska state line in excess of the amount ordered by canals with storage contracts below the Wyoming-Nebraska state line as the unintended result of physical limitations on the ability to control water deliveries;

(2) to replace evaporation from the storage ownership accounts of Pathfinder Reservoir, Guernsey Reservoir, Seminoe Reservoir, Alcova Reservoir, and Glendo Reservoir; and

(3) to supplement the natural flow that is available for apportionment pursuant to paragraph V.

XVIII. The creation of the North Platte Decree Committee is hereby approved and ratified. Procedures that have been approved and adopted in the Final Settlement Stipulation may be modified from time to time by the North Platte Decree Committee if the modifications are consistent with the Modified Decree. In the event of a conflict between any procedure, the Final Settlement Stipulation and the Modified Decree, the provisions of this Modified Decree shall control.

Appendix B

Redline/Strikeout Version of the North Platte Decree

NEBRASKA
v.
WYOMING et al
~~(325 U.S. 589)~~
No. 108, Original

MODIFIED DECREE

[Entered on October 8, 1945, ~~Order Modifying and Supplementing Decree Entered June 15, 1953)~~ *Nebraska v. Wyoming*, 325 U.S. 589, 665 (1945), modified and supplemented on June 15, 1953, *Nebraska v. Wyoming*, 345 U.S. 981 (1953), and further modified _____, 2001, ____ U.S. ____ (2001)]

~~This cause having been heretofore submitted on the report of the Special Master and the exceptions of the parties thereto, and the Court being now fully advised in the premises:~~

~~The joint motion for approval of~~

This Court equitably apportioned the North Platte River among the States of Colorado, Wyoming, and Nebraska in 1945. *Nebraska v. Wyoming*, 325 U.S. 589, 665 (1945). The Decree was amended pursuant to a stipulation and ~~to modify and supplement the decree is granted and the following order is entered in compliance with the stipulation:~~ joint motion of the parties in 1953. *Nebraska v. Wyoming*, 345 U.S. 981 (1953). In 1986, the State of Nebraska filed suit against the State of Wyoming. In 1987, Wyoming filed counterclaims against Nebraska. This Court resolved certain issues on cross-motions for summary judgment in 1993. *Nebraska v. Wyoming*, 507 U.S. 584 (1993). In 1995, this Court granted in part and denied in part Nebraska's motion to amend its petition, and granted in part and denied in part

Wyoming's motion to amend its counterclaims and to file cross-claims against the United States. *Nebraska v. Wyoming*, 515 U.S. 1 (1995). The parties have agreed upon this Court's entry of this Modified Decree to a dismissal with prejudice of all claims, counterclaims, and cross-claims for which leave to file was or could have been sought in this case.

The parties to this cause having filed a ~~stipulation, dated January 15, 1953, and a joint motion for approval of the stipulation and to modify and supplement the decree entered on October 8, 1945 (325 U.S. 665)~~ Final Settlement Stipulation dated March 13, 2001, which includes the parties' agreement to create the North Platte Decree Committee to assist them in monitoring, administering, and implementing this Modified Decree, and a Joint Motion for Approval of Stipulation, Modification of Decree and Dismissal with Prejudice, and the Court being fully advised:

IT IS ORDERED:

That the Final Settlement S~~s~~tipulation dated ~~January 14, 1953, is approved; and~~ March 13, 2001, is hereby approved and adopted;

That all claims, counterclaims, and cross-claims for which leave to file was or could have been sought in this case are hereby dismissed with prejudice; and

That the Decree of October 8, 1945, as amended on June 15, 1953, is hereby modified as follows:

I. The State of Colorado, its officers, attorneys, agents and employees, be and they are hereby severally enjoined:

(a) From diverting or permitting the diversion of water from the North Platte River and its tributaries for the irrigation of more than a total of 145,000 acres of land in Jackson County, Colorado, during any one irrigation season;

(b) From storing or permitting the storage of more than a total amount of 17,000 acre feet of water for irrigation purposes from the North Platte River and its tributaries in Jackson County, Colorado, between October 1 of any year and September 30 of the following year;

(c) From exporting out of the basin of the North Platte River and its tributaries in Jackson County, Colorado, to any other stream basin or basins more than 60,000 acre feet of water in any period of ten consecutive years reckoned in continuing progressive series beginning with October 1, 1945.

II. ~~Exclusive of the Kendrick Project and Seminoe Reservoir the~~ The State of Wyoming, its officers, attorneys, agents and employees, be~~,~~ and ~~they~~ are hereby severally enjoined

(a) From diverting or permitting the diversion of water for irrigation from the North Platte River and its tributaries, including water from hydrologically connected groundwater wells, upstream of Pathfinder Dam for the consumption in any period of ten consecutive years reckoned in continuing progressive series of more than the largest amount of water consumed for irrigation from such sources in any ten consecutive year period between 1952 and 1999, inclusive. This injunction becomes effective the first full calendar year after the date of entry of this Modified Decree. The consumptive use of irrigation water in this area

to be counted under this injunction shall include the following:

(1) Water consumed for irrigation purposes on lands irrigated with surface water diversions of natural flow;

(2) Water consumed for irrigation purposes on lands irrigated with water stored pursuant to paragraph II(e);

(3) Water consumed for irrigation purposes on lands irrigated by water from hydrologically connected groundwater wells;

(4) Water consumed for purposes other than irrigation under water rights transferred since October 8, 1945 from an irrigation use to another use;

The largest amount of water consumed for irrigation from such sources in any ten consecutive year period between 1952 and 1999 inclusive, has been determined by the parties pursuant to a methodology and procedures approved and adopted in the Final Settlement Stipulation to be 1,280,000 acre feet. For the purpose of determining compliance with this injunction, the amount of water consumed for irrigation from such sources shall be determined by the same methodology and procedures. After ten years of administration, accounting and reporting under this injunction, the methodology and the ten consecutive year limit will be reviewed by the North Platte Decree Committee pursuant to procedures approved and adopted in the Final Settlement Stipulation to determine if there is a better methodology for calculating the largest amount of water consumed for irrigation in such ten consecutive year period and for determining compliance. In making such

calculation, any acreage historically reported by the Wyoming State Engineer as irrigated by direct flow surface water or stored water or as transfers, between 1952 and 1999 inclusive, and used in the existing methodology, shall not be changed. In addition, the other acreage used in the existing methodology shall not be changed unless the North Platte Decree Committee agrees that such change results in a more accurate determination of acres actually irrigated between 1952 and 1999 inclusive. In any new methodology, to determine compliance with the consumptive use limit, the acreage above Pathfinder Dam, when combined with the acreage between Pathfinder Dam and Guernsey Reservoir, cannot exceed the 226,000 acreage limitation pursuant to paragraph II(c). If Nebraska, Wyoming and the United States agree on a new methodology and a new limit, they shall notify the Court and this paragraph will be modified accordingly. As provided in paragraph XIII, absent agreement on a new methodology and a new limit, Nebraska, Wyoming, or the United States may seek recourse to the Court to resolve these issues.

(b) From diverting or permitting the diversion of water for irrigation from the North Platte River and its tributaries, including water from hydrologically connected groundwater wells, between Pathfinder Dam and Guernsey Reservoir for the consumption of more than a total of 89,000 acre feet in any period of ten consecutive years reckoned in continuing progressive series, exclusive of the Kendrick Project. This injunction becomes effective the first full calendar year after the entry of this Modified Decree. The consumptive use of irrigation water in this area to be counted under this injunction shall include the following:

(1) Water consumed for irrigation purposes on lands irrigated with surface water diversions of natural flow;

(2) Water consumed for irrigation purposes on lands irrigated with water stored in reservoirs that store water from the tributaries between Pathfinder Dam and Guernsey Reservoir;

(3) Water consumed for irrigation purposes on lands irrigated by water from hydrologically connected groundwater wells;

(4) Water consumed for purposes other than irrigation with water rights transferred since October 8, 1945 from an irrigation use to another use;

The largest amount of water consumed for irrigation from such sources in any ten consecutive year period between 1952 and 1999 inclusive, has been determined by the parties pursuant to a methodology and procedures approved and adopted in the Final Settlement Stipulation to be 890,000 acre feet. For the purpose of determining compliance with this injunction, the amount of water consumed for irrigation from such sources shall be determined by the same methodology and procedures. After ten years of administration, accounting and reporting under this injunction, the methodology and the ten consecutive year limit will be reviewed by the North Platte Decree Committee pursuant to procedures approved and adopted in the Final Settlement Stipulation to determine if there is a better methodology for calculating the largest amount of water consumed for irrigation in such ten consecutive year period and for determining compliance. In making such calculation, any acreage historically reported by the Wyoming State Engineer as irrigated by direct flow surface water or stored water or as transfers, between 1952 and 1999 inclusive, and used in the existing methodology, shall not be changed. In addition, the other acreage used in the existing

methodology shall not be changed unless the North Platte Decree Committee agrees that such change results in a more accurate determination of acres actually irrigated between 1952 and 1999 inclusive. In any new methodology, to determine compliance with the consumptive use limit, the acreage above Pathfinder Dam, when combined with the acreage between Pathfinder Dam and Guernsey Reservoir, cannot exceed the 226,000 acreage limitation pursuant to paragraph II(c). If Nebraska, Wyoming and the United States agree on a new methodology and a new limit, they shall notify the Court and this paragraph will be modified accordingly. As provided in paragraph XIII, absent agreement on a new methodology and a new limit, Nebraska, Wyoming, or the United States may seek recourse to the Court to resolve these issues.

~~(a)~~ (c) From diverting or permitting the diversion of water from the North Platte River ~~above the~~ and its tributaries, including water from hydrologically connected groundwater wells, upstream of Guernsey Reservoir ~~and from the tributaries entering the North Platte River above Pathfinder Dam~~ for the intentional irrigation of more than a total of ~~168~~226,000 acres of land in Wyoming during any one irrigation season, exclusive of the Kendrick Project. The acres in this area to be counted under this injunction shall include the following, provided that an intentionally irrigated acre that receives water from more than one source shall be counted only once:

(1) Acres irrigated by surface water diversions of natural flow;

(2) Acres irrigated by water stored pursuant to paragraph II(e);

(3) Acres irrigated by water stored in reservoirs that store water from the tributaries between Pathfinder Dam and Guernsey Reservoir;

(4) Acres irrigated with water from hydrologically connected groundwater wells;

(5) The equivalent of the acres found by order of the Wyoming State Board of Control to have been historically irrigated and that formed the basis for the transfer of water rights where water rights on the North Platte River upstream of Guernsey Reservoir or the tributaries upstream of Pathfinder Dam are transferred after October 8, 1945, from an irrigation use to another use; provided, however, that the amount of acres counted for a given year may be reduced proportionately to the extent that the actual diversion and use of water under the transferred water right during that year are less than the total diversion and use allowed by the order approving such transfer;

(6) The equivalent of the acres found by order of the Wyoming State Board of Control to have been historically irrigated and that formed the basis for the transfer of water rights where water rights on the tributaries entering the North Platte River between Pathfinder Dam and Guernsey Reservoir are transferred after January 1, 2001, from an irrigation use to another use; provided, however, that the amount of acres counted for a given year may be reduced proportionately to the extent that the actual diversion and use of water under the transferred water right during that year are less than the total diversion and use allowed by the order approving such transfer;

Ten years after the entry of this Modified Decree, the provision that enjoins Wyoming from intentionally irrigating more than 226,000 acres upstream of Guernsey Reservoir

will be replaced with two injunctions, one that limits the number of acres that can be irrigated above Pathfinder Dam and one that limits the number of acres that can be irrigated between Pathfinder Dam and Guernsey Reservoir. Wyoming has the discretion to designate the irrigated acreage limitation above Pathfinder Dam and the irrigated acreage limitation between Pathfinder Dam and Guernsey Reservoir, so long as the total irrigated acreage limitation does not exceed 226,000 acres. After Wyoming makes such designation, Nebraska, Wyoming and the United States will so notify the Court and the Modified Decree will be modified accordingly.

(d) From diverting or permitting the diversion of water from the Laramie River and its tributaries, including water from hydrologically connected groundwater wells, downstream of the Wheatland Irrigation District's Tunnel No. 2, exclusive of the area within the Wheatland Irrigation District, for the intentional irrigation of more than a total of 39,000 acres of land in Wyoming during any one irrigation season. The acres in this area to be counted under this injunction shall include the following, provided that an intentionally irrigated acre that receives water from more than one source shall be counted only once:

(1) Acres irrigated by surface water diversions of natural flow;

(2) Acres irrigated by stored irrigation water released from a reservoir;

(3) Acres irrigated with water from hydrologically connected groundwater wells;

(4) The equivalent of the acres found by order of the Wyoming State Board of Control to

have been historically irrigated and that formed the basis for the transfer of water rights where water rights are transferred after January 1, 2001, from an irrigation use that is subject to the limitations of this paragraph II(d) to another use; provided, however, that the amount of acres counted for a given year may be reduced proportionately to the extent that the actual diversion and use of water under the transferred water right during that year are less than the total diversion and use allowed by the order approving such transfer;

~~(b)~~(e) From storing or permitting the storage of more than a total amount of 18,000 acre feet of water for irrigation purposes from the North Platte River and its tributaries above Pathfinder Reservoir between October 1 of any year and September 30 of the following year, exclusive of Seminoe Reservoir.

III. - The State of Wyoming, its officers, attorneys, agents and employees, be and they are hereby severally enjoined from storing or permitting the storage of water in Pathfinder, Guernsey, Seminoe, Alcova and Glendo Reservoirs and the Inland Lakes otherwise than in accordance with the relative storage rights, as among themselves, of such reservoirs, which are hereby defined and fixed as follows:

First, Pathfinder Reservoir;
Second, Inland Lakes with the same priority date as Pathfinder Reservoir;
~~Second~~ Third, Guernsey Reservoir;
~~Third~~ Fourth, Seminoe Reservoir;-
~~Fourth~~ Fifth, Alcova Reservoir; and
~~Fifth~~ Sixth, Glendo Reservoir;

Provided, however, that water ~~may be impounded in or released from Seminoe Reservoir, contrary to~~ accruing in

priority to the storage right of a reservoir listed above, and water accruing to the Glendo Reservoir reregulating space pursuant to paragraph XVII(g), may be physically stored in, released from, or exchanged with another reservoir so long as the water is accounted in accordance with the foregoing rule of priority ~~operation for use in the generation of electric power when~~ and only when such storage ~~or~~, release, or exchange will not materially interfere with the administration of water for irrigation purposes according to the priority decreed for the French Canal and the State Line Canals. ~~Storage rights of Glendo Reservoir shall be subject to the provisions of this paragraph III.~~ Further, in accordance with the opinion of this Court dated April 20, 1993, (507 U.S. 584), the United States has the right to divert 46,000 acre feet of water during the non-irrigation season months of October, November and April for storage in the Inland Lakes. Historically, pursuant to annual agreements entered in the discretion of the parties, such diversions have occurred at a rate not exceeding 910 cubic feet per second from gains accruing to the river downstream of Alcova Reservoir. This right shall be administered in accordance with procedures to be reviewed and adopted annually by the North Platte Decree Committee.

IV. The State of Wyoming, its officers, attorneys, agents and employees, be and they are hereby severally enjoined from storing or permitting the storage of water in Pathfinder, Guernsey, Seminoe, Alcova and Glendo Reservoirs, and from the diversion of natural flow water through the Casper Canal for the Kendrick Project between and including May 1 and September 30 of each year otherwise than in accordance with the rule of priority in relation to the appropriations of the Nebraska lands supplied by the French Canal and by the State Line Canals, which said Nebraska appropriations are hereby adjudged to be senior to said five reservoirs and said Casper Canal, and

which said Nebraska appropriations are hereby identified and defined, and their diversion limitations in second feet and seasonal limitations in acre feet fixed as follows:

Lands	Canal	Limitation in Sec. Feet	Seasonal Limitation in Acre ~~Ft.~~Feet
Tract of 1,025 acres	French	15	2,227
Mitchell Irrigation District	Mitchell	195	35,000
Gering Irrigation District	Gering	193	36,000
Farmers Irrigation District	Tri-State	748	183,050
Ramshorn Irrigation District	Ramshorn	14	3,000

This paragraph limits the extent to which these canals may stop the federal reservoirs from storing water and the Casper Canal from diverting natural flow water. It does not place any absolute ceilings or other restrictions on the quantities of water that these canals may actually divert. *Nebraska v. Wyoming*, 507 U.S. 584, 603 (1993); *see also Nebraska v. Wyoming*, 515 U.S. 1, 10 (1995).

V. The natural flow in the Guernsey Dam to Tri-State Dam section between and including May 1 and September 30 of each year, including the contribution of Spring Creek, be and the same hereby is apportioned between Wyoming and Nebraska on the basis of twenty-five per cent to Wyoming and seventy-five per cent to Nebraska, with the right granted Nebraska to designate from time to time the portion of its share which shall be delivered into the Interstate, Fort Laramie, French and Mitchell Canals~~,~~ for use on the Nebraska lands served by these canals. The natural flow in a portion of certain tributaries and drains as defined

in paragraph V(a) shall also be included in the natural flow apportioned by this paragraph. The State of Nebraska, its officers, attorneys, agents, and employees, and the State of Wyoming, its officers, attorneys, agents, and employees, are hereby enjoined and restrained from diversion or use contrary to this apportionment, provided that in the apportionment of water in this section the flow for each day, until ascertainable, shall be assumed to be the same as that of the preceding day, as shown by the measurements and computations for that day~~, and provided further, that unless and until Nebraska, Wyoming and the United States agree upon a modification thereof, or upon another formula, reservoir evaporation and transportation losses in the segregation of natural flow and storage shall be computed in accordance with the following formula taken from United States' Exhibit 204A and the stipulation of the parties dated January 14, 1953, and filed on January 30, 1953:~~ Provided further that:

(a) Diversions under surface water rights for irrigation purposes from those parts of the tributaries and drains to the North Platte River that lie within the area bounded by Whalen Diversion Dam on the west, the Ft. Laramie Canal on the south, the Interstate Canal on the north, and the State Line on the east, excluding the drainage basins of the Laramie River and Horse Creek, shall be administered and accounted as diversions of natural flow for the purposes of the foregoing percentage apportionment, unless the depletions to the North Platte River resulting from such diversions are replaced. The amount of such depletions, and the method for their replacement in the ordinary course of administration, shall be determined and implemented pursuant to procedures that have been approved and adopted in the Final Settlement Stipulation.

(b) Diversions for irrigation purposes from wells with water right priorities between October 8,1945, and including December 31,2000, located within the area bounded by Whalen Diversion Dam on the west, 300 feet south of the Ft. Laramie Canal on the south, one mile north of the Interstate Canal on the north, and the state line on the east, shall be regulated as follows: To the extent the pumping of such wells results in depletions to the North Platte River between Whalen Diversion Dam and the state line or to the portions of tributaries described in paragraph V(a) between May 1 and September 30 of the same year, such depletions shall be replaced or the pumping shall be regulated to prevent such depletions, unless such depletions occur when the natural flow in the Guernsey Dam to Tri-State Diversion Dam reach exceeds irrigation demands in that reach. The amount of such depletions, and the method for their replacement in the ordinary course of administration shall be determined and implemented pursuant to procedures that have been approved and adopted in the Final Settlement Stipulation.

(c) Diversions for irrigation purposes from wells with water right priorities after December 31, 2000, located within the area bounded by Whalen Diversion Dam on the west, 300 feet south of the Ft. Laramie Canal on the south, one mile north of the Interstate Canal on the north, and the State Line on the east, shall be regulated or subject to depletion replacement pursuant to procedures that have been approved and adopted in the Final Settlement Stipulation.

(d) The river carriage and reservoir loss calculations established in the Decree of October 8, 1945, have been replaced with administrative procedures attached to the North Platte Decree Committee Charter. These procedures may be modified from time to time by the North Platte Decree Committee.

Reservoir Evaporation Losses

Seminoe, Pathfinder and Alcova Reservoirs.

Evaporation will be computed daily based upon evaporation from Weather Bureau Standard 4 foot diameter Class "A" pan located at Pathfinder Reservoir. Daily evaporation will be multiplied by area of water surface of reservoir in acres and by co-efficient of 70% to reduce pan record to open water surface.

Glendo and Guernsey Reservoirs.

Compute same as above except use pan evaporation at Whalen Dam.

River Carriage Losses.

River carriage losses will be computed upon basis of area of river water surface as determined by aerial surveys made in 1939 and previous years and upon average monthly evaporation at Pathfinder Reservoir for the period 1921 to 1939, inclusive, using a co-efficient of 70% to reduce pan records to open water surface.

Daily evaporation losses in second feet for various sections of the river are shown in the following table:

River Section	Area Acres	Daily Losses Second Feet				
		May	June	July	Aug.	Sept.
Alcova to Glendo Reservoir	6,740	43	61	70	61	45

Guernsey Reservoir to Whalen	560	4	5	6	5	4
Whalen to State Line	2,430	16	22	25	22	16

Above table is based upon mean evaporation at Pathfinder as follows: May .561ft.; June .767 ft.; July .910 ft.; Aug. .799 ft.; Sept.. .568 ft. Co-efficient of 70% to reduce pan record to open water surface.

Above table does not contain computed loss for section of river from Glendo Dam to head of Guernsey Reservoir (area 680 acres) because this area is less than submerged area of original river bed (940 acres) in Glendo Reservoir and is, therefore, considered as off set.

Above table does not contain computed loss for section of river from Pathfinder Dam to head of Alcova Reservoir (area 170 acres) because this area is less than submerged area of original river bed in Alcova Reservoir, and is, therefore, considered as off set.

Likewise the area between Seminoe Dam and head of Pathfinder Reservoir is less than area of original river bed through Pathfinder Reservoir - considered as off set. - Evaporation losses will be divided between natural flow and storage water flowing in any section of river channel upon a proportional basis. This proposition will ordinarily be determined at the upper end of the section except under conditions of intervening accruals or diversions that materially change the ratio of storage to natural flow at the lower end of the section. In such event

~~the average proportion for the section will be determined by using the mean ratio for the two ends of the section.~~

~~In the determination of transportation losses for the various sections of the stream, such time intervals for the passage of water from point to point shall be used as may be agreed upon by Nebraska, Wyoming and the United States, or in the absence of such agreement, as may be decided upon from day to day by the manager of the government reservoirs, with such adjustments to be made by said manager from time to time as may be necessary to make as accurate a segregation as is possible.~~

VI.– This Modified ~~d~~Decree is intended to and does deal with and apportion only the natural flow of the North Platte River. Storage water shall not be affected by this Modified ~~d~~Decree, and the owners of rights therein shall be permitted to distribute the same in accordance with any lawful contracts which they may have entered into or may in the future enter into, without interference because of this Modified ~~d~~Decree.

VII.– Such additional gauging stations and measuring devices at or near the Wyoming-Nebraska state line, if any, as may be necessary for making any apportionment herein decreed, shall be constructed and maintained at the joint and equal expense of Wyoming and Nebraska to the extent that the costs thereof are not paid by others.

VIII.– The State of Wyoming, its officers, attorneys, agents and employees be and they are hereby severally enjoined from diverting or permitting the diversion of water from the North Platte River or its tributaries at or above Alcova Reservoir in lieu of or in exchange for return flow

water from the Kendrick Project reaching the North Platte River below Alcova Reservoir.

IX. The State of Wyoming and the State of Colorado be and they hereby are ~~each~~ required to prepare and maintain complete and accurate records of the total area of land irrigated and the storage and exportation of the water of the North Platte River and its tributaries within those portions of their respective jurisdictions covered by the provisions of paragraphs I, II(c), II(d) and II(e) ~~hereof, and such records~~. The State of Wyoming is also required to prepare and maintain complete and accurate records of the total consumption of irrigation water in the portion of its jurisdiction covered by paragraphs II(a) and II(b). The record keeping and reporting required of the State of Wyoming by this paragraph shall be implemented in accordance with procedures that have been approved and adopted in the Final Settlement Stipulation. The records required by this paragraph shall be available for inspection at all reasonable times; provided, however, that such records shall not be required in reference to the water uses permitted by paragraphs X ~~hereof.~~ and XII(f).

X. ~~-~~ This Modified ~~d~~Decree shall not affect or restrict the use or diversion of ~~-~~water from the North Platte River and its tributaries in Colorado or Wyoming for ordinary and usual domestic, municipal and stock watering purposes and consumption.

XI. For the purposes of this Modified ~~d~~Decree:

(a) "Season" or "seasonal" refers to the irrigation season, May 1 to September 30, inclusive;

(b) The term "storage water" as applied to releases from reservoirs owned ~~-~~and operated by the United

States is defined as any water which is released from reservoirs for use on lands under canals having storage contracts in addition to the water which is discharged through those reservoirs to meet natural flow uses permitted by this Modified ~~d~~Decree;

(c) "Natural flow water" shall be taken as referring to all water in the stream except storage water;-

(d) Return flows ~~of~~ from the Kendrick Project shall be deemed to be "natural-flow water" when they have reached the North Platte River, ~~and~~ subject to the same diversion and use as any other natural flow in the stream.

(e) "Hydrologically connected groundwater wells" are defined in procedures attached to the North Platte Decree Committee Charter as Exhibits 4, 6, and 12 approved and adopted in the Final Settlement Stipulation. The North Platte Decree Committee may modify such definition in accordance with the Final Settlement Stipulation.

XII. This Modified ~~d~~Decree shall not affect:

(a) - The relative rights of water users within any one of the States who are parties to this suit except as may be otherwise specifically provided herein;

(b) Such claims as the United States has to storage water under Wyoming law; nor will the Modified ~~d~~Decree in any way interfere with the ownership and operation by the United States of the various federal storage and power plants, works and facilities.;

(c) The use or disposition of any additional supply or supplies of water which in the future

may be imported into the basin of the North Platte River from the water shed of an entirely separate stream~~, and which presently do not enter said basin,~~ or the return flow from any such supply or supplies~~.~~;

(d) The apportionment heretofore made by this Court between the States of Wyoming and Colorado of the waters of the Laramie River, a tributary of the North Platte River~~;~~, down to and including the Wheatland Project. The waters of the Laramie River below the Wheatland Project are not apportioned by this Modified Decree. The only existing limitation in this Modified Decree on Wyoming's use of the Laramie River is provided in paragraph II(d);

(e) The apportionment made by the compact between the States of Nebraska and Colorado, apportioning the water of the South Platte River~~.~~;

(f) Water diverted for de minimis uses, defined as:

(1) Ponds with capacities of twenty acre feet or less for purposes other than irrigated agriculture;

(2) Wells with capacities less than or equal to twenty-five gallons per minute for a single project for purposes other than irrigated agriculture; and

(3) Miscellaneous uses that withdraw or divert less than fifty acre feet per year for a single project other than stock watering, domestic or irrigated agriculture.

XIII. Any of the parties may apply at the foot of this ~~decree for its amendment or for further relief, except that for a period of five years from and after June 15, 1953, the State of Colorado shall not institute any proceedings for the amendment of the decree or for proceedings for the amendment of the decree~~ Modified Decree for its amendment or for further relief. ~~In the event that within said period of five years any other party applies for an amendment of the decree or for further relief, then the State of Colorado may assert any and all rights, claims or defenses available to it under the decree as amended~~ Any dispute related to decree compliance or administration shall be submitted to and addressed by the North Platte Decree Committee before a party may seek leave of the Court to bring such dispute before the Court. The Court retains jurisdiction of this suit for the purpose of any order, direction, or modification of the decree, or any supplementary decree, that may at any time be deemed proper in relation to the subject matter in controversy. Further, the Court retains jurisdiction, upon proper showing, to adjudicate all matters for which authority or responsibility is granted to the North Platte Decree Committee by this Modified Decree or the Final Settlement Stipulation. Matters with reference to which further relief may hereafter be sought shall include, but shall not be limited to, the following:

(a) - The question of the applicability and effect of the Act of August 9, 1937 (50 Stat. 564, 595-596) upon the rights of Colorado and its water users ~~when and if water hereafter is available for storage and use in connection with the Kendrick Project in Wyoming.~~;

(b) The question of the effect upon the rights of upstream areas of the construction or threatened

construction in downstream areas of any projects not now existing or recognized in this Modified ~~d~~Decree;

(c) The question of the effect of the construction or threatened construction of storage capacity not now existing on tributaries entering the North Platte River between Pathfinder Reservoir and Guernsey Reservoir;

(d) The question of the right to divert at or above the headgate of the Casper Canal any water in lieu of, or in exchange for, any water developed by artificial drainage to the river of sump areas on the Kendrick Project;

(e) Any question relating to the joint operation of Pathfinder, Guernsey, Seminoe ~~and~~, Alcova and Glendo Reservoirs whenever changed conditions make such joint operation possible~~;~~.

(f) - Any change in conditions making modification of the Modified ~~d~~Decree or the granting of further relief necessary or appropriate.

(g) Failure of the North Platte Decree Committee, or the parties to the North Platte Decree Committee, to act upon, resolve or agree on a matter that has been submitted to the North Platte Decree Committee.

XIV. The costs in ~~this~~ the original cause ~~shall be~~ were apportioned and paid ~~as follows: the State of Colorado one fifth; the State of Wyoming two fifths; and the state of Nebraska two fifths. Payment~~ pursuant to previous order of this Court. The costs in the present cause and the payment of the fees and expenses of the Special Master has~~ve~~ been ~~provided by a previous order of this Court.~~ apportioned and paid according to previous orders of this Court with which the parties agree and the Court hereby confirms.

XV. The clerk of this Court shall transmit to the ~~chief magistrates~~ Governors and Attorneys General of the States of Colorado, Wyoming and Nebraska, and the Solicitor General of the United States of America, and Basin Electric Power Cooperative, copies of this Modified ~~d~~Decree duly authenticated under the seal of this Court.

XVI. Whatever claims or defenses the parties or any of them may have in respect to the application, interpretation or construction of the Act of August 9, 1937 (50 Stat. ~~564-595~~ 564, 595-596) shall be determined without prejudice to any party arising because of any development of the Kendrick Project occurring subsequent to October 1, 1951.

XVII. ~~When Glendo Dam and Reservoir are constructed, the following provisions shall be effective:~~ The following provisions are effective for the operation of Glendo Dam and Reservoir:

(a) The ~~construction and~~ operation of the Glendo Project shall not impose any demand on areas at or above Seminoe Reservoir which will prejudice any rights that the States of Colorado ~~and~~or Wyoming might have to secure a modification of the Modified ~~d~~Decree permitting an expansion of water uses in the natural basin of the North Platte River in Colorado or above Seminoe Reservoir in Wyoming.

(b) ~~-~~ The ~~construction and~~ operation of Glendo Reservoir shall not affect the regime~~n~~ of the natural flow of the North Platte River ~~above Pathfinder Dam. The regimen of the natural flow of the North Platte River below Pathfinder Dam shall not be changed,~~ except that not more than 40,000 acre feet of the natural flow of the North Platte

River and its tributaries which cannot be stored in upstream reservoirs under the provisions of this Modified ~~d~~Decree may be stored in ~~the~~ Glendo Reservoir during any water year for disposition by the United States under contracts, in addition to evaporation losses on such storage, and further, the amount of water that may be held in storage at any one time for disposition by the United States under contracts, including carryover storage, shall never exceed 100,000 acre feet. Such storage water shall be disposed of in accordance with contracts executed or to be hereafter executed, in compliance with federal law, and ~~it~~ may be used for ~~the irrigation of lands in the basin of the North Platte River in western Nebraska~~ any beneficial purpose in Nebraska within the Platte River basin to the extent of 25,000 acre feet annually~~, and for the irrigation of lands in the basin of the North Platte River in southeastern Wyoming below Guernsey Reservoir~~ and for any beneficial purpose in Wyoming within the Platte River basin to the extent of 15,000 acre feet annually~~, provided that it shall not be used as a substitute for storage water contracted for under any existing permanent arrangements~~. The above limitation on the amount of storage of natural flow does not apply: 1) to flood water which may be temporarily stored in any capacity allocated for flood control in ~~the~~ Glendo Reservoir~~, nor~~; 2) to water originally stored in Pathfinder Reservoir which may be temporarily re-stored in Glendo Reservoir after its release from Pathfinder and before its delivery pursuant to contract; ~~nor~~ 3) to Inland Lakes account water temporarily stored in accordance with this Court's Order of April 20, 1993; 4) to water which may be impounded behind Glendo Dam, as provided in the Bureau of Reclamation Definite Plan Report for the Glendo Unit, Wyoming, dated December 1952, as revised through December 1959 (Glendo Definite Plan Report) for the purpose of creating a head for the development of water power; or 5) to water in Glendo

Reservoir used for the purposes described in paragraph XVII(g).

(c) Each State may substitute or supplement quantities of storage water obtained under other contractual arrangements with Glendo Reservoir storage supplies. Subject to contractual arrangements with the United States Bureau of Reclamation, including any required compliance with the Endangered Species Act, 16 U.S.C. § 1531 et seq. and the National Environmental Policy Act, 42 U.S.C. § 4321 et seq., each State shall also enjoy unrestricted use of its respective storage allocation in Glendo Reservoir, so long as the use is below Glendo Reservoir and within the Platte River basin.

(d) Glendo Reservoir storage water may be consumptively used in Wyoming by exchange or other means, upstream of Glendo Reservoir under the terms of this paragraph. For every two acre feet of Glendo storage water diverted upstream of Glendo Reservoir pursuant to such an exchange, all of which may be fully consumed, an additional acre foot of Wyoming's Glendo storage allocation shall be contracted at the same time for storage and release from Glendo Reservoir and passed through Guernsey Reservoir to the North Platte River. Except as may be modified in accordance with paragraph XVII(e), or by agreement of the parties, such additional water shall be released from the reservoir at the same time and at a rate proportionate to the diversion of the water contracted for use upstream from Glendo Reservoir during the irrigation season. During the non-irrigation season, due to operational constraints of the outlets at Guernsey Reservoir, such additional water will be held in the Glendo account and released prior to the first of May as may be operationally practical. Except as provided in paragraph XVII(e), once released, such additional water

shall be considered natural flow water for purposes of the 75/25 apportionment specified in paragraph V.

(e) If the valid exercise or enforcement of federal law or authority requires Wyoming or a water user within Wyoming to cause the release of a portion of Wyoming's Glendo allocation for environmental purposes downstream of Glendo Reservoir, the additional water contracted and released under paragraph XVII(d) may be dedicated to and used for that purpose. Any water released pursuant to such requirement shall not be considered natural flow but shall be administered and protected as storage water in accordance with state law within both Wyoming and Nebraska until used for its intended purposes.

(f) Storage water in Glendo Reservoir from either State's allocation may be used for fish and wildlife purposes downstream of Glendo Reservoir under contractual arrangements with the United States Bureau of Reclamation, subject to approval of Wyoming for contracts for water from Wyoming's storage allocation and subject to approval of Nebraska for contracts for water from Nebraska's storage allocation. Any water released pursuant to such agreement shall not be considered natural flow but shall be administered and protected as storage water in accordance with state law within both Wyoming and Nebraska until used for its intended purposes.

(g) The United States Bureau of Reclamation has the discretion to hold water in Glendo Reservoir in excess of the limitations satated in paragraph XVII(b) in accordance with the operation of the reregulation space in Glendo Reservoir under Permit No. 5998 Res. and Certificate of Construction of Reservoir, as clarified by Order of the Wyoming State Board of Control dated November 29, 2000. Such water may be used, subject to

federal law, for the following purposes:

(1) to replace water that passed the Wyoming-Nebraska state line in excess of the amount ordered by canals with storage contracts below the Wyoming-Nebraska state line as the unintended result of physical limitations on the ability to control water deliveries;

(2) to replace evaporation from the storage ownership accounts of Pathfinder Reservoir, Guernsey Reservoir, Seminoe Reservoir, Alcova Reservoir, and Glendo Reservoir; and

(3) to supplement the natural flow that is available for apportionment pursuant to paragraph V.

XVIII. The creation of the North Platte Decree Committee is hereby approved and ratified. Procedures that have been approved and adopted in the Final Settlement Stipulation may be modified from time to time by the North Platte Decree Committee if the modifications are consistent with the Modified Decree. In the event of a conflict between any procedure, the Final Settlement Stipulation and the Modified Decree, the provisions of this Decree shall control.

Appendix C

Amendment of the 1953 Order to Provide for Use of Glendo Storage Water

No. 108, Original

IN THE SUPREME COURT OF THE UNITED STATES
OCTOBER TERM, 1996

STATE OF NEBRASKA, Plaintiff,

v.

STATE OF WYOMING, et al., Defendant.

BEFORE THE HONORABLE OWEN OLPIN
SPECIAL MASTER

STIPULATION

AMENDMENT OF THE 1953 ORDER
TO PROVIDE FOR USE OF GLENDO STORAGE
WATER

COME NOW, the States of Nebraska, Wyoming, Colorado and the United States of America and hereby stipulate and agree to the amendment of the *1953 Order Modifying and Supplementing Decree of October 8, 1945*, and present this Stipulation, hereinafter referred to as

the *Glendo Stipulation*, for approval by the Special Master and for his recommendation to the United States Supreme Court for entry of an Order approving this *Glendo Stipulation* and amending the 1945 *Decree*, in accordance with the terms hereof.

WHEREAS, on January 14, 1953, the parties to this proceeding entered into a stipulation, hereinafter referred to as the *1953 Stipulation*, in part, to provide for the construction, operation and limitations on the use of water stored in a proposed North Platte River reservoir known as Glendo Reservoir; and

WHEREAS, the *1953 Order Modifying and Supplementing Decree of October 8, 1945, Nebraska v Wyoming*, U.S. Supreme Court, No. 5 Original (October 8, 1945), hereinafter referred to as the *1953 Order*, adopted the 1953 Stipulation of the parties and modified and supplemented the *1945 Decree* to, among other things, allow for the construction and operation of Glendo Reservoir on the North Platte River in Wyoming, and provided for the use of the waters stored therein; and

WHEREAS, pursuant to the *1953 Stipulation*, the 1953 Order authorized the use of 15,000 acre-feet of water stored in Glendo Reservoir for Wyoming and 25,000 acre-feet of water stored in Glendo Reservoir for Nebraska and imposed certain limitations on the States of Nebraska and Wyoming in the use of the storage waters form Glendo Reservoir; and

WHEREAS, the *1953 Stipulation* limited Nebraska's use of the 25,000 acre-feet of Glendo storage water to use for irrigation purposes in the basin of the North Platte River in western Nebraska, and limited Wyoming's use of the 15,000 acre-feet of Glendo storage water to use for irrigation purposes in southeastern Wyoming below

Guernsey Reservoir; and

WHEREAS, the *1953 Stipulation* further limited Nebraska's and Wyoming's use of the Glendo storage water in that it prohibited the use of such water as a substitute for storage water contracted under any existing permanent arrangement; and

WHEREAS, in the present controversy between the parties, Nebraska has claimed that Wyoming and the United States have violated the limitations on Wyoming's use, previously stipulated by the parties and incorporated in the *1953 Order*, and Wyoming has claimed that Nebraska and the United State have violated the limitations on Nebraska's use, previously stipulated by the parties and incorporated in the *1953 Order*; and

WHEREAS, the operation of Glendo Reservoir for approximately the last 40 years has demonstrated that certain restrictions imposed on the parties by virtue of the *1953 Stipulation* are not necessary, but instead operate as an impediment to the efficient use of the waters stored therein; and

WHEREAS, new contracts and renewal of existing contracts with the Bureau of Reclamation for the use of storage waters in Glendo Reservoir will require compliance by the Bureau of Reclamation with the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA) and other federal laws; and

WHEREAS, while Nebraska, Wyoming and the United States do not believe that any revisions to the federal authorization for the Glendo project are necessary to implement this *Glendo Stipulation*, Nebraska and Wyoming have agreed to work cooperatively with the United States Department of Interior to secure such revisions, if any should

become necessary; and

WHEREAS, the proposal contained herein for the operation and use of storage waters in Glendo Reservoir does not affect Colorado's apportionment under the *1945 Decree* or the *1953 Order*, and neither Colorado nor the United States opposes the adoption of this *Glendo Stipulation* by the Court.

NOW, THEREFORE, IT IS HEREBY STIPULATED AND AGREED, following execution of this *Glendo Stipulation* by each of the parties, the parties will file a joint motion with the Special Master to recommend the entry of an Order by the United States Supreme Court approving this *Glendo Stipulation* and modifying the *1945 Decree*, as amended in the *1953 Order*, as follows:

1. Article XVII(b) of the *1945 Decree*, which was added thereto in the *1953 Order Modifying and Supplementing Decree of October 8, 1945*, shall be deleted and the following substituted:

(b) The operation of Glendo Reservoir shall not affect the regimen of the natural flow of the North Platte River except that no more than 40,000 acre-feet of the natural flow of the North Platte River and its tributaries which cannot be stored in upstream reservoirs under the provisions of this decree may be stored in Glendo Reservoir during any water year, in addition to evaporation losses on such storage, and further, the amount of such storage water that may be held in storage at any one time, including carryover storage, shall never exceed 100,000 acre-feet. Such storage water shall be disposed of in accordance with contracts executed or to be

hereafter executed in compliance with federal law, and may be used, in accordance with the terms of this paragraph XVII(b), for any beneficial purpose in Nebraska within the Platte River Basin to the extent of 25,000 acre-feet annually and for any beneficial purpose in Wyoming within the Platte River Basin to the extent of 15,000 acre-feet annually. The above limitation on storage of natural flow does not apply: 1) to flood water which may be temporarily stored in any capacity allocated for flood control in the Glendo Reservoir; 2) to water originally stored in Pathfinder Reservoir which may be temporarily re-stored in Glendo Reservoir after its release from Pathfinder and before its delivery pursuant to contract; 3) to Inland Lakes account water temporarily stored in accordance with the U.S. Supreme Court's Order of April 20, 1993; or 4) to water which may be impounded behind Glendo Dam, as provided in the Bureau of Reclamation Definite Plan Report for the Glendo Unit, Wyoming dated December 1952, as revised through December 1959 (Glendo Definite Plan Report) for the purpose of creating a head for the development of water power.

2. With Glendo Reservoir storage supplies, each state may substitute or supplement quantities of storage water obtained under other contractual arrangements. Subject to contractual arrangements with the United States Bureau of Reclamation, including any required Endangered Species Act and NEPA compliance, each state shall also enjoy unrestricted use of its respective storage allocation in Glendo Reservoir, so long as

the use is below Glendo Reservoir and within the Platte River Basin.

3. Glendo Reservoir storage water may be consumptively used in Wyoming by exchange or other means, upstream of Glendo Reservoir under the terms of this paragraph. For every two acre-feet of Glendo storage water diverted upstream of Glendo Reservoir pursuant to such an exchange, all of which may be fully consumed, an additional acre-foot of Wyoming's Glendo storage allocation shall be contracted as the same time for storage and release from Glendo Reservoir and passed through Guernsey Reservoir to the North Platte River. Except as may be modified in accordance with paragraph 4 below, or by agreement of the parties, such additional water shall be released from the reservoir at the same time and at a rate proportionate to the diversion of the water contracted for use upstream from Glendo Reservoir during the irrigation season. During the non-irrigation season, due to operational constraints of the outlets at Guernsey Reservoir, such additional water will be held in the Glendo account and be released prior to May 1st as may be operationally practical. Except as provided in paragraph 4 below, once released, such additional water shall be considered natural flow water for purposes for the 75:25 apportionment specified in Paragraph V of the *1945 Decree.*

4. If the valid exercise or enforcement of federal law or authority requires Wyoming or a water user within Wyoming to cause the release of a portion of Wyoming's Glendo allocation for environmental purposes downstream of Glendo Reservoir, the additional water contracted and released under paragraph 3 above, may be dedicated to and used for that purpose. Any water released pursuant to such requirement shall not be considered natural flow but shall be administered and protected as storage water in accordance with state law within both Wyoming and Nebraska until used for its intended purposes.

5. Storage water in Glendo Reservoir from either state's allocation may be used for fish and wildlife purposes downstream of Glendo Reservoir under contractual arrangements with the United States Bureau of Reclamation, subject to approval of Wyoming for contracts for water from Wyoming's storage allocation and subject to approval of Nebraska for contracts for water from Nebraska's storage allocation. Any water released pursuant to such agreement shall not be considered natural flow but shall be administered and protected as storage water in accordance with state law within both Wyoming and Nebraska until used for its intended purposes.

IT IS FURTHER STIPULATED AND AGREED, that no other modification of the *1945 Decree* is required to implement the terms of this *Glendo Stipulation*, and that Nebraska and Wyoming will work together and jointly cooperate with the United States Department of Interior to implement this agreement and to secure revisions to the federal authorization for Glendo Reservoir, if necessary.

IT IS FURTHER STIPULATED AND AGREED, that upon entry of an order adopting this *Glendo Stipulation* and amending the *1945 Decree* in accordance with the terms hereof, Nebraska will move to dismiss, with prejudice, Count II of its Amended Petition in this case and Wyoming will move to dismiss, with prejudice, its second and third counterclaims and its second and third cross claims herein.

DATED this 8 day of April, 1998

Respectfully submitted,

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Appendix D

Procedures for 1945 Decree Paragraph II(b) Storage Accounting

[now Paragraph II(e) of the Modified Decree]

No. 108, Original

IN THE SUPREME COURT OF THE UNITED STATES
OCTOBER TERM, 1995

BEFORE THE HONORABLE OWEN OLPIN
SPECIAL MASTER

STATE OF NEBRASKA,
Plaintiff,

v.

STATE OF WYOMING,
Defendant.

STIPULATION

PROCEDURES FOR 1945 DECREE

PARAGRAPH II. (b) STORAGE ACCOUNTING

COME NOW, the States of Nebraska, Wyoming and Colorado and the United States of America and hereby stipulate and agree, and present this Stipulation for approval by the Special Master and for his recommendation to the United States Supreme Court for an Order approving this Stipulation.

WHEREAS Paragraph II. (b) of the *1945 Decree, Nebraska v. Wyoming,* 325 U.S. 589 (1945), provides, in pertinent part:

> II. Exclusive of the Kendrick Project and Seminoe Reservoir the State of Wyoming, its officers, attorneys, agents and employees, be and they are hereby severally enjoined
>
> * * *
>
> (b) From storing or permitting the storage of more than a total amount of 18,000 acre feet of water for irrigation purposes from the North Platte River and its tributaries above the Pathfinder Reservoir between October 1 of any year and September 30 of the following year.

WHEREAS, Paragraph IX of the *1945 Decree* requires Wyoming to prepare and maintain complete and accurate records of, among other things, waters stored pursuant to Paragraph II. (b) thereof; and

WHEREAS the State of Nebraska has alleged that Wyoming's accounting for the waters stored annually pursuant to Paragraph II. (b) of the *1945 Decree* is inadequate and incomplete; and

WHEREAS, Wyoming has denied Nebraska's allegations; and

WHEREAS, the United States has not taken a position in the outcome of this dispute between Nebraska and Wyoming over the adequacy of the accounting for Wyoming's storage in irrigation reservoirs upstream of Pathfinder Reservoir, but consents to the entry of an Order in accordance with the terms hereof; and

WHEREAS, the State of Colorado has not taken a position in the outcome of this dispute between Nebraska and Wyoming over the adequacy of the accounting for Wyoming's storage in irrigation reservoirs upstream of Pathfinder Reservoir, this Stipulation does not affect Colorado's accounting procedures, and by consenting to this Stipulation, Colorado is not admitting that such measures would be reasonable within Colorado; and

WHEREAS, the parties recognize that installation of continuous recording devices to accurately measure such storage in all of the upstream reservoirs would be extremely costly and technically difficult; and

WHEREAS, in order to reach an agreement on the accepted means of accounting for the annual storage accrual in such upstream irrigation reservoirs and to establish the procedures for such accounting in the future, Wyoming and Nebraska have agreed to the procedures contained in this agreement.

NOW, THEREFORE, the parties stipulate and agree as follows:

1. Wyoming will install or cause the installation of measuring devices on no less than the eight largest of Wyoming's irrigation reservoirs storing water from the North Platte River and its tributaries upstream of Pathfinder Reservoir. Such measuring devices shall accurately measure

the amount of annually accrued irrigation storage in each such reservoir.

2. Wyoming will report the information provided from the measuring devices on those eight reservoirs annually to the parties.

3. In addition, for reservoirs falling under Paragraph II. (b) of the Decree in excess of 25 acre feet of capacity, other than those specified in Paragraph 2 herein, Wyoming will continue its current practice of visiting each of its remaining upstream irrigation reservoirs twice per year at the approximate time of the high and low storage points for such reservoirs, in order to estimate the annual storage in each. In making its annual reports, Wyoming shall include, for each such reservoir, the permitted capacity, its storage measurements, the date on which each storage measurement was taken and the means of making each storage estimate.

4. For irrigation storage reservoirs of less than 25 acre feet of capacity, Wyoming may, at its discretion, either estimate and report the accrual storage in the manner provided in paragraph 3, above, or include a list of such reservoirs and their permitted capacities in its annual report. If in any year Wyoming chooses to report only the total permitted capacity of any such reservoirs, rather than estimating actual annual storage in accordance with Paragraph 3 of this Stipulation, each such reservoir will be assumed to have stored water for irrigation purposes to its full permitted capacity in the annual accounting of the Decree Paragraph II. (b) limitation.

5. For any new irrigation reservoir above Pathfinder Reservoir in excess of 600 acre feet of capacity, Wyoming shall require the installation of measuring devices. Such measuring devices shall accurately measure the amount of annually accrued irrigation storage in each such reservoir.

Wyoming shall include the actual storage attributable to such new reservoirs in its annual report.

6. No amendment to the *1945 Decree* is necessary to implement the terms of this Stipulation. The parties shall file a joint motion requesting the Court to enter an Order approving this Stipulation, determining that compliance with this Stipulation shall constitute compliance with the provision of Paragraphs II and IX of the *Decree* insofar as they relate to reporting on storage in Wyoming above Pathfinder, and seeking to dismiss with prejudice those parts of Count I of Nebraska's Amended Petition alleging that Wyoming has violated said Decree provisions relating to storage above Pathfinder and relating to the accounting for the same.

Dated this 12 day of September 1997

Respectfully submitted,

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Appendix E

Stipulation Among the State of Wyoming, The State of Nebraska, and the United States Relating to the Allocation of Water during Periods of Shortage

No. 108, Original

IN THE SUPREME COURT OF THE UNITED STATES
OCTOBER TERM, 1996

STATE OF NEBRASKA, PLAINTIFF

v.

STATE OF WYOMING, et al., DEFENDANT

BEFORE THE HONORABLE OWEN OLPIN
SPECIAL MASTER

STIPULATION AMONG THE STATE OF WYOMING, THE STATE OF NEBRASKA, AND THE UNITED STATES RELATING TO THE ALLOCATION OF WATER DURING PERIODS OF SHORTAGE

WHEREAS, the State of Wyoming claims in its Amended Petition filed on February 18, 1994, that the United States is violating the equitable apportionment established by the Court in the 1945 Decree in *Nebraska v.*

Wyoming, 325 U.S. 665 (1945), as modified, 345 U.S. 981 (1953), by allocating storage in a manner which (a) upsets the equitable balance on which the apportionment of natural flow was based, (b) results in the allocation of natural flow contrary to the provisions of the Decree and contrary to the equitable apportionment and (c) promotes inefficiency and waste of water contrary to federal and state law,

WHEREAS, the United States denies the claims of the State of Wyoming and maintains that the United States allocates storage water in a manner that does not upset the equitable balance on which the apportionment of natural flow was based and is fully consistent with the 1945 Decree, as amended, and all other laws, and

WHEREAS, the undersigned parties desire to resolve this matter by jointly agreeing to a method of allocation of water during periods of shortage;

NOW THEREFORE IT IS STIPULATED AND AGREED THAT:

A. Decree Modification.

No modification of the Decree to implement this agreement is necessary.

B. Allocation Method.

The Bureau of Reclamation, under its existing contractual authorities, shall utilize the following procedures and guidelines when allocating storage water from Pathfinder Reservoir, Guernsey Reservoir, and the Inland Lakes during periods of shortage:

1. Assessment of the Need to Allocate Storage:

a. At the beginning of each new water year (October 1), the Bureau of Reclamation shall determine the amount of water stored in the reservoirs, assess probable inflow conditions and contrast forecasted water supply against approximate irrigation demand for the year of 1,100,000 acre-feet to make an initial assessment of the likelihood of the need to allocate storage during the subsequent irrigation season. The Bureau shall advise the States of Wyoming and Nebraska by October 31 as to whether there may be a need to allocate storage.

b. During the first week of February, March, April, May, and June of a water year, the Bureau of Reclamation shall determine the amount of water stored and the forecasted inflow through July, based on snowmelt runoff forecasts, and contrast the forecasted supply against the approximate irrigation demand of 1,100,000 acre-feet to further assess the need to allocate storage during the subsequent irrigation season. The Bureau shall advise whether there may be a need to allocate storage within 7 days of the first of each month, using the following criteria:

(1) If the forecasted supply is 900,000 acre-feet or less, the Bureau will advise that an allocation is expected.

(2) If the forecasted supply is between 900,000 and 1,100,000 acre-feet, the Bureau will advise that there may be a need for an allocation, based an existing data.

The methodology for determining the "forecasted supply" is described in a Technical Appendix, attached hereto.

2. Declaration of an Allocation of Storage Water

An allocation will be declared if, at the time of the first release of Guernsey Ownership or Pathfinder Ownership for delivery by diversion at or above Tri-State Diversion Dam, the forecasted supply is less than 1,100,000 AF.

3. Supply to be Allocated

The supply to be initially allocated upon the date of allocation is the sum of:

1. The Pathfinder Ownership;

2. The Guernsey Ownership;

3. The contents of the Inland Lakes (Lake Alice, Little Lake Alice, Lake Winters Creek, and Lake Minatare);

4. Project water from drains (Akers Draw, Sheep Creek, Dry Spotted Tail, Wet Spotted Tail, and Tub Springs);

5. Diversions that occur on days when natural flow is released from Guernsey Dam for the North Platte Project between May 1 and the date of the initial allocation; and

6. Storage delivered to the State Line for North Platte Project contractors below Tri-State Diversion Dam during the period of May 1 to the date of the initial allocation. The initial allocation will be made as described in the technical appendix.

4. Storage Water Allocation - Percentages

When an allocation is declared and the supply in item 3 above is allocated, the initial allocation shall be made as described in Technical Appendix II A and subsequent allocations of increased supplies shall be made as described in II B.

5. Storage Water Allocation to Contractors

The determination as to how each state's allocation in paragraph 4 above shall be apportioned to the contractors in the respective states shall be made by the Bureau of Reclamation, in consultation with the respective contractors and state officials and in accordance with the individual contracts. The process of the initial allocation and subsequent allocations of increased supplies is given in detail in the technical appendix.

6. Reallocation Of Unused Storage Water

If a particular contractor advises the Bureau of Reclamation in writing it will not utilize its entire allocation, the Bureau of Reclamation, in consultation with the contractor and the appropriate state officials, will allocate that quantity of water to all other contractors in the same state. If the remaining contractors in the state determine they do not need the water, the Bureau of Reclamation, in consultation with the appropriate state officials, may allocate that quantity of water to all contractors in the other state.

7. Carryover and Utilization of Unused Storage Water

Any storage water allocated to, but not utilized by any contractor during an allocation period shall be considered project water and distributed in the typical manner the following irrigation season, unless the Bureau of

Reclamation again declares the need to allocate water. In the event of consecutive allocation years, any contractor may carry over from the unused portion of its allocation to the following consecutive allocation year, the greater of the remaining balance carried over from the previous year's allocation or the water saved during the current year. The technical appendix contains an example of the carryover process.

DATED this 17th day of December, 1998

Respectfully submitted,

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TECHNICAL APPENDIX

I. "Forecasted Supply"

The method of determining the forecasted water supply will be achieved as follows:

OCTOBER - The sum of:

1. The end of September Pathfinder Ownership less storage in the municipal and environmental accounts.

2. The capacity of the Guernsey Ownership (45,612 AF).

3. The 30-year average inflow above Pathfinder for the months of October through July.

4. The 30-year average inflow of the Pathfinder to Guernsey reach for the months of May through July.

FEBRUARY - The sum of

1. The end of January Pathfinder Ownership less storage in the municipal and environmental accounts.

2. The capacity of the Guernsey Ownership (45,612 AF).

3. The 30-year average inflow to the basin above Pathfinder for the months of February and March.

4. The most probable forecasted inflow to the basin above Pathfinder for the April through July period.

5. The most probable forecasted inflow to the Pathfinder to Glendo basin for the April through July period minus the 30-year average April inflow for the Pathfinder to Glendo basin.

MARCH - The sum of:

1. The end of February Pathfinder Ownership less storage in the municipal and environmental accounts.

2. The capacity of the Guernsey Ownership (45,612 AF).

3. The 30-year average inflow of the basin above Pathfinder for March.

4. The most probable forecasted inflow to the basin above Pathfinder for the April through July period.

5. The most probable forecasted inflow to the Pathfinder to Glendo basin for the April through July period minus the 30-year average April inflow for the Pathfinder to Glendo basin.

APRIL - The sum of:

1. The end of March Pathfinder ownership less storage in the municipal and environmental accounts.

2. The end of March Guernsey Ownership.

3. The most probable forecasted inflow to the basin above Pathfinder for the April through July period.

4. The most probable forecasted inflow for the Pathfinder to Glendo basin for the April through July period minus any forecasted April inflow in excess of the quantity necessary to complete filling of the Guernsey Ownership.

MAY - The sum of

1. The end of April Pathfinder Ownership less storage in the municipal and environmental accounts.

2. The end of April Guernsey Ownership

3. The most probable forecasted inflow for the April through July inflow period for the basin above Pathfinder minus the inflow which occurred in April.

4. The most probable forecasted inflow for the Pathfinder to Glendo basin for the April through July period minus the inflow which occurred in April.

JUNE - The sum of:

1. The end of May Pathfinder Ownership less storage in the municipal and environmental accounts.

2. The end of May Guernsey Ownership.

3. The most probable forecasted inflow for the April through July inflow period for the basin above Pathfinder minus the inflow which occurred in April and May.

4. The most probable forecasted inflow for the Pathfinder to Glendo basin for the April through July period minus the inflow which occurred in April and May.

II. Allocation Procedures

A. Initial Allocation

The supply to be initially allocated upon the date of allocation is the sum of:

1. The Pathfinder Ownership less storage in the municipal and environmental accounts minus any unused allocations carried from a previous year as described in Paragraph II.C. minus 3% estimated evaporation loss and 2% estimated river carriage loss.

2. The Guernsey Ownership minus 3% estimated evaporation loss and 2% estimated river carriage loss.

3. The contents of Lake Alice, Little Lake Alice, Lake Winters Creek, and Lake Minatare forty-eight hours after the release from Guernsey Reservoir of the last of the Inland Lakes water that is being transferred from storage in Glendo and Guernsey Reservoirs to storage in the Inland Lakes and minus a holdover of 6,000 acre-feet.

4. 10,000 acre-feet of project water estimated to be available from the Nebraska Drains (Akers Draw,

Sheep Creek, Dry Spotted Tail, Wet Spotted Tail, and Tub Springs).

5. Diversions that occur on days when natural flow is released from Guernsey Dam for the North Platte Project lands diverting at or above Tri-State Diversion Dam between May 1 and the date of the allocation.

6. Storage delivered to the State Line for North Platte Project contractors below Tri-State Diversion Dam during the period of May 1 to the date of the allocation (Because of their location outside of the critical reach of the North Platte Decree, contractors below Tri-State Diversion Dam cannot call for natural flow from sources above Tri-State Diversion Dam, but they may order and receive storage water prior to the initial allocation.).

The above supply shall be allocated to provide a total of 18.1 percent to contractors in Wyoming and a total of 81.9 percent to contractors in Nebraska. This is each contractor's "initial allocation." Percentage allocations will be rounded to the nearest acre-foot so that the sum of the state's individual contractors' allocations will equal the totals for each state.

Immediately after the initial allocation each contractor's initial balance will be adjusted as follows:

- From the Goshen, Lingle, Hill, Gering-Fort Laramie, and Gering allocations subtract each contractor's respective diversion that occurs on days when natural flow is released from Guernsey Dam between May 1 and the date of the allocation. If Gering-Fort Laramie received more water than requested, the diversion charge assessed to the district will be reduced by any release of the excess at

Gering-Fort Laramie's first wasteway, adjusted for conveyance loss. If Gering received more water than requested, the diversion charge assessed to the district will be reduced by any release of the excess at Gering's first wasteway, adjusted for conveyance loss.

- From the Rock Ranch allocation subtract its diversion that occurs on days when natural flow is released from Guernsey Dam between May 1 and the date of the allocation for lands served under its Warren Act contract.

- From Pathfinder's allocation subtract its diversion, not including the diversion of Inland Lakes water, that occurs on days when natural flow is released from Guernsey Dam between May 1 and the date of the allocation. In addition, subtract the contents of the four Inland Lakes less holdover as defined in section II-A-3 of this Technical Appendix.

- From the Farmers and Northport allocations subtract the water delivered to the State Line for them on days when natural flow is released from Guernsey Dam between May 1 and the date of the allocation. Also, subtract any project water diverted from drains identified in II-A-4, above, on days when natural flow is released from Guernsey Dam between May 1 and the date of allocation. If Northport received more water than requested, the charge assessed to Northport will be reduced by any release of the excess at Northport's first wasteway, adjusted for conveyance loss.

- From the Beerline, Browns Creek, Central, and Chimney Rock allocations subtract the deliveries of storage to the State Line for each respective

contractor between May 1 and the date of the allocation.

In addition, if any contractor carried over water from a previous allocation year as described in Paragraph II.C., that amount of water carried over will be added to their allocation to compute their weekly balance for the first week.

B. Subsequent Allocations

Subsequent allocations of increased supply will be made weekly. Usage of drain water by Northport or Farmers during the week will be deducted from the previous drain estimate to provide the remaining estimated drain water. At the end of the weekly period, the "useable supply" will be the sum of the Pathfinder Ownership less storage in the municipal and environmental accounts minus estimated evaporation and conveyance losses, the Guernsey Ownership minus estimated evaporation and conveyance losses, the remaining estimated drain water, and estimated storage water in transit in the river.

The following water deliveries or diversions will be subtracted from each contractor's weekly balance to determine their "remaining balance":

- For Goshen, Lingle, Hill, Gering-Fort Laramie, Pathfinder, and Gering subtract their diversions for the week. If Gering-Fort Laramie received more water than requested, the diversion charge assessed to the district will be reduced by any release of the excess at Gering-Fort Laramie's first wasteway, adjusted for conveyance loss. If Gering received more water than requested, the diversion charge assessed to the district will be reduced by any release of the excess at Gering's first wasteway, adjusted for conveyance loss.

- For Rock Ranch subtract its total diversion less natural flow diversions for non-Warren Act contract lands.

- For Farmers and Northport subtract the water delivered to the State Line for them and their usage of drain water for the week. If Northport received more water than requested, the charge assessed to Northport will be reduced by any release of the excess at Northport's first wasteway, adjusted for conveyance loss.

- For Beerline, Browns Creek, Central, and Chimney Rock subtract the storage deliveries to the State Line for each respective contractor for the week.

The useable supply minus the sum of the contractors' remaining balances is the "system increase" for the week. The system increase is allocated 18.5% to Wyoming and 81.5% to Nebraska and allocated to the individual contractors using percentages determined by the Bureau of Reclamation in consultation with the respective contractors and state officials. Percentage allocations of the system increase will be rounded to the nearest acre-foot so that the totals allocated to the contractors equal the total weekly system increase.

The end of week allocation balances for the contractors will be the sum of each contractor's remaining balance plus their respective allotment of the system increase. This end of week balance becomes their "weekly balance" for the following weekly allocation period.

If a contractor uses its entire allocation balance, no more storage will be released for them.

C. Carryover

Any storage water allocated to, but not utilized by any contractor during an allocation period shall be considered project water and distributed in the typical manner the following irrigation season, unless the Bureau of Reclamation again declares the need to allocate water. In the event of consecutive allocation years, any contractor may carry over from the unused portion of its allocation to the following consecutive allocation year, the greater of the remaining balance carried over from the previous year's allocation or the water saved during the current year. A contractor's "water saved" in a given allocation year will be the contractor's end of season remaining balance of the current year minus the contractor's carryover from the previous allocation year.

Carryover Example:

Year 1 is not an allocation year, therefore, there are no carryover balances for individual contractors.

Year 2 is an allocation year. There is no carryover balance from the previous year. The contractor's ending balance is 500 acre-feet (AF). The water saved in the current year is 500 (ending balance) – 0 (carryover) = 500 AF. As 500 AF is greater than 0, the contractor's carryover into year 3 would be 500 AF. However, year 3 is not an allocation so there are no carryover balances.

Year 3 is not an allocation year, so there are no carryover balances for individual contractors.

Year 4 is an allocation year. There is no carryover from the previous year. The contractor's ending balance is 300 AF. The water saved in the current year is 300 - 0 = 300 AF. As 300 is greater than 0, the carryover into year 5 would be 300 AF.

Year 5 is an allocation year. The contractor's carryover from the previous year is 300 A.F. The contractor's ending balance is 800 AF. The water saved in the current year is 800 - 300 = 500. As 500 is greater than 300, the carryover into year 6 is 500 AF.

Year 6 is an allocation year. The contractor's carryover from the previous year is 500 AF. The contractor's ending balance is 900 AF. The water saved in the current year is 900 - 500 = 400 AF. As 500 is greater than 400, the carryover into year 7 is 500 AF.

Year 7 is an allocation year. The contractor's carryover from the previous year is 500 AF. The contractor's ending balance is 1,050 AF. The water saved in the current year is

1,050 - 500 = 550 AF. As 550 is greater than 500, the carryover into year 8 is 550 AF.

Year 8 is an allocation year. The contractor's carryover from the previous year is 550 AF. The contractors ending balance is 400 AF. The water saved is zero, since the contractor used a portion of its carryover. The greater of the contractor's remaining balance carried from the previous year (400 AF) and the water saved in the current year (0 AF) is 400 AF. The carryover to year 9 would be 400 AF.

Example of One Diversion Serving Multiple Districts where District B has requested 200 cfs:

1. District A diverts 600 cfs. and delivers 200 cfs to District B, which is equal to District B's requested delivery. District B is charged 200 cfs, and District A is charged 400 cfs.

2. District A diverts 600 cfs and delivers 210 cfs to District B. Although it is more than requested, District B accepts the water. District B is charged 210 cfs, and District A is charged 390 cfs.

3. District A diverts 600 cfs and delivers 210 cfs to District B. District B requested only 200 cfs and releases the 10 cfs excess into its first wasteway. District B is charged 200 cfs, and District A is charged 400 cfs.

4. District A diverts 600 cfs, and a rain event occurs which results in 240 cfs being delivered to District B. District B releases 20 cfs at its first wasteway. District B is charged 220 cfs, and District A is charged 380 cfs.

None of the above examples have been adjusted for conveyance losses which may apply.

Farmers and Northport examples, where Northport's requested delivery from Farmers is 200 cfs:

1. Farmers orders 500 cfs at the State Line for the Tri-State Canal and diverts 50 cfs from the drains. Farmers delivers 200 cfs to Northport. Northport is charged 200 cfs, and Farmers is charged 350 cfs.

2. Farmers orders 500 cfs at the State Line for the Tri-State Canal and diverts 50 cfs from the drains. Farmers delivers 150 cfs to Northport. Northport is charged 150 cfs, and Farmers is charged 400 cfs.

3. Farmers orders 500 cfs at the State Line for the Tri-State Canal and diverts 50 cfs from the drains. Farmers delivers 225 cfs to Northport, and Northport accepts the water. Northport is charged 225 cfs, and Farmers is charged 325 cfs.

4. Farmers orders 500 cfs at the State Line for the Tri-State Canal and diverts 50 cfs from the drains. Farmers delivers 225 cfs to Northport, and wastes 25 cfs at its first wasteway. Northport is charged 200 cfs, and Farmers is charged 350 cfs.

5. Farmers orders 500 cfs at the State Line for the Tri-State Canal and diverts 50 cfs from the drains. A rain event occurs and Farmers delivers 250 cfs to Northport. Northport wastes 25 cfs at its first wasteway. Northport is charged 225 cfs, and Farmers is charged 325 cfs.

6. Farmers orders 500 cfs at the State Line for the Tri-State Canal and diverts 50 cfs from the drains. Farmers delivers 0 cfs to Northport. Northport is charged 0 cfs, and Farm is charged 550 cfs.

None of the above examples have been adjusted for conveyance losses which may apply.

Appendix F

Amendment of the 1953 Order to Provide for the Modification of Pathfinder Reservoir

No. 108, Original

In The

SUPREME COURT OF THE UNITED STATES

October Term, 2000

BEFORE THE HONORABLE OWEN OLPIN
SPECIAL MASTER

STATE OF NEBRASKA,

Plaintiff,

v.

STATE OF WYOMING,

Defendant.

AMENDED STIPULATION

AMENDMENT OF THE *1953 ORDER*
TO PROVIDE FOR THE MODIFICATION OF
PATHFINDER RESERVOIR

COME NOW, the States of Nebraska, Wyoming, Colorado and the United States of America and hereby stipulate and agree to the amendment of the *1953 Order Modifying and Supplementing Decree of October 8, 1945,*

and present this Stipulation, hereinafter referred to as the Pathfinder Modification *Stipulation,* for approval by the Special Master and for his recommendation to the United States Supreme Court for entry of an Order approving this Pathfinder Modification *Stipulation* and amending the *1945 Decree,* in accordance with the terms hereof.

WHEREAS, on January 14, 1953, the parties to this proceeding entered into a stipulation, hereinafter referred to as the *1953 Stipulation,* in part, to provide for the construction, operation and limitations on the use of water stored in a proposed North Platte River reservoir known as Glendo Reservoir; and

WHEREAS, the *1953 Order Modifying and Supplementing Decree of October 8, 1945, Nebraska v. Wyoming*, U.S. Supreme Court, No. 5 Original (October 8, 1945), hereinafter referred to as the *1953 Order,* adopted the *1953 Stipulation* of the parties and modified and supplemented the *1945 Decree* to, among other things, allow for the construction and operation of Glendo Reservoir on the North Platte River in Wyoming; and

WHEREAS Paragraph IV of the *1953 Order Modifying and Supplementing Decree of October 8, 1945*, provides, in pertinent part:

> IV. The State of Wyoming, its officers, attorneys, agents and employees be and they are hereby severally enjoined from storing or permitting the storage of water in Pathfinder, Guernsey, Seminoe, Alcova and Glendo Reservoirs, and from the diversion of natural flow water through the Casper Canal for the Kendrick Project between and including May 1, and September 30

> of each year otherwise than in accordance with the rule of priority in relation to the appropriations of the Nebraska lands supplied by the French Canal and by the State Line Canals, which said Nebraska appropriations are hereby adjudged to be senior to said five reservoirs and said Casper Canal, and which said Nebraska appropriations are hereby identified and defined, and their diversion limitations in second feet and seasonal limitations in acre feet fixed as follows....

WHEREAS, in the present controversy between the parties, Nebraska has claimed that Wyoming is violating and threatening to violate Nebraska's equitable apportionment by depleting the natural flows of the North Platte River through the proposed construction of storage capacity on tributaries entering the North Platte River between Pathfinder Reservoir and Guernsey Reservoir; and

WHEREAS, the proposal contained herein for the modification of Pathfinder Reservoir does not affect Colorado's apportionment under the *1945 Decree* or the *1953 Order,* and neither Colorado nor the United States opposes the adoption of this Pathfinder Modification *Stipulation* by the Court.

WHEREAS, all parties agree that disposition of the issues addressed in this *Stipulation* is not and should not be construed as a precedent for the resolution of any other issue in this case or of these or similar issues in the future.

NOW, THEREFORE, IT IS HEREBY STIPULATED AND AGREED, following execution of this Pathfinder Modification *Stipulation* by each of the parties,

the parties will file a joint motion with the Special Master to recommend the entry of an Order by the United States Supreme Court approving this Pathfinder Modification *Stipulation* and modifying the *1945 Decree,* as amended in the *1953 Order,* as follows:

1. The Pathfinder Modification Project would increase the capacity of the existing Pathfinder Reservoir by approximately 54,000 acre feet to recapture storage space lost to sediment. The modification would be accomplished by raising the elevation of the existing spillway by approximately 2.39 feet with the installation of an inflatable dam or some other means. The recaptured storage space would store water under the existing 1904 storage right for Pathfinder Reservoir and would enjoy the same entitlements as other uses in the reservoir with the exception that the recaptured storage space could not place regulatory calls on existing water rights upstream of Pathfinder Reservoir other than the rights pertaining to Seminoe Reservoir.

2. Approximately 34,000 acre feet of the proposed 54,000 acre foot modification would be accounted for in an environmental account and operated for the benefit of endangered species and their habitat in Central Nebraska.

a. Water would accrue to the environmental account as an equal priority partner to other reservoir uses. The 34,000 acre-foot account is approximately 3.18% (34,000/1,070,000) of the capacity of Pathfinder Reservoir. Therefore, the account would accrue 3.18% of the inflow that is storable under the 1904 storage right.

b. The environmental account could not contain more than 34,000 acre feet at any

one time and will be administered under Wyoming water law. For example, if at the end of a water year, which is defined as October 1 to September 30, 10,000 acre feet of water was in the account, the account could only accrue 24,000 acre feet under its priority fill during the forthcoming water year.

c. The account would be assessed its proportionate share of evaporation losses based on the storage water in the account.

d. If there is a Platte River Recovery Implementation Program (Program), the environmental account could be operated, under contract with the Bureau of Reclamation, by the same manager that would manage the environmental account in Lake McConaughy. If the program does not exist, the account would be operated by the Bureau of Reclamation, in accordance with subsequent contracts and ESA consultations and in a manner consistent with Wyoming water law and the North Platte Decree.

e. The storage and delivery of water from the environmental account to the Wyoming/Nebraska stateline would serve as Wyoming's proposed reasonable and prudent alternative for the Pathfinder Modification Project. If there is a Platte River Recovery Implementation Program (Program) that serves as the reasonable and prudent alternative for water related activities in the Platte River basin, the

storage and deliveries from the environmental account would serve as a Wyoming contribution to the water component of that Program on behalf of Wyoming's existing water users, including the federal storage water contractors located in Wyoming and Nebraska to the extent the activities of such contractors are related to the delivery of storage water from the federal reservoirs in Wyoming. If no Program exists, such storage and deliveries would serve as a proposed reasonable and prudent alternative for the ongoing section 7 consultation on the operation of Bureau of Reclamation reservoirs serving Wyoming and Nebraska. Further, if a separate program is sought by Wyoming and the federal storage contractors in Wyoming and Nebraska, they may seek credit for such deliveries for purposes of ESA evaluations.

3. The State of Wyoming would have the exclusive right to contract with the Bureau of Reclamation for the use of the remaining 20,000 acre feet of the modification capacity in a "Wyoming account" to provide municipal water to North Platte communities in Wyoming, replacement water to satisfy any obligations under the modified North Platte Decree or any stipulation in this case, or water for endangered species as described in Paragraph 3.e.

a. Water would accrue to the Wyoming account as an equal priority partner to other reservoir uses. The 20,000 account is 1.87% (20,000/1,070,000) of the

capacity of Pathfinder Reservoir. Therefore, the account would accrue 1.87% of the inflow that is storable under the 1904 storage right.

b. The Wyoming account could not contain more than 20,000 acre feet at any one time and will be administered under Wyoming water law. For example, if at the end of a water year, which is defined as October 1 to September 30, 5,000 acre feet of water was in the account, the account could only accrue 15,000 acre feet under its priority fill during the forthcoming water year.

c. The Wyoming account would be assessed its proportionate share of evaporation losses based on the storage water in the account.

d. The storage water would be used to supplement Wyoming municipalities' water rights or to satisfy any obligation under the modified North Platte Decree or any stipulation in this case. If released to meet an obligation under the Decree or stipulation in this case, the storage water will be administered under procedures adopted by stipulation in this case as such procedures may be modified from time to time by the North Platte Decree Committee. Storage water used to supplement municipal water rights will be administered as follows: When the municipal surface or hydrologically connected ground water rights, or a portion thereof, are regulated due to a

priority call, the municipality whose rights are regulated, subject to state law, could continue to divert to meet its municipal demands and its depletions would be replaced from its contracted portion of the Wyoming account subject to the following conditions:

i. The municipality must have the capability to measure its diversions and its return flows in a manner approved by the Wyoming State Engineer in order to accurately measure the resulting depletions. If the return flows cannot be measured in a manner acceptable to the Wyoming State Engineer, the entire amount diverted will be considered a depletion and will be debited from the respective municipalities' account.

ii. Contracts for water from the Pathfinder Modification Project with the State of Wyoming will stipulate that the contracting municipality can only serve new individual demands less than 100 acre feet of water per year.

iii. If the City of Casper contracts for water in the Wyoming account, water in its portion of the account must be depleted before it can exercise its entitlements in Seminoe Reservoir. This condition serves to alleviate project impacts on Seminoe Reservoir.

e. The Bureau of Reclamation, under contract with the State of Wyoming, will operate the 20,000 acre feet Wyoming storage account to insure an annual estimated firm yield of 9,600 acre feet. In any year that the demand for municipal use is less than 9,600 acre feet, the remaining balance of the annual firm yield may be used by Wyoming for depletion replacement or release for endangered species in Central Nebraska. Such uses are secondary to the purpose of providing water for municipal use for North Platte communities in Wyoming. Any water used for endangered species purposes must be released from storage before the end of the water year and does not constitute a permanent water right.

4. In order for the project to be implemented, [1] the federal authorization of Pathfinder Reservoir will be amended if necessary to include municipal and environmental purposes, [2] the water right for Pathfinder Reservoir must undergo a partial change of use under Wyoming water law to allow the uses of the Wyoming and environmental accounts contemplated by this Stipulation, and [3] the Wyoming Legislature must approve the export of water for downstream environmental purposes. Further, any decision of the Bureau to proceed with the project in this Stipulation will not be made until after completion of any appropriate analysis under NEPA or consultation under the ESA.

5. In order to address the effects the Pathfinder Modification Project may have on contractors for water from Glendo, Pathfinder and Seminoe Reservoirs in Wyoming, upon completion of the Pathfinder Modification Project,

Wyoming will pay the Wyoming and Nebraska federal storage water contractors' share of the Safety of Dams Modifications to the federal reservoirs to be implemented by the Bureau of Reclamation in the near future.

6. In order to address the effects the Pathfinder Modification Project may have on the Kendrick Project, upon completion of the Pathfinder Modification Project, Wyoming will assist the Casper Alcova Irrigation District with the resolution of existing selenium issues that are impacting its existing operation.

7. Existing Wyoming and Nebraska federal storage water contractors will not be held responsible for any costs assigned to the Pathfinder Modification Project.

8. Subject to the appropriate approvals and conveyance losses, Wyoming, in accordance with its water law, will assure delivery of the storage water from the Pathfinder Modification Project herein designated for downstream environmental purposes to the Wyoming/Nebraska state line. A permit will be secured under Nebraska water law by the contractor for the environmental account to conduct the quantities of water thus delivered at the state line, subject to appropriate conveyance losses, to specified locations between the state line and Chapman, Nebraska. The environmental releases will begin subsequent to completion of the project and issuance of the permits by Nebraska. Beyond the state line, Nebraska will assure delivery of the water in accordance with the terms of any such permit granted and with other applicable Nebraska law.

9. As long as the project is implemented in the manner outlined herein, the State of Nebraska hereby stipulates that it will support the project in this litigation and

in any other proceeding necessary to implement and operate the project.

10. Upon completion of the Pathfinder Modification Project, Wyoming will release the 404 permit and the water rights for the Deer Creek Project, a proposed and permitted reservoir with a capacity of approximately 66,000 acre feet and provide fee simple title to the 470 acres of habitat it owns in the critical habitat area in Central Nebraska to the USFWS or other entities as deemed appropriate by the USFWS. Nebraska will move to dismiss Jess v. West, No. 88-1-308 (D. Neb.).

11. The parties previously entered into a stipulation providing for the modification of Pathfinder Dam filed on September 10, 1997. This document represents the parties amendment to that stipulation and is intended to supersede that stipulation.

DATED this 13th day of March, 2001.

Respectfully submitted,

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Appendix G

North Platte Decree Committee Charter

NORTH PLATTE DECREE COMMITTEE

CHARTER

Article I.

General Purpose of the North Platte Decree Committee

The North Platte Decree Committee (NPDC) is established by the States of Nebraska, Wyoming, and Colorado, and the United States of America to assist in monitoring, administering, and implementing the Modified North Platte Decree and the Final Settlement Stipulation dated March 13, 2001.

Article II.

Membership of the NPDC

A. The parties to the NPDC are the states of Nebraska, Wyoming, and Colorado, and the United States of America.

B. The parties' representatives on the NPDC are:

1. The Wyoming Area Manager of the United States Department of Interior, Bureau of Reclamation (Bureau) or his or her designee;

2. The Director of the Nebraska Department of Natural Resources (Nebraska) or his or her designee;

3. The Wyoming State Engineer (Wyoming) or his or her designee; and

4. The Colorado State Engineer (Colorado) or his or her designee.

C. Each representative may designate an alternate to the NPDC by submitting the alternate's name in writing to the NPDC. An alternate may be removed or replaced at the discretion of the appointing representative.

D. The responsibility for chairing the NPDC shall rotate among the Bureau, Nebraska, and Wyoming representatives. A new chairperson shall be selected by those representatives at least once every two years.

E. Attached as Exhibit 1 to this Charter, is the mailing address for each NPDC representative for purposes of providing notice as may be required by the provisions of this Charter.

Article III.

Definitions

The following terms as used in this document are defined as:

A. Submitted to the NPDC: A matter is deemed to have been submitted to the NPDC when a written statement requesting action or decision by the NPDC has been mailed pursuant to paragraph III.D to the

other NPDC representatives and to the NPDC office or central repository of NPDC documents established under paragraph IV.I. of this Charter.

B. Addressed by the NPDC: A matter is deemed to be addressed by the NPDC when the NPDC has taken final action on such request or failed to reach a decision on the request after a reasonable opportunity to investigate and act on the request.

C. Reasonable Opportunity: The NPDC will be deemed to have had a reasonable opportunity to investigate and act on a request when, at a minimum, the issue has been discussed at two consecutive meetings. If the NPDC determines that an issue requires additional investigation, the NPDC may specify a period of time that constitutes a reasonable opportunity for completion of such investigation and final action on the particular issue.

D. Notice: Notice is deemed to have been given when a NPDC representative mails a written request via certified mail to the other NPDC representatives at the addresses listed on Exhibit 1.

E. Modified Decree: The Decree to be entered by the United States Supreme Court on the request of the parties pursuant to the Final Settlement Stipulation in *Nebraska v. Wyoming*, No. 108, Original.

F. Final Settlement Stipulation: The stipulation filed in *Nebraska v. Wyoming*, No. 108, Original, to which this Charter is attached. The Final Settlement Stipulation supersedes the Principles of Settlement signed by the parties on May 10, 2000.

G. General Operating Expenses: These expenses include administrative expenses such as those incurred in the exercise of the powers and authorities described in paragraphs A2, A7, and A8, of Article V.

H. Actual Interest: A party will be deemed to have an actual interest in a dispute if resolution of the dispute could require action by the party, result in increasing or decreasing the amount of water available to the party, affect the party's ability to monitor or administer water use or water availability, or increase the party's financial obligations.

Article IV.

Operation of the NPDC

A. The NPDC and the administrative procedures attached hereto pursuant to Article VI will become operational when the United States Supreme Court has approved the Final Settlement Stipulation and entered the Modified Decree.

B. A quorum of the NPDC shall be present, and business may be conducted, when the Bureau, Nebraska, and Wyoming representatives, and, as applicable, the Colorado representative, are present. Colorado may attend all meetings of the NPDC, but may vote only when the State of Colorado has an actual interest in an agenda item. Colorado shall make an initial determination whether Colorado has an actual interest in any of the agenda items and if Colorado determines that it has an actual interest in an agenda item, Colorado will provide notice of such interest at least five days prior to a regular meeting

and no later than the day before any specially-scheduled meeting. If any other representative disagrees with Colorado's initial determination that Colorado has an actual interest in an agenda item and if the issue of Colorado's actual interest cannot be resolved by agreement of all the representatives, the representatives other than Colorado may take action on the matter. No such action may be enforced against Colorado nor subject Colorado to any monetary obligation without its consent, nor shall such action be deemed an exhaustion of administrative remedies as to Colorado. If any other representative disagrees with Colorado's initial determination that Colorado does not have an actual interest in an agenda item and if the issue cannot be resolved by agreement of all the representatives, Colorado's refusal to participate shall be construed as an abstention from voting on the matter and Colorado may not thereafter assert failure to exhaust administrative remedies as to the particular matter.

C. Proposed agendas shall be distributed by the chairperson to all NPDC representatives at least two weeks in advance of any regular meeting and as soon as possible prior to any specially-scheduled meeting.

D. Each NPDC representative shall have one vote on each issue submitted to the NPDC. A representative may vote yes, no, or may abstain. A negative vote by any representative shall prevent the proposed action from being adopted. Abstention shall not be counted as a negative vote. Action of the NPDC shall be by formal resolution or as reflected in the approved minutes. A request for formal resolution may be made by any representative.

E. The NPDC will meet at least twice per year at a time and place designated by the representatives. At least one meeting shall be held no later than April 15 of each year, unless the representatives agree otherwise. A second meeting shall be held in October or November of each year, unless the representatives agree otherwise. Specially scheduled meetings for emergency or other purposes shall be held if requested by any representative. The chairperson of the NPDC shall poll all of the representatives prior to setting the meeting date, time, and place of a regular or specially scheduled meeting. All representatives shall make a good faith effort to arrange a mutually agreeable date, time, and place for all meetings. A meeting may be conducted only when all representatives or their alternates are available to attend. In the event a representative requests a specially-scheduled meeting for emergency or other purposes, such meeting shall be held as soon as is reasonably possible, but in no event more than thirty days after the request is made, unless more time is agreed to by the representatives. If scheduling a meeting is not possible within thirty days of a request, the representatives may conduct a telephone conference or use other means available. If any such meeting is not held within thirty days because of the failure of any representative other than the requesting representative to attend or to agree to the date and place for the meeting, the party represented by the requesting representative shall be relieved of any obligation to submit the dispute to the NPDC for potential resolution.

F. Minutes of each meeting will be recorded and approved by the representatives within thirty (30) days of each special or regularly scheduled meeting.

After approval, the minutes will be sent to the representatives and filed at the NPDC's office or central repository established under paragraph IV.I of this Charter.

G. The salary and personal expenses of each representative shall be paid by the party that he or she represents. All general operating expenses incurred by the NPDC in the performance of its duties and functions shall be borne equally by the parties, unless they agree otherwise. If the NPDC undertakes a specific project or study that involves only certain parties, those parties shall share the costs of such project or study equally, unless the representatives agree otherwise. If necessary, the NPDC shall designate a depository institution to aid in such payments. The financial obligations of the parties are subject to appropriations being made available for such purposes.

H. The NPDC Charter may be amended only by written agreement of the parties.

I. The NPDC at its first regular meeting shall establish an office or a central repository of documents where official records of the NPDC shall be kept and where filings with the NPDC shall be made. Such office or repository may be within the offices of one of the representatives and the location may be changed from time to time by the NPDC. The NPDC shall designate the person or persons responsible for maintaining such official records and shall determine whether to pay a salary or other compensation to such person and such determination may be changed from time to time by the NPDC. Files that the NPDC no longer retains shall be archived unless the NPDC has

determined to dispose of them. Each representative shall have the right to review all documents and materials maintained by the NPDC, including all background data, computations, computer files, and related notes.

Article V.

Powers and Authorities of the NPDC

A. The NPDC, consistent with the terms and provisions of this Charter and state and federal law, shall have the power to:

1. Adopt, amend, and revoke by-laws, rules and regulations;

2. Appoint a secretary who shall serve such term, receive such salary or expense reimbursement, and perform such duties as the NPDC may direct;

3. Implement dispute resolution techniques in accordance with Article VII;

4. Employ such technical, engineering or clerical personnel as in the NPDC's judgment may be necessary for the performance of its functions under this Charter;

5. Engage in studies of water supplies, streamflows, diversions, withdrawals, consumption, depletions, return flows, storage and the use of the waters of the North Platte River system;

6. Collect, compile, analyze, correlate, and report on data relating to water supplies, streamflows, diversions, withdrawals, consumption, depletions, return flows, storage, and the use of the waters of the North Platte River system;

7. Maintain the official records of the NPDC and of all other data and information collected and/or compiled by the NPDC;

8. Perform the administrative functions assigned to the NPDC in the Final Settlement Stipulation and the Modified Decree;

9. Review and modify the document entitled, "North Platte River Ownership and Natural Flow Accounting Procedures," which the parties have reviewed annually in the spring and modified for the current water year, as deemed appropriate. An example of this document is attached as Exhibit 2;

10. Review, and consent, or withhold consent, to proposed modifications to the document entitled, "Water Administration of the Lower Laramie River System Relating to Basin Electric Power Cooperative's Water Rights," attached as Exhibit 3. Pursuant to paragraph V.B of the Final Settlement Stipulation, Exhibit 3 cannot be modified without the consent of the NPDC and Basin Electric;

11. Revise the procedures identified in Article VI and adopt new procedures that are consistent

with the Modified Decree, the Final Settlement Stipulation, this Charter, and applicable state and federal law; and

12. Undertake such other activities as deemed appropriate by the parties and consistent with the Modified Decree and the Final Settlement Stipulation.

Article VI.

NPDC Procedures

The parties have adopted the following administrative procedures, attached hereto and incorporated herein as Exhibits 4 through 15, respectively, to assist in monitoring, administering, and implementing the Modified Decree and the Final Settlement Stipulation:

Exhibit 4: Procedure for Administration Upstream of Guernsey Reservoir Acreage Accounting

- Exhibit A: Wyoming Irrigation Original Supply Well Permits as of 12/31/00 Above Pathfinder Reservoir
- Exhibit B: Wyoming Irrigation Original Supply Well Permits as of 12/31/00 Between Pathfinder Dam and Guernsey Reservoir

Exhibit 5: Procedure for Administration Upstream of Guernsey Reservoir During Allocation Years

Exhibit 6: Procedure for Consumptive Use Accounting

Exhibit A: Procedures for Calculating Consumptive Use of Irrigation Water Above Guernsey Reservoir, Wyoming (with example consumptive use calculations)

Exhibit B: Procedure to Evaluate Consumptive Use Calculations Above Guernsey, Wyoming

Exhibit 7: Procedure to Eliminate Negative Natural Flow Upon Occurrence

Exhibit 8: Procedure for Reservoir and Storage Right Evaporation Losses

Exhibit 9: Procedure for River Carriage (Conveyance) Losses

Exhibit A: Source of the Values of the River Carriage Losses

Exhibit B: Distribution of River Carriage Losses

Exhibit 10: Procedure for Whalen Diversion Dam to the State Line Reach Administration of Irrigation Ground Water Rights

Exhibit A: Assumptions Used in the Development of the Well Unit Replacement Requirement

Exhibit B: Potential Methodology for Future Estimates of Triggers

Exhibit 11: Procedure for Whalen Diversion Dam to the State Line Reach Administration of Surface Water Rights from Tributaries and Drains

Exhibit 12: Procedure for Lower Laramie River Basin Acreage Accounting

Exhibit A: Wyoming Irrigation Original Supply Well Permits as of 12/31/00 in the Lower Laramie River Basin

Exhibit 13: Procedure for Reporting Post-2000 Irrigation Wells Within Wheatland Irrigation District

Exhibit 14: Procedure for Reporting New Municipal, Industrial, and Export Permits

Exhibit 15: Procedure for Reporting Permits for New Dams, Enlargements or Groundwater Recharge Projects

Article VII.

Dispute Resolution

A. The NPDC will attempt to resolve any dispute submitted to the NPDC related to compliance with or administration of the Modified Decree or the Final Settlement Stipulation. If such a dispute cannot be resolved by the NPDC, the NPDC will decide

pursuant to Article IV.D whether to refer the dispute to alternative dispute resolution.

B. Alternative dispute resolution methods to be considered by the NPDC include, without limitation: a) Mediation; b) Non-binding arbitration; and c) Binding arbitration.

C. If the NDPC [sic] has decided to refer a matter to alternative dispute resolution, but has not adopted a method and procedure after reasonable opportunity to do so as defined in Article III.C, the matter will be submitted to alternative dispute resolution administered by the American Arbitration Association or a similar organization under their rules and any supplementary procedures for complex disputes, except that no party shall be subject to binding arbitration without its consent. The method for selecting the mediator or arbitrator(s) shall be determined by the NPDC parties that have an actual interest in the dispute as defined in Article III.H.

D. Any mediator or arbitrator(s) shall not be an employee or agent of any party to the NPDC, shall be a person knowledgeable in water resource management, and shall disclose any actual or potential conflict of interest and all current or prior contractual and other relationships with any person or entity who could be directly affected by resolution of the dispute.

E. When the NPDC has addressed a dispute as defined in Article III.B, the parties shall be deemed to have exhausted their administrative remedies before the NPDC for the purpose of seeking leave of the United States Supreme Court to bring an action regarding

such dispute pursuant to paragraph XIII of the Modified Decree.

Exhibit 1

NPDC Representatives' Mailing Addresses

Representative	**Mailing Address**
Wyoming Area Manager of the United States Department of Interior, Bureau of Reclamation	Post Office Box 1630 Mills, Wyoming 82644
Director of the Nebraska Department of Natural Resources	301 Centennial Mall South Post Office Box 94676 Lincoln, Nebraska 68209-4676
Wyoming State Engineer	Herschler Building 4th Floor East Cheyenne, Wyoming 82002
Colorado State Engineer	1313 Sherman Street Room 818 Denver, Colorado 80203

Exhibit 2

North Platte River Ownership and Natural Flow Accounting Procedures for Water Year 2000

NORTH PLATTE RIVER OWNERSHIP AND NATURAL FLOW ACCOUNTING PROCEDURES FOR WATER YEAR 2000

The parties to this criteria agree that administration and operation under this agreement are to conform with Wyoming and Nebraska State Laws, the U.S. Reclamation Law, and the U.S. Supreme Court Decree of 1945 and the 1952 Stipulation, as appropriate.

These ownership accounting and natural flow computing procedures shall be subject to revision and adoption at the annual Natural Flow and Ownership Meeting, and shall not be considered as applicable for any year not adopted. Conditions arising in exception to these procedures will be resolved by agreement of the signatory parties.

The natural flow computing procedure in part B incorporates the provisions of the Amendment of 1953 Order, Paragraph V., River Carriage Losses, Stipulation of the 1945 Decree submitted to Special Master Olpin in September 1997. This stipulation has not been formally approved by the Supreme Court.

It is the intent of this document to provide a reasonable means to maintain the status quo and to provide for conflict-free administration of the river pending resolution of the matters now in litigation.

PART A.

STORAGE OWNERSHIP ACCOUNTING PROCEDURE

The North Platte system storage ownership shall equal the total storage in Seminoe, Kortes, Pathfinder, Alcova, Gray Reef, Glendo, and Guernsey Reservoirs, except for water held in storage under separate contract for other entities by the Bureau of Reclamation or waters held in temporary storage.

All storage ownerships are to be filled in order of priority as provided for by Paragraph III of the 1952 Modification of the U.S. Supreme Court Decree of 1945, Wyoming State Law and as water becomes available. Any water bypassed or spilled is to be charged to that ownership which may not then be refilled until all other appropriations from the river have been satisfied. No storage ownership delivery or evaporation charges will be assessed when water is being spilled from the system.

A one-day time lag will be used in computing the evaporation chargeable to each ownership. Evaporation chargeable today is considered to be equal to yesterday's total actual evaporation.

A. Pathfinder - 1,016,507 A.F. (current capacity)
Priority Date - 12/06/04

1. All river gains upstream of Pathfinder Reservoir for the October 1 through April 30 period are to accrue to this ownership until filled. Gains May 1 through September 30 in excess of natural flow

demands may accrue to Pathfinder ownership until filled.

2. Any Pathfinder ownership in Guernsey Reservoir on September 30 will remain in Pathfinder ownership after October 1. This water will not transfer to Guernsey ownership, but will remain in Pathfinder ownership and may be transferred upstream as Guernsey ownership or the Inland Lakes accrue water. Pathfinder ownership transferred to the Inland Lakes will remain in Pathfinder ownership.
3. The Pathfinder evaporation charge is computed as though all Pathfinder ownership is in Pathfinder Reservoir except for that portion which may be in Guernsey Reservoir which shall be computed at the same rate as that of Guernsey Reservoir.

B. Inland Lakes - 46,000 A.F. (accrual) Priority Date - 12/06/04

The parties do not agree on the question whether natural flow may be stored from the North Platte River in or for the account of the Inland Lakes under the existing Wyoming permits for the North Platte Project. Reserving all of their legal rights, the parties agree that, during any water year, while this litigation is pending:

1. During the months of October, November, and April, gains downstream from Alcova Reservoir will accrue to the Inland Lakes, up to a total of 46,000 A.F., and at a rate not to exceed 910 cubic feet per second.

These gains may be stored in Guernsey and Glendo Reservoirs and transferred to the Inland Lakes when Pathfinder Irrigation District resumes spring operations. The transfer is to be completed no later than May 15th.

2. Evaporation will be charged to this ownership for water stored in upstream reservoirs at the rate determined for the reservoir where stored.

3. The amount of water transferred from this account to the Inland Lakes shall not exceed 46,000 A.F. annually less evaporation losses, measured into the Interstate Canal if other water is being released and at Guernsey if only Inland Lakes water is being released.

In addition, the following conditions apply:

a. For Water Year 2000, the Alcova to Guernsey accruals during the months of October, November, and April have been or will be credited to the Inland Lakes account up to a total of 46,000 A.F.

b. Reclamation will maintain and make available to Wyoming and Nebraska records accounting for all water stored in the Inland Lakes or accrued to the Inland Lakes account on a daily basis.

c. Nothing in these procedures is intended to restrict the delivery of North Platte Project storage water to the Inland Lakes.

C. Guernsey - 45,612 A.F. (current capacity) Priority Date - 04/20/23

1. River gains upstream of Guernsey Reservoir for the October 1 through April 30 period and not credited to the Inland Lakes will accrue to this ownership until filled. Gains May 1 through September 30 in excess of natural flow demands may accrue to Guernsey ownership until filled.

2. The Guernsey evaporation charge is computed as though all Guernsey ownership is in Guernsey Reservoir.

3. The Hydrographer-Commissioner of District 14 and the Division Supervisor of the Bridgeport Office of the Department of Water Resources will be notified in a timely manner of all releases made to fulfill contractual obligations to Federal contractors by the Bureau of Reclamation.

4. Guernsey Reservoir releases after April 30 are to be natural flow calls upon the river following coordination among Wyoming, Nebraska and Bureau of Reclamation personnel. When Guernsey Reservoir releases exceed the natural flow of the river at this point, then the difference is a release of storage water.

5. Guernsey ownership transferred to the Inland Lakes will remain in Guernsey ownership.

D. Kendrick - 1,201,678 A.F. (current capacity; Seminoe - 1,017,273 A.F., Alcova - 184,405 A.F.) Priority Dates (Seminoe - 12/01/31, Alcova - 04/25/36)

1. All gains upstream of Seminoe Reservoir for the October 1 through April 30 period after Pathfinder and Guernsey ownerships have filled are to accrue to Kendrick (Seminoe) ownership until filled. Likewise, all gains upstream of Alcova Reservoir for the October 1 through April 30 period after Pathfinder and Guernsey ownerships have filled are to accrue to Kendrick (Alcova) ownership until filled. Gains May 1 through September 30 in excess of natural flow demands may accrue to the Kendrick ownership until filled.

2. The evaporation chargeable to Kendrick ownership shall be the actual Seminoe and Alcova Reservoir evaporation yesterday, plus the evaporation for Kendrick ownership stored in any other reservoir but assumed to be in Seminoe Reservoir, minus any loss charged to storage held under contract for other entities by the Bureau of Reclamation in Seminoe Reservoir.

E. Glendo - 183,238 A.F. (current capacity) Priority Date - 08/30/51

1. This ownership consists of a power head pool of 63,148 A.F. (elevation 4,570), an irrigation ownership pool not to exceed 100,000 A.F. and an estimated evaporation pool of 20,090 A.F.

2. All gains upstream of Glendo Reservoir for the period October 1 through April 30 after the Pathfinder, Guernsey, and Kendrick ownerships and the Inland Lakes Account have filled are to accrue to the Glendo ownership until filled. At any time that the Guernsey ownership has filled and the Pathfinder or Kendrick ownerships have not filled, all gains between Alcova and Glendo will accrue to Glendo ownership, if not required to fill the inland lakes ownership during October, November, and April. Gains May 1 through September 30 in excess of natural flow demands may accrue to this ownership until filled.

3. When the power head pool of 63,148 A.F. (elevation 4570) is filled, no further accounting need be made for this pool. This minimum power head pool can be filled but once from the river. All Glendo ownership evaporation will be charged against the irrigation pool unless storage for evaporation has been underestimated and evaporation encroaches upon the power head pool. In this case, refilling of the power head pool may be allowed as an

exception by the Wyoming State Engineer.

4. Glendo ownership can accrue annually in the irrigation pool up to 40,000 A.F. plus estimated evaporation, provided this total irrigation ownership, including carryover storage does not exceed 100,000 A.F. plus estimated evaporation. Any difference between actual evaporation charged to the Glendo ownership and that estimated previously will be accounted for by adjustment of next year's allowable storage for evaporation.

5. The Glendo ownership will be accounted for on both a State and an individual contractor basis. Such accounting will include accruals, releases, evaporation, exchanges, and carryover storage. Temporary contracts will be satisfied by withdrawals from uncontracted storage volumes. Such amounts will be allocated by account in proportion to each entity's contracted amount of the Glendo water supply. The total accrual to the irrigation ownership shall not exceed 40,000 A.F. per year, nor will the irrigation pool including carryover accrue beyond 37,500 A.F. for Wyoming or 62,500 A.F. for Nebraska.

6. The evaporation chargeable to the Glendo ownership is the total actual evaporation minus that chargeable to other ownerships and minus any loss charged to storage

held under contract for other entities by the Bureau of Reclamation in Glendo Reservoir.

7. Gains Alcova to Glendo for the October 1 through April 30 period are to be computed as Glendo Reservoir inflow minus 98 percent of the Gray Reef outflow two (2) days earlier.

F. Unintentional Water Below the State Line

1. Deliveries at the State Line for contractors below the State Line will be charged for their order placed two days before. When storage water has been released from Guernsey Reservoir for canals at or above Tri-State Dam and when the quantity of water passing the State Line exceeds the quantity of water ordered two days before for delivery at the State Line, for each day storage water was released, the difference between the order for delivery at the State Line and the measured flow shall be considered unintentional water passing the State Line.

2. The unintentional water passing the State Line shall be first charged to the Operation Water Account described in Section G Paragraph 2. No more than 50 cfs shall be charged against this account on a daily basis under this Section F Paragraph 2. In no event will the annual limitation for that account be exceeded.

3. a. If the Operational Water Account has been depleted or if there is additional unintentional water passing the State Line beyond the 50 cfs charged to the Operation Water Account as described in Section F Paragraph 2, the excess unintentional water will be charged to any contractor, or in the case where two or more contractors share a canal, to the canal, between Guernsey Dam and the State Line whose diversion was less than the amount ordered the previous day by a rate of 5 cfs or greater, or in the case of the Mitchell-Gering Canal ordered two days previously. If more than one contractor should be charged, the charge will be in proportion to the amount each canal ordered but did not divert compared to the total amount ordered but not diverted by all canals being charged. For districts sharing a canal, the canal charge will be distributed to each district in proportion to the initial amount ordered by each district. In no case will this charge exceed the amount of the difference between what was ordered and what was diverted by a canal

3. b. If after charging for water passing the State Line in accordance with Section F Paragraphs 1, 2, and 3.a., there is still remaining unintentional water passing the State Line, the unintentional water will be charged to any contractor who was not charged in accordance with Section F Paragraph 3.a. and who diverted less

water than was ordered for delivery between Guernsey Dam and the State Line the previous day or in the case of the Mitchell-Gering Canal, two days before. The remaining unintentional water charge will be allocated to these contractors in proportion to the amount they ordered but did not divert compared to the total amount ordered but not diverted by all canals. This charge to individual canals shall not be greater than the difference between the canal's order and its diversion.

4. To the extent there is remaining unintentional water passing the State Line that exceeds the amounts accounted in Section F Paragraph 1, 2, 3.a. and 3.b., the balance shall be charged to the Operational Water Account. However, if the Operational Water Account has been depleted, then the balance shall be charged to all contractors who ordered water in an amount that is proportional to their orders.

5. Where extreme precipitation events cause unintentional flows to pass the State Line gage, such quantities shall not be charged against any storage ownership account, and the Bureau of Reclamation will make appropriate and timely Guernsey Dam outflow adjustments. The Division I Superintendent of the Wyoming Board of Control, the Division Supervisor of the Nebraska Department of Water

Resources, and a representative from the Bureau of Reclamation shall consult and jointly determine the duration of time during which no storage ownership account will be charged because of additional precipitation events causing unintentional flows past the State Line gage.

G. Excess to Ownership

1. All gains upstream of Alcova Dam in excess of natural flow demand and not applied to the Pathfinder, Kendrick, Guernsey, or Glendo ownerships, as set forth herein, will accrue to "Excess to Ownership". River gains upstream of Guernsey Dam and below Alcova Dam in excess of natural flow demand not applied to the Inland Lakes ownership, the Guernsey ownership, or Glendo ownership, as set forth herein, will accrue to "Excess to Ownership".

2. The first 15,000 A.F. of water accrued to the "Excess to Ownership" Account shall be stored in the Operational Water Account and shall be used by the Bureau of Reclamation to make up for unintentional water passing the State Line in excess of water needed to fill storage water ordered by canals below Tri-State Dam as described in Section F. Any water remaining in the Operational Water Account after September 30 will carry over to the Operational Water Account on

October 1. The total accrual to the Operational Water Account, including carryover storage, cannot exceed 15,000 A.F.

3. Any "Excess to Ownership" water which is captured at or above Alcova Dam in quantities greater than needed to accomplish Section G Paragraph 2 shall be used to replace evaporation from the Kendrick, Pathfinder, Glendo and Guernsey ownerships, once the ownerships are filled, and until the first release of ownership water at or above Tri-State Dam occurs from any of these ownership accounts. "Excess to Ownership" water which is captured in Glendo or Guernsey Reservoirs in quantities greater than needed to accomplish Section G Paragraph 2 shall be used to replace evaporation from the Glendo and Guernsey ownerships, once the ownerships are filled, and until the first release of ownership occurs from either ownership account for canals at or above Tri-State Dam.

4. Any "Excess to Ownership" water which is captured in quantities greater than needed to accomplish Section G Paragraphs 2 and 3 will be converted and released to fill natural flow demands when natural flow demand exceeds the actual natural flow on a given day.

5. The "Excess to Ownership" water account will accrue and be released in such a manner so as not to interfere with authorized project purposes, or as would endanger the safety of a structure.

PART B.

NATURAL FLOW COMPUTING PROCEDURE

Inflow to Seminoe Reservoir

The Seminoe inflow will be the sum of the flows of the North Platte River above the Seminoe Reservoir and the Medicine Bow River above Seminoe Reservoir.

Natural Flow above Alcova Reservoir

The natural flow above Alcova Reservoir will be the inflow to Seminoe plus the flow of the Sweetwater River entering Pathfinder Reservoir and to this total will be added the following daily accrual for each month:

May	June	July	August	September
90 cfs	45 cfs	40 cfs	35 cfs	35cfs

The total of Seminoe inflow plus the flow of the Sweetwater River plus the accrual will be called the natural flow entering Alcova Reservoir and will be passed through Alcova Reservoir and Gray Reef Reservoir without loss.

Gray Reef Reservoir to Glendo Reservoir

To account for the losses between Alcova and Glendo Reservoir water released at the Gray Reef Reservoir

will be charged daily with the following losses set by the Amendment of 1953 Order, Paragraph V., River Carriage Losses, Stipulation of the 1945 Decree:

May	June	July	August	September
50 cfs	77 cfs	97 cfs	89 cfs	50 cfs

These losses will be distributed between natural flow and storage water in proportion to the quantity of each at Gray Reef Dam.

There will be a two (2) day time lag in transporting water from Gray Reef Reservoir to Glendo Reservoir. Water released at Gray Reef Reservoir will reach Glendo Reservoir two (2) days after the release date.

Glendo Outflow

The natural flow entering the Glendo Reservoir will be calculated as the average of today's natural flow entering Glendo Reservoir and the natural flow entering Glendo Reservoir the two previous days. The natural flow will be passed through Glendo Reservoir without loss and will one (1) day later be called the natural flow out of Glendo Reservoir.

Glendo Reservoir through Guernsey Dam

Natural flow released at Glendo Reservoir plus 20 cfs of river accrual will be called the Natural Flow out of Guernsey Reservoir.

Guernsey Dam to Whalen Dam

Water released at the Guernsey Dam will be charged daily with the following losses set by the Amendment of

1953 Order, Paragraph V., River Carriage Losses, Stipulation of the 1945 Decree to account for the losses between Guernsey Dam and Whalen Dam.

May	June	July	August	September
2 cfs	4 cfs	5 cfs	4 cfs	2 cfs

These losses will be distributed between natural flow and storage water in proportion to the quantity of each at Guernsey Dam.

Total flow below Guernsey Dam is calculated by the summation of the diversions by Interstate Canal and Fort Laramie Canal, the measured flow passing Whalen Dam, plus the stipulated losses. The storage water below Guernsey Dam is the difference between the total flow below Guernsey Dam and the natural flow out of Guernsey Reservoir.

Whalen Dam to Wyoming-Nebraska State Line

A one (1) day time lag is used in taking water from the River gaging station below Whalen Dam to the River gaging station at the State Line. The amount of natural flow passing the State Line gage plus 7 cfs to account for Spring Creek will be used among other factors to calculate the amount of natural flow in the Whalen to Tri-State Dam reach for the 75/25 apportionment.

Carriage losses in the river section Whalen Dam to the Wyoming-Nebraska State Line set by the Amendment of 1953 Order, Paragraph V., River Carriage Losses, Stipulation of the 1945 Decree are as follows:

May	June	July	August	September
10 cfs	19 cfs	21 cfs	17 cfs	9 cfs

The loss to storage between Whalen and the State line will be the previous day's ratio of storage water in the Whalen to State Line section times the daily conveyance loss for the section. A one day time lag is assumed from Whalen to the State Line. The ratio of storage in the Whalen to State Line section is computed as the average of the proportion of storage passing Whalen to total flow passing Whalen one day previous and the proportion of storage at the State Line to total flow at the State Line. This ratio in the section is used to determine the loss to storage between Whalen and the State Line the following day. Storage passing Whalen is the storage at Whalen minus the storage diversions into the canals which divert at Whalen dam. Storage at the State Line is the storage passing Whalen minus the loss from Whalen to the State Line and minus all diversions of storage by contractors diverting below Whalen and above the State Line. After computing storage losses, the balance of the stipulated losses will be subtracted from natural flow.

A loss of natural flow may be borrowed from storage and replaced from subsequent natural flow gains.

The gage readings at the Tri-State Canal of natural flow and storage deliveries to Tri-State Canal may differ from flowrates calculated using the State Line gage for various reasons, including, among other things, changes in travel time of flow between the two gages, and possible gage errors of both or either gage. The States and the Bureau of Reclamation recognize the potential for these discrepancies and are working towards finding ways to minimize them in the future.

/s/ Gordon W. Fassett 6/13/00
Wyoming State Engineer Date

/s/ Roger K. Patterson 5/22/00
Director, Nebraska Department of Water Resources Date

/s/ John W. Lawson 4/28/00
Area Manager, Bureau of Reclamation Date

Exhibit 3

Water Administration of the Lower Laramie River System Relating to Basin Electric Power Cooperative's Water Rights

WATER ADMINISTRATION OF THE LOWER LARAMIE RIVER SYSTEM RELATING TO THE BASIN ELECTRIC POWER COOPERATIVE'S WATER RIGHTS

Proceedings before the Wyoming State Board of Control, in the Wyoming state courts during 1995 and 1996 and the agreement reached by Nebraska, Wyoming, Colorado, the United States and Basin Electric Power Cooperative (Basin Electric) as set forth in the Final Settlement Stipulation have redefined and modified some of the water rights on the lower Laramie River, from the gaging station above Grayrocks Reservoir down to the mouth of the Laramie River at its confluence with the North Platte River. As a result of these proceedings and the agreement, the procedures for administering water in this section of the river require clarification and modification. This document is designed to outline procedures to implement these proceedings and the agreement and to serve as a guide to the administrative personnel whose responsibility it is to administer water in this section of the Laramie River.

I. Start with the measured flow at the gage above Grayrocks Reservoir. The flow at this point would be determined by a midnight-to-midnight average. A one-day transit time will be used to determine the releases to be made from the reservoir. In order to determine the natural flow at this point, any Boughton transfer water, inundated water rights, and

senior downstream water rights that may be in the river must first be deducted.

A. Procedure for defining the amount of Boughton transfer water in the river.

1. This Boughton water is only available from April 13 through June 26.

2. The amount available in priority to the Boughton Ditch is defined by the total flow in the river at the Bosler Gage, less any amounts required to fill prior rights downstream that are calling for water.

a. Determination of the amount of Boughton water that is transferable, as well as the administration of that water down the Laramie River to the gage above Grayrocks, are functions of the designated water commissioner on the Laramie River.

b. Once the transferable amount has been determined, then the following procedure applies:

1) Using a 4-day assumed travel time, this Boughton transfer water is conveyed down the Laramie River, through Wheatland Reservoir #2, and to the gage above Grayrocks.

a) Conveyance losses are assigned to this Boughton transfer water as follows:

(1) 30% when the amount available in priority is 35 c.f.s. or more.

(2) 40% when the amount is between 35 and 22.5 c.f.s.

(3) 50% when the amount is between 22.5 and 5 c.f.s.

(4) 100% when the amount is 5 c.f.s. or less.

3. The maximum amount to be transferred in any water year is 3,117 af., minus the conveyance losses.

   a. The maximum amount that can arrive at the gage above Grayrocks is 2,180 af.

   b. The amount of Boughton transfer water reaching the gage above Grayrocks needs to be accounted for separately so as not to exceed the yearly limit of 2,180 af.

B. Once determined, the amount of Boughton water at the gage above Grayrocks is either:

   1. Directed to the power plant to meet the plant demand, or

   2. Placed in the Temporary Storage Account in Grayrocks Reservoir.

II. After deducting the Boughton transfer water from the flow at the gage above Grayrocks, then the remaining natural flow is handled as follows:

A. Deduct the inundated rights that are prior to all downstream rights (2.995 c.f.s.)

1. The inundated rights are approved for transfer to the power plant from May 1 through September 30, when they are in priority, up to a maximum total of 1,648.1 af. each year.

2. The inundated rights transfer water is either:

a. Directed to the power plant to meet the plant demand; or

b. Placed in the Temporary Storage Account in Grayrocks Reservoir.

3. A separate accounting of the amount of water transferred each year through the inundated water rights transfer is required so as not to exceed the yearly limit of 1,648.1 af. imposed by the Board of Control order.

B. The next priority to be met is a downstream right in the amount of 6.25 c.f.s., for which sufficient water would be released from Grayrocks Reservoir, providing that it is calling for water.

C. The next priorities involve two inundated rights amounting to a total of 0.82 c.f.s. This amount would be deducted from the remaining natural flow water, and handled the same as outlined in A.2.a. & b., above.

D. The next priorities to be met are three downstream rights, which total 7.26 c.f.s. Sufficient water would be released from Grayrocks Reservoir to fill all of these rights that are calling for water.

E. The next priority involved is one inundated right amounting to 0.63 c.f.s. This would be handled the same as outlined in A.2.a. & b., above.

F. The next priorities involve two downstream rights totaling 3.75 c.f.s. for which sufficient water would be released from Grayrocks to fill the rights that are calling for water.

G. The next priority involved is one inundated right amounting to 0.025 c.f.s. This would be handled the same as outline in A.2.a. & b., above.

H. The next priority involves one downstream right amount to 6.40 c.f.s., for which sufficient water would be released from Grayrocks if it is calling for water.

I. The next priority involves one inundated right amount to 0.415 c.f.s. This would be handled the same as outlined in A.2.a. & b., above.

J. The next priorities involve two downstream rights totaling 1.03 c.f.s. for which sufficient water would be released from Grayrocks if water is being called for.

SUMMARY OF FOREGOING ITEMS, II.A. THOUGH J.:

Whenever there is at least 29.575 c.f.s. of natural flow at the gage above Grayrocks, a total of 4.885 c.f.s. will be treated as inundated water rights transfer and handled as outlined in A.2.a. & b.; the balance of 24.69 c.f.s. will be released from Grayrocks Reservoir and accounted for as downstream prior right releases.

K. The next priority is the GID 25 c.f.s. supplemental supply right under Permit No. 4883 Enl., (Original supply is from the North Platte River and Pathfinder Reservoir, through the Ft. Laramie Canal, Permit No. 18544 with a secondary supply from Guernsey Reservoir, Permit No. 5014 Enl.). This right will be acquired by the State of Wyoming pursuant to the Final Settlement Stipulation and transferred to the mouth of the Laramie River as measured at the Ft. Laramie Gage and shall be available for diversion only during the irrigation season (May 1 - September 30).

After filling the prior Laramie River rights listed above and when the available supply of water from the GID original source (North Platte) is less than the maximum amount allowed by Wyoming State Law, then the GID supplemental supply right may (when in priority) be used to augment the original supply water right, subject to the following:

1. After the transfer of the right as required by the Final Settlement Stipulation, the GID right

shall receive an automatic call when in priority.

2. The maximum rate of diversion shall be 25 c.f.s. and not to exceed a yearly limit of 2,500 af. measured at the Ft. Laramie Gage.

3. The Water Commissioner on the North Platte River shall be responsible for determining when GID's original source is less than the maximum amount allowed by state law and will notify the Laramie River Water Commissioner and Basin Electric when this condition occurs.

4. The releases from Grayrocks Reservoir for the GID right shall be the lesser of the following as measured at the Ft. Laramie Gage:

   a. The difference between the amount of natural flow water available in priority to the GID right from the North Platte River, and the total amount of their direct flow right from the North Platte, or

   b. A maximum diversion rate of 25 c.f.s. and not to exceed a yearly limit of 2,500 af. measured at the Ft. Laramie Gage.

L. The next priorities involve two inundated rights totaling 0.50 c.f.s., and would be handled the same as outlined in A.2.a. & b., above.

M. The next priorities involve three downstream rights totaling 0.50 c.f.s., for which sufficient

water would be released from Grayrocks Reservoir to fill the rights that are calling for water.

N. The next priorities involve nine inundated rights totaling 1.235 c.f.s., and would be handled the same as outlined in A.2.a. & b., above.

O. The next priority involves one downstream right amounting to 1.24 c.f.s. for which sufficient water would be released from Grayrocks to fill this right if it is calling for water.

III. Any remaining natural flow in the Laramie River at the gage above Grayrocks Reservoir is then apportioned as follows:

A. To the power plant to meet the plant demand, up to the amount of the water right (45 c.f.s.)

1. The power plant demand is to be filled in the following order, depending on water available:

a. From Boughton transfer water, when in priority.

b. From inundated water rights transfer, when in priority.

c. From natural flow from the Laramie River if it is available.

d. From the Temporary Storage Account in Grayrocks Reservoir.

e. From the Johnson wells.

f. From the Grayrocks Reservoir Storage Account.

B. To the Grayrocks Reservoir General Storage Account (See Section IV.A., below)

C. Any remaining natural flow in the Laramie River after Grayrocks Reservoir has received its "one-fill" per year (defined below) will be handled as follows:

1. Under the "one-fill" concept, a reservoir is entitled to store, between October 1 of any water year and September 30 of the following year, an amount of water which equals the total amount provided for in the reservoir permit (in this case 104,109.6 af.) minus the amount of the General Storage Account at the end of the date on September 30.

2. Once this "one-fill" limit has been reached in any year, additional accruals to the General Storage Account will either be classified as "re-fill storage" or the water will be passed directly through the reservoir and not stored. For purposes of accounting for the "one-fill" limit, the Temporary Storage will not be counted.

a Whenever conditions develop where it is apparent that the "one-fill" limit will be reached, Basin Electric will notify the Water Division Superintendent of this fact, and request permission to utilize the

"re-fill storage" water when it becomes available.

b. Water available for "re-fill storage" in the reservoir will first be released on demand for use by downstream appropriators with junior priorities to that of the reservoir.

c. At any time that "re-fill storage water" is available, releases from the reservoir may be increased to provide "surplus water" (as defined in W.S. 41-4-318-324) to downstream appropriators on demand.

d. Any water passed directly through the reservoir after the "one-fill' limit has been reached will be classified as "spills", and will be available for diversion by downstream appropriators. It will also be accounted for as fulfilling the minimum flow requirements.

e. If the amount of the spill is sufficient to fulfill the minimum flow requirements, then no additional releases from storage will be required for that purpose.

IV. Grayrocks Reservoir storage accounts.

A. When water accrues to storage in Grayrocks Reservoir, it will be credited to the General Storage Account, the total amount of which is 104,109.6 af.

B. When stored water from Grayrocks Reservoir is used for each of the various purposes authorized

by the State Board of Control order dated August 23, 1995, it will be accounted for by the specific purpose for which it is used. The use account will be established as follows:

1. The first storage use account will be for industrial uses, in an amount of 64,051.5 af.

    a. The Board of Control order dated August 23, 1995 allocates 64,051.5 af. for industrial uses. It also provides that this water is available for fish and wildlife use if needed.

2. The next storage use account is for irrigation purposes in an amount of 22,500.0 af.

    a. The Board of Control order indicates that this water may be used for irrigation, but not for fish and wildlife until such time as the Corn Creek Irrigation Project is built and releases are being made from Grayrocks Reservoir to satisfy the Corn Creek Agreement.

    b. Until such time as the Corn Creek Irrigation Project comes into existence, a water use agreement for temporary change of use of this 22,500.0 af. may be submitted to the State Engineer by the Missouri Basin Power Project as provided in Wyoming Statute 41-3-110.

    c. Within three years of court approval of the Final Settlement Stipulation, pursuant to Paragraph VI.A. of the Final Settlement

Stipulation, as part of Wyoming's obligation to acquire the rights pertaining to the development of the Corn Creek Irrigation Project and to cancel all water rights and water supply obligations of Basin Electric as described in Paragraph VI.A. of the Final Settlement Stipulation, Wyoming will, in accordance with an order from the Board of Control, modify the Grayrocks Reservoir permit to eliminate the irrigation account set forth therein and allocate this 22,500.0 af. to be used by the Missouri Basin Power Project consistent with the December 4, 1978 Agreement of Settlement and Compromise among Basin Electric, the State of Nebraska and other parties. Following approval by the Board of Control, this document will be modified accordingly.

3. The next storage use account is for fish and wildlife purposes in an amount of 15,000.0 af. Any of this water not needed for fish and wildlife purposes may be used for industrial purposes provided that a temporary change of use has been approved by the State Engineer.

4. The next storage use account is for recreation purposes in an amount of 2,558.1 af. This is inactive storage and will remain static without any charges being made against it, except for evaporation losses.

5. The next storage use account will be a Temporary Storage Account.

a. Water will be credited to this account from the Boughton transfer and the inundated water rights transfer as indicated above in Section I.B., and Section II.A. and N.

b. Uses of water will be charged against this account whenever water from the account is used at the power plant.

c. Water will be stored in the Temporary Storage Account whenever space is available in the reservoir, but when a full reservoir level is reached, the Temporary Storage water will be released to make room for replacing it with regular storage water up to the maximum permitted capacity of the reservoir.

C. Charge all storage releases from Grayrocks Reservoir against the storage use account for which the releases were made.

1. Releases from storage in Grayrocks Reservoir will be made whenever necessary to meet:

a. Irrigation demands, as provided in the Corn Creek Agreement dated July 24, 1974. Within three years of court approval of the Final Settlement Stipulation, pursuant to Paragraph VI.A. of the Final Settlement Stipulation, as part of Wyoming's obligation to acquire the rights pertaining to the development of the Corn Creek Irrigation Project and to

cancel all water rights and water supply obligations of Basin Electric as described in Paragraph VI.A. of the Final Settlement Stipulation, Wyoming will, in accordance with an order from the Board of Control, modify the Grayrocks Reservoir permit to eliminate the irrigation account set forth therein and allocate this 22,500.0 af. to the account for industrial use. Following approval by the Board of Control, this document will be modified accordingly.

b. Minimum flow requirements (charged to fish and wildlife) as provided in the Fish & Wildlife Agreement dated July 29, 1977, the Agreement of Settlement and Compromise dated December 4, 1978, and also as provided in the Secondary Permit for Grayrocks Reservoir (Permit No. 31837). The fish and wildlife release schedule is outlined as follows:

1) As measured at the gage below Grayrocks.

a) When storage in Grayrocks Reservoir is at least 50,000 af., then:

(1) From October 1 through March 31, maintain minimum flow of 40 c.f.s.

(2) From April 1 through April 30, maintain minimum flow of 50 c.f.s.

(3) From May 1 through September 30, maintain minimum flow of whichever is greater, 40 c.f.s. or 75% of the natural flow at the gage above Grayrocks after all rights have been filled except the Grayrocks Reservoir storage right and the direct flow right for the power plant (i.e., after the Boughton water rights transfer, the inundated water rights transfer, and the senior downstream rights have all been satisfied). This release rate is not to exceed 200 c.f.s.

b) When storage in Grayrocks Reservoir is less than 50,000 af., then:

1) No minimum flow requirements.

2) As measured at the Ft. Laramie Gage.

a) When storage in Grayrocks Reservoir is at least 50,000 af., then:

1) From October 1 through March 31, maintain minimum flow of 40 c.f.s.

2) From April 1 through April 30, maintain minimum flow of 50 c.f.s.

3) From May 1 through September 30, maintain minimum flow of whichever is greater, 40 c.f.s. or 75% of the natural flow at the gage above Grayrocks after all rights have been filled except the Grayrocks Reservoir storage right and the direct flow right for the power plant. This release rate is not to exceed 200 c.f.s.

b) When storage in Grayrocks Reservoir is less than 50,000 af., then:

1) From October 1 through March 31, maintain minimum flow of 20 c.f.s.

2) From April 1 through September 30, maintain minimum flow of 40 c.f.s.

3) All storage releases made to fulfill minimum flow requirements are to be protected as storage releases, and not available for diversion from the Laramie River between Grayrocks Reservoir and the mouth of the Laramie River. The protection of

storage releases will be accomplished in a manner consistent with the secondary permit for the Grayrocks Reservoir (Permit No. 31837).

c. Power plant demands (charged to industrial use and conveyed through the Grayrocks Pipeline) when other sources are insufficient to meet the demand.

2. Charge reservoir evaporation losses proportionately against the General Storage Account, the Temporary Storage Account, and the Inactive Storage Account.

   a. Reservoir evaporation is to be computed daily from May 1 through September 30, and monthly throughout the balance of the year.

   b. In order to compute evaporation loss, first determine the average surface area of the reservoir during the period involved by taking the average water level elevation in the reservoir and converting that to surface area by reference to the Table showing elevations and corresponding surface areas.

   c. Next the pan-evaporation rate for the area is determined. As a basis for this determination, the Grayrocks Evaporation Pan will be used, with appropriate correction factors applied.

d. Next the surface area is multiplied by the pan-evaporation rate times a coefficient of 0.70 to get the total evaporation loss.

e. This loss is then divided between the General Storage Account and the Temporary Storage Account in the proportion to the amount of water in each of these accounts for the period involved.

f. During the period immediately following September 30 each year until the reservoir has been refilled up to the "one-fill" limit, evaporation losses will not be charged to the reservoir but rather totaled separately and then filled at the end of the one-fill period with the approval of the Division Superintendent, and prior to commencing second-fill storage as may be available.

D. If storage in Grayrocks Reservoir gets down to the point where all demands for storage cannot be filled, then contractual obligations will take precedence, and the power plant demand will be the first to take shortages.

1. Whenever a shortage condition appears to be imminent, negotiations will be initiated by the Missouri Basin Power Project to provide alternative sources of water for the operation of the power plant.

V. With respect to water rights administration upstream of Grayrocks Reservoir, Basin Electric shall be deemed to have placed a priority call for Grayrocks

Reservoir each water year without the need to formally request such a call.

VI. There are periods during the winter months when icing conditions affect the accuracy of stream gages. Whenever such conditions are encountered, the gage readings will be recorded as they exist, and a notation will be made in the record that icing conditions exist.

VII. In order to check the accuracy of the account procedures to be utilized on the lower Laramie River, there should be an occasional effort to balance the change in storage numbers as reflected by the reservoir capacity table against the inflow-outflow calculations as reflected on the accounting sheets. If these two are very far out of balance an effort should be made to find out why, and procedures adopted to correct the problems.

VIII. Future modifications to this Agreement (NPDC Charter Exhibit 3) cannot be made without the consent of the North Platte Decree Committee and Basin Electric.

Approved By:

THE STATE OF WYOMING

/s/ Patrick T. Tyrrell — March 13, 2001
Patrick Tyrrell, Wyoming State Engineer — Date

BASIN ELECTRIC POWER COOPERATIVE

/s/ Richard W. Weber — March 14, 2001
Acting CEO & Gen. Mgr. — Date

Exhibit 4

Procedure for Administration Upstream of Guernsey Reservoir Acreage Accounting

Exhibit A: Wyoming Irrigation Original Supply Well Permits as of 12/31/00 Above Pathfinder Reservoir

Exhibit B: Wyoming Irrigation Original Supply Well Permits as of 12/31/00 Between Pathfinder Dam and Guernsey Reservoir

Procedure for Administration Upstream of Guernsey Reservoir

Acreage Accounting

I. Introduction, Purpose and Background

A. The North Platte River Decree, as modified, limits the number of acres that can be intentionally irrigated within certain defined geographic areas of the North Platte River basin in Wyoming. The purpose of this procedure is to outline the general criteria and processes that Wyoming will follow in completing the annual identification and accounting of irrigated acres in the two distinct areas of the North Platte River basin upstream of Guernsey Reservoir.

B. These procedures will guide Wyoming's annual identification and reporting of intentionally irrigated acreage. These procedures may be modified as deemed appropriate by the NPDC.

II. Acreage Limitation

Following the Court's approval of the Modified Decree and the Final Settlement Stipulation, Wyoming may irrigate no more than a total of 226,000 acres between the Colorado-Wyoming state line and Guernsey Reservoir, exclusive of the Kendrick Project. Ten years after court approval of

the Final Settlement Stipulation, Wyoming will designate the division of the 226,000 acres between the two geographic areas described in Paragraph IIIA1.

III. Accounting

A. Definitions

1. Area of Administration – For this procedure, intentionally irrigated acreages will be identified for two geographic areas: One covering the watershed area upstream of Pathfinder Dam in Wyoming and the second, the area between Pathfinder Dam and Guernsey Reservoir including the mainstem and tributaries entering in this reach, exclusive of the irrigated lands within the Kendrick Project

2. Acreage Inspector- One of the individuals on the staff of the Wyoming State Engineer's Office who makes the observations and determinations of actual irrigated acreage.

3. Acreage Reporter- The person on the staff of the Wyoming State Engineer's Office who collects the acreage information from the inspectors and compiles a report for the State Engineer.

4. Irrigated Acreage Map-The base map used for all acreage delineations will be the map described in Section B below.
5. Irrigated Polygon- The irrigated acreage polygon that represents a tract of land

identified as irrigated land for the purposes of this procedure. The borders of the irrigated polygon will be established using the field observations and Global Positioning Systems, or other similar mapping techniques, as described in this procedure.

6. Irrigated Lands - Lands that in any year are intentionally irrigated through the efforts of man using a ditch delivery system or pump from a surface water, hydrologically connected groundwater or reservoir storage source.

B. Base Map

1. A USGS topographic quadrangle or map with a scale of 1:24000 will be used as the base map for all irrigated acreage mapping. Electronic versions of these maps may also be used to simplify the identification, analysis, and reporting.

2. The two geographic areas where irrigated acreage identification is required will be broken down into discrete administrative units. These units are aligned with one or more water districts within Water Division One.

3. The Wyoming State Engineer's Office may also reference, on an on-going basis, available aerial photographs, digital ortho-photo quarter quads and other imagery to assist with the field observations, identification and mapping efforts for this procedure.

4. The base map for above Pathfinder and along the mainstem will delineate:

   a) Irrigated polygons for the year 1999;

   b) All irrigated lands not otherwise delineated in Section 4a) above, marked as irrigated on the available irrigated land maps from 1995, 1996, 1997, and 1998 developed by the Wyoming State Engineer. These lands will be designated as irrigated polygons on the base map. This base map will be completed within one year after Court approval of the Modified Decree and the Final Settlement Stipulation.

5. For those intentionally irrigated areas not previously mapped by the Wyoming State Engineer (i.e., the lands irrigated from water diverted from the tributaries between Pathfinder Dam and Guernsey Reservoir and from ground water and reservoir sources), base maps delineating the irrigated polygons will be developed beginning the first year and refined over the next five years after court approval of the Modified Decree and Final Settlement Stipulation.

6. At least every five years, the base map will be reviewed by Wyoming to ensure all irrigated areas are accurately shown as irrigated polygons on the base map.

C. Field Review, Observations and Accounting

1. Mapping Update from Prior Year: Each acreage inspector will be provided with a copy of the base maps and the irrigated land maps from the previous years for their area. These maps will be used by the inspector for the current year's observations, identification, and map updating work.

2. Observations and Identification: Acreage inspectors, who often are also water administration officials (hydrographers or water commissioners), will make visual observations and keep notes of the occurrence of irrigation activity on lands within their respective water districts during the irrigation season. Irrigated acreage observations will be completed by walking or driving the ditch or observing from a nearby hill overlooking the irrigated acreage. If less than the entire irrigated polygon has been irrigated at any time during the year, the acreage inspector may delineate the irrigated lands on the map for that year using observations and Global Positioning Systems or other similar mapping techniques. While observations are made throughout the early runoff and diversion season, the final inspections and identifications will be made generally during the July through September time period each irrigation season.

3. Annual Irrigated Acreage Maps: As the final observations and inspections are made each year, the acreage inspectors will delineate the

irrigated areas on the work copy of the irrigated acreage map or associated mapping product.

4. Measurements and Tabulation: When the final acreage inspections are completed, all work maps and related materials will be returned to the Acreage Reporter. The new or modified acreage polygons will be plotted, then digitized, and the irrigated areas identified. The final maps for the current year will then be printed, filed with the State Engineer's Office in Cheyenne and a copy will be distributed to the acreage inspectors, in preparation for the next irrigation season.

D. Criteria or Guidelines for Identifying Irrigated Acreage

1. Surface Water Diversion Irrigated Acreage

a. Surface Water Supply: Surface water diversion irrigated acreage is any land that has been intentionally irrigated through the efforts of man using an active and maintained ditch/delivery system or pump from a surface water source. This description includes delivery systems that transport water diverted from the surface water source at a maintained point of diversion, but are designed to spread water with little or no labor using a spreader ditch system. Any lands irrigated by diversions from sources located outside of the North Platte River basin (e.g., imported from the Colorado

River basin) will not be counted.

b. Reservoir Supply: Tracts of land irrigated solely from stored irrigation water released from a reservoir will be included in the acreage limitations.

c. Reported Acreage: The State Engineer will review the information and materials submitted by the Acreage Reporter and prepare a report of the acreage intentionally irrigated in that year from surface water or reservoir storage supplies.

2. Ground Water Irrigated Acreage

a. Initial List of Existing Hydrologically Connected Ground Water Wells: The existing groundwater rights for irrigation use in the North Platte River basin upstream of Guernsey Reservoir that will be considered under the acreage limitation are attached in Exhibits A and B.

b. Hydrologically Connected Ground Water Well Determination: Each well identified in Exhibits A and B will be further screened to determine if the well is hydrologically connected. If the NPDC agrees the well is not hydrologically connected, as defined herein, it will be removed from Exhibits A and B. This will be accomplished for each well by reviewing available Statements of Completion filed with the Wyoming State Engineer's Office and other available

geologic and aquifer information. A hydrologically connected groundwater well is one that is so located and constructed that if water were intentionally withdrawn by the well continuously for 40 years, the cumulative stream depletion would be greater than or equal to 28% of the total groundwater withdrawn by that well.

All future wells in the area of administration will be analyzed in the same manner described in Paragraph III.D.2.b. to determine if they are hydrologically connected. If the wells are determined not to be hydrologically connected, Wyoming will submit the basis for their determination to the NPDC for their concurrence.

c. Observations of Irrigated Lands from Ground Water: Each year the acreage inspectors will include in their seasonal observations, identification and mapping efforts, a delineation of those irrigated polygons that have been intentionally irrigated by hydrologically connected ground water wells and that are not otherwise identified as irrigated by surface water diversions or reservoir water as described in Paragraph D.1. above. The hydrologically connected ground water wells included in these irrigated lands observations and mapping efforts will be those that have been identified as a result of the analysis in Paragraph D.2.b above. All intentionally irrigated acreage from these ground water wells will be included in the annual acreage accounting.

d. Reported Acreage: The report of the State Engineer provided in Paragraph D. 1.c. above, will also include the intentionally irrigated acreage from hydrologically connected ground water wells.

3. Transfers from Irrigation Use to a New Use – Acreage Accounting

a. Maintain List of Approved Transfers: The Wyoming State Engineer will maintain a list of all changes of use (from irrigation use to a new use) approved by the State Board of Control, from a surface water source or a hydrologically connected ground water well located within the North Platte River basin upstream of Guernsey Reservoir, exclusive of the irrigated areas within the Kendrick Project. For the sources of water within the area upstream of Pathfinder Dam and from the mainstem of the North Platte River between Pathfinder Dam and Guernsey Reservoir, this list shall include all transfers approved since October 8, 1945. For the sources of water in the remaining areas of the basin upstream of Guernsey Reservoir, this list shall include all transfers approved after January 1, 2001.

b. Measurements and Data Collection: For each change of use, the Wyoming State Engineer will collect the information needed to determine how much water is actually used for the new use each irrigation season under the Board of Control Order approving the

change of use.

c. Determination of Equivalent Acreage: The actual amount of water used for the current year will be proportioned to (divided by) the total amount of use approved under the Board of Control change of use Order. The proportion will then be applied to the total number of actual acres of irrigated land taken out of production as a result of the approved transfer. The resulting number of acres will be accounted as equivalent acres and included in the annual irrigated acreage report of the Wyoming State Engineer.

d. Reported Acreage: The amount of equivalent acreage determined in Paragraph D.3.c. above will be included in the annual irrigated acreage report and the irrigated acreage accounting identified in Paragraph II above.

IV. Implementation, Schedule and Reporting

A. Identification of Surface Water Diversion Irrigated Lands

The Wyoming State Engineer will, beginning in the first year following court approval of the Final Settlement Stipulation, and each year thereafter, submit an accounting of the intentionally irrigated lands from surface water sources as defined and identified in accordance with this procedure, by March 1st of the year following the irrigation season. This date may be modified by the NPDC.

B. Hydrologically Connected Ground Water Wells

The amount of intentionally irrigated acreage from hydrologically connected ground water wells will be included in the annual acreage identification report as follows:

1. For the area upstream of Pathfinder Dam. The identification report will incorporate acreage intentionally irrigated from hydrologically connected ground water wells used beginning the second full water year following the year of court approval of the Final Settlement Stipulation.

2. For the area between Pathfinder Dam and Guernsey Reservoir, including the tributaries: The identification report will incorporate acreage intentionally irrigated from hydrologically connected ground water wells used during the second full water year after court approval of the Final Settlement Stipulation.

C. Transfers

Wyoming expects to have the data collection and equivalent irrigated acreage analysis efforts referenced in Paragraph D.3.d. above, in place within two years after court approval of the Final Settlement Stipulation. At such time, the equivalent irrigated acreage will be included in the annual report. In the interim, Wyoming will continue the existing recent historical practice of reporting the total amount of irrigated lands taken out of production as a result of an approved

change of use transfer.

V. Record Keeping and Monitoring

A. Wyoming

Data and records supporting the annual intentionally irrigated acreage report will be maintained by the Wyoming State Engineer's Office.

B. Other Parties to the Decree

After providing reasonable notice to Wyoming and the NPDC, the parties will have the opportunity to review the records maintained by Wyoming documenting the intentionally irrigated acreage report. The parties will have the opportunity to monitor Wyoming's implementation of these procedures and to complete their own field review of the acreage irrigated and contained in the annual report, or a joint review with representatives of Wyoming. In either case, these review efforts will be coordinated with the State of Wyoming's State Engineer's Office. If the other parties desire to make their own field reviews, they will be responsible for securing the legal right of access to any private lands.

Any concerns or questions related to the identification report or field observations will be presented in writing to Wyoming and the NPDC.

C. NPDC

The NPDC may develop, review and approve additional procedures or modify this procedure as they deem appropriate for the monitoring of irrigated lands.

Exhibit A to the Procedure for Administration Upstream of Guernsey Reservoir - Acreage Accounting
Above Pathfinder Reservoir in Wyoming
Wyoming Irrigation Original Supply Well Permits as of 12/31/2000

TNS	RNG	SEC	QTR	PERMITNO	PRIORITY	YLDEST (gpm)	YLDACT (gpm)	WELLDEPTH (feet)	OS ADJ (acres)	OS non-ADJ (acres)
14	83	3	9	P81887W	11/21/89	1200	400	110	-	710
14	83	3	7	P546G	2/19/57		1500	100	-	160
14	83	3	12	P996W	3/29/63	600	400	85	-	130
14	83	3	3	P48312W	5/2/79	1000	400	180	127.1	-
14	83	4	1	P997W	3/29/63	375	375	95	-	314
14	83	4	4	P998W	3/29/63	200	200	95	-	314
15	83	6	6	P281G	7/22/54		700	101	-	710.5
15	83	6	6	P1826W	10/7/66	400	1100	102	-	81
15	83	6	8	P45090W	9/22/78	1000	1000	347	-	40
15	83	14	15	P2227W	11/9/67	750	500	200	-	125
15	83	33	13	P212G	9/21/53		1500	100	-	160
15	83	34	11	P64G	1/5/50		1000	91	-	260
15	83	34	11	P211G	9/21/53		2000	100	-	160
15	83	34	12	P545G	2/19/57		1500	100	-	160
15	83	34	14	P48310W	5/2/79	1000	500	145	125	-
15	83	34	3	P48311W	5/2/79	1000	625	96	124	-
15	84	10	1	P33915W	6/8/76	700	700	330	-	8
15	84	12	6	P276G	7/1/54		375	100	10	-
16	83	31	5	P46197W	9/18/78	250	200	300	12.3	-
16	84	8	1	P1626W	1/14/66	1500	650	200	-	8
16	84	30	16	P197W	6/30/59	1000	1300	130	-	75.5
17	84	3	11	P379G	6/3/55		1100	220	-	1280
17	84	15	3	P13764W	5/2/72	700	350	300	-	100
17	84	23	1	P9242W	5/10/71	450	60	100	-	62
18	83	15	7	P1995W	5/10/67	800	400	155	-	51
18	83	17	14	P76105W	1/5/83	1500	1200	145	-	160.7
18	83	17	10	P106506W	5/19/97	1240	1240	88	-	130.8
18	83	17	6	P52672W	9/19/79	250	56	242	-	95.75
18	83	18	8	P422G	1/16/56		1500	70	-	134
18	83	18	12	P42264W	11/17/77	1000	1000	90	-	72.61
18	83	21	2	P69086W	8/28/84	800	800	312	-	9
20	85	25	4	P83293W	8/13/90	3000			-	68
21	85	24	11	P60484W	10/23/81	175	175	20	-	25
25	83	13	13	P9516W	6/9/71	500	695	160	-	62.61
26	76	30	12	P5136W	3/31/70	75	75	490	-	480
26	76	30	13	P5138W	3/31/70	900	900	600	-	480
28	84	35	16	P11416W	12/1/71	225	68	3	-	24
								Total	398.4	6651.5

Exhibit B to the Procedure for Administration Upstream of Guernsey Reservoir - Acreage Accounting
Pathfinder Dam to Guernsey Reservoir
Wyoming Irrigation Original Supply Well Permits as of 12/31/2000

TNS	RNG	SEC	QTR	PERMITNO	PRIORITY	YLDEST (gpm)	YLDACT (gpm)	WELLDEPTH (feet)	OS ADJ (acres)	OS non-ADJ (acres)
26	68	5	1	P28475W	11/21/74	3000	750	395	264	-
27	67	11	15	P47G	7/20/49		1000	58	72	-
27	67	15	5	P611G	5/9/57		450	51	-	10
27	67	19	8	P3798W	12/1/69	800	525	130	149.6	-
27	67	19	4	P3797W	12/1/69	800	800	85	140	-
27	67	21	7	P291G	8/20/54		250	25	-	18
27	68	20	10	P2529W	4/22/69	1000	1000	331	51.1	-
27	68	20	10	P4067W	1/13/70	2500	800	331	20.6	-
27	68	20	11	P67C	8/31/32		1200	19	12.4	-
27	68	27	2	P82848W	7/14/90	400	165	185	-	4.8
27	68	29	6	P2528W	4/22/69	1000	975	295	62.9	-
27	69	24	15	P48944W	5/15/79	375	375	205	67.9	-
27	70	24	4	P24705W	10/17/73	2000	1000	64	-	174
28	67	6	16	P55226W	1/8/81	500	500	63	-	160
28	67	7	5	P63216W	2/10/83	2000	600	45	63.4	-
28	67	7	5	P88708W	7/6/92	800	800	37	4.4	-
28	68	27	2	P62726W	12/29/72	70	70	8	5.4	-
29	66	3	5	P14779W	7/3/72	550	550	192	80	-
29	66	24	14	P60590W	4/21/82	750	500	315	87.94	-
29	68	19	13	P29148W	12/18/74	2000			-	334
29	68	19	8	P677G	5/28/57		1000	30	-	75
29	68	19	9	P472G	8/27/56		300	50	-	55
29	68	19	2	P57460W	5/7/81	450	450	66	47.3	-
29	68	19	11	P507C	12/31/42		300	12	-	35
29	68	19	5	P30176W	4/7/75	1000	200	70	11	-
29	68	20	8	P299C	6/1/21	539	540	1200	-	26
29	68	20	2	P25977W	2/1/74	1000	1000	41	-	4.4
29	68	21	7	P264G	6/8/54		1340	40	-	245
29	68	21	9	P74019W	2/3/86	1200	550	685	-	34
29	70	36	16	P8538W	3/11/71	200	100	4	18	-
29	70	36	13	P4581W	2/11/70	400	400	16	4	-
30	67	19	8	P427C	4/10/41		600	65	-	160
30	67	29	8	P400G	9/30/55		400	96	-	40
30	67	29	8	P401G	9/30/55		400	117	-	40
30	67	32	3	P547G	3/1/57		1000	20	-	57.3
30	68	17	10	P7G	12/29/47		1350	34	-	145
30	68	18	1	P236C	12/31/40		1000	36	-	140
30	68	29	9	P8130W	12/28/70		600	205	-	111
30	69	14	9	P81137W	10/18/89	800	800	237	142.4	-
31	68	3	9	P244G	4/23/54		600	50	-	75
31	68	5	14	P26392W	3/27/74	1500	125	200	159	-
31	69	34	16	P63091W	12/23/82	1000	800	75	44.8	-
31	70	13	16	P501C	3/31/41		400	20	-	36
31	70	18	6	P60372W	4/20/82	450	450	600	-	60
31	71	8	10	P105927W	12/20/96	55	55	2965	-	40

Exhibit B to the Procedure for Administration Upstream of Guernsey Reservoir - Acreage Accounting
Pathfinder Dam to Guernsey Reservoir
Wyoming Irrigation Original Supply Well Permits as of 12/31/2000

TNS	RNG	SEC	QTR	PERMITNO	PRIORITY	YLDEST (gpm)	YLDACT (gpm)	WELLDEPTH (feet)	OS ADJ (acres)	OS non-ADJ (acres)
31	71	8	4	P105926W	12/20/96	55	55	72	-	15
31	71	16	5	P66953W	3/27/84	500	210	12	-	29.9
31	71	30	9	P414G	12/15/55		84	222	-	40
31	74	11	15	P420G	1/3/56		80	34	-	5
31	74	15	2	P421G	1/3/56		400	93	-	95
31	74	27	1	P523G	1/23/57		500	90	-	118
31	80	17	8	P38044W	3/31/77	1500			2.07	-
31	80	18	5	P38042W	3/31/77	1500	1250	105	-	174.2
31	80	18	2	P38043W	3/31/77	1500	500	105	4.53	-
31	80	18	4	P36222W	12/2/76	1000	900	105	-	0.8
31	80	21	10	P26060W	3/1/74	2000			-	8
31	81	11	16	P31545W	8/11/75	2250			-	11
31	81	18	4	P402G	10/3/55		700	79	-	440
31	81	18	1	P89273W	7/30/92	400	125	110	-	18
31	81	18	6	P99578W	5/10/95	800			-	18
31	81	18	2	P95131W	3/11/94	75	60	100	-	5
31	82	11	14	P104250W	10/10/96	225			-	120
31	82	35	16	P26755W	5/6/74	400	400	33	70	-
31	82	35	16	P37137W	9/3/77	600	150	33	36.2	-
31	82	35	16	P33930W	6/15/76	150	150	33	29.1	-
32	66	18	7	P55064W	12/29/80	1000	450	340	99.4	-
32	66	20	9	P20393W	1/23/73	2200	425	380	125.6	-
32	67	10	14	P7482W	12/22/70	1600	375	300	137	-
32	67	10	3	P9551W	7/12/71	1500	250	350	137	-
32	67	25	10	P34879W	9/28/76	600	600	435	-	99
32	67	25	10	P42269W	10/4/77	600	400	435	-	98
32	67	26	16	P34880W	9/28/76	600	600	440	-	100
32	71	8	16	P103850W	8/6/96	350			-	20
32	71	17	16	P22437W	6/4/73	75	75	160	9.05	-
32	71	17	13	P17037W	9/7/72	100	100	60	5.92	-
32	71	21	3	P2033W	7/21/67	100	60	150	-	40
32	78	11	9	P52C	7/9/36		900	160	-	60.2
32	78	22	8	P748G	2/6/58		300	2	-	2
32	81	3	11	P27608W	8/8/74	250	100	20	16.7	-
32	81	3	8	P27609W	8/8/74	250	100	22	16.24	-
32	81	15	13	P12002W	11/11/71		150	804	-	8
32	81	28	8	P25703W	1/29/74	500	650	60	-	80
32	81	28	8	P36873W	9/10/76	200	150	60	-	5.2
32	81	31	9	P27606W	8/7/74	1500	950	84	162.2	-
32	81	31	11	P62305W	6/4/82	300	300	45	39.5	-
32	81	32	5	P53890W	8/8/80	300	250	18	40	-
32	81	32	5	P106875W	7/8/97	300	300	20	-	13
33	70	33	12	P37681W	5/5/77	400	125	420	-	60
33	70	33	9	P43200W	5/9/78	300	300	190	-	60
33	76	1	6	P102679W	3/27/96	150	120	30	-	7.2

Exhibit B to the Procedure for Administration Upstream of Guernsey Reservoir - Acreage Accounting
Pathfinder Dam to Guernsey Reservoir
Wyoming Irrigation Original Supply Well Permits as of 12/31/2000

TNS	RNG	SEC	QTR	PERMITNO	PRIORITY	YLDEST (gpm)	YLDACT (gpm)	WELLDEPTH (feet)	OS ADJ (acres)	OS non-ADJ (acres)
33	76	5	11	P28800W	3/15/74	1800	1500	13	-	284.8
33	76	5	11	P106049W	3/3/97	150	150	17	-	7.3
33	77	3	7	P1808W	1/20/67	300	100	30	-	12.7
33	77	3	8	P102183W	4/10/96	125	125	21	-	9.3
33	77	3	7	P1810W	1/20/67	300	100	40	-	8.7
33	77	3	10	P26406W	4/23/74	100	75	27	7.1	-
33	77	3	9	P6473W	9/14/70	200	250	24	-	6.6
33	77	3	9	P38582W	5/4/77	175	175	22	-	5
33	77	4	3	P453G	6/18/56		1800	12	-	380
33	77	4	4	P10369W	9/13/71	300	250	24	-	17
33	77	4	14	P2011W	4/17/67	800	250	15	-	11
33	77	4	14	P1988W	5/3/67	800	250	20	-	10
33	77	4	13	P305W	2/19/60	160	160	24	9.68	-
33	77	4	7	P27592W	6/26/74	110	110	16	-	8
33	77	4	16	P33944W	6/28/76	300	250	28	7	-
33	77	4	13	P24597W	9/4/73	300	60	24	5.4	-
33	77	4	15	P2012W	4/18/67	150	100	15	-	3
33	77	4	15	P81579W	1/9/90	95	95	100	1.25	-
33	77	5	5	P31934W	9/23/75	153	153	24	-	10
33	77	5	2	P31935W	9/23/75	153	140	8	-	10
33	77	5	5	P42142W	12/8/77	97			-	10
33	77	5	2	P23567W	7/3/73	150	150	21	7.71	-
33	77	5	2	P40761W	7/28/77	225	225	22	7.62	-
33	77	5	5	P85454W	6/3/91	300	200	29	-	1.2
33	78	1	1	P86237W	8/26/91	400	400	30	-	7.45
33	78	2	1	P95980W	6/9/94	1200	1000	32	-	150
33	78	2	1	P40207W	9/12/77	125	75	10	10	-
33	78	2	13	P30571W	7/30/75	60	60	5	-	7
33	78	3	11	P48938W	6/15/79	500	500	12	-	15
33	78	4	5	P98959W	4/10/95	300	85	31	-	44
33	78	5	9	P856W	4/2/62	150	150	42	-	5
33	79	3	2	P1242W	6/12/64	200	75	14	-	5
33	79	3	2	P1243W	6/12/64	200	75	14	-	5
33	79	4	7	P510C	3/31/47		60	55	-	4
33	79	7	12	P1244W	6/12/64	300	200	27	-	7.5
33	79	12	6	P469G	8/16/56		75	555	-	83.47
33	80	12	15	P38836W	3/4/77	200	200	54	14.9	-
33	80	12	16	P28688W	10/30/74	400	150	30	-	7
33	80	13	12	P14290W	6/9/72	150	90	25	6.489	-
33	80	13	11	P3447W	1/8/69	80	80	16	5.68	-
34	75	31	11	P90807W	10/30/92	500	350	15	-	55
34	77	31	12	P3771W	10/31/69	250	200	18	11.6	-
34	77	31	16	P60338W	9/17/81	75	75	26	-	10
34	77	31	16	P36872W	8/4/76	75	75	30	-	9.45
34	77	31	16	P59312W	9/17/81	80	75	18	-	8

Exhibit B to the Procedure for Administration Upstream of Guernsey Reservoir - Acreage Accounting
Pathfinder Dam to Guernsey Reservoir
Wyoming Irrigation Original Supply Well Permits as of 12/31/2000

TNS	RNG	SEC	QTR	PERMITNO	PRIORITY	YLDEST (gpm)	YLDACT (gpm)	WELLDEPTH (feet)	OS ADJ (acres)	OS non-ADJ (acres)
34	77	31	15	P105444W	3/20/97	250	250	24	4	-
34	77	33	11	P62036W	7/19/82	500	500	25	-	150
34	77	34	13	P37501W	7/28/76	900	300	20	29	-
34	77	35	8	P53702W	9/4/80	300	60	70	20	-
34	78	33	11	P94570W	4/2/86	400	400	15	-	120
34	78	36	15	P1800W	3/15/66	250	100	18	-	12
34	83	9	5	P105575W	4/22/97	1500	400	195	-	300
35	74	12	5	P2414W	12/11/68	100	100	600	-	25
35	75	34	6	P32561W	7/21/75	110	80	50	-	40
35	75	34	6	P32562W	7/21/75	110	100	56	-	40
35	75	34	7	P32564W	7/21/75	110	100	46	-	35
35	75	34	7	P32565W	7/21/75	110	100	50	-	35
								Total	2,586.1	5,804.5

Exhibit 5

Procedure for Administration Upstream of Guernsey Reservoir During Allocation Years

NPDC Charter – Exhibit 5

Procedure For Administration Upstream of Guernsey Reservoir During Allocation Years

I. Water Right Administration

A. When the Bureau of Reclamation (Bureau) has advised the other NPDC representatives that the current water year is likely to be an allocation year, as defined in the Allocation Year Stipulation dated December 17, 1998, surface and hydrological connected groundwater rights will be administered in the following manner:

Pathfinder Reservoir

With respect to water rights administration upstream of Pathfinder Reservoir, until May 1st during such allocation years, the Bureau of Reclamation shall be deemed to have placed a priority call for Pathfinder Reservoir, excluding the Pathfinder Modification Project, without the need to formally request such call. Consistent with applicable state law, the Wyoming State Engineer shall determine whether the call is valid and warrants the regulation of water rights upstream of Pathfinder Reservoir. If the State Engineer determines that the call is not valid or that such regulation is not warranted, he/she shall so notify the Bureau and the NPDC and describe the basis for that

determination. However, the Wyoming State Engineer's refusal to honor a call cannot be based upon the provisions of the North Platte Decree or this Final Settlement Stipulation other than the provisions of this Procedure.

In all other circumstances, the call will be applied by the Wyoming State Engineer to discontinue diversions under water rights junior to Pathfinder Reservoir and limit diversions under water rights senior to Pathfinder Reservoir to 1 cfs per 70 acres.

Guernsey and Glendo Reservoirs and Inland Lakes

With respect to water rights administration along the mainstem North Platte River and the tributaries of the North Platte River between Pathfinder Dam and Guernsey Reservoir, until May 1st during such a year that the Bureau has advised is likely to be an allocation year, the Bureau shall be deemed to have placed a priority call for Inland Lakes (April only), Guernsey and Glendo storage rights without the need to formally request such a call.

Consistent with applicable state law, the Wyoming State Engineer shall determine whether the call is valid and warrants the regulation of water rights upstream of the calling water right. If the State Engineer determines that the call is not valid or that such regulation is not warranted, he/she shall so notify the Bureau and NPDC and describe

the basis for that determination. However, the Wyoming State Engineer's refusal to honor a call cannot be based upon the provisions of the Modified North Platte Decree or the provisions of this Final Settlement Stipulation other than the provisions of this Procedure.

In all other circumstances, for water rights along the mainstem North Platte River and the tributaries of the North Platte River between Pathfinder Dam and Guernsey Reservoir, the call will be applied by the Wyoming State Engineer to discontinue diversions under junior water rights and to limit diversions under senior water rights to 1 cfs per 70 acres, with the exception that if Guernsey Reservoir has filled and Glendo Ownership has not filled, water rights with priorities senior to March 1, 1945 will be allowed to divert up to 2 cfs per 70 acres.

B. Nothing in this procedure shall prevent any water right holder from requesting a call on the river.

II. Cumulative Irrigation Diversions Procedure

A. Introduction and Purpose

The purpose of this procedure is to specify the surface water diversion data collection, accounting and reporting processes that Wyoming will use for measuring, reporting and administering the cumulative irrigation diversions from the main stem North Platte River between Pathfinder Dam and Guernsey Reservoir during allocation years to no more than 6,600 acre-feet per two-week period.

These procedures will be applied during the May to September irrigation season of an allocation year, which will be determined in the manner specified in the Allocation Stipulation dated December 17, 1998.

B. Definitions

1. Allocation year - Is a water supply situation determined pursuant to the methods and procedures described in the stipulation dated December 17,1998 and the technical appendix referenced in said stipulation.

2. Forecasted water supply for the North Platte Project – Is the set of methods and procedures that are used by the Bureau of Reclamation to determine the forecasted water supply on or before May 1 for the North Platte Project that are described in the technical appendix attached to the Allocation year stipulation dated December 17,1998.

3. Point of Diversion – The point from which an irrigation water right diverts or pumps water from the surface water source to which it is entitled.

C. Measurements

During each allocation year between May 1 and September 30, Wyoming will use the following procedures to collect, account for, report and administer surface water diversions from the main stem of the North Platte River between Pathfinder Dam and Guernsey Reservoir so as to limit the

cumulative amount of surface water diversions from the main stem of the North Platte River for irrigation purposes to 6,600 acre-feet per two-week period throughout the irrigation season. The two-week period of time will be blocked into consecutive 14-day periods beginning on May 1, with the first period established to end on the second Friday in May.

Wyoming will collect data regarding the volumetric irrigation diversion of surface water from the main stem of the North Platte River using any of the following devices: 1) in-line totalizing flow meters; 2) electric power meters, which, with conversion can be used to compute the volume pumped; or 3) direct measurement of discharges from the pump diversion systems using flumes or similar devices and a continuous recorder for open channel flow measurements. The collection and compilation of surface water diversions will be on a continuous rotating two-week interval. As a result, all the recording devices for every diversion will not be read on the same day. However, the recording devices for all diversions will be read at least once during every two-week interval and once the day for a reading is established, except due to extenuating circumstances, the same schedule for data collection will be maintained throughout the rest of the season. For example, if the continuous recording device for a river pump was first read on the last day of a two-week period, it would continue to be read on the last day of the two-week period, whenever possible. The NPDC may adjust the data collection, recording and compilation intervals in the future.

Cumulative diversions will be calculated by dividing the last recording interval's cumulative diversion

measurement by the number of days over which it was recorded. This value will be assumed to represent the daily diversion volume until the next interval's cumulative measurement is recorded. This value will be used in calculating the total cumulative diversions for the Pathfinder Dam to Guernsey Reservoir reach until the next two-week measurement is taken and a new calculation of daily diversion volume for that diversion is made. Once the later measurement is made, daily diversion volumes from the end of the last two-week reporting period to the current day will be corrected. Diversions will be assumed to take place at a constant rate between measurements. The cumulative diversions accounted for each two-week period will thus be a combination of direct measurements and projections of previous diversion rates. The data collection and recording intervals may be adjusted by the NPDC in the future after further experience working with this procedure.

D. Transfers (Change of use)

In addition to all existing direct flow diversions for irrigation purposes, all changes of use approved by the Wyoming State Board of Control after January 1, 2001, for irrigation use water rights that divert from the main stem North Platte River within this reach to any other type of use, will also be counted against the 6,600 acre-foot cumulative two-week volume limit. The pre-transfer diversion amount, rather than the transferred consumptive use, will be applied against the 6,600 acre-foot cumulative diversion limit. Wyoming will monitor these transfers by requiring measurements and collecting information on the amounts of water diverted by the new use and then

proportioning this amount against the historic amount diverted under the pre-transfer conditions for the original irrigation use. For example, if the pre-transfer diversion was 10 acre-feet in two weeks for irrigation purposes and the State Board of Control approves a change of use that allows 5 acre-feet in two weeks for municipal use (which represents the historic amount consumed at a 50% overall irrigation efficiency rate for this example); then under this procedure, in a future allocation year when the municipality consumes 2 acre-feet in a two-week period using the transferred irrigation water right, 4 acre-feet will be counted against the cumulative diversion limitation for the two-week period. The transferred water, as adjusted to represent diversions, will be counted against the two-week cumulative diversion limitation.

In accordance with other NPDC procedures, the NPDC will be provided with all municipal and industrial permit applications and petitions for changes of use on a monthly basis. Beginning after court approval of the Final Settlement Stipulation, all final State Board of Control Orders granting a transfer (change of use) of irrigation water rights that originally diverted from this reach of the main stem of the North Platte River will be provided to the NPDC.

E. Calibration

Wyoming will ensure that the measurement devices are properly installed, calibrated, and maintained. Installation, calibration, and maintenance will be according to industry standards for the type of diversion installation and measurement device

selected. Wyoming must ensure that all the devices are installed and calibrated by June 1st of the irrigation season following three years after court approval of the Final Settlement Stipulation.

F. Storage Water

Diversion of storage water will not count against the 6,600 acre-foot two-week limit. The amount of storage water diverted for irrigation purposes will be accounted for separately by the Wyoming State Engineer's Office as a part of routine water administration duties and by the Bureau of Reclamation under their storage contracts. Wyoming will provide a report to the NPDC setting forth the total amount of storage water diverted for irrigation purposes by each storage contractor on a monthly basis.

G. Implementation

Wyoming will implement this procedure as required during each allocation year. However, no such accounting will be required until the first irrigation season three years after court approval of the Final Settlement Stipulation. Wyoming will limit the cumulative irrigation diversions to 6,600 acre-feet for each two-week period and take appropriate administrative action to prevent diversions from exceeding 6,600 acre-feet in a two-week period.

H. Records, Review, and Monitoring

All surface water diversion measurements and calculations of cumulative diversions will be recorded, compiled, and provided to the

representatives of the NPDC. A summary report of the recorded and compiled data will be provided to representatives of the NPDC after the end of each two-week period. Representatives of the NPDC will have the right to review all aspects of this administrative procedure.

Exhibit 6

Procedure for Consumptive Use Accounting

Exhibit A: Procedures for Calculating Consumptive Use of Irrigation Water Above Guernsey Reservoir, Wyoming (with example consumptive use calculations)

Exhibit B: Procedures to Evaluate Consumptive Use Calculations Above Guernsey Reservoir, Wyoming

NPDC Charter – Exhibit 6

Procedure for Consumptive Use Accounting

A. Introduction and Purpose

The purpose of this procedure is to specify the data collection, accounting, reporting processes and methodologies necessary to implement the limitations on the consumptive use of irrigation water from the intentional irrigation of lands in the Wyoming portion of the North Platte River drainage located upstream of Guernsey Reservoir.

B. Definitions

1. Area of Administration – This procedure applies to irrigation water rights that divert from the North Platte River upstream of Guernsey Reservoir and other surface water sources that are tributary to the North Platte River upstream of Guernsey Reservoir, exclusive of the Kendrick Project. These procedures also apply to irrigation water rights that withdraw groundwater in this area, as defined below.

2. Irrigated Lands – Lands that are intentionally irrigated by the efforts of man using a ditch delivery system or a pump from a surface water, hydrologically connected groundwater or reservoir source.

3. Hydrologically connected groundwater well – A well that is so located and constructed that if water were intentionally withdrawn by the well continuously for 40 years, the cumulative stream depletion would be greater than or equal to 28% of the total groundwater withdrawn by that well.

C. Administration

1. Consumptive Use Limitations

a. The consumptive use limitations were established by determining the amount of applied irrigation water consumed by the crops on irrigated lands. The limitations set forth in this procedure are established for two distinct portions of the area of administration: First, the area upstream of Pathfinder Dam and second, the area upstream of Guernsey Reservoir and downstream of Pathfinder Dam, exclusive of the irrigated lands within the Kendrick Project.

These limitations are:

For the area upstream of Pathfinder Dam in Wyoming:

1,280,000 acre-feet for a period of ten consecutive years.

For the area between Guernsey Reservoir and Pathfinder Dam:

890,000 acre-feet for a period of ten consecutive years.

b. These limitations are the maximum amounts of water consumed in any period of ten consecutive years under pre-2000 historical conditions and are intended to capture the pre-2000 irrigation practices, including the crops, number of irrigated acres, irrigation management and irrigation facilities, over a baseline climate period of 1952 to 1999, inclusive. The methods and data used for these determinations are attached to this procedure as Exhibit A.

2. Compliance Monitoring

The above limitation shall be enforced on the basis of ten consecutive years. Compliance with these limitations shall be determined by averaging the annual amounts of consumptive use of irrigation water calculated pursuant to Exhibit A for the current year and the preceding nine years, plus the annual amount of water consumed in each of the same ten years under a water right transferred from irrigation use to another use as described below.

3. Future Data Collection, Analyses and Administration

Beginning one year after court approval of the

Final Settlement Stipulation, the NPDC shall cooperatively develop, fund and implement a data collection, analyses and methodology review program as outlined and presented in Exhibit B to investigate potential new methodologies to calculate the consumptive use of irrigation water.

For the area below Pathfinder Dam, irrigated acreage is assessed under the Exhibit A method based on annual NASS surveys. After court approval of the Final Settlement Stipulation, actual inventories of irrigated acreage will be conducted for this area by Wyoming pursuant to Exhibit 4 to the North Platte Decree Committee Charter. The relationship between the Wyoming inventory acreage and the NASS survey information will be investigated with the goal of converting all acreage accounting to the Wyoming inventories. The NPDC will adjust the consumptive use limitations for the area below Pathfinder Dam accordingly, but such adjustments will not reflect post-2000 acreage or technological changes.

In an attempt to more accurately calculate the actual consumptive use, after five years of data collection and analyses pursuant to Exhibit B and during periodic reviews every five years thereafter, the NPDC will develop and adopt a method to calculate the consumptive use of irrigation water.

If at any time the NPDC determines that a new methodology will provide a more reliable

measure of consumptive use and either a credible relationship can be established between the new methodology and the methodology in Exhibit A or the new methodology can be applied to historical data to provide a more accurate and reliable measure of the historical consumptive use from 1952 through 1999, inclusive, the NPDC will adopt the new methodology and will revise the ten consecutive year consumptive use limitations contained in subsection C.1.a. to reflect the new methodology as adopted. Such revisions to the limitations will not reflect post-2000 acreage or technological changes. Thereafter, the adopted methodology will be used by Wyoming to assess compliance with the revised ten consecutive year consumptive use limitations. The adopted methodology will be implemented within the following calendar year, unless the NPDC determines this schedule is not appropriate. The data collection procedures described in Exhibit B will be revised to reflect the adopted changes to Exhibit A as deemed appropriate by the NPDC.

4. Irrigated Lands and Transfers

a. The irrigated lands located within the area of administration for which the consumptive use of irrigation water will be computed and included in the consumptive use calculations and limitations, shall include the following:

1. Lands intentionally irrigated in whole

or in part by direct flow surface water diversions from the North Platte River and its tributaries.

2. Lands intentionally irrigated from hydrologically connected ground water wells that are not otherwise irrigated by direct flow surface water diversions or reservoir water.

3. Lands intentionally irrigated solely from reservoir water that are not otherwise irrigated by direct flow surface water diversions or hydrologically connected ground water wells.

b. The consumptive use calculations and limitations shall include the amount of transferred consumptive use, based on the record of such changes of use of agricultural water rights from irrigation to another beneficial use before the State Board of Control pursuant to Wyoming law. This includes transfers (changes of use) that have occurred within the area of administration since October 8, 1945. The actual amount of the transferred consumptive use water used each year under the new use will be included under the ten consecutive year consumptive use limitation. Future transfers will be accounted in the same manner for the purpose of assessing compliance.

D. Implementation Schedule, Funding and Reporting

1. Implementation Schedule

Wyoming will implement the consumptive use of irrigation water limitations in the first full year after court approval of the Final Settlement Stipulation with the understanding that acres irrigated by hydrologically connected groundwater wells will be treated as described in Exhibit A. Wyoming will be responsible for the collection of the information necessary to comply with the ten consecutive year limitations on consumptive use of irrigation water computations as described in the methodology in Exhibit A.

2. Funding

The Wyoming, Nebraska and the Bureau representatives to the NPDC will use their best efforts to secure appropriations to fund the future data collection and consumptive use analyses program described in Exhibit B within one year of court approval of the Final Settlement Stipulation. If a new methodology for determination of Wyoming's compliance is adopted by the NPDC, Wyoming will be responsible for the collection of the information necessary to comply with the new ten consecutive year limitations on the consumptive use of irrigation water under the new methodology.

3. Reporting

Wyoming will complete the consumptive use calculations including the consumptive use amounts used by an irrigation water right transferred to another use, and provide a report to the NPDC by March 1st of the year following the irrigation season. This date may be modified by the NPDC. This report will include all input data and calculations used to calculate the consumptive use of irrigation water as described in the methodology in Exhibit A and a tabulation of the transferred consumptive use, including the ten consecutive year limitations. All field and other data or information will be maintained by the Wyoming State Engineer and be available upon reasonable notice for inspection by the NPDC or any representative to the NPDC.

EXHIBIT A - PROCEDURES FOR CALCULATING CONSUMPTIVE USE OF IRRIGATION WATER ABOVE GUERNSEY RESERVOIR, WYOMING

This exhibit presents the method used to calculate the consumptive use of irrigation water in the North Platte River basin between the Wyoming:Colorado state line and Guernsey Reservoir over the historical period 1952-1999 and to be used for the calculation of the consumptive use of irrigation water for five years of data collection pursuant to Exhibit B. Basically, the method consists of compilation of meteorological data from established weather stations, calculation of monthly grass reference evapotranspiration (ET_o), multiplication of monthly ET_o by mean monthly crop coefficients (K_{co}) developed to represent the various crops and water-supply conditions in the study area to obtain maximum annual crop evapotranspiration ($ET_{c(max)}$), an annual yield-based adjustment of $ET_{c(max)}$ to reflect annual variations in growing conditions, and subtraction of effective precipitation to obtain the annual unit consumptive use of irrigation water (CU_w) for each crop. These unit CU_w values (acre-ft per acre) are multiplied by the acreage in each crop in each of five climatically-similar sub-areas and the results are summed to obtain the total CU_w in each of two areas: the North Platte River basin in Wyoming above Pathfinder Dam and the North Platte River basin between Pathfinder Dam and Guernsey Reservoir.

I. Reference Evapotranpiration (ET_o)

A. Climate Data

Daily maximum and minimum temperature and total precipitation data are obtained from the following weather stations and monthly averages are computed.

Encampment/Riverside	(Encampment)
Saratoga	(Saratoga 1 SSE)
Medicine Bow	
Muddy Gap	
Casper	(Casper WSO AP)
Glenrock	(Glenrock 5 ESE)
Douglas	(Douglas 1 SE)

Climatic data from the Casper, Glenrock, and Douglas stations are averaged and calculation of CU_w proceeds based on this composite, Pathfinder-Guernsey station data set.

For several of these sites, the physical location at which climate data have been collected has moved over the years. Historical calculations have been made without regard for these shifts, treating all Encampment data, for example, as coming from the same place. For periods in which there has been more than one weather station to choose from at a site (e.g. Douglas), the station most likely to be representative of agricultural conditions has been chosen. This procedure will be continued in the future. Table 1 presents the monthly data that were used to calculate historical CU_w values. These data were acquired from the High Plains Regional Climate Center via internet connection. The Climate Center employs rigorous procedures for estimating missing values and publishes fully-populated climate data summaries. Rather than developing specific protocols for filling in missing data points for this exhibit, the work of the Climate Center has been adopted. This procedure will be continued in the future. The station identifiers for the most recent climate stations used are included with the above list. (A fee subscription is currently required for access to High Plains Regional Climate Center data for Wyoming.)

B. Hargreaves Equation

The Hargreaves equation used for this method is:

$$\lambda ET_o = 0.0023 \; R_A \; TD^{0.5} \; (T + 17.8)$$

where λET_o is estimated reference evapotranspiration (ET) in the same energy units as R_A; R_A is extraterrestrial solar radiation, calculated in MJ m^{-2} d^{-1}; T is mean air temperature in °C; and TD is the difference between daily maximum and minimum air temperatures in °C. The ET_o in MJ m^{-2} d^{-1} is divided by the latent heat of vaporization, λ, in MJ kg^{-1} (varies slightly with temperature) to give ET_o in mm d^{-1}.

For application of this method in Wyoming, the Hargreaves equation was calibrated against the Penman-Monteith equation for grass reference ET using long-term mean climate data from Scottsbluff, Nebraska. This calibration is represented by a series of monthly factors. The Hargreaves equation results are multiplied by these monthly factors to calculate the ET_o values upon which subsequent ET and CU_w calculations are based.

The constants, unit conversions, and calibration factors are combined into the Hargreaves equation to provide monthly calculation of ET_o in inches of water:

$$ET_o = 0.0023 \; R_A \; TD^{0.5} \; (T + 17.8)(calib.factor)$$

where R_A is expressed in units of inches equivalent evaporation depth per month. The following table provides the Hargreaves equation calibration factors used and the R_A

values for each weather station (radiation varies slightly with latitude) for calculation of monthly ET_o in inches.

	Apr	May	Jun	Jul	Aug	Sept	Oct
calibration factor	1.060	0.958	0.964	0.935	0.937	0.967	1.055
R_A (in/mo)							
Encampment	16.26	19.44	19.96	20.15	18.04	14.29	
Saratoga	16.27	19.46	20.00	20.19	18.06	14.30	
Medicine Bow	16.26	19.45	19.99	20.18	18.05	14.29	
Muddy Gap	16.28	19.46	20.00	20.20	18.09	14.32	
Casper-Glenrock-Douglas	16.11	19.42	20.03	20.20	17.98	14.08	10.69

In the future, calculations of ET_o will be made in this same manner, based on annually updated input climate data.

II. Grass-Reference Crop Coefficients (K_{co}) and Maximum Crop Evapotranspiration ($ET_{c(max)}$)

The following mean crop coefficients have been established for use in this method:

Table 2 - Monthly Mean Grass Reference Crop Coefficients

Crop	Apr	May	June	July	Aug	Sept	Oct
A. Alfalfa (one cutting, continued irrigation for pasture after cutting) above Pathfinder	0.330	0.509	1.144	0.820	0.771	0.771	--
B. Alfalfa (one cutting, no irrigation after cutting) above Pathfinder	0.330	0.509	1.144	0.808	precip	precip	--

C. Alfalfa (two cuttings, continued irrigation after 2nd cutting for pasture) below Pathfinder	0.701	1.029	0.889	1.049	0.558	0.501	0.280
D. Alfalfa (two cuttings, no irrigation after 2nd cutting) below Pathfinder	0.701	1.029	0.889	1.049	0.431	precip	precip
E. Grass hay (one cutting, continued irrigation after cutting for pasture) above Pathfinder	0.383	0.577	1.028	0.862	0.777	0.777	--
F. Grass hay (one cutting, no irrigation after cutting) above Pathfinder	0.383	0.577	1.028	0.660	precip	precip	--
G. Grass hay (one cutting, continued irrigation after cutting for pasture) below Pathfinder	0.500	0.702	1.043	1.093	0.685	0.742	0.488
H. Grass hay (one cutting, no irrigation after cutting) below Pathfinder	0.500	0.702	1.043	1.093	precip	precip	precip
I. Irrigated Pasture not harvested; above Pathfinder	0.383	0.536	0.745	0.707	0.777	0.777	--
J. Irrigated pasture not harvested (limited water supply) above Pathfinder	0.383	0.536	0.745	0.707	precip	precip	--
K. Irrigated pasture not harvested; below Pathfinder	0.300	0.461	0.731	0.772	0.772	0.772	0.486
L. Irrigated pasture not harvested (limited water supply) below Pathfinder	0.300	0.461	0.731	0.772	precip	precip	precip
M. Corn	0.250	0.397	1.152	1.253	1.009	0.417	0.250
N. Dry beans	0.250	0.250	0.887	1.183	0.577	0.250	0.250
O. Small grains	0.467	0.977	1.193	0.893	0.339	0.250	0.250

Monthly values of $ET_{c(max)}$ are calculated as:

$$ET_{c(max)} = ET_o * K_{co(mo)}$$

and the monthly results are summed to annual values. $ET_{c(max)}$ values are calculated for each crop for each weather

station. (The Casper, Glenrock, and Douglas stations are combined to represent growing conditions in the Pathfinder to Guernsey reach of the North Platte River.)

Estimates of monthly $ET_{c(max)}$ for the months prior to planting of annual crops (e.g. April and May for beans) and after harvest use a K_{co} of 0.25 (see Table 2).

III. Yield-based ET adjustment (ET_i)

Crop yield data reported by the National Agricultural Statistics Service (NASS) are used as described below to calculate an adjustment of $ET_{c(max)}$ to account for water use at less than the rates reflected in the K_{co} values of Table 2. The yield adjustment is based on the concept of an Aenvelope@ [sic] yield that approximates the yield that would be achieved under a fully-watered condition. To the extent the actual yield is less than this envelope level, a correspondingly lower ET is calculated. The resulting, yield-adjusted ET, is abbreviated as $ET_{c(i)}$, meaning the actual crop evapotranspiration in the specific year (i).

NASS county yield data are used to adjust $ET_{c(max)}$ to ET_i (for use in the subsequent calculations of CU_w) as follows:

Calculation Sub-Area	NASS Yield Data
Encampment	Carbon County
Saratoga	Carbon County
Medicine Bow	Carbon County
Sweetwater	Carbon County
Pathfinder - Guernsey	acreage-weighted average of Natrona and Converse Counties

The acreage-weighted yields for Pathfinder - Guernsey are calculated based on the individual, NASS-reported crop acreages in each county.

The ET adjustment is made as follows:

$$\frac{Y_i}{Y_{env(i)}} = (1 - ky) + ky \frac{ET_{c(i)}}{ET_{c(\max)}}$$

isolating $ET_{c(i)}$:

$$ET_{c(i)} = \left[\frac{1}{ky} \frac{Y_i}{Y_{env(i)}} + 1 - \frac{1}{ky} \right] ET_{c(\max)}$$

where Y_i = the average county yield in year "i"; $Y_{env(i)}$ = the envelope yield for year "i"; $ET_{c(max)}$ = the estimated maximum crop ET; and ky = the crop response function for each respective crop. The ky values used are: alfalfa and other hay, 1.05; corn, 1.25; and beans and small grains, 1.15.

The envelop yields for the historical analysis were calculated by fitting a polynomial equation to three of the highest annual county yield values per decade. The resulting curve of Y_{env} for each crop was then used to determine the individual $Y_{env(i)}$ values for individual year's calculations. Table 3 presents the crop yield data compiled from the NASS, including the $Y_{env(i)}$ values used for each year for calculation of historical CU_w.

The polynomial curve approach used for analysis of the historical period successfully describes yield changes during the period of time when all crop yields were increasing. For

many of the crops grown in the area above Guernsey Reservoir, however, the maximum yields have been leveling off in recent years. Therefore, future values of $Y_{env(i)}$ will be based on linear regression through the top three reported yields in each of the two decades immediately preceding the year of calculation. For example, the $Y_{env(i)}$ value for 2005 above Pathfinder for alfalfa hay will be determined by calculating a linear regression through the three highest alfalfa yields reported from 1986-1995 and the three highest alfalfa yields reported from 1996-2005. Based on the assumption that $Y_{env(i)}$ values are quite unlikely to decline over time, if the regression analysis produces a value lower than that used for the previous year, the previous year's value will be used instead. (For example, the 1999 $Y_{env(i)}$ from Table 3 will be used until it is exceeded by the regression-based value.)

IV. Effective Precipitation

Effective precipitation for all crops from October 1 of the previous year above Pathfinder and from November 1 of the previous year below Pathfinder through March 30 of the current year is calculated as 0.50 x total measured precipitation up to a maximum of three inches.

Effective precipitation for forage crops from April 1 through September 30 of each year above Pathfinder and April 1 through October 31 of each year below Pathfinder is calculated as 0.95 x total measured April - September or April - October precipitation.

Table 1 includes summation of the 50% and 90% of the total measured precipitation for these growing and non-growing seasons of each water year.

For the non-forage crops, effective precipitation during the growing season months is calculated for each month using the method developed by the SCS-USDA as presented in ASCE Manual 70, Eq. 5.5[1]:

$$R_e = f(D)\ [1.25\ R_t^{0.824} - 2.93]\ [10^{0.000955\ ET_i}]$$

where R_e is effective rainfall in mm; R_t = total measured rainfall in mm, ET_i is the monthly, actual crop ET calculated as above (in mm), and f(D) is a factor to adjust for varying depletion depths. For application here, a depletion depth of 75 mm is assumed and f(D) is a constant 1.00.

The annual effective precipitation is subtracted from the annual ET_i to obtain the actual crop consumptive use of irrigation water (CU_w) for the year. Thus, the CU_w values calculated for all the crop types listed in Table 2 reflect an adjustment for annual yields.

V. Crop Proportions

All irrigated acreage within each CU_w calculation subarea is assumed to have the same crop proportions as the county assigned to that subarea (as above). Crop acreages for each county are obtained from the NASS for harvested crops. The additional irrigated acreage that is not harvested is obtained from the U.S. Census of Agriculture conducted every 5 years. The irrigated-not-harvested acreage is assumed to be a constant percent of the NASS total irrigated acreage over the five year period, i.e., the Census acreage is used in the year of the Census and the ratio of Census acreage for

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[1] *Evapotranspiration and Irrigation Water Requirements*. Am. Soc. Civ. Engr. Manuals and Reports on Engineering Practice No. 70, p. 67.

irrigated-not-harvested to the NASS total irrigated-harvested acreage is used to project an irrigated-not-harvested acreage for each following year until replaced by the subsequent Census. The county individual crop acreages so compiled are divided by the total county irrigated acreage to obtain the annual crop proportions.

The Carbon County crop proportions are applied to the entire above-Pathfinder reach, under the assumption that the portion of this reach in Fremont County is more reflective of Carbon County conditions than of the main irrigated area in the lower elevation part of Fremont County.

The crop proportions for the Pathfinder to Guernsey reach are calculated as the acreage-weighted average of the crops reported for Natrona and Converse Counties. These proportions are also applied to the small portions of this reach that are in Platte and Albany Counties.

Table 4 presents the crop acreages compiled from the NASS and Census of Agriculture as well as the crop proportions calculated from those acreages. "Other hay" and "grass hay" are used synonymously in this exhibit; this crop is irrigated and harvested and reported in the annual NASS reports. "Irrigated Pasture" is not reported by the NASS because it is not a harvested crop. However, it is reported (variously as "pastureland and other land", "used only for pasture", and "other cropland irrigated") as a component of total irrigated land by the Census of Agriculture, which is published approximately every 5 years. To fill in the intervening years, the percentage of irrigated pasture in the Census year is calculated and applied to the annual NASS total acreage. In 1978, for example, the irrigated pasture acreage was 40.2% of the total irrigated acreage in Carbon County. Thus, the irrigated pasture for 1979 through 1981 was calculated as "x", such that

$$x \ / \ (x + \text{total NASS acreage}) = 0.402$$

isolating the variable:

$$\text{pasture acreage} = (\text{total NASS acreage} * 0.402) / (1 - 0.402)$$

The next Census of Agriculture was for 1982, so the percentage was changed in that year. Future calculations will continue this same process. The most recent Census of Agriculture is for 1997, in which the total irrigated pasture is listed as "pastureland and other land" under the "Irrigated land" category.

Crop acreage that is accounted by neither the annual NASS surveys or as irrigated pasture by the Census of Agriculture, if any, is assumed to be quite small and is ignored by this procedure. Although there are sometimes discrepancies (generally small) between the NASS total for irrigated, harvested land and the Census of Agriculture listing for "harvested cropland" , the NASS data are used in the methodology of this exhibit.

According to NASS personnel, they continue to review and, potentially, revise their estimates of crop acreage for several years after its initial publication. For calculation of historical CU_w, the most recent NASS data have been used. If , in the future, revisions of previously-published NASS data have an impact on compliance assessment, the NPDC will have to determine an appropriate protocol for the use of revised NASS data.

VI. Irrigated Acreage

A. Above Pathfinder

1. Irrigated Acreage

For this reach, irrigated acreage data are compiled from the annual reports of the Wyoming State Engineer's Office (WSEO). Only the actually-irrigated acreage values are used for these calculations. Consumption of irrigation water under the "Ringsby" transfer and the consumptive use associated with transfers of use from agricultural to other uses is excluded from the irrigated acreage calculations, but is added to the total consumptive use for the above- and below-Pathfinder areas. (See discussion below.)

For the historical period in which the WSEO reporting did not include an acreage breakdown between the Sweetwater, Medicine Bow and North Platte River ("above Sinclair") drainages, the average proportions of acreage among these three areas is applied to the earlier, basin-wide total reported acreage values.

Over the historical period, the WSEO reports do not include groundwater-irrigated acreage (except where such acreage also received a surface water supply) nor, at least in recent years, do they include reservoir-supplied acreage. For purposes of calculating the historical CU_w, acreage is added to the historical WSEO reports in the following quantities:

Reservoir-supplied acreage: reported values for 1989-1999; 1,224 acres (the average of the reported values) for every year from 1952 to 1988.

The reported values for reservoir supplied acreage are:

1989	77
1990	63
1991	253
1992	397
1993	587
1994	495
1995	1378
1996	2771
1997	2573
1998	1860
1999	3005
average	1224

Hydrologically-connected groundwater-irrigated acreage of 2,000 is assumed for 1999[2]. The distribution of this acreage over the 1952-1999 historical calculation period is the same as the temporal distribution of original-supply groundwater permits. (For example, if 65% of the 1999 total original-supply groundwater permits above Pathfinder were in place in 1962, 1962 is assigned 65% of the 2,000 acres.)

Both the reservoir-supply and hydrologically-connected groundwater acreage are distributed among the four CU_w calculation sub-areas in the same proportions as the WSEO-reported direct-flow surface-water irrigated acres in these sub-areas.

For future calculations of CU_w, the annual WSEO accounting of irrigated acreage will include both reservoir-supplied and hydrologically-connected groundwater acreage

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[2]This value was negotiated by Wyoming, US, and Nebraska.

and no additional acreage increments will be added to reflect these types of use.

Division of the WSEO-reported acreage between the CU_w calculation sub-areas is made as follows:

Encampment - 50% of the reported value for "above Sinclair"[3]
Saratoga - 50% of the reported value for "above Sinclair"
Medicine Bow - as reported
Sweetwater - as reported

2. Application of unit CU_w values

The basic crop distribution within each of these acreage totals is apportioned as described above. A more detailed, water-supply-condition crop distribution is provided as follows.

All acreage irrigated under reservoir supply and all acreage irrigated by groundwater is assumed to have a normal water supply and calculations of CU_w are made using the normal-water supply unit CU_w values, i.e. for crops A, E, and I as listed on Table 2. Depending upon the yield-based adjustments applied to $ET_{c(max)}$ values, these "normal irrigation" CU_w values may or may not represent a full irrigation water supply.

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[3]The 50% approximation is based on review of the 1997 WSEO acreage accounting. That accounting found 53.7% of the total "above Sinclair" acreage to be located on the 7.5-minute topographic quadrangles south of 41° 22.5' latitude. The 50:50 approximation is to be held constant until adjusted by decision of the NPDC.

For the remaining irrigated acreage:

1. "alfalfa" acreage is split 50:50 between unit CU_w values for crops A and B.

2. other hay acreage is split 50:50 between unit CU_w values for crops E and F, as above.

3. non-harvested pasture is split 50:50 between unit CU_w values for crops I and J.

4. small grains, corn, and potatoes use unit CU_w values for crop E (grass hay) because the small acreage of these crops in this reach do not justify independent calculation. If the acreage in these crops changes significantly in the future, the NPDC will establish appropriate K_{co} values and discrete CU_w calculations will be made as for the other crops.

Groundwater irrigation is approximated by consideration of groundwater permits. Compilation of groundwater permit information from the files of the WSEO for the North Platte River basin above Pathfinder Dam shows that as of 1999 there were:

398 acres of adjudicated original supply
496 acres of adjudicated additional supply
6,652 acres of unadjudicated original supply
8,182 acres of unadjudicated additional supply

In the absence of detailed data on the actual irrigated acreage under these permits, this method assumes that 100% of the adjudicated acreage is active and that 50% of the unadjudicated acreage is active. Thus, the method estimates there are currently 8,311 acres receiving the water-supply benefits of groundwater irrigation. For the historical analysis, this acreage is assumed to be distributed over the

1952-1999 period in correspondence with the dates on which these permits were issued. For future calculations, the same permit-based analysis will determine the acreage assigned to groundwater CU_w status, with the permit acreage totals listed above used as a 1999 baseline. (For example, if the 2005 groundwater irrigation permit listing shows 498 acres of adjudicated original supply, the total acreage receiving the water-supply benefits of groundwater irrigation will be increased to 8,411 acres.)

B. Below- Pathfinder

1. Mainstem Acreage

For the area between Pathfinder Dam and Guernsey Reservoir, irrigated acreage data are compiled from the annual reports of the WSEO.

2. Tributary Acreage

Irrigated acreage is calculated based on annual NASS surveys for Natrona, Converse, and Platte Counties, with an additional increment from the U.S. Census of Agriculture to account for irrigated acreage that is not harvested. Because the Census of Agriculture only provides an acreage value every 5 years, the most recent percentage is used for each year until the next update is published. (See discussion above, p. [217].)

These county-wide totals are assigned to the tributary portion of the Pathfinder to Guernsey reach of the North Platte in proportion to the surface water rights, e.g. if in a given year the WSEO surface water right permit files show 75% of all the surface water rights in Converse County are on North Platte River tributaries above Guernsey, 75% of the total county irrigated acreage is assigned to the tributaries. Table

5 presents the water-rights based proportions used for the historical period. Future calculations of CU_w will be based on the same procedures applied to an annually updated listing of surface water rights from the WSEO. (It is understood that this method tacitly assumes that all groundwater irrigation, which is included in the NASS and Census of Agriculture totals, has the same geographic distribution as the surface water rights and that actual surface irrigation has the same geographic distribution as the associated water rights.)

As a 1995 baseline for future application of this method, the total permit acreage values listed in Table 6 are adopted.

Table 6 - 1995 Surface Water Irrigation Water Right Permit Total Acreage

	county total permit acreage	tributary permit acreage	%
Natrona	57,957	30,476	52.6
Converse	83,859	64,077	76.4
Platte	132,101	14,162	10.7
Albany	213,064	776	0.36

To these totals, any post-1995 permit acreage will be added for re-calculation of the proportions of the county irrigated acreage attributed to the tributary area. For example, if a permit is issued in 2003 for 5,000 acres of irrigation on a North Platte tributary in Converse County, the proportion of tributary acreage for Converse County will increase to 77.7% (=69077/88859).

3. Other Acreage

Use of WSEO-reported acreage for the mainstem and NASS-based acreage for the tributaries has been found to overlook approximately 3788 acres[4]. Although it is difficult to define the exact location and nature of this "missing" acreage, it is conceptualized as groundwater irrigation along the mainstem. In the absence of information on the temporal distribution of this acreage, but in recognition of the minimal groundwater irrigation in the early 1950's, this quantity is assumed to have grown linearly from 0 in 1952 to 3,788 in 1996 and to remain constant (3,788 acres) into the future. Thus, to the acreage calculated under 1. and 2. above, will be added 3,788 acres until such time as this factor is changed by decision of the NPDC.

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[4]In 1996, an inventory of irrigated lands between Pathfinder and Guernsey was completed for the State of Wyoming by States West Water Resources Corp. That inventory found 16,441 acres irrigated along the mainstem. The 1993-1996 average acreage identified by the Wyoming State Engineer's Office as being irrigated by diversions from the mainstem was 12,653 acres. The difference – 3,788 acres – is assumed to reflect acreage along the mainstem that is not irrigated by mainstem diversions (e.g. groundwater irrigation). Because the method of this exhibit assesses tributary acreage based on the distribution of water rights and mainstem acreage based on the Wyoming State Engineer reports, a 3,788-acre discontinuity is assumed to result and is accommodated by addition of that acreage to the Pathfinder to Guernsey total.

4. Application of unit CU_w values

All crops irrigated from the mainstem or groundwater are assigned the normal irrigation supply unit CU_w values (crops C, G, K, M, N, O on Table 2), with "beets" and "potatoes" assigned the average CU_w calculated for crops M, N, and O (the other non-forage crops). The latter assignment is made because the small acreage of these crops in this reach do not justify independent calculation. If the acreage in these crops changes significantly in the future, the NPDC will establish appropriate K_{co} values and discrete CU_w calculations will be made as for the other crops.

Mainstem acreage is that reported by the WSEO. Groundwater irrigation is derived by consideration of groundwater permits. Compilation of groundwater permit information from the files of the WSEO for the North Platte River basin between Pathfinder Dam and Guernsey Reservoir shows that as of 1999 there were:

2586 acres of adjudicated original supply
3667 acres of adjudicated additional supply
5805 acres of unadjudicated original supply
9073 acres of unadjudicated additional supply

In the absence of detailed data on the actual irrigated acreage under these permits, this method assumes that 100% of the adjudicated acreage is active and that 50% of the unadjudicated acreage is active. Thus, the method estimates there are currently 13,692 acres receiving the water-supply benefits of groundwater irrigation. For the historical analysis, this acreage is assumed to be distributed over the 1952-1999 period in correspondence with the dates on which these permits were issued. For future calculations, the same permit-based analysis will determine the acreage assigned to

groundwater CU_w status, with the above permit numbers used as a 1999 baseline.

The remaining acreage (solely surface-water irrigated acreage on the tributaries) uses the limited water supply unit CU_w values for forage crops and the same non-forage unit CU_w values as above, i.e., crops D, H, L, M, N, and O from Table 2.

VII. Calculation of Total Consumptive Use

Calculation of total CU_w is accomplished by multiplication of each acreage type as defined above, by the corresponding unit CU_w values. Table 5 presents the final acreage values used for CU_w calculation. Processing of these acreage totals by the crop distributions (Table 4) and water-supply assumptions discussed above produces the total CU_w values for each sub-area.

To these totals are added the consumptive use associated with water right "transfers".

The "Ringsby transfer" equivalent acreage is assigned a consumptive use of 1.42 acre-ft/acre. This is the consumption rate used by the WSEO to calculate the equivalent acreage in the first place, so the method simply returns to the original, measured volume of exported water. For the 1970 - 1984 period in which the Ringsby transfer was not reported, the average of the 1985-1996 reported values is used. In the future, consumptive use associated with the Ringsby transfer will be accounted based on the annual Wyoming State Engineer's Office accounting.

For calculation of the historical baseline, the consumptive use under water rights transferred from agricultural production has been compiled from the Wyoming Board of

Control documents permitting those transfers. Table 7 presents those data.

Table 7 - Historical Consumptive Use under Transfer Rights		
Transfer	Starting Year	Annual CU (acre-ft)
ABOVE PATHFINDER		
White/Rock River	1953	43.39
Geneva Steel/Sweetwater	1958	2,800
Storer/NPR	1966	86.47
Storer/NPR	1966	7.58
WLX/Pierce Reservoir	1983	76.9
Saratoga/NPR	1984	30.83
Casper/Rock Creek	1986	13.78
Dumalo/Bridger Creek	1987	9.0
TOTAL		**3,067.95**
BELOW PATHFINDER		
Pacific Power/Keck	1956	819.18
Pacific Power/Lockett	1961	2,308.87
Pacific Power/various	1972	2,785.2

Douglas/NPR	1978	263.52
Casper/Elkhorn Creek	1985	182.04
Mills/Cannon	1989	137.5
Mills/Cannon	1990	56.05
Pacific Power/Cannon	1992	3,037.
TOTAL		**9,589.36**

For the calculation of historical consumptive use, the transfer totals listed above are added to the calculated CU_w for each year beginning with the year in which the transfer began.

Future WSEO accounting procedures will include an explicit increment for the consumptive use associated with transfers from agricultural use, which will be added to the CU_w value calculated for irrigated acres.

Total CU_w is aggregated into two reaches: A) above Pathfinder; and B) below Pathfinder, for reporting to the NPDC. Table 8 presents the annual consumptive use of irrigation water (CU_w) and the additional consumptive use associated with water right transfers for the two overall reporting areas divided by Pathfinder Dam. Ten-year running averages are provided for the historical period, rounded to the nearest 1,000 acre-ft.

Table 1 - Climate Data for CUw Calculation

SARATOGA

Minimum Air Temperature, F

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1951	8.0	14.8	14.8	26.1	35.5	38.7	47.4	46.6	37.0	29.7	15.0	13.8	27.3
1952	9.7	9.7	13.1	27.6	35.5	43.7	46.4	45.5	37.0	26.3	9.1	11.1	26.2
1953	20.4	12.7	22.6	22.9	30.4	38.8	43.8	46.6	36.1	27.4	23.1	8.7	27.8
1954	14.7	18.7	14.6	27.1	34.4	41.5	51.4	45.4	40.0	27.1	19.0	8.5	28.5
1955	7.8	8.2	13.3	24.3	34.2	41.0	43.8	50.2	37.4	27.5	15.4	16.4	26.6
1956	14.2	2.0	14.8	25.5	37.2	43.6	45.4	43.7	35.7	25.5	12.0	9.3	25.7
1957	2.6	19.2	18.6	24.5	34.9	41.2	49.0	48.8	35.6	29.4	14.9	13.4	27.7
1958	6.5	19.0	12.5	23.9	37.7	42.4	45.4	48.3	39.3	26.9	19.5	19.4	28.4
1959	12.1	14.1	19.0	27.1	35.3	46.5	48.0	47.5	38.5	29.0	17.3	12.1	28.9
1960	11.3	7.4	19.7	25.6	35.4	43.4	49.2	45.7	41.2	30.0	19.0	11.2	28.3
1961	7.2	16.6	19.5	24.2	37.0	45.5	49.3	49.2	36.3	28.4	16.1	11.7	28.4
1962	-0.2	16.0	14.5	29.6	37.7	44.1	47.3	43.5	36.7	29.4	22.7	12.1	27.8
1963	3.4	18.4	17.6	27.2	36.8	44.7	50.1	50.4	42.7	33.2	21.6	13.3	30.0
1964	4.9	5.1	10.8	26.9	35.5	42.3	50.9	45.6	35.6	26.6	20.4	13.8	26.5
1965	17.0	12.9	9.0	29.9	35.5	43.0	50.1	45.1	34.8	29.9	26.5	13.3	28.9
1966	11.4	7.1	18.3	21.2	32.0	41.3	49.5	43.9	39.1	26.0	21.7	11.3	26.9
1967	14.8	13.2	22.7	27.3	33.5	40.7	46.7	43.5	38.5	31.1	19.8	8.2	28.3
1968	15.6	16.8	20.5	21.4	31.4	41.8	48.0	44.9	34.5	29.8	16.3	9.4	27.5
1969	16.4	13.3	9.8	29.9	37.0	39.6	47.6	47.9	40.6	24.5	18.4	9.3	27.9
1970	12.4	16.1	16.6	23.7	35.4	42.2	48.7	48.1	35.3	23.6	23.8	11.9	28.2
1971	19.3	12.8	18.8	26.2	33.7	42.8	47.0	47.0	35.2	26.8	18.7	10.6	28.2
1972	12.2	16.3	24.1	28.0	34.3	46.6	47.1	45.9	39.1	32.1	17.0	8.3	29.3
1973	5.0	5.1	16.1	23.6	33.4	42.9	48.5	48.6	37.9	30.4	20.7	14.2	27.2
1974	8.8	11.2	25.1	27.7	34.7	43.9	50.2	41.8	33.0	30.9	21.0	6.7	27.9
1975	12.1	11.5	20.1	23.2	33.3	40.0	50.7	44.1	33.9	28.0	17.0	13.5	27.3
1976	9.6	15.9	17.0	28.1	35.4	42.2	52.0	46.1	38.6	25.3	14.6	10.0	27.9
1977	9.5	12.7	15.9	29.9	34.5	45.7	49.9	47.1	38.0	28.5	18.4	18.6	29.1
1978	12.6	14.3	25.6	30.0	36.1	44.8	49.7	44.8	38.2	28.1	19.4	5.3	29.1
1979	-3.1	16.8	24.0	28.7	35.0	42.9	49.7	48.1	39.1	30.7	12.1	15.8	28.3
1980	10.3	16.3	19.2	27.1	36.7	43.5	51.3	49.0	40.0	27.4	19.6	21.4	30.2
1981	12.8	15.2	22.5	32.0	36.9	46.2	50.5	47.5	43.2	30.8	22.6	18.3	31.5
1982	9.8	11.4	21.4	23.1	34.8	40.5	48.8	51.7	40.8	27.5	14.6	12.1	28.0
1983	14.6	16.4	22.0	22.6	31.8	43.1	51.3	51.6	39.9	30.7	18.5	5.5	29.0
1984	4.1	7.8	18.3	22.3	36.3	42.5	50.6	50.3	38.7	25.6	20.3	12.3	27.4
1985	2.9	6.9	18.7	27.6	34.8	42.9	51.3	45.3	36.4	28.0	19.2	8.5	26.9
1986	15.3	19.0	25.2	28.8	32.9	47.0	48.8	47.5	39.4	28.6	21.5	10.7	30.4
1987	8.7	16.3	17.1	28.8	39.8	43.3	50.1	46.0	37.1	29.3	18.2	10.8	28.8
1988	6.5	12.5	17.5	29.1	37.1	50.3	51.2	47.1	38.1	33.2	22.7	9.3	29.6
1989	12.7	3.8	24.2	30.6	35.6	43.3	51.1	47.9	38.7	29.1	22.2	9.6	29.1
1990	16.4	10.5	24.6	29.8	33.1	44.9	50.3	48.4	44.3	32.9	23.5	4.4	30.3
1991	8.3	18.2	23.4	26.5	37.5	46.7	49.6	49.3	39.7	28.9	18.3	9.5	29.7
1992	6.7	18.1	25.7	33.0	40.2	44.4	48.1	48.1	40.2	33.0	16.3	9.8	30.3
1993	11.7	9.6	22.8	27.9	38.1	43.5	44.5	46.1	37.3	29.8	13.8	12.6	28.1
1994	17.1	11.5	24.3	29.3	38.6	45.1	48.4	48.9	39.6	31.3	17.8	15.8	30.6
1995	12.6	20.6	23.2	27.3	34.5	42.9	48.8	51.5	40.9	28.7	25.7	17.1	31.2
1996	11.8	16.0	20.5	28.7	37.2	45.0	49.9	45.9	38.2	28.4	24.3	18.6	30.4
1997	11.0	11.6	22.2	24.0	36.5	46.8	49.9	49.8	44.2	30.4	17.8	9.0	29.4
1998	19.5	18.3	19.1	28.0	38.1	41.4	53.2	49.4	44.3	31.2	26.1	11.4	31.7
1999	19.5	19.6	23.4	27.2	34.5	44.7	52.8	49.5	37.2	26.9	22.9	13.1	30.9
Average	10.8	13.4	19.3	26.8	35.5	43.4	49.0	47.2	38.4	28.9	19.1	11.9	28.6

Table 1 - Climate Data for CUw Calculation

SARATOGA

Maximum Air Temperature, F

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1951	30.1	38.3	38.7	51.7	65.2	68.8	84.3	78.6	72.2	54.6	40.9	32.6	54.7
1952	32.3	34.3	35.1	54.2	64.7	78.2	82.7	81.0	76.2	66.7	41.1	35.1	56.8
1953	40.3	34.1	46.6	50.3	58.4	78.0	87.1	80.6	76.9	64.2	49.8	35.7	58.5
1954	39.4	47.7	39.9	58.4	69.1	75.5	88.5	81.6	74.0	61.8	52.5	38.7	60.6
1955	32.8	32.3	39.4	51.8	66.5	73.1	85.8	83.5	75.6	62.7	41.1	37.5	56.8
1956	40.7	30.6	41.1	54.7	68.3	81.6	82.2	77.5	76.5	63.5	37.6	36.1	57.5
1957	29.5	41.0	43.7	50.5	61.0	71.8	82.1	81.5	68.9	59.4	38.7	39.8	55.7
1958	37.5	44.0	39.2	49.8	70.9	79.0	81.3	83.0	73.6	63.7	50.2	40.0	59.4
1959	35.6	35.7	40.9	55.1	64.5	79.6	84.2	81.6	68.0	56.3	45.8	42.1	57.5
1960	33.0	29.7	44.6	58.8	66.2	77.8	85.1	81.5	74.3	60.3	43.3	36.6	57.6
1961	38.4	39.4	44.4	53.0	67.2	79.0	82.4	81.9	63.6	57.2	40.1	31.5	56.5
1962	29.5	35.7	38.1	58.5	66.4	74.6	81.8	81.2	73.1	63.5	50.8	40.4	57.8
1963	27.8	42.0	43.5	53.2	69.5	76.4	85.4	79.9	75.5	66.3	50.2	37.0	58.9
1964	30.0	28.9	35.0	50.2	66.2	72.2	86.5	79.2	71.1	62.4	42.5	33.3	54.8
1965	36.3	35.9	34.9	54.1	61.7	73.0	80.5	77.3	60.6	65.0	49.1	39.5	55.7
1966	33.9	33.6	50.1	55.9	71.3	76.1	85.8	80.6	73.1	56.9	46.9	34.2	58.2
1967	33.9	36.3	45.7	53.4	60.4	69.5	78.9	78.6	67.8	58.2	43.9	27.8	54.5
1968	35.1	36.4	42.6	44.5	57.5	74.9	84.5	77.4	71.4	60.9	40.1	33.9	54.9
1969	38.8	38.2	37.5	58.1	71.6	69.6	85.7	85.5	76.2	47.5	44.2	38.7	57.6
1970	32.9	42.6	38.6	46.7	67.3	75.0	84.0	84.3	69.2	52.4	42.3	35.1	55.9
1971	33.0	34.6	40.8	55.4	63.8	79.0	84.3	85.9	69.0	58.0	43.0	31.9	56.6
1972	33.0	38.7	51.4	57.6	67.2	77.3	83.4	81.7	71.3	57.0	37.3	30.9	57.2
1973	28.3	34.3	39.2	45.4	64.0	76.0	81.0	82.7	69.9	63.7	42.8	36.1	55.3
1974	30.5	36.6	47.8	53.0	69.9	79.7	83.7	80.6	72.3	63.0	45.8	33.9	58.1
1975	32.1	35.0	41.8	49.7	62.3	72.6	83.8	81.0	72.0	61.5	44.7	37.4	56.2
1976	34.3	40.9	43.5	56.5	67.8	74.3	85.7	80.6	73.8	59.4	46.2	39.8	58.6
1977	33.6	42.9	42.1	58.8	68.1	84.1	83.8	80.4	76.0	63.5	45.1	38.6	59.8
1978	34.4	37.2	48.1	57.2	61.7	76.7	85.0	78.8	72.3	63.1	43.5	25.6	57.0
1979	21.8	35.2	42.2	55.3	63.4	77.5	84.5	78.4	77.6	61.9	35.7	40.0	56.1
1980	30.2	38.1	40.1	53.7	63.6	79.2	84.1	80.2	72.8	59.3	46.6	44.7	57.7
1981	43.6	41.5	47.7	61.4	61.1	78.4	82.6	81.4	76.2	55.2	47.9	37.8	59.6
1982	32.2	35.7	45.6	54.0	63.2	73.0	81.8	82.6	69.7	55.4	39.9	33.8	55.6
1983	38.7	39.8	43.3	46.9	60.2	71.9	82.0	83.7	74.6	62.0	41.8	26.6	56.0
1984	30.3	36.0	39.7	47.1	67.7	73.2	82.6	81.5	70.6	51.7	45.1	34.6	55.0
1985	27.3	31.6	45.1	58.8	68.2	77.2	82.8	82.4	67.3	59.0	37.8	32.1	55.8
1986	40.3	39.5	54.0	54.4	65.9	80.5	79.4	81.5	67.1	57.0	42.9	38.2	58.4
1987	33.1	39.5	41.9	60.9	65.7	75.5	80.1	76.8	72.0	62.2	42.3	31.4	56.8
1988	27.5	35.7	39.5	59.6	65.6	80.4	84.3	81.6	69.7	65.0	40.4	34.6	57.0
1989	35.1	27.0	49.3	59.2	68.5	74.7	83.3	78.4	72.2	60.3	45.8	33.6	57.3
1990	37.3	34.0	47.1	57.6	64.3	78.2	79.5	79.5	75.4	58.9	46.0	29.2	57.3
1991	30.9	43.4	45.2	52.8	66.3	75.8	79.8	80.2	70.5	60.6	37.0	36.0	56.5
1992	33.4	39.7	48.6	61.3	67.7	72.8	76.3	78.9	72.5	62.9	35.8	32.0	56.8
1993	33.7	31.1	43.7	50.6	64.6	71.2	78.4	76.8	69.2	55.0	37.0	33.7	53.8
1994	34.9	34.6	49.4	56.6	70.4	79.8	82.3	82.3	73.0	56.6	40.5	38.9	58.3
1995	34.7	42.0	47.4	51.6	56.6	71.2	78.7	82.8	70.2	57.3	47.0	39.5	56.6
1996	32.6	40.0	44.9	54.8	65.1	77.6	83.8	82.6	69.1	56.6	44.9	34.9	57.2
1997	31.7	32.5	49.6	49.6	65.7	75.8	81.7	78.6	71.7	58.7	41.3	32.3	55.8
1998	37.6	37.8	42.7	54.2	67.3	69.7	83.0	80.7	75.7	57.7	46.3	34.1	57.2
1999	36.1	40.6	51.9	52.0	63.7	74.8	83.9	80.2	69.0	63.7	55.7	35.3	58.9
Average	33.7	37.0	43.5	54.1	65.4	75.8	82.9	80.8	71.8	59.8	43.6	35.4	57.0

Table 1 - Climate Data for CUw Calculation

SARATOGA

Precipitation, inches

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	50% Oct-Mar	95% Apr-Sep
1951	0.87	0.04	0.66	0.81	1.30	1.16	1.03	1.32	0.38	3.69	0.49	0.46	12.21		
1952	0.69	0.78	0.83	0.84	1.10	0.79	0.84	1.44	0.08	0.00	0.55	0.19	8.13	3.47	4.84
1953	0.46	0.48	0.21	0.96	2.50	0.50	0.64	0.97	0.14	0.07	0.49	0.21	7.63	0.95	5.42
1954	0.54	0.25	1.95	0.00	0.42	0.00	0.31	0.44	1.00	0.77	0.43	0.33	6.44	1.76	2.06
1955	0.20	0.32	0.77	0.38	0.60	0.25	0.00	1.83	0.13	0.57	0.70	0.45	6.20	1.41	3.03
1956	0.62	0.41	0.25	0.83	0.99	0.36	1.50	0.80	0.00	0.73	0.45	0.88	7.82	1.50	4.26
1957	0.64	0.22	0.81	0.36	2.59	0.85	0.43	1.49	0.36	2.30	0.31	0.04	10.40	1.87	5.78
1958	0.08	0.13	0.81	0.43	0.81	0.66	0.56	0.93	0.75	0.01	0.02	0.67	5.86	1.84	3.93
1959	0.41	0.54	0.66	0.23	1.28	1.60	0.10	0.96	1.27	0.97	0.06	0.14	8.22	1.16	5.17
1960	0.15	0.39	0.82	0.48	0.85	1.38	0.77	0.81	0.12	0.55	1.28	0.07	7.67	1.27	4.19
1961	0.24	0.44	0.35	0.87	1.47	1.04	1.30	1.03	2.93	0.58	0.52	0.13	10.90	1.47	8.21
1962	1.08	1.08	0.46	1.41	0.77	1.27	0.44	0.35	0.27	1.01	0.21	0.12	8.47	1.93	4.28
1963	0.44	0.17	0.41	1.69	0.22	0.71	0.91	2.09	0.34	0.29	0.16	0.17	7.60	1.18	5.66
1964	0.48	0.73	0.61	1.94	0.76	1.50	0.27	1.28	0.52	0.18	0.61	0.86	9.74	1.22	5.96
1965	0.23	0.15	0.66	1.02	3.55	0.67	1.24	0.35	2.86	0.02	0.29	0.60	11.64	1.35	9.21
1966	0.08	0.15	0.85	0.87	0.20	1.53	0.60	1.15	1.19	1.78	0.63	0.39	9.42	1.00	5.26
1967	0.48	0.76	1.36	0.66	1.39	2.31	1.79	0.86	1.80	1.07	1.09	1.62	15.19	2.70	8.37
1968	0.51	1.00	0.40	3.16	1.47	0.38	0.51	1.17	0.70	0.72	0.81	0.30	11.13	2.85	7.02
1969	0.43	0.51	0.34	0.61	0.40	2.16	0.17	0.43	0.67	2.25	0.22	0.51	8.70	1.56	4.22
1970	0.18	0.02	0.89	1.04	0.51	2.01	0.74	0.73	1.48	1.47	0.89	0.55	10.51	2.04	6.18
1971	0.17	0.28	0.29	0.69	1.91	0.04	0.24	0.57	0.59	0.72	0.10	0.28	5.88	1.83	3.84
1972	0.41	0.26	0.34	0.51	0.90	2.00	0.61	0.64	1.14	3.24	0.79	0.74	11.58	1.06	5.51
1973	0.27	0.42	1.27	1.91	0.46	1.01	1.44	0.58	1.36	0.03	1.53	0.98	11.26	3.37	6.42
1974	0.31	0.26	0.51	1.42	0.09	0.98	3.12	0.30	0.67	1.62	0.32	0.73	10.33	1.81	6.25
1975	0.76	0.17	1.04	1.09	0.57	0.61	1.39	0.49	0.41	1.60	0.22	0.75	9.10	2.32	4.33
1976	0.05	0.53	0.40	1.16	1.76	1.46	2.49	0.52	0.44	0.17	0.00	0.23	9.21	1.78	7.44
1977	0.29	0.25	0.75	1.35	3.26	0.45	1.10	1.30	0.40	0.34	0.60	0.00	10.09	0.85	7.47
1978	0.55	0.45	0.54	0.38	2.40	0.24	0.62	0.95	0.47	0.55	0.41	1.10	8.66	1.24	4.81
1979	0.39	0.41	1.02	0.93	1.67	0.20	0.15	1.76	0.15	1.29	0.43	0.37	8.77	1.94	4.62
1980	2.03	0.50	0.86	0.33	1.85	0.00	0.74	1.01	1.11	1.27	0.39	0.38	10.47	2.74	4.79
1981	0.12	0.22	0.59	0.72	3.02	0.00	1.46	0.76	0.53	1.60	0.41	0.33	9.76	1.49	6.17
1982	0.28	0.18	0.35	0.39	1.14	1.41	2.69	0.47	1.63	0.67	0.98	0.68	11.07	1.58	7.34
1983	0.02	0.13	1.47	1.72	1.53	1.60	2.33	0.79	0.78	1.16	2.28	0.69	14.50	2.08	8.31
1984	0.22	0.68	1.46	2.22	0.15	0.81	3.45	2.29	1.69	0.33	0.41	0.06	13.77	3.25	10.08
1985	0.68	0.23	0.62	0.50	0.61	0.37	1.04	0.22	0.58	0.99	1.16	0.43	7.43	1.17	3.15
1986	0.05	0.70	0.63	1.50	1.45	2.31	0.98	1.34	0.87	1.18	0.71	0.15	11.87	1.98	8.03
1987	0.41	0.74	0.88	0.48	1.24	0.24	1.02	1.21	0.21	0.82	1.13	0.91	9.29	2.04	4.18
1988	0.84	0.14	1.71	0.30	1.64	0.18	0.39	0.30	1.35	0.01	0.61	0.38	7.85	2.78	3.95
1989	0.08	1.92	0.47	0.06	0.26	0.42	0.79	1.09	1.28	0.48	0.18	0.57	7.60	1.74	3.71
1990	0.27	0.99	0.84	0.40	0.74	0.79	0.99	1.17	0.60	0.93	0.69	0.43	8.84	1.67	4.46
1991	0.34	0.32	0.61	0.79	2.49	1.15	0.78	0.64	0.53	0.50	0.99	0.14	9.28	1.66	6.06
1992	1.06	0.60	0.54	0.40	2.40	0.97	1.63	0.77	0.51	0.88	0.65	0.74	11.15	1.92	6.35
1993	0.19	0.47	0.95	2.02	2.49	0.90	0.29	1.21	1.32	2.22	0.84	0.37	13.27	1.94	7.82
1994	0.37	0.94	0.67	1.04	0.23	0.37	0.24	0.51	0.29	1.31	0.43	0.28	6.68	2.71	2.55
1995	0.52	0.52	0.77	1.51	5.44	2.31	0.99	0.89	1.08	1.18	0.96	0.12	16.29	1.92	11.61
1996	0.71	0.20	0.45	2.04	1.98	0.41	0.31	0.30	0.36	0.91	0.64	0.34	8.65	1.81	5.13
1997	1.19	0.38	0.20	1.67	1.98	1.32	0.80	2.14	2.01	0.55	0.15	0.38	12.77	1.83	9.42
1998	0.17	0.39	0.68	0.56	1.16	3.01	1.29	1.34	0.71	2.28	0.30	0.61	12.52	1.16	7.69
1999	0.70	0.18	0.24	1.03	1.53	1.96	1.38	0.64	1.39	0.14	0.57	0.21	9.97	2.16	7.53
Average	0.45	0.45	0.72	0.97	1.42	0.99	1.00	0.95	0.85	0.98	0.59	0.45	9.83	1.84	5.88

Table 1 - Climate Data for CUw Calculation

MEDICINE BOW

Minimum Temperature

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1951	8.5	15.1	17.9	24.2	35.7	37.0	46.8	44.9	35.6	29.1	16.2	12.5	27.0
1952	12.5	11.1	13.0	26.9	35.2	44.1	46.3	46.6	34.6	24.0	9.8	13.2	26.4
1953	22.5	12.7	21.5	22.9	32.5	43.6	49.5	46.8	35.8	24.9	21.2	10.8	28.7
1954	18.0	21.1	14.7	28.3	32.5	40.7	50.2	42.2	37.6	28.3	19.6	10.1	28.6
1955	7.2	8.0	13.9	21.9	32.9	40.4	46.3	48.0	36.9	27.6	19.0	21.8	27.0
1956	13.6	3.1	16.8	23.8	37.3	43.1	46.2	42.9	33.1	25.7	14.0	13.7	26.1
1957	3.2	20.9	19.3	24.4	35.8	41.8	47.7	47.2	32.9	31.7	16.5	17.8	28.3
1958	9.3	20.8	14.0	24.3	37.2	42.7	45.2	46.3	37.8	25.1	18.7	15.4	28.1
1959	11.4	12.4	18.6	26.0	35.1	43.1	45.9	46.1	36.2	27.7	17.4	13.1	27.8
1960	11.2	7.1	19.6	27.3	33.8	42.8	44.5	42.0	35.8	25.4	17.7	7.9	26.3
1961	10.7	15.9	20.7	25.0	36.1	40.4	45.7	46.9	34.4	24.9	16.5	11.7	27.4
1962	1.7	17.1	11.9	28.7	35.5	41.8	44.5	41.1	34.9	27.5	22.4	13.8	26.7
1963	1.4	18.6	12.8	26.2	34.6	41.8	47.5	45.4	40.4	28.4	20.7	11.8	27.5
1964	8.5	6.9	9.7	25.4	34.0	40.3	47.4	43.4	32.9	24.8	17.5	11.5	25.2
1965	17.5	11.4	6.7	28.1	33.1	41.9	47.7	43.1	33.2	29.0	23.9	14.0	27.5
1966	10.7	10.3	18.5	21.9	34.0	41.0	50.0	43.0	38.3	26.8	22.8	15.3	27.7
1967	16.8	14.9	23.5	25.0	33.0	41.2	47.3	42.6	37.8	29.7	14.8	4.1	27.6
1968	6.2	14.8	20.5	20.7	30.1	41.7	46.9	43.8	32.8	26.2	12.8	8.0	25.4
1969	15.6	12.7	11.2	28.3	35.4	40.5	47.8	45.9	40.3	22.8	19.4	12.7	27.7
1970	16.2	16.9	15.5	22.5	33.7	40.8	47.5	46.5	32.4	20.9	23.4	13.5	27.5
1971	19.5	12.9	19.4	25.2	32.8	43.4	46.7	45.2	34.4	25.2	18.2	11.3	27.9
1972	11.5	15.8	23.7	26.2	33.1	44.9	45.7	46.4	36.4	29.7	14.2	6.5	27.8
1973	4.6	4.7	17.1	22.5	32.1	42.8	48.0	47.9	36.2	28.3	23.5	18.2	27.2
1974	10.3	16.0	23.6	28.6	36.2	42.3	47.0	40.0	30.9	28.4	20.8	8.3	27.7
1975	9.7	8.7	19.3	23.1	31.2	37.9	46.8	40.1	29.0	22.9	14.6	12.4	24.6
1976	9.4	16.0	13.1	25.2	31.6	37.8	46.3	40.5	34.2	16.2	12.5	7.6	24.2
1977	4.7	12.5	13.3	25.4	32.8	44.2	46.4	45.1	35.8	27.0	17.3	18.8	26.9
1978	11.3	14.7	23.9	26.6	33.2	42.4	44.3	42.9	35.7	21.0	16.8	5.0	26.5
1979	-0.1	15.1	20.8	26.9	31.9	41.1	46.2	44.5	34.7	25.6	11.1	15.2	26.1
1980	8.2	12.6	17.9	24.7	34.0	42.0	48.0	43.8	36.9	25.4	16.1	20.5	27.5
1981	11.8	16.8	21.2	33.2	35.6	47.1	49.1	47.1	39.4	30.3	24.5	18.1	31.2
1982	10.6	8.9	22.2	23.1	34.0	40.5	48.7	50.4	39.9	28.2	20.0	14.4	28.4
1983	19.3	14.7	19.9	20.8	30.5	41.0	48.5	51.0	38.3	30.8	18.6	2.5	28.0
1984	8.0	11.5	17.1	20.9	35.6	41.0	48.6	49.5	35.9	24.5	18.7	12.1	27.0
1985	3.7	5.8	17.2	26.9	34.8	39.4	48.2	41.4	35.0	28.8	16.8	10.2	25.7
1986	19.2	17.3	27.0	29.7	33.5	45.4	45.4	46.3	36.2	30.0	19.8	11.1	30.1
1987	8.9	16.2	19.3	27.1	38.7	42.4	47.3	44.6	34.7	27.9	18.8	10.5	28.0
1988	8.5	11.5	18.1	26.3	36.0	48.3	48.3	44.6	35.6	30.8	21.6	9.5	28.3
1989	14.1	3.5	22.8	27.4	34.1	41.3	48.9	43.9	37.1	29.7	23.1	12.2	28.2
1990	18.0	12.1	21.6	27.5	31.6	43.5	48.8	44.5	41.6	30.8	22.9	5.3	29.0
1991	10.2	17.8	22.5	24.9	37.3	45.0	47.8	46.9	37.6	28.6	18.8	10.7	29.0
1992	9.2	18.9	22.6	30.5	37.1	43.2	47.1	46.2	37.7	29.9	16.9	10.6	29.2
1993	9.3	4.6	21.5	27.9	37.0	41.9	43.3	44.2	33.2	27.8	13.3	15.7	26.6
1994	16.5	13.0	23.9	26.7	37.3	44.4	47.0	48.1	35.4	30.4	17.5	17.3	29.8
1995	11.7	20.4	22.0	26.3	34.5	41.5	47.5	46.8	38.4	29.7	25.5	17.6	30.2
1996	8.8	15.3	17.9	27.0	35.6	42.6	48.4	44.3	35.5	27.5	23.3	17.7	28.7
1997	12.7	10.6	21.6	23.2	35.4	45.1	46.6	48.4	42.1	29.1	15.7	9.4	28.3
1998	18.3	18.0	17.7	25.4	36.0	40.4	52.5	47.5	41.7	30.9	27.9	13.1	30.8
1999	17.9	19.0	20.3	26.3	32.6	42.8	47.8	47.5	33.8	24.4	20.2	13.3	28.8
Average	11.2	13.4	18.5	25.7	34.4	42.2	47.3	45.2	36.1	27.1	18.6	12.4	27.7

Table 1 - Climate Data for CUw Calculation

MEDICINE BOW

Maximum Temperature

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1951	29.2	38.6	41.8	51.3	64.6	67.8	82.4	78.5	70.5	54.3	38.9	31.0	54.1
1952	32.9	34.1	34.7	56.5	64.6	79.4	82.9	80.5	75.7	65.5	36.9	33.0	56.4
1953	39.3	33.9	47.8	50.1	59.0	78.5	85.1	80.6	75.2	61.8	48.7	33.4	57.8
1954	39.4	47.2	40.2	60.4	66.7	77.0	87.4	82.2	73.5	59.1	50.2	33.2	59.7
1955	29.6	29.1	37.2	55.8	68.6	71.9	86.3	82.2	72.8	61.3	39.6	37.5	56.0
1956	36.7	27.7	43.3	54.6	69.0	82.5	80.4	77.9	75.6	63.2	37.4	34.5	56.9
1957	26.4	41.6	44.1	50.2	60.0	72.9	81.2	80.0	68.7	58.1	36.2	38.0	54.8
1958	33.2	42.6	35.6	50.5	70.7	77.0	78.6	80.8	71.8	62.7	46.7	36.8	57.3
1959	33.9	33.9	38.9	54.0	61.4	79.3	82.6	80.4	65.5	54.1	43.5	40.3	55.7
1960	31.0	26.3	43.9	58.3	65.9	76.0	83.7	80.6	72.6	58.5	39.0	31.9	55.6
1961	34.3	38.1	44.1	51.1	65.3	78.5	81.5	81.0	64.1	55.4	37.3	29.4	55.0
1962	24.6	34.4	35.8	59.1	65.5	73.9	80.8	80.8	72.7	61.8	48.7	38.4	56.4
1963	25.7	41.6	41.0	51.8	68.1	75.8	84.5	80.6	75.3	66.1	48.9	33.4	57.7
1964	29.1	27.4	32.7	49.0	65.5	72.4	86.2	77.9	72.7	60.5	40.7	31.5	53.8
1965	35.8	33.6	33.1	54.8	60.6	71.7	80.1	77.6	60.8	63.4	48.4	35.5	54.6
1966	30.9	31.6	47.1	53.5	69.1	74.6	85.4	79.2	71.2	56.3	46.9	33.7	56.6
1967	34.7	35.4	46.1	54.7	58.6	69.1	81.9	82.0	70.7	60.0	42.5	25.9	55.1
1968	29.7	35.7	45.3	46.3	61.2	74.8	81.6	76.9	68.8	57.8	39.5	31.6	54.1
1969	38.0	36.5	37.0	62.1	71.0	69.6	86.2	85.5	76.8	48.7	44.5	37.8	57.8
1970	33.8	43.2	38.1	47.7	67.4	74.7	84.3	85.5	70.8	52.5	41.8	34.8	56.2
1971	34.5	33.1	40.8	54.6	62.7	78.2	82.1	84.1	67.9	57.5	41.2	30.7	55.6
1972	30.1	36.3	51.6	56.1	66.0	76.5	80.8	79.9	70.3	56.0	35.3	26.9	55.5
1973	24.8	29.4	36.7	44.3	63.4	75.6	78.8	80.8	68.9	62.8	41.1	36.9	53.6
1974	27.7	33.6	44.1	50.4	66.8	79.6	84.3	80.1	72.1	62.4	44.5	32.1	56.5
1975	32.7	32.1	40.7	50.1	62.5	73.2	83.8	82.6	73.7	60.7	43.9	36.8	56.1
1976	31.8	39.0	41.0	56.5	68.1	74.8	85.6	81.0	74.6	59.4	46.4	37.9	58.0
1977	30.3	43.3	43.3	60.1	68.6	83.2	84.0	80.4	73.2	62.4	44.3	38.6	59.3
1978	30.9	34.4	48.6	56.3	63.9	76.9	85.2	80.6	73.2	62.4	38.1	24.8	56.3
1979	21.3	32.5	39.3	49.1	64.6	78.1	86.2	79.0	79.3	63.0	35.5	38.9	55.6
1980	29.9	34.3	38.7	48.0	65.3	81.7	85.7	82.0	74.5	59.4	44.5	43.0	57.3
1981	42.5	42.6	47.2	63.5	59.9	79.6	84.4	81.7	75.2	52.1	46.4	35.3	59.2
1982	30.6	35.4	46.1	49.0	58.6	68.7	78.2	81.1	66.0	51.4	39.0	32.8	53.1
1983	37.6	37.0	39.8	43.0	55.6	68.2	79.8	79.5	71.1	57.8	37.9	22.2	52.5
1984	28.4	32.9	34.7	40.8	63.5	70.0	80.2	76.2	64.9	47.8	39.3	31.3	50.8
1985	26.7	27.8	38.8	52.6	64.7	72.2	80.0	77.9	63.3	54.9	34.1	29.6	51.9
1986	37.3	32.6	48.4	50.4	59.3	77.5	79.5	82.2	67.0	55.1	39.8	33.6	55.2
1987	29.1	36.6	41.1	61.5	66.7	77.6	81.6	77.9	73.3	62.1	41.7	29.7	56.6
1988	25.0	33.2	38.9	60.2	67.5	83.5	86.7	83.8	71.8	65.5	40.9	31.7	57.4
1989	34.3	22.4	50.0	59.1	67.8	75.5	86.2	80.4	72.6	58.8	45.0	32.2	57.0
1990	36.5	33.0	44.8	57.2	64.5	80.1	81.1	81.6	76.1	59.2	44.0	27.0	57.1
1991	28.7	42.2	45.9	53.1	64.8	76.8	81.9	82.2	71.9	61.0	35.8	30.8	56.3
1992	30.3	40.2	49.7	62.5	69.8	74.8	78.9	80.1	73.5	63.8	33.9	29.0	57.2
1993	29.5	26.5	42.0	51.7	65.5	71.0	80.2	78.9	69.8	55.5	34.5	31.2	53.0
1994	34.3	33.5	49.6	56.8	71.5	81.7	83.9	84.0	74.5	57.4	40.7	36.8	58.7
1995	31.5	40.4	47.2	52.5	56.3	71.5	80.9	84.7	71.0	57.6	46.5	39.7	56.7
1996	30.5	38.6	45.5	55.9	64.9	79.8	85.2	84.0	69.8	56.1	43.6	33.9	57.3
1997	30.9	31.4	48.5	48.6	67.2	77.3	82.6	79.8	73.1	60.3	40.4	29.8	55.8
1998	36.6	37.8	42.0	53.9	67.9	68.5	84.5	82.4	78.6	57.4	46.1	32.6	57.4
1999	34.4	39.0	52.0	49.0	61.8	76.2	85.2	82.0	69.5	59.5	55.4	34.8	58.2
Average	31.8	35.2	42.5	53.4	64.7	75.6	82.9	80.8	71.6	58.8	42.0	33.3	56.1

Table 1 - Climate Data for CUw Calculation

MEDICINE BOW

Precipitation, inches

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	50% Oct-Mar	95% Apr-Sep
1951	0.80	0.25	0.43	1.28	1.81	1.63	0.61	0.30	0.91	1.93	0.56	0.20	10.71		
1952	0.42	0.63	0.76	0.88	2.34	0.48	0.74	1.52	0.39	0.17	0.60	0.48	9.41	2.25	6.03
1953	0.22	0.81	0.29	1.09	1.35	0.61	1.42	0.71	0.13	0.24	0.81	0.11	7.59	1.29	5.04
1954	0.34	0.13	1.09	0.01	0.88	0.31	0.41	0.66	1.10	0.68	0.21	0.37	6.19	1.26	3.20
1955	0.38	0.75	0.88	0.50	0.71	1.54	0.61	1.65	0.34	0.37	1.01	0.29	9.03	1.64	5.08
1956	1.03	0.53	0.33	0.95	1.73	0.36	1.93	0.35	0.05	0.14	0.85	1.01	9.26	1.78	5.10
1957	0.89	0.46	2.02	0.83	2.44	0.54	1.02	1.21	0.40	1.27	0.69	0.11	11.88	2.69	6.12
1958	0.20	0.32	0.81	0.38	1.78	1.02	3.96	1.37	0.28	0.02	0.66	0.91	11.71	1.70	8.35
1959	0.43	0.71	0.82	0.84	1.84	1.30	0.20	0.17	2.45	1.27	0.04	0.06	10.13	1.78	6.46
1960	0.28	0.43	0.42	1.53	0.87	2.12	1.45	0.58	0.41	0.18	1.64	0.29	10.20	1.25	6.61
1961	0.13	0.28	0.89	0.80	1.18	0.66	1.40	0.60	1.94	0.87	0.82	0.26	9.83	1.71	6.25
1962	0.65	0.65	0.68	0.90	2.73	1.72	1.32	0.54	0.32	1.42	0.23	0.07	11.23	1.97	7.15
1963	0.78	0.33	0.76	2.15	0.20	1.29	0.63	1.04	1.29	0.05	0.03	0.21	8.76	1.80	6.27
1964	0.24	0.28	1.43	2.44	0.80	2.11	0.36	0.50	0.70	0.00	0.13	0.51	9.50	1.12	6.56
1965	0.15	0.28	0.24	1.29	1.71	1.55	2.88	0.51	2.75	0.34	0.74	0.52	12.96	0.66	10.16
1966	0.02	0.25	0.06	0.60	0.31	0.84	2.04	0.63	1.07	0.86	0.51	0.16	7.35	0.97	5.22
1967	0.44	0.36	0.87	0.48	1.45	3.40	0.96	0.38	0.81	0.76	1.04	0.75	11.70	1.60	7.11
1968	0.16	0.33	0.26	2.01	1.61	0.65	2.12	0.51	0.60	0.88	0.37	0.19	9.49	1.65	7.13
1969	0.15	0.50	0.39	0.85	0.61	2.66	0.36	0.26	0.02	1.86	0.20	0.38	8.24	1.14	4.52
1970	0.13	0.11	0.58	1.41	0.60	2.05	0.81	0.16	1.22	0.86	0.35	0.16	8.44	1.63	5.94
1971	0.19	0.32	0.65	1.42	2.31	0.03	0.69	1.28	1.07	0.72	0.20	0.85	9.73	1.27	6.46
1972	0.71	0.22	0.16	1.35	0.96	1.65	0.12	1.97	0.96	2.47	0.77	0.88	12.22	1.43	6.66
1973	0.61	0.58	2.18	2.56	0.68	0.48	4.47	0.30	4.22	0.07	1.65	1.39	19.17	3.74	12.07
1974	0.79	0.48	1.08	1.96	0.27	1.88	0.25	0.26	1.21	1.25	0.00	0.17	9.60	2.73	5.54
1975	1.40	1.70	1.87	0.67	1.80	0.44	2.01	0.60	0.94	0.75	0.50	3.22	15.90	3.20	6.14
1976	1.10	0.85	0.50	1.61	0.94	1.10	0.56	1.13	0.14	0.17	0.18	0.49	8.77	3.46	5.21
1977	0.77	0.08	0.43	1.79	1.49	0.62	1.40	0.93	0.00	1.18	0.81	0.10	9.60	1.06	5.92
1978	0.69	0.56	0.67	0.94	3.48	0.48	0.70	1.25	0.70	1.16	0.75	1.74	13.12	2.01	7.17
1979	0.70	0.40	1.15	0.62	0.90	0.27	0.00	3.27	0.10	1.90	0.56	0.40	10.27	2.95	4.90
1980	1.19	1.80	0.79	0.71	0.76	0.00	0.09	0.93	0.62	2.01	0.25	0.11	9.26	3.32	2.95
1981	0.07	0.05	0.50	1.40	3.90	0.02	1.25	0.00	1.00	1.41	0.44	1.06	11.10	1.50	7.19
1982	0.68	0.46	0.93	0.95	2.08	1.59	1.56	0.70	2.03	0.85	0.77	0.72	13.32	2.49	8.46
1983	0.39	0.28	1.47	1.81	1.44	1.39	1.47	1.10	0.47	0.78	2.75	0.99	14.34	2.24	7.30
1984	0.28	0.51	0.85	1.46	0.54	0.61	2.66	0.82	0.94	0.56	0.45	0.60	10.28	3.08	6.68
1985	0.65	0.25	0.69	0.74	1.62	1.13	0.98	0.35	1.04	0.78	1.74	0.43	10.40	1.60	5.57
1986	0.16	0.74	0.31	1.39	1.06	2.75	0.59	1.94	0.64	1.36	0.91	0.01	11.86	2.08	7.95
1987	0.08	0.44	0.18	0.24	2.18	1.10	0.60	1.22	0.34	0.36	0.37	0.92	8.03	1.49	5.40
1988	0.41	0.30	0.38	0.45	1.18	1.12	0.20	0.49	0.32	0.00	0.42	0.19	5.46	1.37	3.57
1989	0.00	1.53	0.41	0.40	1.09	3.46	0.87	0.88	2.21	0.01	0.25	0.18	11.29	1.28	8.46
1990	0.34	0.43	1.73	0.76	0.49	0.00	1.28	0.86	2.16	0.54	0.93	0.41	9.93	1.47	5.27
1991	0.19	0.05	0.10	0.42	3.29	2.03	1.41	0.65	0.24	0.42	1.18	0.10	10.08	1.11	7.64
1992	0.24	0.30	0.85	1.13	3.65	0.77	4.06	0.51	0.62	0.54	0.82	0.59	14.08	1.55	10.20
1993	0.54	0.73	0.34	1.40	1.49	2.07	0.39	1.26	1.71	2.26	0.99	0.22	13.40	1.78	7.90
1994	0.25	0.50	0.27	0.74	0.84	1.96	1.91	0.39	0.21	1.17	0.58	0.41	9.23	2.25	5.75
1995	0.30	0.68	0.28	2.05	4.98	2.26	1.36	0.35	1.85	1.07	0.43	0.18	15.89	1.71	12.30
1996	0.87	0.22	0.30	1.32	1.77	0.76	0.69	0.32	0.78	1.18	0.76	0.31	9.28	1.54	5.36
1997	0.72	0.54	0.39	1.14	1.14	2.19	0.30	2.04	2.06	0.24	0.35	0.37	11.48	1.95	8.43
1998	0.18	0.36	0.84	0.59	1.27	2.60	2.59	1.07	0.70	2.57	0.31	0.78	13.86	1.17	8.38
1999	0.74	0.13	0.24	2.41	1.25	1.01	0.75	0.33	0.38	0.33	0.51	0.17	8.25	2.39	5.82
Average	0.47	0.49	0.71	1.14	1.55	1.28	1.23	0.83	0.96	0.86	0.65	0.51	10.67	1.85	6.65

Table 1 - Climate Data for CUw Calculation

ENCAMPMENT

Minimum Air Temperature, F

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1951	7.8	8.8	14.3	25.5	36.2	36.3	46.9	46.1	34.8	29.6	16.2	9.7	26.0
1952	11.6	9.5	12.4	27.7	35.5	43.7	46.2	47.5	38.5	29.1	11.3	12.8	27.2
1953	20.8	12.2	22.2	23.1	31.9	42.0	49.6	46.6	37.8	30.5	25.5	11.9	29.5
1954	17.6	19.0	14.9	28.9	35.8	40.1	51.1	45.6	40.9	30.5	23.6	13.5	30.1
1955	11.1	7.4	13.5	25.9	34.8	40.2	48.0	50.2	38.8	29.3	17.4	19.3	28.0
1956	16.0	4.8	16.3	25.9	38.0	43.1	45.5	43.8	36.6	29.0	14.2	12.5	27.1
1957	7.6	19.8	18.3	26.1	35.6	42.3	48.8	47.8	36.1	32.2	16.4	16.4	29.0
1958	11.2	23.3	13.7	24.3	38.7	40.7	44.2	48.0	38.4	28.0	21.4	18.6	29.2
1959	11.7	13.5	17.7	26.2	33.9	45.4	45.9	47.3	37.8	27.8	16.4	12.3	28.0
1960	10.2	4.3	17.9	26.1	32.0	38.4	43.5	44.7	41.0	29.6	20.3	10.4	26.5
1961	8.9	15.0	19.4	23.7	35.4	42.9	46.9	48.4	34.0	28.1	15.3	7.5	27.1
1962	2.8	14.8	11.8	27.8	35.1	40.3	45.3	43.8	36.4	28.3	21.9	12.9	26.8
1963	3.2	18.6	17.1	25.9	34.4	40.6	48.1	50.1	43.2	34.4	22.3	12.2	29.2
1964	8.3	5.5	10.2	25.3	34.4	40.5	50.0	46.0	36.3	27.0	19.8	13.8	26.4
1965	14.8	10.7	6.0	29.4	33.7	42.9	48.3	44.4	33.5	30.0	25.8	15.0	27.9
1966	9.4	7.1	18.6	23.0	35.5	41.4	49.9	43.6	39.9	26.5	22.3	12.6	27.5
1967	14.7	12.2	22.5	26.5	33.0	41.0	48.1	45.9	39.4	31.9	20.2	8.1	28.6
1968	13.2	16.4	18.9	22.3	33.7	42.7	48.6	45.5	37.4	31.4	16.8	10.3	28.1
1969	18.4	13.0	7.7	30.0	37.9	40.1	46.7	47.1	40.4	22.6	17.7	14.2	28.0
1970	14.8	17.7	16.0	21.2	35.2	41.8	48.9	49.7	37.7	23.1	23.4	13.0	28.5
1971	17.0	11.9	18.7	24.6	33.2	41.0	45.5	47.9	33.8	26.2	18.8	9.1	27.3
1972	10.9	15.7	24.1	27.4	33.5	44.1	44.2	41.0	37.5	29.9	13.9	8.8	27.6
1973	5.7	10.1	15.6	21.5	32.7	40.1	46.5	47.1	36.8	29.8	19.9	13.5	26.6
1974	9.0	9.8	22.7	25.5	33.1	42.5	48.3	39.5	33.4	31.3	19.9	8.0	26.9
1975	8.0	10.1	17.2	22.3	31.8	38.6	48.2	42.4	32.5	27.4	15.9	14.1	25.7
1976	9.4	15.4	13.7	24.1	32.6	38.9	49.2	43.0	36.5	20.4	13.5	8.7	25.5
1977	8.2	11.8	11.8	27.1	31.8	41.1	45.7	43.0	33.2	25.4	14.8	14.0	25.7
1978	12.6	12.3	18.5	22.2	30.0	34.1	44.1	42.2	35.7	25.1	17.9	6.0	25.1
1979	1.3	13.7	19.9	24.1	32.6	38.0	45.4	45.0	36.5	28.0	12.2	15.9	26.1
1980	11.9	16.9	16.8	22.9	34.2	37.9	46.6	43.7	36.2	27.2	19.9	21.3	28.0
1981	15.5	14.3	21.1	29.6	34.0	41.6	47.1	45.2	40.8	29.4	22.0	16.5	29.8
1982	9.3	10.3	20.9	21.2	32.5	38.5	45.3	49.3	38.9	25.5	16.0	12.0	26.6
1983	15.5	16.3	19.6	19.5	30.2	38.9	45.1	49.1	38.0	29.4	17.1	4.5	26.9
1984	6.5	9.2	14.3	18.3	32.0	38.3	46.9	47.3	36.6	24.0	19.2	12.0	25.4
1985	5.2	4.5	17.7	24.9	33.1	38.9	47.5	39.5	31.6	26.4	16.8	8.5	24.6
1986	16.8	15.6	23.3	25.8	30.4	39.1	42.7	43.8	34.7	26.4	19.5	11.5	27.5
1987	8.5	14.3	16.2	26.5	35.7	41.1	46.7	41.1	31.2	25.5	16.2	8.6	26.0
1988	4.3	10.1	12.4	24.9	31.5	42.5	45.4	46.7	36.5	30.7	16.2	8.3	25.8
1989	6.7	5.0	21.0	28.6	33.1	39.2	47.8	43.5	35.7	26.3	16.1	5.4	25.7
1990	10.8	7.0	17.9	24.9	26.2	42.2	48.1	46.2	42.5	28.0	21.0	1.5	26.4
1991	6.0	15.5	17.2	21.5	31.5	40.8	46.2	47.2	37.7	26.0	14.2	10.8	26.2
1992	7.7	14.2	20.8	28.0	34.6	39.6	42.7	43.3	37.8	32.0	13.7	9.7	27.0
1993	11.3	9.8	18.4	23.6	34.4	39.6	43.0	44.6	36.0	26.8	11.9	9.7	25.8
1994	14.3	9.9	19.7	26.3	33.9	39.0	40.7	43.1	37.3	27.2	15.3	15.4	26.8
1995	11.6	17.8	20.4	22.7	30.6	37.8	41.5	43.8	35.4	25.0	24.7	16.6	27.3
1996	11.1	13.9	18.6	25.4	32.8	39.3	43.5	41.1	32.4	22.4	18.1	14.0	26.1
1997	10.9	11.5	19.9	18.9	31.1	38.8	40.4	41.9	35.1	21.1	9.3	2.6	23.5
1998	8.0	8.6	8.5	17.2	26.3	27.8	40.8	36.4	30.5	17.0	26.9	12.6	21.7
1999	17.7	15.6	19.4	29.2	37.1	43.8	49.6	47.2	34.4	28.1	21.3	14.7	29.8
Average	10.7	12.3	17.1	24.8	33.4	40.2	46.2	45.0	36.6	27.5	18.2	11.7	27.0

Table 1 - Climate Data for CUw Calculation

ENCAMPMENT

Maximum Air Temperature, F

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1951	31.0	38.2	40.4	50.9	64.8	67.1	82.5	77.4	72.4	57.7	42.7	28.8	54.5
1952	32.4	33.7	35.4	54.3	64.5	77.7	81.0	79.3	75.6	67.6	41.2	33.5	56.4
1953	40.8	34.0	46.9	50.0	58.7	76.7	83.7	79.2	75.9	63.8	49.1	35.6	57.9
1954	39.0	43.2	39.9	58.7	67.7	74.6	85.4	81.4	74.1	61.5	52.6	35.8	59.5
1955	32.0	30.3	38.5	53.2	65.2	70.9	85.4	80.5	74.7	62.9	40.1	39.1	56.1
1956	38.8	29.0	41.2	53.2	67.3	77.8	79.8	77.4	77.8	66.3	41.0	35.2	57.1
1957	29.9	39.8	41.2	50.2	60.5	70.8	80.4	80.7	72.6	60.9	41.3	42.1	55.9
1958	36.5	41.8	39.1	50.9	70.1	76.9	79.0	82.2	73.0	64.6	50.1	41.2	58.8
1959	35.4	35.6	38.9	54.5	64.6	78.7	81.8	79.2	68.3	56.4	47.9	42.7	57.0
1960	33.4	29.3	43.8	56.6	63.6	75.5	82.9	80.3	75.0	64.2	45.0	35.6	57.1
1961	36.2	37.2	42.5	49.9	64.9	76.5	79.8	78.9	62.9	59.9	41.6	31.9	55.2
1962	27.7	35.4	36.1	57.7	65.1	71.7	78.9	78.8	71.7	65.2	50.6	43.3	56.9
1963	26.0	40.1	42.9	53.3	67.6	73.9	82.1	76.4	75.3	67.7	51.1	38.4	57.9
1964	31.4	27.9	33.7	49.9	64.4	69.5	84.2	77.5	70.7	64.9	44.7	33.6	54.4
1965	34.5	33.6	32.1	52.9	60.3	69.7	78.3	77.7	60.2	65.4	49.3	40.2	54.5
1966	31.8	31.5	45.3	53.6	67.7	72.0	83.8	77.8	72.8	58.4	49.1	33.5	56.4
1967	33.8	34.1	45.5	53.5	59.4	67.6	80.0	80.5	70.3	60.3	47.0	29.4	55.1
1968	34.0	35.8	42.2	46.6	59.6	74.4	80.4	75.5	68.6	60.5	40.5	32.1	54.2
1969	37.0	34.8	33.7	55.9	69.0	66.0	81.8	83.7	73.4	46.1	43.6	37.7	55.2
1970	32.0	39.7	36.9	44.3	65.3	71.7	81.0	81.4	68.1	52.7	43.2	34.4	54.2
1971	32.3	31.6	39.5	52.5	59.7	73.9	79.3	80.9	66.3	58.0	44.0	31.1	54.1
1972	33.2	38.0	49.3	53.8	63.5	73.1	79.1	76.0	68.6	56.5	37.1	31.6	55.0
1973	28.9	35.3	38.4	44.2	60.8	70.5	75.6	79.0	67.9	62.2	43.2	37.4	53.6
1974	31.1	38.0	46.2	51.6	66.5	74.5	78.5	76.7	68.3	59.8	43.9	32.1	55.6
1975	31.1	34.0	40.3	47.8	59.6	68.4	77.7	75.3	68.4	61.5	46.5	37.4	54.0
1976	34.2	40.9	40.0	54.2	63.9	70.5	80.2	75.5	68.8	58.1	46.5	38.4	55.9
1977	33.4	40.9	40.1	56.2	64.5	78.8	80.3	75.5	73.3	62.5	44.9	37.0	57.3
1978	33.3	37.1	47.5	56.3	59.9	73.7	80.1	78.2	72.9	62.2	45.9	29.2	56.4
1979	24.0	34.7	40.6	52.7	60.0	72.0	78.3	73.9	72.8	58.7	34.3	40.7	53.6
1980	31.6	38.4	39.1	50.0	61.4	75.1	79.0	76.3	70.6	56.4	44.6	45.6	55.7
1981	44.0	40.7	45.4	59.9	57.9	73.8	78.1	77.5	72.1	54.1	48.5	36.7	57.4
1982	33.0	35.6	44.3	50.1	59.5	68.6	75.5	77.2	65.5	52.2	38.2	33.3	52.8
1983	37.3	38.5	40.3	44.2	56.1	67.2	76.0	78.1	70.7	59.0	41.0	26.7	52.9
1984	28.5	31.8	38.4	43.0	64.5	69.0	76.4	75.5	66.1	48.5	43.2	33.6	51.5
1985	26.7	30.2	41.9	55.8	64.5	71.6	76.2	77.2	62.8	55.8	37.9	30.7	52.6
1986	36.5	36.3	50.6	53.6	62.2	74.4	73.9	76.1	63.6	54.8	41.8	35.2	54.9
1987	32.6	37.4	41.6	58.6	62.9	72.6	77.3	73.5	69.1	61.2	41.8	31.3	55.0
1988	29.3	35.3	39.4	57.2	63.8	76.4	78.8	78.8	67.1	62.0	38.6	33.4	55.0
1989	31.5	29.3	45.5	55.4	64.9	71.0	81.7	75.1	69.0	57.9	43.4	31.8	54.7
1990	34.1	32.8	41.8	53.9	61.5	76.0	77.1	77.8	73.0	56.0	44.3	27.6	54.7
1991	30.1	40.6	41.1	49.6	63.2	72.6	78.5	78.6	69.4	59.3	37.3	35.5	54.7
1992	34.7	38.6	44.7	57.5	64.6	70.3	74.0	76.5	69.7	61.3	34.3	31.5	54.8
1993	34.2	31.8	41.7	46.4	62.0	68.9	76.1	75.4	67.5	52.6	36.0	33.1	52.1
1994	33.4	33.9	44.3	54.1	69.1	77.6	81.2	80.6	72.9	56.6	41.6	38.4	57.0
1995	35.5	43.4	47.5	51.6	55.2	69.5	78.3	83.0	70.1	58.1	48.2	40.0	56.7
1996	34.0	39.7	44.0	54.6	64.8	75.0	81.6	80.7	68.7	57.7	45.7	35.7	56.9
1997	35.3	35.6	50.8	49.5	63.9	74.5	81.4	77.5	71.6	59.3	44.4	37.1	56.7
1998	38.5	37.9	44.2	54.3	67.0	67.3	82.4	78.4	76.4	60.1	45.9	33.4	57.2
1999	34.7	38.9	48.8	52.4	60.6	71.9	79.6	76.6	66.2	62.8	49.5	34.9	56.4
Average	33.3	36.0	41.9	52.5	63.2	72.6	79.7	78.1	70.3	59.4	43.8	35.2	55.5

Table 1 - Climate Data for CUw Calculation

ENCAMPMENT

Precipitation, inches

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	50% Oct-Mar	95% Apr-Sep
1951	1.64	0.37	1.12	2.43	0.56	1.23	1.13	1.79	0.25	3.08	0.94	1.73	16.27		
1952	1.00	0.67	1.51	0.82	0.95	1.54	0.90	1.08	0.09	0.00	0.96	0.55	10.07	4.47	5.11
1953	0.68	0.94	0.64	2.43	2.84	1.99	1.43	2.10	0.41	0.60	1.14	0.51	15.71	1.89	10.64
1954	1.01	0.58	3.96	0.13	1.28	0.31	1.38	1.51	1.75	1.86	0.62	0.55	14.94	3.90	6.04
1955	0.61	0.66	1.02	0.58	1.36	1.10	0.29	3.17	0.36	1.70	1.58	1.07	13.50	2.66	6.52
1956	1.90	0.55	0.55	1.90	2.05	0.57	2.03	0.59	0.00	0.69	1.09	1.82	13.74	3.68	6.78
1957	1.15	1.29	1.10	1.95	4.45	1.55	2.30	1.69	0.50	2.23	1.00	0.33	19.54	3.57	11.82
1958	0.24	0.62	1.77	1.75	1.99	0.61	0.83	1.89	0.78	0.07	0.67	1.23	12.45	3.10	7.46
1959	0.53	0.67	1.20	0.88	2.14	1.37	0.44	1.57	1.41	1.02	0.23	0.72	12.18	2.19	7.42
1960	0.00	0.87	1.12	0.31	1.89	1.57	0.58	0.77	0.81	0.99	1.32	0.49	10.72	1.98	5.63
1961	0.34	0.35	1.29	2.49	1.92	1.61	2.68	2.32	4.98	0.55	1.15	0.63	20.31	2.39	15.20
1962	1.75	1.60	0.40	2.13	1.00	1.88	0.57	0.75	0.51	0.58	0.36	0.62	12.15	3.04	6.50
1963	0.74	0.26	0.51	1.97	0.22	1.25	1.53	3.51	0.66	0.45	0.84	0.74	12.68	1.54	8.68
1964	1.05	1.12	0.94	1.62	1.12	1.74	0.63	1.96	0.69	0.53	2.22	1.15	14.77	2.57	7.37
1965	0.68	0.60	0.96	2.05	3.53	1.83	1.32	3.14	2.66	0.00	1.18	0.86	18.81	3.07	13.80
1966	0.50	0.72	1.01	1.12	0.50	1.51	1.08	2.58	1.08	1.96	0.36	0.92	13.34	2.14	7.48
1967	0.56	0.73	1.73	1.39	1.94	2.12	3.72	1.51	2.75	1.48	0.49	1.67	20.09	3.13	12.76
1968	0.42	0.95	0.29	3.28	1.98	0.47	1.18	1.88	1.37	1.24	1.63	0.67	15.36	2.65	9.65
1969	1.09	1.08	0.90	1.49	0.83	3.47	0.96	1.21	1.20	3.41	0.99	0.68	17.31	3.31	8.70
1970	0.31	0.29	0.89	2.10	1.51	2.37	0.74	3.65	1.92	3.04	1.58	0.83	19.23	3.29	11.68
1971	0.48	0.88	0.87	1.64	1.67	0.44	1.37	0.64	0.89	0.83	0.69	1.24	11.64	3.84	6.32
1972	1.14	0.65	0.70	1.63	0.79	1.85	0.58	1.13	2.03	3.18	1.27	2.30	17.25	2.63	7.61
1973	0.50	0.50	1.24	3.04	1.95	1.04	1.66	0.62	1.25	0.23	2.45	1.58	16.06	4.50	9.08
1974	1.02	0.72	2.35	2.25	0.59	1.69	1.27	0.20	1.05	1.18	0.41	1.03	13.76	4.18	6.70
1975	1.67	0.66	2.69	2.17	1.68	0.68	2.15	0.87	0.55	2.39	0.52	1.55	17.58	3.82	7.70
1976	0.37	1.32	1.50	1.69	1.41	1.85	1.49	1.28	0.30	0.40	0.28	0.59	12.48	3.83	7.62
1977	0.47	0.59	1.66	2.11	4.20	0.06	2.41	1.62	0.86	0.77	1.22	0.32	16.29	2.00	10.70
1978	0.72	0.83	1.01	0.68	3.03	0.68	0.25	0.20	1.07	0.87	0.92	2.14	12.40	2.44	5.61
1979	0.48	0.40	1.38	1.11	1.38	0.20	0.32	2.40	0.39	1.72	0.66	0.34	10.78	3.10	5.51
1980	2.38	0.79	1.28	0.26	2.02	0.03	0.39	0.82	1.30	1.26	0.53	0.19	11.25	3.59	4.58
1981	0.06	0.52	0.94	1.00	4.36	0.80	1.93	1.31	0.81	1.53	0.63	0.87	14.76	1.75	9.70
1982	1.33	0.38	0.87	0.64	1.41	1.34	1.68	0.46	1.45	1.85	1.04	0.60	13.05	2.81	6.63
1983	0.08	0.44	2.21	2.12	1.56	2.79	1.45	1.34	0.52	1.74	2.59	1.18	18.02	3.11	9.29
1984	0.28	0.84	1.58	2.51	0.69	1.26	1.72	1.49	1.81	0.80	0.72	0.60	14.30	4.11	9.01
1985	1.02	0.36	1.07	1.36	0.65	0.60	1.88	0.24	1.27	2.04	2.08	0.44	13.01	2.29	5.70
1986	0.10	1.85	0.95	1.39	1.23	2.48	1.38	0.73	1.15	1.83	0.75	0.26	14.10	3.73	7.94
1987	0.67	0.63	0.88	1.02	1.24	0.79	1.45	1.07	0.11	1.23	0.83	0.91	10.83	2.51	5.40
1988	0.62	0.56	1.41	0.36	1.30	1.29	0.46	0.45	1.35	0.15	1.29	0.55	9.79	2.78	4.95
1989	0.25	2.63	1.05	0.33	0.49	0.77	0.91	1.87	1.50	0.33	0.70	0.88	11.71	2.96	5.58
1990	0.22	1.38	1.26	0.99	0.51	0.99	1.98	0.70	1.12	1.68	0.84	0.48	12.15	2.39	5.98
1991	0.60	0.41	0.89	1.01	2.15	1.46	0.53	1.51	0.48	0.42	1.72	0.18	11.36	2.45	6.78
1992	2.20	0.81	0.86	1.30	2.39	1.43	2.88	1.28	1.05	0.95	1.55	1.34	18.04	3.10	9.81
1993	0.70	1.53	1.48	2.77	1.84	2.26	0.34	1.30	1.55	2.10	2.08	1.28	19.23	3.78	9.56
1994	0.41	1.74	1.01	1.35	0.66	0.66	0.40	1.35	0.22	1.18	1.07	0.34	10.39	4.31	4.41
1995	1.01	0.69	0.95	1.59	5.12	1.73	1.53	0.54	2.06	1.70	1.21	0.10	18.23	2.62	11.94
1996	0.51	0.43	0.90	1.55	2.21	0.47	1.01	0.93	0.60	1.76	1.75	1.17	13.29	2.43	6.43
1997	1.70	0.57	0.41	2.62	1.34	0.77	0.96	2.39	2.80	1.24	0.25	0.34	15.39	3.68	10.34
1998	0.29	1.04	0.96	1.29	1.02	2.27	2.76	0.84	0.78	2.38	0.55	0.76	14.94	2.06	8.51
1999	0.86	0.59	0.55	2.15	1.69	1.45	1.10	1.03	1.20	0.37	0.45	0	11.44	2.85	8.19
Average	0.78	0.81	1.18	1.57	1.73	1.31	1.31	1.41	1.14	1.30	1.05	0.84	14.42	3.00	8.06

Table 1 - Climate Data for CUw Calculation

MUDDY GAP

Minimum Air Temperature, F

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1951	4.7	15.9	15.7	26.1	37.7	39.9	54.0	49.5	37.9	33.4	18.9	10.8	28.7
1952	12.3	12.7	12.2	31.5	38.5	49.1	51.9	54.9	41.9	32.3	15.0	15.9	30.7
1953	21.1	12.5	22.3	25.6	35.1	50.9	56.5	56.4	47.9	34.4	26.9	13.6	33.6
1954	19.9	23.3	17.5	33.3	37.5	46.8	58.7	52.3	45.7	33.3	28.3	17.5	34.5
1955	12.4	11.9	15.3	29.1	38.3	44.1	50.8	56.1	44.7	33.0	19.6	18.7	31.2
1956	18.5	9.7	21.8	26.4	41.1	50.7	51.1	49.9	42.1	36.6	18.6	14.9	31.8
1957	5.9	23.5	21.6	26.5	39.6	45.9	54.2	54.0	38.5	34.5	17.9	19.2	31.8
1958	14.0	24.5	14.6	27.4	41.7	45.4	48.9	52.6	43.4	33.4	19.9	19.9	32.1
1959	12.9	14.6	20.0	29.7	35.4	48.6	51.5	52.5	41.2	31.4	16.5	17.6	31.0
1960	14.5	5.3	18.9	32.7	37.4	48.5	52.6	49.0	42.6	33.5	23.1	12.9	30.9
1961	14.2	19.1	24.2	28.0	38.9	49.7	51.8	53.2	38.3	30.6	19.2	12.7	31.7
1962	6.2	19.0	17.4	31.9	38.8	45.3	50.4	51.5	39.0	35.4	27.0	18.5	31.7
1963	2.4	20.6	20.8	28.6	40.6	46.3	53.1	53.8	46.2	37.2	26.7	15.8	32.7
1964	12.8	9.0	13.8	28.5	38.3	44.4	56.4	50.4	40.0	33.3	18.7	13.9	30.0
1965	19.3	16.4	10.4	32.6	36.1	46.5	52.9	49.8	35.0	34.3	28.8	19.2	31.8
1966	13.0	11.1	22.4	25.6	38.8	46.4	56.6	49.3	44.8	32.6	25.7	15.5	31.8
1967	14.5	17.8	27.4	29.3	35.6	45.3	52.8	52.0	46.2	34.2	22.8	7.0	32.1
1968	15.5	18.1	25.3	25.6	35.5	47.2	53.5	50.2	38.8	33.6	21.3	11.4	31.3
1969	19.8	18.2	14.1	34.2	39.8	42.2	53.5	55.7	46.8	27.7	25.1	19.8	33.1
1970	17.5	21.6	17.1	24.8	38.9	44.7	54.2	53.0	37.7	25.9	25.1	15.6	31.3
1971	18.9	16.3	22.3	28.5	35.3	46.8	49.9	54.0	40.5	28.7	20.7	13.1	31.3
1972	10.4	17.6	28.0	29.3	37.1	47.8	48.2	47.7	36.1	32.0	20.5	7.9	30.2
1973	7.1	10.1	19.2	23.0	35.0	45.7	52.8	53.3	40.8	32.0	23.3	16.8	29.9
1974	8.1	15.0	25.2	30.1	35.4	48.7	55.0	46.7	38.4	32.0	24.9	11.9	31.0
1975	13.2	13.0	20.3	24.7	32.0	43.1	57.0	49.9	37.8	32.6	19.6	17.9	30.1
1976	13.4	15.7	21.7	30.9	38.3	46.4	56.4	52.6	45.1	31.9	22.1	17.0	32.6
1977	9.6	18.5	17.5	32.6	39.2	52.2	55.5	49.6	43.8	33.6	21.7	15.8	32.5
1978	11.9	13.4	23.8	30.6	35.5	47.3	52.4	49.3	42.4	31.6	16.9	3.5	29.9
1979	1.0	15.4	24.3	28.8	36.1	43.2	51.4	49.9	45.3	32.7	13.1	14.7	29.7
1980	5.1	13.2	18.5	29.7	36.5	45.9	52.9	53.5	42.9	31.2	21.2	25.4	31.3
1981	18.0	16.7	24.0	31.8	38.5	47.1	53.1	50.7	47.6	31.9	23.4	17.7	33.4
1982	11.6	14.2	23.6	25.3	36.7	43.9	53.1	55.2	43.0	32.7	20.3	15.7	31.3
1983	21.4	18.6	23.8	24.0	33.8	46.0	52.7	56.8	43.2	34.8	22.8	3.3	31.8
1984	13.1	15.1	22.9	27.5	37.8	44.1	52.9	55.3	37.9	26.7	21.7	9.8	30.4
1985	8.5	11.0	21.4	29.2	39.2	44.9	54.0	49.1	39.5	32.0	15.1	13.0	29.7
1986	21.8	15.6	28.4	30.2	37.2	51.6	51.7	50.3	40.4	32.6	20.4	14.0	32.9
1987	10.7	16.1	21.4	32.4	41.5	47.8	53.0	49.0	40.8	32.5	24.7	12.7	31.9
1988	8.8	16.2	20.0	31.3	39.5	53.7	54.9	50.7	39.4	35.9	21.4	13.3	32.1
1989	13.9	5.6	25.8	30.1	38.5	45.3	55.6	50.8	42.7	34.6	25.0	13.5	31.8
1990	18.5	14.9	23.3	31.1	34.3	47.1	53.1	51.3	46.4	44.0	27.5	5.6	33.1
1991	11.8	21.7	23.9	29.4	39.2	47.1	53.1	52.7	41.8	31.3	19.1	15.9	32.3
1992	14.0	21.4	26.9	33.0	41.6	47.0	49.1	49.6	44.9	33.7	19.8	12.4	32.8
1993	11.1	11.3	24.0	29.8	40.5	43.3	46.6	48.5	41.0	33.0	17.3	17.0	30.3
1994	17.9	15.2	25.8	30.2	40.5	46.8	50.3	52.6	43.8	34.1	19.2	21.2	33.1
1995	15.3	22.3	22.9	29.0	33.8	43.6	49.9	54.4	43.4	32.9	25.4	19.4	32.7
1996	12.0	16.4	19.2	27.6	37.8	47.7	52.3	51.7	42.2	34.2	28.0	19.7	32.4
1997	0.4	15.4	24.4	25.6	38.6	49.2	52.3	52.6	48.7	33.4	19.4	12.4	31.0
1998	21.4	20.3	18.5	29.4	36.7	42.6	55.8	52.9	48.3	34.6	27.4	16.0	33.7
1999	19.3	21.9	22.6	27.7	38.6	47.9	56.4	55.4	39.7	34.4	32.9	18.1	34.6
Average	13.1	16.0	21.2	29.0	37.7	46.6	53.0	51.9	42.2	33.0	22.0	14.8	31.7

Table 1 - Climate Data for CUw Calculation

MUDDY GAP

Maximum Air Temperature, F

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1951	27.6	35.8	37.5	51.4	62.5	65.6	83.8	79.5	67.1	55.2	38.5	30.1	52.9
1952	28.9	31.8	32.5	54.7	66.5	76.4	82.7	83.0	76.3	67.4	38.6	33.5	56.0
1953	39.6	34.0	45.5	50.2	58.5	78.0	87.7	81.5	75.5	62.2	49.6	33.2	58.0
1954	36.5	45.5	39.2	60.2	67.9	75.7	86.9	82.9	75.4	59.6	50.7	32.6	59.4
1955	27.9	27.9	36.0	51.6	66.7	74.0	84.5	84.5	72.9	61.7	40.7	35.5	55.3
1956	35.7	29.6	45.5	56.1	68.5	82.5	83.5	78.8	78.5	61.9	38.4	34.1	57.8
1957	24.9	41.3	45.4	50.0	60.6	73.3	83.9	81.8	71.8	59.0	34.7	34.6	55.1
1958	31.2	42.5	37.5	51.9	71.1	77.1	81.9	84.1	75.4	64.2	46.3	37.9	58.4
1959	34.0	32.6	40.1	55.3	63.0	80.6	85.1	83.0	69.3	57.4	45.0	40.3	57.1
1960	28.4	24.9	45.0	59.7	67.6	79.1	86.7	83.2	76.7	60.5	41.1	34.2	57.3
1961	34.7	38.3	45.6	54.3	66.8	79.3	84.3	83.1	63.8	57.9	37.2	28.3	56.1
1962	24.2	34.6	37.1	61.7	66.0	75.3	81.9	82.7	75.8	64.7	51.0	40.1	57.9
1963	27.0	46.0	42.9	54.5	68.0	77.0	85.5	80.6	76.5	67.8	49.1	34.3	59.1
1964	28.6	27.6	33.7	51.3	65.2	70.6	87.2	80.2	72.9	64.7	40.9	30.6	54.5
1965	35.1	34.5	35.4	54.4	60.8	72.0	81.5	78.6	60.8	67.1	49.3	32.9	55.2
1966	29.1	29.5	45.9	54.4	70.4	74.9	87.1	80.9	74.7	57.4	45.8	29.9	56.7
1967	31.2	36.9	48.5	55.6	61.0	70.8	82.6	82.7	73.3	62.9	43.8	26.4	56.3
1968	30.6	36.4	45.8	51.1	62.0	76.0	82.7	77.8	71.9	62.1	41.9	29.3	55.6
1969	37.4	35.9	36.7	59.4	71.9	70.8	85.8	86.3	76.8	48.3	44.4	36.6	57.5
1970	34.1	44.3	40.9	45.1	68.3	75.3	83.9	85.3	70.1	55.0	43.1	31.6	56.4
1971	32.9	35.5	43.1	52.5	63.2	77.6	81.9	84.2	65.6	54.7	35.8	26.7	54.5
1972	27.8	34.7	50.9	55.1	66.1	76.9	82.2	80.3	70.8	57.9	35.8	25.8	55.4
1973	23.8	27.8	36.7	42.2	61.7	76.1	79.3	83.9	64.7	60.1	40.5	34.7	52.6
1974	26.2	31.3	45.4	54.7	67.0	75.9	85.0	77.7	71.6	61.2	44.0	30.4	55.9
1975	28.4	31.1	38.8	47.5	60.6	72.8	86.2	81.7	70.4	58.6	41.2	34.6	54.3
1976	30.6	34.3	42.3	55.8	68.3	71.8	86.3	81.6	74.0	58.3	44.3	36.1	57.0
1977	29.8	40.7	40.4	57.6	65.8	83.0	85.0	80.0	75.3	62.6	44.2	37.3	58.5
1978	31.3	33.1	46.6	56.7	58.9	76.1	83.9	79.2	72.0	64.8	40.7	22.6	55.5
1979	18.0	31.8	40.8	56.1	63.7	75.2	85.1	78.2	77.5	61.0	35.2	35.8	54.9
1980	27.5	33.4	39.3	53.8	60.5	78.1	86.5	81.7	74.4	58.8	43.8	45.3	56.9
1981	42.6	41.7	47.6	61.8	62.3	79.9	86.0	83.6	76.8	55.8	48.8	38.7	60.5
1982	32.7	35.2	46.7	53.5	63.8	73.9	84.9	87.8	68.8	55.4	39.0	30.0	56.0
1983	36.9	34.9	43.3	46.6	60.2	73.5	85.1	88.2	76.8	63.3	41.8	25.2	56.3
1984	26.3	31.6	39.0	49.1	69.2	77.0	86.7	85.7	71.2	53.7	44.3	30.4	55.4
1985	24.6	28.4	43.8	60.4	71.1	80.1	86.5	85.3	68.4	60.9	35.1	28.3	56.1
1986	36.8	36.9	54.1	56.9	66.0	84.3	81.7	85.0	68.6	57.2	43.3	34.6	58.8
1987	30.4	35.7	41.7	63.9	69.3	80.6	83.9	82.1	75.8	63.5	42.0	31.6	58.4
1988	28.1	38.1	41.4	61.6	70.3	86.6	89.8	85.9	72.8	65.9	44.3	31.4	59.7
1989	32.0	22.5	50.4	61.4	69.4	76.2	88.3	81.0	73.3	58.9	46.5	34.0	57.8
1990	35.7	37.8	48.2	59.6	64.4	80.5	83.8	84.1	77.6	73.6	44.2	26.1	59.6
1991	29.4	44.7	48.6	52.7	64.1	77.3	84.8	85.1	72.9	60.7	37.4	30.8	57.4
1992	29.8	39.1	50.8	64.3	70.8	76.4	80.8	83.2	74.9	64.9	36.3	27.5	58.2
1993	28.5	28.7	43.4	53.5	67.6	71.9	78.9	80.5	72.1	57.7	36.0	31.9	54.2
1994	35.7	33.3	50.8	58.6	73.5	82.7	87.2	87.7	75.8	57.2	38.5	37.3	59.9
1995	32.2	40.8	48.0	52.9	58.8	73.3	83.6	86.6	71.3	56.8	48.1	38.8	57.6
1996	32.1	40.3	46.8	57.8	64.5	80.7	86.7	87.2	72.3	58.0	44.2	35.1	58.8
1997	35.0	33.8	49.4	51.0	68.5	78.5	84.7	82.5	73.5	59.5	41.3	29.4	57.3
1998	36.1	36.0	40.6	55.0	65.9	68.1	86.7	84.4	74.5	57.2	45.6	34.6	57.1
1999	37.5	39.6	52.8	50.0	64.1	75.5	87.8	84.9	69.6	62.3	55.5	36.0	59.6
Average	31.1	35.2	43.4	54.8	65.6	76.4	84.7	82.9	72.6	60.4	42.6	32.8	56.9

Table 1 - Climate Data for CUw Calculation

MUDDY GAP

Precipitation, inches

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	50% Oct-Mar	95% Apr-Sep
1951	0.38	0.43	0.93	1.01	2.06	1.66	0.36	0.27	0.59	1.28	0.30	0.32	9.59		
1952	0.05	0.77	0.64	0.56	3.16	1.10	0.50	1.26	0.00	0.16	0.32	0.14	8.66	1.68	6.25
1953	0.21	0.86	0.85	1.50	2.78	0.60	0.07	2.51	0.02	0.00	0.52	0.47	10.39	1.27	7.11
1954	0.20	0.20	0.51	0.08	1.40	2.80	0.94	0.12	0.13	0.80	0.22	0.25	7.65	0.95	5.20
1955	0.43	0.73	0.07	0.33	0.63	0.30	0.76	0.39	1.02	0.20	0.63	0.94	6.43	1.25	3.26
1956	0.30	0.03	0.19	0.70	1.09	0.00	2.19	0.71	0.10	0.80	0.61	0.47	7.19	1.15	4.55
1957	0.07	0.21	0.91	2.53	4.50	1.24	3.01	1.64	0.57	1.45	0.77	0.20	17.10	1.54	12.82
1958	0.13	0.02	0.93	0.88	2.02	1.75	1.48	0.60	0.40	0.10	0.36	0.42	9.09	1.75	6.77
1959	0.28	0.94	0.86	0.47	3.04	0.78	0.00	0.28	2.87	0.30	0.14	0.12	10.08	1.48	7.07
1960	0.32	0.62	0.25	0.81	0.87	0.87	0.22	0.16	0.50	0.30	0.58	0.36	5.86	0.88	3.26
1961	0.07	0.71	0.33	0.62	1.42	0.92	0.66	0.48	1.34	1.15	0.20	0.04	7.94	1.18	5.17
1962	0.24	0.15	0.71	1.60	1.96	0.23	1.05	0.34	0.63	1.10	0.18	0.05	8.24	1.25	5.52
1963	0.31	0.14	1.03	1.28	0.16	2.48	0.52	1.27	0.87	0.21	0.22	0.43	8.92	1.41	6.25
1964	0.29	1.18	0.67	1.47	4.67	0.77	0.00	0.01	0.50	0.12	0.55	0.27	10.50	1.50	7.05
1965	0.27	0.22	0.07	1.64	3.37	1.54	1.27	0.81	1.34	0.17	0.00	0.83	11.53	0.75	9.47
1966	0.06	0.84	0.24	0.39	0.93	1.19	1.03	1.16	0.41	1.97	0.62	0.49	9.33	1.07	4.85
1967	0.70	0.29	0.23	0.56	2.62	2.11	0.66	0.09	0.76	0.78	0.62	1.10	10.52	2.15	6.46
1968	0.10	0.32	0.62	1.76	1.40	0.70	0.34	1.02	0.15	0.06	0.33	0.90	7.70	1.77	5.10
1969	0.00	0.20	0.59	0.87	0.51	0.51	0.09	0.15	0.05	0.95	0.46	0.16	4.54	1.04	2.07
1970	0.09	0.08	1.06	2.18	0.50	2.72	0.45	0.62	0.56	0.74	0.73	0.76	10.49	1.40	6.68
1971	0.36	0.49	0.11	1.40	4.05	0.19	0.33	0.25	1.89	2.26	0.40	0.25	11.98	1.60	7.70
1972	0.45	0.33	0.19	1.89	1.35	0.89	0.59	1.05	0.12	3.26	0.52	1.21	11.85	1.94	5.60
1973	0.78	0.25	0.40	2.37	0.10	0.06	2.60	0.00	2.39	0.34	0.88	0.94	11.11	3.21	7.14
1974	0.51	1.64	0.19	2.76	0.20	1.32	1.82	0.50	0.91	1.07	0.34	1.00	12.26	2.25	7.13
1975	0.61	0.41	0.78	0.43	4.32	0.60	2.18	0.00	0.48	0.55	0.11	0.29	10.76	2.11	7.61
1976	0.49	0.44	0.25	0.67	0.70	1.09	1.11	0.54	0.39	0.72	0.23	0.18	6.81	1.07	4.28
1977	0.59	0.55	1.15	1.90	1.83	0.23	1.26	1.07	0.29	0.61	0.95	0.18	10.61	1.71	6.25
1978	0.77	0.46	0.52	1.45	4.71	0.31	1.18	0.84	0.51	0.18	1.25	1.00	13.18	1.75	8.55
1979	0.30	0.17	1.08	0.97	2.85	1.27	0.38	3.69	0.02	1.20	0.78	0.42	13.13	1.99	8.72
1980	0.83	0.48	1.22	0.49	2.48	0.00	0.00	1.24	0.06	0.83	0.88	0.05	8.56	2.47	4.06
1981	0.17	0.08	2.98	0.94	3.08	0.00	0.94	0.77	1.03	0.56	0.41	0.07	11.03	2.50	6.42
1982	0.25	0.09	0.46	0.57	1.58	1.17	0.62	0.14	4.28	1.07	1.01	0.54	11.78	0.92	7.94
1983	0.25	0.48	1.05	2.46	1.66	1.22	0.72	0.81	0.41	1.14	3.37	0.89	14.46	2.20	6.92
1984	0.41	0.56	0.79	2.57	0.68	0.57	2.65	0.59	0.55	0.43	0.27	0.32	10.39	3.58	7.23
1985	0.53	0.57	0.73	1.65	0.69	1.46	1.32	0.05	1.55	0.09	0.78	0.86	10.28	1.43	6.38
1986	0.17	0.70	1.98	2.05	1.94	1.56	0.68	0.65	0.44	1.94	0.95	0.06	13.12	2.29	6.95
1987	1.25	0.52	0.58	0.69	1.79	1.63	1.15	1.16	0.31	0.72	0.92	0.77	11.49	2.65	6.39
1988	0.60	0.27	1.35	0.87	1.87	0.06	0.10	0.31	2.30	0.00	0.26	1.01	9.00	2.32	5.23
1989	0.25	1.35	0.49	0.36	1.59	0.56	1.75	0.77	1.65	0.41	0.49	0.43	10.10	1.88	6.35
1990	0.06	0.42	1.31	1.22	1.66	1.15	1.64	0.03	1.63	1.19	1.80	0.74	12.85	1.56	6.96
1991	0.30	0.29	0.20	1.71	5.11	2.21	0.77	0.38	0.71	0.58	1.54	0.04	13.84	2.26	10.35
1992	0.26	0.24	1.22	0.76	4.29	1.16	1.15	0.52	0.24	0.14	1.74	0.74	12.46	1.94	7.71
1993	0.62	0.56	0.88	2.84	1.72	2.28	0.96	0.21	0.75	1.73	0.30	0.47	13.32	2.34	8.32
1994	0.28	0.39	0.18	0.97	0.28	0.25	0.70	0.22	0.72	2.17	1.06	0.08	7.32	1.68	2.98
1995	1.17	0.47	0.14	1.48	5.36	1.82	0.60	0.00	1.47	2.46	0.48	0.22	15.67	2.56	10.19
1996	0.56	0.15	0.89	1.50	3.54	0.54	0.02	0.13	0.73	1.64	1.01	0.52	11.23	2.38	6.14
1997	0.37	0.60	0.68	2.25	2.20	1.41	0.93	1.25	0.85	0.44	0.33	0.75	12.06	2.41	8.45
1998	0.07	0.70	3.85	0.53	0.80	2.80	1.31	0.28	1.06	2.15	0.54	0.41	14.50	3.07	6.44
1999	0.48	0.15	0.09	3.06	0.92	0.21	0.03	1.03	1.81	0.02	0.25	0.02	8.07	1.91	6.71
Average	0.37	0.46	0.76	1.31	2.09	1.07	0.92	0.66	0.86	0.87	0.66	0.47	10.51	1.82	6.58

Table 1 - Climate Data for CUw Calculation

CASPER/GLENROCK/DOUGLAS

Average Minimum Air Temperature, F

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1951	9.4	18.5	16.8	26.4	40.6	43.8	54.0	52.1	39.8	33.9	22.7	10.1	30.7
1952	15.1	15.8	16.8	32.6	41.7	50.7	52.8	53.5	43.9	29.7	14.3	20.1	32.3
1953	24.2	14.7	24.6	26.9	36.4	50.2	57.5	55.0	43.7	33.9	27.2	14.2	34.0
1954	16.3	23.5	15.7	33.0	40.7	49.6	59.4	53.1	45.4	32.7	26.9	19.7	34.7
1955	10.5	10.0	15.6	30.1	40.5	47.6	56.2	56.8	44.2	33.8	15.4	16.7	31.5
1956	15.0	12.7	19.8	27.5	42.7	49.9	54.3	50.3	41.5	33.7	18.9	19.1	32.1
1957	5.0	19.5	22.0	28.0	40.2	47.3	54.9	55.7	40.1	35.2	21.4	23.3	32.7
1958	16.3	17.5	18.7	29.7	43.7	48.9	51.3	54.1	43.6	32.1	23.1	17.5	33.0
1959	12.9	15.1	23.0	28.4	38.7	50.1	51.7	52.2	42.6	30.2	16.0	17.5	31.5
1960	12.8	10.5	21.6	31.9	38.8	49.5	54.8	52.4	44.4	33.2	23.4	13.7	32.3
1961	17.7	20.9	26.4	29.8	41.6	50.0	53.7	56.3	39.0	31.1	19.7	12.9	33.3
1962	5.8	18.7	20.6	32.8	41.8	48.3	53.9	50.9	42.4	37.4	28.4	17.9	33.2
1963	1.4	22.3	23.7	30.6	40.8	50.0	56.4	55.9	48.2	39.4	25.7	13.4	34.0
1964	14.3	12.8	15.3	30.1	40.1	47.5	58.0	50.9	39.7	30.3	21.1	15.2	31.3
1965	20.3	12.6	9.6	36.0	39.8	48.8	55.0	50.2	36.3	34.4	27.0	19.3	32.4
1966	10.7	13.2	24.6	26.7	38.3	46.9	58.4	50.8	46.9	31.4	24.5	15.7	32.3
1967	18.2	18.3	26.5	29.7	38.2	46.5	54.4	51.8	45.8	34.7	18.6	8.3	32.6
1968	12.0	21.3	24.9	26.8	35.9	47.3	53.4	50.2	39.9	33.7	20.9	10.4	31.4
1969	14.2	17.4	17.9	34.2	40.4	45.3	54.7	54.5	46.6	28.7	24.0	16.4	32.9
1970	12.7	19.7	17.1	27.5	39.2	47.9	54.7	54.8	39.5	27.7	25.4	13.2	31.6
1971	15.8	14.9	20.4	29.8	37.6	48.4	50.3	52.8	39.1	29.7	22.0	17.0	31.5
1972	6.9	17.9	25.6	30.0	39.2	48.8	49.1	52.3	39.2	30.1	19.3	6.6	30.4
1973	10.0	14.7	21.6	25.4	35.7	46.7	52.9	53.1	41.4	33.3	23.0	17.6	31.3
1974	8.9	19.8	24.7	31.9	38.0	48.8	56.0	48.5	37.7	33.1	24.6	14.2	32.2
1975	12.4	11.6	21.0	27.4	37.8	45.7	58.1	52.1	39.7	32.4	21.0	18.9	31.5
1976	13.2	22.1	19.2	32.7	40.0	46.2	56.9	52.6	43.3	29.4	20.0	17.5	32.8
1977	6.9	19.7	22.3	33.1	41.8	53.1	57.1	51.9	43.7	34.5	22.5	15.6	33.5
1978	7.2	12.2	25.3	33.4	38.4	48.0	54.1	50.4	42.7	31.7	16.6	4.7	30.4
1979	-2.1	16.9	25.7	30.6	37.5	47.0	54.9	53.8	44.3	34.6	16.3	17.8	31.4
1980	6.4	16.4	21.1	30.2	38.2	47.4	55.8	51.4	42.8	31.0	23.4	23.0	32.2
1981	17.6	17.2	25.1	35.4	40.7	49.8	56.4	52.8	44.8	33.5	26.8	17.4	34.8
1982	9.8	14.1	23.8	27.6	39.1	47.5	54.5	57.1	43.5	32.8	23.1	17.4	32.5
1983	21.5	23.9	26.5	27.2	36.2	47.7	55.5	59.0	42.9	34.3	21.2	1.2	33.1
1984	13.4	20.4	25.3	27.0	38.6	46.7	56.4	55.1	38.4	29.4	23.1	12.4	32.2
1985	6.1	9.8	21.0	31.1	40.4	45.1	55.9	49.2	40.9	29.8	8.4	10.8	29.0
1986	22.0	18.8	30.5	32.2	36.9	51.8	52.7	52.7	43.8	34.2	22.0	17.6	34.6
1987	14.2	20.9	22.6	33.8	44.4	48.2	54.4	50.4	40.8	29.9	23.5	13.6	33.1
1988	9.8	15.1	22.8	29.5	39.9	55.6	55.4	51.9	41.6	33.0	23.7	16.8	32.9
1989	15.8	3.5	23.2	30.9	39.4	46.0	55.4	52.5	42.1	32.0	26.5	12.1	31.6
1990	20.5	17.1	22.5	31.3	37.1	48.6	54.7	51.6	45.6	31.0	25.5	4.8	32.5
1991	7.6	22.5	23.3	29.7	40.5	49.7	53.8	53.5	42.6	29.0	21.6	16.9	32.5
1992	18.4	23.2	27.1	33.3	41.1	49.1	52.6	51.6	42.1	33.9	19.3	10.5	33.5
1993	12.3	4.7	26.0	30.9	42.1	46.0	50.7	51.2	41.5	31.3	17.8	20.2	31.2
1994	17.7	13.7	27.4	31.6	45.0	50.8	54.1	55.8	44.7	33.2	23.1	20.8	34.8
1995	16.8	20.8	25.5	29.8	38.8	46.6	51.9	55.4	43.0	31.4	26.8	17.5	33.7
1996	10.2	17.9	19.2	31.5	39.3	48.4	53.7	50.6	41.7	30.7	22.3	17.8	31.9
1997	14.3	16.6	25.5	24.8	38.6	50.5	53.8	53.8	47.1	33.9	21.2	14.8	32.9
1998	15.4	23.4	21.3	30.9	40.6	45.0	56.6	53.6	49.1	34.3	31.6	14.7	34.7
1999	16.8	22.4	23.4	29.3	38.4	47.3	55.6	54.4	38.7	30.1	28.8	19.0	33.7
Average	12.9	16.9	22.2	30.2	39.6	48.3	54.7	52.9	42.5	32.3	22.2	15.2	32.5

Table 1 - Climate Data for CUw Calculation

GLENROCK

Average Minimum Air Temperature, F

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1951	10.0	19.3	17.9	26.5	40.3	43.1	54.8	51.3	40.1	33.6	24.0	10.5	31.0
1952	15.5	16.0	16.0	32.8	42.5	50.1	51.7	53.6	43.6	29.5	15.3	22.1	32.4
1953	25.7	15.9	25.8	27.4	36.4	50.2	58.1	55.5	44.6	33.8	27.7	14.9	34.7
1954	16.5	23.8	15.9	32.4	41.2	50.8	60.2	52.8	44.9	32.4	25.5	19.5	34.7
1955	11.4	10.0	15.5	30.6	41.0	47.8	57.1	56.6	44.5	34.3	17.2	18.4	32.0
1956	15.4	13.7	19.0	27.2	42.7	50.2	54.6	50.6	40.0	33.1	20.3	20.3	32.3
1957	5.7	20.6	22.2	27.5	39.3	47.2	54.9	55.5	40.0	35.9	22.4	25.7	33.1
1958	17.5	18.0	20.1	30.4	44.0	50.2	51.7	54.5	45.0	33.1	25.7	19.1	34.1
1959	16.1	17.8	24.3	29.2	39.5	50.1	51.1	50.7	42.0	31.8	17.7	18.5	32.4
1960	14.4	10.9	21.2	32.8	39.2	49.7	53.0	52.3	45.5	34.9	26.0	14.2	32.8
1961	21.7	22.1	28.3	32.3	43.2	50.7	53.3	57.7	41.7	31.0	20.6	14.2	34.7
1962	8.5	21.0	21.6	33.6	42.7	48.7	55.1	51.8	43.2	40.1	30.8	19.5	34.7
1963	4.9	26.0	26.4	31.6	42.2	50.9	57.3	57.0	49.0	41.4	28.7	16.4	36.0
1964	18.4	17.1	18.9	32.0	40.4	49.1	58.8	52.5	41.2	32.3	25.1	19.6	33.8
1965	23.8	15.4	11.4	38.4	41.8	51.1	56.5	52.0	38.4	36.6	29.5	22.7	34.8
1966	14.3	17.0	26.4	28.9	40.6	49.5	60.2	53.1	49.3	34.7	28.1	19.8	35.2
1967	21.6	21.0	29.8	32.4	41.0	48.3	55.9	54.1	47.8	38.2	22.4	11.8	35.4
1968	14.4	24.1	27.0	29.4	37.9	50.0	55.8	52.7	43.3	36.7	25.1	14.7	34.3
1969	16.0	19.0	20.2	37.2	43.2	48.0	57.7	57.3	50.1	31.8	28.4	20.0	35.7
1970	16.1	22.5	20.2	29.1	39.9	49.7	56.2	56.7	42.3	30.0	27.4	16.1	33.9
1971	18.0	15.9	21.4	32.4	38.1	49.0	51.7	53.6	38.8	30.5	25.2	20.5	32.9
1972	10.1	19.4	26.8	30.9	39.9	48.8	48.6	51.8	38.1	29.4	19.4	6.3	30.8
1973	11.3	17.3	19.0	26.3	36.6	48.5	53.1	54.1	40.9	34.5	22.5	21.2	32.1
1974	11.6	22.8	27.4	33.0	40.6	50.2	56.1	49.6	39.2	34.8	28.9	16.5	34.2
1975	14.9	14.7	23.3	28.9	40.4	48.6	61.2	53.8	40.6	35.5	24.6	21.9	34.0
1976	16.2	25.1	21.3	34.6	41.7	47.7	56.2	54.0	44.9	31.0	22.9	21.7	34.8
1977	10.9	23.1	25.0	34.5	43.9	54.2	59.2	53.6	45.9	37.7	25.0	19.4	36.0
1978	10.3	14.6	27.5	35.2	39.5	49.9	55.0	51.4	43.8	33.5	18.5	7.9	32.3
1979	2.1	21.8	28.2	33.0	39.9	49.8	56.9	55.5	46.0	37.4	19.1	20.3	34.2
1980	9.6	17.3	22.4	32.3	38.7	48.2	56.6	53.5	44.3	32.2	26.2	26.0	33.9
1981	19.4	19.8	26.5	36.7	42.0	51.3	57.8	54.5	45.8	34.7	28.4	21.1	36.5
1982	12.5	18.1	25.3	29.3	41.0	49.4	56.3	59.7	44.7	33.6	26.2	20.5	34.7
1983	22.5	26.4	28.0	28.8	38.0	48.8	57.9	60.4	43.9	35.8	24.0	4.2	34.9
1984	17.5	22.8	26.8	27.5	39.2	48.9	59.8	57.8	42.7	32.9	26.5	16.8	34.9
1985	10.0	13.4	21.4	32.5	41.4	46.1	58.0	51.1	42.0	30.6	8.3	11.3	30.5
1986	23.3	22.8	34.2	34.6	39.8	53.3	53.5	54.5	46.7	37.3	24.9	18.9	37.0
1987	17.8	23.2	25.7	36.0	46.2	50.0	56.3	52.0	42.4	33.2	24.2	19.1	35.5
1988	13.6	17.5	25.8	31.8	41.5	58.3	56.1	53.5	42.9	34.6	25.8	20.5	35.2
1989	19.8	6.3	24.8	33.0	40.8	46.8	55.4	53.1	42.7	33.1	28.2	14.6	33.2
1990	25.2	19.2	24.1	32.6	39.1	49.2	55.4	52.4	45.4	31.9	25.5	5.9	33.8
1991	7.9	22.2	23.4	28.4	39.3	48.7	52.6	51.8	40.7	27.0	22.7	20.0	32.1
1992	21.8	24.2	28.3	35.6	42.8	49.6	54.1	52.8	43.1	35.7	21.1	13.8	35.2
1993	14.3	7.3	26.9	30.8	42.2	46.3	51.5	50.9	42.2	32.3	19.1	22.8	32.2
1994	19.6	15.3	30.6	33.8	47.2	53.1	55.4	57.3	47.1	34.1	24.2	24.4	36.8
1995	20.2	22.0	28.0	32.6	40.3	48.8	55.5	59.2	45.9	34.3	29.8	19.5	36.3
1996	13.0	21.7	21.2	34.5	42.5	51.8	57.0	54.2	44.7	32.6	24.3	20.7	34.9
1997	17.8	19.6	28.6	27.2	41.6	54.7	56.5	56.0	49.0	36.2	23.2	15.9	35.5
1998	17.8	25.0	23.4	32.6	43.5	48.0	58.4	55.2	50.9	35.5	35.2	19.5	37.1
1999	20.3	27.5	23.6	31.0	40.1	48.8	57.1	57.1	39.2	30.7	31.7	20.9	35.7
Average	15.5	19.1	23.8	31.7	41.0	49.6	55.8	54.1	43.7	33.8	24.4	17.8	34.2

Table 1 - Climate Data for CUw Calculation

CASPER

Average Minimum Air Temperature, F

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1951	10.4	18.1	15.5	25.4	40.6	43.6	54.7	53.0	40.4	33.6	23.0	8.9	30.6
1952	15.5	16.7	16.9	33.6	41.2	51.0	53.9	55.3	46.7	33.9	16.9	20.2	33.5
1953	22.9	14.9	24.4	26.7	36.1	49.9	57.8	55.7	45.6	36.6	28.1	15.8	34.5
1954	16.4	25.2	14.5	32.6	39.7	47.5	59.3	54.7	46.3	33.0	28.8	21.4	35.0
1955	12.8	11.0	15.2	30.0	40.5	47.8	56.5	58.5	46.1	36.4	14.9	17.3	32.3
1956	17.9	13.3	20.7	28.5	43.0	51.1	55.9	51.9	44.0	35.8	19.4	19.3	33.4
1957	5.2	20.2	21.9	27.7	40.9	47.8	56.1	56.9	41.7	34.9	21.3	22.8	33.1
1958	18.3	18.9	17.5	28.8	44.5	48.4	51.4	55.0	44.2	34.1	22.0	18.9	33.5
1959	12.2	13.0	22.5	28.1	37.7	50.4	53.2	54.5	43.1	30.6	17.1	18.8	31.8
1960	13.3	8.3	21.3	29.6	38.4	47.8	55.3	51.1	46.6	34.1	24.0	15.2	32.1
1961	18.8	21.4	25.7	28.6	41.4	51.3	55.6	57.5	38.5	32.6	20.4	11.9	33.6
1962	5.3	16.9	19.4	32.5	41.4	47.8	53.4	51.8	42.7	37.9	28.9	19.5	33.1
1963	1.7	19.7	23.3	29.9	41.0	50.1	55.8	56.1	49.0	40.6	26.7	14.6	34.0
1964	13.6	11.6	14.6	28.6	40.6	47.6	58.1	50.9	39.4	30.8	19.8	13.8	30.8
1965	19.8	11.1	8.0	34.1	38.0	46.8	53.9	49.7	34.1	35.0	26.5	19.1	31.3
1966	11.1	14.5	23.2	25.5	37.4	44.9	57.1	49.7	46.0	31.1	23.3	15.1	31.6
1967	17.6	17.0	23.2	27.7	37.1	45.2	53.8	51.5	45.6	34.0	19.1	7.3	31.6
1968	12.7	20.2	25.2	26.0	34.4	45.7	52.0	49.4	39.3	33.1	20.3	8.0	30.5
1969	15.1	18.0	16.9	32.9	38.9	43.6	53.4	53.6	45.1	27.1	23.1	17.4	32.1
1970	11.6	19.5	15.8	27.5	39.1	47.2	53.9	54.4	38.9	27.3	24.7	15.2	31.3
1971	15.1	13.8	20.1	28.4	36.6	47.6	49.2	53.1	38.5	30.0	21.3	15.1	30.7
1972	6.5	17.6	24.9	29.6	38.1	48.6	48.4	52.4	39.6	31.0	21.1	8.8	30.6
1973	10.4	15.2	23.6	25.6	36.3	46.6	52.9	53.3	42.2	34.4	24.0	17.4	31.8
1974	8.8	18.2	23.5	31.6	36.5	48.4	56.9	48.0	38.7	34.6	24.2	15.9	32.1
1975	11.7	10.7	19.8	26.7	36.3	44.1	57.2	51.0	38.9	33.0	20.5	19.1	30.8
1976	13.6	21.0	19.0	31.3	38.9	44.8	58.0	52.3	44.2	30.6	21.6	18.1	32.8
1977	8.4	18.8	20.9	33.2	40.4	53.2	55.8	50.3	42.1	33.8	21.5	13.4	32.7
1978	6.5	12.8	24.9	31.4	38.0	47.8	53.0	51.5	43.4	32.2	15.7	2.5	30.0
1979	-2.4	13.8	25.2	29.4	35.8	44.6	52.8	52.9	42.9	32.6	16.0	18.9	30.2
1980	4.3	18.3	20.4	29.7	37.5	45.7	54.2	49.3	42.1	32.3	22.9	22.6	31.6
1981	18.5	16.9	24.5	33.9	39.3	47.9	54.9	51.3	44.2	32.7	26.9	15.7	33.9
1982	7.6	12.6	23.3	26.8	37.8	46.3	53.5	56.6	43.1	33.3	21.1	14.9	31.4
1983	21.5	22.3	26.3	26.7	34.7	46.8	53.8	57.8	42.3	34.4	20.8	-0.3	32.3
1984	14.1	19.4	24.6	26.4	38.7	45.0	53.9	53.9	35.7	26.5	23.4	11.0	31.1
1985	6.4	9.1	21.3	30.4	39.6	44.5	55.0	48.6	39.6	30.6	8.2	12.4	28.8
1986	23.0	17.8	28.8	30.7	35.0	51.7	53.0	52.0	42.5	34.2	21.0	16.6	33.9
1987	14.3	19.7	23.0	34.1	43.5	47.5	53.7	49.6	41.0	30.0	25.1	12.7	32.9
1988	10.6	15.6	21.2	29.2	38.7	55.3	55.4	51.6	42.3	33.0	22.7	17.1	32.7
1989	14.5	2.3	22.1	29.0	38.6	45.8	55.4	51.9	42.9	33.7	26.6	14.1	31.4
1990	17.6	16.4	22.2	30.6	35.0	46.7	53.9	51.4	46.3	31.5	26.2	4.8	31.9
1991	10.3	24.3	23.3	30.2	39.5	49.4	54.7	55.1	43.4	30.5	20.8	18.5	33.3
1992	18.3	24.4	27.8	32.7	40.6	48.7	52.1	52.3	43.3	34.8	22.6	11.0	34.1
1993	12.0	8.0	27.9	32.0	43.0	46.4	50.5	52.0	43.3	34.0	19.6	20.1	32.4
1994	18.8	14.1	28.4	32.1	44.0	50.1	54.4	56.4	45.8	34.1	22.8	22.4	35.3
1995	18.1	20.3	24.6	28.0	37.6	45.5	51.5	54.0	43.3	31.0	25.1	16.6	33.0
1996	9.2	15.7	17.9	29.7	36.6	45.5	50.9	47.7	39.2	29.8	20.3	15.9	29.9
1997	11.2	14.1	23.4	22.1	35.9	46.6	52.4	52.9	45.7	32.7	20.0	13.5	30.9
1998	16.1	21.9	21.5	30.1	38.7	43.8	55.8	52.7	48.5	32.7	28.6	13.0	33.6
1999	16.7	21.9	22.2	28.1	36.0	45.5	53.8	52.4	38.5	30.0	30.1	20.1	32.9
Average	12.9	16.5	21.7	29.5	38.8	47.5	54.2	52.8	42.6	32.8	22.2	15.2	32.2

Table 1 - Climate Data for CUw Calculation

DOUGLAS

Average Minimum Air Temperature, F

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1951	7.9	18.0	16.9	27.3	40.9	44.6	52.6	52.1	38.8	34.4	21.0	10.9	30.5
1952	14.4	14.8	17.4	31.3	41.5	51.0	52.9	51.6	41.5	25.6	10.7	17.9	30.9
1953	24.1	13.2	23.5	26.5	36.8	50.4	56.7	53.7	40.9	31.2	25.8	11.9	32.9
1954	15.9	21.5	16.8	33.9	41.1	50.5	58.6	51.8	45.0	32.6	26.5	18.2	34.4
1955	7.3	9.1	16.0	29.6	39.9	47.2	55.0	55.4	42.1	30.8	14.1	14.5	30.1
1956	11.6	11.0	19.6	26.7	42.4	48.4	52.5	48.3	40.4	32.2	17.1	17.6	30.7
1957	4.0	17.6	21.8	28.7	40.5	46.8	53.8	54.7	38.7	34.8	20.5	21.3	31.9
1958	13.1	15.5	18.5	30.0	42.5	48.1	50.8	52.9	41.7	29.1	21.5	14.5	31.5
1959	10.5	14.5	22.2	28.0	38.8	49.9	50.9	51.4	42.6	28.3	13.2	15.3	30.5
1960	10.7	12.3	22.4	33.4	38.8	50.9	56.0	53.8	41.2	30.5	20.2	11.8	31.8
1961	12.7	19.1	25.3	28.5	40.1	48.1	52.3	53.6	36.9	29.7	18.2	12.5	31.4
1962	3.5	18.3	20.7	32.2	41.3	48.5	53.1	49.0	41.4	34.1	25.6	14.6	31.9
1963	-2.5	21.2	21.4	30.2	39.2	49.1	56.2	54.5	46.5	36.2	21.7	9.3	31.9
1964	11.0	9.8	12.3	29.6	39.4	45.9	57.0	49.4	38.6	27.7	18.5	12.2	29.3
1965	17.2	11.3	9.5	35.5	39.5	48.4	54.5	48.9	36.4	31.6	24.9	16.2	31.2
1966	6.7	8.2	24.1	25.6	36.9	46.3	58.0	49.5	45.4	28.5	22.2	12.3	30.3
1967	15.4	16.9	26.4	29.1	36.5	46.0	53.4	49.8	44.0	32.0	14.2	5.8	30.8
1968	8.9	19.7	22.4	24.9	35.5	46.2	52.5	48.5	37.1	31.3	17.2	8.6	29.4
1969	11.6	15.3	16.6	32.4	39.2	44.3	53.0	52.6	44.6	27.1	20.6	11.8	30.8
1970	10.4	17.1	15.3	25.8	38.7	46.7	53.9	53.4	37.3	25.8	24.1	8.3	29.7
1971	14.4	14.9	19.6	28.7	38.1	48.6	50.0	51.7	40.0	28.5	19.4	15.5	30.8
1972	4.0	16.8	25.1	29.5	39.5	48.9	50.3	52.7	40.0	29.8	17.3	4.8	29.9
1973	8.2	11.6	22.3	24.4	34.3	45.1	52.8	51.8	41.2	31.1	22.5	14.2	30.0
1974	6.2	18.3	23.3	31.1	36.8	47.7	55.0	47.8	35.2	30.0	20.6	10.2	30.2
1975	10.7	9.3	19.8	26.7	36.8	44.4	56.0	51.4	39.5	28.7	17.8	15.6	29.7
1976	9.8	20.2	17.4	32.2	39.5	46.0	56.4	51.5	40.8	26.5	15.5	12.8	30.7
1977	1.3	17.2	21.0	31.6	41.0	52.0	56.2	51.8	43.2	31.9	20.9	13.9	31.8
1978	4.8	9.3	23.6	33.6	37.6	46.2	54.2	48.4	40.9	29.5	15.6	3.8	29.0
1979	-5.9	15.1	23.6	29.5	36.7	46.7	55.1	52.9	44.0	33.8	13.9	14.1	30.0
1980	5.3	13.5	20.6	28.5	38.3	48.2	56.5	51.3	42.0	28.4	21.2	20.5	31.2
1981	15.0	14.8	24.2	35.6	40.7	50.2	56.6	52.6	44.3	33.2	25.2	15.5	34.0
1982	9.2	11.5	22.9	26.8	38.5	46.9	53.7	55.0	42.6	31.6	22.0	16.8	31.5
1983	20.4	23.0	25.1	26.1	35.9	47.5	54.9	58.9	42.6	32.7	18.9	-0.4	32.1
1984	8.5	19.1	24.4	27.1	38.0	46.3	55.5	53.7	36.9	28.9	19.3	9.4	30.6
1985	1.8	7.0	20.3	30.5	40.1	44.8	54.7	47.8	41.1	28.1	8.7	8.6	27.8
1986	19.7	15.8	28.5	31.3	35.8	50.5	51.6	51.6	42.1	31.0	20.0	17.3	32.9
1987	10.5	19.9	19.2	31.4	43.6	47.1	53.3	49.5	38.9	26.4	21.1	9.0	30.8
1988	5.3	12.1	21.4	27.6	39.6	53.3	54.6	50.7	39.6	31.5	22.5	12.7	30.9
1989	13.1	1.8	22.6	30.7	38.9	45.3	55.4	52.5	40.6	29.2	24.8	7.5	30.2
1990	18.7	15.8	21.3	30.7	37.3	49.8	54.7	51.1	45.0	29.6	24.8	3.6	31.9
1991	4.5	21.0	23.3	30.4	42.6	50.9	54.0	53.6	43.7	29.6	21.2	12.2	32.3
1992	15.0	21.0	25.1	31.6	40.0	48.9	51.5	49.7	39.9	31.2	14.2	6.6	31.2
1993	10.6	-1.3	23.1	29.9	41.2	45.4	50.1	50.8	38.9	27.5	14.7	17.6	29.0
1994	14.7	11.7	23.3	28.8	43.9	49.3	52.4	53.6	41.1	31.3	22.4	15.5	32.3
1995	12.0	20.1	23.9	28.9	38.4	45.6	48.6	53.0	39.9	28.9	25.5	16.4	31.8
1996	8.3	16.3	18.6	30.2	38.9	47.8	53.2	49.9	41.3	29.8	22.3	16.9	31.1
1997	13.9	16.1	24.6	25.1	38.2	50.3	52.6	52.6	46.6	32.7	20.4	14.9	32.3
1998	12.3	23.2	19.1	30.1	39.6	43.2	55.6	53.0	48.0	34.6	30.9	11.7	33.4
1999	13.5	17.8	24.5	28.7	39.1	47.6	56.0	53.8	38.3	29.6	24.5	16.1	32.5
Average	10.2	15.0	21.2	29.5	39.2	47.8	54.0	51.8	41.2	30.4	20.1	12.6	31.1

Table 1 - Climate Data for CUw Calculation

CASPER/GLENROCK/DOUGLAS

Average Maximum Air Temperature, F

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1951	33.8	45.0	45.7	53.1	67.0	70.6	86.4	85.4	71.5	58.0	47.2	34.7	58.2
1952	38.9	40.4	39.6	63.5	68.5	83.2	87.1	85.7	81.6	67.9	42.4	40.3	61.6
1953	46.1	38.6	52.4	52.9	63.2	83.1	90.3	87.5	80.8	67.7	53.9	37.9	62.9
1954	42.6	52.3	41.6	63.3	68.8	80.2	93.6	88.2	79.4	61.7	54.5	42.0	64.0
1955	33.9	32.8	39.5	58.6	69.8	72.6	89.8	88.1	75.9	66.6	41.5	40.0	59.1
1956	38.7	37.3	47.8	53.7	70.1	86.8	86.8	82.6	79.6	66.1	41.2	40.3	60.9
1957	28.9	45.3	48.5	52.0	62.6	75.7	88.5	86.4	72.0	59.1	39.9	45.0	58.7
1958	41.2	43.3	39.8	52.4	74.4	79.2	81.6	88.3	77.9	66.7	48.2	40.1	61.1
1959	37.7	35.9	44.1	57.1	64.6	84.0	87.8	87.2	70.7	58.4	45.9	44.5	59.8
1960	34.0	31.4	46.6	61.1	70.1	80.7	89.5	86.0	77.5	63.6	45.1	38.1	60.3
1961	40.6	42.7	48.8	55.4	67.4	81.8	86.4	87.3	66.0	59.1	42.3	34.6	59.4
1962	29.5	39.1	43.2	63.4	69.2	75.9	83.5	85.4	75.9	66.2	53.0	43.0	60.6
1963	27.5	46.4	48.3	56.4	70.9	80.4	89.7	86.1	80.4	70.7	52.9	37.1	62.2
1964	36.0	33.5	39.1	52.9	68.6	76.0	91.7	83.4	76.2	66.2	46.2	36.5	58.9
1965	42.1	37.3	34.9	59.2	63.5	74.2	85.2	83.8	62.2	69.7	53.9	42.2	59.0
1966	35.1	36.3	51.8	54.0	75.3	79.4	93.1	84.8	77.9	61.0	50.2	38.5	61.4
1967	38.9	40.8	52.0	59.1	61.5	71.8	86.2	86.9	76.4	64.5	44.5	31.6	59.5
1968	38.0	42.8	50.5	52.9	63.2	77.7	87.2	81.5	74.9	64.6	46.0	33.5	59.4
1969	40.4	41.5	41.1	62.5	73.4	71.9	90.1	90.9	81.9	50.6	48.5	41.1	61.2
1970	36.6	47.0	41.6	50.8	69.9	79.7	89.3	91.0	72.5	56.8	46.4	39.1	60.1
1971	38.2	37.7	44.9	55.6	64.6	81.9	86.3	89.0	70.5	57.2	43.9	37.4	58.9
1972	32.1	42.6	54.1	57.6	67.4	81.4	84.9	84.7	75.0	60.8	42.0	30.3	59.4
1973	33.7	39.9	45.6	48.2	67.2	80.6	85.3	88.3	69.2	65.4	45.1	40.2	59.1
1974	31.8	40.8	50.5	56.6	68.8	82.1	89.4	83.1	72.5	64.5	47.9	36.6	60.4
1975	33.4	34.6	42.7	51.3	64.6	75.5	89.6	85.6	74.9	64.6	47.1	40.7	58.7
1976	35.0	42.7	46.7	57.6	69.7	76.6	87.3	85.6	75.9	58.7	47.2	41.5	60.4
1977	33.0	45.9	44.8	60.8	69.8	85.4	87.3	82.5	79.4	65.2	46.7	38.7	61.6
1978	29.3	32.2	51.4	58.3	62.6	79.7	86.3	82.3	77.7	64.9	40.0	27.2	57.7
1979	21.9	37.3	48.2	59.4	64.5	79.5	88.2	82.2	81.3	64.1	38.9	41.7	58.9
1980	30.7	37.0	43.3	58.8	65.0	82.9	90.3	84.2	77.9	61.6	46.7	47.4	60.5
1981	44.9	44.2	52.0	64.6	63.5	81.3	88.5	85.8	79.5	57.5	53.0	40.8	63.0
1982	34.9	40.8	50.1	56.3	64.5	72.8	87.1	89.7	71.4	57.4	43.1	34.9	58.6
1983	42.0	43.3	46.1	49.6	62.6	74.8	88.4	90.7	77.9	65.4	43.3	22.3	58.9
1984	33.7	39.3	44.9	51.2	70.2	78.0	87.2	87.8	70.7	56.4	48.7	36.8	58.7
1985	28.9	32.8	47.3	62.1	71.9	78.9	89.4	86.2	67.9	59.9	32.4	31.4	57.4
1986	42.7	40.8	57.9	58.2	68.0	83.7	85.7	86.9	69.3	59.3	45.4	38.7	61.4
1987	36.3	40.3	44.7	66.8	72.9	82.5	88.6	83.8	77.3	64.4	48.3	35.7	61.8
1988	32.6	41.0	45.1	64.6	72.2	90.1	92.4	89.2	76.2	67.6	46.9	39.0	63.1
1989	42.7	25.4	49.7	61.3	69.0	77.3	90.3	85.1	74.0	59.4	49.1	35.2	59.9
1990	41.8	40.7	47.6	58.3	66.1	82.9	85.0	85.0	79.2	61.4	49.3	29.0	60.5
1991	33.1	47.7	49.6	54.0	63.9	78.3	86.7	86.1	73.8	59.1	41.6	40.1	59.5
1992	42.2	50.1	54.4	65.6	72.9	78.7	81.8	83.3	78.9	65.8	42.1	33.9	62.5
1993	32.6	31.9	48.5	56.4	69.7	74.1	81.6	82.9	71.9	60.8	39.9	39.4	57.5
1994	39.6	37.5	54.5	61.0	77.1	85.7	87.5	88.6	79.8	59.3	44.3	42.7	63.1
1995	38.2	43.0	49.7	53.5	59.5	74.7	82.5	90.9	72.5	57.6	50.2	41.7	59.5
1996	34.3	43.4	45.1	59.2	64.5	82.8	88.2	87.6	73.9	60.9	46.4	38.2	60.4
1997	34.1	37.2	52.5	50.5	68.6	79.2	85.7	83.1	75.3	62.8	44.6	34.6	59.0
1998	37.4	41.7	44.4	58.0	71.8	71.9	88.1	87.0	81.1	57.8	49.6	38.6	60.6
1999	40.1	46.0	54.1	51.4	66.0	76.2	89.2	86.7	70.5	63.9	59.4	42.0	62.1
Average	36.2	40.2	47.1	57.2	67.8	79.1	87.6	86.1	75.2	62.2	46.3	37.9	60.2

Table 1 - Climate Data for CUw Calculation

CASPER

Average Maximum Air Temperature, F

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1951	30.6	41.1	41.8	50.4	65.3	68.9	85.0	83.4	70.2	55.0	44.0	31.8	55.6
1952	35.4	36.4	37.0	61.6	66.2	81.4	86.2	85.5	79.7	65.3	39.2	36.3	59.2
1953	42.5	34.8	48.5	50.1	61.6	81.6	89.1	86.3	78.7	64.8	50.3	33.6	60.2
1954	37.8	49.3	37.8	61.1	66.6	78.6	92.8	87.5	78.3	59.0	51.6	38.2	61.6
1955	31.7	29.5	36.5	57.0	69.1	73.3	89.9	87.8	75.0	64.4	38.1	37.1	57.5
1956	36.4	34.9	46.1	52.9	69.2	85.3	85.6	82.1	78.3	63.8	40.2	37.4	59.4
1957	27.2	44.0	47.9	49.7	62.5	75.5	87.5	85.2	70.6	57.9	37.3	41.6	57.2
1958	38.2	43.6	39.3	51.7	73.5	78.9	81.2	87.5	75.9	65.3	45.9	39.1	60.0
1959	35.1	32.9	42.6	55.9	63.4	83.1	86.8	86.1	69.3	56.7	44.3	42.2	58.2
1960	30.9	28.6	45.2	59.5	68.7	79.6	87.4	83.4	74.8	61.2	43.3	35.9	58.2
1961	38.5	41.3	48.3	54.3	67.3	81.2	85.3	86.7	64.3	56.9	40.2	31.3	58.0
1962	25.4	37.0	41.5	61.8	67.8	75.2	82.4	83.6	74.7	65.2	51.3	41.2	58.9
1963	26.2	45.0	46.2	54.8	69.3	79.6	88.2	84.7	79.2	68.6	49.8	35.1	60.6
1964	32.3	30.8	35.6	50.8	67.6	74.5	90.0	81.2	73.7	63.4	42.8	33.0	56.3
1965	39.5	34.1	32.9	57.4	61.7	73.3	84.6	82.9	61.2	69.0	53.1	39.0	57.4
1966	32.5	34.1	49.2	52.3	74.1	78.7	92.6	83.9	78.3	59.2	48.8	35.5	59.9
1967	35.8	38.3	49.6	57.6	61.1	71.8	85.9	86.4	76.3	62.3	42.5	27.4	57.9
1968	34.2	40.3	48.2	50.7	61.7	75.8	86.1	80.3	73.6	62.6	43.6	29.6	57.2
1969	38.5	40.0	39.8	60.5	72.5	70.4	89.7	90.0	81.4	48.6	45.7	39.6	59.7
1970	35.7	45.8	39.4	48.8	67.5	78.3	88.4	90.1	70.5	55.7	45.1	35.2	58.4
1971	35.7	35.6	43.2	53.8	63.5	81.0	85.6	89.4	69.2	55.5	39.6	32.7	57.1
1972	28.9	39.4	52.0	56.4	66.1	81.4	83.4	83.6	73.8	57.9	40.0	26.5	57.5
1973	28.0	34.3	42.4	46.5	65.9	79.4	83.9	88.0	67.8	63.0	42.1	36.0	56.4
1974	28.5	36.9	48.8	54.5	66.3	81.4	88.2	80.8	70.0	62.4	44.3	32.7	57.9
1975	30.5	31.0	40.6	48.7	61.4	73.5	88.5	85.0	74.4	62.2	44.4	37.7	56.5
1976	32.4	39.3	45.0	56.7	68.3	76.6	87.5	84.4	74.7	56.9	46.9	38.4	58.9
1977	32.4	43.1	41.7	59.8	69.8	85.5	87.6	81.9	78.5	63.8	45.0	36.3	60.5
1978	27.6	31.8	49.4	57.8	61.5	79.4	86.2	82.1	76.9	63.6	38.0	23.8	56.5
1979	20.0	34.0	45.6	57.9	62.7	78.9	88.8	82.4	81.3	63.0	36.9	38.5	57.5
1980	28.4	36.7	42.1	58.7	65.6	83.1	89.9	83.5	77.2	60.6	44.7	46.0	59.7
1981	44.2	42.8	51.4	62.7	63.4	80.7	88.5	86.8	79.8	56.0	51.0	38.9	62.2
1982	32.5	38.8	49.9	55.4	64.4	74.3	87.9	90.7	71.2	57.1	43.2	32.5	58.2
1983	41.2	40.7	46.2	49.3	62.0	74.0	89.1	92.1	78.3	64.9	41.5	22.5	58.5
1984	29.6	35.9	44.1	51.8	70.3	78.0	86.9	88.4	69.3	53.7	46.1	34.8	57.4
1985	25.7	30.3	45.3	60.6	71.0	78.0	88.2	84.7	67.2	59.9	32.3	30.2	56.1
1986	40.1	39.1	56.8	58.0	66.7	83.1	85.0	86.6	69.0	57.6	43.5	35.7	60.1
1987	31.9	37.0	41.7	65.8	71.4	82.1	87.6	82.7	75.8	63.4	45.8	34.8	60.0
1988	29.9	39.2	42.8	62.7	69.6	89.8	91.6	87.9	73.6	67.2	45.2	35.5	61.3
1989	37.7	21.5	49.1	60.8	69.3	76.6	91.4	86.1	73.4	58.8	48.0	34.4	58.9
1990	40.5	39.4	48.5	57.9	66.0	82.4	85.4	85.4	80.1	61.0	47.6	26.8	60.1
1991	32.3	46.6	49.6	55.0	64.1	80.5	88.3	88.9	75.5	61.5	39.9	37.2	60.0
1992	38.0	48.1	53.5	65.2	71.7	78.7	82.0	84.5	78.9	66.5	42.0	32.0	61.8
1993	30.9	31.1	48.7	55.8	69.3	74.1	82.9	84.0	73.0	60.7	39.2	37.7	57.3
1994	39.2	36.3	54.5	61.4	78.0	86.7	88.4	90.3	79.8	57.0	41.4	41.1	62.8
1995	36.5	41.4	49.2	52.8	59.1	73.3	86.5	91.6	72.7	56.9	49.3	40.1	59.1
1996	32.5	40.9	43.6	56.8	64.0	83.0	88.9	87.6	72.4	58.3	44.7	36.0	59.1
1997	31.4	35.3	50.5	48.1	67.2	79.8	85.5	83.9	74.2	61.0	44.5	31.9	57.8
1998	34.6	40.4	44.0	56.8	70.7	71.2	89.5	87.1	80.9	56.8	48.1	35.9	59.7
1999	38.5	43.9	53.1	50.1	63.8	76.3	89.8	87.5	70.2	64.3	57.4	39.7	61.2
Average	33.6	37.8	45.4	55.9	66.7	78.5	87.3	85.8	74.3	60.7	44.3	35.2	58.8

Table 1 - Climate Data for CUw Calculation

GLENROCK

Average Maximum Air Temperature, F

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1951	35.1	46.7	47.9	54.9	68.3	72.5	88.2	88.3	71.9	57.9	48.3	35.6	59.6
1952	38.8	41.8	40.6	64.3	69.5	83.8	88.4	86.3	84.0	70.2	45.4	43.3	63.0
1953	47.9	41.2	54.9	54.9	64.7	84.6	91.8	90.0	83.3	69.4	56.0	40.0	64.9
1954	44.4	53.3	44.1	64.7	70.7	81.4	94.8	88.9	80.1	63.6	57.2	44.6	65.7
1955	36.8	35.5	42.5	60.6	71.8	73.8	91.1	89.5	77.0	68.7	44.5	41.7	61.1
1956	40.8	39.4	49.6	55.6	72.2	88.3	89.2	84.0	80.8	67.7	41.3	40.9	62.5
1957	29.8	46.4	49.2	55.8	64.5	77.2	90.4	88.6	74.3	60.4	41.5	47.2	60.4
1958	43.3	44.3	41.3	54.3	76.0	80.7	83.6	90.2	80.3	67.8	49.3	42.0	62.8
1959	39.5	37.9	45.6	58.4	66.3	85.2	89.2	88.3	72.6	60.5	47.1	46.1	61.4
1960	35.5	31.9	46.7	62.2	70.8	82.4	90.8	87.5	78.2	64.7	46.3	39.5	61.4
1961	42.8	43.5	49.8	57.3	68.9	83.2	88.2	89.2	67.7	60.0	43.5	35.8	60.8
1962	30.6	39.5	43.5	63.0	70.1	75.6	83.9	87.0	77.6	67.1	55.2	44.2	61.4
1963	29.3	47.3	49.0	57.8	72.5	80.9	91.3	87.9	81.7	72.5	55.2	40.2	63.8
1964	38.0	34.5	41.1	55.2	70.7	77.3	93.6	85.6	77.4	67.5	46.8	38.9	60.6
1965	43.6	38.9	36.2	60.4	65.2	75.6	86.2	85.1	63.4	70.5	53.4	43.7	60.2
1966	36.7	37.7	54.3	56.6	77.3	80.4	94.0	86.1	77.8	62.3	50.8	40.3	62.9
1967	41.0	42.2	53.9	61.4	63.5	73.3	87.8	88.3	77.3	66.3	46.8	33.7	61.3
1968	40.1	44.7	51.6	55.5	66.0	81.2	88.9	82.8	77.0	66.6	47.2	35.5	61.4
1969	42.3	42.2	42.0	64.7	75.3	74.2	92.2	92.5	83.0	52.0	50.1	42.2	62.7
1970	38.1	48.9	43.3	52.8	72.9	82.3	91.6	93.5	75.3	58.1	47.8	41.9	62.2
1971	39.9	39.4	47.0	57.5	67.3	84.7	89.4	89.0	72.9	58.7	45.7	38.9	60.9
1972	33.5	44.2	55.0	60.1	69.6	83.1	89.1	87.2	77.6	63.5	43.8	32.9	61.6
1973	37.2	43.5	48.4	49.6	68.8	83.7	88.4	90.5	72.3	68.2	47.5	43.2	61.8
1974	33.3	42.0	50.7	58.2	71.1	83.6	90.8	86.1	75.6	66.0	50.6	37.6	62.1
1975	35.7	37.3	44.4	52.8	67.6	77.7	91.2	86.8	76.4	66.5	47.9	42.5	60.6
1976	36.5	44.3	47.4	59.2	71.9	77.8	86.9	86.9	77.5	60.2	47.3	43.0	61.6
1977	34.7	47.1	46.7	61.5	70.0	85.8	88.6	84.9	80.7	66.8	47.3	40.2	62.9
1978	31.7	33.4	53.0	59.2	64.4	80.8	88.2	83.4	78.7	66.4	40.7	28.4	59.0
1979	24.0	40.4	50.1	60.7	66.8	81.5	90.3	83.1	82.3	64.5	39.5	42.6	60.5
1980	30.9	37.1	43.3	58.3	64.3	83.1	92.1	86.8	79.3	62.7	47.1	48.7	61.1
1981	45.2	45.5	52.2	65.8	64.3	82.9	90.2	86.7	80.2	58.1	52.8	42.1	63.8
1982	36.2	41.6	50.1	56.8	65.6	72.5	88.5	91.2	72.5	58.3	44.2	36.6	59.5
1983	43.2	45.5	47.2	50.7	64.9	77.6	90.7	91.7	78.4	66.2	45.1	22.4	60.3
1984	35.7	40.3	45.5	51.6	70.5	79.1	87.1	87.7	72.0	57.1	49.3	37.1	59.4
1985	29.7	32.8	46.5	62.4	71.4	79.1	90.9	88.2	67.4	59.1	31.1	29.8	57.4
1986	41.6	41.9	59.4	59.4	70.7	87.2	86.8	88.2	70.0	61.5	47.3	41.2	62.9
1987	38.1	41.5	46.9	69.3	74.4	84.2	90.0	85.8	79.4	66.2	49.7	37.4	63.6
1988	34.6	42.9	46.9	66.7	74.9	92.2	95.8	92.0	79.8	69.0	48.1	41.3	65.4
1989	45.2	27.8	49.4	62.4	67.9	77.7	89.4	83.3	74.6	59.6	47.6	35.3	60.0
1990	42.3	41.5	46.9	58.5	66.2	83.4	85.0	83.9	76.8	58.4	47.0	27.5	59.8
1991	30.0	45.5	47.3	51.2	61.8	75.2	83.8	81.5	70.1	55.7	40.6	40.4	56.9
1992	43.3	50.7	55.7	66.0	74.2	78.5	82.1	83.0	79.0	66.0	42.1	34.6	62.9
1993	33.8	33.3	48.9	57.4	70.3	74.6	80.3	81.8	71.7	60.7	40.2	40.0	57.8
1994	40.7	37.8	54.3	60.6	77.0	86.0	88.5	87.5	79.7	60.4	45.3	44.1	63.5
1995	40.1	44.7	51.2	55.3	62.0	76.9	88.0	91.5	75.2	60.4	51.5	43.1	61.7
1996	36.9	45.6	46.8	61.8	66.0	84.6	89.7	89.0	75.9	62.9	48.4	40.6	62.4
1997	36.4	39.2	54.9	53.3	71.0	79.9	87.1	83.8	76.8	64.4	45.0	35.8	60.6
1998	37.9	41.8	44.8	57.7	71.8	72.3	88.6	86.9	81.8	58.5	50.1	39.5	61.0
1999	39.9	46.2	54.1	51.9	66.3	75.6	89.1	85.9	71.0	61.1	59.1	41.2	61.8
Average	37.6	41.5	48.2	58.5	69.2	80.3	89.0	87.2	76.5	63.3	47.3	39.3	61.5

Table 1 - Climate Data for CUw Calculation

DOUGLAS

Average Maximum Air Temperature, F

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1951	35.7	47.3	47.5	53.9	67.3	70.5	85.9	84.6	72.3	61.2	49.3	36.6	59.3
1952	42.5	42.9	41.3	64.6	69.8	84.3	86.8	85.3	81.1	68.3	42.5	41.4	62.6
1953	48.0	39.9	53.7	53.8	63.2	83.0	90.0	86.2	80.5	68.9	55.4	40.1	63.6
1954	45.5	54.4	42.8	64.1	69.2	80.5	93.2	88.1	79.9	62.6	54.6	43.3	64.9
1955	33.1	33.4	39.4	58.2	68.6	70.7	88.4	87.1	75.8	66.7	41.8	41.1	58.7
1956	38.9	37.5	47.6	52.7	68.8	86.7	85.5	81.8	79.6	66.9	42.2	42.7	60.9
1957	29.8	45.6	48.5	50.5	60.8	74.3	87.5	85.3	71.2	59.1	40.9	46.1	58.3
1958	42.0	42.0	38.9	51.3	73.6	78.0	79.9	87.1	77.5	67.0	49.4	39.3	60.5
1959	38.6	36.8	44.2	56.9	64.1	83.7	87.5	87.3	70.3	58.1	46.4	45.3	59.9
1960	35.7	33.7	48.0	61.7	70.8	80.2	90.2	87.2	79.6	64.9	45.6	39.0	61.4
1961	40.4	43.3	48.4	54.5	66.0	80.9	85.8	86.1	66.1	60.5	43.3	36.7	59.3
1962	32.4	40.9	44.6	65.4	69.7	76.8	84.3	85.5	75.5	66.3	52.6	43.6	61.5
1963	27.0	46.9	49.6	56.7	70.8	80.8	89.7	85.6	80.3	71.1	53.7	35.9	62.3
1964	37.8	35.2	40.7	52.7	67.4	76.2	91.6	83.3	77.5	67.6	49.0	37.6	59.7
1965	43.2	38.8	35.7	59.7	63.6	73.6	84.7	83.5	62.0	69.5	55.1	43.8	59.4
1966	36.2	37.1	51.9	53.0	74.5	79.0	92.7	84.5	77.5	61.4	51.0	39.6	61.5
1967	39.8	41.8	52.4	58.2	59.9	70.4	84.8	86.1	75.6	64.8	44.1	33.8	59.3
1968	39.6	43.4	51.7	52.6	61.9	76.1	86.7	81.3	74.2	64.6	47.2	35.4	59.6
1969	40.5	42.4	41.4	62.2	72.5	71.0	88.4	90.3	81.2	51.1	49.6	41.4	61.0
1970	36.0	46.4	42.1	50.7	69.2	78.6	87.9	89.4	71.6	56.7	46.4	40.3	59.6
1971	39.0	38.1	44.4	55.6	63.1	80.1	84.0	88.5	69.4	57.3	46.3	40.7	58.9
1972	33.8	44.2	55.3	56.2	66.5	79.6	82.3	83.2	73.5	60.9	42.3	31.6	59.1
1973	35.9	41.9	45.9	48.4	66.9	78.7	83.7	86.5	67.6	65.0	45.6	41.5	59.0
1974	33.6	43.6	52.0	57.0	68.9	81.4	89.3	82.3	71.9	65.1	48.9	39.6	61.1
1975	34.1	35.5	43.2	52.3	64.7	75.4	89.0	85.0	73.9	65.0	49.1	42.0	59.1
1976	36.2	44.5	47.8	56.9	68.9	75.5	87.4	85.4	75.5	59.1	47.5	43.0	60.6
1977	32.0	47.4	45.9	61.1	69.5	84.8	85.7	80.7	79.0	65.0	47.8	39.5	61.5
1978	28.5	31.3	51.9	57.8	62.0	78.8	84.6	81.3	77.6	64.7	41.3	29.3	57.4
1979	21.7	37.6	48.9	59.6	64.1	78.0	85.5	81.1	80.4	64.7	40.2	44.1	58.8
1980	32.9	37.3	44.4	59.3	65.2	82.5	88.9	82.2	77.3	61.6	48.3	47.5	60.6
1981	45.2	44.4	52.4	65.2	62.7	80.2	86.9	83.9	78.5	58.3	55.1	41.4	62.9
1982	36.1	41.9	50.2	56.6	63.6	71.5	84.9	87.2	70.6	56.7	41.9	35.6	58.1
1983	41.7	43.6	44.8	48.9	60.9	72.7	85.3	88.4	77.1	65.2	43.4	22.1	57.8
1984	35.8	41.6	45.2	50.1	69.7	76.9	87.6	87.2	70.8	58.4	50.7	38.6	59.4
1985	31.2	35.3	50.2	63.3	73.4	79.7	89.0	85.7	69.1	60.8	33.7	34.2	58.8
1986	46.4	41.4	57.5	57.2	66.7	80.7	85.3	85.9	68.9	58.8	45.4	39.3	61.1
1987	38.8	42.5	45.6	65.2	72.8	81.1	88.1	82.8	76.7	63.7	49.4	34.9	61.8
1988	33.4	41.0	45.5	64.5	72.1	88.4	89.7	87.7	75.1	66.6	47.5	40.1	62.6
1989	45.1	26.8	50.7	60.8	69.8	77.5	90.2	86.0	74.0	59.8	51.6	35.9	60.7
1990	42.7	41.1	47.5	58.4	66.2	83.0	84.7	85.6	80.8	64.7	53.2	32.8	61.7
1991	36.9	51.0	51.8	55.8	65.8	79.2	88.0	87.9	75.9	60.0	44.3	42.7	61.6
1992	45.3	51.6	53.9	65.7	72.9	79.0	81.4	82.5	78.9	64.9	42.2	35.2	62.8
1993	33.0	31.3	47.9	55.9	69.5	73.5	81.5	83.0	71.1	61.1	40.4	40.4	57.4
1994	39.0	38.4	54.7	60.9	76.2	84.3	85.6	87.9	79.8	60.4	46.1	42.9	63.0
1995	38.1	42.9	48.8	52.5	57.4	73.8	73.0	89.7	69.6	55.4	49.9	41.9	57.8
1996	33.5	43.7	44.9	59.0	63.5	80.9	86.1	86.1	73.5	61.6	48.1	38.0	59.7
1997	34.4	37.2	52.2	50.1	67.7	77.9	84.6	81.6	75.0	63.1	44.3	36.0	58.7
1998	39.6	42.9	44.3	59.5	72.8	72.1	86.3	87.1	80.7	58.2	50.6	40.5	61.2
1999	41.8	47.8	55.1	52.3	67.8	76.7	88.7	86.8	70.3	66.3	61.6	45.0	63.4
Average	37.3	41.2	47.6	57.1	67.4	78.4	86.5	85.4	74.9	62.6	47.2	39.2	60.4

Table 1 - Climate Data for CUw Calculation

CASPER/GLENROCK/DOUGLAS

Average Precipitation, inches

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	50% Nov-Mar	95% Apr-Oct
1951	0.44	0.12	0.88	1.67	1.92	2.11	1.75	0.55	1.04	1.89	0.09	0.48	12.74		
1952	0.38	1.16	1.40	0.26	4.22	1.51	0.84	0.89	0.44	0.32	0.84	0.11	12.37	1.78	8.06
1953	0.49	0.88	0.21	1.40	1.83	1.04	1.38	1.35	0.25	0.17	0.67	0.50	10.16	1.26	7.05
1954	0.28	0.22	2.08	0.44	1.32	0.56	0.42	0.66	0.33	1.45	0.19	0.35	8.32	1.88	4.92
1955	0.54	0.74	0.92	1.76	1.38	2.62	0.54	1.00	0.49	0.54	0.84	0.65	12.01	1.37	7.91
1956	0.30	0.40	0.49	1.68	2.38	0.45	0.74	0.76	0.18	0.26	1.27	0.56	9.46	1.34	6.12
1957	0.27	0.13	1.07	2.32	3.57	2.20	1.01	1.50	1.08	1.55	0.54	0.33	15.57	1.65	12.57
1958	0.22	0.35	1.59	1.83	1.04	1.32	1.88	0.49	0.29	0.05	0.66	0.37	10.08	1.52	6.56
1959	0.59	0.39	1.03	0.50	2.37	2.15	0.35	0.16	1.86	0.70	0.23	0.16	10.48	1.52	7.88
1960	0.48	0.47	0.49	0.63	1.19	0.84	1.05	0.67	0.26	0.24	1.40	0.48	8.20	0.92	4.63
1961	0.01	0.56	1.04	0.86	1.26	1.31	1.09	0.24	2.75	1.40	0.46	0.27	11.04	1.75	8.27
1962	0.70	0.51	0.30	0.77	4.67	3.42	1.84	0.43	0.74	2.02	0.48	0.26	16.15	1.12	13.21
1963	0.53	0.30	0.30	2.27	0.99	1.91	1.09	0.58	1.39	0.35	0.27	0.23	10.22	0.94	8.16
1964	0.88	0.62	0.57	2.84	2.29	1.12	0.59	0.28	0.28	0.21	0.27	0.44	10.20	1.19	7.23
1965	0.88	0.61	0.39	0.57	3.46	2.58	1.33	0.74	2.16	0.11	0.06	0.78	13.67	1.30	10.40
1966	0.26	0.55	0.41	1.10	0.37	1.21	0.50	0.98	0.71	1.36	0.30	0.39	8.13	1.03	5.91
1967	0.48	0.35	0.98	1.70	2.41	5.29	1.99	0.42	1.29	1.23	0.96	0.58	17.67	1.25	13.61
1968	0.33	0.40	0.84	1.71	2.85	2.63	0.52	0.78	0.45	0.47	0.39	0.55	11.91	1.58	8.93
1969	0.25	0.52	0.79	1.67	0.99	3.21	0.88	0.45	0.14	1.06	0.84	0.19	10.98	1.25	7.98
1970	0.71	0.28	1.53	1.70	1.45	2.92	1.60	0.10	0.34	1.27	1.06	0.65	13.60	1.77	8.90
1971	0.37	0.83	0.77	4.34	6.12	0.56	0.19	0.53	1.39	1.51	0.70	0.14	17.55	1.84	14.01
1972	1.08	0.29	1.02	1.91	1.72	1.88	1.26	2.27	0.62	1.69	0.44	0.50	14.68	1.61	10.78
1973	0.53	0.38	1.01	4.24	0.81	0.57	3.65	0.40	4.29	0.34	0.70	0.44	17.36	1.43	13.61
1974	0.52	0.39	0.27	2.38	0.38	0.60	0.50	0.86	0.78	0.96	0.23	0.33	8.21	1.16	6.14
1975	0.42	0.41	2.03	0.50	2.85	1.07	0.58	0.76	0.58	1.15	0.33	0.82	11.47	1.71	7.10
1976	0.30	0.62	0.36	2.75	3.21	1.63	0.84	0.18	1.41	1.15	0.13	0.20	12.78	1.21	10.62
1977	0.24	0.43	0.69	1.63	1.92	0.21	2.77	0.89	0.25	0.79	1.10	0.48	11.40	0.84	8.03
1978	0.48	0.48	0.59	1.26	5.62	0.85	1.70	1.10	0.18	0.73	0.64	0.84	14.47	1.57	10.87
1979	0.69	0.18	0.91	0.87	1.61	1.22	1.80	1.63	0.28	0.41	1.36	0.30	11.26	1.63	7.43
1980	0.74	0.56	0.84	0.30	3.17	0.03	0.44	0.93	0.11	0.46	0.62	0.32	8.54	1.90	5.17
1981	0.30	0.17	0.83	1.56	3.60	0.30	1.56	0.42	0.23	0.61	0.65	0.26	10.51	1.12	7.86
1982	0.40	0.18	0.34	1.52	2.64	3.54	1.74	0.67	2.61	1.12	0.74	2.07	17.57	0.93	13.14
1983	0.17	0.19	2.12	1.53	1.98	2.92	1.83	0.96	0.11	0.66	2.39	0.51	15.36	2.65	9.48
1984	0.55	0.37	1.04	1.89	1.46	0.84	1.91	0.51	0.58	0.76	0.32	0.58	10.80	2.43	7.54
1985	0.49	0.35	0.49	1.23	1.31	1.35	1.46	0.27	1.43	0.81	1.07	0.88	11.14	1.12	7.48
1986	0.18	0.73	0.55	2.01	1.26	3.68	0.98	0.27	1.17	1.80	1.14	0.18	13.96	1.71	10.61
1987	0.74	1.22	1.42	0.22	1.89	0.72	1.28	1.21	0.70	0.30	0.73	0.76	11.20	2.35	6.01
1988	0.18	0.68	0.86	0.35	1.28	0.54	0.82	0.34	0.77	0.10	0.61	0.39	6.92	1.61	3.99
1989	0.11	1.14	0.36	1.32	2.14	1.70	0.62	1.35	3.07	1.02	0.23	0.30	13.36	1.31	10.66
1990	0.43	0.54	1.27	2.01	1.79	0.55	2.76	1.15	0.40	0.87	1.17	0.41	13.36	1.39	9.06
1991	0.38	0.25	0.53	1.59	5.88	2.11	0.44	0.55	0.58	0.63	0.90	0.18	13.99	1.37	11.18
1992	0.17	0.35	1.64	0.20	1.95	2.18	1.55	0.78	0.42	0.65	0.85	0.83	11.53	1.61	7.31
1993	0.45	1.19	0.80	2.58	1.62	3.35	1.20	0.88	1.06	1.21	1.18	0.53	15.87	1.96	11.33
1994	0.47	0.59	0.35	1.44	0.83	0.24	2.10	0.85	0.61	3.43	1.18	0.39	12.27	1.56	8.82
1995	0.66	0.71	0.47	1.86	5.75	3.18	0.68	0.17	2.76	1.75	0.61	0.23	18.63	1.71	15.14
1996	0.56	0.10	0.68	2.40	2.08	0.67	0.80	0.21	0.58	1.65	0.86	0.55	11.12	1.09	7.96
1997	0.67	0.96	0.80	1.80	2.03	1.68	1.93	1.61	0.98	0.73	0.08	0.41	13.27	1.82	10.02
1998	0.68	1.02	1.16	1.14	1.05	2.42	1.53	1.26	1.14	4.94	0.41	0.20	16.95	1.68	12.81
1999	0.42	0.21	0.41	3.26	1.94	2.48	0.35	0.13	2.34	0.33	0.36	0.13	12.36	0.83	10.31
Average	0.45	0.51	0.84	1.58	2.28	1.70	1.24	0.74	0.98	1.00	0.69	0.46	12.47	1.49	9.01

Table 1 - Climate Data for CUw Calculation

CASPER

Average Precipitation, inches

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	50% Nov-Mar	95% Apr-Oct
1951	0.27	0.18	0.44	1.31	1.45	1.53	3.05	0.10	1.12	0.88	0.20	0.42	10.93		
1952	0.00	0.75	1.56	0.20	3.93	1.06	0.56	0.61	0.25	0.46	0.57	0.03	10.00	1.47	6.74
1953	0.53	1.00	0.25	0.94	1.60	1.07	1.52	0.98	0.21	0.18	0.72	0.74	9.72	1.19	6.18
1954	0.45	0.37	2.43	0.30	0.70	0.62	0.38	0.29	0.23	1.38	0.25	0.32	7.70	2.36	3.69
1955	0.59	1.01	0.99	1.44	0.73	2.07	0.27	0.81	0.65	0.47	1.19	1.04	11.26	1.58	6.12
1956	0.44	0.45	0.71	1.58	1.96	0.03	0.76	0.77	0.07	0.28	1.30	0.59	8.92	1.92	5.16
1957	0.42	0.15	0.91	2.45	3.85	1.93	1.00	1.13	1.06	1.99	0.77	0.43	16.11	1.69	12.76
1958	0.11	0.38	2.27	1.95	0.78	1.32	0.96	1.00	0.34	0.02	1.06	0.23	10.42	1.98	6.05
1959	0.58	0.81	1.32	0.74	1.99	1.79	0.27	0.23	1.99	0.71	0.27	0.25	10.75	1.90	7.33
1960	0.71	0.85	0.42	1.08	0.56	0.40	0.59	0.57	0.41	0.27	1.03	0.47	7.34	1.25	3.67
1961	0.04	0.51	1.16	0.95	0.71	0.54	1.21	0.08	2.46	1.12	0.56	0.82	9.96	1.61	6.72
1962	0.85	0.44	0.55	0.93	3.80	1.75	1.24	0.25	1.14	2.48	0.34	0.23	14.00	1.51	11.01
1963	0.38	0.49	0.35	2.07	0.80	0.94	1.20	0.39	0.33	0.33	0.31	0.31	7.90	0.90	5.78
1964	0.75	0.72	0.66	3.09	2.17	0.59	0.72	0.47	0.34	0.23	0.66	0.47	10.87	1.38	7.23
1965	0.78	0.37	0.52	0.96	2.64	2.47	1.16	0.21	2.07	0.00	0.07	0.87	12.12	1.40	9.03
1966	0.30	0.43	0.49	1.29	0.30	1.12	0.46	1.03	0.39	1.33	0.43	0.57	8.14	1.08	5.62
1967	0.58	0.85	0.66	1.24	1.62	3.75	1.46	0.41	1.67	1.37	1.09	0.62	15.32	1.45	10.94
1968	0.33	0.46	0.92	1.18	3.35	1.86	1.02	0.61	0.30	0.58	0.56	0.71	11.88	1.81	8.46
1969	0.08	0.55	1.10	1.52	0.85	2.39	0.70	0.78	0.16	1.43	0.96	0.16	10.68	1.50	7.44
1970	0.59	0.27	1.53	1.57	2.03	2.01	0.73	0.16	0.21	1.01	1.01	0.89	12.01	1.76	7.33
1971	0.19	0.80	1.17	3.40	5.59	0.17	0.11	0.11	0.74	1.73	0.61	0.34	14.96	2.03	11.26
1972	0.98	0.41	1.41	1.43	0.78	0.83	1.04	1.52	0.37	2.04	0.66	0.41	11.86	1.88	7.59
1973	0.83	0.57	0.52	3.85	1.02	0.88	2.26	0.34	3.28	0.60	0.80	0.55	15.08	1.40	11.41
1974	0.69	0.42	0.37	3.90	0.62	0.60	0.75	1.00	0.83	1.15	0.46	0.22	11.01	1.42	8.41
1975	0.51	0.51	2.01	0.97	3.88	0.94	0.63	0.12	0.11	1.01	0.51	0.72	11.92	1.86	7.28
1976	0.44	0.89	0.50	1.52	2.69	1.66	1.07	0.31	1.15	1.21	0.08	0.38	11.91	1.53	9.13
1977	0.35	0.69	1.05	1.07	1.93	0.19	1.88	0.34	0.30	0.71	0.79	0.71	10.01	1.28	6.10
1978	0.70	0.75	0.93	1.05	6.46	1.40	2.62	0.93	0.26	0.40	0.94	1.20	17.84	1.94	12.46
1979	0.81	0.39	1.31	0.83	2.24	1.31	1.22	2.66	0.18	0.50	0.75	0.36	12.56	2.33	8.49
1980	0.81	0.63	1.19	0.35	2.82	0.10	0.85	0.65	0.10	0.64	0.74	0.37	9.25	1.87	5.23
1981	0.46	0.23	0.77	1.58	3.51	0.37	1.27	0.50	0.23	0.76	0.75	0.43	10.84	1.29	7.79
1982	0.41	0.33	0.60	1.25	2.10	4.15	1.92	0.88	3.40	1.18	0.55	3.71	20.48	1.26	14.14
1983	0.42	0.35	2.29	2.28	1.40	3.76	2.61	0.75	0.20	0.88	2.71	0.75	18.40	3.86	11.29
1984	1.19	0.48	1.59	2.23	1.33	1.34	2.24	0.25	0.50	0.71	0.70	0.78	13.34	3.36	8.17
1985	0.79	0.61	0.52	1.25	1.37	1.32	1.57	0.09	1.09	0.46	1.56	1.05	11.68	1.70	6.79
1986	0.36	0.89	0.55	1.89	1.33	4.04	0.88	0.27	1.31	2.63	1.48	0.27	15.90	2.21	11.73
1987	1.41	1.42	1.43	0.35	1.40	0.70	1.91	1.80	0.59	0.55	0.77	0.63	12.96	3.01	6.94
1988	0.28	0.79	0.71	0.71	1.24	0.28	0.55	0.16	0.74	0.12	0.48	0.50	6.56	1.59	3.61
1989	0.16	1.37	0.49	0.72	2.77	1.95	0.28	1.00	3.22	1.16	0.34	0.31	13.77	1.50	10.55
1990	0.27	0.70	1.13	1.35	1.09	0.66	2.15	1.89	0.52	0.90	1.27	0.61	12.54	1.38	8.13
1991	0.54	0.38	0.45	1.42	4.75	1.70	0.09	0.61	0.40	0.55	1.18	0.34	12.41	1.63	9.04
1992	0.17	0.35	1.27	0.08	2.05	0.79	1.51	0.86	0.29	0.22	0.90	0.88	9.37	1.86	5.51
1993	0.72	1.00	0.52	2.37	2.85	2.79	0.86	1.14	0.97	1.14	0.87	0.68	15.91	2.01	11.51
1994	0.60	0.82	0.57	0.90	0.37	0.22	2.66	0.85	0.68	4.17	1.79	0.37	14.00	1.77	9.36
1995	0.84	0.94	0.50	1.66	6.31	3.62	0.43	0.04	2.56	1.07	0.82	0.34	18.93	2.22	14.91
1996	0.94	0.24	0.56	1.72	1.29	0.83	1.26	0.32	0.47	1.62	1.06	0.51	10.82	1.35	7.13
1997	0.57	0.89	0.92	1.79	1.99	1.21	1.46	0.76	1.21	0.83	0.08	0.53	12.04	1.88	8.79
1998	0.49	0.56	0.52	1.00	0.73	2.67	1.99	0.59	0.79	4.62	0.42	0.10	14.48	1.09	11.77
1999	0.22	0.30	0.45	1.53	2.29	1.78	0.24	0.11	1.30	0.25	0.38	0.10	8.93	0.75	7.13
Average	0.53	0.59	0.93	1.45	2.12	1.45	1.18	0.65	0.88	1.03	0.77	0.58	12.15	1.72	8.31

Table 1 - Climate Data for CUw Calculation

GLENROCK

Average Precipitation, Inches

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	50% Nov-Mar	95% Apr-Oct
1951	0.48	0.02	0.72	1.64	2.18	2.05	1.01	0.78	1.10	2.68	0.00	0.81	13.27		
1952	0.90	1.50	1.27	0.28	5.32	2.43	0.69	0.99	0.64	0.18	0.76	0.06	15.02	2.14	10.00
1953	0.31	0.53	0.11	1.51	3.31	0.94	1.42	2.13	0.31	0.24	0.34	0.28	11.43	0.89	9.37
1954	0.22	0.06	1.73	0.64	2.10	0.49	0.52	0.46	0.15	1.56	0.12	0.25	8.31	1.32	5.63
1955	0.47	0.66	0.71	2.83	1.53	2.97	0.55	1.30	0.37	0.77	0.49	0.33	12.78	1.11	9.61
1956	0.24	0.46	0.43	1.77	2.76	0.57	0.65	0.82	0.36	0.31	1.31	0.47	10.15	0.98	6.88
1957	0.15	0.12	1.28	2.37	3.11	2.43	0.95	1.58	0.91	1.37	0.19	0.21	14.67	1.67	12.08
1958	0.50	0.31	1.22	1.58	0.98	1.34	1.78	0.04	0.20	0.09	0.56	0.28	8.86	1.22	5.69
1959	0.57	0.20	0.84	0.31	2.69	2.20	0.44	0.09	1.83	0.86	0.11	0.08	10.22	1.23	8.00
1960	0.45	0.26	0.52	0.57	1.31	0.61	1.33	0.69	0.25	0.37	2.08	0.57	8.99	0.71	4.87
1961	0.00	0.67	1.35	0.69	1.79	1.23	1.48	0.32	3.20	1.80	0.69	0.08	13.28	2.33	9.97
1962	0.55	0.48	0.18	0.69	5.51	4.27	2.57	0.60	0.30	2.24	0.61	0.25	18.25	0.99	15.37
1963	0.48	0.12	0.37	2.12	1.11	3.55	0.52	0.88	3.22	0.17	0.35	0.15	13.04	0.92	10.99
1964	1.05	0.79	0.66	2.97	2.83	1.34	0.85	0.33	0.45	0.29	0.09	0.43	11.88	1.50	8.42
1965	1.02	1.21	0.43	0.11	3.93	3.38	1.25	0.98	2.38	0.11	0.02	0.76	15.58	1.59	11.53
1966	0.22	0.67	0.40	1.04	0.45	1.72	0.62	1.29	0.79	1.37	0.19	0.35	9.11	1.04	6.92
1967	0.51	0.20	1.20	1.73	2.67	6.41	2.94	0.72	1.12	1.52	0.84	0.49	20.55	1.23	16.44
1968	0.42	0.32	0.88	1.78	2.29	3.25	0.21	0.81	0.39	0.44	0.26	0.67	11.72	1.48	8.71
1969	0.16	0.59	0.67	1.66	1.12	4.30	0.48	0.26	0.25	0.92	0.69	0.15	11.23	1.18	8.52
1970	0.97	0.28	1.78	1.68	0.94	3.70	2.10	0.00	0.20	1.73	0.89	0.80	14.87	1.84	9.83
1971	0.54	1.08	0.71	5.28	7.70	1.06	0.19	0.94	1.92	1.89	0.72	0.00	21.83	1.91	17.84
1972	1.10	0.26	0.41	2.22	2.28	3.09	0.67	2.04	0.80	1.98	0.30	0.80	15.95	1.25	12.43
1973	0.84	0.29	1.33	5.67	0.90	0.46	4.16	0.35	5.43	0.31	0.59	0.48	20.81	1.78	16.42
1974	0.36	0.57	0.25	1.78	0.30	0.00	0.50	1.00	0.80	1.00	0.00	0.50	7.06	1.13	5.11
1975	0.18	0.27	3.02	0.24	1.97	1.16	0.54	1.07	0.45	1.42	0.37	0.80	11.47	1.98	6.51
1976	0.15	0.39	0.29	3.19	3.84	1.57	1.05	0.12	1.70	1.50	0.09	0.07	13.96	1.00	12.32
1977	0.08	0.50	0.55	1.84	2.24	0.15	4.24	1.23	0.26	1.12	1.41	0.33	13.93	0.64	10.53
1978	0.26	0.38	0.52	1.73	6.18	0.58	1.27	1.50	0.19	0.95	0.30	0.88	14.72	1.45	11.78
1979	0.51	0.08	0.98	1.03	1.49	0.85	1.41	1.30	0.38	0.39	2.54	0.17	11.11	1.38	6.49
1980	0.92	0.41	0.48	0.33	2.30	0.00	0.15	1.00	0.16	0.22	0.84	0.29	7.10	2.26	3.95
1981	0.32	0.10	0.89	1.86	4.02	0.24	1.60	0.35	0.36	0.61	0.63	0.28	11.26	1.22	8.59
1982	0.63	0.08	0.13	2.89	2.80	4.26	0.24	0.14	1.91	0.77	0.91	1.25	15.81	0.88	12.17
1983	0.00	0.13	1.99	1.22	1.87	2.91	0.37	0.63	0.06	0.89	2.44	0.39	12.70	2.14	7.36
1984	0.10	0.21	0.73	1.75	1.44	0.00	1.25	0.85	0.68	1.12	0.15	0.32	8.60	1.94	6.74
1985	0.19	0.03	0.45	1.39	1.51	1.56	0.90	0.34	1.34	1.16	0.68	1.08	10.81	0.57	7.79
1986	0.01	0.51	0.66	1.46	1.40	2.39	0.49	0.20	0.87	1.55	0.79	0.17	10.50	1.48	7.94
1987	0.49	1.41	1.65	0.13	1.55	0.47	0.87	0.87	0.50	0.11	0.52	0.98	9.53	2.26	4.28
1988	0.11	0.77	0.48	0.07	1.33	0.65	0.78	0.40	0.86	0.18	0.76	0.30	6.47	1.42	3.85
1989	0.15	1.20	0.21	1.85	2.06	1.52	0.91	1.12	3.59	0.99	0.11	0.20	13.91	1.31	11.44
1990	0.36	0.31	0.87	2.14	1.52	0.49	3.31	0.90	0.21	1.19	1.08	0.38	12.76	0.93	9.27
1991	0.31	0.22	0.38	1.47	5.40	1.91	0.58	0.69	0.30	0.77	0.54	0.00	12.57	1.19	10.56
1992	0.20	0.38	1.85	0.15	1.93	2.32	1.74	0.48	0.78	1.85	0.92	0.87	12.85	1.39	8.58
1993	0.27	1.08	0.58	1.55	0.81	2.85	1.68	0.42	1.08	0.92	1.55	0.50	13.27	1.75	8.64
1994	0.37	0.57	0.25	1.24	0.27	0.29	1.83	0.06	0.89	1.97	0.79	0.27	8.60	1.62	6.03
1995	0.66	0.87	0.51	1.52	5.30	2.39	0.53	0.09	2.83	1.99	0.78	0.12	17.39	1.45	13.92
1996	0.26	0.02	0.79	3.35	2.27	0.31	0.30	0.02	0.74	1.58	0.84	0.58	11.06	0.99	8.14
1997	0.73	1.33	0.53	1.23	1.81	1.42	1.38	2.09	0.81	0.54	0.11	0.21	11.99	2.01	8.63
1998	0.34	0.39	1.11	1.17	0.62	1.86	0.99	0.82	1.05	3.43	0.32	0.01	12.21	1.08	9.54
1999	0.09	0.09	0.15	3.17	1.37	2.84	0.37	0.08	2.78	0.31	0.14	0.05	11.44	0.33	10.37
Average	0.41	0.47	0.80	1.64	2.38	1.81	1.16	0.74	1.08	1.04	0.65	0.39	12.54	1.38	9.30

Table 1 - Climate Data for CUw Calculation

DOUGLAS

Average Precipitation, inches

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	50% Nov-Mar	95% Apr-Oct
1951	0.57	0.18	0.88	2.07	2.14	2.74	1.18	0.76	0.89	2.12	0.08	0.42	14.03		
1952	0.23	1.24	1.38	0.31	3.40	1.03	1.26	1.07	0.42	0.33	1.18	0.23	12.08	1.68	7.43
1953	0.62	1.11	0.27	1.74	0.58	1.12	1.20	0.95	0.23	0.10	0.95	0.47	9.34	1.71	5.62
1954	0.18	0.24	2.08	0.37	1.16	0.57	0.36	1.23	0.61	1.44	0.21	0.49	8.94	1.96	5.45
1955	0.55	0.55	1.05	1.20	1.89	2.83	0.79	0.89	0.46	0.37	0.84	0.58	12.00	1.43	8.01
1956	0.21	0.30	0.32	1.72	2.42	0.74	0.82	0.68	0.10	0.18	1.19	0.62	9.30	1.13	6.33
1957	0.25	0.11	1.01	2.15	3.74	2.23	1.08	1.80	1.26	1.28	0.68	0.35	15.92	1.59	12.86
1958	0.05	0.35	1.29	1.97	1.37	1.31	2.90	0.43	0.32	0.04	0.35	0.59	10.97	1.35	7.92
1959	0.62	0.36	0.94	0.44	2.43	2.45	0.35	0.15	1.75	0.54	0.31	0.14	10.48	1.43	7.70
1960	0.28	0.30	0.54	0.25	1.71	1.51	1.22	0.75	0.11	0.08	1.12	0.40	8.27	0.79	5.35
1961	0.00	0.49	0.62	0.34	1.28	2.15	0.61	0.31	2.58	1.28	0.13	0.10	9.89	1.32	8.12
1962	0.69	0.61	0.17	0.70	4.71	4.25	1.71	0.43	0.78	1.35	0.49	0.31	16.20	0.85	13.23
1963	0.73	0.29	0.19	2.83	1.07	1.25	1.54	0.48	0.63	0.54	0.14	0.22	9.71	1.01	7.73
1964	0.25	0.36	0.40	2.47	2.08	1.44	0.21	0.03	0.05	0.10	0.08	0.43	7.86	0.69	6.04
1965	0.85	0.24	0.23	0.64	3.82	1.88	1.57	1.03	2.02	0.22	0.08	0.72	13.30	0.91	10.62
1966	0.25	0.55	0.35	0.96	0.37	0.79	0.41	0.61	0.94	1.37	0.29	0.25	7.14	0.98	5.18
1967	0.34	0.21	1.08	2.14	2.73	5.70	1.58	0.12	1.09	0.79	0.95	0.42	17.15	1.09	13.44
1968	0.25	0.43	0.71	2.17	2.90	2.79	0.34	0.86	0.67	0.39	0.34	0.27	12.12	1.38	9.61
1969	0.51	0.42	0.60	1.82	1.00	2.93	1.48	0.32	0.00	0.84	0.86	0.26	11.04	1.07	7.97
1970	0.58	0.29	1.29	1.86	1.38	3.04	1.98	0.13	0.61	1.08	1.29	0.46	13.93	1.63	9.54
1971	0.39	0.61	0.42	4.34	5.07	0.75	0.27	0.55	1.51	1.11	0.76	0.07	15.85	1.59	12.92
1972	1.15	0.21	1.25	2.07	2.13	1.71	2.08	3.25	0.69	1.04	0.35	0.29	16.22	1.72	12.32
1973	0.12	0.28	1.18	3.19	0.52	0.58	4.61	0.50	4.16	0.12	0.72	0.28	16.28	1.11	13.00
1974	0.51	0.18	0.20	1.46	0.23	1.19	0.26	0.58	0.70	0.74	0.22	0.28	6.55	0.95	4.90
1975	0.58	0.44	1.07	0.30	2.70	1.12	0.56	1.09	1.11	1.02	0.11	0.93	11.03	1.30	7.51
1976	0.30	0.58	0.30	3.55	3.11	1.67	0.40	0.10	1.39	0.73	0.20	0.14	12.47	1.11	10.40
1977	0.31	0.10	0.48	1.97	1.58	0.30	2.18	1.10	0.20	0.54	1.11	0.40	10.27	0.62	7.48
1978	0.48	0.31	0.32	1.00	4.22	0.59	1.20	0.87	0.09	0.85	0.69	0.44	11.06	1.31	8.38
1979	0.78	0.07	0.44	0.74	1.09	1.51	2.77	0.94	0.30	0.33	0.80	0.36	10.11	1.20	7.30
1980	0.50	0.64	0.86	0.21	4.40	0.00	0.31	1.15	0.07	0.53	0.28	0.31	9.26	1.58	6.34
1981	0.12	0.17	0.82	1.25	3.28	0.29	1.80	0.40	0.11	0.48	0.58	0.14	9.42	0.85	7.21
1982	0.15	0.13	0.30	0.61	3.02	2.21	3.07	0.99	2.51	1.41	0.77	1.25	16.42	0.65	13.13
1983	0.10	0.10	2.07	1.08	2.68	2.09	2.51	1.50	0.06	0.40	2.01	0.39	14.99	2.15	9.80
1984	0.37	0.42	0.79	1.70	1.60	1.18	2.23	0.42	0.55	0.44	0.11	0.64	10.45	1.99	7.71
1985	0.49	0.42	0.50	1.04	1.04	1.18	1.91	0.38	1.86	0.81	1.00	0.51	11.14	1.08	7.81
1986	0.17	0.80	0.45	2.68	1.05	4.60	1.58	0.35	1.34	1.23	1.14	0.10	15.47	1.47	12.17
1987	0.33	0.83	1.19	0.19	2.73	0.98	1.05	0.98	1.01	0.25	0.90	0.69	11.11	1.80	6.81
1988	0.15	0.47	1.40	0.27	1.26	0.70	1.14	0.46	0.92	0.00	0.60	0.37	7.74	1.81	4.51
1989	0.03	0.85	0.37	1.40	1.58	1.62	0.67	1.92	2.41	0.92	0.24	0.39	12.40	1.11	9.99
1990	0.67	0.61	1.81	2.55	2.75	0.51	2.83	0.65	0.47	0.52	1.17	0.24	14.78	1.86	9.77
1991	0.30	0.14	0.76	1.87	7.48	2.71	0.65	0.35	1.04	0.58	0.98	0.14	17.00	1.31	13.95
1992	0.15	0.31	2.01	0.38	1.87	3.37	1.39	0.95	0.21	0.07	0.74	0.93	12.38	1.80	7.83
1993	0.38	1.50	0.89	3.82	1.21	4.40	1.07	1.09	1.20	1.56	1.12	0.41	18.43	2.11	13.83
1994	0.45	0.37	0.23	2.17	1.24	0.20	1.80	1.63	0.48	4.16	0.97	0.53	14.21	1.29	11.08
1995	0.49	0.53	0.41	1.79	5.65	3.46	1.09	0.39	2.89	2.20	0.44	0.24	19.58	1.47	16.60
1996	0.48	0.05	0.88	2.12	2.67	0.88	0.83	0.29	0.53	1.74	0.67	0.55	11.49	0.95	8.81
1997	0.71	0.85	0.38	1.79	2.50	2.34	2.95	1.99	0.93	0.82	0.08	0.48	15.78	1.57	12.65
1998	1.22	2.11	1.84	1.26	1.50	2.93	1.61	2.37	1.57	6.77	0.50	0.48	24.16	2.86	17.11
1999	0.94	0.25	0.63	5.14	2.15	2.82	0.45	0.20	2.94	0.43	0.58	0.23	16.78	1.40	13.42
Average	0.42	0.47	0.80	1.63	2.34	1.85	1.38	0.83	0.99	0.94	0.64	0.41	12.70	1.37	9.43

Table 3 - Crop Yield Data for CUw Calculation
Carbon County - Above Pathfinder

	NASS Annual Reports					Calculated Y_{aw}	
Year	Alfalfa ton/acre	Other Hay ton/acre	Grains bu/acre	Corn bu/acre	Potatoes cwt/acre	Alfalfa ton/acre	Other Hay ton/acre
1952	1.50	0.78	34.6		90	1.85	0.83
1953	1.60	0.75	35.3		150	1.89	0.85
1954	1.05	0.64	30.9		80	1.92	0.87
1955	1.50	0.72	26.0		56	1.96	0.89
1956	2.00	0.61	38.7		90	1.99	0.91
1957	2.00	0.93	48.2		60	2.02	0.92
1958	2.30	0.98	45.0		50	2.06	0.94
1959	1.58	0.91	34.7		75	2.09	0.96
1960	1.35	0.73	39.0			2.12	0.98
1961	1.75	0.90	39.5			2.15	1.00
1962	1.60	0.93	41.7			2.18	1.02
1963	1.70	0.82	42.0			2.20	1.04
1964	1.68	0.93	41.4			2.23	1.06
1965	2.41	0.90	42.2			2.26	1.08
1966	2.16	1.01	39.2			2.28	1.10
1967	2.32	1.24	48.5			2.31	1.12
1968	1.92	0.95	46.3			2.33	1.14
1969	2.27	1.11	47.1			2.35	1.16
1970	1.92	1.07	50.1			2.38	1.18
1971	2.20	1.16	50.9			2.40	1.20
1972	1.90	1.11	51.6	70		2.42	1.22
1973	1.90	1.13	44.5	74		2.44	1.24
1974	1.90	1.19	41.3	78		2.46	1.27
1975	2.06	1.10	42.2	63		2.48	1.29
1976	1.50	1.20	47.4	55		2.49	1.31
1977	1.60	0.98	44.4	55		2.51	1.33
1978	1.60	1.30	62.5	61		2.53	1.35
1979	2.00	1.40	47.3			2.54	1.38
1980	2.10	1.30	68.3			2.56	1.40
1981	2.20	1.40	46.4			2.57	1.42
1982	2.47	1.59	56.4			2.58	1.44
1983	2.67	1.62	55.2			2.59	1.47
1984	2.20	1.60	59.5			2.60	1.49
1985	2.29	1.66	53.9			2.61	1.51
1986	1.71	1.37	63.6			2.62	1.54
1987	1.64	1.57	59.1			2.63	1.56
1988	2.12	1.36	54.1			2.64	1.59
1989	2.24	0.87	54.2			2.65	1.61
1990	1.65	1.27	57.7			2.65	1.64
1991	2.10	1.34	52.3			2.66	1.66
1992	2.10	1.30	45.4			2.66	1.68
1993	2.10	1.80	61.3			2.67	1.71
1994	2.00	1.42	48.3			2.67	1.73
1995	2.40	1.70	49.0			2.67	1.76
1996	2.10	1.50	76.7			2.68	1.79
1997	2.60	1.60	57.2			2.68	1.81
1998	2.30	1.80	71.0			2.68	1.84
1999	2.20	1.70	70.0			2.67	1.86

Table 3 - Crop Yield Data for CUw Calculation
Natrona County Yield Data

	NASS Annual Reports						
Year	Alfalfa ton/acre	Other Hay ton/acre	Grains bu/acre	Corn bu/acre	Beans lbs/acre	Beets ton/acre	Potatoes cwt/acre
1952	2.00	0.75	26.8	10	1,400		90
1953	2.00	0.79	27.7		1,429		140
1954	1.79	0.55	24.9	10	1,167		135
1955	2.00	0.90	19.7		933		120
1956	2.10	1.09	38.6		1,100		120
1957	2.05	1.20	37.6		1,200		105
1958	2.10	1.04	32.8	40	1,400		150
1959	1.71	0.87	27.5	49	1,377		160
1960	1.30	1.02	37.5	38	1,400		160
1961	1.91	0.97	33.9	43	1,700		140
1962	2.30	0.96	38.3	65	1,100		
1963	2.40	0.77	37.9	50	1,600		
1964	2.08	0.89	35.9	46			
1965	2.14	1.02	47.3	50		8.5	
1966	2.09	0.87	35.2	60			
1967	2.40	1.12	47.0	64			
1968	1.95	1.00	50.8	60			
1969	1.84	1.12	37.6	58			
1970	2.00	1.10	56.3	60			
1971	2.25	1.07	53.3	73			
1972	2.42	1.00	54.8	70			
1973	2.46	1.60	48.8	73			
1974	2.21	0.80	45.6	50			
1975	2.50	1.30	49.2	55			
1976	2.57	1.00	59.5	55			
1977	2.10	0.80	49.9	55			
1978	2.19	1.30	59.9	61			
1979	2.24	1.20	63.5	75			
1980	2.60	0.90	54.9	85			
1981	2.60	1.20	48.4	74			
1982	3.54	2.40	65.8	87			
1983	2.90	1.85	61.3	78			
1984	2.30	1.20	55.2	65			
1985	1.21	1.24	50.6	60			
1986	2.27	1.90	53.2	76			
1987	2.04	1.67	51.1	80			
1988	1.93	1.55	37.3	90			
1989	2.18	0.78	51.8	85			
1990	2.25	1.01	46.6	90			
1991	2.30	1.70	54.6	94			
1992	2.50	0.90	66.2	38			
1993	2.80	1.80	66.7	89			
1994	2.40	0.90	56.3	89			
1995	3.00	1.80	90.7	89			
1996	2.60	1.30	57.3	103			
1997	3.10	1.60	70.0	120			
1998	2.10	2.00	80.1				
1999	2.80	1.60	82.6				

Table 3 - Crop Yield Data for CUw Calculation
Converse County Yield Data

	NASS Annual Reports						
Year	Alfalfa ton/acre	Other Hay ton/acre	Grains bu/acre	Corn bu/acre	Beans lbs/acre	Beets ton/acre	Potatoes cwt/acre
1952	2.10	0.94	33.9	23	1,458	11.0	220
1953	1.50	1.00	32.5	0	1,418	5.0	250
1954	1.27	0.67	19.0	30	1,100	6.5	60
1955	1.60	1.10	32.8	30	1,000	12.0	140
1956	1.70	0.63	20.9	25	1,300	12.3	140
1957	1.90	1.30	33.5	35	1,040	11.7	130
1958	1.70	0.90	37.7	38	1,563	12.9	150
1959	1.49	0.95	32.1	39	1,096	12.9	70
1960	1.50	1.10	24.8	38	1,200	12.2	115
1961	1.75	0.98	39.4	54	1,600	12.0	110
1962	1.70	0.99	41.8	25	943	11.6	
1963	1.80	0.93	41.6	37	1,825	13.8	
1964	1.55	0.95	38.7	40	1,060	9.7	
1965	2.09	1.04	39.0	24	1,100	6.8	
1966	2.14	1.03	33.1	40	1,300	9.1	
1967	2.18	1.28	46.2	41	1,600	11.9	
1968	1.94	0.99	50.0	40	1,500	8.7	
1969	2.29	1.07	48.9	28	1,500	18.1	
1970	2.62	1.24	48.6	50	1,541	12.5	
1971	2.66	1.15	45.3	59	1,657	13.2	
1972	2.03	1.16	56.3	57	1,775	14.7	
1973	2.30	1.20	48.7		1,750	10.3	
1974	2.20	1.40	35.7	68	1,720		
1975	2.30	0.90	43.0	68	1,540		
1976	2.40	1.10	52.3	71	1,600		
1977	1.90	1.00	29.7	81	1,423		
1978	2.10	0.90	54.7	91	1,580		
1979	2.20	0.90	37.9	80	1,900		
1980	2.00	1.39	47.4	90	1,880		
1981	2.20	1.40	44.5	84	1,700		
1982	2.03	1.70	57.1	84	1,500		
1983	2.24	2.20	54.9	85	1,460		
1984	2.00	1.40	51.5	94	1,900		
1985	1.64	1.27	55.2	94	1,800		
1986	2.24	0.90	56.6	94	1,800		
1987	2.00	1.36	45.0	92	1,900		
1988	1.65	0.75	36.7	126	2,000		
1989	1.83	0.70	45.3	91	1,700		
1990	2.36	1.00	52.4	120	1,750		
1991	2.40	1.60	63.1	99	1,700		
1992	2.00	1.30	60.0	97			
1993	2.70	1.90	58.3	80			
1994	2.10	1.20	51.3	96			
1995	2.80	1.70	86.0	96			
1996	2.40	1.60	57.0	96			
1997	2.60	1.80	57.2	110			
1998	2.20	1.60	73.3	90			
1999	2.60	1.90	67.0	100			

Table 3 - Crop Yield Data for CUw Calculation
Pathfinder to Guernsey Yield Data

	Acreage-Weighted Average from NASS Annual Reports							Calculated Y_{ann}				
Year	Alfalfa ton/ac	Other Hay ton/ac	Small Grains bu/ac	Corn bu/ac	Beans lbs/ac	Beets ton/ac	Potatoes cwt/ac	Alfalfa ton/ac	Other Hay ton/ac	Grains bu/ac	Corn bu/ac	Beans lbs/ac
1952	2.07	0.87	32.4	22.4	1,450	11.0	199	1.88	1.00	32.5	21.7	1,446
1953	1.65	0.93	31.7	0.0	1,420	5.0	234	1.91	1.01	33.4	24.5	1,463
1954	1.51	0.60	19.7	28.2	1,121	6.5	130	1.94	1.01	34.2	27.3	1,481
1955	1.79	0.99	31.2	30.0	980	12.0	123	1.96	1.02	35.1	30.1	1,498
1956	1.89	0.88	29.9	25.0	1,250	12.3	122	1.98	1.02	35.9	32.8	1,515
1957	1.97	1.25	35.7	35.0	1,067	11.7	108	2.01	1.03	36.8	35.5	1,532
1958	1.85	0.96	35.3	38.7	1,545	12.9	150	2.03	1.04	37.6	38.1	1,548
1959	1.57	0.91	30.3	42.1	1,138	12.9	149	2.06	1.05	38.5	40.7	1,565
1960	1.43	1.05	30.3	38.0	1,260	12.2	155	2.08	1.06	39.4	43.2	1,581
1961	1.81	0.97	37.0	48.5	1,640	12.0	136	2.11	1.07	40.3	45.7	1,597
1962	1.92	0.98	40.3	39.5	1,000	11.6		2.13	1.08	41.2	48.2	1,612
1963	2.03	0.84	40.4	46.8	1,738	13.8		2.15	1.09	42.1	50.6	1,628
1964	1.76	0.92	37.8	45.3	1,060	9.7		2.18	1.10	43.0	53.0	1,643
1965	2.11	1.03	41.9	43.5	1,100	7.0		2.20	1.12	44.0	55.4	1,659
1966	2.12	0.94	34.0	55.4	1,300	9.1		2.22	1.13	44.9	57.7	1,674
1967	2.27	1.20	46.5	60.7	1,600	11.9		2.24	1.14	45.9	59.9	1,688
1968	1.95	1.00	50.3	54.5	1,500	8.7		2.27	1.16	46.8	62.1	1,703
1969	2.07	1.10	43.7	47.7	1,500	18.1		2.29	1.17	47.8	64.3	1,718
1970	2.32	1.17	51.9	56.5	1,541	12.5		2.31	1.19	48.7	66.4	1,732
1971	2.46	1.11	49.0	68.3	1,657	13.2		2.33	1.20	49.7	68.5	1,746
1972	2.22	1.10	55.6	66.3	1,775	14.7		2.36	1.22	50.7	70.6	1,760
1973	2.37	1.35	48.7	73.0	1,750	10.3		2.38	1.24	51.7	72.6	1,773
1974	2.20	1.16	38.5	56.8	1,720			2.40	1.26	52.7	74.6	1,787
1975	2.39	1.09	45.0	61.9	1,540			2.42	1.27	53.7	76.5	1,800
1976	2.47	1.05	54.6	62.7	1,600			2.44	1.29	54.7	78.4	1,813
1977	1.98	0.90	35.7	64.1	1,423			2.46	1.31	55.8	80.2	1,826
1978	2.14	1.11	56.3	74.1	1,580			2.49	1.33	56.8	82.0	1,839
1979	2.22	1.03	43.9	77.5	1,900			2.51	1.35	57.9	83.8	1,851
1980	2.25	1.19	49.3	86.9	1,880			2.53	1.38	58.9	85.5	1,864
1981	2.38	1.32	45.9	79.3	1,700			2.55	1.40	60.0	87.2	1,876
1982	2.73	2.02	60.9	85.4	1,500			2.57	1.42	61.1	88.9	1,888
1983	2.50	2.01	57.7	81.8	1,460			2.59	1.44	62.1	90.5	1,899
1984	2.11	1.28	52.8	85.8	1,900			2.61	1.47	63.2	92.0	1,911
1985	1.46	1.25	53.3	79.6	1,800			2.63	1.49	64.3	93.5	1,922
1986	2.25	1.53	55.1	86.0	1,800			2.65	1.52	65.4	95.0	1,933
1987	2.01	1.49	47.3	88.5	1,900			2.67	1.54	66.5	96.4	1,944
1988	1.75	1.08	36.9	116.5	2,000			2.69	1.57	67.7	97.8	1,955
1989	1.95	0.73	48.0	88.2	1,700			2.71	1.60	68.8	99.2	1,966
1990	2.32	1.00	49.8	105.9	1,750			2.73	1.62	69.9	100.5	1,976
1991	2.36	1.65	58.9	97.1	1,700			2.75	1.65	71.1	101.8	1,986
1992	2.17	1.08	62.5	66.7				2.76	1.68	72.2	103.0	1,996
1993	2.75	1.84	63.1	84.8				2.78	1.71	73.4	104.2	2,006
1994	2.24	0.96	53.3	91.6				2.80	1.74	74.6	105.3	2,016
1995	2.89	1.78	90.2	93.9				2.82	1.77	75.8	106.4	2,025
1996	2.48	1.39	57.2	98.9				2.84	1.80	76.9	107.5	2,034
1997	2.81	1.70	64.0	114.8				2.86	1.83	78.1	108.5	2,043
1998	2.15	1.87	77.4	90.0				2.87	1.86	79.4	109.5	2,052
1999	2.69	1.74	74.8	100.0				2.89	1.90	80.6	110.5	2,061

Table 4a - Irrigated, Non-harvested Acreage for CUw Calculation
U.S. Census of Agriculture

Year	Albany	Carbon	Natrona	Converse	Platte	Notes
1949	42,945	58,595	3,052	8,815	6,852	entry for "irrigated pasture"; data from 1954 report
1954	27,414	52,081	5,474	6,830	1,028	entry for "irrigated pasture"
1959	67,000	47,572	7,815	9,518	15,975	entry for "land irrigated" minus "irrigated cropland harvested"; data from 1964 report
1964	45,564	68,058	10,989	9,535	3,500	entry for "irrigated pasture or grazing land"
1969	34,925	57,815	7,382	9,390	9,605	sum of "used only for pasture", and "pasture, other than cropland pasture"
1974	49,931	50,065	7,687	7,852	13,607	sum of "cropland pasture irrigated", "other cropland irrigated" and "pasture irrigated, other than cropland pasture"
1978	82,179	71,692	8,977	13,502	16,679	sum of "pastureland irrigated" and "other land irrigated", Converse and Carbon values from 1982 report
1982	84,352	44,471	7,343	7,081	9,222	entry for "pastureland and other land"
1987	46,797	40,362	11,079	7,666	12,632	entry for "pastureland and other land"
1992	54,901	63,377	7,992	3,692	9,537	entry for "pastureland and other land"
1997	71,495	87,087	23,511	11,526	10,112	entry for "pastureland and other land"

Table 4b - Crop Acreage and Distribution for CUw Calculation
Carbon County

	NASS Crop Acreage						Cens. of Ag		Calculated Crop Distribution					
Year	Irr Harv Corn Acres	Irr Harv Potatoes Acres	Irr Harv Alfalfa Acres	Irr Harv Other Hay Acres	Irr Harv Grains Acres	Irr Harv Crops Total Acres	Irrigated Non-Harv Pasture Acres	TOTAL Irrigated Acres	% Irr Harv Corn	% Irr Harv Potatoes	% Irr Harv Alfalfa	% Irr Harv Other Hay	% Irr Harv Grains	% Irr Non-Harv Pasture
1952		20	9,000	115,800	2,000	126,820	76,287	203,107		0.01%	4.4%	57.0%	0.98%	37.6%
1953		20	9,100	107,900	1,680	118,700	71,402	190,102		0.01%	4.8%	56.8%	0.88%	37.6%
1954		10	11,500	74,090	980	86,580	52,081	138,661		0.01%	8.3%	53.4%	0.71%	37.6%
1955		10	12,900	80,400	770	94,080	56,593	150,673		0.01%	8.6%	53.4%	0.51%	37.6%
1956		20	13,400	80,800	2,600	96,820	58,241	155,061		0.01%	8.6%	52.1%	1.68%	37.6%
1957		20	13,800	87,800	3,000	104,620	62,933	167,553		0.01%	8.2%	52.4%	1.79%	37.6%
1958		20	13,600	75,200	2,900	91,720	55,173	146,893		0.01%	9.3%	51.2%	1.97%	37.6%
1959		10	10,800	77,750	3,270	91,830	47,572	139,402		0.01%	7.7%	55.8%	2.35%	34.1%
1960			11,000	77,200	3,900	92,100	47,712	139,812			7.9%	55.2%	2.79%	34.1%
1961			11,300	82,100	3,650	97,050	50,276	147,326			7.7%	55.7%	2.48%	34.1%
1962			11,300	91,600	3,650	106,550	55,198	161,748			7.0%	56.6%	2.26%	34.1%
1963			10,400	89,600	3,050	103,050	53,384	156,434			6.6%	57.3%	1.95%	34.1%
1964			10,600	94,750	1,840	107,190	68,058	175,248			6.0%	54.1%	1.05%	38.8%
1965			8,200	98,600	2,050	108,850	69,112	177,962			4.6%	55.4%	1.15%	38.8%
1966			8,700	88,100	1,750	98,550	62,572	161,122			5.4%	54.7%	1.09%	38.8%
1967			9,000	95,300	1,850	106,150	67,398	173,548			5.2%	54.9%	1.07%	38.8%
1968			12,000	93,000	1,450	106,450	67,588	174,038			6.9%	53.4%	0.83%	38.8%
1969			12,100	92,100	1,750	105,950	57,815	163,765			7.4%	56.2%	1.07%	35.3%
1970			12,200	98,800	1,600	112,600	61,444	174,044			7.0%	56.8%	0.92%	35.3%
1971			13,200	101,600	1,700	116,500	63,572	180,072			7.3%	56.4%	0.94%	35.3%
1972	100		12,500	96,000	1,700	110,300	60,189	170,489	0.06%		7.3%	56.3%	1.00%	35.3%
1973	200		12,000	86,000	1,750	99,950	54,541	154,491	0.13%		7.8%	55.7%	1.13%	35.3%
1974	600		12,000	81,500	2,200	96,300	50,065	146,365	0.41%		8.2%	55.7%	1.50%	34.2%
1975	400		14,000	88,000	2,100	102,500	53,288	155,788	0.26%		9.0%	55.2%	1.35%	34.2%
1976	400		11,500	100,000	2,200	114,100	59,319	173,419	0.23%		6.6%	57.7%	1.27%	34.2%
1977	400		10,000	77,500	1,700	89,600	46,582	136,182	0.29%		7.3%	56.9%	1.25%	34.2%
1978	300		10,000	95,000	1,200	106,500	71,692	178,192	0.17%		5.6%	53.3%	0.67%	40.2%
1979			11,000	92,000	1,900	104,900	70,615	175,515			6.3%	52.4%	1.08%	40.2%
1980			9,000	100,000	1,400	110,400	74,317	184,717			4.9%	54.1%	0.76%	40.2%
1981			10,500	101,000	1,800	113,300	76,270	189,570			5.5%	53.3%	0.95%	40.2%
1982			9,500	92,100	1,200	102,800	44,471	147,271			6.5%	62.5%	0.81%	30.2%
1983			9,500	90,000	1,300	100,800	43,606	144,406			6.6%	62.3%	0.90%	30.2%
1984			11,000	83,000	1,500	95,500	41,313	136,813			8.0%	60.7%	1.10%	30.2%
1985			8,000	81,000	1,400	70,400	30,455	100,855			7.9%	60.5%	1.39%	30.2%
1986			9,000	73,000	2,100	84,100	36,381	120,481			7.5%	60.6%	1.74%	30.2%
1987			8,500	58,000	2,100	68,600	40,362	106,962			7.9%	52.4%	1.96%	37.7%
1988			9,500	61,500	1,400	72,400	43,877	116,277			8.2%	52.9%	1.20%	37.7%
1989			7,500	70,000	1,300	78,800	47,758	126,558			5.9%	55.3%	1.03%	37.7%
1990			8,000	57,500	1,300	66,800	40,483	107,283			7.5%	53.6%	1.21%	37.7%
1991			15,500	74,000	1,000	90,500	54,846	145,346			10.7%	50.9%	0.69%	37.7%
1992			9,000	85,000	500	94,500	63,377	157,877			5.7%	53.8%	0.32%	40.1%
1993			10,500	88,000	400	98,900	66,328	165,228			6.4%	53.3%	0.24%	40.1%
1994			8,500	77,000	300	85,800	57,542	143,342			5.9%	53.7%	0.21%	40.1%
1995			8,000	95,000	100	103,100	69,145	172,245			4.6%	55.2%	0.06%	40.1%
1996			16,000	85,600	700	102,300	68,608	170,908			9.4%	50.1%	0.41%	40.1%
1997			14,900	81,000	500	96,400	87,087	183,487			8.1%	44.1%	0.27%	47.5%
1998			15,500	68,000	400	83,900	75,795	159,695			9.7%	42.6%	0.25%	47.5%
1999			15,700	80,000	100	95,800	86,545	182,345			8.6%	43.9%	0.05%	47.5%

Table 4b - Crop Acreage for CUw Calculation
Natrona County

	NASS Crop Acreage								Cens. of Ag	
Year	Irr Harv Corn Acres	Irr Harv Beets Acres	Irr Harv Beans Acres	Irr Harv Potatoes Acres	Irr Harv Alfalfa Acres	Irr Harv Other Hay Acres	Irr Harv Grains Acres	Irr Harv Crops Total Acres	Irrigated Non-Harv Pasture Acres	TOTAL Irrigated Acres
1952	10		100	50	4,400	9,600	1,600	15,760	4,893	20,653
1953	0		140	40	5,000	8,600	970	14,750	4,580	19,330
1954	10		150	150	11,200	5,760	360	17,630	5,474	23,104
1955	0		150	140	12,400	7,700	390	20,780	6,452	27,232
1956	0		100	150	13,300	7,100	2,280	22,930	7,120	30,050
1957	0		100	140	13,800	8,300	3,400	25,740	7,992	33,732
1958	100		100	150	13,800	5,400	2,900	22,450	6,971	29,421
1959	100		130	150	10,300	5,800	1,840	18,120	7,815	25,935
1960	100		150	150	10,500	6,000	1,850	18,750	8,087	26,837
1961	300		200	150	10,700	6,600	1,750	19,700	8,496	28,196
1962	200		200		11,700	8,400	1,960	22,460	9,687	32,147
1963	300		250		12,600	9,200	1,650	24,000	10,351	34,351
1964	210				14,600	10,700	1,480	26,990	10,989	37,979
1965	450	85			14,000	10,600	1,900	27,035	11,007	38,042
1966	500				13,800	9,900	2,000	26,200	10,667	36,867
1967	600				15,500	10,700	2,200	29,000	11,807	40,807
1968	800				18,700	10,400	2,300	32,200	13,110	45,310
1969	1,150				18,800	10,300	3,250	33,500	7,382	40,882
1970	1,300				18,600	11,100	3,050	34,050	7,503	41,553
1971	1,000				18,900	11,400	3,350	34,650	7,635	42,285
1972	1,000				17,500	7,000	3,050	28,550	6,291	34,841
1973	900				17,000	7,000	2,350	27,250	6,005	33,255
1974	2,000				15,500	5,200	1,800	24,500	7,687	32,187
1975	900				16,000	7,800	2,000	26,700	8,377	35,077
1976	1,300				14,000	9,800	2,000	27,100	8,503	35,603
1977	1,300				15,000	8,500	2,000	26,800	8,409	35,209
1978	900				15,000	10,000	1,900	27,800	8,977	36,777
1979	700				15,000	6,500	1,200	23,400	7,556	30,956
1980	1,100				15,500	7,000	1,400	25,000	8,073	33,073
1981	900				18,500	6,500	1,600	27,500	8,880	36,380
1982	900				20,500	5,500	2,300	29,200	7,343	36,543
1983	1,300				15,500	8,500	2,900	28,200	7,092	35,292
1984	600				15,000	9,500	1,700	26,800	6,739	33,539
1985	1,000				14,500	8,000	1,900	25,400	6,387	31,787
1986	1,000				15,000	10,000	2,100	28,100	7,066	35,166
1987	500				11,500	12,000	2,000	26,000	11,079	37,079
1988	500				13,500	10,500	1,100	25,600	10,909	36,509
1989	1,400				13,300	8,500	1,200	24,400	10,397	34,797
1990	1,500				15,500	7,500	1,500	26,000	11,079	37,079
1991	800				15,000	15,000	1,900	32,700	13,934	46,634
1992	1,900				13,000	10,000	1,400	26,300	7,992	34,292
1993	2,200				22,500	12,000	1,200	37,900	11,517	49,417
1994	1,700				21,500	16,500	800	40,500	12,307	52,807
1995	500				20,500	21,000	2,300	44,300	13,462	57,762
1996	700				20,000	13,600	2,000	36,300	11,031	47,331
1997	1,100				17,500	7,500	1,700	27,800	23,511	51,311
1998	0				19,800	13,000	1,100	33,900	28,670	62,570
1999	0				21,700	11,000	700	33,400	28,247	61,647

Table 4b - Crop Acreage for CUw Calculation
Converse County

	NASS Crop Acreage								Cens. of Ag	
Year	Irr Harv Corn Acres	Irr Harv Beets Acres	Irr Harv Beans Acres	Irr Harv Potatoes Acres	Irr Harv Alfalfa Acres	Irr Harv Other Hay Acres	Irr Harv Grains Acres	Irr Harv Crops Total Acres	Irrigated Non-Harv Pasture Acres	TOTAL Irrigated Acres
1952	200	288	590	260	12,200	15,200	5,630	34,368	11,773	46,139
1953	100	197	550	230	12,200	15,700	5,190	34,167	11,705	45,872
1954	100	436.5	340	10	12,800	3,550	2,700	19,937	6,830	26,767
1955	100	462	350	20	14,000	6,800	2,840	24,572	8,418	32,990
1956	200	565.5	400	20	14,300	6,000	2,200	23,686	8,114	31,800
1957	200	702.8	500	20	15,000	8,000	2,900	27,323	9,360	36,683
1958	200	545.3	800	20	22,500	7,900	3,100	35,065	12,013	47,078
1959	220	593	730	20	18,500	5,400	2,900	28,363	9,518	37,881
1960	200	534.2	350	20	18,900	4,300	2,400	26,704	8,961	35,666
1961	300	560.2	300	20	19,800	6,200	2,350	29,530	9,910	39,440
1962	350	602	350		20,400	8,900	2,800	33,402	11,209	44,611
1963	100	850.4	400		20,600	7,700	3,500	33,150	11,125	44,275
1964	30	745.5	630		22,800	8,700	2,950	35,656	9,535	45,391
1965	150	730	600		19,000	9,600	3,600	33,680	8,956	42,636
1966	150	450	600		18,800	7,400	3,100	30,500	8,111	38,611
1967	100	375	550		22,200	10,100	3,750	37,075	9,859	46,934
1968	300	390	520		18,600	10,300	3,850	33,960	9,031	42,991
1969	600	415	260		18,900	10,300	3,800	34,275	9,390	43,665
1970	700	380	370		19,400	11,700	4,100	36,650	10,041	46,691
1971	500	450	350		19,600	11,700	3,800	36,400	9,972	46,372
1972	400	500	400		19,000	12,000	3,800	36,100	9,890	45,990
1973	0	210	400		20,000	12,000	3,750	36,360	9,961	46,321
1974	1,200		500		21,000	8,000	4,500	35,200	7,852	43,052
1975	1,000		800		21,000	9,000	4,100	35,900	8,008	43,908
1976	1,200		800		21,000	8,500	4,100	35,600	7,941	43,541
1977	700		800		23,000	7,800	4,700	37,000	8,254	45,254
1978	700		800		22,000	9,400	4,400	37,300	13,502	50,802
1979	700		1,200		23,000	9,000	3,900	37,800	13,683	51,483
1980	700		700		22,000	10,000	4,100	37,500	13,574	51,074
1981	1,000		500		23,000	9,000	2,900	36,400	13,176	49,576
1982	1,000		200		24,000	6,700	3,000	34,900	7,081	41,981
1983	1,500		200		24,000	7,500	3,600	36,800	7,466	44,266
1984	1,600		400		24,500	6,000	3,200	35,700	7,243	42,943
1985	1,400		300		21,000	3,000	2,600	28,300	5,742	34,042
1986	1,300		300		29,000	6,000	2,900	39,500	8,014	47,514
1987	1,200		300		21,500	17,000	3,200	43,200	7,666	50,866
1988	1,400		400		26,000	15,000	2,300	45,100	8,003	53,103
1989	1,600		600		26,000	12,000	1,700	41,900	7,435	49,335
1990	1,700		600		29,000	13,000	1,800	46,100	8,181	54,281
1991	1,300		200		26,000	13,000	2,000	42,500	7,542	50,042
1992	1,800				26,000	8,000	2,100	37,900	3,692	41,592
1993	1,900				26,500	7,000	900	36,300	3,536	39,836
1994	1,000				28,000	4,000	1,200	32,200	3,137	35,337
1995	1,200				28,000	6,000	300	33,500	3,263	36,763
1996	1,000				29,000	6,000	1,500	37,500	3,653	41,153
1997	1,200				24,000	8,000	1,500	34,700	11,526	46,226
1998	1,200				22,000	6,500	700	30,400	10,098	40,498
1999	1,000				25,000	10,000	700	36,700	12,190	48,890

Table 4b - Crop Distribution for CUw Calculation
Pathfinder to Guernsey Acreage-Weighted Crop Mix

Year	Corn	Beets	Beans	Potatoes	Alfalfa	Other Hay	Small Grains	Non-Harv Pasture
1952	0.3%	0.4%	1.0%	0.5%	24.9%	37.1%	10.8%	25.0%
1953	0.2%	0.3%	1.1%	0.4%	26.4%	37.3%	9.4%	25.0%
1954	0.2%	0.9%	1.0%	0.3%	48.1%	18.7%	6.1%	24.7%
1955	0.2%	0.8%	0.8%	0.3%	43.8%	24.1%	5.4%	24.7%
1956	0.3%	0.9%	0.8%	0.3%	44.6%	21.2%	7.2%	24.6%
1957	0.3%	1.0%	0.9%	0.2%	40.9%	23.1%	8.9%	24.6%
1958	0.4%	0.7%	1.2%	0.2%	47.5%	17.4%	7.8%	24.8%
1959	0.5%	0.9%	1.3%	0.3%	45.1%	17.2%	7.4%	27.2%
1960	0.5%	0.9%	0.8%	0.3%	47.0%	16.5%	6.8%	27.3%
1961	0.9%	0.8%	0.7%	0.3%	45.1%	18.9%	6.1%	27.2%
1962	0.7%	0.8%	0.7%	0.0%	41.8%	22.5%	6.2%	27.2%
1963	0.5%	1.1%	0.8%	0.0%	42.2%	21.5%	6.6%	27.3%
1964	0.3%	0.9%	0.8%	0.0%	44.9%	23.3%	5.3%	24.6%
1965	0.7%	1.0%	0.7%	0.0%	40.9%	25.0%	6.8%	24.7%
1966	0.9%	0.6%	0.8%	0.0%	43.2%	22.9%	6.8%	24.9%
1967	0.8%	0.4%	0.6%	0.0%	43.0%	23.7%	6.8%	24.7%
1968	1.2%	0.4%	0.6%	0.0%	42.2%	23.4%	7.0%	25.1%
1969	2.1%	0.5%	0.3%	0.0%	44.6%	24.4%	8.3%	19.8%
1970	2.3%	0.4%	0.4%	0.0%	43.1%	25.8%	8.1%	19.9%
1971	1.7%	0.5%	0.4%	0.0%	43.4%	26.1%	8.1%	19.9%
1972	1.7%	0.6%	0.5%	0.0%	45.2%	23.5%	8.5%	20.0%
1973	1.1%	0.3%	0.5%	0.0%	46.5%	23.9%	7.7%	20.1%
1974	4.3%	0.0%	0.7%	0.0%	48.5%	17.5%	8.4%	20.7%
1975	2.4%	0.0%	1.0%	0.0%	46.8%	21.3%	7.7%	20.7%
1976	3.2%	0.0%	1.0%	0.0%	44.2%	23.1%	7.7%	20.8%
1977	2.5%	0.0%	1.0%	0.0%	47.2%	20.3%	8.3%	20.7%
1978	1.8%	0.0%	0.9%	0.0%	42.2%	22.2%	7.2%	25.7%
1979	1.7%	0.0%	1.5%	0.0%	46.1%	18.8%	6.2%	25.8%
1980	2.1%	0.0%	0.8%	0.0%	44.6%	20.2%	6.5%	25.7%
1981	2.2%	0.0%	0.6%	0.0%	48.3%	18.0%	5.2%	25.7%
1982	2.4%	0.0%	0.3%	0.0%	56.7%	15.5%	6.7%	18.4%
1983	3.5%	0.0%	0.3%	0.0%	49.6%	20.1%	8.2%	18.3%
1984	2.9%	0.0%	0.5%	0.0%	51.6%	20.3%	6.4%	18.3%
1985	3.6%	0.0%	0.5%	0.0%	53.9%	16.7%	6.8%	18.4%
1986	2.8%	0.0%	0.4%	0.0%	53.2%	19.4%	6.0%	18.2%
1987	1.9%	0.0%	0.3%	0.0%	37.5%	33.0%	5.9%	21.3%
1988	2.1%	0.0%	0.4%	0.0%	44.1%	28.5%	3.8%	21.1%
1989	3.6%	0.0%	0.7%	0.0%	46.7%	24.4%	3.4%	21.2%
1990	3.5%	0.0%	0.7%	0.0%	48.7%	22.4%	3.6%	21.1%
1991	2.2%	0.0%	0.2%	0.0%	42.4%	29.0%	4.0%	22.2%
1992	4.9%	0.0%	0.0%	0.0%	51.4%	23.7%	4.6%	15.4%
1993	4.6%	0.0%	0.0%	0.0%	54.9%	21.3%	2.4%	16.9%
1994	3.1%	0.0%	0.0%	0.0%	53.9%	23.3%	2.3%	17.5%
1995	1.8%	0.0%	0.0%	0.0%	49.2%	28.6%	2.8%	17.7%
1996	1.9%	0.0%	0.0%	0.0%	55.4%	22.2%	4.0%	16.6%
1997	2.4%	0.0%	0.0%	0.0%	42.5%	15.9%	3.3%	35.9%
1998	1.2%	0.0%	0.0%	0.0%	40.6%	18.9%	1.7%	37.6%
1999	0.9%	0.0%	0.0%	0.0%	42.2%	19.0%	1.3%	36.6%

Table 5a
Irrigated Acreage Data Used in CUw calculations

	ABOVE PATHFINDER						
	WSEO-reported irrigated acreage			WSEO-reported Ringsby "acreage"	reservoir-supply acreage	original-supply groundwater-irrigated acreage	assumed original and additional-supply groundwater-irrigated acres
Year	Above-Sinclair	Medicine Bow	Sweetwater				
1952	77,078	40,332	8,351		1,224	74	130
1953	66,147	34,613	8,351		1,224	165	290
1954	55,658	29,124	7,678		1,224	369	805
1955	58,440	30,580	8,440		1,224	732	1,445
1956	61,362	32,109	8,440		1,224	770	1,512
1957	81,420	42,605	8,598		1,224	861	1,672
1958	83,762	43,830	8,598		1,224	861	1,787
1959	78,344	40,995	8,469		1,224	882	2,136
1960	82,366	43,099	8,469		1,224	882	2,871
1961	81,087	42,431	8,700		1,224	882	2,871
1962	82,449	43,143	8,810		1,224	882	2,891
1963	81,300	42,541	8,500		1,224	1,097	3,663
1964	85,032	44,495	9,721		1,224	1,097	3,663
1965	92,724	48,520	9,721		1,224	1,097	3,663
1966	83,452	43,668	8,749		1,224	1,123	4,100
1967	92,823	48,571	9,721		1,224	1,173	4,449
1968	93,099	48,715	9,721		1,224	1,173	4,639
1969	88,318	46,214	5,809		1,224	1,173	4,740
1970	88,971	43,473	6,589	3,082	1,224	1,445	5,220
1971	89,004	43,490	6,589	3,082	1,224	1,487	5,295
1972	87,888	42,906	6,589	3,082	1,224	1,515	5,345
1973	89,053	43,516	6,589	3,082	1,224	1,515	5,345
1974	87,740	42,829	6,589	3,082	1,224	1,515	5,345
1975	88,226	43,083	9,690	3,082	1,224	1,515	5,345
1976	81,959	50,614	9,690	3,082	1,224	1,518	5,425
1977	62,735	45,386	9,690	3,082	1,224	1,538	6,530
1978	79,798	47,481	9,690	3,082	1,224	1,553	6,950
1979	84,191	43,980	9,690	3,082	1,224	1,687	7,395
1980	84,464	44,071	8,951	3,082	1,224	1,687	7,395
1981	86,345	43,131	14,092	3,082	1,224	1,694	7,407
1982	88,468	45,635	13,791	3,082	1,224	1,694	7,407
1983	88,351	42,826	11,236	3,082	1,224	1,740	7,596
1984	88,054	43,594	10,410	3,082	1,224	1,742	7,837
1985	88,030	41,300	9,352	830	1,224	1,742	7,837
1986	88,366	42,438	11,269	0	1,224	1,742	7,837
1987	88,646	41,013	11,338	1,310	1,224	1,742	7,837
1988	88,621	40,932	10,713	3,639	1,224	1,742	7,837
1989	77,822	39,421	9,783	1,682	77	1,944	8,192
1990	87,989	40,119	8,860	3,227	63	1,963	8,226
1991	88,109	40,239	10,911	4,083	253	1,963	8,246
1992	88,391	38,272	8,972	1,896	397	1,963	8,246
1993	88,461	39,421	11,070	6,578	587	1,963	8,246
1994	85,489	38,166	10,424	5,199	495	1,963	8,246
1995	88,878	45,214	11,446	6,143	1,378	1,963	8,246
1996	89,510	42,616	11,632	2,400	2,771	1,963	8,246
1997	89,986	43,245	11,521	4,041	2,573	2,000	8,311
1998	91,747	44,361	11,029	2,123	1,860	2,000	8,311
1999	96,634	42,988	10,355	608	3,005	2,000	8,311
maximum	96,634	50,614	14,092	6,578	3,005	2,000	8,311
average	83,891	42,320	9,446	3,000	1,224	1,412	5,528
minimum	55,658	29,124	5,809	0	63	74	130

Table 5b
Irrigated Acreage Data Used in CUw calculations

	BELOW PATHFINDER			
Year	WSEO-reported mainstem irrigated acreage	NASS-based tributary irrigated acreage	"mainstem groundwater" acreage	assumed original and additional-supply groundwater-irrigated acres
1952	14,626	50,242	0	1,860
1953	14,221	49,119	86	1,860
1954	13,815	31,201	172	2,212
1955	14,505	38,369	258	2,492
1956	14,814	38,545	344	2,818
1957	15,136	44,623	430	3,552
1958	13,033	53,157	517	3,757
1959	13,033	46,474	603	3,757
1960	13,033	44,396	689	3,767
1961	13,150	48,074	775	3,767
1962	13,150	53,160	861	3,769
1963	13,075	53,370	947	3,769
1964	13,145	54,039	1,033	3,778
1965	13,145	51,908	1,119	3,778
1966	13,145	48,274	1,205	3,784
1967	13,145	56,889	1,291	3,842
1968	13,145	55,719	1,377	3,858
1969	16,283	54,537	1,464	4,284
1970	16,502	57,505	1,550	4,860
1971	16,502	57,092	1,636	5,810
1972	14,195	53,386	1,722	5,708
1973	14,800	53,682	1,808	6,139
1974	15,995	52,005	1,894	7,758
1975	15,455	53,720	1,980	8,446
1976	15,852	54,113	2,066	8,784
1977	16,483	54,978	2,152	10,147
1978	16,594	60,514	2,238	10,212
1979	16,323	59,805	2,324	10,464
1980	16,426	59,389	2,411	10,971
1981	16,613	60,417	2,497	11,159
1982	16,254	53,813	2,583	11,529
1983	15,948	54,914	2,669	11,853
1984	15,978	52,728	2,755	11,878
1985	16,061	44,931	2,841	11,918
1986	15,996	58,052	2,927	12,043
1987	15,358	61,629	3,013	12,043
1988	15,386	62,813	3,099	12,053
1989	15,202	59,785	3,185	12,196
1990	14,866	64,274	3,271	12,244
1991	12,913	64,897	3,358	12,274
1992	14,369	52,187	3,444	12,498
1993	12,746	56,946	3,530	12,498
1994	13,194	53,809	3,616	12,578
1995	11,873	56,895	3,702	12,612
1996	12,798	56,679	3,788	13,349
1997	13,077	62,406	3,788	13,689
1998	13,376	62,462	3,788	13,692
1999	13,062	69,338	3,788	13,692
maximum	16,613	69,338	3,788	13,692
average	14,537	54,110	2,012	8,033
minimum	11,873	31,201	0	1,860

Table 5c
Irrigated Acreage Data Used in CUw calculations

National Agricultural Statistics Service (NASS) and U.S. Census of Agriculture Crop Acreage

	Albany County		Natrona County		Converse County		Platte County	
Year	NASS	Census of Ag	NASS	Census of Ag	NASS	Census of Ag	NASS	Census of Ag
1952	88,140	62,243	15,760	4,893	34,366	11,773	43,686	3,686
1953	79,330	56,021	14,750	4,580	34,167	11,705	41,692	3,518
1954	38,820	27,414	17,630	5,474	19,937	6,830	12,183	1,028
1955	40,960	28,925	20,780	6,452	24,572	8,418	18,067	1,524
1956	43,710	30,867	22,930	7,120	23,586	8,114	18,816	1,588
1957	54,010	38,141	25,740	7,992	27,323	9,360	25,259	2,131
1958	74,310	52,476	22,450	6,971	35,065	12,013	40,762	3,439
1959	85,080	67,000	18,120	7,815	28,363	9,518	41,120	15,975
1960	84,310	66,394	18,750	8,087	26,704	8,961	37,260	14,475
1961	86,560	68,165	19,700	8,496	29,530	9,910	39,430	15,318
1962	87,550	68,945	22,460	9,687	33,402	11,209	38,611	15,000
1963	82,000	64,575	24,000	10,351	33,150	11,125	36,922	14,344
1964	81,700	45,564	26,990	10,989	35,856	9,535	36,690	3,500
1965	83,400	46,512	27,035	11,007	33,680	8,956	36,200	3,453
1966	72,200	40,266	26,200	10,667	30,500	8,111	35,600	3,396
1967	78,000	43,501	29,000	11,807	37,075	9,859	41,600	3,968
1968	77,400	43,166	32,200	13,110	33,960	9,031	42,740	4,077
1969	76,550	34,925	33,500	7,382	34,275	9,390	40,750	9,605
1970	81,900	37,366	34,050	7,503	36,650	10,041	43,560	10,267
1971	84,500	38,552	34,650	7,635	36,400	9,972	42,410	9,996
1972	78,100	35,632	28,550	6,291	36,100	9,890	38,600	9,098
1973	73,700	33,625	27,250	6,005	36,360	9,961	43,500	10,253
1974	70,600	49,931	24,500	7,687	35,200	7,852	48,520	13,607
1975	94,100	66,551	26,700	8,377	35,900	8,008	47,630	13,357
1976	108,100	76,452	27,100	8,503	35,600	7,941	50,600	14,190
1977	101,300	71,643	26,800	8,409	37,000	8,254	48,950	13,728
1978	100,500	82,179	27,800	8,977	37,300	13,502	50,200	16,679
1979	112,900	92,318	23,400	7,556	37,800	13,683	56,000	18,606
1980	111,900	91,501	25,000	8,073	37,500	13,574	49,900	16,579
1981	108,200	88,475	27,500	8,880	36,400	13,176	56,400	18,739
1982	85,300	84,352	29,200	7,343	34,900	7,081	59,250	9,222
1983	103,100	101,954	28,200	7,092	36,800	7,466	57,000	8,872
1984	84,100	83,165	26,800	6,739	35,700	7,243	54,450	8,475
1985	75,700	74,859	25,400	6,387	28,300	5,742	51,900	8,078
1986	69,500	68,728	28,100	7,066	39,500	8,014	64,900	10,101
1987	56,900	46,797	26,000	11,079	43,200	7,668	66,300	12,632
1988	55,300	45,481	25,600	10,909	45,100	8,003	64,000	12,194
1989	46,600	38,326	24,400	10,397	41,900	7,435	68,400	13,032
1990	50,800	41,780	26,000	11,079	46,100	8,181	66,840	12,735
1991	81,800	67,276	32,700	13,934	42,500	7,542	67,400	12,842
1992	75,000	54,901	26,300	7,992	37,900	3,682	56,170	9,537
1993	62,000	45,385	37,900	11,517	36,300	3,536	59,960	10,180
1994	46,200	35,283	40,500	12,307	32,200	3,137	52,830	8,970
1995	67,300	49,264	44,300	13,462	33,500	3,263	52,900	8,982
1996	71,800	52,559	36,300	11,031	37,500	3,653	55,600	9,440
1997	86,300	71,495	27,800	23,511	34,700	11,526	57,100	10,112
1998	91,000	75,389	33,900	28,670	30,400	10,098	58,300	10,325
1999	90,700	75,140	33,400	28,247	36,700	12,190	64,800	11,476
maximum	112,900	101,954	44,300	28,670	46,100	13,683	68,400	18,739
average	77,942	57,530	27,169	9,907	34,730	8,857	47,537	9,840
minimum	38,820	27,414	14,750	4,580	19,937	3,137	12,183	1,028

Table 5d
Irrigated Acreage Data Used in CUw calculations

Permit-based distribution of reported county irrigated acreage totals

	Percent of total county irrigation water rights on North Platte River tributaries between Pathfinder and Guernsey				County total irrigation water right acres			
Year	Albany (%)	Natrona (%)	Converse (%)	Platte (%)	Albany	Natrona	Converse	Platte
1952	0.37	36.73	78.79	12.14	211,804	55,849	76,569	110,452
1953	0.37	36.58	78.42	12.34	211,844	56,164	77,610	110,888
1954	0.37	36.57	78.00	12.33	211,879	56,187	78,519	111,178
1955	0.37	36.61	77.96	12.38	211,879	56,233	79,263	111,423
1956	0.37	36.62	77.83	12.35	211,879	56,274	79,488	111,723
1957	0.37	36.96	77.52	12.34	211,879	56,723	79,803	111,792
1958	0.37	36.94	77.26	12.34	211,879	56,765	80,081	111,792
1959	0.37	36.94	77.23	12.40	211,879	56,765	80,103	112,039
1960	0.37	36.94	77.17	12.38	211,879	56,765	80,452	112,174
1961	0.37	36.94	76.87	12.37	211,999	56,765	80,799	112,282
1962	0.37	36.96	76.39	12.36	212,004	56,783	81,311	112,347
1963	0.37	36.96	76.39	12.32	212,004	56,783	81,315	112,735
1964	0.37	36.96	76.20	12.32	212,026	56,783	81,875	112,773
1965	0.37	37.06	76.12	12.31	212,026	56,918	81,963	112,884
1966	0.37	37.08	76.18	12.25	212,038	56,945	82,166	113,377
1967	0.37	37.02	76.18	12.25	212,038	57,080	82,166	113,377
1968	0.37	37.02	76.25	12.23	212,038	57,080	82,401	113,607
1969	0.37	37.08	75.21	12.17	212,038	57,159	82,401	114,119
1970	0.36	37.14	75.23	12.10	212,702	57,234	82,470	114,814
1971	0.36	37.14	75.24	11.54	212,923	57,234	82,511	120,367
1972	0.36	37.14	75.24	11.38	212,984	57,234	82,511	122,058
1973	0.36	37.19	75.24	11.30	212,984	57,288	82,519	123,168
1974	0.36	37.19	75.98	11.08	212,984	57,300	83,112	125,888
1975	0.36	37.19	76.00	11.01	213,050	57,300	83,191	126,944
1976	0.36	37.19	76.02	10.95	213,050	57,300	83,278	127,650
1977	0.36	37.19	76.02	10.93	213,050	57,300	83,278	127,957
1978	0.36	37.50	76.28	10.93	213,050	57,688	83,388	127,957
1979	0.36	37.58	76.28	10.93	213,050	57,800	83,388	127,957
1980	0.36	37.59	76.29	10.91	213,050	57,808	83,413	128,149
1981	0.36	37.59	76.29	10.92	213,050	57,814	83,413	128,160
1982	0.36	37.59	76.29	10.85	213,050	57,814	83,413	128,939
1983	0.36	37.61	76.29	10.82	213,050	57,837	83,413	129,381
1984	0.36	37.61	76.29	10.71	213,050	57,837	83,438	130,627
1985	0.36	37.61	76.30	10.76	213,050	57,837	83,477	130,877
1986	0.36	37.61	76.30	10.76	213,050	57,837	83,477	130,877
1987	0.36	37.61	76.31	10.76	213,050	57,837	83,494	130,877
1988	0.36	37.61	76.31	10.75	213,050	57,837	83,494	130,921
1989	0.36	37.61	76.32	10.73	213,050	57,837	83,532	131,222
1990	0.36	37.62	76.32	10.76	213,050	57,842	83,532	131,480
1991	0.36	37.66	76.32	10.72	213,064	57,903	83,532	132,019
1992	0.36	37.71	76.32	10.72	213,064	57,957	83,532	132,019
1993	0.36	37.71	76.32	10.72	213,064	57,957	83,532	132,101
1994	0.36	37.71	76.32	10.72	213,064	57,957	83,532	132,101
1995	0.36	37.71	76.32	10.72	213,064	57,957	83,859	132,101
1996	0.36	37.71	76.32	10.72	213,064	57,957	83,859	132,101
1997	0.36	37.71	76.32	10.72	213,064	57,957	83,859	132,101
1998	0.36	37.71	76.32	10.72	213,064	57,957	83,859	132,101
1999	0.36	37.71	76.32	10.72	213,064	57,957	83,859	132,101

Table 8a - Total Annual Consumptive Use
Above Pathfinder

Year	Calculated CUw (ac-ft)	Ringsby Transfer CU (ac-ft)	Non-Ag Transfers CU (ac-ft)	TOTAL Above Pathfinder CU (ac-ft)	10-yr run. average rounded CU (ac-ft)
1952	113,976	0	0	113,976	
1953	85,531	0	43	85,575	
1954	75,349	0	43	75,392	
1955	83,848	0	43	83,892	
1956	62,563	0	43	62,606	
1957	91,802	0	43	91,845	
1958	134,452	0	2,843	137,296	
1959	121,518	0	2,843	124,361	
1960	96,611	0	2,843	99,454	
1961	85,563	0	2,843	88,406	96,000
1962	107,507	0	2,843	110,351	96,000
1963	93,686	0	2,843	96,530	97,000
1964	103,555	0	2,843	106,399	100,000
1965	50,956	0	2,843	53,799	97,000
1966	136,936	0	2,937	139,873	105,000
1967	92,137	0	2,937	95,075	105,000
1968	76,112	0	2,937	79,050	99,000
1969	139,739	0	2,937	142,677	101,000
1970	98,277	4,377	2,937	105,591	102,000
1971	137,636	4,377	2,937	144,950	107,000
1972	116,994	4,377	2,937	124,308	109,000
1973	62,936	4,377	2,937	70,250	106,000
1974	117,047	4,377	2,937	124,361	108,000
1975	88,695	4,377	2,937	96,009	112,000
1976	108,213	4,377	2,937	115,528	110,000
1977	69,574	4,377	2,937	76,888	108,000
1978	126,337	4,377	2,937	133,651	113,000
1979	144,623	4,377	2,937	151,937	114,000
1980	138,079	4,377	2,937	145,393	118,000
1981	124,481	4,377	2,937	131,795	117,000
1982	114,361	4,377	2,937	121,676	117,000
1983	91,623	4,377	3,014	99,014	120,000
1984	90,762	4,377	3,045	98,184	117,000
1985	150,079	1,179	3,045	154,303	123,000
1986	86,237	0	3,059	89,296	120,000
1987	142,525	1,860	3,068	147,454	127,000
1988	134,521	5,167	3,068	142,757	128,000
1989	43,889	2,388	3,068	49,345	118,000
1990	98,308	4,582	3,068	105,958	114,000
1991	80,412	5,798	3,068	89,278	110,000
1992	49,133	2,692	3,068	54,893	103,000
1993	92,834	9,341	3,068	105,242	104,000
1994	119,497	7,383	3,068	129,948	107,000
1995	51,761	8,723	3,068	63,552	98,000
1996	115,240	3,408	3,068	121,716	101,000
1997	87,023	5,738	3,068	95,829	96,000
1998	115,974	3,015	3,068	122,056	94,000
1999	98,942	863	3,068	102,873	99,000
Maximum	150,079	9,341	3,068	154,303	128,000
Average	100,997	2,662	2,603	106,262	108,103
Minimum	43,889	0	0	49,345	94,000

Table 8b - Total Annual Consumptive Use
Below Pathfinder

Year	Calculated CUw (ac-ft)	Non-Ag Transfers CU (ac-ft)	TOTAL Below Pathfinder CU (ac-ft)	10-yr run. average rounded CU (ac-ft)
1952	78,110	0	78,110	
1953	79,275	0	79,275	
1954	47,007	0	47,007	
1955	64,064	0	64,064	
1956	72,732	819	73,551	
1957	51,627	819	52,447	
1958	82,001	819	82,820	
1959	60,795	819	61,614	
1960	77,358	819	78,178	
1961	67,572	3,128	70,700	69,000
1962	48,261	3,128	51,389	66,000
1963	76,926	3,128	80,054	66,000
1964	69,366	3,128	72,494	69,000
1965	59,021	3,128	62,149	69,000
1966	90,148	3,128	93,276	71,000
1967	56,199	3,128	59,327	71,000
1968	63,316	3,128	66,444	70,000
1969	90,578	3,128	93,706	73,000
1970	96,246	3,128	99,374	75,000
1971	61,912	3,128	65,040	74,000
1972	71,568	5,913	77,481	77,000
1973	67,693	5,913	73,606	76,000
1974	98,269	5,913	104,182	79,000
1975	85,029	5,913	90,942	82,000
1976	72,013	5,913	77,927	81,000
1977	69,528	5,913	75,442	82,000
1978	60,060	6,177	66,237	82,000
1979	79,493	6,177	85,669	82,000
1980	104,511	6,177	110,687	83,000
1981	98,135	6,177	104,312	87,000
1982	69,207	6,177	75,384	86,000
1983	74,475	6,177	80,652	87,000
1984	69,928	6,177	76,105	84,000
1985	55,501	6,359	61,860	81,000
1986	77,058	6,359	83,417	82,000
1987	103,733	6,359	110,092	85,000
1988	97,065	6,359	103,424	89,000
1989	37,019	6,496	43,516	85,000
1990	65,692	6,552	72,244	81,000
1991	70,454	6,552	77,006	78,000
1992	62,637	9,589	72,226	78,000
1993	67,997	9,589	77,586	78,000
1994	62,382	9,589	71,972	77,000
1995	47,761	9,589	57,350	77,000
1996	83,052	9,589	92,642	78,000
1997	75,794	9,589	85,383	75,000
1998	59,017	9,589	68,607	72,000
1999	82,851	9,589	92,441	77,000
Maximum	104,511	9,589	110,687	89,000
Average	72,092	4,979	77,071	77,795
Minimum	37,019	0	43,516	66,000

Example Calculation
Grass Hay - Encampment Area - One Cutting with Additional Irrigation - 1978

This appendix presents step-by-step calculations for one crop in one area in one year to illustrate the calculation procedures presented in the text. Comments describe variations for other crops, areas, and years, and those items for which future calculations will be done differently than for the historical period.

I. Input Data

A. Encampment Weather Station (monthly averages - 1978; source: High Plains Regional Climate Center). This one of the seven weather stations needed for complete calculations above Guernsey.

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept
precip (in)	0.77	1.22	0.32	0.72	0.83	1.01	0.68	3.03	0.68	0.25	0.20	1.07
max. temp (°F)							56.3	59.9	73.7	80.1	78.2	72.9
min. temp (°F)							22.2	30.0	34.1	44.1	42.2	35.7

B. Crop Yields (Carbon County - 1978; source: National Agricultural Statistics Service - Wyoming). Units are tons per acre.

Grass Hay	1.30	("grass hay" and "other hay" are used synonymously in this example and in Exhibit A.)

C. Crop Distribution (Carbon County - 1978; source: National Agricultural Statistics Service (NASS) - Wyoming for 1978 and U.S. Census of Agriculture for 1978. Units are acres.

Alfalfa	10,000 = 6%
Other Hay	95,000 = 53%
Minor Crops	
Corn	300 = 0.2%
Small Grains	1,200 = 0.7%
Potatoes	0 = 0.0%
Irrigated Pasture	71,692 = 40%
TOTAL	178,192 = 100%

D. Acreage (source: Wyoming State Engineer's Office annual irrigated acreage accounting)

Above Sinclair	79,798 (58%)
Medicine Bow	47,481 (35%)
Sweetwater	9,690 (7%)
TOTAL	136,969

These are the actually irrigated acres. "Equivalent" acreage for the Ringsby or other transfers is not included. For 1978, 1224 reservoir-supplied irrigated acres are assumed to have been present, but not to have been included in the reported totals. For 1978, 1553 groundwater-supplied (original-supply) acres are assumed to have been present, but not to have been included in the reported totals. Total irrigated acreage for which consumptive use is calculated is thus 136,969 + 1,224 + 1,553 = 139,746.

In the future, all reservoir-supplied and original-supply groundwater acres will be included in the reported total, so no adjustments to that total will be necessary. However, it will be necessary to estimate the "reservoir-supply" acreage in order to account for its improved water supply (see below).

There is no equivalent for "reservoir-supply" or "original-supply groundwater" in the calculations below Pathfinder.

II. Unit Reference ET_o Calculation

For grass hay, the growing season is assumed to extend from April to September, inclusive (see Table 2). ET_o is calculated as presented on page [210] of Exhibit A:

$$ET_o = 0.0023\, R_A\, TD^{0.5}\, (T + 17.8)(calib.factor)$$

For the 1978 growing season at Encampment:

	Apr	May	Jun	Jul	Aug	Sept
R_A (in/mo)	16.26	19.44	19.96	20.15	18.04	14.29
calibration factor	1.060	0.958	0.964	0.935	0.937	0.967
Temp. Difference (°C)	18.94	16.61	22.00	20.00	20.00	20.67
Average Temp. (°C)	4.03	7.19	12.17	16.72	15.67	12.39
reference ET_o (in/mo)	3.77	4.36	6.22	6.69	5.82	4.36

The conversion from °F (example section I.A.) to °C for these calculations is:

$$°C = (°F - 32) / 1.8$$

temperature difference in °C = temperature difference in °F / 1.8

The same ET_o calculations are used for all crops for each of the 5 weather stations. (Monthly climate data are averaged for the Casper, Glenrock, and Douglas stations to create a single, composite "station" before ET_o calculation.)

III. Unit $ET_{c(max)}$ Calculation

Table 2 provides the crop coefficients (Kc_o) for grass hay under conditions of one cutting with further irrigation (Crop E).

$$ET_{c(max)} = ET_o * Kc_o$$

Thus (units are inches of water),

	Apr	May	Jun	Jul	Aug	Sept	TOTAL
K_{co}	0.383	0.577	1.028	0.862	0.777	0.777	
$ET_{c(max)}$	1.44	2.52	6.39	5.77	4.52	3.39	24.03

The same procedure is used for each of the major crops grown above Pathfinder, i.e. crops A, B, E, F, I, and J in Table 2. For those crops with "precip" listed in Table 2, $ET_{c(max)}$ is set equal to the month's precipitation and no further calculations are made.

IV. Yield-based Calculation of $ET_{c(i)}$

The yield adjustment is made as explained on p. [214] of Exhibit A:

$$ET_{c(i)} = \left[\frac{1}{ky} \frac{Y_i}{Y_{env(i)}} + 1 - \frac{1}{ky} \right] ET_{c(max)}$$

Table 3 lists the envelope yields ($Y_{env(i)}$) for each crop and year. For grass hay in Carbon County, $Y_{env(i)} = 1.35$ tons/acre. The reported grass hay yield (Y_i)in 1978 was 1.30 tons/acre, so

$$Y_i/Y_{env(i)} = 0.96$$

(If the computed ratio exceeds 1.0, it is set to = 1.0) The ky term is 1.05 for grass hay, so the 1978 $ET_{c(i)}$ for grass hay with additional irrigation at Encampment is 23.12 inches (1.93 ft).

V. Effective Precipitation and Unit CU_w Calculation

The total precipitation from October, 1977 to March, 1978 was 4.87 inches. The Exhibit A method assumes that 50% of this (2.44 inches) is stored in the soil for use by crops during the subsequent growing season.

A total of 5.91 inches of precipitation fell from April to September, 1978. The Exhibit A method assumes that 95% of this (5.61 inches) is available for use by crops during the growing season.

Thus, the total effective precipitation for the year is 8.05 inches. This quantity is subtracted from the $ET_{c(i)}$ value calculated above (23.12 in.) to determine the consumptive use of water supplied by irrigation. Thus,

$$CU_w = 15.07 \text{ inches} = 1.26 \text{ feet}$$

This calculation is made in the same manner for all crops, with the exception that effective precipitation is calculated as explained on p.[216] for non-forage crops (corn, beans, small grains, etc.) below Pathfinder. (No specific calculations of CU_w are made for non-forage crops above Pathfinder.)

VI. Crop Mix Calculations

All irrigated acres above Pathfinder are assumed to have the same mix of crops as reported for Carbon County. 95,000 acres of other hay / 178,192 total acres = 53.3% other hay.

VII. Acreage Calculations

A. Total Irrigated Acreage

The method assumes that growing conditions for 50% of the reported acreage "above Sinclair" is best represented by the Encampment weather data. Reservoir-supply and original-supply groundwater acreage is assumed to be distributed in the same proportions as the historically reported irrigated acreage, i.e. 58% of it "above Sinclair" and 50% of that around Encampment. Thus, the total Encampment acreage is:

39,899 (50% of the "above Sinclair" value)
356 (50% of 58% of the total reservoir-supply acreage)
+ 452 (50% of 58% of the original-supply groundwater acreage)
40,707 acres

In the future, all of these acreages will be directly accounted by the Wyoming State Engineer's Office; it will not be necessary to add similar acreage increments.

B. Normal and Limited Water Supply

All reservoir-supplied acreage is assumed to have enough water supply that irrigation occurs after the cutting of forage crops. Groundwater acreage, whether under original or

additional-supply permits, is also assumed to have enough water supply that irrigation occurs after the cutting of forage crops. All remaining acreage is assumed to be split 50:50 between conditions which allow and do not allow irrigation after cutting.

This "groundwater" acreage is different from the original-supply groundwater acreage discussed above. Here, "groundwater" irrigation includes both original and additional-supply and it is estimated based solely on permit data (see Exhibit A, p. [222]). In 1978, 100% of all adjudicated groundwater irrigation permit acreage plus 50% of all unadjudicated groundwater irrigation permit acreage above Pathfinder totaled 6,950 acres. This is proportioned to the Encampment sub-area as above, i.e. 2,016 acres.

Thus:

assumed post-cutting irrigation	assumed no post-cutting irrigation	
356		reservoir-supply acres
2,016		groundwater acres
+ 19,167	19,167	50:50 split of remainder
21,539	19,167	

All acreage is assumed to have the same crop proportions:

> Other hay = 53.3% of the 21,539 acres with post-cutting irrigation = 11,480 acres

The minor crops above Pathfinder (i.e. other than alfalfa, grass hay and irrigated pasture) are assumed to have the same unit CU_w as normally-irrigated grass hay. Thus, the 0.9% of both the 21,539 and the 19,167 representing the minor crops is assigned to the same unit CU_w.

VIII. Total Consumptive Use Calculations

A. Total consumptive use of irrigation water (CU_w)

The individual crop acreages are then multiplied by the appropriate unit CU_w to produce an acre-ft total. For the grass hay ("other hay"), one cutting, with additional irrigation of this example:

CU_w = 11,480 acres * 1.26 ft. unit CU_w = 14,465 acre-ft.

Calculations are completed in the same manner for each crop type and weather station, resulting in the total CU_w (in acre-ft) for each crop and station. Values for the Encampment, Saratoga, Medicine Bow, and Muddy Gap stations are then combined into a single CU_w value for above Pathfinder Dam. For 1978, that value is 126,337 acre-ft.

To this CU_w for irrigated lands are added two additional consumptive use components:

B. The Ringsby transfer.

In 1978, the Wyoming State Engineers Office did not report equivalent acreage for Ringsby. Therefore, a value equal to the average of the reported values for 1985 - 1996 was assumed. This value (3,082 acres) is multiplied by 1.43 acre-ft per acre to provide the total equivalent consumptive use of irrigation water (4,377 acre-ft).

In the future, the annually reported Ringsby equivalent acreage will be used for this calculation.

C. Transfers from Agricultural Use

In 1978, there had been total transfers amounting to 2,937 acre-ft approved by the Wyoming Board of Control (see Table 7). This quantity is added to the historical 1978 CU_w.

In the future, the quantity of consumptive use for each transfer will be calculated on an annual basis, as explained in a separate procedure. This value will be used instead of the total on Exhibit A, Table 7 for future calculations of consumptive use.

D. Total Consumptive Use

The total consumptive use above Pathfinder Dam for 1978 is:

126,337 + 4,377 + 2,937 = 133,651 acre ft
(see Exhibit A, Table 8)

EXHIBIT B - PROCEDURES TO EVALUATE CONSUMPTIVE USE CALCULATIONS ABOVE GUERNSEY RESERVOIR, WYOMING

I. Background

Exhibit A provides the procedures to be used to calculate the historical and future consumptive use of irrigation water in the North Platte Basin of Wyoming above Guernsey Reservoir. In recognition of possible deficiencies in the procedures described in Exhibit A to estimate current consumptive use rates and to capture changes in agricultural conditions that may change the amount of irrigation water consumption per unit area, this exhibit (Exhibit B) presents a program for data collection and analysis and the review of consumptive use calculation methods. Like Exhibit A, the program described in this exhibit applies to the portion of the North Platte Basin in Wyoming above Guernsey Reservoir. If the North Platte Decree Committee (NPDC) concludes that alternate methodologies provide more reliable measures of consumptive use than the method presented in Exhibit A, a new methodology will be adopted by the NPDC and the consumptive use caps developed previously will be adjusted accordingly. An initial data collection, analysis, and review period of five years is established. This data collection, analysis and review will occur during the first ten years following court approval of the Final Settlement Stipulation.

II. Data Collection

A. Climate Data

The NPDC will install and operate 4 - 6 automated weather stations to collect precipitation, temperature, humidity, wind speed, solar radiation and soil temperature (at the 4-inch depth) data. These stations will be located to be as representative as possible of agricultural conditions in the Encampment, Saratoga, Medicine Bow, Sweetwater, and Casper to Guernsey areas of the North Platte River Basin. The specific locations will be determined by the NPDC with consideration given to the data needs of item III (below) to minimize the need for additional stations in the water balance subareas.

The requirements for continuous data collection will be evaluated after five years of operation. Procedures and contracts for the construction, operation, sensor calibration, general maintenance, and data retrieval and distribution for these stations will be developed by the NPDC. Standard methods typical of such weather station networks will be used in establishing the weather data network.

B. Irrigation Inventory

Beginning in the first year of implementation of this procedure and every 5 years thereafter, an inventory of irrigation systems throughout the Wyoming North Platte Basin above Guernsey will be conducted under guidelines established by the NPDC to provide a baseline and periodic comparisons for determining if changes in farming and irrigation practices over time may impact consumption of irrigation water. This inventory will include identification of the types of irrigation systems used (e.g. earthen head ditch with flood irrigation, center pivot sprinkler, gated pipe, etc.),

methods of conveyance (earthen canals, lined canals, pressurized pipe, etc.), number and types of runoff reuse systems, and drainage facilities present. To the extent feasible, observations of crop type and irrigations system type will be recorded in conjunction with the annual irrigated acreage accounting performed by Wyoming State Engineer's Office personnel pursuant to other NPDC procedures.

In conjunction with the facilities inventory, a representative survey of irrigation practices will be conducted every five years until such time as the NPDC may decide such surveys are no longer necessary. This survey will consist of operator questionnaires to acquire information on the number and dates of cuttings of forage crops, beginning and ending irrigation dates, grazing practices, crop rotations, plant species, fertilizer practices, crop yields, and land leveling activities.

In addition to the periodic irrigation inventories, the NPDC may obtain supplemental information by acquisition and interpretation of remote-sensing data to assess the uniformity of crop growth as influenced by irrigation in key areas.

C. Diversion Data

Information on irrigation diversions in the area above Guernsey Reservoir will be compiled annually from the records of the Wyoming State Engineer's Office (WSEO) and other available sources as appropriate. Such diversion records may include, for example, the spot measurements and gage readings recorded by WSEO personnel in the course of routine water administration, available data from automatically recording gages, and measurements and readings by USGS or USBR personnel.

If data beyond that which can be compiled from existing sources are necessary to assess the statistical variation in unit diversions (acre-ft per irrigated acre) for the basin above Guernsey Reservoir, additional diversion monitoring will be established. Specifically, sufficient diversion data will be collected to allow prediction of the number of diversion measurements that would be necessary to achieve an accuracy of ±5% at a 90% confidence level for the total irrigation diversions above Guernsey Reservoir.

D. Database Maintenance

A database including all data collected in accordance with this exhibit will be maintained by the NPDC in a manner and format that facilitates access by all members of the NPDC and calculation of consumptive use by both Exhibit A and potential alternative methods.

III. Water Balance Study Sites

The NPDC will select a minimum of two subareas (study sites) below Pathfinder Reservoir and three subareas above Pathfinder Reservoir in which it appears feasible to directly monitor inflow and outflow as a means to examine calculations of consumptive use of irrigation water based on other parameters. Calculations of consumptive use and effective precipitation based on climate and crop data will be supplemented with measurements of irrigation water diversion and application to fields within each subarea selected. For these detailed study sites, the NPDC will locate subareas in which water inflows and outflows can be carefully measured, irrigation conditions are representative of the larger irrigated areas of the basin, critical irrigation efficiency parameters can be effectively isolated, non-agricultural consumptive uses are minimal, and groundwater underflow and surface storage is minimal.

Within each subarea selected:

1. All major irrigation diversions will be measured.
2. Irrigation field deliveries will be measured under representative systems to assess conveyance losses.
3. Streamflow entering and exiting the subarea will be gaged. Protocols for operation and maintenance of such gages and the processing of flow records will be based on USGS stream-gaging procedures.
4. Groundwater underflow, if any, will be estimated.
5. All potential sources of streamflow depletion will be inventoried and appropriate estimates of consumptive use will be developed (e.g. from natural vegetation).
6. Precipitation will be measured.
7. Groundwater levels will be monitored if necessary to assess changes in groundwater storage.
8. Changes in surface water storage, if any, will be measured.
9. Soil water content at representative sites will be measured on or about April 1 and again on or about November 1 to evaluate storage of precipitation outside the growing season relative to total measured precipitation and any net change in soil moisture storage over the growing season.
10. Additional measurements and observations may be made from time to time as directed by the

NPDC (e.g. use of a modern Bowen Ratio or eddy-correlation instrumentation to verify estimates of evapotranspiration).

The water balance for a study site can be written as:

$$CU = IN + P \pm GW_n - OUT \mp S - ET_{ni} \quad (1)$$

where

CU = total actual consumptive use on irrigated land

IN = volume of surface water that enters the study site

P = volume of precipitation

GW_n = net ground water extraction

OUT = volume of surface water flowing out of the area

S = volume of water stored in the study site, and

ET_{ni} = evapotranspiration from non-irrigated lands.

The water balance will be conducted over a five year period to develop a database for estimation of actual consumptive use. These data will be used with methods for calculation of consumptive use, for example, to estimate representative on-farm and conveyance efficiencies for the study sites.

IV. Methodology Review

The data collection described above will be used to review methods for calculation of consumptive use of irrigation water, including the Exhibit A procedures, improved versions of the Exhibit A procedures, and procedures which

incorporate additional or different parameters (e.g. as discussed below).

Calculations using alternative methods will be made as data acquisition allows. Where possible, consumptive use calculations will be made in parallel with procedures in Exhibit A. For example, it is anticipated that the calibration of the Hargreaves equation used in Exhibit A will be compared with a new, local calibration using the Penman-Monteith equation as recently standardized by the American Society of Civil Engineers[1] as soon as the automated weather stations (II.A.) are in place. Similarly, it may be possible to begin evaluating the application of other approaches, e.g. tying consumptive use to the total days of diversion or to the total volume of diversions, after the first year's investigations under section III above.

The objective of the methodology review program is to evaluate alternatives to Exhibit A in the calculation of the past, present, and future consumptive use of irrigation water. Although it is not possible to anticipate all the alternatives which may prove viable, at a minimum, the alternative calculation methods described below (IV.A and IV.B.) will be evaluated. The final methodology selected should be acceptable to science and engineering communities, and may require periodic training of staff who will collect data and make calculations. Alternate calculation procedures will be statistically evaluated with respect to the confidence intervals associated with the calculated consumptive use of irrigation water. Alternate calculation procedures will also be evaluated in relation to the Exhibit A procedures with respect to accuracy, reliability, and suitability for appropriate re-calculation of the consumptive use caps established using the Exhibit A procedures.

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[1] ASCE Committee on Evapotranspiration in Irrigation and Hydrology, 2000, *Standardized Reference Evapotranspiration Equation.*

Other technology not yet developed may become available to estimate evapotranspiration (ET) over irrigated areas such as those in the North Platte River Basin in Wyoming in a cost effective manner. The NPDC will consider future new technology as it becomes available to improve methodology described in Exhibit A and as described above.

A. Exhibit A Method - Modified

During the initial five year period, local re-calibration of the Hargreaves equation used to calculate historical consumptive use and the future use of the Penman-Monteith equation will be investigated. The crop coefficients of Exhibit A will be refined to reflect annually varying climate and irrigation dates. For example, representative ending dates of diversions, followed by a delay of about two weeks, may be substituted for fixed conditions to reflect the beginning of dryland ET conditions. Annual observations of crop growth stage and uniformity will be used to refine the maximum crop coefficients.

For the area below Pathfinder, irrigated acreage is assessed under the Exhibit A method based on annual NASS surveys. Beginning with implementation of the settlement agreement, actual inventories of irrigated acreage will be conducted for this area by WSEO personnel in the same manner as has historically been done above Pathfinder. The relationship between WSEO inventory acreage and NASS survey acreage will be investigated with a goal of converting all irrigated acreage accounting to the WSEO inventories. This may require adjustment of the consumptive use cap, but no such adjustment will reflect acreage or technological changes that occurred after 2000.

B. Diversion - Efficiency Adjusted Method

A method that uses measured water diversions, rather than estimated crop yields, to adjust for variations in the annual water supply and that includes provisions to quantify the

impact of technological and production practice changes on consumptive use will be evaluated to predict consumptive use in the future. The method depends on the computed consumptive use per unit land area when water supplies are not limiting, similar to the method described in Exhibit A for the quantity ($CU_{w(max)}$). The consumptive use for well-watered conditions is reduced by a factor determined from the efficiency of water use on farms, the conveyance efficiency of the systems that supply water, and the annual variation of irrigation water supplies.

The consumptive use of irrigation water under a full water supply is the difference between the evapotranspiration for well-watered conditions (ET_m) and the amount of the precipitation that is effective in meeting crop water requirements (P_e):

$$CU_{w(max)} = ET_m - P_e \qquad (2)$$

Under this method, the well-watered evapotranspiration can be computed with the Penman-Monteith equation for reference crop evapotranspiration and crop coefficients as used in Exhibit A. The effective precipitation can be estimated similarly to the procedures described in Exhibit A. As indicated in Exhibit A and earlier in Exhibit B, the procedures for computing these quantities may be reviewed and improved over time.

A consumptive use ratio (R) can be defined as the ratio of the consumptive use of irrigation water for actual water supplies to the consumptive use of irrigation water for well-watered conditions (using the terminology from Exhibit A, $R = CU_w/CU_{w(max)}$). The ratio depends on the measured diversion of surface and ground water, the well-watered consumptive use and estimates of the well-watered on-farm

(E_f) and conveyance (E_c) efficiencies. The ratio can be computed by the following equation:

$$R = 1 - \left[1 - E_f E_c \left(\frac{D_v}{CU_{w(max)}}\right)\right]^{1/E_f} \quad (3)$$

For example, suppose that the annual well-watered consumptive use of irrigation water is 1.5 acre-feet/acre and that an irrigator diverted 3 acre-feet. The ratio of diversion to well-watered consumptive use is therefore 2.0. Furthermore, if the well-watered on-farm efficiency is 0.6 and the conveyance efficiency is 0.5, then the consumptive use ratio is 0.78. (A similar consumptive use ratio can be calculated for any given set of efficiencies and diversion divided by $CU_{w(max)}$.) Using this ratio the actual consumptive use would be 0.78 x 1.5 = 1.17 acre-feet/acre. The realized on-farm efficiency is assumed to be somewhat greater than the well-watered on-farm efficiency (E_f) whenever the diversion is inadequate to fully meet the crop water requirement.

To use this method, diversions of surface and ground water would be measured, and the on-farm and conveyance efficiencies would be estimated. These values may be determined from selected areas (study sites) that represent typical soils, irrigation systems, cropping systems, management practices and other factors for the areas above the Guernsey Reservoir.

Direct measurement of on-farm and conveyance efficiencies is difficult. Efficiencies change throughout the year and vary from location to location. Also such measurements often only apply to areas near the measurement site. A representative average for the study site is needed instead of locally measured values. To avoid complications in direct measurement of efficiencies, the water balance

measurements will be used to attempt to quantify the actual consumptive use for each study site. Then, the average on-farm and conveyance efficiency may be determined through calibration to water-balance based consumptive use. Estimates of the conveyance efficiency will be compared to measurements of diversion and delivery on some canals/ditches.

If this method were implemented basin-wide, the average efficiencies determined from the water balance procedures would be used on similar lands throughout the irrigated region above Guernsey Reservoir.

Exhibit 7

Procedure to Eliminate Negative Natural Flow Upon Occurrence

Procedure to Eliminate
Negative Natural Flow At Orin Upon Occurrence

Background

The phrase "negative natural flow at Orin" is a term used within the river accounting system to track the delivery of storage water through the North Platte River system. This tracking system, which is in conformity with the Natural Flow and Ownership Accounting Procedures, was developed and is maintained by the U.S. Bureau of Reclamation in cooperation and coordination with the Wyoming State Engineer's Office and the Nebraska Department of Natural Resources (NDNR). This term is unique to the discrete segment of the North Platte River between Gray Reef Reservoir outflow (Gray Reef) and Orin gages.

A negative natural flow at Orin occurs in the accounting of water when the total flow gaged at the Orin gage is less than the amount of storage water released from Gray Reef two days prior, after adjusting and accounting for the conveyance losses provided in Exhibit 9, "Procedure for River Carriage (Conveyance) Losses."

A negative natural flow at Orin can occur from one or more of the following conditions: 1) a substantial increase in the release of water from Gray Reef Dam, which can result in significant actual daily variations in travel times and conveyance losses that differ from the preset values, 2) inaccurate gaging at either the Gray Reef or Orin gage, 3) a conveyance loss value that is too low, 4) an assumed two-day travel time from the Gray Reef gage to the Orin gage

that is incorrect, 5) an incorrect calculation of the natural flow arriving at the Orin gage, or 6) the interception of storage releases by diverters that are not in conformance with, or do not have, a storage contract. Due to the extensive daily river accounting system used for the North Platte River operations, the Bureau of Reclamation and Wyoming State Engineer field office staff can anticipate the likely development of river flow, accounting or operational conditions as listed above, that may result in the occurrence of a negative natural flow at Orin.

Procedure

On a daily basis, the Wyoming State Engineer's Office will evaluate the stream gage, river and storage accounting data between the Gray Reef gage and the Orin gage to monitor any changes or trends to the daily accounting and river flow data that may indicate the likely development of negative natural flows at Orin.

Upon occurrence of negative natural flow at Orin, unless Wyoming identifies and reports to the field office of NDNR and the Bureau of Reclamation office in Mills that one or more of the above numbered conditions one through five is the cause of such negative natural flow, Wyoming will administer water rights and/or take other actions necessary to eliminate the negative natural flow at Orin. If there is disagreement on the cause of the negative natural flow among the State field offices and the Bureau of Reclamation office in Mills, these officials will report the disagreement to the NPDC for further review.

If the cause of the negative natural flow at Orin is determined to be number six above, it will be eliminated by the Wyoming State Engineer Offices actions as soon as possible within three days of the time of occurrence. The

Wyoming State Engineer will report to the NPDC, with respect to any specific actions taken to eliminate the occurrence of negative natural flow at Orin.

Exhibit 8

Procedure for Reservoir and Storage Right Evaporation Losses

NPDC Charter – Exhibit 8

Procedures for Reservoir and Storage Right Evaporation Losses

1. Background

As a result of the Final Settlement Stipulation, the parties agreed to changes in the reservoir and storage evaporation loss provisions of Article V of the 1945 decree, as modified in 1953. The parties have agreed that such losses can be removed from Article V and instead placed in this procedure.

The reservoir and storage right evaporation methods described below shall be used by the NPDC in its operating procedures for the annual accounting of storage water. The NPDC may consider and approve modifications to the following procedures.

2. Reservoir Evaporation Losses

Seminoe
Evaporation will be computed daily based upon evaporation from Weather Bureau Standard 4 foot diameter Class "A" pan located at Seminoe during the irrigation season and using the Class "A" pan located at Pathfinder during the non irrigation season.

Pathfinder and Alcova
Evaporation will be computed daily based upon evaporation from Weather Bureau Standard 4 foot diameter Class "A" pan located at Pathfinder Reservoir.

Glendo
Evaporation will be computed daily based upon evaporation from Weather Bureau Standard 4 foot diameter Class "A" pan located at Glendo during the irrigation season and using the Class "A" pan located at Whalen Diversion Dam during the non irrigation season.

Guernsey
Evaporation will be computed daily based upon evaporation from Weather Bureau Standard 4 foot diameter Class "A" pan located at Whalen Diversion Dam.

For all of the above listed stations the daily pan evaporation will be multiplied by the area of the water surface of the reservoir in acres and by a coefficient of 70% to reduce recorded pan evaporation to the estimated equivalent open water surface evaporation.

3. Distribution of Reservoir Evaporation Losses

A one-day time lag will be used in computing the evaporation loss distributed to water stored under each storage right. Evaporation loss distributed today is considered to be equal to yesterday's total reservoir evaporation.

No evaporation loss will be distributed when water is being spilled from the system.

Pathfinder
The evaporation loss is computed as though all water stored under the Pathfinder Reservoir storage right is in Pathfinder Reservoir, except for that portion which may be in Guernsey Reservoir, which shall be computed at the same rate as that of Guernsey Reservoir.

Inland Lakes
Evaporation will be distributed against water stored for the Inland Lakes at the rate determined for the reservoir where the Inland Lakes water is temporarily stored before such storage is transferred to the Inland Lakes.

Guernsey
The evaporation loss is computed as though all water stored under the Guernsey storage right is in Guernsey Reservoir.

Seminoe and Alcova
The evaporation loss to water stored under the Seminoe and Alcova storage rights shall be the Seminoe and Alcova Reservoir evaporation yesterday, plus the evaporation for Seminoe and Alcova storage water stored in any other reservoir but accounted as in Seminoe Reservoir, minus any evaporation loss attributed to storage held under contract for other entities by the Bureau of Reclamation in Seminoe Reservoir.

Glendo
All evaporation from water stored under Glendo storage rights will be applied against the Glendo evaporation pool, unless storage for evaporation has been underestimated and evaporation encroaches upon the irrigation pool. In lieu of utilizing the irrigation pool for evaporation, the power head pool may be used when refilling of the power head pool has been allowed as an exception by the Wyoming State Engineer.

The evaporation loss to the water stored under the Glendo storage right is the total reservoir system evaporation minus that applied to other storage rights and minus any evaporation loss attributed to storage held under contract for other entities by the Bureau of Reclamation in Glendo

Reservoir.

In accordance with the operation of the reregulation space in Glendo Reservoir under Permit No. 5998 Res. and Certificate of Construction of Reservoir as clarified by the Wyoming Board of Control order entered November 29, 2000, water may be held in Glendo Reservoir in excess of the limitations stated in paragraph XVII (b) of the Modified Decree and may be used to replace evaporation from the water stored under storage rights of Pathfinder Reservoir, Guernsey Reservoir, Seminoe Reservoir, Alcova Reservoir, and Glendo Reservoir. Water that is accrued to the available reregulation space and stored at or above Alcova Dam in quantities greater than needed to provide operational water to make up for unintentional water passing the state line in excess of water needed to fill storage water orders by canals below the state line, is used to replace evaporation from the water stored under the Seminoe, Alcova, Pathfinder, Glendo and Guernsey storage rights, once the storage rights are filled, and until the first release of storage water occurs from any of these storage rights for diversion by canals at or above Tri-State Dam. Water that is accrued to the available reregulation space and stored below Alcova Dam in quantities greater than needed to provide operational water is used to replace evaporation from the water stored under the Glendo and Guernsey storage rights, once the storage rights are filled, and until the first release of storage occurs from either storage right for use at or above Tri-State Dam.

Exhibit 9

Procedure for River Carriage (Conveyance) Losses

Exhibit A: Source of the Values of the River Carriage Losses

Exhibit B: Distribution of River Carriage Losses

Procedure for River Carriage (Conveyance) Losses

1. Background

As a result of the Final Settlement Stipulation, the parties agreed to changes to the river carriage loss provisions of Article V of the 1945 Decree, as modified in 1953. The parties have agreed that such losses can be removed from Article V and instead placed in this procedure.

The river carriage losses and methods described below shall be used by the NPDC in its operating procedures for the annual accounting of natural flow and storage water. The NPDC may consider and approve modifications to the following loss values and methods.

2. River Carriage (Conveyance) Losses

Unless and until the NPDC agrees otherwise, daily carriage losses in second-feet for various sections of the river shall be administered as shown in the following table:

River Section	May	June	July	August	September
Alcova to Glendo Reservoir	50	77	97	89	50
Guernsey Reservoir to Whalen	2	4	5	4	2
Whalen Div. to State Line	10	19	21	17	9
State Line to Minatare Gage	8	12	13	11	6
Minatare Gage to Bridgeport Gage	8	11	12	10	7
Bridgeport Gage to Lisco Gage	12	16	18	14	10
Lisco Gage to Lewellen Gage	12	16	18	15	10

Attached to this procedure is Exhibit A, which sets forth the source of the values of the above river carriage losses.

The above table does not contain computed losses for the section of river from Glendo Dam to the head of Guernsey Reservoir (area 680 acres) because this area is less than the submerged area of the original river bed (940 acres) in Glendo Reservoir and is, therefore, considered as off-set.

The above table does not contain computed losses for the section of river from Pathfinder Dam to the head of Alcova Reservoir (area 170 acres) because this area is less than the submerged area of the original river bed in Alcova Reservoir and is, therefore, considered as off-set.

Likewise, the area between Seminoe Dam and the head of Pathfinder Reservoir is less than the area of original river bed through Pathfinder Reservoir and is, therefore,

considered as off-set.

3. Distribution of Losses

In the Alcova Dam to Whalen Diversion Dam section of the river, the distribution of carriage loss will be based on the proportion of storage water and natural flow to total flow calculated at the upstream end of each section, unless the NPDC agrees otherwise.

In the Whalen Diversion Dam to State Line gage section of the river, the method to be used to distribute the carriage losses will be based on the proportions of natural flow and storage water to total flow at the ends of the section. The average proportion for the section will be determined by using the mean ratio for the ends of the section as described in Exhibit B. This method will be used unless the NPDC agrees otherwise.

In the State Line to Lewellen gage sections of the river, the method to be used to distribute the carriage losses will be based on the proportions of natural flow and storage water in the section to the total flow in the section as described in Exhibit B. Once natural flow and storage water are delivered to the State Line, Nebraska will have the responsibility for delivering the water to the Tri-State Canal and other contractors below the state line gage in accordance with the Modified Decree. The ratio of storage water in the section will be determined by dividing the amount of storage water at the upper end of the reach by either the sum of all the measured inflows to the reach or the sum of all the measured outflows from the reach, whichever is larger. The ratio of natural flow in the reach will be determined by subtracting the ratio of storage water in the reach from one. This method will be used unless the NPDC agrees otherwise.

SOURCE OF THE VALUES OF THE RIVER CARRIAGE LOSSES

In 1989, the States of Wyoming and Nebraska and the U.S. Bureau of Reclamation contracted with Bishop and Brogden, Inc. (BB)[1], to ascertain the conveyance losses. The BB report accounted for conveyance losses by estimating monthly evaporation and evapotranspiration losses for each section of the river. The accuracy of the evaporation loss estimates was acceptable to Nebraska, Wyoming and the U.S Bureau of Reclamation. However, there was no agreement among the parties on the validity of the estimates of the remaining conveyance losses. The dispute was settled by a compromise in which the parties agreed to accept the consultant's estimates of evaporation losses for each section of the river and a certain percentage of the consultant's estimated evapotranspiration losses. For the sections between Alcova Reservoir and Whalen Dam, the parties agreed to assess an additional 62.5 percent of the estimated evapotranspiration losses. Between Whalen Dam and the state line, 10 percent of the estimated evapotranspiration losses was added to the evaporation losses.

To fully resolve all differences, carriage loss values were also carried further downstream, between the Wyoming-Nebraska state-line and Lewellen. These monthly values result from river channel water surface estimates made from aerial photographs and from pan evaporation records for nearby National Weather Service stations plus a component for

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[1]Bishop-Brogden Associates, Inc. Determination of Present-Day Conveyance Losses. North Platte River, Alcova Reservoir ro the Nebraska-Wyoming State Line. June 1990.

"additional losses". To represent field conditions, the pan evaporation was reduced 30 percent. Finally. each value was rounded to the nearest whole unit.

The conveyance losses assigned to each section are shown in Table 1.

Table I. Stipulated Carriage Losses Alcova Reservoir to Lewellen

May

	Evaporation Losses	Stipulated Additional Losses	Total Conveyance Loss
Alcova Reservoir to Glendo Reservoir	36	14	50
Guernsey Reservoir to Whalen Dam	2	0	2
Whalen Dam to State Line	6	4	10
State Line to Minatare Gage	6	2	8
Minature Gage to Bridgeport Gage	6	2	8
Bridgeport Gage to Lisco Gage	10	2	12
Lisco Gage to Lewellen Gage	10	2	12

* Evaporation losses calculated by Bishop-Brogden for Alcova Reservoir to Tri-State Dam calculated by Nebraska Department of Water Resources from Tr-State Dam to Lewellan.

** "Additional losses" includes, among other losses, a consideration of evapotranspiration.

[Table I. (cont.)]

	June		
	Evaporation Losses	Stipulated Additional Losses	Total Conveyance Loss
Alcova Reservoir to Glendo Reservoir	46	31	77
Guernsey Reservoir to Whalen Dam	4	0	4
Whalen Dam to State Line	12	7	19
State Line to Minatare Gage	7	5	12
Minature Gage to Bridgeport Gage	7	4	11
Bridgeport Gage to Lisco Gage	12	4	16
Lisco Gage to Lewellen Gage	12	4	16

* Evaporation losses calculated by Bishop-Brogden for Alcova Reservoir to Tri-State Dam calculated by Nebraska Department of Water Resources from Tr-State Dam to Lewellan.

** "Additional losses" includes, among other losses, a consideration of evapotranspiration.

[Table I. (cont.)]

July

	Evaporation Losses	Stipulated Additional Losses	Total Conveyance Loss
Alcova Reservoir to Glendo Reservoir	51	46	97
Guernsey Reservoir to Whalen Dam	5	0	5
Whalen Dam to State Line	13	8	21
State Line to Minatare Gage	7	6	13
Minature Gage to Bridgeport Gage	8	4	12
Bridgeport Gage to Lisco Gage	13	4.7	18
Lisco Gage to Lewellen Gage	13	5	18

* Evaporation losses calculated by Bishop-Brogden for Alcova Reservoir to Tri-State Dam calculated by Nebraska Department of Water Resources from Tr-State Dam to Lewellan.

** "Additional losses" includes, among other losses, a consideration of evapotranspiration

[Table I. (cont.)]

	August		
	Evaporation Losses	Stipulated Additional Losses	Total Conveyance Loss
Alcova Reservoir to Glendo Reservoir	46	43	89
Guernsey Reservoir to Whalen Dam	4	0	4
Whalen Dam to State Line	10	7	17
State Line to Minatare Gage	6	4.6	11
Minature Gage to Bridgeport Gage	6	4	10
Bridgeport Gage to Lisco Gage	11	3	14
Lisco Gage to Lewellen Gage	11	4	15

* Evaporation losses calculated by Bishop-Brogden for Alcova Reservoir to Tri-State Dam calculated by Nebraska Department of Water Resources from Tr-State Dam to Lewellan.

** "Additional losses" includes, among other losses, a consideration of evapotranspiration

[Table I. (cont.)]

	September		
	Evaporation Losses	Stipulated Additional	Total Conveyance Loss
Alcova Reservoir to Glendo Reservoir	34	16	50
Guernsey Reservoir to Whalen Dam	2	0	2
Whalen Dam to State Line	6	3	9
State Line to Minatare Gage	4	2	6
Minature Gage to Bridgeport Gage	5	2	7
Bridgeport Gage to Lisco Gage	8	2	10
Lisco Gage to Lewellen Gage	8	2	10

* Evaporation losses calculated by Bishop-Brogden for Alcova Reservoir to Tri-State Dam calculated by Nebraska Department of Water Resources from Tr-State Dam to Lewellan.

** "Additional losses" includes, among other losses, a consideration of evapotranspiration

DISTRIBUTION OF RIVER CARRIAGE LOSSES

Whalen to State Line Section

The loss to storage between Whalen and the State line will be the previous day's ratio of storage water in the Whalen to State Line section times the daily conveyance loss for the section. A one day time lag is assumed from Whalen to the State Line. The ratio of storage in the Whalen to State Line section is computed as the average of the proportion of storage passing Whalen to total flow passing Whalen one day previous and the proportion of storage at the State Line to total flow at the State Line. This ratio in the section is used to determine the loss to storage between Whalen and the State Line the following day. Storage passing Whalen is the storage at Whalen minus the storage diversions into the canals which divert at Whalen Dam. Storage at the State Line is the storage passing Whalen minus the loss from Whalen to the State Line and minus all diversions of storage by contractors diverting below Whalen and above the State line.

Sections Downstream of the State Line

The ratio of storage water in the section will be determined by dividing the amount of storage water at the upper end of the reach by either the sum of all the measured inflows to the reach or the sum of the measured outflows from the reach, whichever is larger. The ratio of natural flow in the reach will be determine

by subtracting the ratio of storage water in the reach from one.

A one day lag time is required for the accounting for natural flow and storage in each reach below the State Line. In the Whalen to the Wyoming-Nebraska state-line section, the proportion of natural flow and storage passing the State Line gage will not be determined until two days after the flows have passed the gage. In order to permit water administration with no more than a one-day delay, Nebraska will use the amount of storage ordered to be delivered at the state line on a given day in its calculations. If after the final accounting for storage deliveries in the Whalen to the Wyoming-Nebraska state-line section, it is determined the amount of storage water at the State Line gage was less than was assumed to be present by more than 5%, the accounting for each section of the river below Minatare will be adjusted accordingly.

Exhibit 10

Procedure for Whalen Diversion Dam to the State Line Reach Administration of Irrigation Ground Water Rights

Exhibit A: Assumptions Used in the Development of the Well Unit Replacement Requirement

Exhibit B: Potential Methodology for Future Estimates of Triggers

NPDC Charter – Exhibit 10

Procedure for Whalen Diversion Dam to the State Line Reach

Administration of Irrigation Ground Water Rights

A. Definitions

1. Area of Administration – The area bounded by Whalen Diversion Dam on the West, 300 feet south of the Ft. Laramie Canal on the South, one mile north of the Interstate Canal on the North and extending downstream to the Wyoming/Nebraska State Line on the East.

2. Rights Affected – The water rights affected by this administration procedure are ground water rights having a priority date on or after October 8, 1945 for wells used for irrigation purposes that are located within the area of administration defined in section A.1 above.

3. Base Line Well – Any irrigation well that has pumped water for irrigation purposes during the ten years immediately prior to court approval of the Final Settlement Stipulation will be considered a "base line well" as described in sections C.1 and C.2.

4. Active Well – For the purposes of the future data collection and analyses described in section D and for determining the annual replacement water requirement as described in section C.1, a well will be considered active if it pumped water for irrigation purposes during the previous irrigation season.

B. General Provisions

1. Irrigation wells in the defined area of administration having a ground water right with a priority date earlier than October 8, 1945 shall continue to be administered by the State of Wyoming without regard to the Modified Decree and Final Settlement Stipulation.

2. Replacement wells for irrigation wells with ground water rights with a priority date earlier than October 8, 1945 are allowed but may continue to deplete no more than the amount of water depleted by the original well that they replaced, no matter when the well was completed.

3. The estimated depletions from irrigation wells with priority dates between October 8, 1945 and December 31, 2000, inclusive, located in the area of administration that occur between and including May 1 and September 30 will be administered and replaced in the manner provided by the administration procedures described below.

4. The estimated depletions from irrigation wells with priority dates after December 31, 2000, located in the area of administration will be administered and replaced in the manner provided by the administration procedures described below.

5. The replacement water required as a result of the implementation of these administration procedures may be provided from a variety of sources, including but not limited to, Wyoming's allocation of storage water from Glendo Reservoir, the Wyoming account in the Pathfinder Modification Project, other storage releases, replacement from other surface and ground water supplies or the cancellation or transfer of water rights.

6. The replacement water sources provided in section B.5 above are contingent upon being able to demonstrate to the NPDC that the actual replacement water will become a part of the natural flow in the Whalen Diversion Dam to State Line reach. The replacement water required as a result of the implementation of this administration procedure will be provided as a supplement to natural flow in the manner described below in section B.7.

7. The replacement water shall be available to supplement the natural flow in the Whalen Diversion Dam to State Line

reach of the North Platte River and be provided each year during the May through September period when natural flow is insufficient to meet the demands of both Wyoming and Nebraska irrigators who divert from North Platte River at or above Tri-State Dam.

8. Wyoming will initiate the State Board of Control process to adjudicate all existing unadjudicated (priority dates on or prior to December 31, 2000) irrigation ground water rights in the area of administration affected by these procedures within one year of court approval of the Final Settlement Stipulation and complete such State Board of Control adjudication within five years of said final court approval. Adjudication will proceed pursuant to Wyoming law and will result in adjudication or cancellation of each such ground water right affected by this process.

9. Wyoming will initiate the State Board of Control process to adjudicate any new (priority dates after December 31, 2000) ground water rights for irrigation purposes, which are permitted under Wyoming law after the date of court approval of the Final Settlement Stipulation, within ten years after permitting each such ground water right. Such adjudications will proceed pursuant to Wyoming law.

C. Administration

1. Required replacement water

a. The replacement water requirement for the pumping of individual active ground water irrigation wells with priority dates on or between October 8, 1945 and December 31, 2000 will be 24.4 acre-feet per well (unit replacement water requirement). Attached to this procedure is Exhibit A identifying the assumptions used to develop this unit replacement water requirement.

b. The total seasonal replacement water requirement will be determined by multiplying the unit replacement water requirement per well described in section C.1.a by the number of active ground water irrigation wells in the defined area of administration.

c. Beginning in the first full irrigation season after the number of base line wells has been determined, Wyoming will initiate the delivery of the required replacement water amounts as described in section C.1.b above. These deliveries will be made in the manner described in section B.7 above.

d. Each year thereafter, Wyoming will

complete a new list of the number of base line wells that were active in that year and will provide a report of this information to the NPDC by December 31st of each year. This list of active wells, together with the unit replacement water requirement provided in section C.1.a, will be used to determine and set the amount of replacement water required for the following irrigation season.

2. Irrigation Ground Water wells

   a. Wyoming, in cooperation with Nebraska and the Bureau of Reclamation, will jointly identify, pursuant to paragraph A.3, the number of active irrigation wells with priority dates on or between October 8, 1945 and December 31, 2000 in the area of administration. This joint cooperative effort shall be completed within one year after court approval of the Final Settlement Stipulation and shall result in a determination and listing of the "base line wells".

   b. Base Line Wells - Upon completion of the determination of the number of base line wells provided in section C.2.a above, the following procedure will be used by Wyoming relative to future activities

associated with these ground water irrigation wells. Under each of the situations described below, the unit replacement water requirement will be as provided in section C.1.a.

i. If any of the base line wells are abandoned, Wyoming may replace the abandoned well with a new well and the new well will be a base line well, so long as the rate of withdrawal and the amount of irrigated land under the new well do not exceed those of the abandoned well.

ii. If any of the base line wells are in need of replacement due to collapse or other operational problems, the replacement well will be a base line well, so long as the rate of withdrawal and the amount of irrigated land for the replacement well do not exceed those of the original base well.

iii. If the irrigation ground water right associated with one of the base line wells is transferred under Wyoming water law to a new location within the area of administration, the well with the transferred ground water right will be a base line well, so long as the rate of withdrawal and the amount of irrigated land for the

well with the transferred ground water right do not exceed those of the original well.

c. New Wells – Are defined as irrigation wells permitted by the Wyoming State Engineer and located within the area of administration with a priority date after December 31, 2000 and that are not considered base line wells under one of the situations described in section C.2.b above.

i. The depletion unit replacement water requirement for new wells shall be 80 acre-feet per well. Wyoming may request, and the NPDC may grant, a variance from this unit replacement water requirement for a specific new well applicant, upon adequate demonstration to the NPDC that the actual unit replacement water requirement differs from the unit replacement water requirement being used for new wells in the area of administration and is inappropriate for the specific circumstances presented.

ii. The replacement water required from these new wells shall be provided to supplement the natural flow in the Whalen Diversion Dam to State Line

reach in the same manner as the replacement water requirement for the base line wells and as described in section B.7 above.

3. Regulation of Wells

   a. Base Line Wells - If Wyoming is unable to assure or provide the required replacement water in any one year, Wyoming will be required to regulate ground water right irrigation wells within the area of administration. In years when Wyoming does not anticipate having adequate replacement water available for the base line wells, Wyoming will regulate, *i.e.* prevent from pumping for the entire irrigation season, a sufficient number of base line wells to equal the anticipated shortfall in replacement water.

      Wyoming will use the unit replacement water requirement provided in section C.1.a above for the base line wells to determine the number of base line wells to be regulated to make-up the deficit of replacement water. For example, as 24.4 acre-feet per well is the replacement water requirement, if Wyoming is unable to provide 1,220 acre-feet of the required replacement amount, Wyoming will regulate, *i.e.*

prevent from pumping 50 of the irrigation wells during the entire irrigation season.

b. New Wells - Wyoming will assure that the replacement water requirements are provided by the appropriator for each new well in accordance with this procedure. If such required amounts are provided, the new wells will not be subject to regulation to make up an anticipated shortfall in replacement water. However, if such individual source of replacement water is not available, regulation of these wells will be required.

D. Future Data Collection and Analyses

1. Each year, beginning one year after the court approval of the Final Settlement Stipulation, Wyoming will collect and provide to the NPDC prior to its meeting in April, the following information related to the prior irrigation season:

   a. The number of active irrigation wells.

   b. An estimated amount of ground water pumped for irrigation purposes in the area of administration based on power records and other available

measured flow information. For calibration purposes, Wyoming will periodically measure, per industry standards, the pumpage of a representative number of wells (five percent of the active wells on electric power) to confirm the electric power record conversions to estimated volumetric amounts.

2. Every five years, beginning five years after court approval of the Final Settlement Stipulation, the NPDC will collect information on the basic parameters used to estimate the replacement water requirements, including but not limited to a general survey to determine the type of irrigation practices and application facilities in place (gravity or sprinkler irrigation), type of conveyance facilities, the amount of irrigated land, the types of crops grown and production practices.

3. Each year, the NPDC will use the detailed procedures developed by the Bureau of Reclamation to compile information regarding the estimated number of "trigger days." These step by step procedures are attached to this procedure as Exhibit B. The information derived from using these "trigger days" procedures will also be made available to the NPDC for their review and use with the information collected in section D.2 above.

4. The NPDC will also assure that the weather station currently located in Torrington, Wyoming will be operated in the future to collect data on precipitation, solar radiation, air temperature, relative humidity, wind speed and soil temperature. In the future, if it is necessary for the NPDC to contract for the operation of this weather station, Wyoming, Nebraska and the Bureau of Reclamation will share such costs.

5. Every five years, beginning five years after court approval of the Final Settlement Stipulation, the NPDC will review the collected information provided in section D. Each representative or the NPDC may develop and complete analyses with this information that could be used by the NPDC to review and approve adjustments to the unit replacement water requirements, provided in this procedure. These analyses could include the use of ground water models or other appropriate methods to estimate consumptive use, depletions and unit ground water response functions as they relate to the use of ground water for irrigation purposes in the area of administration.

6. If the NPDC adjusts the unit replacement water requirements, then these values will be used annually for the succeeding five years to set the seasonal replacement

water requirements.

Exhibit A to the
Procedure for Whalen Diversion Dam to the State Line Reach Administration of Irrigation Ground Water Rights

ASSUMPTIONS USED IN THE DEVELOPMENT OF THE WELL UNIT REPLACEMENT REQUIREMENT

The unit replacement requirement was based on the concept that well depletions in the Whalen to State Line reach of the river would only need to be replaced on those days when Glendo is not releasing flood flow in excess of demand and/or reach gains were insufficient to meet the May 1 to September 30 surface water irrigation demand in the reach. The unit replacement well requirement was developed by 1) determining the monthly depletions to the river caused by pumping irrigation wells that are located in the area of administration; 2) determining the number of days each month that well depletions would have an impact on the availability of the flows in this reach to meet irrigation demands; 3) using the number of days each month when flows were insufficient to meet demand to determine the amount of the monthly well depletion to the river that should be replaced; 4) summing these monthly depletions to calculate the annual replacement requirement and 5) dividing this number by the estimated number of pumping wells to determine a per well replacement requirement. The monthly depletions caused by irrigation wells were based on modifications of results of ground-water flow models of the alluvial aquifer of the North Platte River valley in the area from Whalen Dam to the Wyoming State Line developed for the Nebraska v. Wyoming litigation. The number of days

these depletions have an impact on the availability of flows to meet demand was based on an analysis of daily flows and diversions developed by the U. S. Bureau of Reclamation Wyoming Area Office.

Analysis of Number of Days Replacement Is Required

The following methodology was used to determine the days when replacement for ground water depletions is required in the reach from Whalen Dam to the State Line.

This is determined by a series of conditions that are described below.

1) If Glendo Reservoir is in the flood pool, no replacement is required because, in this situation, there is no storage being released other than from the Glendo flood pool.

a) Glendo Reservoir is determined to be in the flood pool when the content on a given day is in excess of 517,485 Acre Feet.

2) If Glendo is not in the flood pool and if the Guernsey Dam and Powerplants gates are closed, replacement is not required unless there is no unused water at the State Line, in which case replacement is required.

a) Guernsey Dam and powerplant gates are determined to be closed if the flow below Guernsey Dam at the gaging station is less than 50 cfs on a given day. The determination of whether there is unused water at the State Line is described in 4 below.

3) If Glendo Reservoir is not in the flood pool and the Guernsey Dam gates are not closed, it is necessary to

determine if the gains from Whalen Diversion Dam to the State Line are adequate to meet the diversions in the reach plus the diversion into the Tri-State Canal. If the gains are adequate to meet the diversions, no replacement is required.

a) The diversions in the Whalen to State Line reach are determined as the sum of the diversions of the New Grattan, North Platte, Rock Ranch, Pratte Ferris, Burbank, Torrington, Lucerne, Narrows, Mitchell, and Gering canals as reported by Wyoming and Nebraska.

b) The flow at the State Line is determined from the gaging station at the State Line.

c) The diversion to the Tri-State canal is the reported diversion into the canal.

d) To determine the gain, the diversions in the Whalen Dam to State Line reach on the previous day are added to the flow at the State Line and the flow which passed Whalen Diversion Dam on the previous day are subtracted.

e) To determine if the gain is adequate to meet diversions, the Tri-State canal diversion is subtracted from the gain. If a positive amount remains, the gain was adequate.

4) If Glendo is not in the flood pool and the Guernsey Dam gates are not closed and the gains in the Whalen to State Line reach are not adequate to meet diversions, it is necessary to determine if there is unused water at the State Line and whether storage water is being delivered in the reach or whether there is a charge to the operational water account. If there is unused water at the State line and there is

no storage diverted in the reach and there also is no charge to the operational water account, no replacement is required. If there is unused water at the state line and there is a charge to the operational water account, replacement is required. If there is unused water at the State Line and storage water is delivered in the reach, replacement is required.

a) The orders for storage water delivery below the Tri-State Diversion Dam is the sum of the storage water orders by Beerline, Brown's Creek, Central, Chimney Rock, Enterprise, CNPPID and Bridgeport as reported by Nebraska for use in the daily water North Platte River Water accounting

b) To determine if there is unused water at the State Line, the diversion for the Tri-State Canal and the orders for storage water delivery below Tri-State Dam are subtracted from the gaged flow at the State Line. If the flow at the State Line is in excess of the diversion of the Tri-State Canal and the orders for storage water delivery below the State Line, there is unused water present at the State Line.

c) The storage deliveries in the Whalen to State Line reach equal the sum of the storage water diversions of the New Grattan, North Platte, Rock Ranch, Pratt Ferris, Burbank, Torrington, Lucerne, Narrows, Mitchell, Gering and Tri State canals as determined in the Distribution of Natural Flow and Storage North Platte River Accounting.

d) The charge to operational water account is as determined in the Distribution of Natural Flow and Storage North Platte River Accounting.

Description of Detailed Calculations Shown on Table 1.

1) (Glendo in Flood Pool) Bureau of Reclamation Hydromet Data System, Content of Glendo Reservoir greater than 517,485 AF (YES or NO).

2) (Guernsey outflow) Bureau of Reclamation Hydromet Data System.

3) (Guernsey PP and Gates Closed) Column determines Guernsey Powerplant and Gates are closed if flow below Guernsey is less than 50 cfs.

If Column 2 is less than 50 then "YES" else "NO".

4) (PP and Gates Closed and Unused at S.L.) Columns checks column 3 to see if Guernsey Powerplant and Gates are closed and if there is unused water at the State Line.

If Column 3 is equal to "YES" and Column 16 is greater than 0 then "YES" else "NO".

5) (Interstate Canal) Bureau of Reclamation Hydromet Data System, information only.

6) (Fort Laramie Canal) Bureau of Reclamation Hydromet Data System, information only.

7) (Passing Whalen) Bureau of Reclamation Hydromet Data System.

8) (Diverted Between Whalen and State Line) Diversion for New Grattan, North Platte, Rock Ranch, Pratte Ferris, Burbank, Torrington, Lucerne, Narrows, Mitchell, and Gering as reported by Wyoming and Nebraska and entered in

Distribution of Natural Flow and Storage Accounting North Platte River Accounting.

9) (State Line) Bureau of Reclamation Hydromet Data System.

10) (Tri-State Diversion) Bureau of Reclamation Hydromet Data System.

11) (Gain between Whalen and State Line) Diverted between Whalen and State Line on previous day plus State Line flow minus flow passing Whalen on previous day.

Column 8 (previous day) + Column 9 - Column 7 (previous day).

12) (Diversion Plus Tri-State) Diverted between Whalen and State Line on previous day plus Tri-State Diversion.

Column 8 (previous day) + Column 10.

13) (Gains are Adequate to Meet Delivery) Column determines if gain between Whalen and State Line is adequate to meet diversion between Whalen and State Line plus Tri-State Diversion.

If Column 12 is greater than Column 11 then "NO" else "YES".

14) (Orders Below Tri-State) Orders by Beerline, Brown's Creek, Central, Chimney Rock, Enterprise, CNNPID, and Bridgeport as reported by Nebraska and entered in Distribution of Natural Flow and Storage North Platte River Accounting.

15) (Storage Diverted in Reach) Storage diverted below Whalen and at or above Tri-State (New Grattan, North Platte, Rock Ranch, Pratte Ferris, Burbank, Torrington, Lucerne, Narrows, Mitchell, Gering) determined by Distribution of Natural Flow and Storage North Platte River Accounting, information only.

16) (Unused Water at State Line) State Line Flow minus Tri-State Diversion minus Orders Below Tri-State. If this results in a negative number, it is forced to be zero.

If Column 9 - Column 10 - Column 14 < 0 then it is equal to 0 otherwise Column 9 - Column 10 - Column 14.

17) (Charge to Operational Account) North Platte Storage Ownership Accounting. There was an operational account in 1999, 1998 and 1997 but not in 1990 through 1996. Column 16 for 1990 through 1996 was filled in with "NO". There might have been a charge to "excess water" June 26 through July 5 in 1990.

18) (Unused Water at S.L. and No Charge to Oper./Storage) If there is unused water at the State Line, no charge to the operational account, and no storage is diverted then "YES" otherwise "NO".

If Column 16 > 0 and Column 17 = "NO" and Column 15 = 0 then "YES" else "NO".

19) (Replacement Required by Wyoming) If Column 1, Column 4, Column 13, or Column 18 is equal to "YES" then Wyoming does not need to replace groundwater otherwise it does.

Applying the Number of Days Replacement is Required to the Monthly Well Depletions

The number of days each month replacement is required was divided by the number of days in the month to prorate the time replacement should be required each month. The modeled monthly depletion was then multiplied by this ratio to determine the amount of water that is needed to replace depletions that month. The annual replacement requirement is the sum of the monthly depletions. These calculations are shown in Table 2.

Table 2: Applying the Number of Days Replacement is Required to the Monthly Well Depletions

	May	June	July	August	September	Total
Days Replacement Required	2.7	4.3	18.1	28.5	21.3	74.9
Ratio of Days Replacement Required to Total Days in Month	.087	.143	.584	.919	.710	
Modeled Monthly Depletion acre feet	1,792	1,955	2,746	3,748	3,767	14,008
Monthly Replacement Requirement acre feet	155.9	279.6	1,603.7	3,444.4	2,674.4	8,158.2

The total replacement per well was calculated by dividing the total annual replacement by the number of wells used to model the well depletions. The model assumed 335 wells were being pumped. Therefore the depletion per well was

8158.2 acre feet / 335 wells = 24.4 acre feet per well.

Groundwater Replacement Trigge

	Test 1	Test 2			Test 3					
	1	2	3	4	5	6	7	8	9	10
Date	Glendo In Flood Pool (YES/NO)	Guernsey Outflow (cfs)	Guernsey PP and Gates Closed (YES/NO)	PP and Gates Closed and Unused at S.L. (YES/NO)	Interstate Canal (cfs)	Ft.-Laramie Canal (cfs)	Passing Whalen (cfs)	Diverted Between Whalen and State Line (cfs)	State Line (cfs)	Tri-State Diversion (cfs)

			Test 4					
11	12	13	14	15	16	17	18	19
Gain Between Whalen and State Line (cfs)	Diversion Plus Tri-State (cfs)	Are Gains Adequate to Meet Delivery (YES/NO)	Orders Below Tri-State (cfs)	Storage Delivered in Reach (cfs)	Unused Water at State Line (cfs)	Charge to Operational Account* (YES/NO)	Unused at S.L. and No Charge to Oper./Storage (YES/NO)	Replacement Required by Wyoming (YES/NO)

Exhibit B to the
Procedure for Whalen Diversion Dam to the State Line Reach Administration of Irrigation Ground Water Rights

POTENTIAL METHODOLOGY FOR FUTURE ESTIMATES OF TRIGGERS

The following methodology will be used to compile information to be used in D.3 of the "Whalen Diversion Dam to the State Line Reach, Administration of Irrigation Ground Water Rights Procedure." The following series of conditions that is described and defined in detail below will be used to provide information to the NPDC.

1) If Glendo Reservoir is in the flood pool, no replacement is required because in this situation, there is no storage being relesed other than from the Glendo flood pool.

a) Glendo Reservoir is determined to be in the flood pool when the content on a given day is in excess of 517,485 Acre Feet.

2) If Glendo is not in the flood pool and if the Guernsey Dam and Powerplants gates are closed, replacement is not required unless there is no unused water at the State Line in which case replacement is required.

a) Guernsey Dam and powerplants gates are determined to be closed if the flow below Guernsey Dam at the gaging station is less than 50 cfs on a given day. The determination of whether there is

unused water at the State Line is described in 4 below.

3) If Glendo Reservoir is not in the flood pool and the Guernsey Dam gates are not closed, it is necessary to determine if the gains from Whalen Diversion Dam to the State Line are adequate to meet the diversions in the reach plus order for delivery at the State Line to Tri-State Canal. If the gains are adequate to meet the diversions, no replacement is required.

a) The diversions in the Whalen to State Line reach are determined as the sum of the diversions of the New Grattan, North Platte, Rock Ranch, Pratte Ferris, Burbank, Torrington, Lucerne, Narrows, Mitchell, and Gering canals as reported by Wyoming and Nebraska.

b) The flow at the State Line is determined from the gaging station at the State Line.

c) The diversion to the Tri-State canal is the order of the Tri-State Canal if the water was delivered to the State Line.

d) To determine the gain, the diversions in the Whalen Dam to State Line reach on the previous day were added to the flow at the State Line and the flow which passed Whalen Diversion Dam on the previous day was subtracted.

e) To determine if the gain is adequate to meet diversions, the order of the Tri-State canal is subtracted from the gain. If a positive amount remains the gain was adequate.

4) If Glendo is not in the flood pool and the Guernsey Dam gates are not closed and the gains in the Whalen to State Line reach are not adequate to meet diversions and Tri-State Canal's order, it is necessary to determine if there is unused water at the State Line and whether storage water is being delivered in the reach or whether there is a charge to the operational water account. If there is unused water at the State line and there was no storage diverted in the reach and there also was no charge to the operational water account, no replacement is required. If there is unused water at the state line and there is a charge to the operational water account, replacement is required. If there is unused water at the state line and storage water was delivered in the reach, replacement is required.

a) The orders for Tri-State Canal and storage water orders below the State Line is the sum of the order of Tri-State Canal and the storage water orders by Beerline, Brown's Creek, Central, Chimney Rock, Enterprise, CNPPID and Bridgeport as reported by Nebraska for use in the daily water North Platte River Water accounting.

b) To determine if there is unused water at the State Line, the orders for the Tri-State Canal and the orders for storage water by other canals below the State Line are subtracted from the gaged flow at the State Line. If the flow at the State Line is in excess of the orders of the Tri-State Canal and the orders for storage water delivery below the State Line, there is unused water present at the State Line.

c) The storage deliveries in the Whalen to State Line reach equal the sum of the storage water diversions of the New Grattan, North Platte, Rock Ranch, Pratte

Ferris, Burbank, Torrington, Lucerne, Narrows, Mitchell, Gering and the storage delivered to the state line to meet the orders of the Tri State canal as determined in the Distribution of Natural Flow and Storage North Platte River Accounting.

d) The charge to operational water account is as determined in the Distribution of Natural Flow and Storage North Platte River Accounting.

Description of Detailed Procedures

1) (Glendo in Flood Pool) Bureau of Reclamation Hydromet Data System, Content of Glendo Reservoir greater than 517,485 AF (YES or NO).

2) (Guernsey outflow) Bureau of Reclamation Hydromet Data System.

3) (Guernsey PP and Gates Closed) Column determines Guernsey Powerplant and Gates are closed if flow below Guernsey is less than 50 cfs.

If Column 2 is less than 50 then "YES" else "NO".

4) (PP and Gates Closed and Unused at S.L.) Columns checks column 3 to see if Guernsey Powerplant and Gates are closed and if there is unused water at the State Line.

If Column 3 is equal to "YES" and Column 16 is greater than 0 then "YES" else "NO".

5) (Interstate Canal) Bureau of Reclamation Hydromet Data System, information only.

6) (Fort Laramie Canal) Bureau of Reclamation Hydromet Data System, information only.

7) (Passing Whalen) Bureau of Reclamation Hydromet Data System.

8) (Diverted Between Whalen and State Line) Diversion for New Grattan, North Platte, Rock Ranch, Pratte Ferris, Burbank, Torrington, Lucerne, Narrows, Mitchell, and Gering as reported by Wyoming and Nebraska and entered in Distribution of Natural Flow and Storage Accounting North Platte River Accounting.

9) (State Line) Bureau of Reclamation Hydromet Data System.

10) (Tri-State Order) Bureau of Reclamation records or orders reported by Farmers I.D. and entered in Distribution of Natural Flow and Storage North Platte River Accounting.

11) (Gain between Whalen and State Line) Diverted between Whalen and State Line on previous day plus State Line flow minus flow passing Whalen on previous day.

Column 8 (previous day) + Column 9 - Column 7 (previous day).

12) (Diversion Plus Tri-State) Diverted between Whalen and State Line on previous day plus Tri-State order if the water was delivered to the State Line.

Column 8 (previous day) + Column 10.

13) (Gains are Adequate to Meet Delivery) Column determines if gain between Whalen and State Line is

adequate to meet diversion between Whalen and State Line plus Tri-State Order.

If Column 12 is greater than Column 11 then "NO" else "YES".

14) (Orders at State Line) Beerline, Brown's Creek, Central, Chimney Rock, Enterprise, CNNPID, and Bridgeport as reported by Nebraska and entered in Distribution of Natural Flow and Storage North Platte River Accounting and the order of the Tri-State Canal.

15) (Storage Diverted in Reach) Storage diverted below Whalen and at or above State Line (New Grattan, North Platte, Rock Ranch, Pratte Ferris, Burbank, Torrington, Lucerne, Narrows, Mitchell, Gering) plus the storage delivered at the State Line for Tri-State Canal, determined by Distribution of Natural Flow and Storage North Platte River Accounting, information only.

16) (Unused Water at State Line) State Line Flow minus Tri-State Order minus Orders for storage by other canals below the State Line. If this results in a negative number, it is forced to be zero.

If Column 9 - Column 10 - Column 14 < 0 then it is equal to 0 otherwise Column 9 - Column 10 - Column 14.

17) (Charge to Operational Account) North Platte Storage Ownership Accounting.

18) (Unused Water at S.L. and No Charge to Oper./Storage) If there is unused water at the State Line, no charge to the operational account, and no storage is diverted then "YES" otherwise "NO" .

If Column 16 > 0 and Column 17 = "NO" and Column 15 = 0 then "YES" else "NO".

19) (Replacement Required by Wyoming) If Column 1, Column 4, Column 13, or Column 18 is equal to "YES" then Wyoming does not need to replace groundwater otherwise it does.

Groundwater Replacement Trigge

	Test 1	Test 2			Test 3					
	1	2	3	4	5	6	7	8	9	10
Date	Glendo In Flood Pool (YES/NO)	Guernsey Outflow (cfs)	Guernsey PP and Gates Closed (YES/NO)	PP and Gates Closed and Unused at S.L. (YES/NO)	Interstate Canal (cfs)	Ft.-Laramie Canal (cfs)	Passing Whalen (cfs)	Diverted Between Whalen and State Line (cfs)	State Line (cfs)	Tri-State Order (cfs)

			Test 4					
11	12	13	14	15	16	17	18	19
Gain Between Whalen and State Line (cfs)	Diversion Plus Tri-State (cfs)	Are Gains Adequate to Meet Delivery (YES/NO)	Orders at State Line (cfs)	Storage Delivered In Reach (cfs)	Unused Water at State Line (cfs)	Charge to Operational Account* (YES/NO)	Unused at S.L. and No Charge to Oper./Storage (YES/NO)	Replacement Required by Wyoming (YES/NO)

Exhibit 11

Procedure for Whalen Diversion Dam to the State Line Reach Administration of Surface Water Rights from Tributaries and Drains

NPDC Charter – Exhibit 11

Procedure for Whalen Diversion Dam to the State Line Reach

Administration of Surface Water Rights from Tributaries and Drains

A. Definitions

1. Area of Administration – Includes all North Platte River surface water tributaries and drains, excluding the Laramie River and Horse Creek drainages, in the area bounded by Whalen Diversion Dam on the west, the Ft. Laramie Canal on the south, the Interstate Canal on the north, and the Wyoming/Nebraska State Line on the east.

2. Rights affected – The water rights affected by this administration procedure are those for irrigation purposes that divert from the surface water sources in the area of administration defined in section A.1 above. Wyoming will provide the NPDC a list of adjudicated surface water rights located within the area of administration.

3. Average irrigation efficiency – The fraction of the amount of water diverted that is consumptively used by the crop.

4. Point of diversion – The point from which an irrigation water right diverts or pumps water from the surface water source to which it is entitled.

B. Administration

1. The rights affected within the area of administration will be accounted and regulated in combination with the percentage apportionment of natural flow in the Guernsey Dam to Tri-State Dam section of the North Platte River under Paragraph V of the Modified Decree. Diversions from irrigation surface water rights in the defined area of administration will be added to the mainstem natural flow diversions for the purpose of calculating the 75% - 25% split between Nebraska and Wyoming. Wyoming will continue to distribute all of the available natural flow in the area of administration to irrigation water rights in accordance with Wyoming law.

2. Where needed to accomplish the below described alternative regulation and accounting procedures, measuring devices and continuous recorders, that are consistent with the industry standards for the type of diversion installation, will be required at the point of measurement for each diversion. At the time allowed by the implementation schedule described below in section B.3.c, the Wyoming State Engineer will not allow diversions within this area of administration unless an approved measuring device has been installed. The Water Division One Superintendent, or designee, shall approve the type, location and installation of each measuring device in writing. The Wyoming State Hydrographer or Water Commissioner shall be responsible for the monitoring of diversions and the collection of diversion records.

3. The regulation and accounting procedures for this administration will be accomplished under either of two alternatives, Regulation With No Replacement or Regulation With Depletion Replacement, as described below:

   a. Regulation With No Replacement – This administration will be accomplished by Wyoming on a daily basis during the period May 1 through September 30 each year by including diversions from irrigation water rights in the area of administration in the river accounting system that is used to monitor and administer diversions and river flows consistent with the North Platte River Ownership and Natural Flow Accounting Procedure annually reviewed and adopted by the NPDC. Using the daily natural flow and storage accounting system, if Wyoming determines there is insufficient natural flow to meet all direct flow demands within Wyoming's 25% share, priority administration will occur against those irrigation water rights not in priority to divert.

   b. Regulation With Depletion Replacement -- As an alternative administration to being regulated when the water supply is insufficient to satisfy the direct flow diversion water rights, the water right appropriator may opt to continue to divert so long as the amount of water depleted as a result of the water right diversion is replaced, in accordance with sections B.3.b.i.and B.3.b.ii. below. Under this alternative, the

amount of water diverted will not be included in the accounting of natural flow.

i. The amount of depletions to be replaced, resulting from surface water diversions for irrigation purposes within the area of administration, shall be equal to the quantity diverted times the average irrigation efficiency. Initially, the average irrigation efficiency shall be assumed to equal 50% of the water diverted. Such depletions shall be assumed to occur simultaneously with the diversion. Such depletion amounts shall be replaced either on the tributary or drain below the diversion point or to the North Platte River at or below Whalen Diversion Dam and upstream of the State Line. The depletion replacement amounts will be in as nearly as possible uniform daily amounts during the month following the month of diversion and will be treated as natural flow within the area of administration. For diversions that occur in September, replacement will occur the following irrigation season as a supplement to natural flow upon first release of storage water from the North Platte Project.

ii. The average irrigation efficiency and the time period for replacement will be reviewed at least once every five years and may be modified by the NPDC based on new or site-specific information, including information or investigations on crop types and irrigation systems.

iii. The NPDC may grant a variance to an appropriator holding an affected water right, as defined in section A.2 above, upon adequate demonstration to the NPDC that the actual irrigation efficiency differs from the assumed irrigation efficiency being used for the area of administration.

iv. The replacement water for depletions may be provided from any source, including but not limited to, Wyoming's allocation of storage water in Glendo Reservoir, the Wyoming account in the Pathfinder Modification Project, other storage releases, replacement from other surface or groundwater supplies, or the cancellation or transfer of active water rights, pursuant to Wyoming water law.

v. All replacement sources are contingent upon Wyoming being able to demonstrate to the NPDC that actual replacement water will become part of the natural flow on the tributary or drain below the point of diversion or the North Platte River below Whalen Dam and upstream of the State Line.

vi. Wyoming will provide to the Bureau of Reclamation Area Office in Mills, Wyoming and the Nebraska Department of Natural Resources field office in Bridgeport, Nebraska monthly reports of the surface water diversions and the replacement water, if applicable, for depletions within the area of administration.

c. Implementation Schedule – Wyoming will implement the administration alternatives described above for the first full irrigation season beginning two years after court approval of the Final Settlement Stipulation and Modified Decree.

4. Wyoming will initiate the State Board of Control process to adjudicate any existing unadjudicated surface water rights for irrigation purposes that divert from the tributaries or drains in the defined area of administration within one year of court approval of the Final Settlement Stipulation and Modified Decree and complete such Board of Control adjudication within five years of said court approval. Adjudication will proceed pursuant to Wyoming law and will result in adjudication or cancellation of each such right affected by this process. Upon completion of this adjudication process, Wyoming will provide the NPDC with an updated list of adjudicated surface water rights within the area of administration.

Exhibit 12

Procedure for Lower Laramie River Basin Acreage Accounting

Exhibit A: Wyoming Irrigation Original Supply Well Permits as of 12/31/00 in the Lower Laramie River Basin

NPDC Charter – Exhibit 12

Procedure for Lower Laramie River Basin

Acreage Accounting

I. Introduction, Purpose and Background

The Modified Decree limits the number of acres that can be intentionally irrigated within the Lower Laramie River basin, exclusive of the area within the Wheatland Irrigation District. The purpose of this procedure is to outline the general criteria and processes that Wyoming will follow in completing the annual identification and accounting of irrigated acres.

This procedure will guide Wyoming's annual identification and reporting of intentionally irrigated acreage. This procedure may be modified as deemed appropriate by the NPDC.

II. Acreage Limitation

Wyoming will limit irrigated acreage in the Lower Laramie River basin, exclusive of the area within the Wheatland Irrigation District, so that the total number of intentionally irrigated acres does not exceed 39,000 acres.

III. Accounting

A. Definitions

1. Area of Administration – Lower Laramie River basin downstream of the

Wheatland Irrigation District's tunnel #2 exclusive of the area within the Wheatland Irrigation District. Wheatland Irrigation District's tunnel #2 is located in the vicinity of Section 36, Township 23 North, Range 72 West. The Laramie River Decree between Colorado and Wyoming is not to be affected by the implementation of this procedure or future amendments to this procedure.

2. Acreage Inspector- One of the individuals on the staff of the Wyoming State Engineer's Office who makes the observations and determinations of actual irrigated acreage.

3. Acreage Reporter- The person on the staff of the Wyoming State Engineer's Office who collects the acreage information from the inspectors and compiles a report for the State Engineer.

4. Irrigated Acreage Map-The base map used for all acreage delineations will be the map described in Section B below.

5. Irrigated Polygon- The irrigated acreage polygon that represents a tract of land identified as irrigated land for the purposes of this procedure. The borders of the irrigated polygon will be established using the field observations and Global Positioning Systems, or other similar mapping techniques, as described in this procedure.

6. Irrigated Lands - Lands that in any

year are intentionally irrigated through the efforts of man using a ditch delivery system or pump from a surface water, hydrologically connected groundwater or reservoir storage source.

B. Base Map

1. A USGS topographic quadrangle or map with a scale of 1:24000 will be used as the base map for all irrigated acreage mapping. Electronic versions of these maps may also be used to simplify the identification, analysis, and reporting.

2. The Wyoming State Engineer's Office may also reference, on an on-going basis, available aerial photographs, digital ortho-photo quarter quads and other imagery to assist with the field observations, identification and mapping efforts for this procedure.

3. The base map will be developed beginning the first year and refined over the next five years after court approval of the Modified Decree and Final Settlement Stipulation.

4. At least every five years, the base map will be reviewed by Wyoming to ensure all irrigated areas are accurately shown as irrigated polygons on the base map.

C. Field Review, Observations and Accounting

1. Mapping Update from Prior Year: Each acreage inspector will be provided with a copy of the base map and the irrigated land maps from the previous years for their area. These maps will be used by the inspector for the current year's observations, identification, and map updating work.

2. Observations and Identification: Acreage inspectors, who often are also water administration officials (hydrographers or water commissioners), will make visual observations and keep notes of the occurrence of irrigated activity on lands within their respective water districts during the irrigation season. Irrigated acreage observations will be completed by walking or driving the ditch or observing from a nearby hill overlooking the irrigated acreage. If less than the entire irrigated polygon has been irrigated at any time during the year, the acreage inspector may delineate the irrigated lands on the map for that year using observations and Global Positioning Systems or other similar mapping techniques, as described in this procedure. While observations are made throughout the early runoff and diversion season, the final inspections and identifications will be made generally during the July through September time period each irrigation season.

3. Annual Irrigated Acreage Maps: As the final observations and inspections are made each year, the acreage inspectors will

delineate the irrigated areas on the work copy of the irrigated acreage map or associated mapping product.

4. Measurements and Tabulation: When the final acreage inspections are completed, all work maps and related materials will be returned to the Acreage Reporter. The new or modified acreage polygons will be plotted, then digitized, and the irrigated areas identified. The final maps for the current year will then be printed, filed with the State Engineer's Office in Cheyenne and a copy will be distributed to the acreage inspectors, in preparation for the next irrigation season.

D. Criteria or Guidelines for Identifying Irrigated Acreage

1. Surface Water Diversion Irrigated Acreage

a. Surface Water Supply: Surface water diversion irrigated acreage is any land that has been intentionally irrigated through the efforts of man using an active and maintained ditch/delivery system or pump from a surface water source. This description includes delivery systems that transport water diverted from the surface water source at a maintained point of diversion, but are designed to spread water with little or no labor using a spreader ditch system. Any lands irrigated by diversions from

sources located outside of the Laramie River basin will not be counted.

b. Reservoir Supply: Tracts of land irrigated solely from stored irrigation water released from a reservoir, will be identified, reported and included in the acreage limitations.

c. Reported Acreage: The State Engineer will review the information and materials submitted by the Acreage Reporter and prepare a report of the acreage intentionally irrigated in that year from surface water or reservoir storage supplies.

2. Ground Water Irrigated Acreage

a. Initial List of Existing Hydrologically Connected Groundwater Wells: The existing groundwater rights for irrigation use in the area of administration that will be considered under the acreage limitation are attached in Exhibit A.

b. Hydrologically Connected Ground Water Well Determination: Each well identified in Exhibit A will be further screened to determine if the well is hydrologically connected. If the NPDC agrees that the well is not hydrologically connected, as defined herein, it will be removed from

Exhibit A. This will be accomplished for each well by reviewing available Statements of Completion filed with the Wyoming State Engineer's Office and other available geologic and aquifer information. A hydrologically connected groundwater well is one that is so located and constructed that if water were intentionally withdrawn by the well continuously for 40 years, the cumulative stream depletion would be greater than or equal to 28% of the total groundwater withdrawn by that well.

All future wells in the area of administration will be analyzed in the same manner described in Paragraph III.D.2.b. to determine if they are hydrologically connected. If the wells are determined not to be hydrologically connected, Wyoming wills submit the basis of their determination to the NPDC for concurrence.

c. Observations of Irrigated Lands from Ground Water: Each year the acreage inspectors will include in their seasonal observations, identification and mapping efforts, a delineation of those irrigated polygons that have been intentionally irrigated by hydrologically connected ground water wells and that are not otherwise identified as irrigated by

surface water diversions or reservoir water as described in Paragraph D.1. above. The hydrologically connected ground water wells included in these irrigated lands observations and mapping efforts will be those that have been identified as a result of the analysis in Paragraph D.2.b above. All intentionally irrigated acreage from these ground water wells will be included in the annual acreage accounting.

d. Reported Acreage: The report of the State Engineer provided in Paragraph D. 1.c. above, will also include the intentionally irrigated acreage from hydrologically connected ground water wells.

3. Transfers from Irrigation Use to a New Use – Acreage Accounting

a. Maintain List of Approved Transfers: The Wyoming State Engineer will maintain a list of all changes of use (from irrigation use to a new use) approved by the State Board of Control after January 1, 2001, from a surface water source or a hydrologically connected ground water well located within the area of administration.

b. Measurements and Data Collection: For each change of use,

the Wyoming State Engineer will collect the information needed to determine how much water is actually used for the new use each irrigation season under the Board of Control Order approving the change of use.

c. Determination of Equivalent Acreage: The actual amount of water used for the current year will be proportioned to (divided by) the total amount of use approved under the Board of Control change of use Order. The proportion will then be applied to the total number of actual irrigated lands taken out of production as a result of the approved transfer. The resulting number of acres will be accounted as equivalent acres and included in the annual irrigated acreage report of the Wyoming State Engineer.

d. Reported Acreage: The amount of equivalent acreage determined in Paragraph D.3.c. above will be included in the annual irrigated acreage report and included under the acreage limitation identified in Paragraph II above.

IV. Implementation, Schedule and Reporting

A. Identification of Surface Water Diversion Irrigated Lands

The Wyoming State Engineer will, beginning in the first year following court approval of the Final Settlement Stipulation, and each year thereafter, submit an accounting of the intentionally irrigated lands from surface water sources as defined and identified in accordance with this procedure, by March 1st of the year following the irrigation season. This date may be modified by the NPDC.

B. Hydrologically Connected Ground Water Wells

The amount of intentionally irrigated acreage from hydrologically connected ground water wells will be included in the annual acreage identification report for the second full water year after court approval of the Modified Decree and Final Settlement Stipulation.

V. Record Keeping and Monitoring

A. Wyoming

Data and records supporting the annual intentionally irrigated acreage report will be maintained by the Wyoming State Engineer's Office.

B. Other Parties to the Decree

After providing reasonable notice to Wyoming and the NPDC, the parties will have the opportunity to review the records maintained by Wyoming documenting the intentionally irrigated acreage report. The parties will have the opportunity to monitor Wyoming's implementation of these procedures and to complete their own field review of

the acreage irrigated and contained in the annual report, or a joint review with representatives of Wyoming. In either case, these review efforts will be coordinated with the State of Wyoming's State Engineer's Office. If the other parties desire to make their own field reviews they will be responsible for securing the legal right of access to any private lands.

Any concerns or questions related to the identification report or field observations will be presented in writing to Wyoming and the NPDC.

C. NPDC

The NPDC may develop, review and approve additional procedures or modify this procedure as it deems appropriate for the monitoring of irrigated lands.

Exhibit A to the Procedure for Lower Laramie River Basin Acreage Accounting
Wyoming Irrigation Original Supply Well Permits as of 12/31/2000

TNS	RNG	SEC	QTR	PERMITNO	PRIORITY	YLDEST (gpm)	YLDACT (gpm)	WELLDEPTH (feet)	OS ADJ (acres)	OS non-ADJ (acres)
20	68	24	11	P389G	8/4/55		500	8	-	15
21	67	13	2	P7098W	11/25/70	1500	150	55	-	240
22	66	19	1	P32493W	3/24/76	2000	600	65	102.56	-
22	66	20	5	P890W	2/19/62	125	125	125	49	-
22	66	20	5	P1674W	5/23/66	300	300	130	32	-
22	70	27	4	P82802W	6/18/90	250	250	14	10	-
22	70	34	8	P536G	2/1/57		250	30	-	50
23	67	4	6	P5998W	6/29/70	1000	350	400	119	-
23	67	5	8	P2764W	2/14/69	1000	850	60	-	92
23	67	25	7	P68692W	7/26/83	1000	225	33	-	3
23	67	25	10	P68693W	7/26/83	1000	225	34	-	3
23	69	36	2	U.W. 25980	2/13/74	900	900	10	0	81.5
24	66	29	9	P33599W	6/4/76	400	400	390	-	160
24	66	29	12	U.W. 33600	6/4/76	100	312	450	0	160
24	67	1	15	P17036W	12/12/72	3000	1275	355	373.37	-
24	67	3	14	P39299W	1/26/77	1500	350	55	40.8	-
24	67	3	2	P15540W	10/5/72	325	325	30	40.2	-
24	67	3	2	U.W. 27694	4/9/74	0	0	500	15.3	0
24	67	14	7	U.W. 62603	8/20/82	0	0	600	69.7	0
24	67	15	7	P13238W	3/13/72	2500	700	68	668.7	-
24	67	16	16	U.W. 64370	5/22/78	0	0	36	8	0
24	67	16	3	U.W. 66703	10/5/83	2500	800	300	113.5	0
24	67	20	13	P21887W	5/23/73	1800			-	282
24	67	21	4	P13014W	2/16/72	1200	325	62	179.6	-
24	67	21	10	P76090W	6/10/85	350	350	40	0.8	-
24	67	21	13	U.W. 47537	2/7/78	0	0	70	128	0
24	67	30	13	P64305W	4/7/83	650	650	300	37	-
24	67	31	5	P64304W	4/7/83	850	850	300	96	-
24	67	31	14	U.W. 2713	6/13/69	500	500	57	0	162
24	67	31	14	U.W. 76103	12/10/80	0	0	150	0	6.3
24	67	32	14	P1500W	4/28/65	500	500	160	60.3	-
24	67	32	15	P1501W	4/28/65	1000	475	141	8.8	-
24	69	10	9	P408G	10/24/55		620	17	-	30
24	69	36	12	P1590W	9/21/65	180	180	365	88.8	-
24	69	36	16	P1591W	12/6/65	100	100	135	19	-
24	70	35	10	P55081W	1/9/81	1000	60	50	1.3	-
25	65	5	8	P766G	2/27/58		1250	70	48.4	-
25	65	7	6	P892W	6/20/62	1250	1250	51	114	-
25	65	11	8	P38189W	3/21/77	2000	2000	65	-	27
25	65	34	9	P54C	6/10/38		180	17	-	9
25	66	11	16	P462W	11/21/60	1050	1050	63	52.5	-
25	66	14	9	P373G	5/24/55		1300	50	-	25
25	66	15	13	P342W	6/14/60	200	100	40	-	5
25	66	20	6	P52286W	6/18/79	2500	900	195	124.04	-
25	66	30	5	P7090W	11/30/70	900	900	33	-	35.79

Exhibit A to the Procedure for Lower Laramie River Basin Acreage Accounting
Wyoming Irrigation Original Supply Well Permits as of 12/31/2000

TNS	RNG	SEC	QTR	PERMITNO	PRIORITY	YLDEST (gpm)	YLDACT (gpm)	WELLDEPTH (feet)	OS ADJ (acres)	OS non-ADJ (acres)
25	66	30	10	P13016W	2/16/72	1200	675	57	50	-
25	67	7	6	P79141W	1/20/89	800	800	355	133.4	-
25	67	17	12	P2353W	10/23/68	1000	600	53	22.1	-
25	67	20	9	P31939W	10/2/75	1000	650	455	87	-
25	67	20	11	P13674W	4/19/72	1250	750	862	70	-
25	67	20	9	U.W. 32581	3/30/76	0	0	460	27.4	0
25	67	23	9	P26759W	5/6/74	1500	850	40	46.7	-
25	67	30	4	P8559W	4/2/71	1000	750	1040	82	-
25	67	36	16	P108296W	2/18/97	1200			-	250
25	67	36	14	P97276W	8/22/94	1500	750	480	130.6	-
25	68	1	12	P15510W	9/21/72	850	800	436	121.8	-
25	68	1	6	P24717W	7/30/73	1000	1000	448	154	-
25	68	1	6	U.W. 79089	6/3/77	50	50	448	7.5	0
25	68	2	11	P5362W	5/4/70	775	775	460	130	-
25	68	2	13	P31817W	1/28/76	1000	900	420	146.6	-
25	68	2	7	P16516W	11/3/72	3000	725	500	122.4	-
25	68	11	1	P4369W	12/19/69	1500	950	380	131.4	-
25	68	12	13	P79090W	12/5/78	85	85	340	11.2	-
25	68	12	15	U.W. 79088	5/19/76	54	30	871	5.6	0
25	68	14	14	P15508W	9/21/72	600	600	536	120	-
25	68	14	14	P33401W	12/29/75	400	400	536	21.03	-
25	68	15	16	P20228W	3/9/73	1125	1125	545	300.5	-
25	68	15	16	U.W. 33404	12/29/75	0	0	545	208.7	0
25	68	23	4	P31837W	11/12/75	1050	1050	500	119.5	-
25	69	36	14	P3589W	11/18/69	450	450	510	137.1	-
26	64	20	12	P13590W	4/5/72	2500	850	100	109	-
26	64	21	12	P1435W	2/5/65	1200	60	52	-	6
26	64	28	6	P6446W	7/30/70	500	500	60	31.2	-
26	64	28	6	P9658W	7/15/71	500	500	60	17	-
26	64	29	6	P777W	10/31/61	1200	1240	84	-	50
26	64	29	10	P233G	1/20/54		1000	26	-	38.1
26	64	29	16	P66782W	2/16/84	1000	375	170	22.9	-
26	64	30	11	P487G	10/20/56		1500	25	-	150
26	64	31	6	P26562W	3/22/74	500	500	59	62.4	-
26	64	31	6	P55121W	12/10/80	400	0	59	36.9	-
26	64	31	6	P27601W	7/22/74	800	425	59	14.8	-
26	65	6	15	U.W. 31834	10/30/75	1500	725	62	45	0
26	65	7	1	U.W. 19312	3/7/73	1000	600	82	97	0
26	65	9	8	U.W. 12180	11/1/72	1500	1400	51	111	0
26	65	9	8	U.W. 24289	8/28/73	0	0	51	36.1	0
26	65	25	11	P1933W	4/18/67	1300	1600	80	73.63	-
26	65	26	7	P47597W	7/10/78	2500	1400	116	-	53
26	65	26	3	P1482W	5/6/65	1475	1475	80	22.9	-
26	65	27	3	P20414W	4/6/73	2500	1320	62	-	100
26	65	27	3	P69252W	1/16/85	1180	1180	82	-	50

Exhibit A to the Procedure for Lower Laramie River Basin Acreage Accounting
Wyoming Irrigation Original Supply Well Permits as of 12/31/2000

TNS	RNG	SEC	QTR	PERMITNO	PRIORITY	YLDEST (gpm)	YLDACT (gpm)	WELLDEPTH (feet)	OS ADJ (acres)	OS non-ADJ (acres)
26	65	32	12	P29881W	1/18/75	1000	1000	78	71.2	-
26	67	15	8	U.W. 30336	7/7/75	1200	800	600	167.6	0
26	67	20	2	P35552W	12/14/76	1000	1000	480	-	154
26	67	22	5	P3450W	11/3/69	1100	1100	593	189.2	-
26	67	29	1	P35555W	12/14/76	1000	1000	600	-	154
26	67	29	14	P36283W	12/14/76	1000	1000	580	-	160
26	67	31	8	P28182W	10/23/74	1500	850	348	160	-
26	67	32	7	P28513W	12/9/74	1500	825	348	152	-
26	67	32	7	U.W. 33400	12/29/75	0	0	348	12.4	0
26	68	5	1	U.W. 28475	11/21/74	3000	750	395	264	0
26	68	23	9	P6496W	1/14/70	1300	1300	1085	160	-
26	68	23	15	P5481W	5/7/70	1000	1000	606	160	-
26	68	23	6	P4852W	3/17/70	3200	800	688	-	141.5
26	68	23	15	U.W. 32204	1/30/75	0	0	600	13.55	0
26	68	23	9	U.W. 32206	1/30/75	0	0	400	69	0
26	68	24	4	P14970W	8/1/72	1200	525	408	26.4	-
26	68	26	15	P6497W	1/14/70	900	900	700	180	-
26	68	26	6	P6495W	1/14/70	5000	1100	623	-	160
26	68	26	6	P32205W	6/30/75	0	1100	623	-	25
26	68	26	3	P32203W	1/30/75	0	500	415	-	14
26	68	27	9	P15934W	10/19/72	1200	975	453	147.7	-
26	68	35	13	P15511W	9/21/72	800	800	371	160	-
26	68	35	7	P28506W	10/24/74	1100	975	477	140	-
26	68	35	13	P33405W	12/29/76	500	500	371	25.5	-
26	69	24	13	P14970W	8/1/72	1200	525	408	26.4	-
27	68	20	11	S.C. 67	11/19/47	1500	1200	22	12.4	0
27	68	20	10	U.W. 2529	4/22/69	1000	1000	331	51.1	0
27	68	20	10	U.W. 4067	1/13/70	2500	800	330	20.6	0
27	68	20	10	U.W. 32273	9/15/75	0	0	200	27.7	0
27	68	27	2	U.W. 82848	7/14/89	400	165	185	0	4.8
27	68	29	6	U.W. 2528	4/22/69	1000	975	295	62.9	0
27	68	29	6	U.W. 32272	9/15/75	0	0	200	13	0
								Total	7,979.7	2,897.0

Exhibit 13

Procedure for Reporting Post-2000 Irrigation Wells Within Wheatland Irrigation District

NPDC Charter – Exhibit 13

Procedure for Reporting Post-2000 Irrigation Wells Within Wheatland Irrigation District

On a monthly basis, Wyoming will report all water right applications for post year 2000 original and additional supply irrigation wells within the Wheatland Irrigation District. The reports will consist of a copy of each of the water right applications and any available well logs and pump tests received by the Wyoming State Engineer. The reports will also include notification of any final decisions made by the Wyoming State Engineer relative to the water right applications. The reports will be submitted to the offices of the Bureau of Reclamation and State of Nebraska representatives on the NPDC. Representatives to the NPDC may request that a particular water right application be placed on the agenda for discussion at a NPDC meeting. The reports will be submitted within fifteen days from the end of the reporting period. For example, the report for the January 1 to January 31 period will be submitted by February 15. The NPDC may change the frequency of the reporting. The first report will be submitted by the 15th day of the month following the first full month after court approval of the Final Settlement Stipulation. The first such report will address all such water right applications for original and additional supply irrigation wells within the Wheatland Irrigation District received by the Wyoming State Engineer on or after January 1, 2001.

In addition, Wyoming will report the measured pumpage from post year 2000 original and additional supply irrigation wells within the Wheatland Irrigation District and will

annually report this information and any available periodic pumpage measurements to the offices of the Bureau of Reclamation and State of Nebraska representatives on the NPDC by December 31st of each year. The NPDC may change the frequency of the data collection and reporting. For purposes of measuring pumpage, Wyoming will use in-line meters, electric power records, direct measurement of discharges with flumes or similar devices for open channel flow measurements, or any other methods pursuant to the specifications to be developed by the NPDC. The first reporting period for pumpage measurements will begin the first full irrigation season following court approval of the Final Settlement Stipulation.

Exhibit 14

Procedure for Reporting New Municipal, Industrial, and Export Permits

Procedure for Reporting Municipal, Industrial and Export Permits

On a monthly basis, Wyoming will report all municipal, industrial and export water right applications and petitions for water right changes of use within the Wyoming North Platte River basin, excluding the Laramie River basin upstream of the Wheatland Tunnel No. 2 and excluding those uses defined as de minimis in the Modified Decree. The reports will consist of a copy of each water right application received by the Wyoming State Engineer and each petition for water right change of use received by the Wyoming Board of Control after court approval of the Final Settlement Stipulations. The reports will also include notification of any final decisions made by the Wyoming State Engineer relative to the water right applications and the Wyoming Board of Control relative to the petitions for water right change of use. The reports will be submitted to the offices of the Bureau of Reclamation and State of Nebraska representatives on the NPDC. Representatives to the NPDC may request that a particular water right application or petition for a water right change of use be placed on the agenda for discussion at a NPDC meeting. The reports will be submitted within fifteen days from the end of the reporting period. For example, the report for the January 1 to January 31 period will be submitted by February 15. The NPDC may change the frequency of the reporting. The first report will be submitted by the 15th day of the month following the first full month after court approval of the Final Settlement Stipulation. The first report will address all such water right applications and petitions received by the Wyoming State Engineer or Wyoming Board of Control

after the date of court approval of the Final Settlement Stipulation.

Exhibit 15

Procedure for Reporting Permits for New Dams, Enlargements or Groundwater Recharge Projects

NPDC Charter – Exhibit 15

Procedure for Reporting Permits for New Dams, Enlargements or Groundwater Recharge Projects

On a monthly basis, Wyoming will report all water right applications received for the construction of new dams or enlargements of existing dams with a proposed reservoir capacity for storage of water originating in the North Platte River basin of greater than 20 acre feet and ground water recharge projects within the Wyoming North Platte River basin, excluding the Laramie River basin upstream of the Wheatland Tunnel No. 2. The reports will consist of a copy of each water right application received by the Wyoming State Engineer after court approval of the Final Settlement Stipulation. The reports will also include a copy of any final decisions made by the Wyoming State Engineer relative to the water right applications and reports submitted for filing as part of the public record regarding ground water recharge applications. The reports will be submitted to the offices of the Bureau of Reclamation and State of Nebraska representatives on the NPDC. Representatives to the NPDC may request that a particular water right application be placed on the agenda for discussion at a NPDC meeting. The reports will be submitted within fifteen days from the end of the reporting period. For example, the report for the January 1 to January 31 period will be submitted by February 15. The NPDC may change the frequency of the reporting. The first report will be submitted by the 15th day of the month following the first full month after court approval of the Final Settlement Stipulation. The first report will address all such water right applications received by the Wyoming State Engineer after the date of court approval of the Final Settlement Stipulation.