

March 10, 2003

Technical Memorandum Wind/Big Horn Basin Plan

Subject: Wyoming Water Law

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This Technical Memorandum discusses Wyoming water law and includes as an attachment the Technical Memorandum from the Green River Basin Plan, Pat Tyrrell, 2001. The document fulfills the reporting requirements of Task 1.

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Section 1 - Introduction

Wyoming water law is founded on the doctrine of prior appropriation or “**first in time is first in right**”. This basic premise prevails throughout the statutes. Other basic precepts include:

- Water within the state is the property of the state. Water rights do not convey ownership of waters but allow for priority use of the water for beneficial purposes.
- Beneficial use is the basis, measure, and limit to the right to use water at all times.

Beneficial use is not defined by statute, but may include: Chemical, Commercial, Culinary, Domestic, Drilling, Steam Engines, Fish Protection, Fish Propagation, Flood Control, Irrigation, Industrial, Instream Flow, Mechanical, Manufacturing, Municipal, Milling, Mining, Miscellaneous, Oil Refining or Production, Pollution Control, Power Development, Railroad, Recreational, Refining, Supply of a Reservoir, Stock and Transportation, or other beneficial uses as determined by the Wyoming State Engineer.

Preferred uses, as defined in the Wyoming Water Law Summary, include: Drinking water for humans and livestock; water for municipal purposes; water for steam engines and general railroad use, cooking, laundering, bathing, and refrigerating, and water for steam power plants; and water for industrial purposes. All water uses other than those listed as preferred uses are considered non-preferred. When the water supply is insufficient to meet water rights, rights with

a preferred use do not take precedence over a non-preferred use. The priority date of a water right, preferred or non-preferred, determines who is entitled to water.

The Wind River, Clarks Fork, and Big Horn Basin Plan (WRBHB) focuses on major water uses which include: Agricultural, Municipal, Domestic, Industrial, environmental and recreational, and water use from storage.

Section 2 - Compacts and Decrees

The interstate compact applicable to the WRBHB is the Yellowstone Compact which apportions unappropriated flows after 1950 from the Wind River/Big Horn drainage system (80% Wyoming, 20% Montana) and the Clarks Fork drainage system (60% Wyoming, 40% Montana). Refer to Summary of the Yellowstone Compact, Chapter 1, Tab 2

The Big Horn General Adjudication relative to the Wind River Reservation and the Big Horn River system has a distinct impact on future water planning in the WRBHB. Refer to Summary of the Big Horn General Adjudication, Chapter 1, Tab 2.

Section 3 - Institutional Constraints

General institutional restraints to water development are described in the respective technical memorandum, Chapter 1, Tab 3. Additional environmental related restraints are described in the Environmental and Recreational Technical Memorandum, Chapter 2, Tab 9.

ATTACHMENT A

WYOMING WATER LAW SUMMARY GREEN RIVER BASIN PLAN

TECHNICAL MEMORANDUM

SUBJECT: Green River Basin Plan
Wyoming Water Law Summary

PREPARED BY: Pat Tyrrell, States West Water Resources Corporation

Introduction

One of the primary tenets established during conception of the current water planning process was that Wyoming Water Law would be respected throughout that process. That is, while many aspects of the use, availability, value and future demands of Wyoming's water would be under review, the principles of administration of that water would not. Wyoming's water laws, as administered by the State Engineer's Office, are, for purposes of this plan, assumed to function as they have historically evolved.

Administration of Wyoming Water Law as we now know it can be described by reviewing a dispute between two territorial pioneers, William McCrea and Charles Moyer, in what is now Campbell County in northeast Wyoming. Moyer, whose name adorns a famous spring in the coal-mining region north of Gillette, developed that spring for irrigation in 1890. Unfortunately, Mr. McCrea had in 1887 developed an irrigation project on the Little Powder River downstream of, and supplied partly by, Moyer's spring. With Moyer's development McCrea's ditch was now short of water, and the resulting argument climbed into the Wyoming State Supreme Court. In an affirmation of the "first in time is first in right" doctrine by siding against Moyer, the Supreme Court formalized what Territorial Engineer Elwood Mead had been fostering.

As Engineer for the Territory of Wyoming, and later its first State Engineer, Mead understood that in a water short region, water must be administered in a fair and equitable fashion, and his method for doing so was to let the earlier developer have the better right to the water (the *priority* system). He also knew that the amount of any right must be affirmed by an agent of the State, lest the applicant greatly exaggerate the amount needed, and be based on the amount put to "beneficial use." Another stamp of Mead's early efforts in Wyoming is the resolution of water disputes via a "Board of Control," rather than the water court system used in neighboring states such as Colorado. In Wyoming, water rights are considered property rights in that they are attached to the land and can be transferred in use or in location only after application to and careful consideration, and possible modification, by the Board of Control. The Board of Control is made up of the four water division superintendents and the State Engineer.

Water Law in the Constitution and Statutes

Water ownership and administration is defined in Article 8 of the Wyoming Constitution:

- **Section 1** declares water within the state to be the property of the state;

- **Section 2** establishes the Board of Control and its composition;
- **Section 3** establishes the priority system as giving the better right;
- **Section 4** establishes four (4) water divisions within the state;
- **Section 5** establishes the position of State Engineer and his role.

Water law is further defined and codified in the Wyoming State Statutes. The State Engineer's role is defined under Title 9, Chapter 1, Article 9, (W.S. 9-1-901 through 909), along with the authority to establish fees for services. Interestingly, weather modification activities are placed under the authority of the State Engineer in this Article, and moisture in the clouds and atmosphere within the state boundaries is declared property of the state.

Title 41 is entitled "Water" and contains the bulk of Wyoming's laws related to water. Under this Title the following chapters are included:

- **Chapter 1** – General Provisions
- **Chapter 2** – Planning and Development
- **Chapter 3** – Water Rights; Administration and Control
- **Chapter 4** – Board of Control; Adjudication of Water Rights
- **Chapter 5** – Care, Maintenance and Protection of Irrigation Works
- **Chapter 6** – Irrigation and Drainage Districts (Generally)
- **Chapter 7** – Irrigation Districts
- **Chapter 8** – Watershed Improvement Districts
- **Chapter 9** – Drainage Districts
- **Chapter 10** – Water and Sewer District Law
- **Chapter 11** – Interstate Streams Commission
- **Chapter 12** – Interstate Compacts
- **Chapter 13** – Watercraft
- **Chapter 14** – Storage of Water for Industrial and Municipal Uses

Within Title 41, Chapters 3 and 4 contain the important laws relating to establishment, administration and adjudication of water rights in Wyoming. These relate to appropriation from all sources of water whether they be live streams, still waters and reservoirs, or underground water (ground water).

The reader is referred to the Constitution and to these statutes for the complete language defining Wyoming Water Law. The monogram "Wyoming Water Law: A Summary" by James J. Jacobs, Gordon Fassett and Donald J. Brosz is attached hereto as Appendix A. A glossary of water-related terms is also attached as Appendix B.

Appendix A

Wyoming Water Law: A Summary

Wyoming Water Law: A Summary

James J. Jacobs, UW Professor, Natural Resource Specialist
Gordon Fassett, State Engineer, Cheyenne
Donald J. Brosz, UW Professor Emeritus

Wyoming water law dates back to territorial days and is based on the "doctrine of prior appropriation." Under this doctrine the first to put the water to beneficial use has the first right, or "first in time is first in right." Therefore, water rights in Wyoming, and in most of the western states, are regulated by priority. This means the earliest rights are entitled to water during periods of limited supply, while those with later rights are denied water during these times.

The Wyoming Constitution provides that water of all natural streams, springs, lakes, or other collections of still water be the property of the state.

Water Administration

The state engineer is the chief administrator of Wyoming waters. In administering these waters, the state is divided into four water divisions. Water division 1 includes the North Platte, South Platte River, Little Snake and the Niobrara River drainages. Water division 2 includes all drainages north of the Niobrara and North Platte Rivers and east of the Big Horn Mountains. Water division 3 includes the Big Horn and Clark's Fork River drainages, and water division 4 includes the Green, Bear, and Snake River drainages. A Wyoming map showing the water divisions is found below.

A water division superintendent administers the waters of each water division with assistance from water commissioners and hydrographer-commissioners. These four superintendents and the state engineer constitute the State Board of Control. The board of control meets quarterly to adjudicate or finalize water rights and to consider other matters pertaining to water rights, such as change in point of diversion and other amendments or corrections of water rights.

When you write the state engineer for necessary forms and information, address correspondence to:

State Engineer's Office
4th Floor East
Herschler Building
Cheyenne, Wyoming 82002-0370

You can also obtain information from each of the water division superintendents' offices, which are located in these Wyoming cities:

Water division 1: Torrington

Water division 2: Sheridan
Water division 3: Riverton
Water division 4: Cokeville

Prior to statehood in 1890, a water right could be established by a procedure predicated on the use of water and the filing of a claim with territorial officials. Water rights with priority dates before 1890 are termed "territorial" water rights. Since statehood, the only way a water right can be acquired in Wyoming is by securing a permit from the state engineer. Water rights cannot be obtained by historic use or adverse possession in any case. Wyoming water law requires that you follow certain procedures to obtain a valid water right. Following is a summary of these procedures for surface and ground water.

Surface Water

Wyoming's first surface water laws were enacted in 1875. More comprehensive laws were adopted along with the state constitution in 1890. In brief, and paraphrased, these laws state:

1. If you (or an association or corporation) want to use surface water, you must first apply to the state engineer for a permit. Application forms are available from the state engineer's office, the water division superintendent's office or the county clerk's office.
2. An engineer or surveyor, licensed to practice in Wyoming, must make a survey and prepare the maps and plans needed to apply for your permit. Generally this engineer or land surveyor also has the necessary application forms.
3. Submit the application form, maps, and plans, along with a filing fee, to the state engineer as a package. The priority date is established by the date of application acceptance in the state engineer's office.
4. Upon approval of the application, the state engineer issues a permit for developing the proposed water project.
5. You must complete and beneficially use the project within the time specified on the approved permit.
6. You must notify the state engineer on appropriate forms when the construction was completed, and when water was put to beneficial use. The appropriate forms are provided with the approved permit.
7. If in the time prescribed you cannot begin and complete the project and put the water to use, the state engineer may be requested to extend any or all of the time limits. Make your request before the original time limits expire, and cite good cause for needing an extension. If a time extension is granted, the date of priority remains the same.

8. After the water has been put to beneficial use, or a reservoir constructed and the notices as outlined in point 6 submitted, you must submit a final proof of appropriation or construction to the appropriate water division superintendent. This proof is advertised in a local newspaper, and an inspection of the project is made. Only lands found to be irrigated and/or possessing a reservoir will be accepted for adjudication. If everything is found in order and no protests are filed, the proof is submitted to the Board of Control. A certification of appropriation and/or construction is issued, if approved by the board of control, and is recorded in the county clerk's office in which the project is located, as well as in the state engineer's office. It is then listed in the tabulation of adjudicated rights for the respective division. This is evidence of an adjudicated water right. Once adjudicated, the water right is permanently attached to the specific land or place of use described on the certificate of appropriation and cannot be removed except by action of the state board of control to change the use or place of use (see page 7). The adjudicated water right takes its place in the list of priorities for that stream. Water is delivered to that right only when sufficient water is available to meet all earlier water rights on that stream.

9. Limits on unstored water for irrigation:

- a. Water rights for irrigation are adjudicated on the basis of one cubic foot per second (cfs) per 70 acres.
- b. Water rights with priority dates of March 1, 1945, or earlier are entitled to an additional 1 cfs per 70 acres. If you hold such a water right, you are entitled to divert water in the volume of 2 cfs for each 70 acres of land before any water is made available to the holder of a water right with a priority date after March 1, 1945.

If there is not sufficient water to furnish 2 cfs to each pre-March 1, 1945, water right, but more than enough to furnish 1 cfs to each of such rights, then the surplus water is divided among those rights on a pro rata basis. If there is so little water that each pre-March 1, 1945, right cannot receive 1 cfs, they are regulated on a strict priority basis.

Any water beyond that required to furnish 2 cfs for each 70 acres of pre-March 1, 1945, water rights is first allocated to rights with priority dates after March 1, 1945, and before March 1, 1985. Wyoming's Excess Water Law states that each water right with a priority date of post-March 1, 1945, but pre-March 1, 1985, is entitled to 2 cfs per 70 acres before any water is made available to post-March 1, 1985, water rights. If there is not sufficient water to furnish 2 cfs to each post-March 1, 1945, and pre-March 1, 1985, water right, but more than enough to furnish 1 cfs to each of these rights, the excess water is divided among those rights on a pro rata basis. If there is so little water that each post-March 1, 1945, and pre-March 1, 1985, water right cannot receive 1 cfs, the rights are regulated on a strict priority basis.

For post-March 1, 1985, water rights, those rights are entitled to 1 cfs per 70 acres only after all pre-March 1, 1985, rights have received 2 cfs per 70 acres. Under Excess Water Law, the post-March 1, 1985, water rights may also receive 2 cfs if water is available.

10. The granting of a water right by the state engineer does not include the granting of ditch easements and rights of way. You must negotiate these with the affected landowners.

Simplified Forms

The state engineer may issue you a permit for water storage and development of a spring. File a simplified form, which does not require maps and plans prepared by a registered engineer or surveyor, for the following water uses:

1. Construction of small reservoirs for stock purposes only and fishing reserve waters, and wetland ponds, where the capacity of such a reservoir does not exceed 20 acre-feet of water or the height of the dam does not exceed 20 feet.
2. Construction of flood detention dams that:
 - a. Store 50 acre-feet of water or less
 - b. Have a dam height not exceeding 20 feet
 - c. Have as a minimum an outlet 18 inches in diameter, and
 - d. Have a dead storage that does not exceed 20 acre-feet.
3. Development of springs may be filed on by one of two methods, depending upon the rate of flow and the use to which the water will be applied. The conditions that determine the method to use are described below:
 - a. If the spring flows 25 gallons per minute (gpm) or less, and if the water is to be used only for stock watering and/or domestic uses (which includes watering of lawns and gardens not exceeding 1 acre in size), the spring shall be filed as ground water. No map is required. After the approval of the application, some type of artificial diversion must be constructed to qualify for a water right. The proposed method of development of the spring and means of conveying the water to the point of use must be described on the application under the section titled "Remarks,"
 - b. If the spring flows in excess of 25 gpm (0.056 cfs) and is to be used for stock purposes only, surface water special application procedures must be followed. The use will be limited to 25 gpm (0.056 cfs).

c. All Springs flowing in excess of 25 gpm (0.056 cfs) or for other uses will be filed using surface water filing procedures (see page 2).

4. Any system using a catchment apron to collect direct flow for storage in a cistern or tank for later use in a guzzler (drinking trough) can be filed using surface water special application procedures.

Reservoir Storage

A reservoir is entitled to be filled in priority once each year if water is available. If water remains unused in the reservoir at the end of the normal use period, the water is designated as carry-over storage and counts toward providing water to meet the following year's supply for appropriation.

Instream Flow

The 1986 Legislature declared that instream flow for maintenance or improvement of existing stream fisheries is a beneficial use of water than can be provided from natural streamflows or from storage water. A statutory procedure was established for the state, represented by the Wyoming Water Development Commission, to appropriate specified flow rates for instream flows in segments of streams identified by studies and reports of the Wyoming Game and Fish Commission. The WWDC must conduct a hydrologic study to determine whether the instream flow can be provided from the natural flow of the stream or whether storage water from an existing or new reservoir will be needed for part or all of the instream use. The WWDC report is supplied to the state engineer for his consideration. If storage water is needed from a new reservoir project, normal legislative project authorization procedures must be followed by WWDC.

After receiving reports from the Game and Fish Commission and WWDC, the state engineer may conduct his own evaluation of the proposed appropriations for instream use. Before granting or denying a permit for instream flow in the specified stream segment, the state engineer must conduct a public hearing and consider all available reports and information. If granted, an instream flow permit can contain a condition for review of continuation of the permit at a future time.

The instream flow appropriation goes into effect the date the state engineer approves the permit. The water right cannot be adjudicated by the board of control for three years thereafter. An instream water right has a date of priority as of the date that the application was received and recorded by the state engineer, and all senior priority water rights must be recognized in administration of the stream.

The state engineer cannot issue an instream flow permit if it would result in loss of a portion of Wyoming's consumptive share of water allocated by interstate compact or U.S. Supreme

Court decree, or if it would result in more water leaving Wyoming than allocated for uses downstream of Wyoming.

Other persons can appropriate water from instream flow on a segment of a stream within 1 mile of the Wyoming state line or within 1 mile upstream from major reservoirs on the Big Horn, Green, and Snake rivers.

Ground Water

The first Wyoming ground-water laws were enacted in 1945 and amended in 1947. A new ground-water law went into effect March 1, 1958, repealing and replacing the 1945 and 1947 laws. Major amendments were made in 1969.

Priority of Wells

1. For all wells drilled prior to April 1, 1947, the date of priority is the date the well was completed if a claim for the well was filed before March 1, 1958, as provided by the law.
2. For wells drilled between April 1, 1947, and March 1, 1958, the date the well was registered established its priority date.
3. After March 1, 1958, the priority date is the date the application for a permit to drill the well is accepted in the state engineer's office.
4. An exception to the above is a well used solely for stock and/or domestic purposes. These wells, until the enactment of the 1969 amendment to the ground-water law, were exempt from filing and held a preferred right over wells used for all other purposes.
5. Under the 1969 amendment, all domestic and/or stock wells drilled after May 24, 1969, and all wells drilled for other purposes, establish a priority as of the date the application for permit to drill is received in the state engineer's office.
6. Under the 1969 amendment, all stock and/or domestic wells drilled and used before May 24, 1969, and registered with the state engineer before December 31, 1972, established a priority date as of the well's completion and water use.

Domestic and Stock Water Uses (Ground Water)

The law defines domestic use as household use, including the watering of lawns and gardens for noncommercial family use, where the area to be irrigated does not exceed 1 acre. The

quantity of water to be pumped for family or stock use shall not exceed 25 gpm. A well may supply water to more than one, but not more than three single-family dwellings and still be considered a domestic use provided that:

1. The yield does not exceed 25 gpm.
2. The total area of lawns and gardens to be watered does not exceed 1 acre.
3. No charge, hidden or otherwise, is levied for the use of the water.
4. The water is not used in conjunction with a commercial endeavor.

Stock watering use is defined as the normal watering of livestock, including any project whereby water will be piped to no more than four points of use within 1 mile of the well. Large feedlot operations or any project whereby the water will be piped to five or more points of use, or the points of use are greater than 1 mile from the well, are considered miscellaneous use.

Ground Water Permitting Procedures

The same general procedures to acquire surface-water rights apply to acquiring a ground-water right:

1. Before a well is drilled, you must file an application and have it approved by the state engineer. This requirement applies to all wells used for any purpose.
2. Forms to be filed with the state engineer are available from that office, the water division superintendent's office, or the county clerk's office.
3. A permit to construct a well will generally be granted as a matter of course by the state engineer. An exception may be in a ground-water control area.

The board of control may designate a control area where:

- a. The use of ground water is approaching a use equal to the current recharge rate
- b. Ground-water levels are declining or have declined excessively
- c. Conflicts between users are occurring or are foreseeable
- d. The waste of water is occurring or may occur, or

- e. Other conditions exist or may arise that require regulation for protection of the public interest.
4. You must complete the well and apply the water to beneficial use before the dates specified on the permit and submit the proper notice(s) verifying compliance to the state engineer's office.
5. If you cannot begin construction of a well, complete it, or put the water to use in the time prescribed, request in writing (to the state engineer) an extension of time. Be sure to state good cause in the request.
6. A plat, showing the location of the well(s) and the point(s) of use and distribution system, is required at the time of filing the final proof of appropriation and beneficial use. Have this plat certified by an engineer or land surveyor licensed to practice in Wyoming.
7. After you have filed final proof of appropriation, an inspection of the project is made by the division water superintendent, and the proof is advertised. If everything is in order and no protests are filed, you are issued a certificate of appropriation by the board of control. It is recorded in the county clerk's office where the project is located and in the state engineer's office as well. This is your evidence of an adjudicated water right.

Changes in Location and Depth

You may change a well location within the same aquifer in the vicinity of the original location or the well depth without loss of priority, provided you have obtained approval from the state board of control if the ground-water right has been adjudicated or the groundwater right has not been adjudicated but the water has been applied to beneficial use. In cases involving domestic and stock water wells that are not adjudicated but whose water has been applied to beneficial use, the state engineer may approve a change of location. If the right is not adjudicated and the water has not been applied to beneficial use, approval for the change in location may be granted by the state engineer. For all wells, the state engineer may approve a change in well location even if the water has not been put to a beneficial use.

Special Water Right Conditions for Ground Water

1. Remember that the permit to appropriate ground water carries with it no guarantee of a continued water level or artesian pressure.
2. Where underground waters in different aquifers are so interconnected as to constitute one source of supply, or underground water and surface water are so interconnected as to constitute one source of supply, priorities of rights to the use of the interconnected waters shall be correlated and a single schedule of priorities shall relate to the common water supply.

3. By-product water is water that has not been put to prior beneficial use, and is a by-product of some nonwater-related economic activity and has been developed only as a result of such activity such as oil and gas production, mining, etc.

Preferred Uses

Wyoming water law defines the preferred uses of both surface and ground water and lists them in the following order:

1. Drinking water for both humans and livestock
2. Water for municipal purposes
3. Water for steam engines and general railway use; water for cooking, laundering, bathing, and refrigerating (including the manufacturing of ice); water for steam and hot-water heating plants, steam power plants
4. Water for industrial purposes.

Non-preferred Uses

All uses of water other than those listed as preferred uses are considered non-preferred.

When the water supply is insufficient to meet water rights, rights with a preferred use do not take precedence over a non-preferred use. The priority date of a water right, preferred or non-preferred, determines who is entitled to water. The only way you can obtain a preferred right for a non-preferred prior right is by purchase or by condemnation through court action. The right of condemnation cannot be used by industrial concerns to obtain water rights. However, ground-water wells yielding 25 gpm or less and used solely for domestic and stock purposes do have preferred rights over wells for all other uses regardless of date of priority.

Example: An irrigation water right (non-preferred use) with an early priority is entitled to use water even when it may involve denying water to a municipality (preferred use) with a later right. The municipality may acquire, through condemnation if necessary, the earlier irrigation right and change it to municipal use, provided just compensation is paid.

Keeping Water Rights Valid

To keep a water right valid when changes are made in the point of diversion, in the location of a well, in the location of an irrigation ditch, or similar circumstances, you must secure permission. Do this by petitioning the state board of control if the water is adjudicated. If it is not adjudicated, send your petition to the state engineer.

In most instances, obtaining permission for changes does not change the priority date of the water right but keeps the water right up to date and legal. Public hearings on the changes may be held to ensure that no injury occurs to the other water right holders because of the change. Keep the water right in proper standing so no legal questions are raised concerning its validity.

Change in Use

If you own a water right and wish to change it from its current use to another use, or from the place of use under the existing right to a new place of use, you must file a petition with the board of control requesting permission for a change. The petition sets forth all pertinent facts about the existing use and the proposed change in use. When you request a change in place of use, all pertinent information about the existing use and the proposed place of use shall be specified in the petition. The board may require that an advertised public hearing be held at your expense. The petitioner shall provide a transcript of the public hearing to the board. The change in use, or change in place of use, may be allowed.

If such an allowance is granted, the quantity of water transferred by the granting of the petition shall not exceed the amount of water historically diverted under the existing use. Furthermore, the historic rate of diversion and the amount consumed cannot exceed that under the existing use. Finally, such a petition, if allowed, shall not decrease the historic amount of return flow, or in any manner injure other existing lawful appropriators. The board of control considers all facts it believes pertinent to the transfer. These may include the following:

1. The economic loss to the community and the state if the use from which the right is transferred is discontinued
2. The extent to which such economic loss will be offset by the new use
3. Whether other sources of water are available for the new use

In all cases where the matter of compensation is in dispute, the question of compensation shall be submitted to the proper district court for determination.

Subdivisions with Attached Water Rights

Wyoming law now provides that any time you subdivide a parcel of land with water rights attached, you (the developer) must dispose of the water rights in one of three ways:

1. Voluntarily abandon the water rights, removing them from the land forever
2. Transfer the water rights to other owned lands that have no other water right from the same source

3. Develop a subdivision irrigation plan showing which lands have the water right, amount of the water right, supply and waste ditches, and other information necessary for the protection of individual lot owners in retaining the water right on the land.

Each of these actions requires review by the state engineer's office or the state board of control before the subdivision can be approved by the respective county.

Water Right Abandonment

A water right for surface or ground water not used for five successive years when water is available to satisfy the right is considered abandoned, but a statutory procedure must be followed to bring about legal abandonment. The law provides a procedure for abandonment, but it must be brought by an affected water user who has a priority equal or junior to the right being abandoned, or by the state engineer. If a right is declared abandoned, the user forfeits all water rights, easements, ditch rights, and the like, and the water again becomes subject to appropriation. Water must have been available but not used for an abandonment to take place. Wyoming law provides standing so that abandonment action can be brought by a pre-March 1, 1945, water right holder, even though senior in priority, against another pre-March 1, 1945, water right holder to protect the right to surplus water.

Wyoming Water Law

Basic precept

1. Beneficial use is the basis, measure, and limit to the right to use water at all times.
2. To bring about a more economical use of the available water supply, two or more water users may rotate the use of their combined water rights after obtaining permission of the water division superintendent.
3. You are responsible for maintenance of your ditches so that the water therefrom does not flood or damage the property of others.
4. You are responsible for your waste water at all times.
5. In administering water to the various appropriations on a stream, the state is obligated to deliver the full amount of any appropriation in priority at its head gate out of the stream. Any ditch loss between the head gate and the appropriator's land is the responsibility of the appropriator.

6. Temporary uses of water, such as for oil well drilling, highway construction, etc., may be granted by the state engineer upon proper application.

7. In any case where a ditch was in place before any houses or other property, the property owners are compelled to protect themselves from any damage created by seepage from the ditch. If, because of seepage, a newly built ditch creates damage to property that was present before the ditch was built, the ditch owners shall be liable for any damage.

Summary

In Wyoming a valid right to the use of water may be acquired only by following the procedures established by state law for both surface and ground water.

Water users should be sure of the status of their water rights. Check the records in the county clerk's office, or through the state engineer's office. The records indicate the appropriation amount, priority of the right, and how and where the water is to be used. If there are any questions, check with the state engineer's office and request complete information on the status of the water right in question.

Cooperative Extension Service

University of Wyoming

College of Agriculture

Appendix B

Glossary of Water-Related Terms

GLOSSARY OF WATER-RELATED TERMS

Abandonment: The loss of a water right based on the nonuse of that water right when water was available for a period of 5 consecutive years, or the voluntary relinquishment of an adjudicated water right.

Acre-Foot (AF): The volume of water required to cover 1 acre of land to a depth of 1 foot; 325,850 gallons or 1233.5 cubic meters. One acre-foot supplies a family of four for about one year.

Additional Supply: Water from a groundwater source applied to lands which already have a more senior original supply water right.

Adjudication: A judicial or quasi-judicial proceeding in which a priority is assigned to an appropriation and a decree or certificate issued publicly recognizing the defined water right and conveying property-right status on the appropriation.

Administrative Procedures: Proceedings before an officer of the executive branch of government as distinguished from proceedings before the judicial branch of government.

Alluvium: Deposits of sand and gravel derived from erosional processes and laid down in river channels and floodplains.

Appropriation: The acquisition of a water right by fulfilling the requirements of law for a certain portion of the waters of the state and the application of same to a beneficial use.

Aquifer: A water bearing geologic formation.

Artesian Well: A well that taps a confined aquifer and may have a pressure sufficient to support a flowing well.

Artificial Recharge: The addition of water to the groundwater reservoir by human activities, such as irrigation or induced infiltration from streams, wells, or spreading basins.

Bank Storage: The water contained in an aquifer hydraulically connected with a stream or lake and capable of supplying water to the stream or lake following a lowering of the free water surface, or capable of storing water flowing from the stream or lake on a rise of the free water surface.

Beneficial Use: The use of that amount of water that is reasonable and appropriate under reasonable efficient practices to accomplish, without waste, the purpose for which the diversion is lawfully made and without limiting the generality of the foregoing, and can include impoundment of water for recreational purposes, including fishery or wildlife.

Board of Control: A Constitutionally-created quasi-judicial executive branch board made up of the State Engineer and Superintendents of the four Wyoming water divisions whose purpose is to oversee and decide

matters of water right adjudication and changes. Its decisions are subject to review by Wyoming courts on appeal.

Braided Channel: Situation where the water flow of a river or creek is not confined to a single channel, but instead flows into multiple channels of varying width and capacity.

Call: The placing of a call by any appropriator to the water commissioner to regulate appropriations to their permitted priorities and amounts. In such cases, junior priorities may be curtailed or called out so that a senior is able to divert its full entitlement.

Canal: A constructed open channel for transporting water from the source of supply to the point of distribution.

Capacity: The maximum volume of water that can be held in a reservoir, or the flow rate that can be transported through a channel, ditch, pipeline, weir, etc., without the facility overflowing or submerging.

Capillary fringe: Saturated layer at the top of the groundwater zone consisting of water held by capillary tension above the level that would represent the hydrostatic surface influenced by gravity alone.

Channel: A natural stream that conveys water; a ditch or canal excavated for the conveyance of water.

Channel capacity: Maximum discharge that can be contained within the banks of a channel.

Closed basin: Area of land that has no drainage outlet to an ocean.

Compact: A contract between states of the union, entered into with the consent of the national government, and in water, defining the relative rights of two or more states on an interstate stream to use the waters of that stream.

Cone of Depression: The resulting water table form representing the gradient towards a well caused by withdrawals from the aquifer.

Confined Aquifer: An aquifer enclosed between impermeable formations.

Conjunctive Management: Treating ground water and surface water as a single, connected source.

Consistent Units: A system that permits using only one unit of a kind in scientific quantifications or calculations. Computational procedures require units be consistent. Data expressed in units other than those of a chosen system must be converted to the chosen system. Some conversion factors used in computations are given below:

To Convert	To	Multiply by
Gallons per minute	Cubic feet per second	0.002228
Meinzers unit (permeability)	Feet per second	$1,5472 \times 10^{-6}$

Meinzers unit (transmissivity)	Feet squared per second	1.5472 x 10 ⁻⁶
Acre-feet	Cubic feet	43,560
Cubic feet per second	Gallons per minute	448.8
One year (365 days)	Seconds	31,536,000
One month (1/12 year)	Seconds	2,628,000
One day	Seconds	86,400

Consumptive Use: The amount of water consumed during use of the water and no longer available to the stream system. For irrigation, consumptive use is water used by crops in transpiration and building of plant tissue and excludes return flow.

Continuous Record: Data (streamflow, diversion records) collected on a consistent, long-term basis.

Conveyance Loss: The loss of water from a conduit due to leakage, seepage, evaporation, or evapotranspiration.

Creek: A natural stream of water, normally smaller than, and often tributary to, a river.

Critical Year: Usually considered a year in which the annual precipitation was considerably less than average and runoff in most of the streams was low. The critical year is used to test the dependability of water rights under worst-case conditions.

Cross-Section: View of a channel taken perpendicular to the flow, or view of a dam taken perpendicular to its length.

Cubic foot per second (cfs): Standard measure of discharge for streamflow, indicating one cubic foot of water passing through a channel cross-section every second (abbreviated CFS), also known as a “second-foot.”

Darcy’s Law: A law discovered by Henry Philibert Gaspard Darch (1803-1858). His experiments showed that the velocity of flow through porous media is proportional to the first power of the gradient.

Decree: An official document issued by a court or the State Board of Control defining the priority, amount, use, and location of a water right or plan of augmentation. When issued, the decree serves as a mandate to the state engineer to administer the water rights involved in accordance with the decree.

Deed: Legal document for conveyance of land from owner to new owner. (See Water Right Deed).

Deep Percolation: The drainage of soil water by gravity below the maximum effective depth of the root zone.

Dependable Yield: See Yield, firm.

Depletion: Net rate or quantity of water taken from a stream or groundwater aquifer and consumed by beneficial and nonbeneficial uses. For irrigation or municipal uses, the depletion is the headgate or well-head diversion less return flow to the same stream or groundwater aquifer.

Digital Elevation Model: Computer file with elevations recorded for the intersections of a fine-grained latitude/longitude grid; the digital equivalent of a topographic base map; abbreviated DEM.

Direct Flow Right: A right defined under the terms of a permit to beneficially use natural streamflow, as opposed to reservoir storage or groundwater.

Discharge, or Rate of Flow: The volume of water passing a particular point in a unit of time. Units of discharge commonly used include cubic feet per second (cfs) or gallons per minute (gpm).

Ditch: A conduit cut into or built upon the surface of the ground to transport water from a stream to a point of use away from the stream.

Divert: To remove water from its natural course or location, or impound water in its natural course or location, by means of a ditch, canal, flume, reservoir, bypass, pipeline, conduit, well, pump, or other structure or device.

Diversion Records: Record of the instantaneous flow in cubic feet per second for a ditch or other diversion structure. Compiled by the district water commissioner, ditch rider, or other water official, diversion records are generally on file and available for review at the State Engineer's Office.

Domestic Water Use: Water used for normal (non-commercial) household purposes, such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens. Also called residential water use or domestic withdrawals. The water may be obtained from a public supply or may be privately supplied.

Drainage Area: The surface area contributing to a drainage basin, inside which all surface waters will flow to a common outlet.

Drawdown: The drop in water table elevation from an initial stable configuration, generally caused by pumping.

Due Diligence: The effort necessary to bring an intent to appropriate into fruition. Due diligence does not require unusual effort or expenditures, but only such constancy in the pursuit of the undertaking as is usual with those in like enterprises. Actions which demonstrate a good faith intention to complete the undertaking within a reasonable time.

Duty of Water: The amount of irrigation water required to mature a particular type of crop in a specific location. It includes consumptive use, evaporation, and seepage from ditches and canals, and the water eventually returned to streams by percolation and surface runoff, usually expressed in acre-feet per acre, or cfs per unit of application area.

Effective Precipitation: The amount of rain that falls during the growing season and is available for growth of crops. Effective precipitation is a portion of the total rain that falls during the growing season and is a function of the type of soil, the time period in which each rain falls, and its intensity. Effective precipitation is usually less than precipitation measured at a given point.

Endangered Species: Under provisions of the federal Endangered Species Act of 1973, a species that is in danger of extinction throughout all or a significant portion of its range.

Enlargement: A subsequent water right awarded to a ditch or structure enlarging the amount of water granted originally. More than one enlargement may be awarded to a ditch or structure and each enlargement will have a priority related to the date it was filed for appropriation.

Eutrophication: Aging process by which nutrient additions to a water body initially lead to additional growth of aquatic organisms which may eventually consume all available dissolved oxygen.

Evaporation: The physical process by which a liquid or solid is transformed to the gaseous state which, in irrigation, usually is restricted to the change of water from liquid to gas.

Evapotranspiration: The combined processes by which water is transferred from the earth surface to the atmosphere; evaporation of liquid or solid water plus transpiration from plants (See Consumptive Use).

Expiration (Expired Permit): The status of an invalid water permit when the permittee has not complied with the notice requirements within the time specified on the permit. An expired permit is not a property right of the current landowner.

Floodplain: An area adjacent to a stream or other water course which is subject to flooding.

Flood Stage: Situation when flow of water exceeds the capacity of the incised channel of a creek or river and overflow of the natural banks begins.

Flowing Well: A well from an artesian aquifer in which the water is under sufficient pressure to rise above the ground surface.

Flume: A type of in-channel measuring device of known cross-sectional area in a ditch or river. Also used to describe the facility used to bridge flowing water across another channel, depression, or other rough terrain.

Forfeiture: Failure to use a water right for the statutorily provided period of time, or failure to timely file the notices required by the permit.

Freeboard: The additional height on a dam or other water control structure to provide against overtopping due to wave action and excess inflow.

Futile Call: A situation in which a junior priority will be permitted to continue to divert in spite of demands by a senior appropriator in the same watershed, because to curtail the junior from diversion would not effectively produce water for beneficial use by the senior.

Gage: (1) An instrument used to measure magnitude or position; gages may be used to measure the elevation of a water surface, the velocity of flowing water, the pressure of water, the amount or intensity of precipitation, the depth of snowfall, and so on. (2) The act or operation of registering or measuring magnitude or position. (3) The operation, including both field and office work, of measuring the discharge of a stream of water in a waterway.

Gage Height: The height of the water surface above the gage datum. Gage height is often used interchangeably with the more general term, stage, although gage height is more appropriate when used with a gage reading.

Gaging Station: A particular site on a stream, canal, lake, or reservoir where systematic observations of gage height or discharge are made, generally with permanently installed continuous-recording instrumentation.

Grab Sample: A water quality sample taken at random.

Gradient: A slope of the water table tending to cause the flow of groundwater. Also the slope of a ditch, canal, pipeline, or surface of the ground.

Groundwater: Groundwater is usually defined as any water not visible on the surface of the ground under natural conditions.

Groundwater, Confined: Groundwater under pressure significantly greater than atmospheric, with its upper limit the bottom of a bed with hydraulic conductivity distinctly lower than that of the material in which the confined water occurs.

Groundwater Divide: A line of a water table on either side of which the water table slopes downward. It is analogous to a drainage divide between two drainage basins on a land surface.

Groundwater Mining: The pumping of groundwater from a basin where the safe yield is very small, thereby extracting groundwater which accumulated over a long period of time. It occurs when withdrawals exceed replenishment or when replenishment is negligible.

Groundwater Overdraft: Pumpage of groundwater in excess of safe yield.

Groundwater, Perched: Groundwater that is separated from the main body of groundwater by unsaturated material.

Groundwater Recharge: Inflow to a groundwater reservoir.

Groundwater Reservoir: An aquifer or aquifer system in which groundwater is stored. The water may be placed in the aquifer by either artificial or natural means.

Growing Season: That portion of the year, usually May through October, that the plants are consuming water and nutrients, or, in irrigation, the period between spring and fall killing frosts.

Head: 1. The pressure created from the weight of water.
2. Locally, an amount of irrigation water that can be supplied through a headgate.

Headgate: A physical structure on a stream, (reservoir, canal, ditch or lateral), through which water is diverted into a smaller ditch, a stream channel, a pipeline, or onto land.

Historic Use: The documented diversion and use of water by a water right holder over a period of years.

Hydrologic Cycle: The circuit of water movement from the atmosphere to the earth and return to the atmosphere through various stages or processes, such as precipitation, interception, runoff, infiltration, percolation, storage, evaporation, and transpiration.

Hydrology: Study of the distribution, movement and properties of water.

Impermeable: Not permeable.

Impervious: An adjective describing a material through which water either cannot pass or through which it passes with great difficulty.

Infiltration: Water moving into the ground from a surface supply such as precipitation or irrigation.

Inflow: The quantity of water coming from all sources into a storage facility or a channel at a given point.

Insolation: (Contracted from incoming solar radiation.) Solar radiation received at the earth's surface.

Instream Use: Any use of water which does not require diversion from a water course or impoundment.

Instream Flow Rights: A doctrine used to preserve minimum river or streamflows for fish and wildlife, recreation, water quality and scenic beauty, among other public purposes. Such rights are limited to the use of water within its natural course, not requiring diversion. In Wyoming, instream flow rights are limited to fishery purposes.

Irrigation: The application of water to crops, lawns, and gardens by artificial means to supplement natural precipitation. Water can be applied by spreading, sprinkling, or dripping.

Irrigation District: In the United States, a cooperative, self-governing public corporation set up as a subdivision of the state, with definite geographic boundaries, organized to obtain and distribute water for

irrigation of lands within the district; created in District Court under authority of the state legislature with the consent of a designated fraction of the landowners or citizens and having taxing power.

Irrigation Efficiency: The ratio of the volume of water consumed by irrigation as compared to the volume of water delivered. Efficiency may be computed in terms of the water diverted at the ditch headgate or the water delivered to the farm headgate. Overall efficiency is the product of conveyance efficiency x application efficiency x use efficiency, expressed in percent.

Irrigation Return Flow: Applied water which is not consumptively used and returns to a surface water or groundwater supply. In water right litigation the definition may be restricted to measurable water returning to the stream from which it was derived.

Irrigation Water Requirement: The quantity of water, exclusive of effective precipitation, that is required from irrigation to meet crop needs for full growth and maturation.

Isohyet: A line on the surface of the earth, as represented on a map, connecting all points of equal precipitation. Also called isohyetal line and isopluvial line.

Junior Rights: A junior water rights holder is one who holds rights that are more recent than senior rights holders. All water rights are defined in relation to other users, and a water rights holder only acquires the right to use a specific quantity of water under specified conditions. Thus, when limited water is available, junior rights are not met until all senior rights have been satisfied.

Lag Time: The time from the center of a unit storm to the peak discharge it generates at a point downstream; similarly, the time from the daily maximum amount of snow being melted to the peak discharge it generates at a selected point downstream. Also, the time it takes for the peak discharge in a diurnal flow pattern to move from one point on a stream to another.

Lateral: A minor ditch or pipeline headgating off the main ditch or pipeline used to direct water onto the land. A ditch may have many laterals, depending on the amount of acreage irrigated, the slope of the land, and the rate of seepage losses.

Law of the River: The name applied to the legal framework comprised of interstate and interregional compacts, state and federal laws, Supreme Court decisions, and international treaties which govern the distribution of water from the Colorado River system.

Loss: The difference between the amount of water that is actually placed on the land and the amount of water that was physically diverted to the headgate. Losses usually are from seepage and evaporation.

Lysimeter: An instrument used to measure the quantity or rate of downward water movement through a block of soil, usually undisturbed, or to collect such percolated water for analysis of its quality.

Manning Equation: An equation developed for mathematical calculation of flow volume in open channels. Manning's equation is written as follows:

$$v = \frac{1.486}{n} r^{2/3} S^{1/2}$$

or

$$Q = \frac{1.486}{n} a r^{2/3} S^{1/2}$$

where:

Q = discharge in cubic feet per second

a = the cross section of flow area in square feet,

v = the velocity in feet per second,

n = a roughness coefficient,

r = the hydraulic radius = area (a) ÷ wetted perimeter (p)

s = the slope of the energy gradient.

The value of the roughness coefficient, n , varies according to the physical roughness of the sides and bottom of the channel and is influenced by such factors as channel curvature, size and shape of cross section, alinement, and type and condition of the material forming the wetted perimeter.

Values of n commonly used in design of artificial channels are as follows:

Description of channel	Values of n		
	Minimum	Maximum	Average
Earth channels, straight and uniform	0.017	0.025	0.0225
Dredged earth channels	.025	0.033	.0275
Rock channels, straight and uniform	.025	.035	.033
Rock channels, jagged and irregular	.035	.045	.045
Concrete lined	.012	.018	.014
Neat cement lined	.010	.013	-----
Grouted rubble paving	.017	.030	-----

Corrugated metal	.023	.025	.024
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Mean Annual Flow: The average flow over the 12 month period of a given creek or river at a particular gage site.

Miner's Inch: The term miner's inch, formerly used in hydraulic mining and irrigation in the western United States, is practically obsolete. It is defined as the quantity of water which will flow through an orifice 1 inch square under a stated head which varies from 4 to 6 ½ inches in different localities. The use of this unit has led to much confusion; its value in terms of cubic feet per second has been fixed by statute in most of the western states, as follows:

- (1) 50 miner's inches - 1 second foot in Idaho, Kansas, Nebraska, New Mexico, North Dakota, South Dakota, Utah, Washington, and Southern California.
- (2) 40 miner's inches - 1 second foot in Arizona, Montana, Nevada, Oregon, and Northern California.
- (3) 38.4 miner's inches - 1 second foot in Colorado.

Natural Flow: The amount of water in a given channel that arise from sources other than storage releases or transbasin diversions. The amount available for diversion to direct flow water rights.

Nonconsumptive Use: A use of water that does not reduce the supply, such as for hunting, fishing, boating, water-skiing, swimming and power generation.

Nontributary Groundwater: Water that is not part of a natural surface stream as established through geologic and hydrologic facts. The factual determination of nontributary usually involves the length of time the impact of withdrawal would take to reach the stream and the amount of impact relative to the total volume of surface flow impacted.

Original Right or Original Supply: The first right awarded to a ditch or storage structure which may be augmented by a later secondary, supplemental or additional supply.

Outflow: Movement of water out of a drainage basin or reservoir.

Paper Right: A document purporting to be legal proof of a water right, but which may have lost its legal validity because of abandonment or lack of due diligence in perfecting the right.

Parshall Flume: A specifically-designed measuring device for flow in a ditch or other water diversion or creek.

Peak Flow Gage: A streamflow gage which records the peak flows from a streamflow event.

Permeability: A term used to describe the ability of water or other liquid to move through a porous formation under the action of a gradient. The facility with which a fluid will move through a formation is greater for some than for others. For a given bed, the permeability is expressed by a constant K representing the flow through unit in unit time under the influence of a unit gradient. The flow is expressed in terms of entire water.

Phreatophyte: A plant growing in or along a waterway which consumes water.

Piezometer: An instrument which measures hydraulic pressure head.

Porosity: Amount of pore spaces in a geologic unit, usually expressed as a ratio of volume of pore spaces to total volume of rock.

Pot Hole: A natural depression which stores water. Generally associated with glaciated areas such as the northern Great Plains (Dakotas, prairie provinces of Canada).

Potential Evapotranspiration: The rate of which water, if available, would be removed from the soil and plant surface expressed as the rate of latent heat transfer per square centimeter or depth of water. For comparative purposes potential evapotranspiration refers to a well-watered crop like alfalfa (lucerne) with 30 to 50 centimeters of top growth and about 100 millimeters of fetch under given climatic conditions unless otherwise defined.

Precipitation: Moisture that falls to the earth's surface.

Preferred Use: In Wyoming, includes the following uses, in order:

1. Drinking water for both humans and livestock;
2. Water for municipal purposes;
3. Water for steam engines and general railway use; water for cooking, laundering, bathing, and refrigerating (including the manufacturing of ice); water for steam and hot-water heating plants, steam power plants;
4. Water for industrial purposes.

When water rights are acquired through court condemnation, the former use of water can be changed to a higher preferred use. Irrigation is not a preferred use except to hydropower.

Prior Appropriation: A term describing the general process by which limited water is distributed among several claimants. In the West the first person to file and use the water beneficially gets the first water right, whether or not that person owns land next to the river or lake from which the water is diverted.

Priority: The relative seniority of a water right as determined by its claim date or filing date. Other factors are sometimes involved in determining priority. The priority of a water right determines its ability to divert in relation to other rights in periods of limited supply.

Proof Inspection: The State's visual verification that a water permit has been developed and beneficially using water within the terms of the permit.

Production (Well): The total volume of well flow counted from the time of initiation of flow.

Property Right: In water, the point at which a permit to use water is developed to actual water use and the permittee files notice of beneficial use. Before that point, the permit is not a property right attaching to the land.

Public Interest: An interest or benefit accruing to society generally, rather than to any individuals or groups of individuals in the society.

Public Supply: Water withdrawn for all uses by public water suppliers and delivered to users that do not supply their own water. Water suppliers provide water for a variety of uses such as domestic, commercial, industrial, and public water use.

Rainshadow: Phenomena caused when major topographic features create a barrier to moisture-laden air; air is warmed as it descends on the lee side of the barrier resulting in warm-dry conditions.

Reach: A specified length of a stream or channel.

Recharge: Process by which water is added to the zone of saturation, as recharge of an aquifer.

Recurrence Interval: Expected time interval between hydrologic events of a given magnitude (e.g., 100-year peak flow, 10-year/7-day low flow).

Reserved Water Rights: This class of water rights is a judicial creation derived from “Winters v. United States” (207 U.S. 564, 1907) and subsequent federal case law, which collectively hold that when the federal government withdraws land from general use and reserves it for a specific purpose, the federal government by implication reserves the minimum amount of water unappropriated at the time the land was withdrawn or reserved to accomplish the primary purpose of the reservation. Federal reserved water rights may be claimed when Congress has by statute withdrawn lands from the public domain for a particular federal purpose or where the President has withdrawn lands from the public domain for a particular federal purpose pursuant to congressional authorization. Examples are Indian reservations, national forests, national parks/monuments.

Reservoir: A pond, lake, or basin, either natural or artificial, used for the storage, regulation, and control of water.

Reservoir Capacity: The amount of water usually measured in units of acre-feet that can physically be retained in a storage reservoir.

Return Flow: Unconsumed water which returns to its source or some other water body after its diversion as surface water or its extraction from the ground. Also, tailwater, drainage.

Riparian: Pertaining to the banks of a stream, lake, or body of water.

Riparian Land: Land which abuts upon the banks of a stream or other natural body of water.

Riparian Rights: A system used primarily in the eastern states to determine who has rights to water. The riparian system gives water rights to the owners of the lands through which water flows. (See Prior Appropriation)

Riparian Vegetation: Vegetation growing on the banks of a stream or other body of surface water.

River Basin: The area drained by a river and its tributaries.

River Stage: The instantaneous elevation of the water surface at a specified station above some arbitrary zero datum.

Runoff: Precipitation that flows to and in surface streams; renewable water.

Salinity: The amount of dissolved solids in water, sometimes referred to as Total Dissolved Solids (TDS), as well as Soluble Mineral Content (SMC). 500 ppm is acceptable for drinking water; plant damage occurs at 800-1000 ppm.

Secchi Disc: A measuring device for determining water clarity.

Secondary Supply: Attachment by permit of a reservoir storage allocation to specific lands or area/points of use.

Sediment: Unconsolidated particles of clay, silt, sand, gravel, cobbles and boulders.

Seepage: (1) The slow movement of water through small cracks, pores, interstices of a material into or out of a body of surface or subsurface water. (2) The loss of water by infiltration into the soil from a canal, reservoir, or other body of water, or from a field. Seepage is generally expressed as flow volume per unit time. During the process of priming of canals, the loss is called absorption loss.

SNOTEL: Specific remote telemetric instrumentation maintained by the Natural Resources Conservation Service for comparing snowpack conditions at various sites within a season or over many years.

Snowpack: The amount of snow accumulating during the winter months. May be reported in height, water equivalency or percent of average.

Soil Moisture: Water held in the soil.

Solar Radiation: The total electromagnetic radiation emitted by the sun (see Insolation).

Spillway: The facility associated with a storage reservoir or diversion structure to allow for the bypass of water when the reservoir or ditch is full or in flooding conditions.

Spring Box: A device that collects and/or diverts water from a developed spring.

Spring Development: The diversion of water from a naturally flowing spring or the enhancement of flow from a spring.

Staff Gage: A graduated scale used to indicate the height of the water surface in a stream channel, reservoir, lake, or other water body.

Stage: The height of a water surface above an established datum plane (see Gage Height).

State Engineer: The chief executive officer in the executive department of the state government who administers water rights.

Stilling Well: A vertical casing which is connected to a source of water to still the turbulence on the natural surface as water levels rise and fall with flow in a channel so the water stage can be accurately measured.

Storage Right: A right defined in terms of the volume of the water which may be diverted from the flow of the stream and stored in a reservoir or lake to be released and used at a later time either within the same year or a subsequent year.

Stream: Body of water flowing in a channel; may be classified in relation to flow frequency:

Ephemeral: Stream that only flows water during storm-period events and whose channel is above the water table at all times.

Intermittent: Stream that flows water between 1 and 3 seasons per year, or one that flows water over most of its course.

Perennial: Stream that flows water continuously.

Streams may also be classified in relation to groundwater:

Insulated: Stream that neither contributes to nor receives water from the zone of saturation because it is separated by an impermeable layer.

Gaining: Stream that receives water from the zone of saturation (effluent seepage or bank storage).

Losing: Stream that contributes water to the zone of saturation (influent seepage or bank storage).

Perched: Either a losing stream or insulated stream that is separated from the underlying groundwater by a zone of aeration.

Sublimation: Process by which water vapor is converted into solid water (snow/ice) directly without passing through the liquid phase.

Supplemental Supply: An additional irrigation water supply water right from a separate stream which supplements the original surface water permit.

Surface Area of Reservoir: The 2 dimensional area covered by water stored in a reservoir, usually measured in units of acres.

Territorial Water Rights: In Wyoming, water rights with priority dates before July 1, 1890 (year of statehood).

Thalweg: The thread of maximum flow through the cross-section of a flowing stream. It moves from one bank toward the other bank in meandering channels.

Total Consumptive Use: The amount of water, regardless of its source, used by the crops during the growing season. It is the amount of water that is physically removed from the stream's system and is not available in return flows for other users on the stream.

Total Dissolved Solids (TDS): Dry weight of dissolved material, organic and inorganic, contained in water that will not be removed by a 0.45 micron filter; usually described in units of mg/l.

Total Suspended Sediments (TSS): A water quality measure of the sediments that are suspended within a water body.

Triple Divide: Common point along the drainage divide for three river systems.

Trans-Basin Diversion: The removal of the water of a natural stream from its natural basin of origin into the natural basin of another stream across a hydrographic divide.

Transfer: State authorization for change in use, change in place of use, or change in point of diversion and means of conveyance.

Transpiration: The process by which water in plants is transferred as water vapor to the atmosphere.

Tributary Groundwater: Seepage, underflow, and percolating water that will eventually become part of the natural surface stream. A natural stream's waters include water in the unconsolidated alluvial aquifer of sand, gravel, or other sedimentary materials, and all other waters hydraulically connected thereto, which can influence the rate or direction of movement of the water in that alluvial aquifer or natural stream.

Unadjudicated: A water right permit before it has been publicly recognized by proof inspection and advertisement. See adjudicated.

Unconfined Aquifer: An aquifer in which the water table serves as the upper surface of the zone of saturation.

Ungaged Streams: Creeks or rivers which have not been equipped with measuring devices. Equations exist for estimating the flow from these streams based upon parameters such as drainage areas.

Vapor Pressure: The partial pressure of water vapor in the atmosphere.

Velocity: The speed of water as it travels through a channel or pipe.

Virgin Flow: The flow of a river that would occur in the absence of human activities; synonymous with native supply.

Volume: A specific quantity of water generally expressed in terms of acre-feet. An acre-foot is defined as the amount of water required to cover 1 acre of land to a depth of 1 foot and is equivalent to 43,560 cubic feet, or 325,850 gallons.

Walton Rights: Reserved water rights for non-Indian successors on Indian reservations.

Water Commissioner: Public officials under the direction of the division superintendents who carry out the detailed daily administration of the waters in portions of each water division.

Water Court: In Colorado, special division of a district court with a district judge, called the water judge, to deal with certain specific water matters principally having to do with adjudication and change of water rights. In Wyoming, it is initially handled by the executive branch of state government, instead of the judicial branch, under the Board of Control.

Water Development: The process of building diversion, storage, pumping, and/or conveyance facilities to apply water to beneficial use.

Water District or Water Commissioner District: A subdivision of a water division, usually defined by drainage basin.

Water Division: One of four statutorily-described divisions of the State of Wyoming correlating to their inclusion in major river systems of the United States.

Water Equivalent: A measurement of the moisture contained in snowpack.

Water Right: A right to use, in accordance with its priority, a certain portion of the waters of the state by reason of the specific appropriation of the same.

Water Right Deed: (Obsolete reference) Conveyance from the landowner of the right to seek, from the state, a change in place of use to a new owner.

Watershed: The area from which water drains to a single point.

Water Table: The upper limit of the completely saturated material in an aquifer.

Water Well: A water well is a hole or shaft, usually vertical, excavated in the earth for bringing groundwater to the surface. Occasionally wells serve other purposes, such as subsurface exploration and observation, artificial recharge, and disposal of wastewater. Many methods exist for constructing wells; selection of a particular method depends on the purpose of the well, the quantity of water required, depth to groundwater, geologic conditions, and economic factors. Shallow wells are dug, bored, driven or jetted; deep wells are drilled by cable tool or rotary methods.

Water Year: The 12-month period October 1st through September 30th, generally correlating with the snowpack and subsequent growing season. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1959, is the 1959 water year.

Weir: A certain kind of water flow measuring device.

Yield: (1) The quantity of water expressed either as a continuous rate of flow or as a volume per unit of time (AF per year), which can be collected for a given use or uses from surface or groundwater sources on a watershed. The yield may vary with the proposed use, the plan of development, and also economic considerations. Yield is fairly synonymous with water crop. (2) Total runoff. (3) The streamflow in a given interval of time derived from a unit area of watershed. It is determined by dividing the observed streamflow at a given location by the drainage area above that location and is usually expressed in cubic feet per second per square mile. See also Yield, Firm; Yield Perennial; Yield, Safe.

Yield, Average Annual: The average annual supply of water produced by a given stream or water development.

Yield, Firm: The maximum annual supply of a given water development that is expected to be available on demand, with the understanding that lower yields will occur in accordance with a predetermined schedule or probability.

Yield, Perennial: The amount of usable water of a groundwater reservoir that can be economically withdrawn and consumed each year for an indefinite period of time. It cannot exceed the natural recharge to that groundwater reservoir and ultimately is limited to the maximum amount of discharge that can be utilized for beneficial use.

Yield, Safe: With reference to either surface or groundwater supply, the rate of diversion or extraction for consumptive use which can be maintained indefinitely, within the limits of economic feasibility, under specified conditions of water supply development (see also Yield, Perennial).

Yield, Water Right: The volume of water diverted by a water right. Yield may be expressed as an average for a period of years (average yield) or as the yield of one selected year representing the lowest or critical amount of water provided (critical year yield). Yield also may refer to diversion at the headgate (headgate yield) or at the farm turnout where it is applied to irrigation (farm yield). The difference between headgate yield and farm yield is the amount of water lost to seepage and other causes related to the conveyance of water through the ditch.