



DIVERSION RECORDS STANDARD



**Department of Natural Resources
Division of Water Resources**

Effective November 1, 2010
Version 1.6

Revision Sheet

Version No.	Date Effective	Version Description
0	September 2009	Legacy documents compiled into new User's Manual format and updated
1.4	November 2010	Added "ACCTS" to WDIDs. Revised summation routines and water class coding to eliminate SOURCE codes "6", "7" and "R". Defined rules for the use of the FROM code. Changed USE code "Q" to mean "Quantified"; added USE code "Z". Added TYPE codes "D", "J", "F", "L", "Q", "U", "V", "W" and "R"; removed TYPE code "3" and modified TYPE code "7". Added new TO code. Added OBSERVATION codes "K", "U" and "C".
1.5	November 2010	Corrected miscellaneous typographical errors; re-ordered one section; no significant content changes.
1.6	June 2012	General revisions to remove inconsistencies and add clarifying information discovered during roll out of new standard. Deleted TYPE code "6" as being redundant; TYPE code "7" now is just "release to stream". Replaced the sections discussing the proposed development of Accounts with an overview of what was actually developed. Deleted all "proposed development" sections. Added clarification on recharge being associated with both accretions to the stream and underground "storage" for later direct withdrawal. Reordered "Diversion Records Warranted" and "Entry of Diversion Records" to come after "Diversion Record Codes" and "Water Class Protocols". Added "Ground water Protocols" section to the "Source Code Rules".



Diversion Records Standard Authorization

This manual is provided both as a standard and reference guide for the process of collecting data and compiling Diversion Records in accordance with Section 37-80-105, C.R.S. Effective November 1, 2010, all Diversion Records should transition to this standard.

A handwritten signature in black ink that reads "Dick Wolfe".

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Director/State Engineer

June 29, 2012

Date

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1 BASIS OF DIVERSION RECORDS

As established by the constitution of the state of Colorado¹:

“The water of every natural stream, not heretofore appropriated, within the state of Colorado, is hereby declared to be the property of the public, and the same is dedicated to the use of the people of the state, subject to appropriation...”

The use of water in Colorado is the use of the public’s property. Such rights are termed “usufructuary”, meaning the right to use someone else’s property. In order to track the use of the public resource, Colorado statute² directs that the state engineer “shall require” the division engineers:

“to report to him at suitable times their official actions; and shall require of them annual statements... of the amount of water diverted from the public streams in their respective divisions and such other statistics as, in the judgment of the state engineer, will be of benefit to the state.”

Diversion records are the compilation of the “annual statements” required by statute and document administered diversions, user supplied information regarding diversions and the associated use of the water. While some may think diversion records are associated with uses of water “authorized” by the Division of Water Resources (Division), the coding standard makes no such affirmation even though the statement is generally true. The November 1, 2010 revision includes coding that for the first time affirms a diversion was, in fact, “unauthorized” from the Division’s perspective. The implementation of such coding does not, however, infer the contrary position that all records not coded as “unauthorized” were by default or design “authorized”. Diversion records document:

- the place of diversion or use;
- the volume of water diverted;
- the source of the water diverted;
- the use to which the water was placed;
- whether the diversion was made
 - by exchange;
 - by trade;
 - as an alternate point;
 - under the authority of something besides the Prior Appropriation Doctrine ; or,
 - as an “unauthorized” diversion.

Depending upon the complexity of the operations involved, diversion records may also provide information regarding the volume and types of water stored and other more specific information. The term “diversion record” applies to both the action of diverting water into a structure and releasing water from a structure.

¹ Colorado Constitution, Article XVI, Section 5.

² Section 37-80-105, C.R.S.

2 PURPOSE OF DIVERSION RECORDS

There are five primary reasons to maintain diversion records.

2.1 Public Information

First and foremost, diversion records are the “annual statements” required by statute³. Diversion records provide the public with information regarding the use of their property. The key information contained in a diversion record is:

- the SOURCE and volume of water diverted or released; and,
- how and where that water was put to beneficial USE.

2.2 Verify Administration

Diversion records may also be used to verify that the waters of the state are administered in accordance with the prior appropriation doctrine⁴, Colorado revised statutes, decrees of the district court or water court, federal compacts and Supreme Court decrees. As required by statute⁵, water must be placed to a beneficial use and must not be wasted. Not only can diversion records be used to verify administration, if entered timely they can also be used as a basis of administering deliveries, return flows or other operations associated with previous diversions.

2.3 Basis for Change of Water Rights Analysis

When water rights are changed in water court, diversion records provide a basis for determining the historical use of the water right, which can then be used to determine the historical consumption associated with the diversion. An adequate understanding of the historical use of a water right is required to prevent the change of use from injuring vested water rights, including water rights with priorities junior to the water right being changed. This application of the “vested-rights doctrine” as it applies to the diversion of water in Colorado holds that a water right has the right to the conditions of the river that existed at the time the water right was established. Because the supply relied upon by the junior water right may, at least in part, depend on the return flows and historical practices of the senior water right, those vested junior rights must not be injured by a new change to the senior right. Diversion records should provide the data required to make such an analysis.

³ Section 37-80-105, C.R.S.

⁴ The “prior appropriation doctrine” provides that water rights developed first in time are first in the right to use the water; this doctrine is also commonly known as “first in time, first in right”. It is in contrast with the “riparian doctrine”, which associates water rights with adjacent land ownership.

⁵ Section 37-92-502(2)(a), C.R.S.; see also 37-84-107.

2.4 Abandonment Process

As set forth in statute⁶, the division engineer is required to prepare a “decennial abandonment list” and is directed to:

“investigate the circumstances relating to each water right for which the available water has not been fully applied to a beneficial use.”

Diversion records are an essential part of this investigation.

2.5 Data Source for Modeling

Policy and planning decisions associated with issues ranging from population migration to water supply projections increasingly rely upon the science and technology of computer models to forecast change or provide virtual responses to “what if” scenarios. Such models require a robust database of information in order to formulate accurate solutions. Diversion records are a key part of such data.

⁶ Section 37-92-401, C.R.S.

3 DIVERSION RECORD OPTIONS

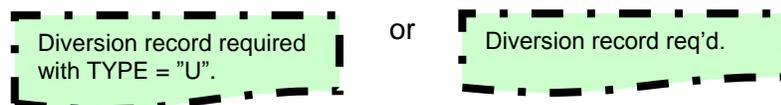
There are four forms of diversion records: Diversion Comment, Infrequent Diversion Record, Daily Diversion Record, and Reservoir Record.

3.1 Diversion Comment

A Diversion Comment is only used when either or both of the following general pieces of information is available⁷:

- “not used/ not released” codes (NUC/NRC); and/or,
- a general comment regarding the structure.

The available NUC/NRC are shown in Table 3-1. To determine whether a Diversion Comment is sufficient, refer to the “Diversion Record Logic Diagram” in Appendix A. A Diversion Comment with the resultant NUC/NRC is a sufficient record unless the result of the logic diagram is:



If the result of the logic diagram is either of the above “Diversion record req’d” results, then either an Infrequent Diversion Record or a Daily Diversion Record, depending on the data available, is required.

Table 3-1: Not Used/Not Released Codes (NUC/NRC)

	Blank is acceptable
A	Structure not usable
B	No water available
C	Water available, but not taken
D	Water taken in another structure
E	Water taken, but no data available
F	No information available

⁷ Acres irrigated was historically collected using a Diversion Comment. With the ability to use spatial data analysis of aerial photographs to determine the area irrigated by each division on an annual basis, there is no longer a need to enter this information.

3.2 Infrequent Diversion Record

If a diversion record is required based on the logic diagram in Appendix A and the data associated with the diversion structure is quantified on a monthly or annual basis, the Infrequent Diversion Record option should be used. The data may be in one of four formats:

- average daily amount for a month $[(\text{total amount for month})/(\text{number of days in month})]$;
- total amount for a month;
- average daily amount for the year $[(\text{total amount for year})/(\text{the number of days in year})]$;
- or,
- total amount for the year.

3.3 Daily Diversion Record

The Daily Diversion Record option may be used **only** if the diversion is quantified on a daily basis. Quantification of daily amounts may be based on:

- regular⁸ visits to the diversion structure with a log of the associated measurement;
- continuous measurement recorder; or,
- other equivalent process approved by the division engineer.

A Daily Diversion Record should NOT be used to capture “manufactured” daily data based on annual or monthly information. If a user needs to have monthly or annual infrequent data represented on a “daily” basis, the infrequent diversion record with the “average daily amount” option should be used.⁹

3.4 Reservoir Records

Reservoirs must also be included in the diversion record and annual diversion information report. These reports may be used to generate an Infrequent Diversion Record in the absence of other data.

In addition to the minimum information detailed in the following two sections, reservoirs that make releases requiring administration, such as releasing water to the stream, must make a record of such releases. Any reservoir that has release records must also make records of the diversions to storage. Diversion records of the losses, such as evaporation or seepage, may be made at the option of the water commissioner or division engineer.

⁸ A “regular” visit schedule is whatever the water commissioner or division engineer believes is necessary to make the daily record. Daily visits are preferred, but a less frequent schedule, such as weekly or when the ditch turns on or off, may be acceptable.

⁹ An example of such an operation is recharge accretions. In general, accretions to the river from recharge are determined by models using a monthly time step, which means the model only provides the volume of recharge accretions for any given month. Replacement of out-of-priority depletions, however, is done on a daily basis. In order to use the modeled data, the monthly data must be provided in terms of the “average daily amount” where the monthly volume is divided by the number of days in the month. A diversion record in this format is required to drive accretion tools used by the water commissioner to determine daily credits and deficits in the administration of the associated plan of augmentation.

3.4.1 Small Irrigation Only Reservoirs

Reservoirs that are only used to supply irrigation water must submit:

- the end of irrigation year (October 31) stage and volume amounts;
- the date and stage/volume amount when diversions to storage ended; and,
- the dates associated with the beginning and ending of releases from the reservoir.

3.4.2 Large or Multiple Use Reservoirs

Large and/or multiple use reservoirs must submit, at a minimum, end-of-month stage readings and storage volume data. Daily storage and release records are also required if any release from the reservoir requires administration.

4 DIVERSION RECORD PRINCIPLES

4.1 Create a Complete Record

Diversion records use data management methodology associated with common accounting systems. As with all such systems, the basic goal is to reconcile the “ins” and the “outs”. Instead of “income” and “expenses”, diversion records document how much of each particular SOURCE of water is put to a specific USE. In the case of reservoirs or recharge areas, diversion records may also be used to record the administration of the volume of the structures in addition to the diversions to and releases from the structures.

Every record that quantifies a diversion (or release) from a SOURCE of water must either include the USE detail or have an associated record that provides the USE information. In order to adequately reconcile how the water of the state is used, a complete diversion record is required. It begins with a comprehensive set of records establishing how much of each SOURCE is diverted, requires a complete record of each USE of the SOURCE and includes the ability to effectively report that data.

4.1.1 SOURCE and USE Data Have the Same OBSERVATION Code

In the event the water commissioner or division staff can attest to the USE of the water, for instance in the case of ditches that are used only for irrigation, a single diversion record may be all that is needed to complete the diversion record and reconcile the SOURCE and USE information:

WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	O	Description
0100501	1		1				*	Natural stream diverted to direct use.

Similarly, a diversion record based on information provided by a user for a well could also be reconciled with a single entry:

WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	O	Description
0105056	3		1	A	0103354		K	Ground water pumped pursuant to plan of augmentation 0103354, used for irrigation.

4.1.2 SOURCE and USE Data Have Different OBSERVATION Code

If the SOURCE and USE of water have different bases of OBSERVATION, two (or more) records are required. For instance, if a water commissioner can verify that the natural stream was diverted in priority, but relies upon “User Supplied – Known Reliability” information as the basis of the USE data, two records would be required.

WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	O	Description
0100501	1		Q				*	Natural stream carried in structure
0100501	1		2	R			K	User supplied record of USE

The TYPE code in the above example prevents the water from being double counted.

4.2 Water Class Protocol Compliance is Required

Diversion records are a language. The nouns and verbs of the water class can only communicate clearly regarding the associated volume data if the protocols are followed rigorously. It is not enough for the water commissioner or division engineer to understand what is meant by a particular water class code; it must be interpretable based on the application of the protocols. If the record does not comply with the protocol, the meaning of the record will ultimately be lost.

Also, bad data or data that does not comply with a known standard is worse than no data as it, in the first case, may represent as true something that is not; and in the second case, subjects what is true to interpretation, which almost always leads to misinterpretation. Either result presents a less desirable condition upon which to base a scientific analysis. It would, generally, be more reliable to use educated assumptions about such data than to draw conclusions from bad or misinterpreted data.

4.3 Diversion Records are NOT Accounting

Although diversion records employ accounting techniques, diversion records are not accounting; they are a record of the diversion and use of water. A “complete” diversion record does not mean the USE volume will necessarily equal the volume of the SOURCE; nor is there a record of every aspect of the water’s “use”. There is no requirement, for instance, to include transit loss in the record. Diversion records, however much they may look like “accounting”, do not “account” for the water. Wherever the record happens to correspond to an actual accounting of the water is merely coincidental to maintaining the information required to document administration or report the volume of a SOURCE of water diverted for USE.

4.4 Diversion Record is a Historical Document

One of the most significant aspects of the diversion record is its historical context. As discussed above, the historical impact is lost if the record cannot be reliably interpreted. That is one context of what it means to “think historically”. A second one is the incredibly obvious observation that the only way a diversion record can be part of the historical understanding is if the record is made in the first place. There are times when it would be beneficial to have more than just the “complete record” required by Section 4.1.

Take the case of an irrigation ditch that has consistently run more tail than required to effectively operate the ditch. Recording the rate at which the natural stream was diverted for the irrigation USE may actually constitute a “complete record”. But, if that’s the only record made, a future historical consumptive use analysis of the ditch for the purposes of a change of use would result in the entire tail being included in the amount of water diverted and “used”, instead of just the amount of tail required to effectively operate the ditch. Such a historical perspective should prompt the user to make an excessive tail record to document the amount of water that was diverted without ever really being able to put it to a beneficial use. If such a record is made, the historical analysis could reduce the diversion to the volume actually “used”; which is the appropriate basis for such an analysis. This would be an example of how the user is urged to think historically when compiling the diversion record.

4.5 Minimize the Number of Undocumented Diversions

A Diversion Comment would be considered as providing a “complete record” and should, therefore, be used to the fullest extent possible. However, an effort should also be made to minimize the number of NUC/NRC = (“E” or “F”) comments over time. These codes mean the status of a structure is either unknown or the structure is diverting water but has no data associated with the diversion. While there may be occasions when “active” structures fall into one of these two categories, they should not be allowed to remain in either of these conditions for an extended period of time. If the structure is one that, in the opinion of the division staff, will never be required to submit diversion records, the user should consider changing the CIU code to “U”¹⁰. If the structure is consistently diverting water, the user should determine the most effective way to obtain the associated data. This may mean requiring structures that divert “significant” amounts of water to install a measurement structure with recorder, establishing a User Supplied diversion record report with the water user or some other appropriate action.

¹⁰ HydroBase CIU code “U” means “Active structure but diversion records are not maintained.”

5 DIVERSION RECORD CODES

5.1 Water Class

Diversion records consist of volume data and a series of codes that describe the diversion called a “Water Class”. The Water Class includes:

- WDID - structure ID at which the diversion was made
- ACCT - each WDID **may** have multiple accounts as indicated by a three digit extension appended to the right of a decimal point after the WDID
- SOURCE - source of the water being diverted
- FROM - structure ID of “enabling structure” associated with more complex diversions; may also have an ACCT extension
- USE - how the diverted water was used
- TYPE - provides additional detail required for more complex diversions
- GROUP - the WDID of a group or authorizing agent associated with the diversion
- TO - the WDID of a structure to which a release is being delivered; may also have an ACCT extension

5.1.1 Organized by Irrigation Year

Diversion records are organized by Irrigation Year, which begins November 1 of the previous calendar year and ends October 31 of the “irrigation year”¹¹. This practice is a holdover from the agrarian based development of most water rights as irrigation typically ended in October.

5.1.2 Water Class is Unique

There can be only one diversion record for each Water Class in any given irrigation year. Versions of the following table format have been used throughout this document to illustrate diversion record water classes.

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	O	Description
1	0802500	1		0					

5.1.3 Water Class Format – Summation Logic

In addition to communicating that an identified structure diverted a specific SOURCE of water for a beneficial USE, the format of the Water Class is also the key to understanding whether the volume of the record should be included in the total volume determination of the SOURCE of water associated with the record.

¹¹ Irrigation year “2008” (IYR 2008) would begin November 1, 2007 and end October 31, 2008.

“Natural Water” Sources

“Natural water” sources include “natural stream flow”, “ground water” and “non-stream flow” (SOURCE = “1”, “3”, “5”). The total volume of water associated with these SOURCE codes is determined by summing the records that document the initial diversion of water directly from the SOURCE. In order to add the volume of water diverted only once, the summation routine relies upon the water class format to distinguish records that are diversions directly from the SOURCE from records that are “subsequent” diversions or re-measurement of the same water. The water class provides this information in one of two ways, depending on whether: 1) the subsequent record is associated with a different WDID; or, 2) the subsequent record has the same WDID used to record the initial diversion.

Subsequent Record is Re-measured by Second WDID

If the subsequent record is based on a measurement structure that has its own WDID, the FROM code is used to prevent the volume of the second record from being counted twice. An example would be the case where a water commissioner makes an “Observed” record of the diversion from the stream and relies upon “User Supplied” data for the USE record:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	O	Description
1	0100501	1		Q				*	WC Observed record
2	0104516	1	0100501	2				K	User Supplied–Known reliability

The WDID in the FROM code of the above USE record (Row 2) informs the summation routine that the record is a subsequent measurement of SOURCE = “1” water that has already been counted. The SOURCE summation routine will, therefore, not add the water a second time. The volume of water in the second record would, however, still be included in the USE summation routine.

While the presence of any WDID in the FROM code would suffice from the standpoint of the summation routine logic, the USE association routine requires the FROM code of a subsequent diversion record to have the WDID of the structure making the “initial” diversion of water from the SOURCE. This enables the routine to associate the initial diversion with the ultimate USE and place of USE.

Subsequent Record is Same WDID used for Initial Diversion

If the subsequent record uses the same WDID used to record the initial diversion, there is no WDID to use in the FROM code. To illustrate, consider the previous example where water is diverted by the water commissioner, some of the water is re-measured for USE and the balance of the water is delivered without being measured a second time. Since the SOURCE record and USE record will have the same WDID, the two records must be distinguished so that the volume is not counted twice by the SOURCE summation routine. To accomplish that, the USE record is assigned a TYPE = “R” code. The following example diversion records demonstrate such a case:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	O	Description
1	0100501	1		Q				*	WC Observed record
2	0104516	1	0100501	2				K	User Supplied–Known reliability
3	0100501	1		1	R			K	User Supplied–Known reliability

The TYPE = "R" code has the same effect as having a WDID in the FROM code in that the volume of the record will be included in the USE summation, but will not be included in the SOURCE summation.

"Manufactured Water"

"Manufactured water" is water that has been diverted and subjected to an administrative change such that the water has some new characteristic it did not have before. Manufactured water includes "reservoir water", "transbasin water" and "re-usable water" (SOURCE = "2", "4", "8"). While the summation routine used to determine the total SOURCE of natural water only sums diversions made directly from the SOURCE, the summation routine for manufactured water sums only the releases of such water to system. This is due to the fact that manufactured water is not available for USE until it has been released from a structure.

As a result, the only water class codes relied upon by the summation routine for these SOURCE codes is the FROM and TYPE codes. Only releases that make the water available for USE are included in the summation of the manufactured water SOURCE codes. These summation release TYPE codes are "7", "8" and "L".

5.2 WDID / Structures

Diversion records are entered for "structures". Structures are identified by the division staff and assigned a unique seven digit identification number known as the "WDID". The first two digits of the WDID are the "Water District". The water district is a geographical area identified by the Office of the State Engineer that generally relates to the drainage area of a stream or group of streams. The last five digits of the WDID are simply a sequential identification number or "ID".

5.2.1 WDID is Required

The WDID is the basic, most elementary data requirement for any structure that requires administration. If a structure requires administration, the structure must be in the database. The only way to include the structure in the database (HydroBase) is to assign the structure a WDID. ***Structures that are being administered for any reason, such as accounting, diversions, rule compliance, etc. must have a WDID.***

5.2.2 Structure WDID is Unique

The WDID is a unique number, which means it is the one and only WDID that applies to a structure or some specific aspect of the structure. For instance, a ditch may have a WDID assigned to the head gate and a second WDID assigned to the return structure used to release water back to the stream. Previous data base limitations prompted the creation of "duplicate" WDIDs for the purpose of inter-district diversion records. Some users also created multiple WDIDs for a single structure in order to track multiple aspects of the structure, such as assigning a WDID to specific pools of storage water in a reservoir. Such practice only contaminates the database and compromises its integrity. ***Every effort must be made to identify and eliminate duplicate WDIDs and merge the associated diversion records.***

5.2.3 Update Annually

In order to maintain a complete database, diversion records for new structures must be added annually. This will best be achieved through a collaborative process between the water commissioners and the division staff charged with tabulating new water rights. ***The division engineer should work to insure that such a process is in place and supported.***

5.2.4 Structure Location

With the advent of technology, accurate structure locations bear more importance than simply being able to locate the structure in the field. All structures must have accurate GPS locations in order to properly model the relative locations of the structures and correctly display their locations.

5.2.5 Structure Types Allowed to make Diversion Records

Only diversion structures are allowed to have a diversion record. Structure types that are allowed to have diversion records are shown in Table 5-1.

Table 5-1: Diversion Structure Types

Code	Structure Type Name	Aggregating or Non-Aggregating
1	Ditch	N
2	Well	N
WG	Well Group	N
WF	Well Field	A
3	Reservoir	A
RS	Reservoir System	A
4	Spring	N
5	Seep	N
6	Mine	N
7	Pipeline	N
8	Pump	N
9	Power Plant	N
0	Other	N
M	Measuring Point	N
MF	Minimum Flow	N
R	Reach	N
AR	Aggregating Reach	A
RA	Recharge Area	A

The “structure type” element of the data is used to provide additional information to the user and provide opportunities for QA/QC protocols. Structure type is also separated into “aggregating” and “non-aggregating” structures (see Table 9-1 and Table 9-2) to allow the program to know which summation routine to use to calculate the “Total Inflow to the Structure”.

The name of most structure types provides an adequate understanding of the structure: “Ditch”, “Well”, “Reservoir”, etc. need no further explanation.

Well Group

A “Well Group” is simply a collection of wells that have been grouped to simplify the diversion record process. One record is made for the Well Group instead of multiple records, one for each well in the group

Well Field

A Well Field, primarily, is the volume of ground water allocated under the Statewide Nontributary Ground Water Rules¹². Well Field diversion records document the administration of the allocated volume of water by recording additions through recharge or releases of water, typically to individual wells associated to the Well Field. Typical diversion records would be as follows:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	TRANSID	4		Q	7			Transbasin released to stream
2	PUMPID	4	TRANSID	Q				Transbasin picked up by pump in stream
3	WELLID	4	TRANSID	R	W			Injection record
4	WELLFLD	8	WELLID	Q				Quantification in well field used to aggregate recharge
5	WELLFLD	8		Q	8		(WELLID2)	Recovery of the recharged water at a later date
6	WELLID2	8	WELLFLD	2				Individual well pumping water for USE and releasing it to system.

Or, in the case of diverting allocated ground water:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	WELLFLD	3		Q	8			Aggregate release from the well field for all pumping
2	WELLID1	3	WELLFLD	#				Individual well pumping water for USE.

Well Field structures use the aggregated structure totals protocol, which means water must be added to and released from the structure with separate, unique diversion records.

¹² The Statewide Nontributary Ground Water Rules, 2 CCR 402-7, are available at www.state.co.us. The Rules guide the issuance of well permits pursuant to §37-90-137(4), C.R.S. “to withdraw nontributary ground water or any ground water in the Dawson, Denver, Arapahoe, and Laramie-Fox Hills aquifers” (underscore emphasis added).

Administration of Well Field Volume

The allocated volume of water associated with a Well Field involves an annual appropriation designed to achieve a 100 year aquifer life and allows water to be “banked”¹³ from year to year. Diversion records, should the user so desire, could easily document the administration of the volume over time:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	WELLFLD1	3	AQRESVN	Q				Annual appropriation allowed from amount reserved
2	WELLFLD1	3		Q	8			Appropriated ground water
3	WELLFLD1	3	WELLFLD1	Q	Q		WELLFLD2	Volume transferred to another allocation.
4	WELLFLD2	3	WELLFLD1	Q				Transferred volume added to second well field allocation.
5	WELLFLD1	8	RCHGWELL	Q				Recharge added to well field volume
6	WELLFLD1	8		Q	8			Recharge released from well field

Reservoir System

“Reservoir System” structure types are similar to Well Group in that they simply record a group of reservoirs that are administered as a single entity. Reservoir System structure types follow all the same protocols as Reservoir structure types.

Minimum Flow

A “Minimum Flow” is simply a special type of “Measuring Point” – as can be said of many of the structure types. Minimum Flow structures are used either for an in-stream flow reach or a natural lake level water right.

Reach

A “Reach” is as the name implies: a reach of stream. In diversion records, it is primarily used to receive the replacement supply associated with plans of augmentation, substitute supply plans or return flow obligations. It may also be used to quantify exchange volumes or other volumes of water being administered through the Reach.

Aggregating Reach

Due to the complexity of some replacement operations, there are occasions when the Reach is used to aggregate the volumes of water it receives prior to making a release, much like a reservoir would receive water with one set of records and release it with a second set. These operations use the “Aggregating Reach” structure type. The only distinction between “Reach” and “Aggregating Reach” is the structure total summation protocol, discussed in Section 9.2.1.

¹³ Pursuant to 2 CCR 402-7 Rule 8.A, “the allowed annual amount of withdrawal may exceed the allowed average annual amount of withdrawal as long as the total volume of water withdrawn from the well or wells does not exceed the product of the number of years since the date or dates of issuance of the well permit or permits or the date or dates of determination or determinations of right to ground water by the water court, whichever comes first, times the allowed average annual amount of withdrawal.”

5.2.6 Structure Types NOT Allowed to make Diversion Records

Structure types that are not allowed to have diversion records are shown in Table 5-2:

Table 5-2: Structure Types NOT Allowed to have Diversion Records

DS	Ditch System
EP	Exchange Plan
P	Augmentation/Replacement Plan

Ditch System

While wells and reservoirs are also allowed to maintain diversion records as members of a Well Group or Reservoir System, Ditch structure types are not administered as part of a Ditch System. Ditch System structure types exist merely to provide a way to associate a ditch to another ditch.

Plans

Exchange and augmentation/replacement plans are just what the name implies: they are plans, not structures. Only structures can make a diversion.

5.2.7 Non-Storage Structures

WDIDs associated with non-storage, surface water diversion structures, such as ditches, pipelines, etc., represent, first and foremost, the “head gate” or “principal intake” measurement structure. In many cases, this WDID has also been used to represent the general reach of the structure’s length, as in the case of an irrigation ditch. As a result, diversion records of the USE of water diverted by the intake structure have been assigned to the diversion structure WDID unless the USE occurred after diversion by a subsequent structure.

If a subsequent measurement structure is used to take water out of the diversion structure for USE, the second structure is assigned its own WDID and the USE is recorded using the second structure WDID. The WDID of the first structure must then be used in the FROM code of the subsequent record to prevent double counting the SOURCE of water being measured by the second structure and to associate the initial diverting structure to the USE and place of USE.

Because non-storage, surface water diversion records are associated specifically to the head gate, release records must be assigned to a second structure ID in order for the SOURCE and USE summation logic to work correctly. If the FROM code is “blank”, the summation routine for sources of natural water (SOURCE = “1”, “3” or “5”) diverted by the structure will include the volume in the SOURCE total, unless TYPE = “R”. If the structure is making a release, one of the release TYPE codes must be used which means the TYPE code cannot be “R”. As a result, the only mechanism available to prevent the volume of water associated with the release record from being counted twice is to have an ID in the FROM code. The SOURCE/USE association routine requires the use of the intake structure WDID in the FROM code, which means the release record must use an ID other than the structure’s intake ID.

The two IDs may either be completely different WDIDs:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0800500	1		1				Irrigation diversion through head gate of ditch
2	0800500	1		Q				Water carried thru head gate
3	0807695	1	0800500	Q	7	0803500		Release from ditch tail using separate WDID for return structure
4	0809595	1	0800500⁺	A	Q	0803500		Augmentation of reach associated with aug plan

or, may simply be different ACCT IDs for the same WDID:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0800500.001	1		1				Irrigation diversion through head gate of ditch; ACCT 001 is defined as "head gate"
2	0800500.001	1		Q				Water carried thru head gate
3	0800500.003	1	0800500.001	Q	7	0803500		Release from ditch tail; ACCT 003 is defined as "ditch tail"
4	0809595	1	0800500.001⁺	A	Q	0803500		Augmentation of reach associated with aug plan

⁺(Note that in both examples, the water received by the in-stream reach has the FROM code associated with the initial diversion of the water, as opposed to the immediately preceding structure.)

There is one common exception when a non-storage, surface water structure release record would not double count the volume. Such is the case when a ditch decree allows the ditch to forego a diversion and leave water that it could have diverted in the stream, using the water as a source of replacement supply. Theoretically, the following record would result in a correct SOURCE summation.

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0800500	1		1				Irrigation diversion through head gate of ditch
2	0800500	1		Q	7	0803500		Theoretical Record of water left in stream for replacement

The principal problem with record "2" in the above example is the potential confusion created by the presumption that the WDID represents, "first and foremost", the diversion through the head gate of the ditch. The volume of water associated with record "2" was not "diverted" by the head gate and would not be included in any associated head gate chart record. Even though the above example results in a correct SOURCE summation, such a record may not be used. The WDID or WDID.ACCT associated with the head gate of a ditch should correlate to the flow through the head gate¹⁴. The ditch WDID, by itself, for a ditch that still diverts water from the stream for USE may not make a record of water "left in the stream".

¹⁴ An exception to this standard would be, for example, a ditch that has been completed dried up and now only represents the volume of water "available" at the head gate.

The user will need to either create a measuring point ID in the stream and use that as the ID for the record:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0800500	1		1				Irrigation diversion through head gate of ditch
2	0807575	1		Q	7	0803500		In-stream measuring point associated with water left in stream by ditch 0800500.
3	0809595	1	0807575	A	Q	0803500		Augmentation of reach associated with aug plan

or, use an ACCT with the ditch WDID:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0800500.001	1		1				ACCT 001: "head gate"
2	0800500.002	1		Q	7	0803500		ACCT 002: "bypass"
3	0809595	1	0800500.002	A	Q	0803500		Augmentation of reach associated with aug plan

5.2.8 Storage Structures

For storage structures, the WDID represents the pool of water stored in the structure and its primary release point. Because of the change in SOURCE that occurs when water is stored in the structure, release records do not present a concern regarding the FROM code not being "blank" like non-storage, surface water structures. Storage structure WDIDs, therefore, may make both diversion and release records.

The singular USE to which the diverted SOURCE is placed (USE = "0") also simplifies the summation routine such that additional ACCT IDs are required only if the user needs to track more information than diversions to and from the general pool of storage in the structure historically represented by the WDID.

Only storage structures can "store" (USE = "0") water. Reservoirs that require a release record (Section 3.4) must also record all water stored.

5.3 Accounts

The use of accounts is **not** required. In fact, the vast majority of structures do not need the complexity of accounts in order to accurately administer the structure. When accounts have not been set up for a structure, the WDID will simply look and function exactly as it has historically. Accounts are used for the singular purpose of tracking multiple subgroups in a structure.

Accounts are assigned to a WDID by the addition of a 3-digit number that appends the WDID to the right of a decimal point. The meaning of the ACCT code is unique to each WDID; there is no ability to select or customize ACCT codes absent a master design by the user. The WDID, without appended ACCT, represents the structure as a whole. Using the WDID with appended ACCT signifies diversions associated with that specific account. For instance, 0202503.001 would represent ACCT 001 of WDID 0202503, etc.

Only structure types authorized to have a diversion record, shown in Table 5-1, may have accounts. All accounts must be subsets of only the parent structure; every account is completely independent from every other account.

5.3.1 Account Templates

Diversion Location

Non-storage diversion structures that also release water back to the stream must release the water either through a second measurement structure or by using accounts. For example, a ditch diverts more water than it can beneficially use and the water commissioner wants to make a record of the excess tail release and proposes the following water class:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	1000501	1		Q	E			Unacceptable record

But this is an unacceptable water class because such a record would result in the volume of the excess tail being included in the summation routine of the Total SOURCE of natural stream flow. The only reason to make the record in the first place is to diminish the inferred use of an earlier record that showed the ditch diverting and using water from SOURCE = "1" in excess of what the ditch actually put to beneficial use. Instead of accomplishing that, this water class would add the volume a second time to the SOURCE total for the structure. The only way to prevent the double counting is to use an ID in the FROM code. This can be done by either assigning the tail a WDID or using accounts.

If the tail has a measurement structure, it could be assigned a WDID, say "1000951" for this example. An acceptable water class would then be:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	1000951	1	1000501	Q	E			Excess tail

This record correctly accounts for the release as an "excess diversion" by WDID 1000501 without double counting the SOURCE.

Accounts could also be used, and should be used if the tail is not equipped with a measurement structure. If ACCT 001 is the "head gate" diversion and ACCT 003 is the "tail" account, the record would be:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	1000501.003	1	1000501.001	Q	E			Excess tail

In order to use accounts, the “head gate” diversions historically made using only the WDID must now be recorded by a “head gate” account (ACCT 001 in the above example). The WDID then becomes the number used to refer to the structure when an account is not required, such as the ID in the FROM code of the record for an alternate point of diversion, etc. The single account attribute for such Diversion Location based accounts are:

Table 5-3: Diversion Location Account Attribute

Acct	Name	Full Description	Attribute: Location
			(Headgate, Bypass, Tail, etc.)

Entity/Ownership

Similar to the Diversion Location template, Entity/Ownership based accounts are pretty straight forward should you want to track water based on ownership. The single account attribute for such Diversion Location based accounts are:

Table 5-4: Entity/Ownership Account Attribute

Acct	Name	Full Description	Attribute: Entity/Owner

Consider a well that is used to supply irrigation water for the same plan of augmentation, same owner, etc., but some of the irrigation is flood and some is sprinkler. Because of the different application efficiencies, the volume of ground water applied to flood irrigation must be distinguished from that used through a sprinkler in order to correctly calculate the depletion impact on the river. Both volumes of water have the same water class, absent accounts:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	1000501	3		1	A	1003500		Total pumping

Again, there are games the user could play with the TO code or Comment, but a more reliable method to distinguish between application types would be to use accounts. ACCT 001 tracks flood based irrigation and ACCT 002 tracks sprinkler:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	1000501.001	3		1	A	1003500		Flood irrigation
2	1000501.002	3		1	A	1003500		Sprinkler irrigation

The volumes associated with both diversion records would add to both the Total SOURCE of ground water pumped and to the USE of the ground water. If the operation was such that the two meters necessary to determine the two volumes were interdependent instead of independent, such as a meter on the total pumped and a meter on the sprinkler, the user could easily accommodate such a set up with an additional administrative record:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
0	1000501	3		Q	0			Total pumped meter
1	1000501.001	3		1	A	1003500		Flood: Row [0]–Row [2]
2	1000501.002	3		1	A	1003500		Sprinkler irrigation meter

The summation of the volumes with the above three records still result in accurate SOURCE and USE totals as the TYPE = "0" record is ignored. The tabulation of the accounts could associate the information required to know how to calculate the respective depletions in the very same way it does for two different structures.

Water Right Priority

The Water Right Priority template also has a single attribute:

Table 5-5: Water Right Priority Account Attribute

Acct	Name	Full Description	Attribute: Priority

Reservoir Pools

A more common need is to administer "pools" of water in a reservoir. The Reservoir Pools template allows the user to track the storage of water with two attributes.

Since the water class for each "pool" of water stored is exactly the same absent an ACCT designation, such tracking was previously accomplished by assigning each owner a WDID and using that ID in the GROUP code or assigning the reservoir multiple WDIDs associated with each of the owners, etc. Any such use of the WDID, however, significantly corrupts the integrity of the data and, as discussed in Section 5.2.1, is not allowed.

The correct way to manage the data is to assign an ACCT to each pool of water stored in order to maintain a unique water class association with the water stored, such as:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0802500.001	1		0				Owner 1 water
2	0802500.002	1		0				Owner 2 water

A similar example would be the need to track the use of transbasin water through the importing system if the transbasin water is ever stored. Because the transbasin water changes SOURCE from "4" to "2" when it's stored and the downstream diversion of the reservoir release uses the reservoir WDID as the associated FROM code, users would need to use an ACCT to track the storage, release and associated downstream use of transbasin water stored in a reservoir:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0802500.003	4	0804600	0				TB water stored in an account
2	0802500.003	2		Q	7			TB water released for delivery
3	0200551	2	0802500.003	1				TB water used for irrigation

The Reservoir Pools template has two attributes:

Table 5-6: Reservoir Pool Account Attributes

Acct	Name	Full Description	Attribute_1: Pool	Attribute_2: Owner

Reservoir Accounts – Division 2

Compliance with the Arkansas River Compact requires fairly sophisticated reservoir administration in Division 2. As a result, this template has four attributes:

Table 5-7: Reservoir Accounts – Division 2 Account Attributes

Acct	Name	Full Description	Attribute_1: Entity/Owner	Attribute_2: Pool	Attribute_3: Use	Attribute_4: Vintage
				(I&W, Project)	(AG, M&I)	(Current Year, Carry Over)

5.3.2 Storage/Recharge Accounts

As stated earlier, an ACCT may not be a subset of another ACCT. Therefore, the sum of the volumes placed in each ACCT associated with a reservoir or recharge area must be equal to the volume placed in the structure as a whole.

Once water is placed in a recharge or reservoir structure ACCT, releases from the structure must also be made from that ACCT. As with any other release, the WDID and ACCT of the structure must be in the FROM code of the record that receives the released water.

“Bookover” Between ACCTs

To transfer water from one account to another requires the dual entry of a release from one account and subsequent storage or recharge in another. In order to keep the records from adding to the SOURCE/USE Totals or Structure Totals the release record must have the WDID in the TO code. Likewise, the ACCT receiving the water must have the WDID in the FROM code:

WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1002501.002	2		Q	Q		1002501.003	Quantified amount released
1002501.003	2	1002501.002	0				Release transferred to new acct

5.3.3 Attribute Combinations are Unique

Data integrity requires that in addition to a unique Account Name, the set of user supplied attributes that describe an account must also be unique. Even though each account is not required to use every attribute, a “blank” attribute cannot be the only characteristic that distinguishes the account from another account.

Attributes are also “progressive” in that in order for Attribute 2 to have a value, Attribute 1 for that account cannot be blank. Likewise, for Attribute 4 to have a value, Attributes 1 through 3 must not be blank.

5.3.4 Changing Account Attributes

Given the complexities of managing account information, once a set of account attributes are assigned and the account is used in an approved diversion record, the attributes for that account cannot be modified or deleted. If the administration of the account requires a change of attributes, the old account becomes invalid and must be “ended”. A new account or accounts with the new attributes must be created.

5.4 SOURCE Code

The SOURCE codes shown in Table 5-8 are available for use with diversion records.

Table 5-8: SOURCE Codes

1	Natural Stream Flow	Waters of the state that are diverted directly from a stream.
2	Reservoir Storage	Water released from storage in a reservoir; not flow through water.
3	Ground Water	Includes tributary and non-tributary water.
4	Transbasin Water	Water imported from another basin the drainage from which does not combine with drainage from the importing basin within the state of Colorado. Transbasin water is considered “foreign water” to the receiving basin and is, therefore, generally fully consumable.
5	Non-Stream Flow	Direct flow from springs, localized run-off, etc. before water enters stream; may also include diversions of water that is “futile” to the call or otherwise considered non-tributary, such as adit drainage, etc.
8	Re-usable Water	The unconsumed portion of fully consumable water that has been quantified and maintained under dominion and control after previous diversion, USE and release.
X ¹⁵	Unspecified	Water of an unspecified nature or water associated with multiple SOURCEs used for “total through head gate” kinds of diversion records for administrative purposes. (TYPE must equal “0”) .

5.4.1 SOURCE Codes Only Change by Administrative Operation

The SOURCE code of water is maintained until changed by one of the administrative operations described below. The code change associated with the administrative operations applies regardless of what SOURCE the water was before the operation.

Stored Water

All water undergoes a change to “Reservoir Water” when stored (USE = “0”). When released, the water is SOURCE = “2”, regardless of what SOURCE it was prior to storage.

Transbasin Water

When exported (USE = “T”), water becomes SOURCE = “4” in the importing basin regardless of what SOURCE the water was when exported.

Re-usable Water

The unconsumed portion of water diverted for USE that is still legally available for subsequent USE becomes SOURCE = “8” water regardless of what SOURCE the water was when first diverted.

¹⁵ SOURCE “X” should not be used as the only record for a structure as it provides no understanding regarding the SOURCE of water diverted.

5.5 FROM Code

The FROM code is used to:

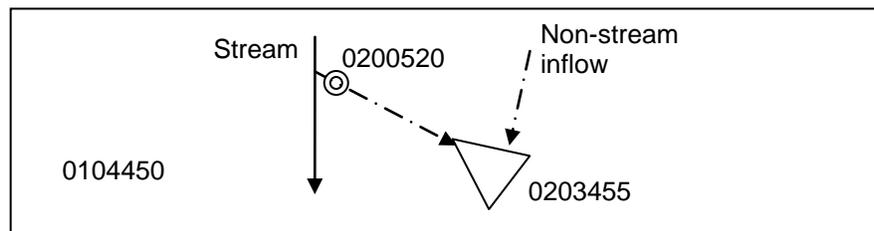
- Identify the diversion, in the case of “natural water”, as a subsequent diversion to prevent the SOURCE of the water from being double counted;
- Associate the structure initially diverting or releasing the SOURCE to the USE and place of USE.
- Identify a structure “enabling” the diversion, such as:
 - the source of replacement supply for an exchange;
 - the structure foregoing an in-priority diversion and trading the water to the diverting structure; or,
 - the in-priority structure to which the record WDID is a decreed alternate point for an alternate point diversion.

Records for diversions that divert water directly from a SOURCE for a USE need no FROM code. In order to prevent double counting and not overextend the usage of the FROM code, the code must be used in, and only in, the following scenarios.

5.5.1 Diversions of by Subsequent Structures

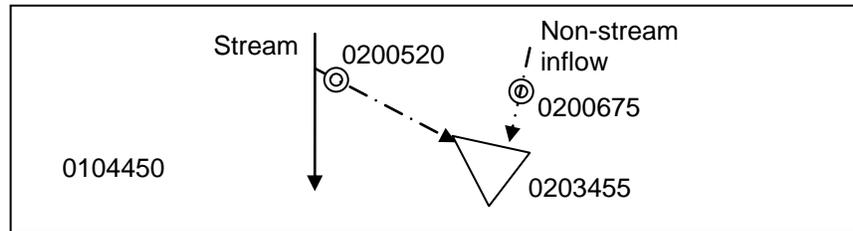
Records associated with subsequent measurements must include the WDID of the structure initially diverting or releasing the water in the FROM code in order to prevent the SOURCE of water from being double counted and/or associate a release or diversion to its USE place of USE.

As illustrated in the example below, the storage of “natural stream flow” (Row 2) requires a FROM code to prevent double counting the SOURCE = “1” water. The storage of “non-stream flow” (Row 3) does not require a FROM code because the storage record is also the initial diversion record of the SOURCE = “5” water.



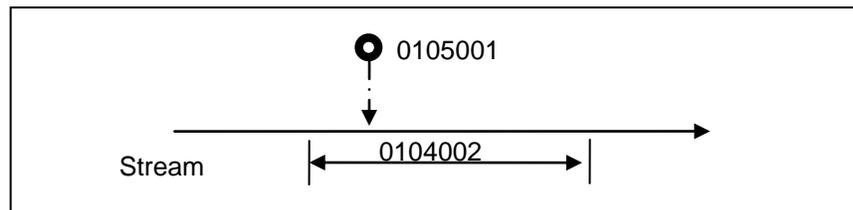
	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0200520	1		Q				Diversion of natural stream flow
2	0203455	1	0200520	0				Subsequent storage; FROM code required to prevent double counting the natural stream flow
3	0203455	5		0				Direct storage of non-stream flow: FROM must be blank since this is initial diversion.

Had the “non-stream flow” been measured prior to storage in the reservoir, the storage record would require a WDID in the FROM code to prevent double counting the SOURCE = “5” water, as shown below.



	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0200520	1		Q				Diversion of natural stream flow
2	0203455	1	0200520	0				Subsequent storage; FROM code required to prevent double counting the natural stream flow
3	0200675	5		Q				Measured non-stream flow
4	0203455	5	0200675	0				Subsequent storage; FROM code required to prevent double counting

Another example of a subsequent measurement structure requiring the use of the FROM code to prevent double counting a SOURCE would be an on-stream “reach” receiving SOURCE = “3” water for augmentation (USE = “A”). The WDID of the well delivering the water would be in the FROM code so the volume of SOURCE = “3” water is not counted twice.

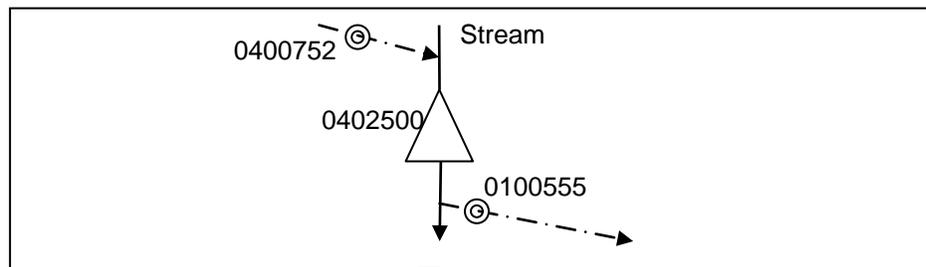


	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0105001.001	3		Q	A	0103335		Ground water pumping by an augmented well
2	0105001.002	3	0105001.001	Q	7	0103335		Ground water released as replacement supply
3	0104002	3	0105001.001	A	Q	0103335		Augmentation of stream reach

In the above example, the subsequent records (Rows 2 and 3) require a FROM code to prevent double counting the SOURCE = “3” water. It also demonstrates the use of accounts as ACCT 001 of 0105001 measures water pumped out of the ground while ACCT 002 tracks the water released to the stream. Even though it is entirely likely that the two records (Rows 1 and 2) have the same volume, both records are still required because of the need to capture the two TYPE codes (“A” and “7”).

5.5.2 Water Released by Other Structures

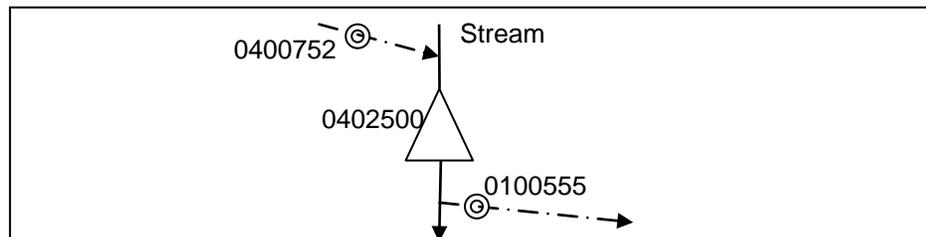
As a SOURCE of water that was added to the stream for delivery and use downstream is diverted or remeasured, the WDID of the structure and ACCT, if used, that released the water to the stream must be included in the FROM code. This is necessary to associate the USE and place of USE with the SOURCE of water and affirmatively demonstrate the water was delivered. As illustrated below, transbasin water stored in an on-stream reservoir would include the WDID of the structure and ACCT, if used, releasing the transbasin water in the FROM code of the reservoir storage record (Row 2).



	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0400752	4		Q	7			Transbasin release to stream for delivery
2	0402500	4	0400752	0				Storage of transbasin water
3	0402500	2		Q	7			Reservoir release to stream
4	0100555	2	0402500	1				Reservoir water used for irrigation

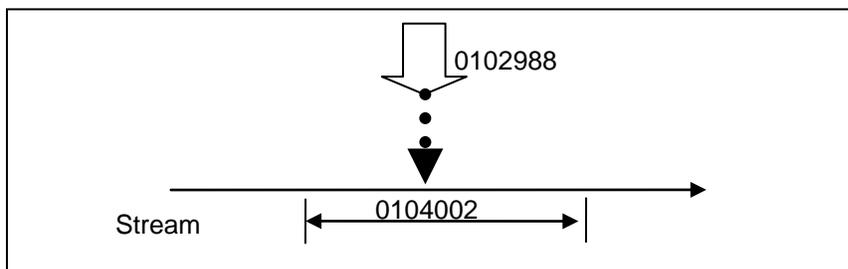
As illustrated by Row 3 in the above example, when the stored transbasin water is released from the reservoir it has been changed from SOURCE = "4" to SOURCE = "2". The downstream structure that diverts the release from the reservoir (Row 4) will now have the reservoir WDID and ACCT, if used, in the FROM code, since that's the structure that released the SOURCE = "2" water.

If it is necessary to track specific water through the system in spite of the change in SOURCE that occurs when water is stored, use an ACCT in the reservoir to track the water as shown in the following example.



	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	O	Description
1	0400752	4		Q	7			*	Transbasin release to stream for delivery
2	0402500.006	4	0400752	0				*	Storage of transbasin water; ACCT 006 is "transbasin"
3	0402500.006	2		Q	7				Stored transbasin water released for delivery
4	0100555	2	0402500.006	1				*	Stored TB water to irrigation

Indirect releases to a stream reach must also be associated with the structure causing the stream impact by including the WDID of the structure and ACCT, if used, in the FROM code. As an example, recharge accretions to a stream reach are recorded as a SOURCE = "8" release to a reach WDID. The WDID of the recharge structure and ACCT, if used, placing the water into the alluvial aquifer are included in the FROM code. There may be exceptions to this rule, as in the case of lawn irrigation return flows (LIRFs) that are associated with an Entity ID instead of a distinct point of origin. In either case, the GROUP code would identify the replacement plan for which the accretions are available.



	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0104002	8	0102988	Q		0103335		Accretions from recharge area 0102988

5.5.3 Diversions by Exchange

When diversions are made by exchange (TYPE = "1"), the WDID of the structure and ACCT, if used, releasing the associated replacement water must be in the FROM code of the diversion record. See Section 5.7.1 for a complete list of coding requirements associated with an exchange.

5.5.4 Diversions by Trade

When diversions are made by trade (TYPE = "2"), two TYPE = "2" records are required:

- 1) The diversion record for the structure receiving the replacement water must have TYPE = "2" to distinguish the receipt of the water from a non-trade based delivery of water and the FROM code must have the WDID of the structure and ACCT, if used, releasing the associated replacement water.
- 2) The structure diverting the "natural stream flow" by Trade must have TYPE = "2" and must have the WDID of the in-priority structure receiving the replacement water in the FROM code.

See Section 5.7.1 for a complete list of coding requirements associated with a trade.

5.5.5 Alternate Points of Diversion

Structures diverting or storing water as an alternate point (TYPE = "4") must have the WDID of the in-priority structure to which the structure is operating as an alternate in the FROM code. See Section 5.7.1 for a complete list of coding requirements associated with an alternate point.

5.6 USE Code

USE codes describe the beneficial USE to which the diverted volume of water was placed. Even though some codes, such as “storage”, “sub-basin export”, “recharge” and “trans-basin export” only make the water available for future beneficial USE, such activity has been assigned a USE code. USE codes are shown in Table 5-9.

Table 5-9: USE Codes

0	Storage	Stored for a later beneficial USE or placed in a recharge area impoundment.
1	Irrigation	Application of water for the growth of beneficial vegetation.
2	Municipal	Urban uses by a municipality or quasi-governmental entity legally responsible for distribution of water.
3	Commercial	Ordinary non-manufacturing business such as hotels, campgrounds, retail stores, restaurants and stock yards.
4	Industrial	Manufacturing, mining, steam production, etc.
5	Recreation	Generally non-consumptive (except evaporation) uses for such things as aesthetics, acoustical, etc.
6	Fishery	Generally non-consumptive (except evaporation) where only use is production of fish.
7	Fire	As needed for emergencies or training.
8	Domestic	Residential use for inside uses and lawn and garden irrigation; see also “H”, for household use only diversion records.
9	Stock	Livestock watering; no record required to document incidental access to water diverted for other uses.
A	Augmentation	Replacement supply; must include the associated plan of augmentation in the GROUP.
B	Sub-basin export	Diverted from one sub-basin to another that is in the same river system. (Typically involves moving water from one water district to another water district within the same water division.)
C	Change of Use Return Flows	Water released to replace historic return flow obligations as a result of diverting changed water.
E	Evaporation	Evaporative loss, generally from storage or recharge area impoundment.
F	Federal reserved	U.S. Government claimed uses in existence at statehood, typically associated with springs for stock and domestic or public campground wells.
G	Geothermal	Nonconsumptive, thermal energy exchange.
H	Household use only	Generally associated with single dwelling, exempt wells; no uses outside the home or for more than basic sanitary and residential consumption.
K	Snow making	Water turned into snow.
M	Minimum stream flow/lake level	Defined in statute and used in decrees granted to the CWCB.
P	Power generation	Non-consumptive, hydroelectric operation.
Q	Quantification of amount	Denotes a quantification of a volume of water simply being carried by the structure. May or may not include a TYPE code, depending on the nature of the diversion.
R	Recharge	Released underground or delivered to a recharge structure for later USE in accordance with a decree or approval of the State Engineer.
S	Export from State	Released out of state.
T	Transbasin export	Released from one basin to another basin, the drainage from which does not combine with drainage from the releasing basin within the State of Colorado. (Typically involves moving water from one water division to another.)
W	Wildlife	Habitat and wildlife watering.
Z	Other	Use is something other than a USE specified by this table. (Comment required to describe “use”.)

5.6.1 USE Code Associated to Structure where USE Occurs

The USE code should be associated with the WDID where the USE occurred. For instance, the only purpose of a ditch may be to divert water into a reservoir for storage. The USE = "0" should still be recorded as a reservoir record, not a ditch record.

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	1000503	1		0				INCORRECT RECORD
2	1000503	1		Q				Stream diverted by ditch
3	1003590	1	1000503	0				Storage USE at reservoir

Likewise, water released from a reservoir may be used exclusively for augmentation. The USE record should be the in-stream structure that makes use of the augmentation water, as opposed to showing the USE = "A" as part of the reservoir release record since the reservoir is not where the augmentation USE occurred.

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	1003500	2		A	7	1005500		INCORRECT RECORD
2	1003500	2		Q	7	1005500		Release for augmentation
3	1007575	2	1003500	A	Q	1005500		Reservoir release used for augmentation

5.6.2 USE Code "Q"

Diversion records are often only able to document that a certain "quantity" of water has been diverted. For example, ditch 1000503 diverts natural stream flow to reservoir 1002104, which then releases the water to ditch 1000511 for irrigation. The diversion record for the first ditch would be:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	1000503	1		Q				Natural stream diverted by ditch

If the water is actually stored in the reservoir and then released off-stream for the irrigation ditch, the subsequent records would include:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
2	1002104	1	1000503	0				Subsequent measurement and/or diversion at the reservoir for storage
3	1002104	2		Q	8			Reservoir release of stored water to off-stream system
4	1000511	2	1002104	1				Irrigation use of reservoir water

If the water only passes through the reservoir without technically being stored, the subsequent records would be:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
2	1002104	1	1000503	Q				Subsequent measurement at the reservoir is quantified
3	1000511	1	1000503	1				1000503 is still the FROM code as that was the initial diversion of the SOURCE = "1" water.

5.6.3 USE Code "B"

The USE = "B" code is really just a special kind of USE = "Q". USE = "B" identifies a quantity of water that was diverted from one sub-basin to a second sub-basin. As discussed in Table 5-9, sub-basins are in the same river system, meaning the drainage from each sub-basin combines before the water leaves the state. The USE = "B" code typically involves moving water from one water district to another water district within the same water division.

5.6.4 USE Code "R"

The term "recharge" refers to two different operations. It can refer to water placed in the alluvium in order for the water to supplement the natural stream by accretion. Recharge is also used to describe the "storage" of water underground for later direct withdrawal from the underground "storage" area, which is typically, but not always, a confined aquifer.

Four structure types, based principally on decreed function, are allowed to have USE = "R": Recharge Area, Reservoir, Ditch or Well. The distinction between the two operations is made by the TYPE code associated with the record. TYPE = "V" indicates a release of water that will accrete back to the stream. TYPE = "W" is all other underground releases, which includes water that is being "stored" for later direct withdrawal (USE = "R") and water that is simply being injected for disposal or some other purpose (USE = "Q" or "Z").

Underground “Storage”

Currently, there is no specific USE code for underground “storage”. Instead, water is placed underground by means of a “Recharge” (USE = “R”) record and then “Quantified” (USE = “Q”) into a Well Field structure. The USE = “R” record changes the water to SOURCE = “8”. The recharged water may then be distinguished from releases of ground water from the Well Field by the SOURCE code:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	PUMP001	1		Q				Water pumped from the stream
2	WELL001	1	PUMP001	R	W			Recharge by well
3	WFLD001	8	WELL001	Q				Water quantified into well field
4	WFLD001	8		Q	8			Recharged water release from well field
5	WELL002	8	WFLD001	2				Recharged water put to USE
6	WFLD001	3		Q	8			Ground water appropriated by WFLD001 released
7	WELL002	3	WFLD001	2				Ground water put to USE (Record may also be T=A with a plan WDID in GROUP)

5.7 TYPE Code

The type of diversion is characterized by the codes shown in Table 5-10. There are three categories of TYPE codes: diversions, releases and data. If no TYPE code is required to describe the diversion, release or water class data, the field is left blank.

Table 5-10: TYPE Codes

	Blank is acceptable	TYPE Code is not, generally, required data.
Types of diversions		
1	Exchange	Diversion allowed only because a downstream replacement supply provides water to the vested water right that would have been able to divert water; WDID of structure and ACCT, if used, releasing replacement supply must be in FROM code.
2	Trade	A particular kind of exchange in that the replacement supply is released off-stream directly to an in-priority structure instead of the stream. Trades always involve 3 records.
4	Alternate Point of Diversion	Diversion allowed only because of right to operate as an alternate point of diversion or storage to an in-priority structure. The WDID of the in-priority structure to which the diverting structure is an alternate must be in the FROM code.
A	Augmented	Diversion allowed only pursuant to an approved replacement plan; must include the associated plan WDID in the GROUP.
U	Unauthorized Diversion	Characterizes a diversion of "waters of the state" that was not authorized by DWR such as an out-of-priority diversion, etc.
D	Out-of-priority Depletion	Calculated impact associated primarily with ground water pumping that must be replaced to prevent impact to vested water rights.
J	In-priority Depletion	Calculated impact associated primarily with ground water pumping that is considered an in-priority diversion that does not impact vested water rights.
Types of releases		
7	Released to Stream	Released to stream.
8	Released Off-stream	Released to off-stream system.
L	Release of Dominion and Control	Released with relinquishment of dominion and control of the water.
E	Release of Excess Diversion	Water diverted in excess of either what could have been or what actually was beneficially used.
Q	Release of Quantified Amount	Similar to USE="Q", this code simply indicates the water is being released. Typically used to reconcile volumes in a reservoir or recharge area or with subsequent releases.
V	Release to Alluvial Aquifer	Water released to the alluvial aquifer for accretion back to stream, typically associated with recharge.
W	Released Underground	Water released underground for disposal or later direct withdrawal.
Types of data		
0	Administrative Record Only	Volumes will not be added to the SOURCE or USE totals.
R	USE Only Volume Data	Volume adds to the USE total, but not the SOURCE total.

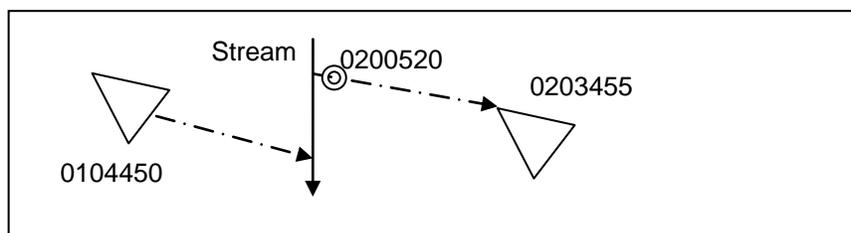
5.7.1 Types of Diversions

TYPE Code “1” (Exchange)

An exchange allows a structure to divert water it would have otherwise not been allowed to divert by providing a suitable¹⁶ replacement supply at a location such that no vested water right is injured by the diversion. The release must be recorded with a USE = “Q” and TYPE = “7” water class. The associated diversion must have the WDID of the structure releasing the replacement supply in the FROM code and TYPE = “1”. The SOURCE of the diversion by exchange is the SOURCE of water released by the replacement structure as that is the water being legally diverted. Even though the record with TYPE = “1” is taking water directly from the stream, the SOURCE of the diversion is only SOURCE = “1” **IF** the replacement supply is SOURCE = “1”.

The diversion is allowed at the same rate as the replacement supply and is generally considered an instantaneous operation where the release and diversion occur simultaneously. If necessary to prevent specific injury, the water commissioner may require the release of replacement supply to lag the diversion by the amount of time that would have been required for the diverted water to arrive at the replacement location or make other modifications to the timing or amount diverted to prevent injury.

The exchange TYPE code (“1”) is only used once. The storage, or any other down ditch USE, that occurs subsequent to the diversion by exchange is not part of the exchange, even though the relationship between the SOURCE of the water and the structure that released the water must be maintained by using the releasing structure WDID in the FROM code.



	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0104450	2		Q	7			Replacement supply release
2	0200520	2	0104450	Q	1			Diversion of replacement supply by exchange
3	0203455	2	0104450	0				Subsequent USE of exchanged water

¹⁶ Section 37-80-120(3), C.R.S., “Any substituted water shall be of a quality and continuity to meet the requirements of use to which the senior appropriation has normally been put.”

TYPE Code “2” (Trade)

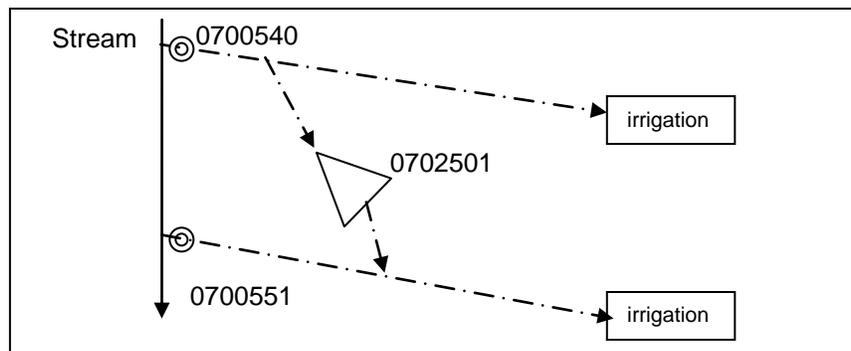
A diversion by trade is similar to an exchange, except that the replacement supply is released to an off-stream system instead of using the stream to transfer the water. To divert by trade, an in-priority structure must be provided water by an off-stream replacement supply. In trade, an associated on-stream diversion that would not otherwise be authorized is allowed to divert the amount of water provided as a replacement supply to the in-priority structure that takes the replacement supply instead of making an authorized diversion from the stream.

The out-of-priority diversion by trade is allowed to operate at the same rate the replacement supply is released generally without any delays if the diversion is upstream of the in-priority structure. If the diversion occurs downstream, the water commissioner must reduce the diversion for any transit loss incurred.

As with the exchange operation, the trade may only be allowed if it causes no injury to the vested water rights. Trades always involve three records:

- 1) a TYPE = “8” release of the replacement supply;
- 2) a record for the in-priority WDID receiving the replacement supply with the WDID of the structure releasing the replacement supply in the FROM code and TYPE = “2”; and
- 3) a record for the WDID making the out-of-priority diversion from the stream with SOURCE = “1”, FROM equal to the WDID of the in-priority structure taking the replacement supply, and TYPE = “2”.

Because the diversion records for a “trade” are perhaps not straightforward or familiar, consider the following example:



Ditch 0700551 is in priority and could take water to irrigation by decree. Reservoir 0702501 has water stored for irrigation use. Ditch 0700540 is out-of-priority. The diversion “trade” allows reservoir 0702501 to deliver water off-stream for irrigation under ditch 0700551 and the water released is taken in “trade” out of the river by out-of-priority structure 0700540. The associated water classes look like:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0702501	2		Q	8			Off-stream release
2	0700551	2	0702501	1	2			Use of released water taken as part of a trade
3	0700540	1	0700551	1	2			Amount equal to Row 1 taken by trade

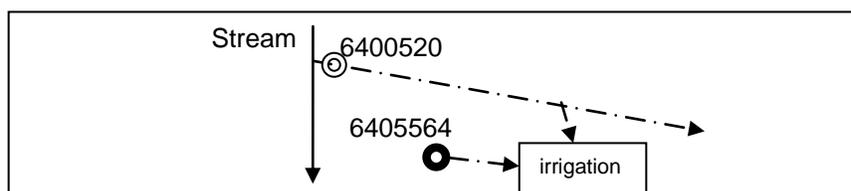
The in-priority structure receiving the replacement supply (Row 2) has TYPE = “2” code to distinguish the diversion as part of a trade instead of a delivery otherwise allowed by decree. A bottom line data check is that for every “trade” there should be one TYPE = “8” record and two TYPE = “2” records; one for the structure receiving the replacement supply and one for the on-stream diversion taking water by trade.

TYPE Code “4” (Alternate Point)

A diversion by alternate point may only be made in accordance with specific decreed terms and conditions. The structure making the diversion must be a decreed alternate point to a structure that is in-priority. If both structure’s water rights are out-of-priority, the diversion is an “augmented” (TYPE = “A”) diversion, not an alternate point diversion. The alternate point diversion decree may or may not address the issue of rate, available diversion supply at the location of the in-priority diversion, etc. At a maximum, the combination of diversions by the decreed location and all decreed alternate points of diversion of a water right must not exceed the decreed rate. To indicate a diversion is made as a decreed alternate point to an in-priority structure, the WDID of the in-priority structure to which the diverting structure is an alternate point of diversion must be in the FROM code and TYPE = “4”.

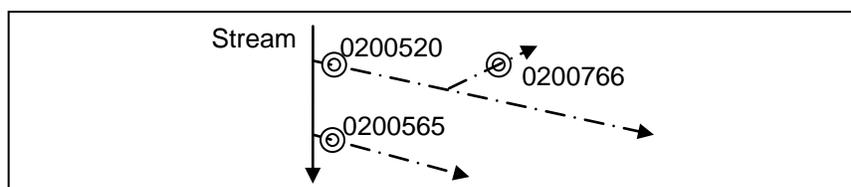
The coding associated with storage at an alternate point of storage is similar to that of the diversion by an alternate point, except that the TYPE = “4” alternate point code is used with the alternate point storage record. As with exchanges, the alternate point diversion TYPE code (“4”) is only used once.

The following examples demonstrate the distinctions. The first example relates a diversion and USE by alternate point. Ditch 6400520 is in-priority; well 6405564 is a decreed alternate point of diversion.



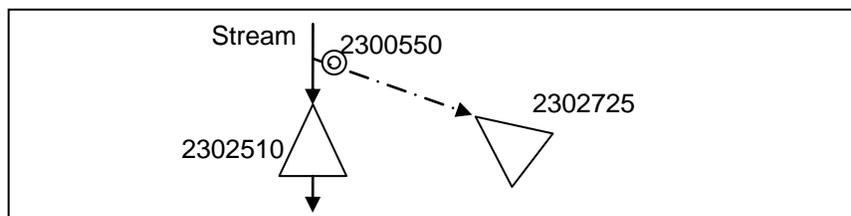
	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	6405564	3	6400520	1	4			Diversion by alternate point

If the alternate point of diversion is associated with a subsequent record, only the diversion at the decreed alternate point includes the TYPE = “4” code. In the following example, ditch 0200565 is in-priority and ditch 0200520 is a decreed alternate point of diversion. Ditch 0200766 is a subsequent measurement.



	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0200520	1	0200565	Q	4			Alternate point diversion
2	0200766	1	0200520	2				Down ditch USE is not T = 4

In contrast to the above example, if the diversion is an alternate point of storage, the TYPE = "4" code is used with the storage (USE = "0") record. In the following example, reservoir 2302510 is in-priority and reservoir 2302725 is a decreed alternate point of storage.



	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	2300550	1		Q			2302725	Natural stream carried by ditch
2	2302725	1	2302510	0	4			Down ditch USE is the alternate point storage

TYPE Code "A" (Authorized/Augmented Diversion)

Diversions that are not an "exchange", "trade" or "alternate point" and that absent some special authorization could not be made in accordance with the Doctrine of Prior Appropriation⁴ are TYPE = "A" diversions. Such diversions are most commonly being made in accordance with the terms and conditions of a plan of augmentation or substitute water supply plan. There are other examples, however, such as statutory authorizations and other decrees of the court. These diversion records must have the WDID of the authorizing agent in the GROUP code.

TYPE Code "U" (Unauthorized Diversion)

There is occasionally a need to affirmatively document that an "unauthorized" diversion was made. The use of a TYPE code to document such a diversion should not present any conflict in the coding rules. "Unauthorized" diversions cannot be made by "exchange", "trade" or as an "alternate point" since each of those operations require "authorization". Diversions made by structures covered by a replacement plan may be "unauthorized" from the perspective of the plan administrator, but from the perspective of the Division, those diversions are "authorized" by virtue of the replacement plan and are, therefore, TYPE = "A" diversions.

"Unauthorized" diversions made in association with an insufficient or unacceptable release are also coded as TYPE = "U". The associated release should be coded as TYPE = "L" since the water could not be delivered or was an illegal USE. An example would be the release of a replacement supply for an exchange that was not approved by the Division because it was injurious. A record of the diversion and USE should be made using SOURCE = "1" and TYPE = "U". The release should be coded as TYPE = "L" instead of TYPE = "7" since it couldn't actually be used as a replacement supply. Another example would be water stored "in-priority" for specific decreed USE being released, delivered downstream and diverted to a USE not included in the storage decree, such as senior irrigation water delivered to an oil well work over rig. The "industrial" USE of the "natural stream flow" should be recorded with TYPE = "U" and the reservoir release record should have TYPE = "L".

TYPE Code “D” (Out-of-priority Depletion)

A “depletion” is the volume of water drawn from the stream as a result of a previous off-stream diversion, typically associated with alluvial wells. The impact diminishes natural stream flow as a result of the USE associated with the previous off-stream diversion. The depletion is not, in and of itself, a USE of water. Depletion records, if done at all, are made at in-stream structures, typically a Reach of Aggregated Reach structure type. The SOURCE = “1” since it’s the natural stream flow that’s “depleted” and USE = “Q” because it’s a quantity of water associated with another off-stream USE.

If the depletion is associated with a decreed water right, it represents the appropriate priority of the right and may or may not, depending on stream conditions, be consider “in-priority”. If such an analysis determines the depletion is out-of-priority, the TYPE code of the diversion would be TYPE = “D”.

TYPE Code “J” (In-priority Depletion)

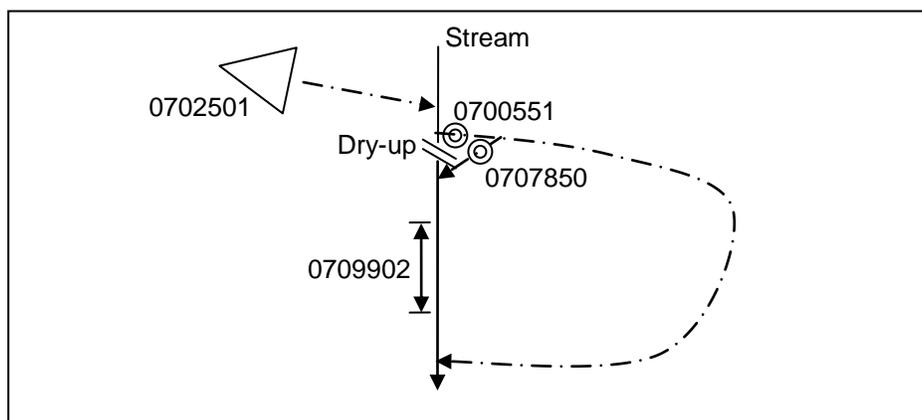
TYPE code “J” is used when the depletion analysis discussed in the previous subsection results in a determination that the depletion is “in-priority”.

5.7.2 Types of Releases

There are a number of “release” TYPE codes: “7”, “8”, “L”, “V”, “W”, “E” and “Q”. Water users have an explicit statutory right¹⁷ to use the natural stream to deliver water. Diversion records, by default, are records of diversions “into” a structure unless one of the release TYPE codes is used. Release codes are, therefore, used to show water being taken out of a structure. Such records are required to either document administration or balance the volume of water in storage/recharge structures.

Release codes, with the exception of TYPE = “Q”, must be used only once for each specific volume of water released as the water is, in fact, only added to the system, or “released”, once. As a result, there is only one “releasing” structure with each release of water. For example, water released for use downstream would have a diversion record with a TYPE = “7” code from the structure releasing the water. If that water is delivered past a dry-up point by diverting the water into a head gate and releasing the water immediately back to the river, the release record associated with the structure bypassing the sweeping diversion cannot include a TYPE = “7” code as it is not a new amount of water being released. While it is important to make a record showing the water was delivered past the dry-up, that record is not associated with the “release” of the water. The structure diverting the delivery back to the river can have a USE = “Q”, TYPE = “Q” record, indicating a “quantity” of water was released and the type of the release was for “quantification” purposes.

¹⁷ Section 37-84-113, C.R.S.



WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
0702501.003	2		Q	7	0703333	0709902	Release replacement supply
0700551	2	0702501.003	Q		0703333		Delivery picked up at dry-up structure
0707850	2	0702501.003	Q	Q	0703333		Quantified release of delivery to stream
0709902	2	0702501.003	A	Q	0703333		Delivery used by reach and released to stream

TYPE Code “7” (Release to Stream)

Releases of water to the stream for diversion and USE downstream, USE in stream or to provide the replacement supply for an exchange are TYPE = “7” releases. The WDID of the releasing structure must be included in the FROM code of the diversion record associated with the USE of the released water. Also, as discussed above, the TYPE = “7” code is only included in the diversion record associated with the “initial” release of water to the stream in order to make sure that SOURCE = (“2”, “4” or “8”) water is only counted once. As an example, if water is released to cover out-of-priority depletions for a plan of augmentation but must be delivered downstream to the affected reach, the following diversion records would be required:

WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1002104.xxx	2		Q	7	1003301	1009902	Release replacement supply
1009902	2	1002104.xxx	A	Q	1003301		Stream reach augmented by release.

The distinction between releases that maintain dominion and control and those that do not has historically been made, if at all, by the use of a Diversion Comment, not by the use of a TYPE code. Because of the potential importance of the issue regarding subsequent use of the released water and future analyses, TYPE = “7” releases will identify releases of water to the stream for which the user has retained dominion and control.

TYPE Code “8” (Release to an Off-Stream System)

Releases made to an off-stream system are TYPE = “8”. If the USE is not recorded at the time of the release, subsequent records are required to document the USE or loss of dominion and control. The defining characteristic of the release is that it is made off-stream.

TYPE Code “E” (Excess Diversion)

TYPE = “E” records are used to document diversions that the user made in “excess” of their ability to actually use the water. Generally, the diversion was “in-priority” or otherwise “allowed” by the water commissioner or division engineer, but once made was determined excessive. In essence, the record is made to document that the user should not be credited, typically for the purpose of historical consumptive use analyses or perfecting conditional water rights, as ever having established dominion and control of the water. The “releases” are not TYPE = “L” (relinquishing dominion and control), because the structure should not be credited as having dominion and control in the first place.

Examples of this kind of record would include ditch tails that are in excess of that required to effectively operate the ditch¹⁸, water stored out-of-priority with the division engineer’s permission pursuant to the upstream out-of-priority storage statute¹⁹ that is then released to satisfy a downstream senior, etc. TYPE = “E” should not be used to record “unauthorized” releases; unauthorized releases should be coded TYPE = “L” as discussed above.

TYPE Code “L” (Relinquishment of Dominion and Control)

Intentional releases of water to the stream for which the user has no ability to maintain dominion and control²⁰ must include a TYPE = “L” code. Releases of water for which no authorized USE was allowed are also TYPE = “L”. An example of such a release, as discussed in Section 5.7.1, would be a reservoir releasing irrigation water that was picked up downstream for industrial use by an oil well work over rig. When discovered, the release would be TYPE = “L” and the diversion of SOURCE = “1” water for USE = “3” would be TYPE = “U”.

TYPE Code “V” (Release to Alluvial Aquifer)

TYPE code “V” is used to record releases to the alluvial aquifer to identify the volume of water being placed in the aquifer that will be available in the future by way of making its way back to the stream in accordance with the terms of a decree.

TYPE Code “W” (Released Underground)

Releases underground, other than TYPE = “V” releases, are coded as TYPE = “W”. Records of water used to recharge an aquifer would have USE = “R”. This would include any water placed underground that the user has the right to later recover by directly withdrawing the water from the aquifer. Water that is simply deep injected for disposal would have a USE = “Q”.

¹⁸ An “excessive” ditch tail/return flow must rely almost exclusively on the judgment of the water commissioner or division engineer. If in their opinion, the return is running more than required to effectively operate the ditch, the excess flow should be recorded so that future historical consumptive use analyses can have that information.

¹⁹ Section 37-80-120(1), C.R.S.

²⁰ In general, if the user cannot identify a legitimate delivery destination for the water commissioner at the time the water is released or the water commissioner was not made aware of the release, the release should be a TYPE = “L” release. The water commissioner may, at their discretion, choose to code the release as TYPE = “7” after the fact provided the water was actually delivered without injury to other vested water rights.

TYPE Code “Q” (Quantity)

The TYPE = “Q” release code is used to identify a “release” of a quantity of water. It is typically used with “subsequent” releases, ACCT balancing in reservoirs or an uncontrolled “loss” of water.

An example of a TYPE = “Q” record associated with a second release record would be the bypass example discussed in Section 5.7.2.

An example of ACCT balancing in a reservoir would be:

WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1002104.003	2		Q	Q			Water removed from ACCT 003
1002104.005	2	1002104.003	0				And stored in ACCT 005.

An example of an uncontrolled “loss” of water would be reservoir evaporation:

WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1002155	2		E	Q			Evap record [†]

[†]While such water may be TYPE = “L” in the sense that the water user has lost dominion and control of the water, it is not a TYPE = “L” record because the water user did not intentionally “relinquish dominion and control”.

5.7.3 Types of Data

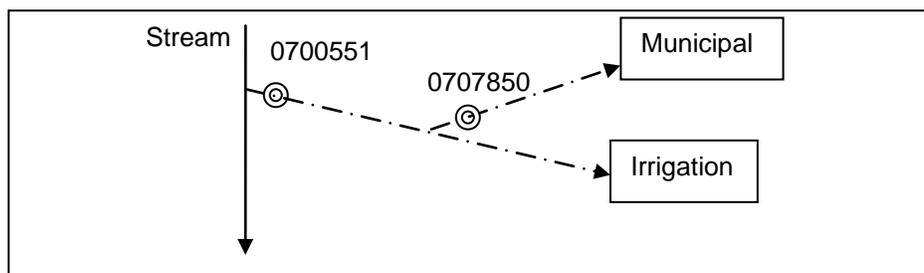
TYPE Code “0” (Administrative Record)

Volumes associated with an administrative record will not be included in either SOURCE or USE summation routines. These records simply document administrative information such as: the total volume through a structure that has unspecified or more than one SOURCE and/or USE of water as a basis of documenting the volume of water recorded by a chart recorder or data logger; comparing or constructing detailed SOURCE and/or USE diversion records using the water commissioner’s spreadsheet; etc. Another use may be to document water delivered past a structure that is sweeping the river. The structure has no right to take credit for “bypassing” the water, so the diversion is not a “bypass” and there is no other USE associated with the diversion. Because the user needs to record that water was delivered past the dry-up point, the TYPE = “0” record could provide that documentation.

TYPE Code “R” (USE Data Only)

This TYPE code is used to indicate that the volume associated with the diversion record is associated only with the USE code, not the SOURCE code. Such a distinction is required in order to prevent a SOURCE from being double counted by the summation routines. It will almost always be associated with subsequent diversion records that have the same WDID used to divert the SOURCE of the water.

To illustrate, water is diverted into a ditch that can provide water to a municipality through a subsequent diversion structure with the remainder of the diversion being used for the historical irrigation USE. The water commissioner doesn’t know how much water the city is taking until they submit their User Supplied data, but wants to document the in-priority diversion into the structure. The associated records would look like the following example.



	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0700551	1		Q				In-priority diversion observed by water commissioner
2	0707850	1	0700551	2				User Supplied city record of water to municipal use
3	0700551	1		1	R			Irrigation use: Row[1]– Row[2]

The diversion from the stream (Row 1) is included in the SOURCE total. The User Supplied USE record (Row 2) only adds to the USE total because of the WDID in the FROM code. The irrigation record (Row 3), without the TYPE = “R” code, would add to both the SOURCE and USE totals, which would result in double counting the SOURCE. Using TYPE = “R” prevents such double accounting.

5.8 GROUP, TO and OBSERVATION Codes

5.8.1 GROUP Code

The GROUP code is an associated entity used to combine records. It is most often the WDID of the authorizing agent for an otherwise “unauthorized” diversion, such as replacement plan, statutory or decreed allowance, etc. The WDID of the authorizing agent must be included in the GROUP code for all diversions where TYPE = “A”. When the authorizing agent is a replacement plan, the WDID must also be used in the GROUP code of all other records associated with the release, delivery or USE of replacement supply associated with the plan.

5.8.2 TO Code

The TO code is only used to help track the delivery of water and does not replace the requirement to enter a diversion record for the WDID, or ACCT, receiving the water. If water is released from a reservoir and diverted downstream by a ditch, the ditch WDID – entirely at the discretion of the water commissioner - may or may not be placed in the TO code of the release record. Regardless of whether the ditch WDID is or is not in the TO code of the release record, a diversion record for the ditch WDID is required to divert the delivered water out of the stream for USE. The user should view the presence of a WDID in the TO code as simply a way to document the intended location of the delivery, nothing more.

5.8.3 OBSERVATION Code

There are a number of OBSERVATION codes for diversion records that describe the source and/or accuracy of the volume data.

Table 5-11: OBSERVATION Codes

*	Observed
U	User Supplied – Unknown Reliability
K	User Supplied – Known Reliability
E	Estimated
C	Calculated

Observed Record

Observed diversion records represent information that DWR can defend in water court regarding the volume of water associated with the record. Observed records rely on data obtained by regular site visits to the structure, data associated with a continuous recorder or information from data management systems approved and audited by DWR staff.

User Supplied Record – Unknown Reliability

Information provided by a user does not necessarily warrant a diversion record or may require comments regarding the information if used. Examples of User Supplied records would include:

- well diversions;
- time periods when the water commissioner is not on the payroll;
- non-administered areas that are not visited regularly;
- new structures;
- non-irrigation uses, such as industrial, municipal, commercial, etc.; and,
- non-consumptive uses, such as recreation, piscatorial, power, etc.

User supplied records are subject to review and approval by the water commissioner or division staff. The review should confirm the:

- accuracy of the water class;
- reliability of the volume data;
- adequacy of the water user's accounting system; and,
- data is submitted timely.

Information submitted for which DWR has no knowledge regarding the reliability of the record should be assigned an OBSERVATION code of "U" for "Unknown Reliability".

User Supplied Record – Known Reliability

Alternatively, User Supplied records based on diversion volume information that, in the opinion of DWR staff, has a "Known Reliability" are assigned an OBSERVATION code of "K".

Estimated Record

Estimated records may be made only by DWR personnel. The term, “Estimated” refers to data associated with operations that are not “Observed”. This could include, for instance, daily diversion records that estimate when a ditch starts or stops making diversions or an estimated number based on USE, etc.

Calculated Record

Some records are based on information that depends on other records or is “calculated” by modeling tools, such as depletion response functions associated with alluvial wells, etc. These records are assigned an OBSERVATION code of “C” to indicate that they have been calculated.

The process of using math to determine the amount of water associated with a diversion record does not make the record a “Calculated” record. The user should think of “Calculated” in terms of the amount being the result of a “model”.

6 WATER CLASS PROTOCOLS

One key to making sure diversion records are understandable is a set of clear protocols that, as discussed in Section 4.2, are rigorously followed. This section delineates those protocols, principally through the use of several tables. The tables are organized by SOURCE code, Protocol 1, USE code, Protocol 2, and TYPE of diversion, Protocol 3. The more pedantic rules, such as if USE is “irrigation”, then USE = “1”, have not been included so as to not belabor the point.

The protocol tables should be viewed not in isolation, but as a collaborative set. If there are protocols associated with a certain water class in more than one table, all the protocols apply equally, with one exception. The use of TYPE = “U” (“Unauthorized” diversion) supersedes the use of all other TYPE codes.

6.1 SOURCE Code Rules

SOURCE code based rules are shown in Protocol 1.

6.1.1 “Manufactured” Water (SOURCE = “2”, “4” or “8”)

If the TYPE code for records of SOURCE = (“2”, “4” or “8”) water is not a “release” TYPE code, the FROM code cannot be blank. The FROM code must be the WDID (and ACCT, if an account was used) of the structure that released the “manufactured” source of water. This code association is required to know the ultimate USE and place of USE of the water.

6.1.2 Ground water (SOURCE = “3”)

The division administers a number of different kinds of ground water. While each kind of ground water does not have a completely unique water class structure, it is important to understand the water class differentiation between the groups of ground water diversion records. Protocols for the following categories of Well structure types are also shown in Protocol 1:

- Exempt structures, structures diverting non-tributary water or non-exempt structures located in a basin that is not yet “over-appropriated”²¹;
- Structures decreed as an alternate point to in-priority surface water right;
- Non-exempt structures located in an “over-appropriated” basin that have been authorized to divert by statute, decree of the court or substitute supply plan approved by the state engineer; and,
- Non-exempt structures located in an “over-appropriated” basin that have no plan of augmentation or state engineer approved substitute supply plan.

Well Group structures would also fall into one of the above categories of Well structure types because a Well Group is simply a group of Wells being administered in aggregate.

²¹ In addition to being “over-appropriated”, the basin would need to have rules implemented by the state engineer that govern the operation of the wells.

A Well Field is the volume of ground water allocated pursuant to 37-90-137, C.R.S. and is more or less equivalent to an underground “reservoir”. A Well Field will have associated Well or Well Group structures that are included in one of the above categories.

6.2 FROM Code Rules

As discussed in Section 5.5, the use of the FROM code is limited to the information required for specific operations. Because the FROM code information is based on one of the other codes, its requirements are in the “Then” sections of the protocol tables.

6.3 USE Code Rules

In order to properly correlate USE to place of USE, certain USE codes may only be used with specific “structure types”. The restrictions are shown in the USE Code Based rules, Protocol 2.

6.3.1 Storage (USE = “0”)

Storage only occurs in “Reservoir” or “Reservoir System” structure types. Even if the only purpose of a ditch, as in the following example, is to divert natural stream flow to a reservoir, the USE = “0” code still may not be used with the ditch WDID because a ditch cannot “store” water. In order to make the coding universally understood, it’s also not enough to rely on the TO code in the following example and/or the user’s knowledge regarding the layout of the ditch and reservoir to understand that the water associated with the following record was actually stored in reservoir 1003504.

WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1000503	1		0			1003504	Unacceptable record

The following record, by itself, would also be unacceptable since the WDID in the FROM code would prevent the volume data from being added to the SOURCE total. One might argue that the simplest response would be to leave the FROM code “blank”. The problem with that is, again, the potential confusion regarding what natural stream flow was diverted directly by an off-stream reservoir.

WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1003504	1	1000503	0				Unacceptable record

The only consistently clear record requires both the diversion from the stream and the storage in the reservoir by means of two records:

WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1000503	1		Q			1003504 (optional)	Natural stream diverted with ditch as carrier
1003504	1	1000503	0				Water stored in 1003504 that was diverted from the SOURCE by ditch 1000503

6.3.2 Augmentation (USE = "A")

By definition, the natural stream is the location where "Augmentation" occurs. Most replacement plans designate either explicitly or implicitly the section of stream or a point location on the stream requiring flow augmentation. A record that water was released for "Augmentation" USE by a structure is usually not sufficient information to demonstrate that the water was actually delivered to the point of depletion.

In order to fully demonstrate that the location of the natural stream requiring augmentation received a replacement supply of water, USE = "A" will only be accepted for in-stream structure type WDIDs. The two most common structures used to designate the location where augmentation (USE = "A") occurs are "reach" and "measuring point".

If the water was released directly to the stream (TYPE = "7") by another structure as a "replacement supply", the in-stream structure receiving the water for augmentation USE must have the WDID and ACCT, if used, of the structure making the TYPE = "7" release in the FROM code and a TYPE = "Q" release code.

If the water was released by an off-stream structure, such as a recharge area, using the TYPE = "V" ("Release to Alluvial Aquifer") code, the in-stream structure using the water for augmentation will typically receive the water by a "Calculated" diversion record that has the releasing structure in the FROM code and USE = "Q". The reason for this is two-fold. First, the record is a modeled output that is quantifying the accretion. The model does not know whether the accretion will be used as a replacement supply or released to the stream without dominion and control. Second, the in-stream structure will be used to aggregate the accretions from all the recharge structures associated with the replacement plan and will then be used to make releases to the stream. The in-stream structure in this case will then either USE the water for augmentation with a USE = "A" and TYPE = "7" code or release the water with a USE = "Q" and TYPE = ("7" or "L") code.

In all cases, the in-stream structure using the water for augmentation must have the plan WDID authorizing the replacement in the GROUP code.

6.3.3 Evaporation (USE = "E")

"Evaporation" as a USE by diversion only occurs from bodies of water. Structure types "Reservoir", "Reservoir System", "Recharge Area" (for those that have impoundments) or "Well" (in the case of an un-lined gravel pit) can have USE = "E". Evaporative loss records are discretionary records unless the administration is required to reconcile the volume stored or contained by the impoundment. USE = "E" records always have TYPE = ("Q" or "A").

6.3.4 Minimum Stream Flow/Lake Level (USE = "M")

As expressed by the name, USE = "M" is associated with lake levels or specific stream segments. The respective structure types corresponding to these geographical features for which USE = "M" may be used are "Reservoir", "Reach" or "Measuring Point".

6.3.5 Recharge (USE = "R")

"Recharge" (USE = "R") occurs when water is:

- delivered to a recharge structure under the dominion and control of a water right or as otherwise authorized by the state engineer;
- released directly to the alluvium by seepage from a ditch or reservoir in accordance with a decreed water right; or,
- placed underground for later direct withdrawal.

Five structure types may be associated with a USE= "R" record, including "Recharge Area", "Reservoir", "Reservoir System", "Ditch" and "Well".

Recharge by a "Recharge Area"

Water diverted into a recharge area is assigned USE = "R" upon placement of the water into the impoundment being used to seep the water into the aquifer. The USE = "R" record, in effect, is the "gross" recharge since some amount of water is typically lost to evapotranspiration. The associated "net recharge" that seeps into the ground is "released to the alluvial aquifer" by means of a USE = "Q", TYPE = "V" diversion record.

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0700501	1		Q				Natural stream diversion
2	0702501	1	0700501	R				Water delivered to recharge area impoundment
3	0702501	8		E	Q			Evaporative loss (optional)
4	0702501	8		Q	V	0703301		Release to aquifer
5	0709595	8	0702501	Q		0703301		Calculated accretion from 0702501

Rows 1 and 2 in the above example are typically daily records whereas rows 3, 4 and 5 are typically infrequent, monthly records.

Recharge by a "Reservoir"

If a reservoir has a water right that enables the owner to maintain dominion and control of seepage from the reservoir, the reservoir may "recharge" (USE = "R") the seepage and release it back to the stream by means of accretion through the alluvial aquifer (TYPE = "V") or withdraw it directly back from ground at a later time (TYPE = "W"), depending on the terms of the decree.

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0200551	1		Q				Natural stream diversion
2	0202525	1	0200551	0				Storage record
3	0202525	2		R	8			Seepage from reservoir claimed as "recharge" pursuant to water right.
4	0202525	8	0202525	Q	V			Calculated accretion

Recharge by a "Ditch"

As with reservoirs, some ditches have a right to claim seepage as "recharge" (USE = "R"), typically as a release to the alluvial aquifer (TYPE = "V") for accretion credit back to the stream. If the recharge is recorded by the ditch WDID, the user will have to make sure the volume of the recharge record is not included in another head gate record to prevent double counting. To illustrate, consider the example where a ditch diverts 10 cfs to a single recharge area with an

above ground impoundment and loses 10% to seepage in the process of carrying the water to the recharge area. The 10% seepage loss, by decree, can also be claimed as recharge:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0100501	1		Q				Total through head gate-10 cfs
2	0102525	1	0100501	R				Delivered to recharge-9 cfs
3	0100501	1		R	R			Transit loss to recharge – 1cfs
4	0102525	8		Q	V	0103500		Recharged volume – 45 AF
5	0100501	8	0100501	Q	V	0103500		Recharged volume – 6 AF

Rows 1, 2 and 3 in the above example are daily records whereas rows 4 and 5 are typically monthly, infrequent records.

There are two alternative solutions to the above example that the user may want to consider. One would be to use accounts:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0100501.001	1		Q				Total through head gate-10 cfs ACCT 001: "head gate"
2	0102525	1	0100501.001	R				Delivered to recharge – 9 cfs
3	0100501.003	1	0100501.001	R				Transit loss to recharge – 1 cfs ACCT 003: "ditch seepage"
4	0102525	8		Q	V	0103500		Recharged volume – 45 AF
5	0100501.003	8	0100501.001	Q	V	0103500		Recharged volume – 6 AF

Rows 1, 2 and 3 in the above example are daily records whereas rows 4 and 5 are typically monthly, infrequent records.

A second alternative would be to tabulate the ditch segment decreed for seepage credit as a separate "Recharge Area" structure and assign it a WDID:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0100501	1		Q				Total through head gate-10 cfs ACCT 001 defined as "head gate"
2	0102525	1	0100501	R				Delivered to recharge – 9 cfs
3	0107575	1	0100501	R				Transit loss to recharge – 1 cfs
4	0102525	8		Q	V	0103500		Recharged volume – 45 AF
5	0107575	8		Q	V	0103500		Recharged volume – 6 AF

Rows 1, 2 and 3 in the above example are daily records whereas rows 4 and 5 are typically monthly, infrequent records.

Recharge by a "Well"

A well may also be used to recharge the alluvial aquifer. The only distinction for these records is that the USE = "R" and "release to the alluvial aquifer" (TYPE = "V") are a single operation:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0100505	1		Q				Water carried by supply ditch
2	0105500	1	0100505	R	V	0103200		Water injected in alluvial aquifer by a well

Water Released Underground

Water placed in underground structures for which the user is maintaining dominion and control by means of direct withdrawal at a later time is assigned the USE of “recharge”, much like reservoirs are assigned the USE “storage”. In addition to the USE = “R” code, the recharge must also have a TYPE = “W” record to indicate the water was released underground. The structure releasing the water is typically a well, whereas the structure holding (“storing”) the water underground is a Well Field.

The recharge (underground “storage” and later recovery of the water) would have water classes like the ones shown below. The SOURCE is “8” because the water was already put to USE = “R”. This also distinguishes the water class from the water classes used to divert the groundwater appropriated by the Well Field pursuant to rule or decree, discussed in Section 5.2.5 - Well Field.

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0805565	1		R	W		(0809500)	Well recharging an aquifer
2	0809500	8	0805565	Q				well field receiving recharged water from well.
3	0809500	8		Q	8			Recovery of water held by the well field.
4	0805565	8	0809500	2				Recovered water put to USE

Water placed underground to dispose of the water would have a USE = “Q” and TYPE = “W”.

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	6705575	3		Q	A	6702555		Water generated by gas well
2	6708500	3	6705575	Q	W	6702555		Water disposed underground

Protocol 1: SOURCE Code Based Water Class Coding Protocols

If:	Then:
SOURCE = ("2", "4" or "8") AND record is the initial release to the system for immediate USE	TYPE code must equal ("7", "8", "L"). (TYPE = {"E", "Q", "V" and "W"} releases are either not being made as the "initial" release or are not available for "immediate USE".
SOURCE = ("2", "4" or "8") AND TYPE <> ("7", "8", "L", "E", "Q", "V" or "W")	WDID of the structure and ACCT, if used, that made the "initial" release is required in the FROM code.
SOURCE = "3" AND WDID diverts "nontributary" ground water OR is an "exempt" well OR is a "non-exempt" well in a basin that is not yet "over appropriated"	TYPE code is "blank".
SOURCE = "3" AND WDID is a decreed alternate point of diversion to an "in-priority" surface water right structure	FROM code is the WDID of the in-priority surface water structure AND TYPE code is "4". (This is same protocol as TYPE = 4 shown in Protocol 3.
SOURCE = "3" AND WDID is a "non-exempt" well in an "over-appropriated" basin that has been authorized to pump by statute, decree of the court or substitute water supply plan approved by the state engineer	TYPE coded is "A"; GROUP is the WDID of the authorizing entity.
SOURCE = "3" AND WDID is a "non-exempt" well in an "over-appropriated" basin that has no decreed plan of augmentation or approved substitute water supply plan	TYPE code is "U". (This is same protocol as TYPE = U shown in Protocol 3.
SOURCE = "3" AND diversion is from an allocated volume of groundwater appropriated by a Well Field	WDID structure type is "Well Field", USE = Q. If appropriation is also made pursuant to the terms of a plan of augmentation: TYPE = A and GROUP is the WDID of the plan.

Protocol 2: USE Code Based Water Class Coding Protocols

If:	Then:
USE = "0" (zero)	Structure type must be a "Reservoir" or "Reservoir System".
USE = "A"	Structure type must be an in-stream structure: "Reach", "Reservoir", "Minimum Flow" or "Measuring Point"; WDID of plan authorizing diversion must be in the GROUP code; and, TYPE = ("7" or "Q"). If TYPE = "Q", WDID of structure and ACCT, if used, making the TYPE = "7" replacement supply release must be in the FROM code.
USE = "E"	Structure type must be "Reservoir", "Reservoir System", "Recharge Area" or "Well" (gravel pit) and TYPE = ("Q" or "A")
USE = "E" AND SOURCE = "2"	Structure type must be "Reservoir" or "Reservoir System" and TYPE = ("Q" or "A")
USE = "M"	Structure type must be "Reach", "Reservoir" or "Measuring Point".
USE = "R"	Structure type must be "Recharge Area", "Reservoir", "Reservoir System", "Ditch " or "Well".

Protocol 3: Diversion TYPE Water Class Protocols

If diversion is:	Then
By exchange	Two records are required: 1) Structure taking water must have SOURCE = the SOURCE of the water being released as a replacement supply, FROM = WDID with ACCT, if used, of structure releasing replacement supply and TYPE = "1"; and 2) Structure WDID with ACCT, if used, releasing replacement supply must identify the SOURCE of water being released, USE = "Q" and TYPE = "7".
By trade	Three records are required: 1) Structure taking water from the stream must have SOURCE = "1", FROM = WDID of in-priority structure authorized to divert water and TYPE = "2"; 2) Structure releasing replacement supply must have a record identifying the SOURCE of water being released, USE = "Q" and TYPE = "8"; and 3) Structure receiving replacement supply in lieu of making an in-priority diversion from the stream must have SOURCE = SOURCE of water released as a replacement supply, FROM = WDID and ACCT, if used, of the structure releasing the replacement supply and TYPE = "2".
At a decreed alternate point to an in-priority structure	SOURCE is the SOURCE actually diverted by the alternate point, FROM = WDID of in-priority structure authorized to divert water, and TYPE = "4". No ACCT ID required in FROM code.
Release to stream	WDID and ACCT, if used, releasing water; TYPE = "7". If USE = "Q", additional records are required until USE <> ("B" or "Q"); subsequent records must have SOURCE = SOURCE released and FROM = WDID and ACCT, if used, of releasing structure.
Release to an off-stream system	WDID and ACCT, if used, releasing water; TYPE = "8". If USE = "Q", additional records are required until USE <> ("B" or "Q"); subsequent records must have SOURCE = SOURCE released and FROM = WDID and ACCT, if used, of releasing structure.
Release to stream with relinquishment of dominion and control	WDID and ACCT, if used, releasing water; USE = "Q" and TYPE = "L".
Release that user diverted in excess of the amount beneficially used	WDID and ACCT, if used, releasing water; USE = "Q" and TYPE = "E".
Release of quantified volume	WDID and ACCT, if used, releasing water; TYPE = "Q".
Release to alluvial aquifer	WDID and ACCT, if used, releasing water; TYPE = "V".
Release underground	WDID and ACCT, if used, releasing water; TYPE = "W".
Diversion authorized by something other than the Prior Appropriation Doctrine	TYPE = "A"; WDID of authorizing agent must be in GROUP code.
Unauthorized	TYPE = "U". ¹
¹ TYPE = "U" does not apply to "releases" and, in any event, supersedes the use of all other TYPE codes. Releases that are subsequently put to an "Unauthorized" USE are coded TYPE = "L".	

7 DIVERSION RECORDS WARRANTED

This section identifies administration that, in the opinion of the state engineer, warrants a diversion record. Diversion records beyond the scope of those discussed here may also be made, at the discretion of the water commissioner or division engineer:

- Direct Diversions;
- Direct Releases;
- Off-stream Diversions;
- Off-stream Releases; and,
- Records of Non-use.

7.1 Direct Diversions

A “direct diversion” removes any SOURCE of water directly from the natural stream system without a delayed impact. The following direct diversions warrant a record:

- All substantive²² diversions of natural stream flow, nonstream flow (such as seeps and springs) and any other SOURCE of water being transported by the natural stream system, including diversions by exchange, trade or alternate point as well as diversions by head gate wells²³ or other similar structures; and,
- All diversions by on-stream reservoirs as recorded by either inlet measurement structure or stage-capacity curve and gauge height.

7.2 Direct Releases

A “direct release” occurs when water is released directly (i.e. without delayed impacts) to the natural stream system or to an off-stream system for use. The following direct releases warrant diversion records:

- Excessive²⁴ tail-water releases;
- Releases to the stream for delivery and diversion or USE downstream;
- Releases to an off-stream system for USE;
- Releases that relinquishes dominion and control, returning the water to the public domain;
- Releases of any reusable effluent;
- Return flow releases; and,
- Transbasin imports/exports.

²² “Substantive” means any diversion that requires administration.

²³ A “head gate” well is a structure that, in effect, diverts water from the natural stream even though the structure is not necessarily in direct physical contact with the stream. The state engineer has permitted wells that operate without delayed depletions to the stream to operate in effectively the same way as a ditch head gate.

²⁴ “Excessive” means the volume released exceeds the volume minimally required to operate the ditch. Such records are required in order to prevent an inflated use analysis of the ditch shares.

7.3 Off-Stream Diversions

7.3.1 Alluvial Ground Water

Diversions of alluvial ground water by >50 GPM wells that deplete the natural stream must record the total volume pumped.

Records are not required for exempt structures or structures that cover their augmentation requirements by releasing the un-consumed portion of the diversion back to the natural stream system by means of a non-evaporative leach field. The water commissioner or division engineer may include records for such structures at their discretion. Such records, however, should be based on actual meter data and not simply an assumed volume based on USE or permitted rate.

7.3.2 Ground Water with Limited Appropriative Rights

In addition to >50 GPM alluvial wells, wells that have volumetric limits on the appropriation they are allowed to make require diversion records to effect administration. Examples would be: the 100 year volumetric limit of Denver Basin wells; decreed limits, such as the Coffin wells²⁵ in Division 1; or, well permit based limits. These wells should have, at a minimum, an infrequent record of the total volume diverted.

7.3.3 Depletion Record

In general, Decision Support System (DSS) tools will be relied upon to model and record the depletion caused by off-stream diversions that impact the stream, provided there is a diversion record of the volume pumped.

7.4 Off-Stream Releases

7.4.1 Recharge

Off-stream releases that recharge the alluvial aquifer and impact the natural stream must have the diversion records shown below. The records, at the discretion of the water commissioner or division engineer, may be “Observed” or “User Supplied – Known Reliability”.

- Deliveries to recharge areas or recharge wells; and,
- Volume “released to the alluvial aquifer”²⁶.

²⁵ Judge Coffin decreed a number of alluvial wells as “non-tributary” in 1951; many have volumetric limits that require enforcement in order to limit the impact of the wells to their decreed conditions.

²⁶ This is the volume that seeps into the aquifer from a recharge area holding pond or other structure, such as ditch segment decreed for recharge or structure with decreed authorization to obtain credit for seepage loss.

7.4.2 Decreed Indirect Return Flows

Non-recharge based return flows, such as decreed lawn irrigation return flow credit or losses of transbasin water using accounting approved by the court or division engineer, to the extent the return flow is quantified and:

- Used to replace depletions by a replacement plan ;
- Used as the substitute supply for an exchange;
- Delivered downstream; or,
- Put to an in-stream USE.

7.4.3 Accretion Record

Decision Support System tools will be generally relied upon to calculate and report:

- Accretions to the stream associated with a “release to the alluvial aquifer”.

7.5 Records of Non-use

Statute²⁷ directs that on each tenth anniversary of July 1, 1990, the division engineer:

“shall...prepare...a separate abandonment list comprising all absolute water rights which he has determined to have been abandoned in whole or in part and which previously have not been adjudged to have been abandoned.”

Statute²⁸ further provides that:

“failure for a period of ten years or more to apply to a beneficial use the water available under a water right when needed by the person entitled to use same shall create a rebuttable presumption of abandonment of a water right with respect to the amount of such available water which has not been so used; except that such presumption may be waived by the division engineer or the state engineer if special circumstances negate an intent to abandon.”

In order to comply with these statutes, an adequate record of failure to use an available water right is warranted. Such records may be as simple as the entry of a Diversion Comment, as discussed in Section 3.1.

²⁷ Section 37-92-401(1)(a), C.R.S.

²⁸ Section 37-92-402(11), C.R.S.

8 ENTRY OF DIVERSION RECORDS

8.1 Timing

Diversion records should be made as soon after the diversion as possible, however, must be completed by March 1 of the following irrigation year in order to allow sufficient time to incorporate the information into the annual July 1 refresh of the data base.

8.2 Responsibilities for Making Records

Following are the recommended assignments for the responsibility of making diversion records, recognizing the division engineer is ultimately responsible for assigning the work duties of the division staff.

8.2.1 Water Commissioners

Water commissioners or other division staff should be responsible for making all “Observed” records related to the administration of the natural stream in their water district(s). This includes:

- Direct diversions (Section 7.1);
- Direct releases (Section 7.2);
- Off-stream releases(Section 7.4); and,
- Records of non-use (Section 7.5).

8.2.2 Division Staff/Others

Other division staff, water user groups or Decision Support System tools may be relied upon to supply the following diversion records:

- Off-stream diversions (Section 7.3); and,
- Accretions from “releases to the alluvial aquifer” (Section 7.4.3).

9 DIVERSION RECORD REPORTS

In addition to informing the user about the standard diversion record reports that are available, an explanation of the logic used to query diversion records will help the user fully comprehend the protocols associated with the water class coding discussed in Section 5.

9.1 USE/SOURCE Report

This report summarizes the volume of water by USE for a water district, water division or for the entire state for each SOURCE of water. Information for individual structures is provided by the Structure Totals Report, discussed in Section 9.2, below. The format of the “USE/SOURCE Report” is shown in Report 1.

Referring to USE/SOURCE Report, the “USE/SOURCE Ratio” is the “USE Total” divided by the “SOURCE Total”, expressed in percent. The “SOURCE Total” of each SOURCE and “USE Total” are determined as discussed in the following subsections.

9.1.1 USE Total - Summation Protocol

The USE summation combines diversion record volumes by USE, subtotaled by SOURCE, for records that meet the following criteria:

Protocol 4: USE Total Summation

WDID is Member of requested area
TYPE <> 0 (zero)
USE <> (B, Q, 0 or R) OR USE = (0 or R) if WDID (sans ACCT) <> FROM (sans ACCT)

All the summation routines ignore TYPE = “0”, administrative only, records.

The USE volume summation does not include USE = (“B” or “Q”) records as these records are simply a “quantification” of amounts associated with one or more other records that specify the USE. Including these USE codes would only artificially inflate the USE totals.

USE = (“0” or “R”) are included as long as the WDID (without ACCT extension) is not equal to the FROM (without ACCT extension) as these records are simply recording the “book over” of water within reservoir or recharge area accounts.

9.1.2 SOURCE Total - Natural Water Summation Protocol

The volume of each SOURCE of natural water is the sum of diversion volumes associated with water classes that meet the following criteria:

Protocol 5: SOURCE Total Summation - Natural Water

WDID is Member of requested area
SOURCE = (1, 3 or 5); Subtotaled individually
FROM = "blank" OR TYPE = (2 ²⁹ or 4 ³⁰)
TYPE <> (0 or R)

If the FROM is "blank", the diversion record is the initial diversion of the natural water from its SOURCE and is, therefore, included in the summation total.

If the diversion is a "trade" or "alternate point", the FROM will be the ID of the structure enabling the diversion. Nonetheless, the diversion will be the initial diversion of the natural water and must be included in the summation.

As stated earlier, all summation routines ignore TYPE = "0", administrative only, records. By definition, TYPE = "R" record volumes relate only to the USE of water, not the SOURCE and are, therefore, also excluded from this summation.

9.1.3 SOURCE Total - Manufactured Water Summation Protocol

The SOURCE of manufactured water is based on the volume of water released to the system for subsequent USE or loss of dominion and control. The total volume of each SOURCE of manufactured water is determined by summing the volume for water classes with the following criteria:

Protocol 6: SOURCE Total Summation - Manufactured Water

WDID is Member of requested area
SOURCE = (2, 4 or 8); Subtotaled individually
TYPE = (7, 8 or L) ³¹ OR USE = E

Only manufactured water being made available to the system is included in the summation routine. In order for such water to be "available", it must be "released". Therefore, if the TYPE is ("7", "8" or "L"), the water is included in the summation. Even though evaporative loss is not making any water available for USE, it included in the USE summation and must also, therefore, be included in the SOURCE summation.

²⁹ TYPE = "1" is not included as the summation will have already included the water as part of the replacement supply diversion and release record(s).

³⁰ Diversion records where the FROM code is not "blank" are generally subsequent records; such records are not the "initial" diversion and would therefore double count the water if the volume was included in the summation. Diversions made by trade (TYPE = "2") or as an alternate point (TYPE = "4"), however, are an exception to this generalization and must be included in the summation.

³¹ TYPE = ("7" OR "8") make the water "available for USE". TYPE = "L" releases are included even though as soon as the release is made it becomes natural stream flow to document that the water was available, but voluntarily surrendered.

Report 1: USE/SOURCE Report

USE/SOURCE Report - [WD, Div, State]							
[Start date] - [End date] OR [IYR]							
AF							
	Natural Streamflow	Reservoir Storage	Ground Water	Transbasin	Non-Stream	Re-usable	TOTAL
USE/SOURCE Ratio	{%}	{%}	{%}	{%}	{%}	{%}	
SOURCE Total (Section 9.1)							
USE Total ¹	{Sum}	{Sum}	{Sum}	{Sum}	{Sum}	{Sum}	
Storage (0)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Irrigation (1)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Municipal (2)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Commercial (3)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Industrial (4)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Recreation (5)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Fishery (6)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Fire (7)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Domestic (8)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Stock (9)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Augmentation (A)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Change of Use RF (C)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Evaporation (E)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Federal reserved (F)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Geothermal (G)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Household use only (H)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Snow making (K)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Minimum streamflow (M)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Power generation (P)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Recharge (R)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Export from State (S)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Transbasin export (T)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Wildlife (W)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
Other (Z)	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	{Amt}	
¹ Use codes "B" and "Q" are not included as such records are simply a "quantification" of an amount associated with a USE that has been included in this report.							

9.2 Structure Totals Report

When looking at an individual structure, it is useful to know:

- Amount of water entering the structure;
- Total water released from the structure; and,
- How the water entering the structure was used.

An example Structure Report is shown in Report 2.

9.2.1 Total Water Into Structure

The Total Water into Structure, or Headgate Total, summation routine for structures that aggregate all the inflow before making a release record is different than the summation routine for non-aggregating structure types. Aggregating structures must make an inflow only diversion record while non-aggregating structures may record the inflow into the structure and release from the structure with a single record.

A reservoir, for example, records all inflow and then makes release records:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	0802555	1		0				Reservoir inflow
2	0802555	2		Q	7			Reservoir release

while a measuring point in the stream might simply record the inflow that's also being released to the stream:

	WDID.ACCT	S	F.ACCT	U	T	G	To.ACCT	Description
1	2305585	1		Q	7	0803335		Measuring point delivery

Aggregating Structure Type

Aggregating structure types must make separate inflow and release diversion records in order for the structure inflow summation routine to correctly sum the Total Water into Structure. Aggregating structure types are shown in Table 9-1.

Table 9-1: Aggregating Structure Types

WF	Well Field
3	Reservoir
RS	Reservoir System
RA	Recharge Area
AR	Aggregating Reach

A Well Field is the volume of ground water allocated pursuant to 37-90-137, C.R.S. and is more or less equivalent to an underground "reservoir". Recharge Areas are aggregating structures because of the need, typically, to impound the water in an above ground pond to facilitate the recharge. An Aggregating Reach is the same as a Reach structure type, except that the inflows into an Aggregating Reach are, typically, generated by a model. The total inflow into an Aggregating Reach must be summed and compared to the conditions of the stream before

knowing whether all or just part of the inflow can be used. Water that is put to a beneficial USE will have a TYPE = "7" release code, while water that is simply released without USE will have a TYPE = "L" release code.

The criteria used to determine which records to include in the Total Inflow into Structure for aggregating structure types is as follows:

Protocol 7: Total Water Into Structure Summation - Aggregating Structure Types

WDID is the requested structure
WDID (sans ACCT) <> FROM (sans ACCT)
TYPE <> (7, 8, L, Q, V, W, 0 or R)

A diversion record where the WDID (without ACCT extension) is equal to the FROM (without ACCT extension) is simply moving water from one ACCT to another ACCT in the same structure. The water associated with such a record is clearly not inflow into the structure as it's already in one ACCT of the structure.

If the TYPE code is ("7", "8", "L", "Q", "V" or "W"), the diversion record is a "release", which by definition cannot also be used to record inflow into aggregating structure types. All the summation routines ignore TYPE = "0", administrative only, records. TYPE = "R" records are associated with USE only information, which are of necessity concerned only with water that is already "in" the structure.

Non-Aggregating Structure Type

Non-aggregating structures may use one diversion record to quantify both the inflow into the structure and a release from the structure. Non-aggregating structures are shown in Table 9-2.

Table 9-2: Non-Aggregating Structure Types

1	Ditch
2	Well
WG	Well Group
4	Spring
5	Seep
6	Mine
7	Pipeline
8	Pump
9	Power Plant
0	Other
M	Measuring Point
MF	Minimum Flow
R	Reach (Non-Aggregating)

The criteria to determine the total water into a non-aggregating structure are as follows.

Protocol 8: Total Water Into Structure Summation - Non-Aggregating Structure Types

WDID is the requested structure
WDID (sans ACCT) <> FROM (sans ACCT)
TYPE <> (0 or R)

The criteria are the same as the aggregating structures criteria, except that “release” TYPE codes are not excluded.

9.2.2 Total Water Released From Structure

The criteria used to determine the total water released from a structure, regardless of whether the structure type is aggregating or non-aggregating, are as follows:

Protocol 9: Total Water Released From Structure Summation

WDID is the requested structure
TYPE = (7, 8, L, Q, V or W)
TO (sans ACCT) <> WDID (sans ACCT)

If the diversion record has a “release” TYPE code, the record volume is included unless the TO (without ACCT extension) is equal to the WDID (without ACCT extension). Records where the same parent ID is in the WDID and TO codes are associated with transfers of water from one ACCT to another ACCT in the same structure and are, therefore, not a release from the structure.

9.2.3 Total USE Associated to Structure

The volume of water put to a USE either by the structure for which the data is being requested or by a subsequent structure that received water from the subject structure can be determined using the following criteria:

Protocol 10: Total USE Associated to Structure Summation

(WDID or FROM) is the requested structure
TYPE <> 0
USE <> (B, Q, 0 or R) OR USE = (0 or R) if WDID (sans ACCT) <> FROM (sans ACCT)

The TYPE and USE criteria are the same as USE Total Summation, Protocol 4, presented in Section 9.1.1.

9.2.4 Other Structure Information

In addition to the water diverted, released or used, the structure report also shows the administrative records (TYPE = "0") for the structure, as well as:

- First Day Used;
- Last Day Used;
- Days Water Carried; and,
- Max Flow (Q), CFS.

Report 2: Structure Report

Structure Report – 0100677 IYR - 2011 Amounts in AF			
Total Diversion			112
	0100677 S:1 F: U:1 T: G: To:	37	
	0100677 S:1 F: U:Q T: G: To:	40	
	0100677 S:2 F:0502555 U:1 T: G: To:	35	
Total Release			0
Associated USE			
	Irrigation	67	
	0100677 S:1 F: U:1 T: G: To:	37	
	0100677 S:2 F:0502555 U:1 T: G: To:	30	
	Recharge	32	
	0102555 S:1 F:0100677 U:R T: G: To:	32	
Administrative Records			
	0100677 S:X F: U:Q T:0 G: To:	112	
Statistics ¹			
	First Day Used	4/15/2010	
	Last Day Used	8/25/2010	
	Days Water Carried	52	
	Max Q (CFS)	4	
¹ Only included when "Irrigation Year" option selected for date range.			

Appendix B: Quick Guide to Diversion Record Codes

SOURCE Code ¹	
1	Natural Stream Flow
2	Reservoir Storage
3	Ground Water
4	Transbasin Water
5	Non-Stream Flow
8	Re-usable Water
X ²	Unspecified

TYPE Code ¹	
	Blank is acceptable
Types of diversions	
1	Exchange
2	Trade
4	Alternate Point of Diversion
A	Authorized/Augmented
U	Unauthorized Diversion
D	Out-of-priority Depletion
J	In-priority Depletion
Types of releases	
7	Released to Stream
8	Released Off-stream
L	Release of Dominion and Control
E	Release of Excess Diversion
Q	Release of Quantified Amount
V ³	Release to Alluvial Aquifer
W	Released Underground
Types of data	
0	Administrative Record Only
R	USE Only Volume Data

USE Code ¹	
0	Storage
1	Irrigation
2	Municipal
3	Commercial
4	Industrial
5	Recreation
6	Fishery
7	Fire
8	Domestic
9	Stock
A	Augmentation
B	Sub-basin export
C	Change of Use Return Flows
E	Evaporation
F	Federal reserved
G	Geothermal
H	Household use only
K	Snow making
M	Minimum stream flow/lake level
P	Power generation
Q	Quantification of amount
R	Recharge
S	Export from State
T	Transbasin export
W	Wildlife
Z	Other

OBSERVATION Code	
*	Observed
U	User Supplied - Unknown Reliability
K	User Supplied - Known Reliability
E	Estimated
C	Calculated

Not Used/Not Released Code (NUC/NRC)	
	Blank is acceptable
A	Structure not usable
B	No water available
C	Water available, but not taken
D	Water taken in another structure
E	Water taken, but no data available
F	No information available

Structure Type Allowed to have a Diversion Record ⁴		
1	Ditch	N
2	Well	N
WG	Well Group	N
4	Spring	N
5	Seep	N
6	Mine	N
7	Pipeline	N
8	Pump	N
9	Power Plant	N
0	Other	N
M	Measuring Point	N
MF	Minimum Flow	N
R	Reach (Non-Aggregating)	N
WF	Well Field	A
3	Reservoir	A
RS	Reservoir System	A
RA	Recharge Area	A
AR	Aggregating Reach	A

Structure Type NOT Allowed to have a Diversion Record	
AQ	Aquifer NNT/NT Reservation
DS	Ditch System
EP	Exchange Plan
P	Augmentation/Replacement Plan

¹ For more complete definitions see Table 5-8, Table 5-9 and Table 5-10.

² SOURCE "X" should not be used as the only record for a structure as it provides no understanding regarding the SOURCE of water diverted.

³ TYPE "V" releases are associated with water that will accrete to the natural stream.

⁴ Structure Types are divided into "Aggregating" (A) and "Non-Aggregating" (N); see Section 9.2.

