Texas Water Development Board

Exhibit D

Guidelines for 2026 Regional Water Plan Data Deliverables

February 2023

This document is subject to future revision based upon any future Legislative actions.

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Background

The Texas Legislature directed the Texas Water Development Board (TWDB) to establish standards for reports and data presented in regional water plans (RWPs). Section 16.053(d) of the Texas Water Code (TWC) states: "The Board shall provide guidelines for the format in which information shall be presented in the Regional Water Plans." The rules found in 31 Texas Administrative Code (TAC) § 357 were promulgated from the TWC § 16.053(d). The current version of the guidance developed from 31 TAC § 357 is known as the *Guidelines for Regional Water Planning Data Deliverables*, which is Exhibit D in the regional water planning grant contracts.

These guidelines are separate from and in addition to the *General Guidelines for Sixth Cycle of Regional Water Plan Development*, which is Exhibit C in the regional water planning grant contracts.

Purpose

This guidance document, along with 31 TAC § 357, provides data reporting and formatting specifications for regional water planning groups (RWPGs) to follow when submitting electronic data to the TWDB, including submitting data into the Regional Water Planning Application/State Water Planning Database (DB27). It serves as a companion document to *General Guidelines for Sixth Cycle of Regional Water Plan Development*. If there is a conflict in the guidance between the two documents, the most current *General Guidelines for Sixth Cycle of Regional Water Plan Development* will take precedence. Both Exhibit C and Exhibit D are subject to revisions due to any future Legislative actions. The most up-to-date versions will be posted on the following website:
http://www.twdb.texas.gov/waterplanning/rwp/planningdocu/2026/documents.asp

The data submitted into DB27 by the RWPGs is used to develop the State Water Plan (SWP) and the Interactive SWP web application. The SWP is a statewide summary of the data developed at the regional level and is designed to help the State of Texas ensure that there is adequate water supply in a time of drought. The SWP data is used for a wide variety of data analyses, such as calculating Water User Group (WUG) water supply needs and source water balances, as well as the standardized data visualizations provided in the Interactive SWP for use by all stakeholders. It provides Texas Lawmakers and other decision makers with the information required to support Texas' water planning process. Entering regional water planning data into DB27 correctly and consistently across the regional water planning areas (RWPAs) will help provide Texas with the data it needs to secure its water supply for future generations.

1 General Data Requirements

Data should conform and comply with all 31 TAC § 357 rules that require RWPGs to evaluate the adequacy of water supplies in each region during drought of record conditions. The data should also be developed based on the guidance in subsequent sections of this document and the most current *General Guidelines for Sixth Cycle of Regional Water Plan Development.* Evaluations should consider surface water, groundwater, reuse, and conservation data from the SWP, existing water rights, contracts and option agreements, and any other relevant planning, water supply, and conservation studies available. In addition

- submitted information must be accurate and based on the best data and science practicable;
- potential interregional conflicts should be identified and resolved prior to data being certified as complete by the RWPG;
- RWPGs must enter information into all fields in DB27 unless otherwise stated in the guidance documents;
- data provided should follow specified units of measure (see Appendix 1);
- new to the sixth round of planning, data entered in DB27 must be in title case;
- spelling, word order, and proper names must be used consistently and correctly when entering data into DB27;
- proper names used in the RWPs should match those entered in DB27;
- RWPGs must use the same reporting conventions for data shared by more than one region;
- RWPGs must agree on underlying data (e.g. availability numbers) prior to data entry;
- only whole numbers should be entered into DB27;
- projection, source availability, and water supply data are reported in planning decadal increments starting with the year 2030 and extending through the year 2080 (31 TAC § 357.10(21)). Each decadal increment is based on data associated with the first year of the decade and is representative of all years in that decade.

If application users have any questions regarding DB27 data entry, they are encouraged to contact TWDB Water Supply Strategy & Analysis (WSSA) staff early in the process to obtain assistance. This will avoid the inadvertent creation of errors that could be difficult to correct. WSSA staff contact information can be found on the Help page of the DB27 application.

2 Formats for Electronic Data

All final versions of files acquired or developed for the 2026 RWPs are considered joint property of the TWDB and must be submitted along with the RWP. Upon delivery, files should be in a ready-to-use format and uploaded in a single delivery using a Microsoft OneDrive that the TWDB sets up. TWDB staff will provide RWPGs with instructions on how to use Microsoft OneDrive.

This includes but is not limited to all technical reports (MS Word and PDF), MS Excel files, Water Availability Model (WAM)/Groundwater Availability Model (GAM) input/output/supporting data files, GIS, CAD, and image-formatted data. Files required for delivery to the TWDB shall be in an approved format as specified in this document. Alternative software or delivery methods will be allowed with pre-approval from the TWDB if these requirements present a significant burden on the RWPG or as technology changes.

2.1 Introduction

Formats of all computer files provided to the TWDB should be compatible with widely distributed versions of the following software:

- Microsoft Word (MS Office 2010 or newer versions)
- Microsoft Excel (MS Office 2010 or newer versions)
- Microsoft Access (MS Office 2010 or newer versions)
- ArcGIS (10.0 or newer version which includes ArcGIS Pro)
- Internet Explorer (11 or newer versions)
- Adobe Acrobat (2015 or newer versions)

2.2 File Formatting

2.2.1 Accessibility

The digital copy of the final RWP must comply with the requirements and standards specified in 1 TAC § 213, Subchapter B (Electronic and Information Resources Accessibility Standards for State Agencies).

All figures and images contained in documents that will be posted for public viewing must have alternative text descriptions, except for decorative elements, which should be tagged as artifacts or background elements. Accessibility level of files used in the development of the regional water plan, not posted for public viewing will be at the discretion of the RWPG. The file must be titled, and language specified. In addition, the document must establish a logical reading order through the consistent use of styles and headings. Non-accessible elements such as text boxes should be avoided.

2.2.2 PDF and MS Word Specifications

All PDFs intended for online publication must be tagged for accessibility and reflow. All electronic Adobe PDF files shall use embedded fonts with electronically searchable text. Hyperlinks should be live, and bookmarks used in a consistent manner to provide easy navigation. Reading order should be evaluated and tab order correctly set. PDFs must pass the Acrobat accessibility full check. It is recommended that PDF files be a size of 50 MB or less to minimize the amount of time it will take to download from the TWDB website. However, if a larger file size is necessary, please ensure that the PDF file is no greater than a file size of 100 MB.

2.2.3 Image formatting

All drawings and graphs included in reports should also be provided separately to the TWDB in Encapsulated PostScript (EPS) or Tagged Image Format (TIFF) format. The color model should be CMYK, and resolution should be 300 dpi.

2.2.4 Correspondence Specifications

All relevant email correspondence of significance shall be saved as PDF files and adhere to the PDF specifications in Section 2.2.2.

2.2.5 Model Input Files

All water availability model (WAM) and groundwater availability model (GAM) input files used in the development of the RWPs should be in their original text file format, so that they can be verified by a TWDB modeler. In the WAM input file, please include the reservoir identification value when appropriate.

When submitting a DAT file

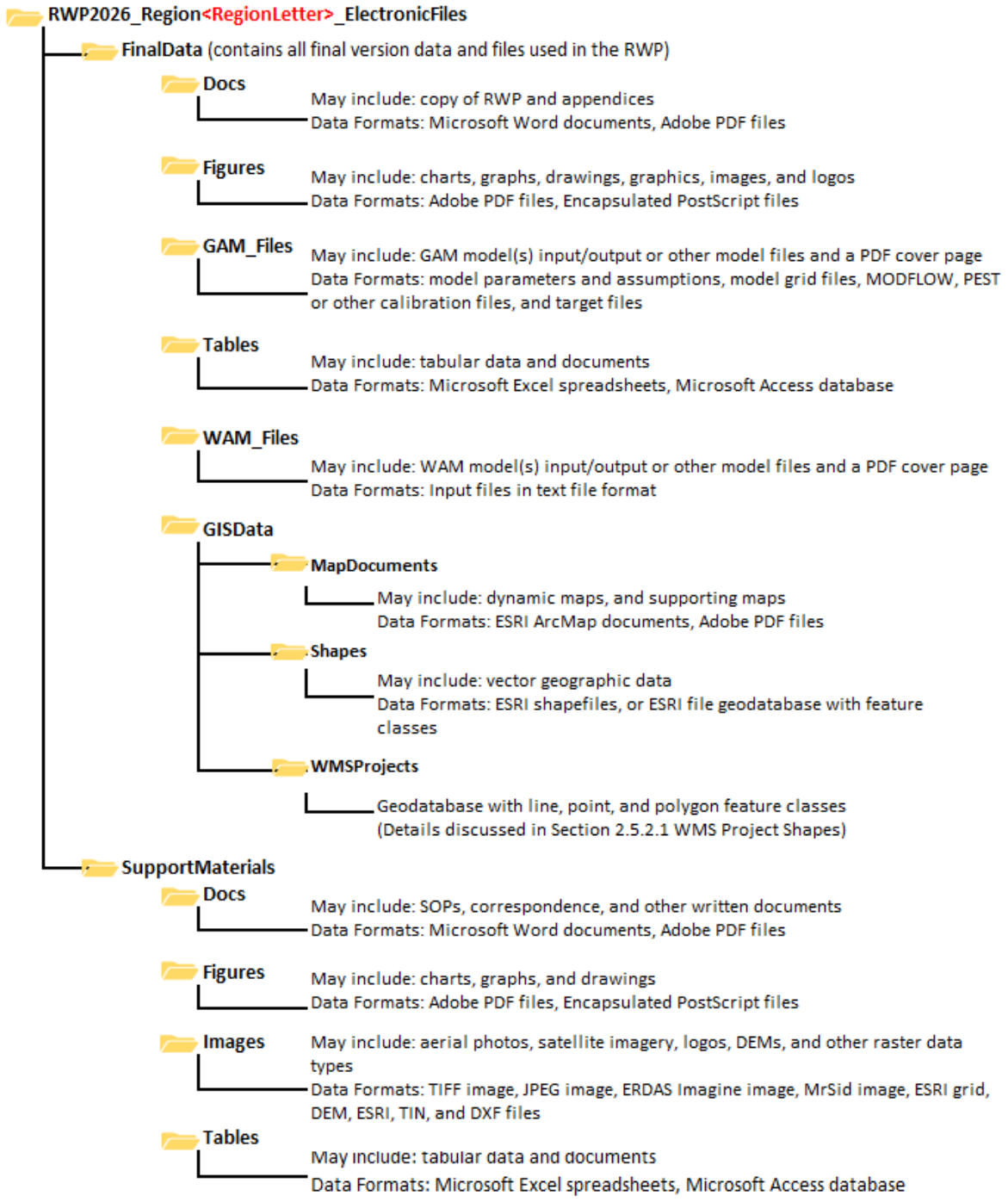
- Provide a separate .dat input file for each reservoir or reservoir system. Name the .dat file using the full name, an abbreviated name, or the WAM ID of the reservoir.
- Provide a separate .dat file for each planning decade and add the decade to the end of the filename using the convention "_<decade>", example (_2030.dat).

When submitting other WAM input files (e.g., .eva, .flo, .dis, etc.) submit one file for each type.

2.3 File Structure

A standard naming convention should be used consistently for all file names and include the region letter, data type, and figure title when relevant. It is preferred that "camel case" be used for file name formatting, which is a formatting style that capitalizes the first letter of each word. File names should not contain spaces, or special characters except for underscores. See Figure 1 for an example of how data delivery folders should be structured. Contact the TWDB WSSA team for a copy of the preferred folder structure. It is not necessary to include files that were provided by the TWDB as supporting materials if their use is clearly documented and referenced.

Figure 1. File Delivery Example



2.4 GIS Data Requirements

2.4.1 Metadata

All GIS files developed for the TWDB are required to have associated metadata. Deliverables are not considered complete without metadata. Metadata, including information about the data's projection, can be developed using one of several built-in or add-on tools within ArcGIS, and typically is associated with the geometry file as an XML file.

Metadata submitted to the TWDB must have spatial reference information that describes the projection, datum, and where applicable, the collection methods.

2.4.2 Projection

All electronic geospatial data shall have spatial reference information and be projection defined (have its coordinate system identified and embedded in or associated with the data file).

Vector data shall be submitted in NAD83 geographic coordinate system with decimal degree units.

Raster data, such as aerial photographs may be submitted in their native projection, and maps shall be in the appropriate projection/coordinate system for the area depicted.

2.5 GIS Data Deliverables

All GIS data deliverables must be stored in the GISData folder as shown in Figure 1. The following sections explain how the information should be provided.

2.5.1 Map Documents

All ArcMap documents (.mxd), ArcGIS Pro files (.aprx), or equivalent map document formats used in final map production are also required for delivery to the TWDB with accompanying data in a stand-alone directory structure. Map document formats must be configured to use relative paths and not be set to use a printer-specific paper setting.

2.5.2 Shape Deliverable Overview

All vector geographic data including shapefiles, geodatabase with feature classes, or any other data used in final map productions are required to be submitted.

RWPGs shall provide all supporting and final GIS data developed or acquired for the RWP and geographic information illustrating important features of each RWPA including but not limited to

- political subdivisions,
- major water demand centers such as cities,
- major providers of municipal and industrial water,
- major water supply sources,
- reservoirs, and
- mapped aquifers.

It is not necessary to include geographic data that was provided by the TWDB as supporting materials if its use is clearly documented and referenced.

2.5.2.1 WMS Project Shapes

Each RWPG is responsible for submitting digital data files containing final geographic data including all recommended and alternative water management strategy projects (WMSP) identified in the RWP.

The WMS project vector data shall be divided into point, polygon, and polyline features based on the WMS Type and WMS Project component and submitted as three shapefiles in a single folder or three feature classes in a single file geodatabase (See Figure 2). One WMS Project can be represented in multiple feature types. For example, an ASR project may be presented as a point for each of the wells required for the site or as a single centroid for the ASR injection and recovery well site. If the WMS project also includes conveyance, a line shapefile may be required to show the transmission lines going from the ASR project site to the water treatment plant. Conservation WMSPs like advanced meter infrastructure installment and system water loss mitigation can be shown as the centroid of the impacted system or part of system. For projects related to county level WUGs like irrigation or municipal county-other, the conservation project point can be placed in the centroid of the project impact area or if that is not known, the centroid of the county. If more than one shape is required for a project, make sure that the related data includes the same WMSProjectId so that all related shapes can be filtered for a specific project. To explain what the shape represents, include a brief description of the shape in the data column labeled 'ProjComp.'

Files shall use a standard naming convention of "WMSProject," Region letter, and geometry type (point, polygon, line) with no spaces. EX: WMSProject_RegionA_Point or WMSProject_RegionL_Polygon.

WMS Project vector data shall have spatial reference information and be projection defined (have its coordinate system identified and embedded in or associated with the data file).

Each WMS Project line, polygon, and point shapefile or feature class file shall include the following fields and additional attribute fields shall be included to provide further detail or clarification as needed. See Table 1 for a list of required fields in each shapefile/feature class attribute table.

Figure 2. WMS project shape folder structure

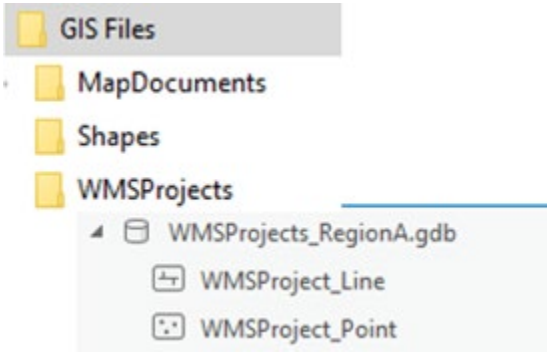


Table 1 Required fields in attribute tables of WMS Project line, point and polygon shapefile/feature class data

Field Name	Description	Format	Example
ObjectId	Unique identifier for each feature (Auto generated)	FID/OID	51
WMSProjectId	DB27 WMS Project ID	Short integer, 5	945
Status	Recommended or Alternative WMS Project	String, 11	Recommended
SponsorRegion	Letter of RWPG project sponsor	String, 4	A
ProjectName	DB27 WMS Project name	String, 100	Develop New Well Field (Ogallala Aquifer) – Cactus
ShapeDescription	Brief description of what the shape represents	String, 255	Centroid of well field

3 Data for Sources of Supply

This section describes the information found in the Sources module of DB27. All current and potential future sources of water supply must be entered into the DB27 Sources module. Each source will be designated as 'groundwater,' 'surface water,' or 'reuse' and will also be categorized within a more specific *Source Subtype* category. Sections 3.3–3.5 provide instructions on how to apply source type labels to sources.

Source availability, referred to as *Total Availability* in DB27, is entered in the DB27 Sources module for all existing sources. It is defined in 31 TAC § 357.10(3) as being "the maximum amount of water that could be produced by a source during a repeat of the drought of record, regardless of whether the supply is physically connected to or legally accessible by water user groups." Existing water supply, which is associated with a WUG, is different from source availability. Existing supply is defined in TAC § 357.10(13), as the "maximum amount of water that is physically and legally accessible from existing sources for immediate use by a WUG under a repeat drought of record conditions" and is entered for WUGs in the DB27 Entities module. See Section 4 for Entity module information.

All new sources must be requested through the Sources module of DB27 and will be reviewed by the TWDB. It is important to ensure that the new source is legitimate and not a duplicate of another source in the database prior to connecting it to entity water volumes and water management strategy (WMS) supplies. By taking the time to review the sources initially, less time will be required to verify the source data during review of the initially prepared plans. When a source is no longer applicable, a request must be submitted to the TWDB WSSA team to update the source to 'Inactive.'

Source data is used to analyze the types of sources that are used in each of the state's RWPAs. The source's existing *Total Availability* is also used to ensure that the amount of water allocated to WUGs as current supply does not exceed the source's available water volumes during a drought of record (i.e., source is not over-allocated).

3.1 Source Status

When requesting to add a new source through the DB27 application, the source will be identified as 'existing', 'future', or 'both' existing and future by selecting a value from the field labeled *Is this an existing or future source?*. Only sources that are labeled as 'existing' or 'both' have the potential to be related to entities as directly accessed source water volumes, sales/transfers, or WUG existing supplies in the DB27 Entities module. See Section 4 for Entity module information. Only sources with a source status of 'future' or 'both' can be related to a WMS in the DB27 WMS module. See Section 5 for WMS module information. Once a source is approved, a request must be sent to the TWDB WSSA team to update the source status to a different value.

3.1.1 Existing Sources

'Existing' sources are defined as currently available for entities to connect with and use. This includes sources whose supply may not be available during drought of record conditions. Source availability will be entered for all existing sources in the DB27 Sources module. If a source is used by WUG(s) as existing supply but the source has no supply available during drought of record conditions, it should still be added to the RWP database with zero availability in all planning decades. See Sections 3.3–3.5 for additional information regarding source availability by source type.

3.1.2 Future Sources

'Future' only sources are not currently available for use. A WMSP must be developed for the future source to be available for use by WUGs. Once a future source is created through the DB27 Sources module, it can be related to one or more WMSs which are then related to a WMSP. Future sources require the following fields to be entered in the DB27 Sources module which are described in detail by *Source Subtype* in Sections 3.3–3.5:

- Source Name
- Source Detail
- Source Region
- Source County
- Source Basin
- Source Type
- Source Subtype
- Is this source generally considered brackish or saline?
- Source Comments

An example of a future source is a new reservoir or a new aquifer storage and recovery (ASR) site. Source availability will be entered for all future sources using the DB27 WMS module. Once a future source is related to a WMS having a *WMS Source Use Type* of 'Availability Increase,' future supply made available through the WMS can be entered with the WMS source. See Section 5.1.2 for more information on relating 'future' sources to an availability increase WMS.

3.1.3 Both Existing & Future Sources

Sources can be used as both existing availability and as part of a WMS. When a source with a source status of 'both' is related to a WMS, it can mean that the existing availability is being delivered to WUGs as part of the WMS or an existing source's availability is being increased or decreased through the WMS. For example, a WMS can be added that reallocates an existing reservoir's conservation pool to increase the amount of supply that could be delivered to WUGs. See Section 5.1.1.7 for more information on relating sources with a status of 'both' to a WMS. Existing availability for sources with a status of 'both'

will be entered in the DB27 Sources module the same as 'existing' sources and can be allocated to WUGs as either existing supplies or through a WMS having a *WMS Source Use Type* of 'Existing Availability'. Future availability will be entered once the source is related to a WMS having a *WMS Source Use Type* of 'Availability Increase' (as with 'future' sources). See Sections 3.3–3.5 for additional information regarding existing source availability by source type.

3.2 Water Quality

The salinity and impacts to water supply data values are collected for each *Source Subtype*. Salinity is collected for existing sources and future sources, but the impacts to water supply value is only collected for sources with a status of 'existing' or 'both.'

3.2.1 Salinity

The DB27 Sources module field, *Is this source generally considered brackish or saline?,* indicates whether the source availability is considered 'fresh' (less than 1,000 mg/L), 'brackish' (1,000 to 10,000 mg/L), 'saline' (10,001 to 34,999 mg/L), or 'seawater' (35,000 mg/L or greater). Sources can also be labeled as 'fresh/brackish' or 'brackish/saline' if a combination of the salinity types is appropriate. The default value for the salinity field is 'fresh.' Once a source request is approved, a request must be sent to the TWDB WSSA team to change the salinity value of the source.

3.2.2 Impacts to Source Availability

For the sixth cycle of planning, the phrasing of the data collection field previously labeled "Was total availability reduced due to water quality conditions?" has been updated to "Does this source's water quality limit its use by a water use category? If so, please briefly explain water quality issues and WUG limitations in the source availability comments section." The person entering data will choose "Y" or yes to indicate that the source has water quality issues that must be addressed if one or more WUG types want to use the source. Examples of water quality issues that could impact the use of the source by WUG type categories are salinity, nitrates, arsenic, hydrocarbons, and radionuclides. Even though a WUG may already be addressing the water quality issue through treatment, it is still necessary to answer "Y." If the source has no known water quality issues, then select "N" or no.

3.3 Surface Water Source Type

The following *Source Subtypes* are categorized under the *Source Type* 'Surface Water' in the DB27 Sources module. Data related to these *Source Subtypes* will be grouped under the surface water heading in the 2027 SWP. Under each *Source Subtype* heading is a list of data entry fields found in the Edit Source Details page of the DB27 Sources module and information on how to provide the required data.

3.3.1 Run-of-River Source Subtype

Water right permits that allow users to divert water directly from a river or stream are entered as a 'Run-of-River' *Source Subtype*. This *Source Subtype* does not include reservoir, off-channel reservoir, ASR, or reuse related water volumes. When a run-of-river supply contributes to the water volumes associated with those other *Source Subtypes*, this supply must be entered as the source it is contributing to, using appropriate labeling as described in Sections 3.3–3.5. The following data fields are collected for sources labeled as 'Run-of-River':

- Source Name: A run-of-river source's name is the concatenation of the basin it is in and the text 'Run-of-River.' For example, a run-of-river source associated with the Canadian River Basin will have the name 'Canadian Run-of-River.'
- Source Details: The *Source Details* field provides additional information about the water rights included with the surface water source. When the run-of-river source is associated with a single water right, the *Source Detail* value should begin with 'Single, then a forward slash '/'and a brief description of the water right name. When the run-of-river source contains multiple water rights, the *Source Detail* value should begin with 'Multiple, then a forward slash '/' and a brief description of the water right grouping. For example, a grouping of agriculture water rights would be entered as 'Multiple/Agricultural Water Rights.'
- Source Region, County, & Basin: When selecting a planning region, county, and basin for this *Source Subtype*, they should represent the location of the run-of-river diversion.
- Methodology used to determine availability volumes: Select the methodology value that best represents how the source availability was determined when the source has a source status of 'existing' or 'both.' See Section 3.1 for more information on how the Source Status is chosen. The most common methodology values for a run-of-river source are 'WAM Run 3' or 'WAM Run 3 Modified'. For a complete list of acceptable values by *Source Subtype*, see Appendix 2. Certain methodology values require additional comments, please enter them into the methodology value comments box. For guidance on surface water availability modeling, see Exhibit C Section 2.3.1.
- Total Availability: The *Total Availability* column represents the existing firm diversion water volume in acre-feet for each planning decade. Future availability developed through a WMS should be entered as an Availability Increase WMS. See Section 5.1.1.7 and Section 5.1.2 for information on how to enter an Availability Increase WMS and its WMS supply.
- Source Comments: Comment fields are provided for both the source level and the source availability level. For sources with a subtype of 'run-of-river,' use the source availability comments field to provide a more detailed description of the water rights included with the source which can include the ownership, water right number, permit diversion, and type of usage.

3.3.2 Reservoir Source Subtype

Sources that have a *Source Subtype* of 'Reservoir' represent a single reservoir that is not included in a reservoir system. If a future reservoir is built and combined with a system, it must start out as a single future reservoir and then it can be combined with a system once it is online and ready for use. See Section 5.1.2 for more information on how to add future reservoirs to a strategy.

All reservoirs that provide water supply must be included in DB27 even if they have zero firm availability. Reservoirs with zero firm availability should relate to the WUGs demonstrating that the WUG relies upon the reservoir when its supply is available.

When water is stored in a reservoir, it is labeled as a surface water reservoir in the database even if the origin of the stored water is a different *Source Subtype*. For example, when water is pumped from a run-of-river during a period of high streamflow and used as the source water of an off-channel reservoir, the reservoir must be entered in the database along with information regarding the origin of the reservoir's water supply in the source detail field, rather than linking the entities using the reservoir's supply to the run-of-river source record. Reuse supply contributing to a reservoir or reservoir system must be entered as a separate source record and the reuse source's source detail field will include a reference to the reservoir or system to which it is contributing. The indirect reuse supply that contributes to the reservoir is entered as a separate indirect reuse source record and will reference the reservoir it is contributing to

in the source detail field. The reservoir source will also note the indirect reuse that is contributing to it in its source detail field.

It is important that all new reservoirs are added as a reservoir source record in the DB27 application and associated with the WMS and WMSP that will construct the new reservoir. During Texas legislative sessions, the TWDB is often asked for a list of existing and proposed reservoirs and their attributes. When a WMS is associated with a reservoir project, but the source of the water added to the WMS is not a reservoir, the data is difficult to query and analyze, which is why it is important to standardize these *Source Subtypes*.

The following fields are collected for sources labeled as 'Reservoir':

- Source Name: A reservoir's source name is the concatenation of the name of the reservoir and the text 'Lake/Reservoir.' For example, Lake Meredith will have the name 'Meredith Lake/Reservoir.
- Source Detail: The source details field must provide additional information regarding the reservoir and the origin source of the water supply. For example, if indirect reuse contributes to the reservoir, indirect reuse and the producer of the reuse supply should be noted as "Indirect Reuse:" and name of reuse producer after the colon.
- Source Region, County, & Basin: Since reservoir sources can exist in multiple counties, the county field value, 'reservoir' was created and should be selected for all reservoirs. The region should reflect the planning region that the reservoir is primarily located in, and the basin should reflect the basin that it is located in. For example, the geographic area of the Palo Duro Reservoir is labeled as Region 'A,' 'Reservoir' County, and 'Canadian' Basin.
- Methodology: Select the *Methodology* value that best represents how the source availability was determined when the source has a source status of 'existing' or 'both.' See Section 3.1 for more information on how the Source Status is chosen. The most common methodology values for a reservoir source are 'Water Availability Model (WAM) Run 3' or 'WAM Run 3 Modified'. For a complete list of acceptable values by *Source Subtype*, see Appendix 2. Certain Methodology values require additional comments, please enter them into the methodology value comments box. For guidance on surface water availability modeling, see Exhibit C Section 2.3.1.
- Total Availability: The *Total Availability* column represents the existing reservoir availability in acre-feet for each planning decade. *Total Availability* will represent firm availability unless a hydrologic variance request is granted. If a hydrologic variance is granted, the total availability will represent the modeled availability based on the approved hydrologic variance request. When a reservoir is labeled as an off-channel reservoir and its *Total Availability* water volumes are being deducted from a run-of-river's firm availability, then the related run-of-river *Total Availability* must be reduced to show the movement of water volume from the run-of-river source to the off-channel reservoir in the DB27 application. If the off-channel storage does not rely on the firm portion of the run-of-river water right, then the run-of-river firm availability does not need to be reduced to account for the off-channel reservoir's availability. When entering off-channel reservoir future availability as part of a WMS, see Section 5.1.2 for information on how to enter its future availability and WMS supplies. See Section 5.1.1.7 for information on how to enter a future availability associated with an existing reservoir.
- Firm Availability: If a hydrologic variance request is approved and the *Total Availability* does not represent the firm availability, firm availability must also be entered for the reservoir. To enter existing firm availability related to the reservoir, select the 'N' value on the field*, Is total availability based on firm yield?* and click the **Update** button on the Edit Source Details page of the DB27 Sources module for the specified reservoir. A Firm Yield decadal water volume column

will then be displayed for each planning decade and must be filled out. Please specify in the methodology comments field additional information regarding the hydrologic variance request including the TWDB Executive Administrator approval date and a brief description such as 'addition of return flows' or 'reservoir safe yield.' For a complete list of examples from past plans of potentially appropriate surface water modeling assumptions for RWP development, see Exhibit C Section 2.3.5.1.

- Conservation Pool: Source *Conservation Pool* capacity values are based upon the reservoir's most recent hydrographic survey and are entered in acre-feet.
- Is this reservoir or reservoir component of this system associated with a federal facility, or water right owned or controlled by a federal agency (e.g., dam owned, or reservoir operated by a federal agency)?: The default value for this field is 'N.' If the reservoir is associated with a federal agency, then the field should be updated to 'Y.'
- Source Comments: Comment fields are provided at both the source level and the source availability level. These fields should include any additional information about the reservoir and its source availability. If the reservoir is a future only source, please include all counties that the reservoir is located in.
- Reservoir Major/Minor Designation: In the DB27 database, all reservoirs will be labeled as 'major' or 'minor'. A major reservoir is defined as an impoundment with a storage capacity of at least 5,000 acre-feet at its normal operating level when it was originally permitted. A minor reservoir is defined as having less than 5,000 acre-feet of storage capacity at its normal operating level when it was originally permitted. Reservoirs will be labeled as 'major' or 'minor' by the TWDB WSSA team in a database table that contains a list of DB27 reservoirs. When a new reservoir is requested, please provide this information in the source request comment box, and the TWDB WSSA team will make sure that the reservoir is correctly labeled.
- Off-Channel Reservoir Designation: When a reservoir is located off the main stem of the river and contains water from a river or stream that is diverted for off-channel storage, this field will be labeled 'Y' by the TWDB WSSA team in a database table that contains a list of DB27 reservoirs. When a new reservoir is requested, please include a note stating that the requested reservoir is considered off-channel in the source request comment box, and the TWDB WSSA team will make sure that the reservoir is correctly labeled.

3.3.3 Reservoir System Source Subtype

When multiple reservoirs are operated together as a reservoir system and they meet the criteria listed in Exhibit C Section 2.3.2, they will have the *Source Subtype* 'RESERVOIR SYSTEM.' All reservoir systems must be approved by TWDB staff. If a new reservoir system is being created, contact WSSA staff and they will assist with entering the system's data into DB27. All existing reservoirs that contribute to the system must be represented even if they have zero firm yield associated with them. Future reservoirs associated with a WMS must be shown as individual reservoirs until they are established. See section 3.3.2 for more information on reservoir records. If multiple reservoirs are being developed as part of future system, then they must be shown separately and can be grouped as part of a WMS or WMS group. See Section 5.1.2 for more information on how to set up an availability increase strategy for new reservoir sources. Once established, they can then be combined as a system source. Reuse supply contributing to a reservoir or reservoir system must be entered as a separate source record and the reuse source's source detail field will include a reference to the reservoir or system to which it is contributing. The following fields are collected for sources labeled as 'Reservoir System':

- Source Name: A reservoir system's source name is the concatenation of the name of the system and the text 'Lake/Reservoir System. For example, the Highland lakes system will have the name 'Highland Lake/Reservoir system.'
- Source Detail: The source details field must provide additional information regarding the reservoirs and their origin source of water supply. For example, if indirect reuse contributes to a reservoir, indirect reuse and the producer of the reuse supply should be noted as "Indirect Reuse:" and name of reuse producer after the colon.
- Source Region, County, & Basin: Since system sources can cross multiple counties, the county field value, 'reservoir' was created and should be selected for each reservoir system source. The region should reflect the planning region that the reservoir system is primarily located in, and the basin should reflect the basin in which it is located. For example, the geographic area of the Highland Lakes Reservoir System is labeled as Region 'K,' 'Reservoir' County, and 'Colorado' Basin.
- Methodology: Select the methodology value that best represents how the source availability was determined when the source has a source status of 'existing' or 'both.' See Section 3.1 for more information on how the Source Status is chosen. The most common methodology values for a reservoir system source are 'Water Availability Model (WAM) Run 3 or WAM Run 3 Modified. For a complete list of acceptable values by *Source Subtype*, see Appendix 2. Certain Methodology values require additional comments, please enter them into the methodology value comments box. For guidance on surface water availability modeling, see Exhibit C Section 2.3.1.
- Total Availability: The *Total Availability* column represents the existing reservoir system availability including any system gains in acre-feet for each planning decade. *Total Availability* will represent firm availability unless a hydrologic variance request is granted. If a hydrologic variance is granted, the total availability will represent the modeled availability based on the approved hydrologic variance request. When entering reservoir system future availability as part of a WMS such as a system operations update, see Section 5.1.1.7 and Section 5.1.2 for information on how to enter its future availability and WMS supplies.
- Firm Availability: If a hydrologic variance request is approved and the *Total Availability* does not represent the firm availability, firm availability must still be entered for the reservoir system. To enter existing firm availability related to the reservoir system, select the 'N' value on the field, *Is total availability based on firm yield?*, and then click the **Update** button on the Edit Source Details page of the DB27 Sources module. A Firm Yield decadal water volume column will then be displayed for each planning decade and must be filled out. Please specify, in the methodology comments field, additional information regarding the hydrologic variance request including the TWDB Executive Administrator approval date and a brief description such as 'reservoir system operations.' For a complete list of examples from past plans of potentially appropriate surface water modeling assumptions for RWP development, see Exhibit C Section 2.3.5.1.
- Conservation Pool: The *Conservation Pool* capacity value for each of the reservoirs that makes up the reservoir system must be entered. Source *Conservation Pool* capacity values are based upon the reservoir's most recent hydrographic survey and are entered in acre-feet.
- Is this reservoir or reservoir component of this system associated with a federal facility, or water right owned or controlled by a federal agency (e.g., dam owned, or reservoir operated by a federal agency)?: The default value for this field is 'N.' If the reservoir is associated with a federal agency, then the field should be updated to 'Y.'

- Source System Firm Availability: The source system availability fields represent the firm availability of each of the reservoirs that make up the system in acre-feet for each planning decade. *It is no longer required that RWPGs determine the firm yield of the individual reservoirs that are combined into a system source. If firm yield data will not be entered for the system's reservoirs or if the firm yield of a specific system reservoir is not known, please leave its associated decadal fields blank.*
- Source Comments: Comment fields are provided at both the source level and the source availability level. These fields should include any additional information about the reservoir system and its source availability.
- Reservoir Major/Minor Designation: All reservoirs associated with the system will be labeled as 'major' or 'minor.' A major reservoir is defined as an impoundment with a storage capacity of at least 5,000 acre-feet at its normal operating level when it was originally permitted. A minor reservoir is defined as having less than 5,000 acre-feet of storage capacity at its normal operating level. Reservoirs will be labeled as 'major' or 'minor' by the TWDB WSSA team. When a new reservoir is requested, please provide this information in the source request comment box and the TWDB WSSA team will make sure that the reservoir is correctly labeled.
- Off-Channel Reservoir Designation: When a reservoir reported as part of a system is located off the main stem of the river and contains water from a river or stream that is diverted for off-channel storage, this field will be labeled 'Y' by the TWDB WSSA team in a database table that contains a list of DB27 reservoirs. When a new reservoir is requested, please include a note stating that the requested reservoir is considered off-channel in the source request comment box, and the TWDB WSSA team will make sure that the reservoir is correctly labeled.

3.3.4 Livestock Local Supply Source Subtype

Livestock local supply sources represent limited, unnamed individual surface water supplies that are available only for use by livestock WUGs. The following fields are collected for sources with a *Source Subtype* label of 'Livestock Local Supply':

- Source Name: A livestock local supply source name is the concatenation of the river basin the source is in and the text 'Livestock Local Supply.' For example, a livestock local supply source found in the Brazos River Basin will have the name 'Brazos Livestock Local Supply.'
- Source Detail: The source detail field is available to provide additional information regarding the livestock local supply source.
- Source Region, County, & Basin: When selecting a planning region, county, and basin for this *Source Subtype*, they should represent the location of the livestock local supply source.
- Methodology: Select the methodology value that best represents how the source availability was determined when the source has a source status of 'existing' or 'both.' See Section 3.1 for more information on how the Source Status is chosen. The most used methodology value for a 'livestock local supply' source is 'Published Reports/Data.' For a complete list of acceptable values by *Source Subtype*, see Appendix 2. If additional comments are required for the chosen methodology type, please enter them into the methodology value comments box.
- Total Availability: The *Total Availability* column represents the existing firm livestock local supply volume in acre-feet for each planning decade. Future availability developed through a WMS should be entered as an availability increase WMS. See Section 5.1.1.7 and Section 5.1.2 for information on how to enter an availability increase WMS and its WMS supplies.
- Source Comments: Provide information on how the source's availability will be estimated and the origin of the water (if available).

3.3.5 Other Local Supply Source Subtype

Other local sources represent limited, unnamed individual surface water supplies that are available only for **non-Municipal** WUGs other than livestock. In past planning cycles "other local supply" was used to account for recycled industrial supply from mining or manufacturing. For the sixth cycle of planning, we now have a reuse source subtype that will be used for that category of supply. See Section 3.5.3 for more information on the new source subtype category. The following fields are collected for sources with a *Source Subtype* label of 'Other Local Supply':

- Source Name: An 'other local supply' source name is the concatenation of the river basin the source is in and the text 'Other Local Supply.' For example, an 'other local supply' source found in the Red River Basin will have the name 'Red Other Local Supply.'
- Source Detail: The source detail field must contain information describing what the other local supply represents.
- Source Region, County, & Basin: When selecting a planning region, county, and basin for this *Source Subtype*, they should represent the location of the other local supply source.
- Methodology: Select the methodology value that best represents how the source availability was determined when the source has a source status of 'existing' or 'both.' See Section 3.1 for more information on how the Source Status is chosen. The most used methodology value for an 'other local supply' source is 'Published Reports/Data.' For a complete list of acceptable values by *Source Subtype*, see Appendix 2. If additional comments are required for the chosen methodology type, please enter them into the methodology value comments box.
- Total Availability: The *Total Availability* column represents the existing firm other local supply volume in acre-feet for each planning decade. Future availability developed through a WMS should be entered as an availability increase WMS. See Section 5.1.1.7 and Section 5.1.2 for information on how to enter an availability increase WMS and its WMS supplies.
- Source Comments: Provide information on how the source's availability will be estimated and the origin of the water (if available). Provide information about the user(s) of the water supply.

3.3.6 Rainwater Harvesting Source Subtype

Rainwater harvesting sources represent the collective benefits of rainwater and/or stormwater catchment systems currently used or being planned for within the region, county, and basin area the system is located in. In DB27, rainwater harvesting is the capture and storage of rainwater and/or stormwater for uses such as landscape irrigation, livestock, potable and non-potable indoor use, manufacturing, and storm water abatement. Rainwater harvesting water supply collected and used to add additional water to aquifers should be entered as a groundwater source if considered firm supply. See Sections 3.4.1.4 and 3.4.2 for more information. Rainwater collected in ponds and lakes that do not meet the minor or major reservoir criteria should be entered as livestock local supply or other local supply firm supply. See Section 3.3.4 and Section 3.3.5 for more information. Rainwater that enters a state water course should be labeled as reservoir or run-of-river supply. Source availability associated with the 'rainwater harvesting' *Source Subtype* represents water that is collected through a system in a containment basin or tank. The following fields are collected for sources with a *Source Subtype* label of 'Rainwater Harvesting':

- Source Name: 'rainwater harvesting' source name is the concatenation of the river basin the source is in and the text 'Rainwater Harvesting.' For example, a 'rainwater harvesting' source found in the Sulphur River Basin will have the name 'Sulphur Rainwater Harvesting.
- Source Detail: The source detail field should represent the intended method of use. For example, 'Landscape Irrigation,' 'Potable Use,' or 'Storm Water Abatement.'

- Source Region, County, & Basin: When selecting a planning region, county, and basin for this *Source Subtype*, they should represent the location of the rainwater harvesting system(s) source.
- Methodology: Select the methodology value 'Other' and in the comments field add information about how the total availability was determined when the source has a source status of 'existing' or 'both.' See Section 3.1 for more information on how the Source Status is chosen.
- Total Availability: The *Total Availability* column represents the firm existing rainwater harvesting supply volume in acre-feet for each planning decade. Future availability developed through a WMS should be entered as an availability increase WMS. See Section 5.1.1.7 and Section 5.1.2 for information on how to enter an availability increase WMS and its WMS supplies.
- Source Comments: Provide information on how the source's availability will be estimated, and the rainwater collection system used (if available).

3.3.7 Gulf of Mexico Source Subtype

'Gulf of Mexico' sources represent seawater desalination plants, which process seawater typically containing total dissolved solids of 35,000 milligrams per liter or greater. Each 'Gulf of Mexico' source should represent a single desalination plant. The following fields are collected for sources with a *Source Subtype* label of 'Gulf of Mexico':

- Source Name: 'Gulf of Mexico' will be the source name for each 'Gulf of Mexico' source.
- Source Detail: The name of the desalination plant that produces the water supply will be included in the source detail field. If a region has more than one seawater desalination plant, a Gulf of Mexico source should be created for each plant having the same Source Name, Source Region, Source County, and Source Basin. The Source Detail value distinguishes each desalination plant and the water volumes that it makes available.
- Source Region, County, & Basin: A 'Gulf of Mexico' source has been added to the DB27 database for each region that borders the Gulf of Mexico (Regions: H, K, L, M, and N). The county name and basin name for 'Gulf of Mexico' sources will also be 'Gulf of Mexico.'
- Methodology: Select the methodology value that best represents how the source availability was determined when the source has a source status of 'existing' or 'both.' See Section 3.1 for more information on how the Source Status is chosen. For a complete list of acceptable values by *Source Subtype*, see Appendix 2. If additional comments are required for the chosen methodology type, please enter them into the methodology value comments box.
- Total Availability: The *Total Availability* column represents the existing Gulf of Mexico supply made available through the desalination plant in acre-feet/year for each planning decade. Future availability developed through a WMS should be entered as an availability increase WMS. See Section 5.1.1.7 and Section 5.1.2 for information on how to enter an availability increase WMS and its WMS supplies.
- Source Comments: Provide information on how the source's availability will be estimated.

3.3.8 Atmosphere Source Subtype

The 'Atmosphere' *Source Subtype* represents only supply made available through weather modification. Atmosphere sources are created so that they can be related to WMS to reflect the potential water produced through weather modification. Weather modification sources are considered a future source whose supplies can only be made available through a WMS. See Section 5.1.2 for more information on how to enter a future source WMS. The following fields are collected for sources with a *Source Subtype* label of 'Atmosphere':

- Source Name: The source name for atmosphere source is 'Weather Modification.'
- Source Region, County, & Basin: When the source is 'Weather Modification,' the region will represent the region sponsoring the weather modification WMS. County and Basin will have a value of 'ATMOSPHERE' since a precise county and basin is difficult to determine. For example, the geographic area of a Region A 'Atmosphere' source is labeled as Region 'A,' 'Atmosphere' County, and 'Atmosphere' Basin.
- Source Detail: The source detail field is available to provide additional information regarding the atmosphere source.
- Methodology: Methodology is not collected for future only sources. Information regarding the WMS associated with the weather modification source will be provided in the WMS module.
- Total Availability: Since weather modification is a future source, the *Total Availability* will not be collected in the DB27 Sources Module. Instead, the potential increase in firm supply will be entered with the WMS that the source is associated with. Future availability developed through a WMS should be entered as an availability increase WMS. See Section 5.1.2 for information on how to enter an availability increase WMS and its WMS supplies.
- Source Comments: Provide additional information about how the water will be estimated.

3.4 Groundwater Source Type

The following *Source Subtypes* are categorized under the *Source Type,* 'groundwater' in the DB27 Sources module. Data related to these source subtypes will also be grouped under the groundwater heading in the 2027 SWP. Under each *Source Subtype* heading is a list of data entry fields found in the Edit Source Details page of the DB27 Sources module and information on how to provide the required data.

3.4.1 Conventional Groundwater Source Subtype

The *Source Subtype* 'conventional groundwater' supply category includes groundwater that is naturally occurring and does not include water that is being stored as part of an ASR project. Sources with a subtype of 'conventional groundwater' may have limited source availability depending upon their adopted desired future condition (DFC) and associated modeled available groundwater (MAG) volume. 'Groundwater' *Source Subtypes* are further divided into three categories based on the methodology used to determine their total available water volumes: 'MAG,' 'RWPG-Estimated Groundwater Availability (Non-MAG Availability),' and 'Partial MAG.' The following fields are collected for sources with a *Source Subtype* of 'Groundwater':

- Source Name: A *Source Subtype* 'groundwater' source name is the concatenation of the aquifer name and the text 'Aquifer. For example, a groundwater source associated with the Dockum Aquifer will have the name 'Dockum Aquifer.' If the source is considered an 'Other Aquifer' source, which represents any aquifer not designated as major or minor, the source name will be entered as just 'Other Aquifer.'
- Source Detail: The detail field may be left empty, but it can also contain information such as formation description or other text that helps describe the aquifer.
- Source Region, County, & Basin: The region, county, and basin values will represent the geographic location of the groundwater.
- Other Aquifer: If the source is considered an 'Other Aquifer' source, which represents an aquifer not designated as major or minor, this field will contain text describing the groundwater formation.

- Source Comments: Comment fields are provided at both the source level and the source availability level. These fields should include any additional information about the groundwater source and its source availability. For the sixth cycle of planning, if a source intersects with a brackish groundwater production zone, the zone(s) will be noted in the source comments field.

3.4.1.1 Modeled Available Groundwater (MAG) Availability

Sources designated as a 'MAG' have total available water volumes that are based on the DFCs of the aquifer. For more information regarding DFCs, see Exhibit C Section 2.3.4. Groundwater sources with MAGs and the available water volumes are entered into the DB27 database by the TWDB WSSA team. Specific information should be provided, as necessary, for the following fields when the 'groundwater' subtype source is considered a MAG:

- Methodology: When a groundwater source is considered a 'MAG,' then the methodology value 'Modeled Available Groundwater (MAG)' will be prepopulated. If a groundwater hydrologic variance, such as a requested MAG Peak Factor, has been approved for the MAG, please provide information regarding the request including the TWDB Executive Administrator approval date in the methodology comments field.
- Total Availability: The *Total Availability* column represents the MAG volume associated with the source multiplied by the source's MAG Peak Factor (if applicable) for each planning decade in acre-feet/year.
- MAG Availability: The MAG availability field represents the MAG volume associated with the source in acre-feet/year for each planning decade. This data can only be edited by the TWDB WSSA team. See Exhibit C Section 2.3.4 for information regarding MAG availability.
- MAG Peak Factor: The MAG Peak Factor field represents the approved MAG Peak Factor value (if applicable) by planning decade. This data can only be edited by the TWDB WSSA team. When a MAG Peak Factor is not applied to a planning decade, a value of '1.0000' will be entered. See Exhibit C Section 2.3.5.2 for information regarding the MAG Peak Factor.

3.4.1.2 RWPG-Estimated Groundwater Availability (Non-MAG Availability)

Sources designated as 'RWPG-Estimated Non-MAG' represent aquifers or portions of an aquifer where no DFC has been adopted. It is the discretion of the region to determine the groundwater availability associated with these sources. For the sixth cycle of planning, DFC-compatible water volumes will be entered by WSSA staff when available and documented in the source availability comments field. RWPGs are encouraged to use the DFC-compatible water volumes entered, but not required to use them. See Exhibit C Section 2.3.4.2 for information regarding availability for non-relevant aquifers. Specific information should be provided, as necessary, for the following fields when the 'groundwater' subtype source is considered RWPG-Estimated Non-MAG:

- Methodology: When a groundwater source is considered a 'RWPG-Estimated Non-MAG,' commonly used methodology values are 'Groundwater Availability Model (GAM), 'Published Reports/Data,' and 'Permitted Amount.' If additional comments are required for the chosen methodology type, please enter them into the methodology value comments box.
- Total Availability: The *Total Availability* field represents either the DFC-compatible water volumes or the existing RWPG-Estimated Non-MAG availability in acre-feet/year for each planning decade.

3.4.1.3 Partial MAG Availability

Sources designated as 'Partial MAG' represent sources where a portion of its region, county, and basin geographic area has an adopted DFC, but the remainder of the source area does not. These sources will have both MAG volumes that represent the portion of the source with the adopted DFC and may also

have related RWPG-Estimated Non-MAG water volumes which can represent part of an aquifer, or an aquifer layer designated non-relevant. The MAG volumes will be entered by the TWDB WSSA team, and the RWPG is responsible for entering the RWPG-Estimated Non-MAG portion of the total available water volume associated with the source. For the sixth cycle of planning, DFC-compatible water volumes will be entered when available and documented in the source availability comments field. Specific information should be provided, as necessary, for the following fields when the 'groundwater' subtype source is considered Partial MAG:

- Methodology: When a groundwater source is considered a 'partial MAG,' the methodology value 'other' is the most used. This value allows the RWPG consultant to provide more information regarding the methodology used in the Methodology Comments field.
- Total Availability: The *Total Availability* column represents the sum of the MAG volume associated with the source multiplied by the source's approved MAG Peak Factor value (if applicable) and the RWPG-Estimated Non-MAG availability for each planning decade in acre-feet/year.
- MAG Availability: The MAG availability field represents the MAG value associated with the source in acre-feet/year for each planning decade. This data can only be edited by the TWDB WSSA team. See Exhibit C Section 2.3.4 for information regarding MAG availability.
- MAG Peak Factor: The MAG Peak Factor field represents the approved MAG Peak Factor value (if applicable) by planning decade. This data can only be edited by the TWDB WSSA team. When a MAG Peak Factor is not applied to a planning decade, a value of '1.0000' will be entered. See Exhibit C Section 2.3.4.1 for information regarding the MAG Peak Factor.
- Non-MAG Availability: The Non-MAG availability field represents either the DFC-compatible water volumes or the existing RWPG-Estimated Non-MAG availability in acre-feet/year for each planning decade.

3.4.1.4 Aquifer Recharge Availability

Intentional aquifer recharge (AR) typically takes place when water is added to infiltration basins or spread across a permeable surface to replenish water in an aquifer. If a source with a *Source Subtype* of 'conventional groundwater' is currently benefitting from AR, its total firm available water volumes should reflect the benefits of the AR project. The source availability comments section should include notes that AR is taking place over the aquifer's area, information about the methodology used to validate that the supply added is firm, and the origin source's description. If the conventional aquifer has MAG availability associated with it, the firm availability associated with the AR project can only be shown if the groundwater management area includes the AR project in its modeling.

When reuse is accounted for in intentional AR, the supply should be shown with the groundwater source and the reuse supply should be noted in the groundwater source detail field as "Indirect Reuse:" and name of reuse producer after the colon. If AR is occurring as part of a WMS that will increase the *Total Availability* of an existing groundwater source once the WMS is implemented, then see Section 5.1.1.7 for more information on how to set up an availability increase WMS that uses AR. If intentional AR is being shown with a strategy, the reuse supply will be shown as the increase in groundwater availability rather than it being shown as a separate reuse source to ensure that the supply amounts are not duplicated. However, the intentional AR strategy supply should contain notes explaining that reuse is involved with the AR.

3.4.2 Aquifer Storage & Recovery Source Subtype

The *Source Subtype* 'Aquifer Storage and Recovery' (ASR) represents "a project involving the injection of water into a geologic formation for the purpose of subsequent recovery and beneficial use by the

project operator" according to the TWC § 27.151 (1). ASR sources should be treated as a separate source from aquifer supplies in the same geologic formation that it is in because the water being added is accounted for separately from the existing conventionally stored groundwater availability. Each ASR source record should represent an ASR project site. The ASR site covers all groundwater wells required to inject and recover the supply.

Unlike how indirect reuse is handled with run-of-river and reservoir sources in the DB27 application, when indirect reuse contributes to an existing or future ASR project, the indirect reuse supply is shown with the ASR source record's availability and not entered as a separate indirect reuse. If a portion of the total reuse supply is used without being stored in the ASR project and the rest is stored, then the portion not injected will be shown with an indirect reuse source and the remainder of the reuse supply which is stored in the ASR project, will be allocated to the ASR source's availability. Indirect reuse and the producer of the reuse supply will be noted in the ASR source detail field. If a desalinated source is injected into an ASR project, the availability should be shown with the ASR source and the strategy will be labeled 'Aquifer Storage and Recovery.' The use of desalinated supply as part of the project will be noted in the source availability comments field.

If ASR is occurring as part of a WMS that will increase the *Total Availability* of an existing groundwater source once the WMS is implemented, then see Section 5.1.1.7 for more information on how to set up an availability increase WMS that uses ASR. For future only ASR source records, any associated reuse supply will be shown with the ASR source's availability water volumes rather than shown as a separate reuse source record as is with existing ASR projects.

The following fields are collected for sources labeled as 'Aquifer Storage & Recovery':

- Source Name: A *Source Subtype* 'aquifer storage & recovery' source name is the concatenation of the aquifer name and the text 'Aquifer ASR.' For example, an ASR source associated with the Sparta Aquifer will have the name 'Sparta Aquifer ASR.'
- Source Detail: The source detail field should list one or more sources that represent the origin of the ASR water supply. If the origin source is a reservoir, then include the name of the reservoir as listed in DB27. If the origin source is a run-of-river, then include the concatenation of the basin it is in and the text 'Run-of-River.' If the origin source is another groundwater source, then include the concatenation of the aquifer name and the text 'Aquifer' and note if the supply is being desalinated. If the origin source is reuse, then include the concatenation of the producer's name and the text 'Reuse.' When multiple sources are listed, use a semi-colon to separate them.
- Source Region, County, & Basin: The region, county, and basin values will represent the geographic location of the groundwater ASR project.
- Methodology: Select the methodology value that best represents how the source availability was determined when the source has a source status of 'existing' or 'both.' See Section 3.1 for more information on how the Source Status is chosen. For a complete list of acceptable values by *Source Subtype*, see Appendix 2. If additional comments are required for the chosen methodology type, please enter them into the methodology value comments box.
- Total Availability: The *Total Availability* column represents the existing firm ASR supply volume in acre-feet/year for each planning decade. Future availability developed through a WMS should be entered as an availability increase WMS. See Section 5.1.1.7 and Section 5.1.2 for information on how to enter an availability increase WMS and its WMS supplies.
- Source Comments: Comment fields should contain information on the ASR facility including name, the permit required for the water that is being injected (if applicable), and information about how the source availability is estimated.

3.5 Reuse Source Type

The following *Source Subtypes* are categorized as 'reuse' in the DB27 Sources module. Data related to these *Source Subtypes* will also be grouped under the reuse heading in the 2027 SWP. Under each *Source Subtype* heading is a list of data entry fields found in the Edit Source Details page of the DB27 Sources module and information on how to provide the required data. See Exhibit C Section 2.3.3 for additional information regarding reuse sources.

3.5.1 Direct Reuse (Potable/Non-Potable)

Direct reuse has two related *Source Subtypes*: 'Direct Potable Reuse' and 'Direct Non-Potable Reuse.' Direct non-potable reuse is the beneficial use of reclaimed water that is piped directly from the wastewater treatment plant to where it is used. Direct potable reuse is the introduction of treated reclaimed municipal wastewater either: (1) directly into a public water system or (2) into a raw water supply immediately before the water enters a drinking water treatment plant (Health and Safety Code §341.0391). When choosing which *Source Subtype* to use, assign the potable status of the water based on its intended use. For example, if the direct reuse source will be used for just irrigation, then it will most likely require the 'Direct Non-Potable Reuse' *Source Subtype*. If the direct reuse source is intended for municipal use such as drinking water or potable use, then it will require the 'Direct Potable Reuse' *Source Subtype*. The following fields are collected for sources labeled as 'Direct Potable Reuse' and 'Direct Non-Potable Reuse':

- Source Name: All direct reuse sources will be named 'Direct Reuse.'
- Source Region, County, & Basin: The region, county, and basin values will represent the geographic location of the associated wastewater treatment plant.
- Source Detail: The source detail field will include the reuse producer's name and a forward slash '/' followed by the name of the recipient of the reuse water. For example, if the City of Gainesville is producing direct reuse that will be provided to an irrigation WUG in Cook County, the Source Detail would be entered as 'Gainesville/Irrigation, Cook.'
- Methodology: Select the methodology value that best represents how the source availability was determined when the source has a source status of 'existing' or 'both.' See Section 3.1 for more information on how the Source Status is chosen. For a complete list of acceptable values by *Source Subtype*, see Appendix 2. If additional comments are required for the chosen methodology type, please enter them into the methodology value comments box.
- Total Availability: The *Total Availability* column represents the direct reuse availability in acre-feet/year for each planning decade. Future availability developed through a WMS should be entered as an availability increase WMS. See Section 5.1.1.7 and Section 5.1.2 for information on how to enter an availability increase WMS and its WMS supplies.
- Source Comments: For direct non-potable sources, provide a description of the reuse water supply's end use (examples include landscape, irrigation, and cooling). Also note whether the use of the reclaimed water is considered Type I (likely to come in contact with humans) or Type II (unlikely to come in contact with humans).

3.5.2 Indirect Reuse (Potable/Non-Potable)

Indirect reuse is the beneficial use of reclaimed water that is discharged to a water supply source such as a river, stream, or aquifer and then diverted and used again. Indirect reuse has two related *Source Subtypes*: 'Indirect Potable Reuse' and 'Indirect Non-Potable Reuse.' When choosing which *Source Subtype* to use, assign the potable status of the water based on its intended use. For example, if the indirect reuse source will be used for just irrigation, then it will most likely require the 'Indirect Non-

Potable Reuse' *Source Subtype*. If the indirect reuse source is intended for municipal use such as augmenting a water supply source, then it will require the 'Indirect Potable Reuse' *Source Subtype*.

When an indirect reuse supply contributes to future or existing ASR or AR projects, the reuse supply will be shown with the ASR or groundwater source that is benefiting from the recharge instead of being tracked separately as a reuse source. The following fields are collected for sources labeled as 'Indirect Potable Reuse' and 'Indirect Non-Potable Reuse':

- Source Name: All indirect reuse sources will be named 'Indirect Reuse.'
- Source Region, County, & Basin: The region, county, and basin values will represent the geographic location of indirect reuse diversion.
- Source Detail: The source detail field will include the reuse producer's name and a forward slash '/' followed by the receiving body of water. For example, if the City of Dallas is producing indirect reuse that is added to Lake Lewisville, the Source Detail would be entered as 'DWU/Lake Lewisville.'
- Methodology: Select the methodology value that best represents how the source availability was determined when the source has a source status of 'existing' or 'both.' See Section 3.1 for more information on how the Source Status is chosen. For a complete list of acceptable values by *Source Subtype*, see Appendix 2. If additional comments are required for the chosen methodology type, please enter them into the methodology value comments box.
- Total Availability: The *Total Availability* column represents the indirect reuse availability in acre-feet/year for each planning decade. Future availability developed through a WMS should be entered as an availability increase WMS. See Section 5.1.1.7 and Section 5.1.2 for information on how to enter an availability increase WMS and its WMS supplies.
- Source Comments: For indirect non-potable use, provide description of reuse water supply's end use (examples include landscape, irrigation, and cooling) and permit number (if available). Also note whether the use of the reclaimed water is considered Type I (likely to come in contact with humans) or Type II (unlikely to come in contact with humans). For indirect potable use, provide a permit number (if available). If the reuse source is being used for artificial aquifer recharge (Section 3.4.1.4), please note the name of the aquifer it will be recharging in the source comments field.

3.5.3 Onsite Water Recycling

Water recycling is a new source subtype added to DB27. It represents water supply that is used, recycled onsite, and reused. Implementation of an on-site graywater, blackwater, or industrial onsite recycling system should result in a reduction in WUG demands since the WUG will initially use less water supply from other source types. However, we report reuse supply separately so it will display as a future reuse/onsite water recycling source in the DB27 database. It should only be entered as existing supply if the supply was incorporated into the WUG's 2026 RWP projected demands as reuse. If a WUG has future plans to incorporate on-site water recycling, the source will be added as 'future only' and associated with an availability increase WMS and WMS project in the WMS application module (See section 5.1.1.7) In the last planning cycle, 'other local supply' was used to account for some types of recycled mining or industrial water supply. For example, a pond is used to store previously used mining water which gets reused again onsite. This type of supply will now be included under the water recycling source subtype as 'Mining/Industrial Other Water Recycling' even though it may contain additional supply types like rainwater since storage of the recycled supply is the primary purpose.

If reuse is treated through a wastewater treatment plant and reused, then direct potable or non-potable source subtype should be selected instead (Section 3.5.1). Cooling water recirculation for power generation facilities should not be included with this reuse source subtype. If a power generation plant has a plan to increase water recirculation efficiency and use less water up front, it should be entered as a demand reduction WMS for the industrial WUG (Section 5.1.1.1).

Water recycling supply must be separated into the following water recycling types: 'Graywater,' 'Blackwater', 'Oil and Gas Produced Water', or 'Mining/Industrial Other Water Recycling'. The following fields are collected for sources labeled as 'Onsite Water Recycling':

- Source Name: All water recycling sources will be named 'Water Recycling.'
- Source Region, County, & Basin: The region, county, and basin values will represent the geographic location of water recycling system.
- Water Recycling Type: A drop-down list containing the values 'Graywater', 'Blackwater', and 'Mining-produced water'. One value will be selected to describe the supply. Additional categories may be added in the future as needed. Graywater is wastewater that has not had contact with organic pathogens and requires less treatment like water from clothes-washing machines and bathtubs. Blackwater represents wastewater that has come into contact with fecal matter or organic pathogens. 'Oil and Gas Produced Water' represents water that comes out of the ground as a byproduct of oil and gas extraction. 'Mining/Industrial Other Water Recycling' represents supply collected and used onsite and reused again.
- Source Detail: The source detail field will briefly describe the water recycling project associated with the availability.
- Methodology: Select the methodology value that best represents how the source availability was determined when the source has a source status of 'existing' or 'both.' See Section 3.1 for more information on how the Source Status is chosen. For a complete list of acceptable values by *Source Subtype*, see Appendix 2. If additional comments are required for the chosen methodology type, please enter them into the methodology value comments box.
- Total Availability: The *Total Availability* column represents the firm water recycling availability in acre-feet/year for each planning decade. Future availability developed through a WMS should be entered as an availability increase WMS. See Section 5.1.1.7 and Section 5.1.2 for information on how to enter an availability increase WMS and its WMS supplies.
- Source Comments: Provide information on the water recycling system, permits used, and how water volumes are estimated.

3.6 Conjunctively Used Sources

Existing supply used conjunctively involves alternating the use of multiple water sources (groundwater, surface water, reuse, etc.) to make efficient use of an entity's total water supply operations based on demand, infrastructure, or seasonal conditions.

- Example 1 – A utility has both groundwater and surface water supply and reduces their impact on groundwater by relying on just surface water during periods of average to above average rainfall while depending upon groundwater during periods with below average rainfall.
- Example 2 – A utility collects seasonally high surface water flows that they store in an aquifer recharge or aquifer storage and recovery project.

When existing sources are used conjunctively, this should be noted in the sources' availability comments field.

In the WMS module, strategies and sources can be grouped to demonstrate how they are to be used conjunctively when the WMS is implemented. See Section 5.6 for more information on how to enter conjunctive use WMSs.

3.7 Interregional Sources

If more than one RWPG uses an individual surface water, groundwater, or reuse source, the availability volumes must be consistent among the regions sharing the source. The naming conventions for shared sources must also be listed consistently in the database application. These regions should proactively work together before data entry begins to ensure consistency of their shared data. Each database source record is related to a single planning region which is determined by the location of the source. It is the responsibility of that region to update and/or review the source details and availability water volumes related to the source. A source, such as a reservoir or an ASR, should not be entered multiple times to account for more than one region's use of the source. The agreed upon *Total Availability* should be entered for the source as a whole and the regions using it will connect entities to the source in the Entity module (Section 4) or the WMS module (Section 5). For example, the Toledo Bend Reservoir is in Region I. It is Region I's responsibility to review and update the DB27 Sources module data related to the Toledo Bend Reservoir. Currently, only Region I entities use the Toledo Bend Reservoir as existing supplies, so it is also Region I's responsibility to enter the transaction water supply data in the DB27 Entities module. Regions C, D, H, and I all have recommended WMS that use the remaining Toledo Bend Reservoir water supply. These regions must work together to enter their WMSs in accordance with their RWPs without over-allocating the source's *Total Availability* water volume.

3.8 Over-allocating Sources

RWPGs should not over-allocate water sources on a temporary or a permanent basis. Water volumes allocated to entities in the Entity module and WMS supplies that come from existing availability or entity surpluses are deducted from the source's existing *Total Availability* to ensure that sources are not over-allocated under drought-of-record conditions.

4 Data for Entities

This section describes the information found in the Entities module of DB27. The Entities module is used to display WUG projection data and collect data on currently permitted water supply, its sale, and its use as an existing WUG supply. Entity data is used to analyze and summarize the state's WUG population, water demand, and existing supply trends over the next five decades. Contract demand and entity sales information are collected for WWPs to demonstrate WWP/customer relationships and the transfer of water to WUGs. WUG existing supply data is crucial to the planning process. It is used to calculate WUG water supply needs and to ensure that the state's sources of supply are not over-allocated during drought of record conditions.

4.1 Entity Types

Each entity listed in the database is labeled with an *Entity Type* which is used for data analysis and summarization. *Entity Types* include: 'WUG,' 'WWP,' or WUG/WWP.'

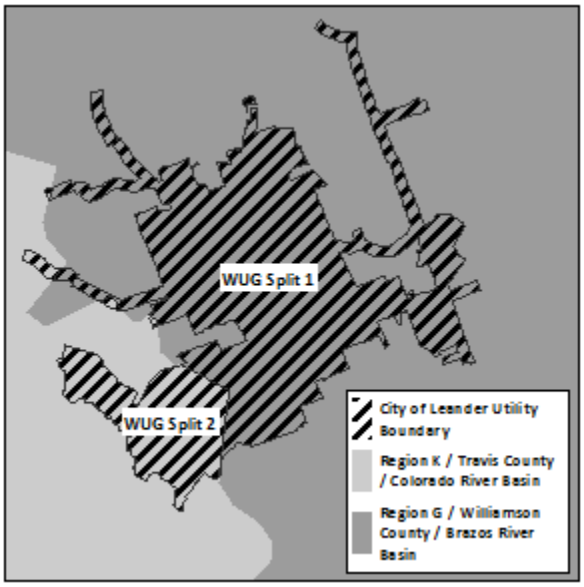
4.1.1 WUGs

The 'WUG' *Entity Type* represents an identified user or group of users for which water demands and existing water supplies have been identified and analyzed, and plans developed to meet water supply needs. For the full definition of a WUG, see 31 TAC § 357.10(42).

WUGs are further categorized into the following WUG types: 'Irrigation,' 'Livestock,' 'Manufacturing,' 'Mining,' 'Municipal,' and 'Steam Electric Power.' Except for municipal water use, all other categories of use are aggregations of water users associated with the WUG type grouped by the county they are located in. Municipal WUGs are subdivided into the categories: 'Utilities,' 'Collective Reporting Units' (CRUs), and 'County-Other.' CRUs are defined as a grouping of utilities with a common association located in an RWPA. For the full definition see 31 TAC § 357.10(5). Like non-municipal WUGs, county-other WUGs represent the aggregation of utilities and individual water users within a county that are not identified in 31 TAC § 357.10(43) (A)-(D).

WUGs that lie in one or more counties, RWPAs, or river basins must have data reported for each river basin, RWPA, and/or county split as stated in 31 TAC § 357.31. In DB27, data is required to be entered for both the WUG as a whole and its geographic WUG splits to report the WUG data as mandated. For example, the City of Leander as a whole WUG is divided into two WUG splits because the WUG boundary is in two different RWPAs, counties, and basins (See Figure 3).

Figure 3. Split WUG Geographic Boundary Example



4.1.2 WWPs

The 'WWP' *Entity Type* represents any person or entity, including river authorities and irrigation districts, which deliver or sell water wholesale (treated or raw) to WUGs or other WWPs or that the RWPG expects or recommends to deliver or sell water wholesale to WUGs or other WWPs during the period covered by the plan.

4.1.3 WUG/WWP

The 'WUG/WWP' *Entity Type* represents entities that are considered both a WUG and a WWP, in that they provide water to retail users as well as sell water wholesale to other entities. Due to WUGs like manufacturing, irrigation and steam electric power being separate WUG categories, sometimes a municipal WUG must show a wholesale sale to a manufacturing WUG to demonstrate that it sells water retail to its manufacturing sector.

4.2 Entity Update Requests

The list of entities designated as WUGs is prepared by the TWDB with input from the RWPGs. It is the responsibility of each RWPG to provide a list of WWP entities to the TWDB that have not already been designated as WUGs during the WUG development and review process. The RWPG will also need to review the final list of WUGs and identify whether any of these WUG entities would qualify to be further designated as a 'WUG/WWP' or a 'WUG/Seller' as defined in Section 4.1, and if yes, the RWPG will need to provide this list to WSSA staff. Once the final WUG list is established through the projection development process and uploaded into DB27 by WSSA staff, RWPG consultants may only request the addition or removal of entities that have a 'WWP' entity type. They may also request an update to a WUG's entity type if the entity remains a WUG. For example, an entity type can be updated from a 'WUG/WWP' to 'WUG.'

4.3 Major Water Providers

Major Water Provider (MWP) is an entity of particular significance to a region's water supply. The RWPG determines whether the WUG or WWP entity should be labeled as an MWP in the RWP. Once the MWP list is submitted to TWDB staff, a column in the DB27 entity table will identify entities considered MWPs. The MWP entity label will be used to summarize demands, sales, existing WUG supply, and WMS data related to WUGs and WWPs in the RWPs.

4.4 Entity Primary Region

Each entity is assigned a primary planning region in DB27 and application users with access to the entity's primary region will be responsible for all DB27 data entry associated with that entity and will be able to add, edit, and delete data related to water supply and sales. The primary region assignment methodology depends upon the entity's type. Entities that are only a WWP are assigned a primary region based on input from RWPGs. Municipal WUGs are assigned a primary region based on the region with the largest portion of the WUG's total population. Non-municipal WUGs, such as irrigation WUGs, are assigned a primary region based on the region with the largest portion of the WUG's water demand. It is important for RWPGs planning for the same WUGs to coordinate their data entry process early in the planning cycle to avoid conflicts.

4.5 WUG Projection Data

The TWDB-adopted WUG population and water demand (acre-feet/year) projections will be included in the DB27 Entity Module's *WUG Projections* application page for entities with an entity type of 'WUG' or 'WUG/WWP'. The projections data is uploaded into DB27 by TWDB staff and is not editable by RWPGs. This data will also include water efficiency savings (gallons) and gallons per capita per day (GPCD). See Exhibit C Section 2.2 for more information on the development of the WUG population and water demand projections.

4.6 Entity Existing Water Use & Sales Transaction Types

Existing Source Availability is related to entities through the following DB27 Entities module application pages: *Direct Source Volume-In*, *Entity Sales/Transfers*, and *Existing WUG Supplies*. These pages demonstrate how water supplies are acquired by an entity and allocated to WUGs and WUG splits as existing WUG supplies. The DB27 Entities module displays information automatically on these pages based on how relationships are established to maintain data integrity and increase the efficiency of data entry. Each of the entity module water transaction types are listed below along with information on what data is required and how the data entered relates to the other DB27 Entities module application pages. See Appendix 5 for a diagram that demonstrates how the Entities module water transaction types relate to each other.

4.6.1 Direct Source Volume-In

The *Direct Source Volume-In* type of transaction represents the existing source availability water volume an entity has legal rights to even if it does not have the infrastructure in place to be able to use it or sell it. However, in a few cases the entity may not have legal rights to the water but acts as a pass through to the entity that does have legal rights. For example, in Region M, there are entities that have water right permits for the Amistad-Falcon Reservoir System and they use the irrigation districts' canals to convey or transfer their water to them. To show this transfer of water, the appropriate irrigation district is entered as the direct source water volume-in recipient entity rather than the entity that holds the water right permit. The decision of which entity to enter as the recipient of the *Direct Source Volume-In* supply can vary depending upon how the RWPG wants to report the data, however this transaction type assignment should be applied consistently in the region's data.

The *Direct Source Volume-In* is entered into the DB27 Entity module's *Entity Direct Source Volume-In* application page and this page is accessible to all entity types. The entity receiving the *Direct Source Volume-In* will relate to the existing source of supply that was entered in the DB27 *Sources* module. Once a source is selected, the amount of *Direct Source Volume-In* supply it receives from the source is entered by planning decade in acre-feet. Comments may be provided in the comments field to help explain water right permits, water losses, or other information that may be helpful when reviewing the data. In the case of the Region M example above, the irrigation district that transfers water to other entities will deduct both its permitted amount and the amount permitted to the entity to which it is transferring water. The same applies for WWPs that sell water to other entities. The WWP will enter the total *Direct Source Volume-In* that they plan to use as existing WUG supplies (if they are a WUG) and sell to other entities (if they are a WWP). If the entity is just a WUG, they will deduct the total amount they can directly receive from the source which will include the water volume they plan to use as existing WUG supplies. Only entities that directly receive water from the source should enter supply volumes in the *Entity Direct Source Volume-In* application page. If water is received from another entity, the transfer of water will be entered in the DB27 Entities module *Entity Sales/Transfers* application page. *Direct Source Volume-In* data is primarily used for calculating source water balances in DB27 and is not reported in the RWP or the SWP.

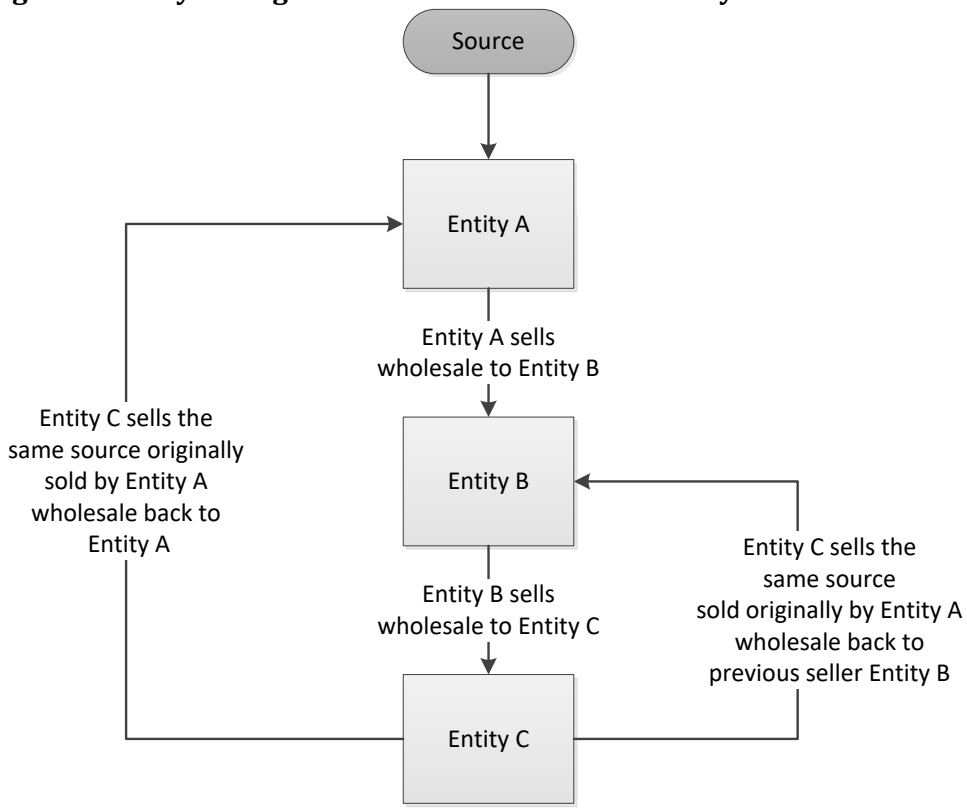
4.6.2 Entity Sales/Transfers

The entity sales/transfers type of transaction represents an entity that sells or transfers water to another entity. This water transaction is added in the DB27 Entities module *Entity Sales/Transfers* application page for entities with an entity type of 'WWP' or 'WUG/WWP'. Each entity that receives water from the seller or entity transferring the water is added as a wholesale buyer. Data is then collected on the buyer's contract demand, total sales, and sales by source. This data is used to analyze

water transfers between entities and to ensure that an entity has enough water to supply customers based on their contracted demands.

The DB27 application is designed to automatically populate data to increase data entry efficiency and maintain consistency. For example, when a buyer is connected to a seller, all sources that the seller has acquired through either *Direct Source Volume-In* or purchases from other entities will automatically display when the buyer's name is selected in the *Entity Sales/Transfers* page. The application user can deselect any of the sources that it does not plan to sell or transfer to that specific buyer. For the application to populate the data without creating an endless loop if the entity attempts to sell or transfer water wholesale back to an entity that had previously sold the water to them, two buttons are available in the *Entity Sales/Transfers* page to differentiate between a first-time purchase of water and when the water is being sold back to the entity who previously sold it. Primarily the DB27 application user will click the button labeled **Add Wholesale Buyer,** which represents the water initially being sold from a seller entity to a buyer entity. The button labeled **Sell Back Wholesale to Previous Seller** represents a sale to an entity that previously sold the water and is now getting it back. When the **Sell Back Wholesale to Previous Seller** is selected, the water can be purchased, but not sold again to another entity to prevent the endless data loop from occurring. See Figure 4 for an example of the data structure involved with selling wholesale back to a previous seller. Selling water back to a previous WWP should occur rarely in DB27 since WUGs are now based on utility boundaries rather than municipal boundaries.

Figure 4. Entity selling back wholesale to another entity data structure



The following fields are collected for both types of purchases:

- Future Customer Only: The customer list created for a seller in the DB27 Entities module *Entity Sales/Transfer* application page is utilized by an automated tool in the DB27 WMS module that

will add all customers of a seller as WMS WUG supply recipients to a WMS at the same time. During data entry into the DB17 database, some consultants chose to add future customers in the *Entity Sales/Transfers* application page, which was meant to represent current sales, so that their current and future customers could be added through the WMS module tool. However, this practice resulted in these future customers showing up in the DB17 application's data checks query because they were not associated with any values in the existing sales data fields. To address these future customers more efficiently, the *Future Customer Only* checkbox has been added to DB22. When this checkbox is selected indicating that the buyer is a future only customer, no other data fields need to be populated. When it is left unchecked, which is the default setting, current sales information must be provided.

- Contract Demand: Contract demand is entered by planning decade in acre-feet. This water volume represents the amount of water the buyer plans to receive based on the contract executed between the buyer and the seller. If the entity is just transferring water to another entity without a purchase transaction and no contract exists, then the contract demand will be zero in all decades.
- Contract Expiration Date: The contract expiration date will be entered by month, day, and year. If the contract is assumed to be renewable or the transaction is just a non-purchase transfer, a date of 12/31/9999 must be entered.
- Buyer/Seller Relationship Comments: Comments regarding the buyer/seller relationship and contracts are entered into this field.
- Total Sale Amount: The total sales volume that represents the amount currently sold to the buyer entity, by planning decade, in acre-feet.
- Sale Amount by Source: The sales volume that represents the volume of water the buyer will receive from the seller from each of the identified contracted water sources, by planning decade in acre-feet. If the seller has acquired the source from more than one entity that originally acquired the water as *Direct Source Volume-In*, then the source will display more than once. Tracking these water volumes in this manner allows the source over-allocation checks to occur at each level of transfer. If the buyer will not receive a source, then it is important to leave the decadal water volumes blank and uncheck checkbox located next to the source indicating that the source will not be sold. By doing this, the application user will minimize the amount of data check errors they will need to address. The sum of all water volumes sold by source must equal the total sale amount in each decade.
- Sale Amount by Source Comments: Comments regarding the buyer/seller/ source combination are entered in this field.

4.6.3 Entity WUG Supply

Entity WUG supply represents the maximum amount of water that is physically and legally accessible from an existing source for immediate use by a WUG under a repeat drought of record conditions. This information is entered into the DB27 Entities module's Entity WUG Supply application page for entities with an entity type of 'WUG' or 'WUG/WWP'. For more information on how to determine existing water supplies for WUGs, see Exhibit C Section 2.3.6. Sources are added to the Entity WUG Supply application page based on the list of sources the entity has acquired through either *Direct Source Volume-In* or purchased volumes from other entities (*Purchased Volume-In*). The application user can deselect any of the sources that it does not plan to use as existing WUG supply. There is a situation in the database that we refer to as diamond water. It is a sales structure that can impact how the WUG supply water balance calculation functions. See Appendix 16 for a diagram explaining the structure. If the application says that existing WUG supply is over-allocated, but it does not appear to be and this sales structure exists in the data, contact the WSSA team for assistance.

Data for the following fields are collected for entity existing WUG supply:

- Whole WUG Supply: The whole WUG supply is entered by planning decade in acre-feet/year and represents the annual volume of water the entity receives from the combination of the source, the entity directly accessing the source, and the WUG's seller. If a WUG receives less than one acre-foot of supply from a source or currently uses the source but the supply is not firm during drought of record conditions, zeros will be entered for the applicable planning decades.
- Split WUG Supply: The split WUG supply is entered by planning decade in acre-feet/year and represents the annual volume of water each entity WUG split receives from the combination of the source, the entity directly accessing the source, and the WUG's seller. If a WUG receives less than one acre-foot of supply or currently uses the source but the supply is not firm during drought of record conditions, the source should remain checked, and zeros entered for the split WUG using the source. If the WUG split will not receive an annual volume of water from the specific combination listed, it is especially important to leave the decadal water volumes blank and uncheck the checkbox located next to it to indicate that the WUG split will not receive water from the source. By doing this, the application user will minimize the amount of data check errors they will need to address. The sum of all split WUG supply volumes must equal the whole WUG supply volume related to the combination of the source, the entity directly accessing the source, and the WUG's seller.
- Water Treatment Level: This is a new field for the sixth cycle of planning. It represents the level of treatment required for the WUG to use the supply. A selection will be chosen from a drop-down list associated with the *Water Treatment Level* field. The options include the following:
    - 'No treatment required'
    - 'Disinfection only'
    - 'Conventional treatment'
    - 'Advanced treatment'
    - 'Desalination'
- WUG Supply Comments: Comments regarding the whole WUG and split WUG existing WUG supplies are entered in the comments field. When sources are being used conjunctively, please note which sources are being conjunctively used in the whole WUG comments field. When a WUG's existing supply source is labeled as 'fresh/brackish' or 'brackish/saline,' add information about the salinity level of the source in the WUG supply comments field.

4.7 Over-allocating Entity Supply

RWPGs should not over-allocate an entity's directly accessed or purchased water supplies on a temporary or permanent basis. This means that the amount of water being sold to another entity or used as its own existing WUG supplies must not exceed the amount of water they received from the source through *Direct Source Volume-In* and/or purchases from other entities.

4.8 Existing Supplies Surface Water Interbasin Transfers

As stated above in Section 4.6.3, if a WUG split will not receive water supply from a source that is related to the whole WUG, it is important to leave the decadal water volume amounts blank and uncheck the checkbox located next to it to indicate that the WUG split will not receive water from the source. This approach will ensure that the correct existing supply data is being labeled as an interbasin transfer (IBT) in the DB27 data summaries. An interbasin transfer occurs when the source and WUG basins do not match.

4.9 Entity Surplus

An entity is considered to have an annual surplus in a given decade when the total annual volume of water it receives from a source as *Direct Source Volume-In* and/or purchases is greater than the sum of the annual volumes that it allocates as sales to other entities and its own WUG supplies. Water volumes related to the entity as "entity surplus" are not reported in the RWP or the SWP since they may also include water losses or non-revenue water. See Section 4.11 for how entity surplus is utilized in the DB27 WMS module. Entity surpluses may represent:

- permitted water that is lost in transmission and/or treatment,
- permitted water that is not currently accessible due to infrastructure constraints, or
- water that is legally and physically available and will be sold to future customers as part of a WMS.

4.10 WUG Water Needs/Surplus

To calculate a WUG's needs and/or surpluses by planning decade, deduct the WUG split's projected annual water demand volumes from the WUG split's total annual existing supply volumes. A positive result identifies unused "surplus" water; a negative result identifies that there are not enough existing supplies to meet the WUG split's projected demands, thus identifying a "need" or shortage. When WUG split needs are summarized at the entity, region, county, basin, or state level, all calculated surpluses at the WUG split level are first updated to zero to ensure that the surpluses associated with one WUG split do not cancel out an identified need in another. When only the decadal WUG needs are summarized, they are displayed as a positive number.

4.11 Use of Entities Module Data in WMS Module

Although a WMS supply volume is not entered into the DB27 Entities module, data entered into the DB27 Entities module is sometimes used in the DB27 WMS module. When an entity has an entity surplus as explained in Section 4.9, this surplus water volume can be allocated to WUGs as WMS supplies by setting up a WMS that utilizes the entity surplus. If a WUG is reducing the water they receive from a source as existing water supplies and plans to acquire water from a new source of supply, then the existing WUG supply can be reduced through a WMS and left as a supply reduction or water that is reduced by one WUG could be transferred to another WUG for future use via a WMS. Projected WUG demands can also be reduced through a WMS to reflect conservation efforts. For more information on how to set up a WMS using water volumes entered into the DB27 Entities module, see Section 5.1.1.

4.12 Water Losses Related to Transferring Existing Supplies

The *Direct Source Volume-In* or *Purchase Volume-In* should represent the total water volume an entity receives from a source including any water loss that occurs during conveyance, treatment, and distribution. Projected demands associated with utility WUGs include retail system water losses since they are based on the water uses survey's net use water volume which is calculated by deducting the wholesale water volume associated with the utility from the intake water volume. Any water losses incurred by the WUG utility should be included with its existing WUG supply water volumes. WUG retail system water loss prevention strategies should be entered as a demand reduction WMS in the WMS module. See Section 5.1.1.1 for more information on how to set up a Demand Reduction WMS. Water losses associated with wholesale water provider at the transmission level should remain with the *Direct Source Volume-In* or *Purchased Volume-In* of the entity that is responsible for the distribution of the water to the other entities. In these cases, water losses will be represented as part of entity surpluses in

the database, which are explained in Section 4.9. Water volumes identified as lost during transfers can then be made available as future WUG supply through an entity surplus WMS when a project is planned to increase the efficiency of the conveyance system. If there is a question about how to account for water losses related to an entity, please contact TWDB WSSA staff.

5 Data for Water Management Strategies & Projects

This section describes the information found in the WMS module of the DB27 data entry application. The WMS module is used to enter information related to entities' proposed plans to meet current and future WUG water supply needs that are projected to occur under a repeat drought of record. These plans are referred to as water management strategies (WMSs) and many of them require capital cost WMS projects (WMSPs) that must be funded and implemented for WUGs to receive their WMS supply.

The WMS module collects data on existing and future water sources used by WMSs to ensure they will not be over-allocated after all recommended WMSs are implemented throughout the state. WMS supply is entered by WUG split so that it can be quantified and used to ensure that the WUG split's needs are being met. WMSP capital costs are entered so that the state can plan for future water supply project funding requests. For more information regarding the selection of WMSs and WMSPs, see Exhibit C Section 2.5.

5.1 WMS

A WMS is a plan to meet to meet a water need (potential shortage) of a WUG. Strategies may or may not require new water infrastructure which is represented in the planning data as a WMSP. An example of strategy that does not need to be related to a WMSP in the DB27 application is a conservation WMS that just relies upon updates to policies that manage supply, like an outdoor watering schedule. If the policy change does not require additional infrastructure or a capital cost, just a WMS can be added for a WUG to show their demand reduction related to the policy change. If a WUG has a plan to increase the amount of supply it receives from a WWP and the increased amount does not require new infrastructure to be built, then only a WMS needs to be added to show the WUG's plan to increase its contract with the WWP.

To meet the water supply needs of the entire state, a variety of WMSs are required. In DB27, WMSs are assigned to multiple categories to calculate water supply balances and summarize the WMS data. This section and its related subsections will provide instructions on how to accurately assign WMSs to their appropriate categories to ensure that they are reported correctly. Listed below are the fields that collect and display data for all categories of WMSs in the DB27 WMS module's WMS Edit/Create application page:

- Database WMS Type: Data for the *Database WMS Type* field is entered when the DB27 application user adds a new WMS and chooses if it will be a 'Source WMS' or an 'Entity WMS.' A WMS with a *Database WMS Type* of 'Source WMS' is selected when the WMS supply volume is associated with existing source availability that has not been allocated to entities, an increase/decrease in an existing source's availability, or a future source of supply. See Section 3 for additional information on Source related data. An 'Entity WMS' is selected if the WMS supply volume is associated with the transfer of an entity's surplus supply, the reduction and potential transfer of a WUG's existing supply, or a reduction in a WUG's projected demand. See Section 4 for additional information on Entity related data. The *Database WMS Type* is not reported in the RWP or SWP. It is used by DB27 to display information for the application user. Once a *Database WMS Type* is selected, it cannot be changed.

- WMS Source Use Type: *WMS Source Use Type* describes how the DB27 WMS module interacts with data in the DB27 Entities and Sources modules and allows the application to calculate water balances at all levels of water supply transactions to ensure that over-allocations do not occur. When the *Database WMS Type* selected is 'Source WMS,' the *WMS Source Use Type* choices are: 'Availability Decrease,' 'Existing Availability,' and 'Availability Increase.' When the *Database WMS Type* selected is 'Entity WMS,' the *WMS Source Use Type* choices are: 'Demand Reduction,' 'Existing Surplus,' 'Supply Reduction by WUG,' and 'Supply Reduction by WWP Customers.' More information on how to choose a *WMS Source Use Type* is provided in Sections 5.1.1–5.1.2. Once a *WMS Source Use Type* is selected, it cannot be changed. Each WMS can have only one *WMS Source Use Type* associated with it. If a region's WMS requires more than one *WMS Source Use Type*, a WMS must be entered for each *WMS Source Use Type*. WMSs can then be grouped together in a *WMS Group* as described in Section 5.5 to demonstrate that they are related in the RWP.
- WMS Name: The *WMS Name* is a brief description of the WMS used when reporting the data that should closely match the name given to the WMS in the RWP. Each region should have a unique list of *WMS Names*. It is recommended that abbreviations and acronyms be used sparingly, and only if they are needed due to space constraints. If used, abbreviations or acronyms should be well recognized, add to the general description, or be a standard acronym for an entity name. Single quotes and ampersands should never be used in WMS names because they interfere with database querying. All numbers should be entered as numerals without any special characters. Please do not use roman numerals, pound signs, or the abbreviation 'No.' when referencing numbers. For example, Utility Expansion #1 should be Utility Expansion 1.
- WMS Sponsor Region: The *WMS Sponsor Region* should represent the primary region engaged in developing the WMS. The WMS sources and WUG recipients of the WMS supply can come from multiple regions, but only one region will have the responsibility of entering the WMS and its WMS supply volumes. DB27 application users with access to the *WMS Sponsor Region* will be able to edit the *WMS Name*, the WMS level *Recommendation Type*, WMS level *Unit Costs*, and will add related entities and/or sources to the WMS depending upon the *WMS Source Use Type* selected. The *WMS Sponsor Region* will also be able to relate the WMS to a WMSP (as described in Section 5.7.3) and add the WMS to a *WMS Group* (as described in Section 5.5).
- WMS Recommendation Type: When a WMS is initially created, the *WMS Recommendation Type* will default to 'Recommended.' When entities and/or sources are related to the WMS as WMS supply and WUGs are added as recipients of the WMS supply, their records will be assigned the same *WMS Recommendation Type* value. Changing the *WMS Recommendation Type* to 'Alternative' at the WMS level will change the *WMS Recommendation Type* for all related entities and/or sources that will provide the WMS supply and the WUGs receiving the WMS supply. It is advised that if a WMS has both 'Recommended' and 'Alternative' versions, then a separate DB27 WMS must be entered for each *WMS Recommendation Type*. The *WMS Names* can be similar, to reflect the relationship but the alternative version should have a *WMS Name* that includes "ALT" to identify it as the alternative WMS.
- WMS Unit Cost: The *WMS Level Unit Cost* should represent the online decade's development cost of the water prior to distribution to WUGs. Unit costs are calculated by dividing a planning decade's annual cost (2023 dollars) by the same decade's WMS supply. Unit costs may include the following expenditures: operations, power cost, purchased water, and debt service.
- Does this WMS benefit from the conjunctive use of its related sources?: This field is new for the sixth cycle of planning. See Section 5.6 for updated conjunctive use definition and examples.

- Remarks: Comments regarding the WMS are entered into the *Remarks* field. These comments are especially useful when more than one WMS must be added to enter data for the RWPA's plan to meet a WUG's water supply need. Explaining how the WMSs are related will assist with the review of the data.

5.1.1 WMS Source Use Types associated with existing sources

A WMS associated with an existing source represents a plan to allocate, reallocate, or increase the availability of the existing source. It can also represent a plan to reduce the consumption of existing source availability through a WMS. These types of WMS can include building infrastructure that allows for new utilization of existing source availability, future sales of entity existing supply to new customers, redistribution of source availability across WUGs, increasing the availability of an existing source, and reducing a WUG's dependence upon a source.

5.1.1.1 Demand Reduction WMS

A 'Demand Reduction' WMS reduces a WUG's projected demand through efforts such as a reduction in water consumption through active conservation measures, drought management, and water loss mitigation in public water supply systems. Reuse water supply should not be included in conservation WMS supply as it is considered a stand-alone water source type which is entered separately from conservation as stated in Exhibit C Section 2.3.3. A Demand Reduction WMS uses WUG projected water demand data from the DB27 Entities module and is categorized as a *DB27 WMS Type* of 'WMS Entity Strategy' in DB27. For the sixth cycle of planning, we are asking that water use reduction and water loss mitigation be entered as separate strategies and projects. This update to how conservation data is collected is required so that their data can be more efficiently analyzed. See Appendix 17, for examples of how conservation best management practices correspond with the two conservation WMS description labels. See Appendix 19 for a diagram that explains when an entity surplus strategy can be labeled as 'Conservation – water loss mitigation.'

After a Demand Reduction WMS is created by selecting 'Demand Reduction' as the *WMS Source Use Type*, WUGs can be added to the WMS as *WUGs Reducing Projected Demands* on the DB27 WMS module's WMS Edit/Create application page. Only WUGs may be related to a Demand Reduction WMS. A separate WMS should be created for each WUG that recommends a Demand Reduction WMS where a WMSP is required for only that WUG. If a WWP is sponsoring a WMS that will reduce the projected demands of multiple WUG customers, a single DB27 Demand Reduction WMS can be created where its WUG customers are added as *WUGs Reducing Projected Water Demands* if they all share the same WMSP. For more information on how to relate a WMSP to a WMS, see Section 5.7.3. WMS supply can be transferred from the WUG reducing their projected demand to another WUG if the water transfer is dependent upon the demand reduction WMS being implemented. See Appendix 6 for a diagram that demonstrates a potential demand reduction transfer data structure. The following fields are collected for WMSs with a *WMS Source Use Type* of 'Demand Reduction' in the DB27 WMS module's Demand Reduction application page:

- WMS Description: The *WMS Description* is chosen from a selection of values and helps describe the WMS. The three choices that may be selected for Demand Reduction WMS are 'Conservation – water use reduction,' 'Conservation- water loss mitigation,' and 'Drought Management.' Conservation measures are defined in 31 TAC § 357.10(35) as 'practices, techniques, programs, and technologies that will protect water sources, reduce the consumption of water, reduce the loss or waste of water, or improve the efficiency in the use of water'. Drought management WMS are defined in 31 TAC § 357.10(10) as 'measures evaluated and/or recommended in a State or Regional Water Plan that quantifies temporary reductions in

demand during drought conditions.' The *WMS Description* value will be used to summarize the WMS supply data. It is also used in conjunction with the WUG, and source type fields related to the WMS to create the WMS types that are listed in the SWP. For a complete list of *WMS Description* values and how they relate to the SWP WMS Types, see Appendix 3.

- Demand Reduction WMS Unit Cost: The *Demand Reduction Unit Cost* should reflect the unit cost (2023 dollars) associated with each whole WUG reducing their demand. Unit costs are calculated by dividing a planning decade's annual cost by the same decade's WMS supply and may include the following expenditures: operations, power cost, and debt service.
- Total Whole WUG Demand Reduction: *Total Whole WUG Demand Reduction* represents the projected demand reduced by the whole WUG by planning decade in acre-feet. Recommended conservation strategy supply should reflect the cumulative benefits of the combined best management practices (BMPs) associated with the strategies if implemented together. Total whole WUG demand reduction includes the volume reduced from its own projected demands and any supply transferred to another WUG that is dependent upon the Demand Reduction WMS. The *Whole WUG Demand Reduction Used* and transferred by the whole WUG must equal the whole WUG's *Total Whole WUG Demand Reduction* in each planning decade. The *Total Whole WUG Demand Reduction* may not exceed the WUG's projected demand.
- Total Split WUG Demand Reduction: *Total WUG Split Demand Reduction* represents the projected demand reduced by the WUG split by planning decade in acre-feet. The *Total WUG Split Demand Reduction* includes the volume reduced from its own projected demands and any supply transferred that is dependent upon the Demand Reduction WMS. The *Split WUG Demand Reduction Used* and transferred by the WUG split must equal the *Total WUG Split Demand Reduction* in each planning decade. If a WUG split will not reduce their projected demand through the WMS, the decadal volumes should remain blank, and its related checkbox updated to unchecked. *Total WUG Split Demand Reduction* may not exceed the projected demand.
- Whole WUG Demand Reduction Used by this Entity: *Whole WUG Demand Reduction Used* represents the demand reduction that the whole WUG will use to reduce its own projected demands by planning decade in acre-feet. Unless the whole WUG plans to transfer water that is dependent upon the Demand Reduction WMS being implemented, the *Whole WUG Demand Reduction Used* volume and the *Total Whole WUG Demand Reduction* volume will be the same.
- Split WUG Demand Reduction Used by this Entity: *Split WUG Demand Reduction Used* represents the demand reduction that the WUG split will use to reduce its own projected demands by planning decade in acre-feet. Unless the WUG split plans to transfer water that is dependent upon the Demand Reduction WMS being implemented, *Split WUG Demand Reduction Used* volume and the *Total WUG Split Demand Reduction* volume will be the same. If a WUG split will not be reducing their projected demand, then the decadal fields should remain blank, and its related checkbox updated to unchecked.
- Transferred Conserved Water Volumes: A WUG can reduce their projected demand through a demand reduction WMS to create a surplus in existing supply that can be transferred to another WUG through the *Transfer Conserved Water Volumes* section. The default value for the field labeled *Transfer Conserved Water Volumes* is 'No' which means that the WUG will not be transferring supplies. By changing the value to 'Yes,' the application will display total existing WUG supplies by source and WUG split that can be reduced and transferred. If the source will not be reduced as part of the Demand Reduction Transfer WMS, the checkbox next to the source must be unchecked. By unchecking the checkbox, the application user will minimize the amount of data check errors they will need to address.

- Total WUG Supplies to Be Transferred: The field labeled *Total WUG Supplies to be Transferred* represents the existing WUG supplies by source that the split WUG will be transferring to another WUG that is dependent upon the Demand Reduction WMS being implemented. This supply should be entered by planning decade in acre-feet. If a WUG split will not transfer water to another entity through the Demand Reduction WMS, the decadal fields should remain blank, and its related checkbox updated to unchecked. By unchecking the checkbox, the application user will minimize the amount of data check errors they will need to address.
- Remarks: The *Remarks* field should contain comments regarding the Demand Reduction WMS by Whole WUG or WUG split.

5.1.1.2 Existing Surplus WMS

An 'Existing Surplus' WMS uses remaining entity surplus from the DB27 Entities module and is categorized as *a DB27 WMS Type* 'WMS Entity Strategy' in DB27. The remaining entity surplus is calculated by deducting the sum of the entity's existing WUG supplies and its sales to other entities from its total direct and *Purchased Volume-In*. See Section 4.9 for more information on how entity surplus is calculated. These WMS include the allocation of supply to existing and future WUG customers. They may also include plans to mend, replace, or line transmission infrastructure such as pipelines and canals to help prevent the loss of water when it is transferred from source to entity or from entity to entity. See Section 4.12 for more information on how water losses are accounted for in the DB27 Entities module. After an Existing Surplus WMS is created by choosing a *WMS Source Use Type* of 'Existing Surplus,' one or more entities are added in the *Entities Transferring Volume-In Water Volumes* section. All sources that the entity receives direct or *Purchased Volume-In* from in the DB27 Entities module are listed along with their calculated entity surplus on the DB27 WMS module's Existing Surplus application page. When entity surplus will not be transferred to WMS WUGs, the source's related checkbox must be unchecked. See Appendix 7 for a diagram that demonstrates a potential Existing Surplus WMS data structure. See Appendix 19 for a diagram that explains when an entity surplus strategy can be labeled as 'Conservation – water loss mitigation.'

5.1.1.3 Supply Reduction by WUG WMS

A 'Supply Reduction by WUG' WMS is created to reduce the volume of existing supply that a WUG will receive. This reduction can involve an unreliable source, a planned transfer from one WUG to another, a transition from one source to a new source of supply, or a combination of reasons. When the WUG supply is reduced, it becomes a source of supply through the WMS that WUGs can receive as WMS supply. These types of WMS are categorized as a *DB27 WMS Type* 'WMS Entity Strategy', since they reduce existing WUG supply entered in the DB27 Entities module. After a WUG supply reduction WMS is created by choosing a *WMS Source Use Type* of 'Supply Reduction by WUG,' one or more WUGs are added in the *WUGs Reducing Existing WUG Supplies* section. The sources that are related to the WUG as existing supplies in the DB27 Entities module are listed by WUG as a whole and its WUG splits. See Appendix 8 for a diagram that demonstrates a potential WUG Supply Reduction WMS data structure. The following fields are collected for WMS with a *WMS Source Use Type* of 'Supply Reduction by WUG' on the DB27 WMS module's WUG Supply Reduction application page:

- Whole WUG Supply Reduction: *Whole WUG Supply Reduction* represents the reduction in existing WUG supplies by the whole WUG and source of supply in acre-feet for each planning decade. If a whole WUG will not be reducing their existing supplies through the WMS for a specific source, then the decadal fields should remain blank, and its related checkbox must be updated to unchecked.
- Split WUG Supply Reduction: *WUG Split Supply Reduction* represents the reduction in WUG supplies by the WUG split and source of supply in acre-feet for each planning decade. If a WUG

split will not reduce their existing supplies through the WMS for a specific source, then the decadal fields should remain blank, and its related checkbox must be updated to unchecked.

- Remarks: The *Remarks* field should contain comments regarding the supply reduction for the associated whole WUG and its WUG split records.

5.1.1.4 WWP Customer Supply Reduction WMS

A 'Supply Reduction by WWP Customers' WMS reduces the supply of all or a select group of a WWP's customers from one or more sources. This reduction can involve the reallocation of a WWP's supply amongst their current and future customers or the transitioning from one source of supply to another. These types of WMS are categorized as a *DB27 WMS Type* 'WMS Entity Strategy', since they reduce existing WUG supply entered in the DB27 Entities module. After a WWP customer supply reduction WMS is created by choosing a *WMS Source Use Type* of 'Supply Reduction by WWP Customers,' a WWP is added in the *WWP/Sellers Customers Reducing Existing WUG Supplies* section. All customers related to the WWP in the DB27 Entities module are listed with the WWP. An individual WUG customer can be unchecked if its existing WUG supply will not be reduced on the DB27 WMS module's WWP Supply Reduction application page. Clicking on the customer's name will take the user to DB27 WMS Module WUG Supply Reduction application page that lists sources that are related to the WUG in the DB27 Entities module and are sold by the WWP/seller selected. WUG supply is listed by the whole WUG and WUG splits that purchase the source from the WWP. See Appendix 9 for a diagram that demonstrates a potential WWP Customer Supply Reduction WMS data structure. The following fields are collected for WMS with a WMS source use type of 'Supply Reduction by WWP Customers' on the DB27 WMS module's WUG Supply Reduction application page:

- Whole WUG Supply Reduction: *Whole WUG Supply Reduction* represents the reduction in existing WUG supplies by the whole WUG customer and source of supply in acre-feet for each planning decade. If a whole WUG will not reduce their existing supplies through the WMS for a specific source, then the decadal fields must remain blank, and its related checkbox updated to unchecked.
- Split WUG Supply Reduction: *WUG split Supply Reduction* represents the reduction in WUG supplies by the WUG split and source of supply in acre-feet for each planning decade. If a WUG split will not reduce their existing supplies through the WMS for a specific source, then the decadal fields must remain blank, and its related checkbox updated to unchecked.
- Remarks: The *Remarks* field should contain comments regarding the customer supply reduction for the associated whole WUG customer and its WUG split records.

5.1.1.5 Existing Availability WMS

Remaining existing availability is calculated by deducting the source's total *Direct Source Volume-In* allocated to entities in the DB27 Entities module (Section 4.6.1) from the source's existing *Total Availability* entered in the DB27 Sources module (Section 3). These types of WMS allow more existing availability to be allocated to WUGs through an expansion of infrastructure and have a *DB27 WMS Type* of 'WMS Source Strategy'. After a source existing availability WMS is created by choosing a *WMS Source Use Type* of 'Existing Availability,' one or more existing sources are added in the *Related Sources* section on the DB27 WMS module WMS Edit/Create application page. WMS WUGs will then use the remaining *Total Availability* from those sources as WMS WUG supply. See Section 5.2 for more information on how to allocate WMS supply to entities. See Appendix 10 for a diagram that demonstrates a potential Existing Availability WMS data structure.

5.1.1.6 Availability Decrease WMS

An Availability Decrease WMS is typically used in conjunction with another WMS to account for the transferring of existing *Total Availability* from one source to another source through methods like the

subordination of downstream water rights. These types of WMS are categorized as a *DB27 WMS Type* 'WMS Source Strategy', since they reduce existing source *Total Availability* entered in the DB27 Sources module. After an Availability Decrease WMS is created by choosing a *WMS Source Use Type* of 'Availability Decrease,' one or more existing sources are added in the *Related Sources* section of the DB27 WMS module's WMS Edit/Create application page. Since the WMS only reduces the *Total Availability* associated with an existing source, WMS WUGs cannot be related to this *WMS Source Use Type*. If the decrease in availability is transferred to another source as part of the overall plan, a separate WMS with a *WMS Source Use Type* of 'Availability Increase' will be created to represent the increase in availability of the other source. WUGs benefiting from the transfer of availability will be associated with the availability increase WMS and the transferred supply can be allocated to them on the WMS WUG supply page. The availability decrease, and increase WMSs can then be grouped in a *WMS Group* as described in Section 5.5 to demonstrate that they are related in the RWP. See Appendix 11 for a diagram that demonstrates a potential Availability Decrease WMS data structure. The following fields are collected for WMS with a *WMS Source Use Type* of 'Availability Decrease' in the DB27 WMS Module's Future Availability application page:

- Future Total Availability Decrease: *Future Total Availability Decrease* represents water that is deducted from a source's existing *Total Availability* by planning decade in acre-feet.
- Conservation Pool Decrease: This value is only collected for WMS with a WMS Source Use Type of 'Availability Decrease' when the related source is a reservoir. If the implementation of the 'Availability Decrease' WMS decreases the *Conservation Pool* of the reservoir, then the volume in acre-feet that the *Conservation Pool* will decrease will be entered in this field. If no change is made to the existing source's *Conservation Pool*, a value of zero will be entered.
- Future Firm Yield Decrease: If the *Future Total Availability Decrease* does not represent the firm availability (i.e., not the standard WAM Run 3 firm yield), then the *Future Firm Availability Decrease* (acre-feet) derived from an approved hydrologic variance must also be entered for the existing reservoir. To enter the *Future Firm Availability Decrease* related to the reservoir when the availability is not based on firm yield, select the 'N' value on the field *Is future total availability based on firm yield?* and click the **Update** button on the Future Availability page of the DB27 WMS module for the specified reservoir. A *Firm Yield* decadal water volume column will then be displayed for each planning decade and must be filled out. When an Availability Decrease WMS is added for an existing reservoir, the *Is future total availability based on firm yield?* value should match the *Is total availability based on firm yield?* value entered in the DB27 Sources module.
- Remarks: The *Remarks* field should contain information explaining why the source's availability is being decreased, if it is being implemented with another WMS, a brief explanation of how they work together.

5.1.1.7 Availability Increase associated with an existing source

An availability increase of an existing source represents a plan to develop new source availability that is not already included as existing *Total Availability* in the DB27 Sources module. Examples of increases in the *Total Availability* of existing sources are conservation pool reallocation, reservoir augmentation, improved systems operations, brush control, and artificial aquifer recharge when it is not related to new reuse supply. An Availability Increase WMS uses source data from the DB27 Sources module and is categorized as a *DB27 WMS Type* 'WMS Source Strategy'. After an Availability Increase WMS is created by choosing a *WMS Source Use Type* of 'Availability Increase,' one or more existing sources whose *Total Availability* is being increased is added to the WMS as *Related Sources* in the DB27 WMS Module's Future Availability application page. The source benefitting from the Availability Increase WMS must be added. For example, when entering a WMS that includes brush control, the source that will benefit from

the vegetation removal will be added to the WMS and the firm yield increase that will result from implementing the WMS will be added. See Appendix 12 for a diagram that demonstrates a potential Availability Increase associated with an existing source WMS data structure. The following fields are collected for WMS with a *WMS Source Use Type* of 'Availability Increase' in the DB27 WMS Module's Future Availability application page when the source added is an existing source:

- Future Total Availability Increase: *Future Total Availability Increase* represents the additional water developed through the WMS by planning decade in acre-feet that is in addition to the existing *Total Availability* entered in the DB27 Source module. The *Future Total Availability Increase* associated with the source should represent the full volume of water that will be developed through the WMS which includes supply allocated to WMS WUG that will benefit from the WMS, the volume that is developed and not allocated to a specific WUG, and estimated water loss related to the WMS. Water will be allocated to those three categories through the DB27 WMS module's WMS WUG Supply Edit/Create application page.
- Conservation Pool Increase: This value is only collected for WMS with a *WMS Source Use Type* of 'Availability Increase' when the related source is a reservoir. When the WMS is increasing the availability of an existing reservoir source, the *Conservation Pool Increase* shall reflect the volume that the *Conservation Pool capacity* is increasing in acre-feet because of the WMS and not the total new *Conservation Pool* water volume. If no change is made to the existing source's *Conservation Pool*, a value of zero will be entered.
- Future Firm Yield Increase: This value is only collected for WMS with a *WMS Source Use Type* of 'Availability Increase' when the related source is a reservoir. If the *Future Total Availability Increase* does not represent the firm availability (i.e., not the standard WAM Run 3 firm yield), then the *Future Firm Availability Increase* (acre-feet) derived from an approved hydrologic variance must also be entered for the existing reservoir. To enter *Future Firm Availability Increase* related to the reservoir when the availability is not based on firm yield, select the 'N' value on the field *Is future total availability based on firm yield?* and click the **Update** button on the Future Availability application page of the DB27 WMS module for the specified reservoir. A *Firm Yield* decadal water volume column will then be displayed for each planning decade and must be updated. Please specify in the *Remarks* field additional information regarding the proposed hydrologic variance request, including a brief description such as 'addition of return flows' or 'reservoir safe yield.' For a complete list of examples from past plans of potentially appropriate surface water modeling assumptions for RWP development, see Exhibit C Section 2.3.5.1. When an Availability Increase WMS is added for an existing reservoir, the *Is future total availability based on firm yield?* value should match the *Is total availability based on firm yield?* value entered in the DB27 Sources module.
- Remarks: The *Remarks* field should contain comments regarding the increase in the availability of the existing source. It should also contain additional information regarding the proposed hydrologic variance request, as necessary.

5.1.2 WMS Source Use Types associated with future sources

A future source WMS represents a plan to develop new source availability that is not already included as existing *Total Availability* in the DB27 Sources module. Examples of future sources include new reuse, ASR, rainwater harvesting, and reservoirs. This category also includes potential increases in water supply because of weather modification WMS. An Availability Increase WMS uses source data from the DB27 Sources module and is categorized as a 'WMS Source Strategy' in DB27. After an Availability Increase WMS is created by choosing a *WMS Source Use Type* of 'Availability Increase,' one or more future sources are added to the WMS as *Related Sources*.

Each new reservoir must be entered as a distinct WMS in DB27 with just the one new reservoir related to the WMS. For example, the WMS Name would be entered as something like 'Development of Reservoir X' and the only reservoir attached to the WMS is Reservoir X. By entering new reservoir WMS into DB27 using this method, the data can be reported consistently across all regions. It also allows the WMSP representing the cost of the new reservoir development to relate to just the new reservoir WMS and its related WMS WUG supply recipients at the WMS level. Relating a WMSP to a WMS is covered in Section 5.7.3. If the development of the new reservoir is related to other WMS like the conveyance of existing availability, these WMS can be added to a *WMS Group* as described in Section 5.5. See Appendix 13 for a diagram that demonstrates a potential Availability Increase associated with a new source WMS data structure. If indirect reuse contributes to a future ASR or reservoir source, then the reuse availability must be shown with the reservoir or ASR source and not as a standalone reuse source.

The following fields are collected for WMS with a *WMS Source Use Type* of 'Availability Increase' in the DB27 WMS Module's Future Availability application page when the source added is a new source:

- Future Total Availability Increase: *Future Total Availability Increase* represents the additional water developed through the WMS by planning decade in acre-feet associated with the future source. The *Future Total Availability Increase* associated with the source should represent the full volume of water that will be developed through the WMS which includes supply allocated to WMS WUG that will benefit from the WMS, the volume that is developed and not allocated to a specific WUG, and estimated water loss related to the WMS. Water will be allocated to those three categories through the DB27 WMS module's WMS WUG Supply Edit/Create application page.
- Conservation Pool Increase: This value is only collected for WMS with a *WMS Source Use Type* of 'Availability Increase' when the related source is a reservoir. When the WMS is developing a new reservoir, it should reflect the planned conservation pool capacity of the new source in acre-feet.
- Future Firm Yield Increase: This value is only collected for WMS with a *WMS Source Use Type* of 'Availability Increase' when the related source is a reservoir. If the *Future Total Availability Increase* does not represent the firm availability (i.e., not the standard WAM Run 3 firm yield), then the *Future Firm Availability Increase* (acre-feet) derived from an approved hydrologic variance must also be entered for the existing reservoir. To enter *Future Firm Availability Increase* related to the reservoir when the availability is not based on firm yield, select the 'N' value on the field *Is future total availability based on firm yield?* and click the **Update** button on the Future Availability application page of the DB27 WMS module for the specified reservoir. A *Firm Yield* decadal water volume column will then be displayed for each planning decade and must be updated. Please specify in the *Remarks* field additional information regarding the proposed hydrologic variance request including a brief description such as 'addition of return flows' or 'reservoir safe yield.' For a complete list of examples from past plans of potentially appropriate surface water modeling assumptions for RWP development, see Exhibit C Section 2.3.5.1.
- Remarks: The *Remarks* field should contain comments regarding the future source. It should also contain additional information regarding the proposed hydrologic variance request, as necessary.

5.2 Allocating WMS Supply to Entities and Assigning WMS Water Losses

WMS supply is allocated to WUGs to meet the WUG's projected needs and ensure that it will have a reliable source of supply. WUGs can be related to a WMS when a source of supply has been added to it

through the DB27 WMS Module's WMS Edit/Create application page. All water supply created through the WMS must be allocated to WUGs through the DB27 WMS Module's WMS WUG Supply Edit/Create application page. In addition to WMS supply allocated to WUGs as future supply, this also includes water that is lost through transmission and/or treatment and WMS supply created but left unassigned to a WUG.

Water losses (non-revenue water) will be assigned to the entity developing the water through a 'water loss' entity. For example, WWP X transfers water to WUGs as part of an unallocated supply utilization WMS. Some of the transferred water volume will not reach the end users and will be entered as WMS WUG supply for the WUG labeled 'WWP X – Water Loss.' Since only WUG entity types display in the DB27 WMS module's WMS WUG Supply Edit/Create page, each entity will have a water loss "faux WUG" associated with it that may be used when water loss needs to be accounted for. The entity name will include the name of the entity responsible for the water and the text 'Water Loss.' These water loss WUGs can only be used in the WMS module. See Section 4.12 for more information on how to enter water loss associated with existing water supply.

WMS supplies created through the WMS that have not been assigned to a WUG will be allocated to the entity responsible for the water through an 'unassigned water volumes' entity. For example, Canadian River Municipal Water Authority is sponsoring a conjunctive use WMS that includes the development of an ASR project. After water has been allocated to WUGs, the remaining supply is allocated to the 'Canadian River Municipal Water Authority-Unassigned Water Volumes' entity as WMS WUG supply. Since only WUG entity types display in the WMS WUG Supply page, each entity will have an unassigned water volume "faux WUG" associated with it that may be used to account for any unassigned water volumes related to it. The entity name will include the name of the entity responsible for the water and the text 'UNASSIGNED WATER VOLUMES.'

The following fields are collected for all types of WMS WUG Supply:

- WMS Sponsor Seller Entity: The *WMS Sponsor Seller Entity* should represent the WWP who is responsible for developing the WMS supply that will be used by WUG. If more than one *WMS Seller Entity* is required to transfer the water to the WUG, the initial seller associated with the development of the WMS should be listed in this field. It will be used to summarize WMS supply being developed for WUGs by each WWP. Once a sponsor seller is chosen, it cannot be changed. If assistance is required when updating the seller associated with a WMS, please contact WSSA staff. To see an example diagram of WMS seller relationships, see Appendix 14.
- Recommendation Type: When a WUG is related to a WMS, the WUG's default *Recommendation Type* value will be the same as the *Recommendation Type* entered for the WMS as a whole. For example, if the WMS is labeled as an alternative WMS, the WUG will also have a value of 'Alternative.' In some cases where the WMS as a whole is recommended, there could be one or more WUGs, but not all that have chosen the WMS as an 'Alternative' WMS. In this instance, the *Recommendation Type* value for the WUG can be changed from 'Recommended 'to 'Alternative.' When the WMS WUG's *Recommendation Type* value is 'alternative,' the related WMS WUG Supply will not be used in the remaining water balance or WUG unmet needs calculations.
- WMS Description: The WMS description is chosen from a selection of values and helps describe the WMS. This value will be used to summarize the WMS WUG Supply data. It is also used in conjunction with the WUG, and source type fields related to the WMS to create the WMS Type summaries that are listed in the SWP. For a complete list of WMS Description values and when to select them, see Appendix 18. To see how WMS description values relate to the SWP WMS type value, see Appendix 3.

- *New or amended water right related to a non-exempt IBT required*?: This field will be labeled as a 'Y' when the WMS WUG supply is related to an IBT that is not exempt under TWC § 11.085(v). The data collected in this field will be used to produce report numbers 15 and 16 listed in Table 3 of Exhibit C Section 2.13.
- WMS WUG Unit Cost: The *WMS WUG Level Unit Cost* should reflect the unit cost (2023 dollars) associated with the development and delivery of the water supply from the source (and its seller if the water is purchased) to the WUG, water loss entity, or unassigned water volumes entity. Unit costs are calculated by dividing a planning decade's annual cost by the same decade's WMS supply and may include the following expenditures: operations, power cost, purchased water, and debt service. If the whole WUG does not plan to receive water from the WMS source, then the checkbox related to the whole WUG must be unchecked to minimize the amount of data checks that will need to be addressed.
- WMS Whole WUG Supply: The *WMS Whole WUG Supply* represents the total water volume (acre-feet) that the whole WUG, water loss entity, or unassigned water volumes entity receives from the WMS source (and its seller when purchased) for each planning decade. This volume should include only the portion of the water supply that the WUG plans to use to meet its own current and future water demands. Existing infrastructure or planned infrastructure expansions can provide more water than is listed with the strategy since the strategy supply being developed and allocated to WUGs must be firm and available under drought of record conditions. For strategy supply to be shown in 2030, it must be implemented and related project online in or before 2030. For strategy supply to be shown in 2040, it must be online between 2031 and 2040. The remainder of the decades follow that project. If a strategy is associated with a phased project, it is expected that strategy supply will increase accordingly with the phased projects online decade.
- WMS Split WUG Supply: The *WMS WUG Split Supply* represents the total water volume (acre-feet) that the WUG split, water loss entity, or unassigned water volumes entity receives from the WMS source (and its seller when purchased) for each planning decade. This volume should include only the portion of the water supply that the WUG split plans to use to meet its current and future demands. If the WUG split does not plan to receive water from the WMS source, then the checkbox related to the WUG split must be unchecked to minimize the amount of data checks that will need to be addressed. When entering unassigned or water loss water volumes, the WUG split's decadal values will match the whole WUG's decadal values.
- Remarks: The *Remarks* field should contain comments regarding the WMS WUG supply for the associated whole WUG and WUG split records.

5.3 Over-Allocating WMS Sources

After all recommended WMS supply deductions are accounted for, no source may be over-allocated. A WMS source is considered over-allocated when the amount of supply allocated to entities as WMS WUG supply exceeds the available water volume associated with the source. The DB27 WMS WUG Supply Edit/Create application page includes calculated rows that display calculated water balances based on the *WMS Source Use Type* of the WMS. The DB27 Data Checks module also includes data checks that ensure that the source availability, entity supply, and existing WUG supplies are not over-allocated after all existing supplies and recommended WMS supply are entered. Listed in this section are explanations of how water balances are calculated for existing availability, future source availability, entity surplus, and WUG supply transfers in both the DB27 WMS WUG Supply Edit/Create application page and the Data Checks module WMS application page. These water balance calculations ensure that the water supply is not being over-allocated at the source level or any level of transaction. When an over-

allocation is detected, it must be resolved by reducing the amount of supply that has been allocated to WUGs.

5.3.1 Existing Source Availability Over-Allocation

A source's existing availability is over-allocated if the sum of its related *Direct Source Volume-In*, recommended availability decreases, and recommended existing availability WMS WUG supply water volumes exceed the existing *Total Availability* of the source in any planning decade. *WMS Source Use Type* 'Availability Decrease' water volumes will be reduced prior to calculating the existing source availability water balance if the associated WMS is related to a *WMS Group* where a recommended WUG supply reduction WMS is offsetting the decrease in availability.

5.3.2 Availability Increase Over-Allocation

A WMS source availability increase is over-allocated if the sum of its recommended WMS WUG supply exceeds its availability increase in any planning decade.

5.3.3 Entity Supply Over-Allocation

An entity's supply source is over-allocated if the sum of the entity's existing WUG supplies, existing sales/transfers to other entities, and recommended entity surplus WMS WUG supply exceeds its direct and *Purchased Volume-In* received from the source.

5.3.4 WUG Existing Supply Over-Allocation

A WUG's existing supply source is over-allocated if the sum of the recommended demand reduction transfer, WUG supply reduction, and WWP customer supply reduction WMS exceeds its existing WUG supply received from the source. There is one instance in the application where the WUG existing water supply balance can calculate an incorrect existing WUG supply balance and cause the application to display red as if the existing WUG supply is over-allocated, but it is not. We call this a diamond water scenario. WSSA staff has a query that will identify when this happens in the data and will contact consultants to warn them of the issue. For a diamond water over-allocation calculation issue to be present in the Entity WUG Supply application page, an entity must sell/transfer water supply from a source to more than one entity and one of the entities that it sells the source water to must sell that water to the other entity who then sells some of the supply to another entity. In this case only, the application will display the incorrect available balance in the WUG supply page of Entity C who is a WUG/WWP. In these instances, an appeal can be submitted for the existing WUG supply over-allocation noting that a diamond water calculation issue may be present in the data. WSSA staff can provide a true water balance for the supply to ensure that it is not over-allocated. See Appendix 16 for an Entity module diamond water example that causes the calculation issue.

5.4 WMS Supplies Interbasin Transfers

As stated above in Section 5.2, if a WUG split will not receive WMS WUG supply from a WMS/source combination, it is important to leave the decadal water volume fields blank and uncheck the related checkbox prior to allocating the whole WUG's existing supply to its geographic WUG splits. This will ensure that the correct WMS WUG supply data will be labeled as requiring a new or amended water right permit involving a non-exempt IBT in DB27 data summaries. WMS WUG supply will be labeled as a non-exempt IBT using the data collected in the DB27 WMS WUG Supply Edit/Create application page field named *New or amended water right related to a non-exempt IBT required*?. See section 5.2 for more information on how to enter WMS WUG supplies.

5.5 Grouping WMS

Two or more WMSs can be related in a *WMS Group* through the DB27 WMS module's WMS Group application page. WMSs should be added to a *WMS Group* when they are identified as a single WMS in the RWP but must be added as multiple DB27 database WMSs to enter the data appropriately through DB27. For example, if an existing availability groundwater WMS and a new ASR project are to be used conjunctively in the RWP, two WMSs will need to be created in DB27 to account for both the 'Existing Availability' *WMS Source Use Type* and the 'Availability Increase' *WMS Source Use Type*. The two DB27 WMSs will then be added to a *WMS Group* to demonstrate that they are related and will be used conjunctively, and the WMS conjunctive use flag will be updated to 'Y' for yes. The *WMS Group Name* should closely resemble the name given to the WMS in the RWP. It is recommended that abbreviations and acronyms be used sparingly, and only if they are needed due to space constraints. If used, abbreviations or acronyms should be well recognized, add to the general description, or be a standard acronym for an entity name. Single quotes and ampersands should never be used in WMS Group names because they interfere with database querying. All numbers should be entered as numerals without any special characters. Please do not use roman numerals, pound signs, or the abbreviation 'No.' when referencing numbers. For example, Utility WTP Expansion #1 should be Utility WTP Expansion 1. See Appendices 11 and 14 for examples of how a WMS Group can be used to link WMS and their WMSPs.

When WMSs are added to a *WMS Group*, a *WMS Tier* value must be added. This value represents the order in which the WMS must be implemented. If all WMS associated with the *WMS Group* must be implemented at the same time, a value of '1' will be entered for each of the WMSs. If there is an order to the implementation of the WMS, then a value of '1' should be assigned to the first WMS that must be implemented, a value of '2' is assigned to the next WMS to be implemented, and so on. If there are three WMS and one WMS needs to be implemented first and the other two implemented later, but at the same time, then the first WMS will be assigned a value of '1' and the other two WMSs will both receive a value of '2.

When multiple WMS are added to a *WMS Group, they* will be reported under the *WMS Group Name* when the WMS data is summarized. When a WMS is not listed with a *WMS Group*, the *WMS Name* will be used to report the information.

5.6 Conjunctive Use WMS

As noted in Section 3.6, supply used conjunctively involves alternating the use of multiple water sources (groundwater, surface water, reuse, etc.) to make efficient use of an entity's total water supply operations based on demand, infrastructure, or seasonal conditions.

- Example 1 – A utility has both groundwater and surface water supply and reduces their impact on groundwater by relying on just surface water during periods of average to above average rainfall while depending upon groundwater during periods with below average rainfall.
- Example 2 – A utility collects seasonally high surface water flows that they store in an aquifer recharge or aquifer storage and recovery project.

A new field is added to DB27 for the sixth planning cycle that collects information on whether the WMS or combined use of WMS are being used conjunctively based on the definition above. The field is labeled "Does this WMS benefit from the conjunctive use of its related sources?" The user will select either 'Y' for yes or 'N' for no.

5.7 WMS Project

A WMSP is a water supply project that has a non-zero capital cost and when implemented will develop, deliver, and/or treat additional water supply volumes, or conserve water for WUGs and WWPs. For example, a WMSP could be the construction of a new reservoir, a water treatment plant expansion, and/or a new transmission line. A WMS may not require a WMSP to be implemented if capital costs are not required to implement the WMS, but a WMSP should always be related to a WMS to demonstrate that the project is necessary for the WMS to be implemented. Relating a WMSP to a WMS also relates the WMSP to the source of supply and the WUGs it will serve in DB27. A DB27 WMSP should not be a grouping of multiple projects. For example, a WMSP should not be entered for the total cost of all new groundwater wells in a region. Each project must be entered as a separate WMSP through the DB27 WMS module's Project Edit/Create application page and related to one or more WMS. For a project to be recommended in the SWP, a WMSP must be related to at least one WMS as recommended. For more information on project selection and cost, see Exhibit C Section 2.5. The following fields are collected for each WMSP:

- Project Name: The *Project Name* is a brief description of the WMSP used when reporting the data that should closely match the name given to the WMSP in the RWP. Each region should have a unique list of *Project Names*. It is recommended that abbreviations and acronyms be used sparingly, and only if they are needed due to space constraints. If used, abbreviations or acronyms should be well recognized, add to the general description, or be a standard acronym for an entity name. Single quotes and ampersands should never be used in project names because they interfere with database querying. All numbers should be entered as numerals without any special characters. Please do not use roman numerals, pound signs, or the abbreviation 'No.' when referencing numbers. For example, Utility WTP Expansion #1 should be Utility WTP Expansion 1.
- Project Sponsor Region: The *Project Sponsor Region* should reflect the primary region engaged in developing the WMSP. *Project Sponsors* can come from multiple regions, but only one region will have the responsibility of entering the WMSP and its related data. DB27 application users with access to the *Project Sponsor Region* will be able to edit the *Project Name*, the *Project Sponsor* information, and the project *Component* list.
- Online Date: The *Online Date* represents the decade that the project will be fully operational. For a project to be online in 2030, it must be online in or before 2030. For a project to be online in 2040, it must be online between 2031 and 2040. The remainder of the decades follow that format.

- Latitude/Longitude: The *Latitude* and *Longitude* fields should represent the proposed location of the WMSP. The basis for selecting a representative location will vary depending on the RWP and type of infrastructure but, in general, the default project locations will relate to
    - approximate locations of at least one component of major infrastructure such as dams, water treatment plants, water intakes for pipelines, or well fields proposed in the plan;
    - the primary location of the WUG in which certain types of infrastructure would be located, such as some water treatment plants within a city or water conservation investments;
    - the centroid of the county in which a project with dispersed infrastructure would be located, such as county-wide irrigation, mining, or manufacturing conservation projects; or
    - the centroid of a county-aquifer polygon for certain, generalized groundwater supply projects.
    - Contact the TWDB WSSA team if guidance is needed when selecting a project location.
- Remarks: The *Remarks* field should contain comments regarding the WMSP.

5.7.1 WMS Project Sponsors

One or more entities are related to a WMSP as *Project Sponsors. Project Sponsors* are responsible for developing the WMSP and acquiring funding for its implementation. The following fields are collected for each *Project Sponsor* related to a WMSP:

- Capital Cost: *Capital Cost* (2023 dollars) should represent the portion of the overall capital cost each WMSP sponsor entity is responsible for. WMSP sponsor *Capital Cost*s are summed to the project level and reported as the total *Capital Cost* of the WMSP. Each project must have a non-zero capital cost associated with it.
- Term of Debt Service: Estimated length or term of the WMSP's funding debt service, in years.
- First Year Funding Required: The *First Year Funding Required* is the first year that funding will be required to finance the WMSP and implement it by the planned *Online Decade*.
- Remarks: The *Remarks* field should contain comments regarding the *Project Sponsor* and their associated WMSP.

5.7.2 WMS Project Components

WMSP *Components* are the necessary actions or infrastructure elements required to develop, treat, and/or convey the WMS supply associated with the WMSP. A WMSP must be related to one or more project *Components* on the DB27 WMS module's Project Edit/Create application page. For a complete list of components see Appendix 4. It is important to review this list and select all *Components* that apply to the WMSP. Project component selections provide a standardized description of WMS project components that can be compared across planning regions.

5.7.3 Relating a WMSP to a WMS

All WMSPs must relate to at least one WMS. A WMSP should only relate to WMS WUG supply that is directly impacted by the WMSP. By relating the project to the WMS and its benefitting WUGs, the population, projected demands, and water supply needs dependent upon the project's implementation can be reported.

When a project is related to a WMS level, it means that all the WUGs that receive water from the WMS are dependent upon the project being operational for them to receive their WMS supply. A WMSP is added to the WMS level in the DB27 WMS module's WMS Edit/Create application page. WMSPs can also be related to more than one WMS if the infrastructure being built is related to more than one WMS

supply. For example, a WMSP creates a new transmission pipeline, and it is used to convey water from both a new reservoir and an existing run-of-river source. The new reservoir and the existing run-of-river WMSs are two different WMS in DB27, but they both require the same pipeline construction project to deliver the water to WUGs.

A WMSP can also be related to specific WMS WUG combinations through the DB27 WMS module's WMS WUG Supply Edit/Create application page. The relationship between the WMS WUG and the WMSP is established when at least one, but not all WUGs related to the WMS require additional infrastructure to get their water. For example, a WWP plans to allocate more of its existing surplus to WUGs. Some of the WUGs associated with the WMS have infrastructure in place to receive the additional supply with no capital cost required, but a few new WUG customers need an additional pipeline built for them to receive the supply. The customers requiring additional infrastructure would relate to the new pipeline WMSP on the WMS WUG Supply Edit/Create application page under the WMS that requires the new infrastructure. See Appendix 15 for a diagram that demonstrates the relationships between WMSs and WMSPs. If a project is connected at the WMS level, it will not be connected at the WMS WUG level because that creates a duplicate connection in the database. Contact the TWDB WSSA team if additional guidance is needed on how to set up WMS and WMSP relationships.

5.7.4 WMS Project Recommendation Type

When a WMSP is related at either the WMS level or the WMS WUG supply level, the relationship is assigned a default *Project Recommendation Type* value of 'Recommended.' If the WMSP is considered an alternative project for the WMS or the WMS WUG, the user must update the *Project Recommendation Type* field to 'Alternative.' If a WMSP is labeled 'Recommended' for at least one WMS at either the WMS level or the WMS WUG level, it will be considered a 'Recommended' WMSP in the SWP. If all its relationships to a WMS are 'Alternative,' then the WMSP will be considered 'Alternative' in the SWP. It is especially important to review the *Recommendation Types* assigned to the WMSP to ensure that they are correct. WMS data checks will also help identify potential errors in DB27 by reviewing combinations of *Project Recommendation Types* selected.

5.7.5 WMS Project Hierarchies

When more than one WMSP is added to either a WMS or a WMS WUG, a *Project Tier* value must be entered. The *Project Tier* value represents the order in which the WMSPs must be implemented. If all WMSPs must be implemented at the same time, the *Project Tier* value will be '1' for all of them. If there is an order to the implementation of the WMSP, then a *Project Tier* value of '1' should be assigned to the first WMSP that must be implemented, a value of '2' is assigned to the next WMSP, and so on. If three WMSPs are required to implement a WMS and one WMSP needs to be implemented first and the other two later, then the first WMSP will get a *Project Tier* of '1' and the second two WMSPs will both have a value of '2.' The WMSP *Project Tier* value is entered on the DB27 WMS module's WMS Edit/Create application page if the WMSP is associated with the WMS as a whole and on the DB27 WMS module's WMS WUG Supply Edit/Create application page if the WMSP is associated with the WMS WUG Supply level. For more information on how WMSPs are related to a WMS, see Section 5.7.3.

5.8 WUG Unmet Needs/Surpluses

To calculate WUG unmet needs/surpluses, each WUG split's projected demands and recommended WMS transfers to other WUGs are deducted from its total existing and recommended assigned strategy supply by planning decade. If the WUG split's projected demand is larger than the total existing and recommended WMS supply assigned to it, the WUG split will have an unmet need in the decade represented by a negative number. If the WUG's projected demand is less than the WUG split's total

supply after recommended WMS, the WUG split will have a surplus in the decade represented by a positive number. When WUG split's unmet needs are summarized at the entity, region, county, basin, or state level, all calculated surpluses at the WUG split level are first updated to zero to ensure that the surpluses do not cancel out other WUGs' unmet needs. Summarized unmet needs are represented as a positive number.

5.9 Interregional WMS and WMS Projects

More than one RWPA may use the same WMS and WMSPs. It is especially important that RWPGs communicate and work together to enter the data correctly into DB27, so that WMS and WMSPs are only entered once for all regions and are not subdivided amongst them. RWPs can reference projects that are sponsored by another region even if the project is not displayed in their RWP DB27 reports. WUGs located in one region can still have their needs met by WMSs sponsored by other regions. TWDB WSSA staff are available to assist RWPG consultants as they plan their method of data entry.

6 Data Checks

The DB27 Data Checks module contains checks for the Sources, Entities, and WMS modules. Prior to a Region's data being certified as complete by TWDB WSSA staff, all potential errors found while running the data checks must either be addressed or have an approved appeal. Only some of the data checks can be appealed. An example of a data check that may not be appealed is when a required field is left blank. Data checks that allow for an appeal look for unusual data structures and ask that the data be reviewed and appealed if correct, such as an unusually low capital cost for a WMSP or a groundwater or surface water source with increasing total availability. Contact WSSA for the full list of checks that the application will run through.

7 DB27 Data Setup and Assistance

Data entered into the DB22 application will be copied into the DB27 database. WSSA staff will update WUGs and WUG splits to match the adopted list for the sixth cycle of planning. They will also update groundwater sources, so they are consistent with the sixth cycle of planning DFC modeled data. Since the existing WUG supply water treatment level field is new and the WMS description and project component lists are being reviewed, data in those fields will be removed so that the updated values can be entered. Please contact the WSSA team if you need assistance updating data or strategizing the most efficient way to enter data into the DB27 data entry application. They have data tools that can assist with data entry in some situations. For example, if a WMS needs to be removed, they can remove all decadal values to make the strategy easier to delete.

Appendix 1
Data Units of Measure

Table 2

Data Element	Unit of Measure
land area	square miles (mi^2)
water area	acres (ac)
water volume	acre-feet (ac-ft)
water supply and demand	acre-feet per year (ac-ft/yr)
treatment plant capacities	millions of gallons per day (mgd)
water use per capita	gallons per capita per day (gpcd)
stream flows and reservoir releases	cubic feet per second (cfs)
pumping rates	gallons per minute (gpm) or million gallons per day (mgd)
costs	September 2023 price indices as reported in the Engineering News Record Construction Cost Index

Appendix 2
Methodology Used to Determine Total Availability by Source Subtype

Table 3

Methodology Used to Determine Total Availability Volumes	Source Type/Subtype	Description of Additional Information Requested in Methodology Other Field
Modeled Available Groundwater (MAG)	Groundwater/MAG	
Groundwater Availability Model (GAM)	Groundwater/Non-MAG Groundwater/Partial MAG	Specify which model was used and the date the model was run.
Groundwater Availability Model (GAM) Modified	Groundwater/Non-MAG Groundwater/Partial MAG	Specify which model was used, the date the model was run, a description of the modification, and the EA approval date.
Effective Aquifer Recharge	Groundwater/Non-MAG Groundwater/Partial MAG	Specify basis of recharge estimates.
Published Data/Reports	Groundwater/Non-MAG Groundwater/Partial MAG Surface Water/Livestock Local Supply Surface Water/Other Local Supply	Name of report/dataset, who published the report/dataset, and the date the report/dataset was published.
Livestock/Holding Tank Volume	Surface Water/Livestock Local Supply Surface Water/Other Local Supply	
Permitted Amount	Groundwater/Non-MAG Groundwater/Partial MAG Reuse/Direct Reuse Reuse/Indirect Reuse	
Diversion Infrastructure Capacity	Surface Water/Run-of-River Surface Water/Reservoir Surface Water/Reservoir System Surface Water/Gulf of Mexico Reuse/Direct Reuse Reuse/Indirect Reuse	
Wastewater Treatment Plant Discharge	Reuse/Direct Reuse Reuse/Indirect Reuse	
Water Availability Model (WAM) Run 3	Surface Water/Run-of-River Surface Water/Reservoir Surface Water/Reservoir System	
Water Availability Model (WAM) Run 3 Modified	Surface Water/Run-of-River Surface Water/Reservoir Surface Water/Reservoir System	Specify which model was used, the date the model was run, a description of the modification, the qualifier, and the EA approval date.
Source is not in use	All Source Types	
Other	All Source Types	Must provide a detailed description of the methodology used. If more than one methodology is identified, any additional information listed previously in this table must also be included.

Appendix 3
SWP WMS Type List

Table 4

WMS Type	DB27 Data Used to Create WMS Type Value
Municipal Conservation	*WMS Description* = 'Conservation-water use reduction' or 'Conservation-water loss mitigation' & *WUG Type* = 'Municipal'
Agricultural Conservation	*WMS Description* = 'Conservation-water use reduction' or 'Conservation-water loss mitigation' & *WUG Type* = 'Irrigation' or 'Livestock'
Industrial Conservation	WMS Description = 'Conservation-water use reduction' or 'Conservation-water loss mitigation' & *WUG Type* = 'Manufacturing', 'Mining', or 'Steam-Electric'
Drought Management	*WMS Description* = 'Drought Management'
Groundwater Wells & Other	*WMS Description* = 'Existing surface water and groundwater availability requiring only conventional treatment and/or conveyance' or 'Aquifer Recharge' & *Source Subtype* = 'Conventional Groundwater'
Groundwater Desalination	*WMS Description* = 'Desalination required, not used in new reservoir or ASR or AR project' & *Source Subtype* = 'Conventional Groundwater'
Aquifer Storage & Recovery	*WMS Description* = 'Aquifer storage and recovery '
New Major Reservoir	*WMS Description* = 'New major reservoir'
Other Surface Water	*WMS Description* = 'Existing surface water and groundwater availability requiring only conventional treatment and/or conveyance', 'New minor reservoir', or 'Surface water yield enhancement' & *Source Type* = 'Surface Water'
Seawater Desalination	*WMS Description* = 'Desalination required, not used in new reservoir or ASR or AR project' & *Source Subtype* = 'Gulf of Mexico'
Direct Potable Reuse	*WMS Description* = 'Reuse not used in future reservoir, ASR or AR project ' & *Source Subtype* = 'Direct Potable Reuse '
Indirect Reuse	*WMS Description* = 'Reuse not used in future reservoir, ASR or AR project' & *Source Subtype* = 'Indirect Potable Reuse ' or 'Indirect Non-Potable Reuse'
Other Direct Reuse	*WMS Description* = 'Reuse not used in future reservoir, ASR or AR project' & *Source Subtype* = 'Direct Non-Potable Reuse'
Other Strategies	*WMS Description* = 'Brush management,' 'Rainwater collection system', 'Weather modification', or 'Desalination required, not used in new reservoir or ASR or AR project' when *Source Subtype* = 'Reservoir', 'Reservoir System', or 'Run-of-River')

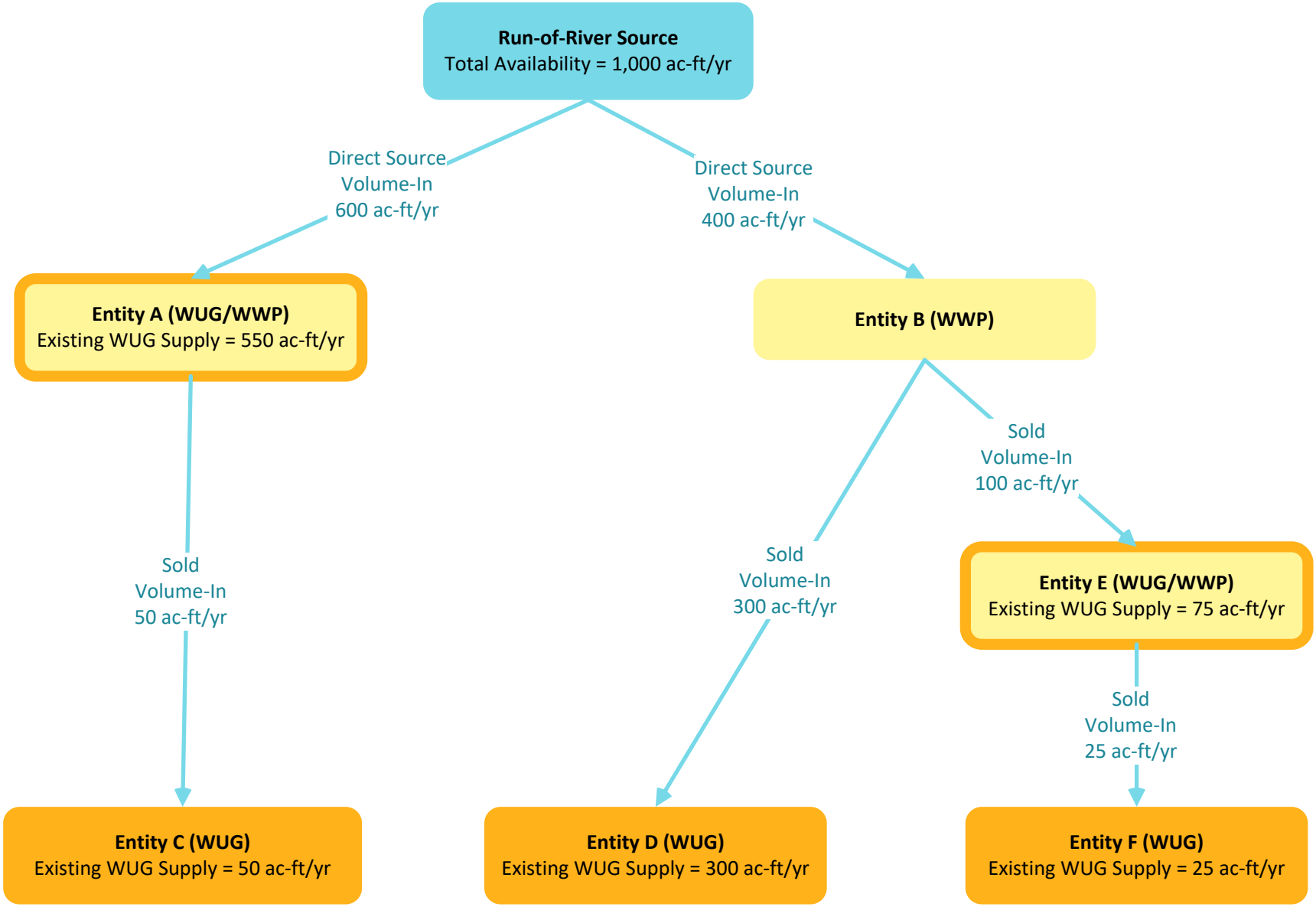
Appendix 4
List of Project Components

Table 5

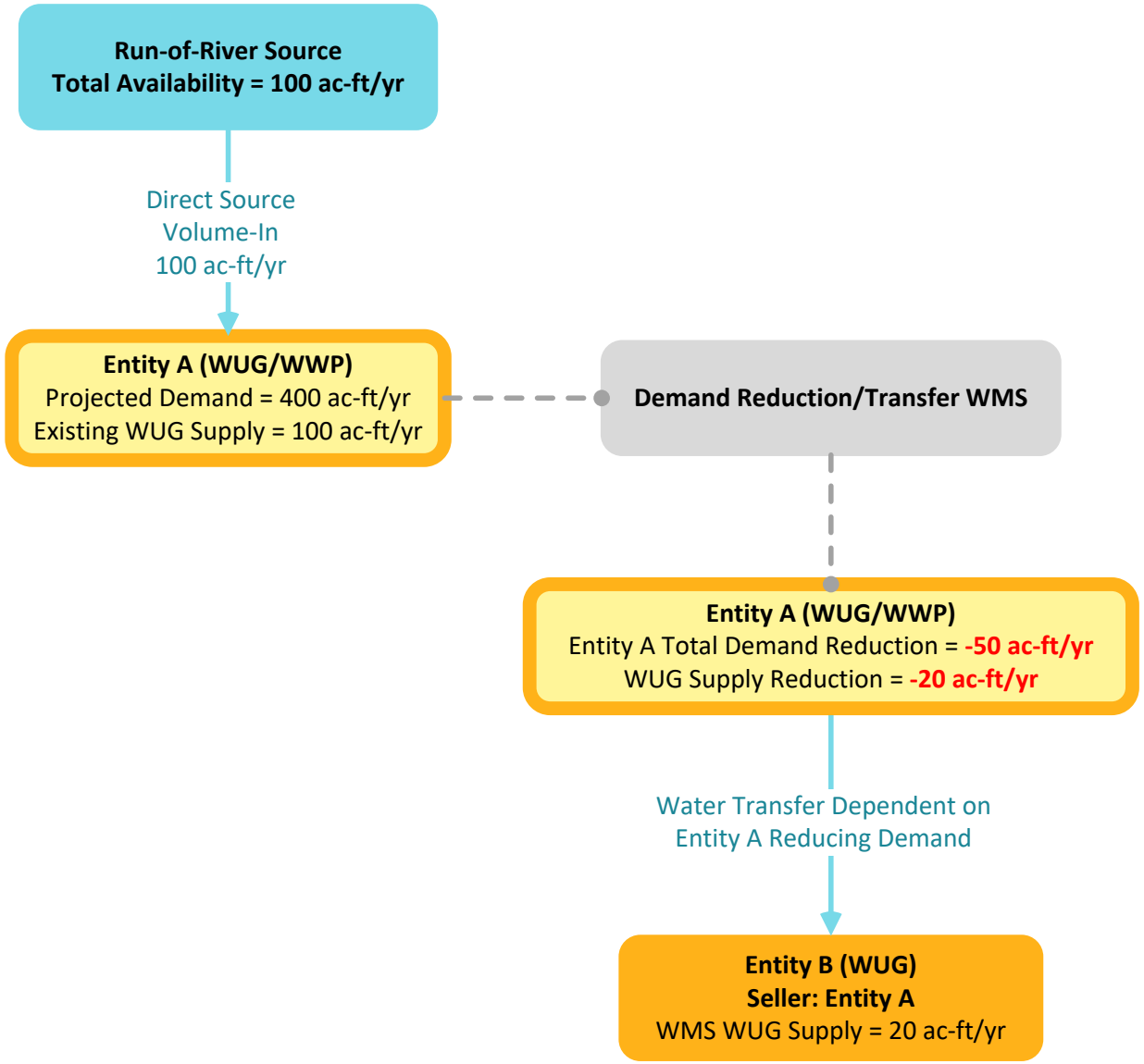
Component Category	WMS Project Component Type Name
Conservation	Data gathering and monitoring technology
Conservation	Plumbing fixture updates
Conservation	Audit
Conservation	Distribution system water loss mitigation
Conservation	Transmission water loss mitigation
Conservation	Canal lining
Conservation	Cropping and management practices
Conservation	Land management
Conservation	On farm water delivery systems
Conservation	Cooling system management
Conservation	Industrial operation improvements
Groundwater	Existing conventional well enhancement
Groundwater	New conventional well
Groundwater	Existing ASR well enhancement
Groundwater	New ASR or AR well
Groundwater	New disposal well
Groundwater	Spreading/infiltration basin
Ownership	Amended water right non-exempt IBT
Ownership	New water right non-exempt IBT
Ownership	New or amended water right NO IBT or exempt IBT
Ownership	New or amended bed and banks permit
Ownership	New 210 permit
Ownership	Contract/agreement
Recycling	Condensate recovery system
Recycling	Graywater recovery system
Recycling	Blackwater recovery system
Recycling	Agriculture tailwater recovery system
Recycling	Industrial recovery system
Surface Water	Diversion and control structure
Surface Water	Dredge to recover capacity
Surface Water	New surface water intake
Surface Water	Raise conservation pool
Surface Water	New water supply reservoir
Surface Water	Saltwater barrier
Surface Water	Surface water intake modification
Transmission	Transmission pipeline
Transmission	Pump station
Transmission	Storage tank/balancing reservoir

Component Category	WMS Project Component Type Name
Treatment	New advanced WTP
Treatment	New desalination WTP
Treatment	New conventional WTP
Treatment	Expand WTP capacity
Treatment	Settling basin/pond
Other	Brush management
Other	Weather modification
Other	Rainwater harvesting system
Other	Stormwater collection system

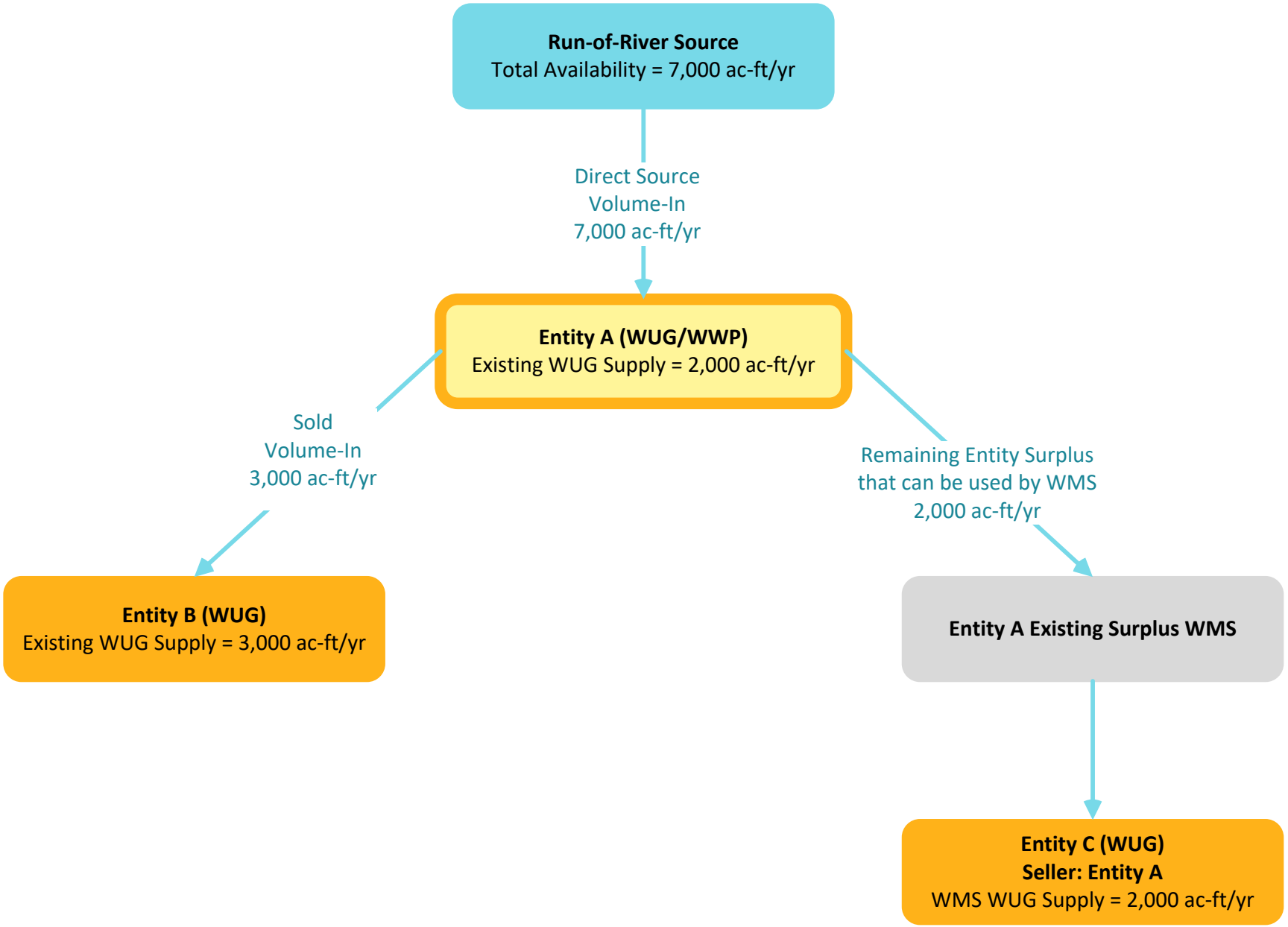
Appendix 5
Existing Sales & WUG Supply Water Transaction Example


Run-of-River Source
Total Availability = 1,000 ac-ft/yr
Direct Source
Volume-In
600 ac-ft/yr
Direct Source
Volume-In
400 ac-ft/yr
Entity A (WUG/WWP)
Existing WUG Supply = 550 ac-ft/yr
Entity B (WWP)
Sold
Volume-In
50 ac-ft/yr
Sold
Volume-In
300 ac-ft/yr
Sold
Volume-In
100 ac-ft/yr
Entity E (WUG/WWP)
Existing WUG Supply = 75 ac-ft/yr
Sold
Volume-In
25 ac-ft/yr
Entity C (WUG)
Existing WUG Supply = 50 ac-ft/yr
Entity D (WUG)
Existing WUG Supply = 300 ac-ft/yr
Entity F (WUG)
Existing WUG Supply = 25 ac-ft/yr

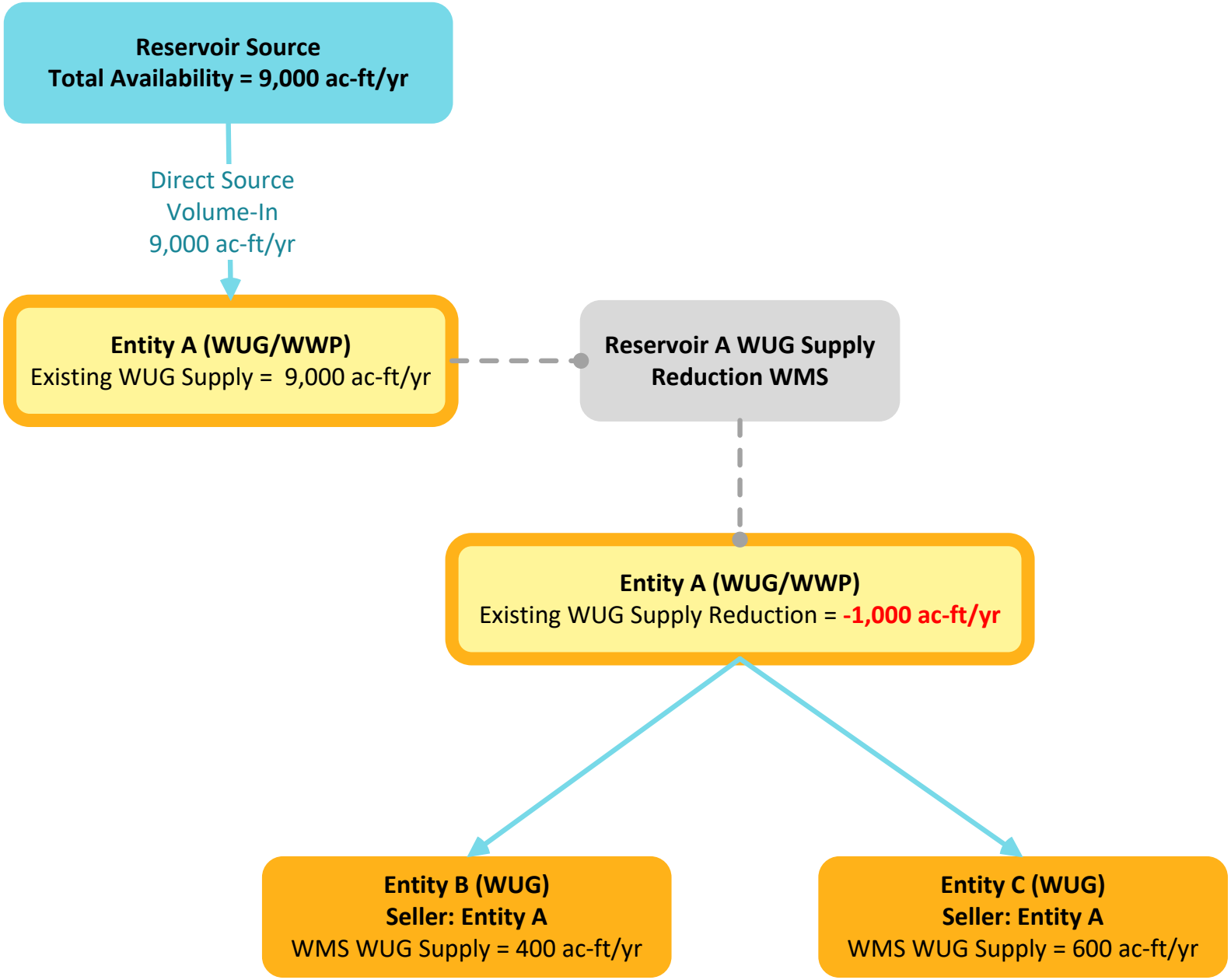
Appendix 6
Demand Reduction Transfer WMS Example


Run-of-River Source
Total Availability = 100 ac-ft/yr
Direct Source
Volume-In
100 ac-ft/yr
Entity A (WUG/WWP)
Projected Demand = 400 ac-ft/yr
Existing WUG Supply = 100 ac-ft/yr
Demand Reduction/Transfer WMS
Entity A (WUG/WWP)
Entity A Total Demand Reduction = -50 ac-ft/yr
WUG Supply Reduction = -20 ac-ft/yr
Water Transfer Dependent on
Entity A Reducing Demand
Entity B (WUG)
Seller: Entity A
WMS WUG Supply = 20 ac-ft/yr

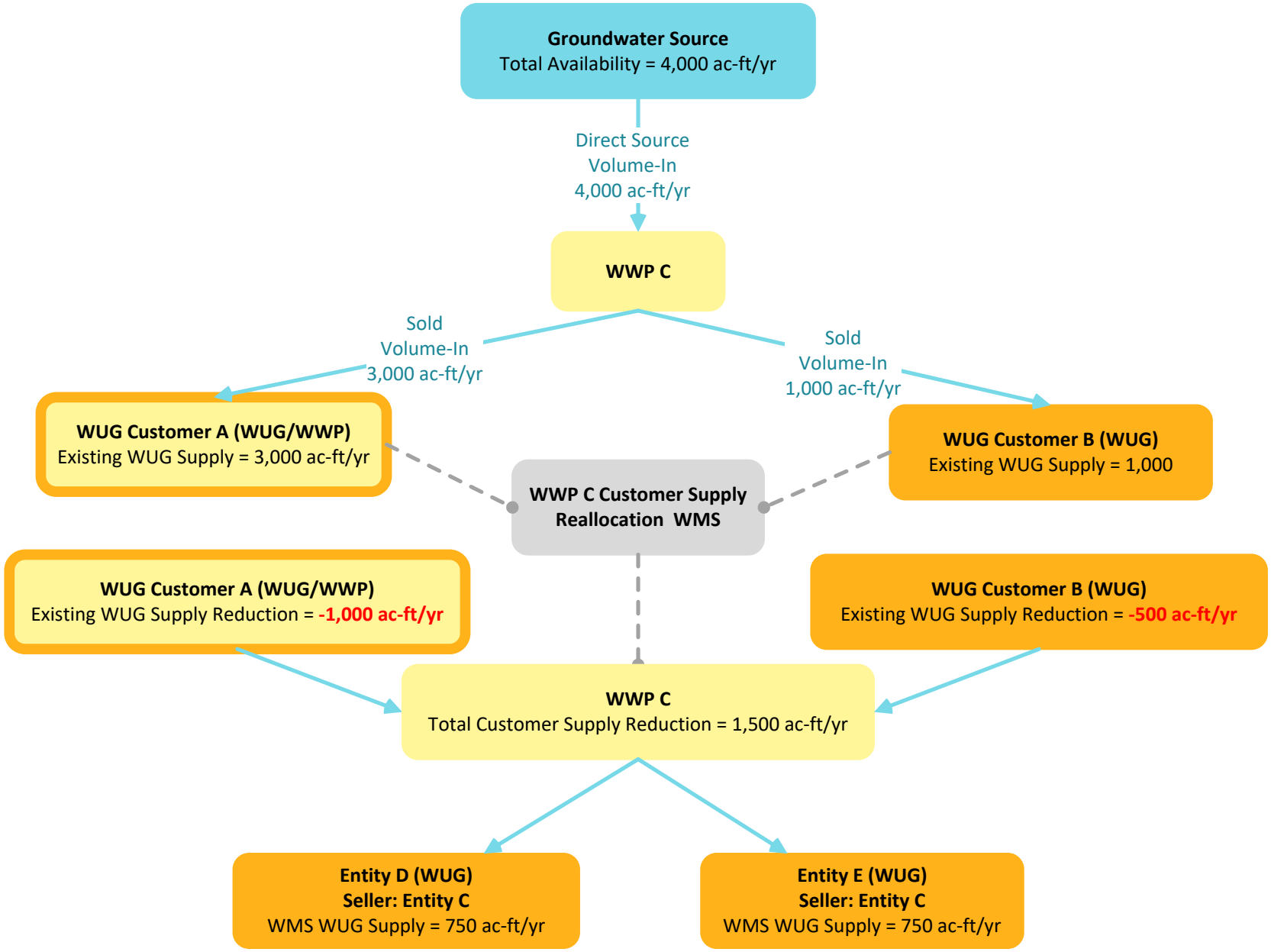
Appendix 7
Existing Surplus WMS Example


Run-of-River Source
Total Availability = 7,000 ac-ft/yr
Direct Source
Volume-In
7,000 ac-ft/yr
Entity A (WUG/WWP)
Existing WUG Supply = 2,000 ac-ft/yr
Sold
Volume-In
3,000 ac-ft/yr
Remaining Entity Surplus
that can be used by WMS
2,000 ac-ft/yr
Entity B (WUG)
Existing WUG Supply = 3,000 ac-ft/yr
Entity A Existing Surplus WMS
Entity C (WUG)
Seller: Entity A
WMS WUG Supply = 2,000 ac-ft/yr

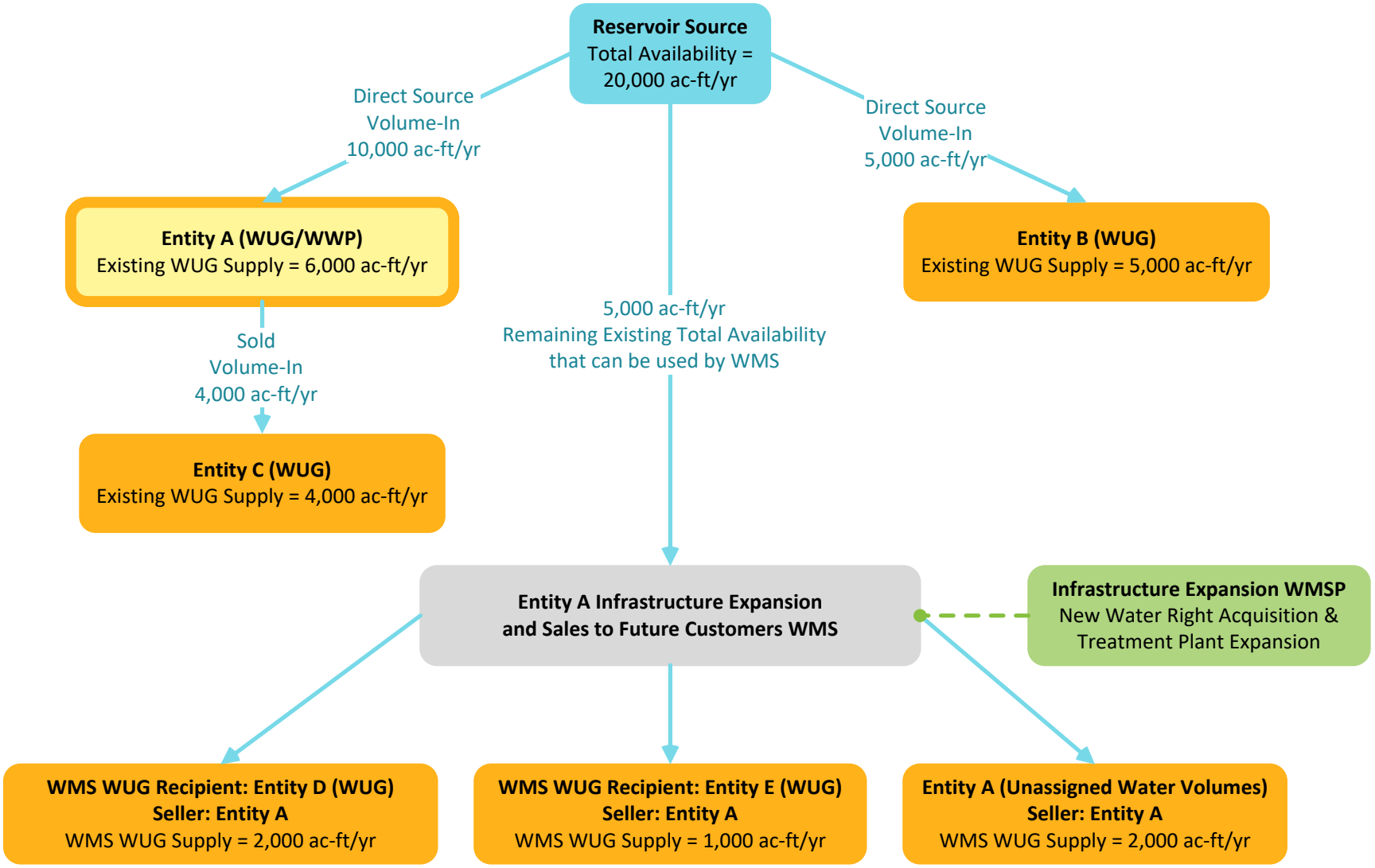
Appendix 8
WUG Supply Reduction WMS Example


Reservoir Source
Total Availability = 9,000 ac-ft/yr
Direct Source
Volume-In
9,000 ac-ft/yr
Entity A (WUG/WWP)
Existing WUG Supply = 9,000 ac-ft/yr
Reservoir A WUG Supply Reduction WMS
Entity A (WUG/WWP)
Existing WUG Supply Reduction = -1,000 ac-ft/yr
Entity B (WUG)
Seller: Entity A
WMS WUG Supply = 400 ac-ft/yr
Entity C (WUG)
Seller: Entity A
WMS WUG Supply = 600 ac-ft/yr

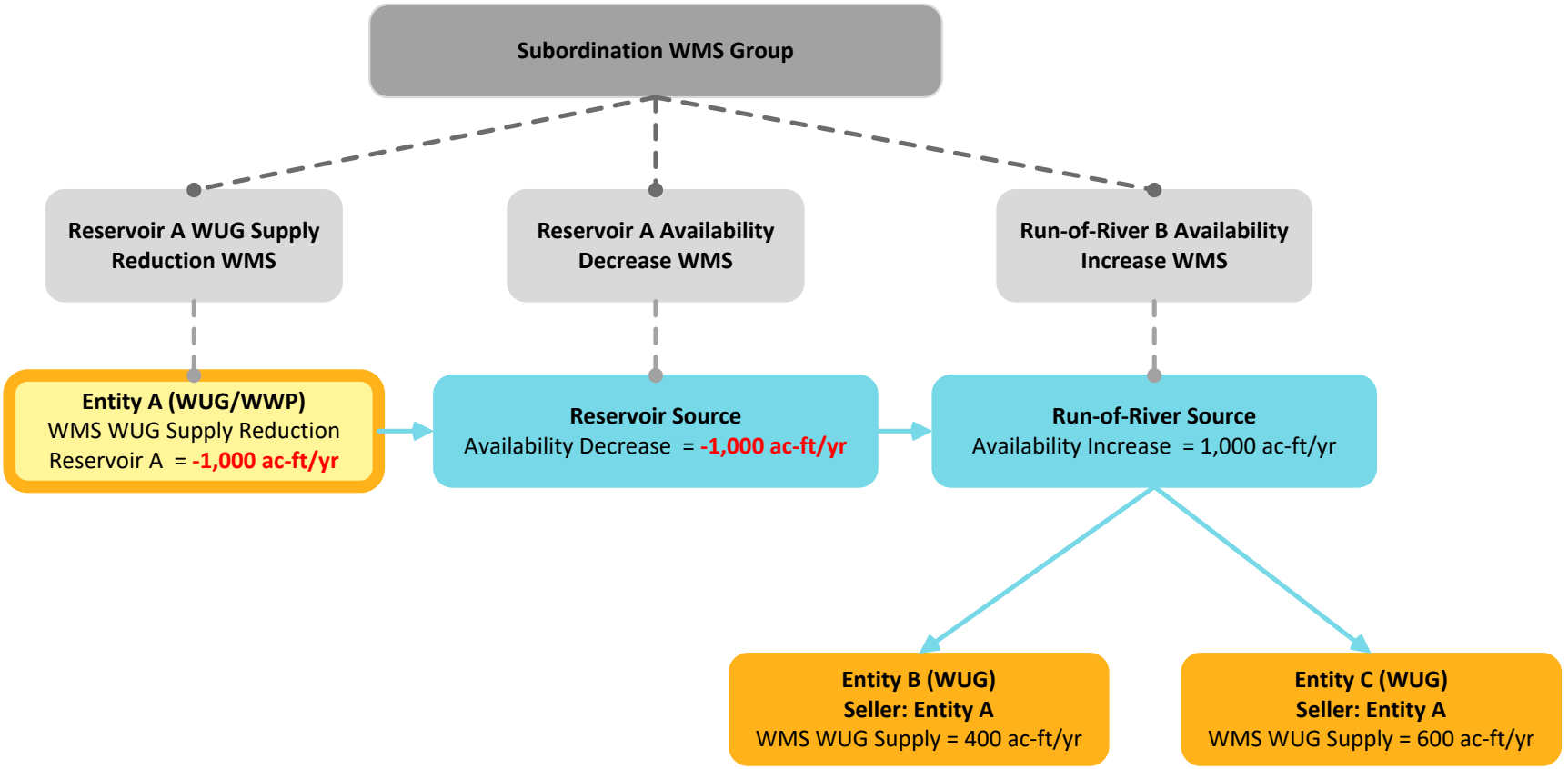
Appendix 9
WWP Customer Supply Reduction WMS Example


Groundwater Source
Total Availability = 4,000 ac-ft/yr
Direct Source
Volume-In
4,000 ac-ft/yr
WWP C
Sold
Volume-In
3,000 ac-ft/yr
Sold
Volume-In
1,000 ac-ft/yr
WUG Customer A (WUG/WWP)
Existing WUG Supply = 3,000 ac-ft/yr
WUG Customer B (WUG)
Existing WUG Supply = 1,000
WWP C Customer Supply
Reallocation WMS
WUG Customer A (WUG/WWP)
Existing WUG Supply Reduction = -1,000 ac-ft/yr
WUG Customer B (WUG)
Existing WUG Supply Reduction = -500 ac-ft/yr
WWP C
Total Customer Supply Reduction = 1,500 ac-ft/yr
Entity D (WUG)
Seller: Entity C
WMS WUG Supply = 750 ac-ft/yr
Entity E (WUG)
Seller: Entity C
WMS WUG Supply = 750 ac-ft/yr

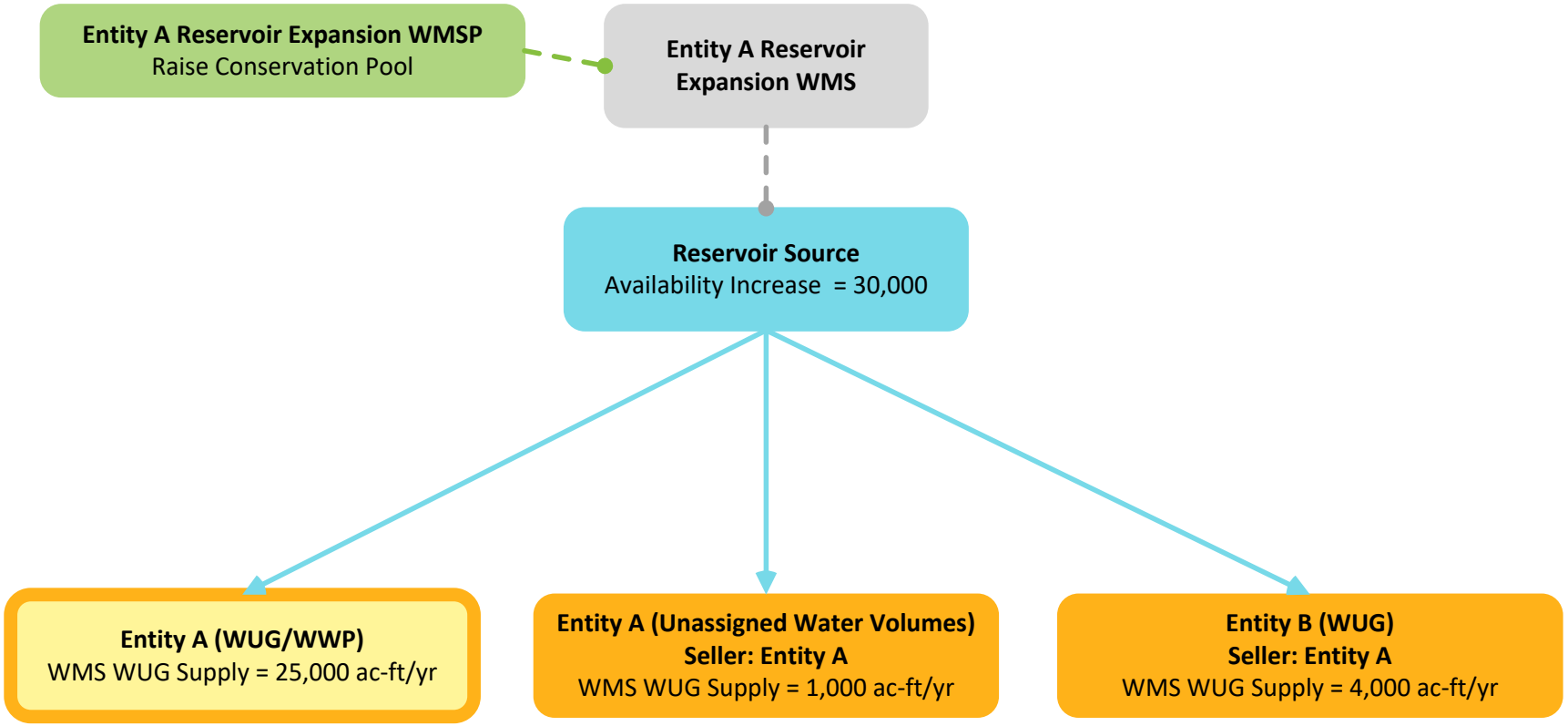
Appendix 10
Existing Availability WMS Example


Reservoir Source
Total Availability = 20,000 ac-ft/yr
Direct Source Volume-In 10,000 ac-ft/yr
Direct Source Volume-In 5,000 ac-ft/yr
Entity A (WUG/WWP)
Existing WUG Supply = 6,000 ac-ft/yr
Entity B (WUG)
Existing WUG Supply = 5,000 ac-ft/yr
Sold Volume-In 4,000 ac-ft/yr
5,000 ac-ft/yr Remaining Existing Total Availability that can be used by WMS
Entity C (WUG)
Existing WUG Supply = 4,000 ac-ft/yr
Entity A Infrastructure Expansion and Sales to Future Customers WMS
Infrastructure Expansion WMSP
New Water Right Acquisition & Treatment Plant Expansion
WMS WUG Recipient: Entity D (WUG)
Seller: Entity A
WMS WUG Supply = 2,000 ac-ft/yr
WMS WUG Recipient: Entity E (WUG)
Seller: Entity A
WMS WUG Supply = 1,000 ac-ft/yr
Entity A (Unassigned Water Volumes)
Seller: Entity A
WMS WUG Supply = 2,000 ac-ft/yr

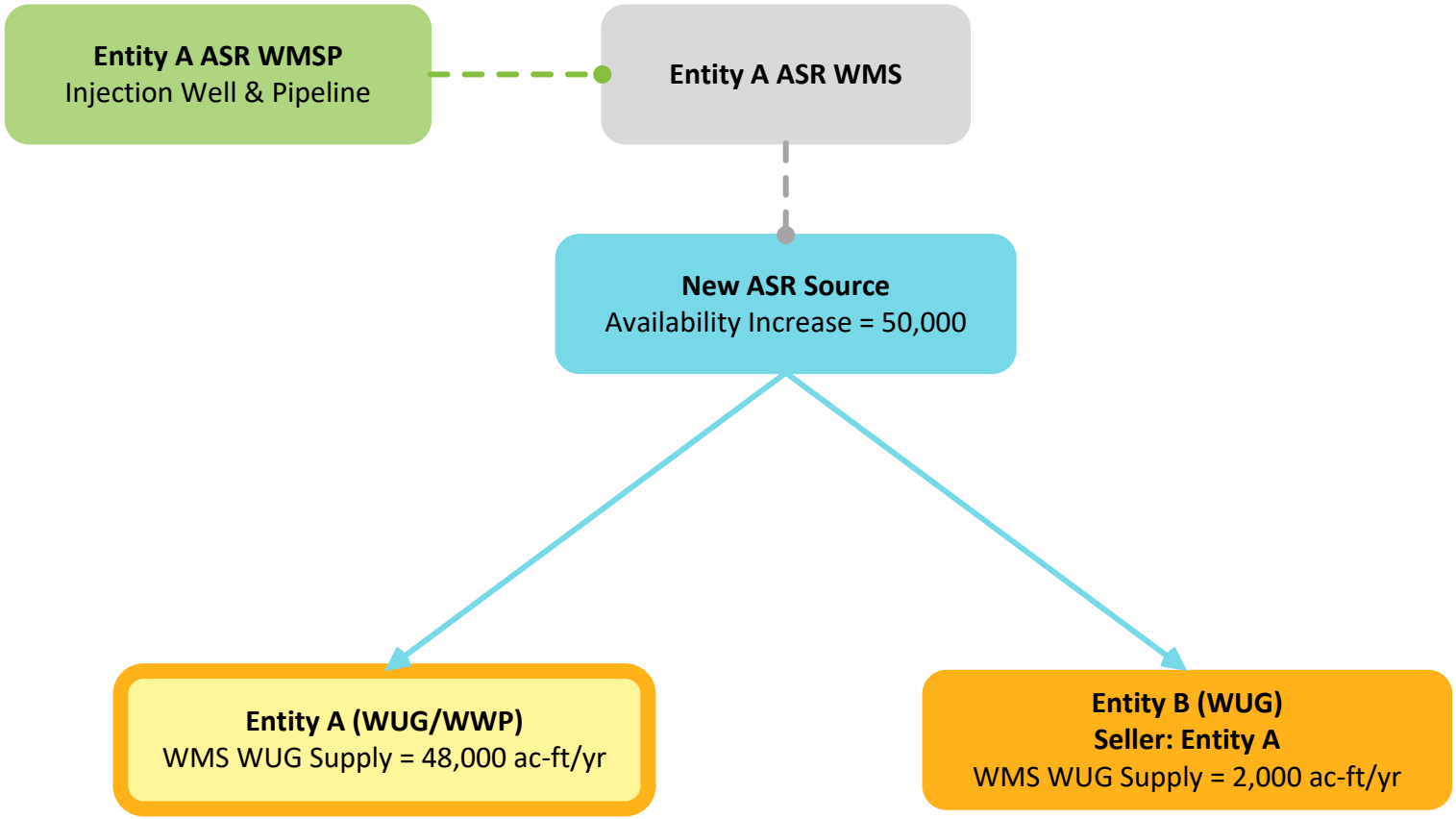
Appendix 11
Availability Decrease/Increase WMS Example


Subordination WMS Group
Reservoir A WUG Supply Reduction WMS
Reservoir A Availability Decrease WMS
Run-of-River B Availability Increase WMS
Entity A (WUG/WWP)
WMS WUG Supply Reduction Reservoir A = -1,000 ac-ft/yr
Reservoir Source
Availability Decrease = -1,000 ac-ft/yr
Run-of-River Source
Availability Increase = 1,000 ac-ft/yr
Entity B (WUG)
Seller: Entity A
WMS WUG Supply = 400 ac-ft/yr
Entity C (WUG)
Seller: Entity A
WMS WUG Supply = 600 ac-ft/yr

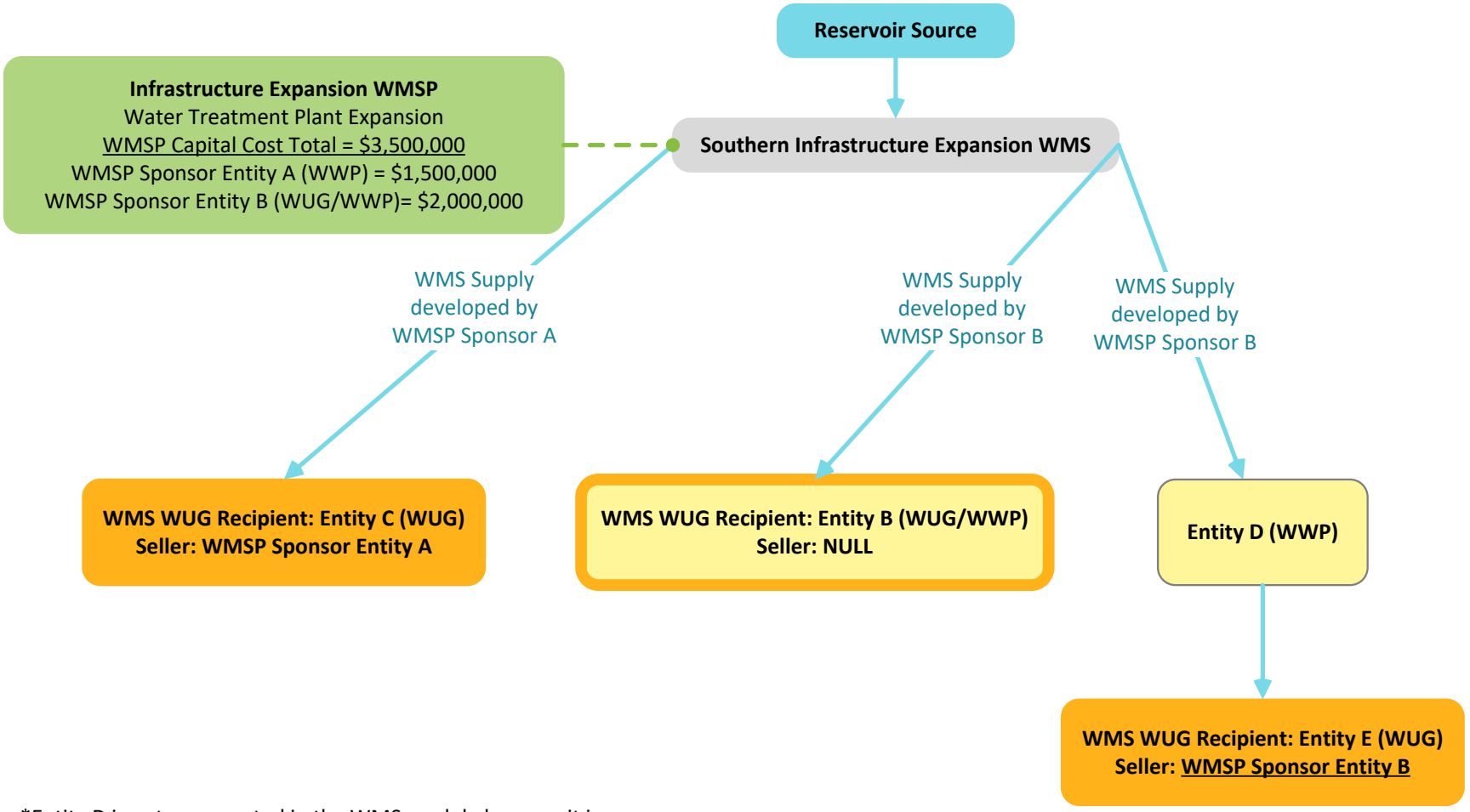
Appendix 12
Existing Source Availability Increase WMS Example


Entity A Reservoir Expansion WMSP
Raise Conservation Pool
Entity A Reservoir Expansion WMS
Reservoir Source
Availability Increase = 30,000
Entity A (WUG/WWP)
WMS WUG Supply = 25,000 ac-ft/yr
Entity A (Unassigned Water Volumes)
Seller: Entity A
WMS WUG Supply = 1,000 ac-ft/yr
Entity B (WUG)
Seller: Entity A
WMS WUG Supply = 4,000 ac-ft/yr

Appendix 13
New Source Availability Increase WMS Example

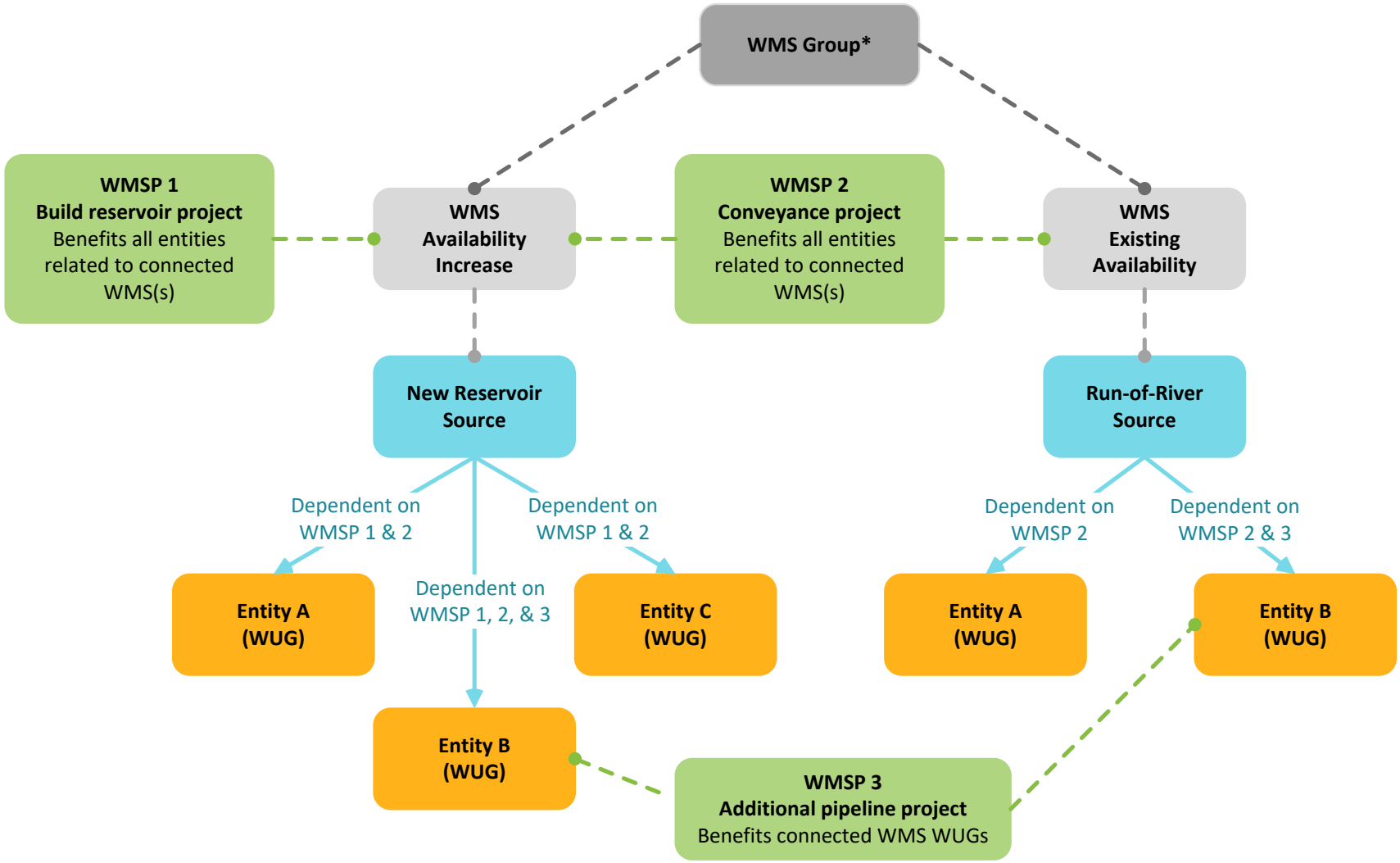

Entity A ASR WMSP
Injection Well & Pipeline
Entity A ASR WMS
New ASR Source
Availability Increase = 50,000
Entity A (WUG/WWP)
WMS WUG Supply = 48,000 ac-ft/yr
Entity B (WUG)
Seller: Entity A
WMS WUG Supply = 2,000 ac-ft/yr

Appendix 14
WMS Sponsor Relationships



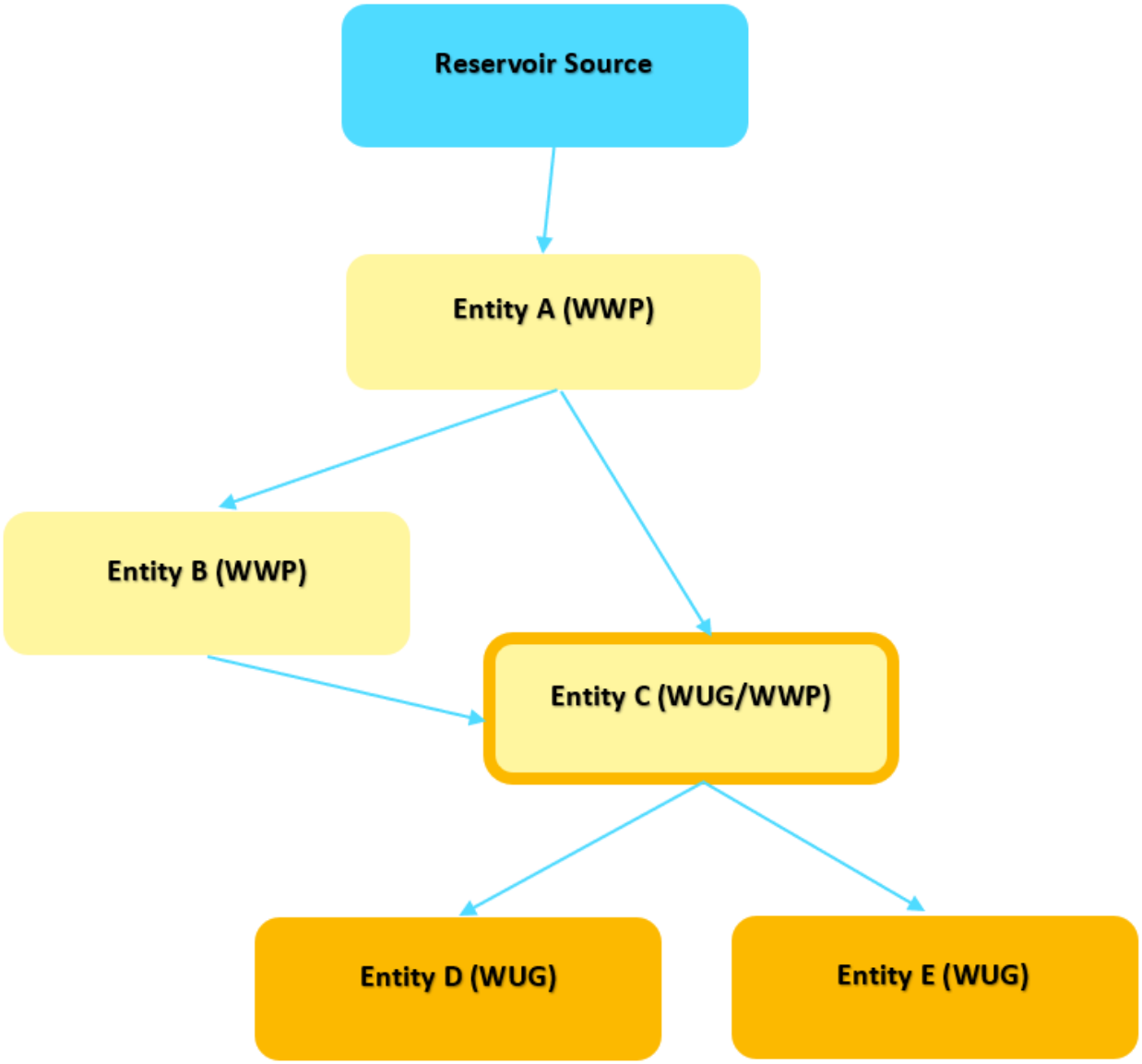
*Entity D is not represented in the WMS module because it is not a WUG and does not initially develop the WMS supply.

Appendix 15
WMS Project Relationship Example



*A WMS Group will link the WMSs if they are represented as a single WMS in the RWP. If WMS are listed separately in the RWP, no WMS Group is required.

Appendix 16
Diamond Water Example


Reservoir Source
Entity A (WWP)
Entity B (WWP)
Entity C (WUG/WWP)
Entity D (WUG)
Entity E (WUG)

Appendix 17
Conservation WMS Descriptions and Example BMPs

WMS Description 'Water loss mitigation' example BMPs

- Agriculture and industrial leak detection/water loss programs
- Advanced metering infrastructure (AMI)/automated meter reading (AMR)
- Plumbing fixture updates
- Utility water audit and water loss
- Transmission system water loss mitigation

WMS Description 'Water use reduction' example BMPs

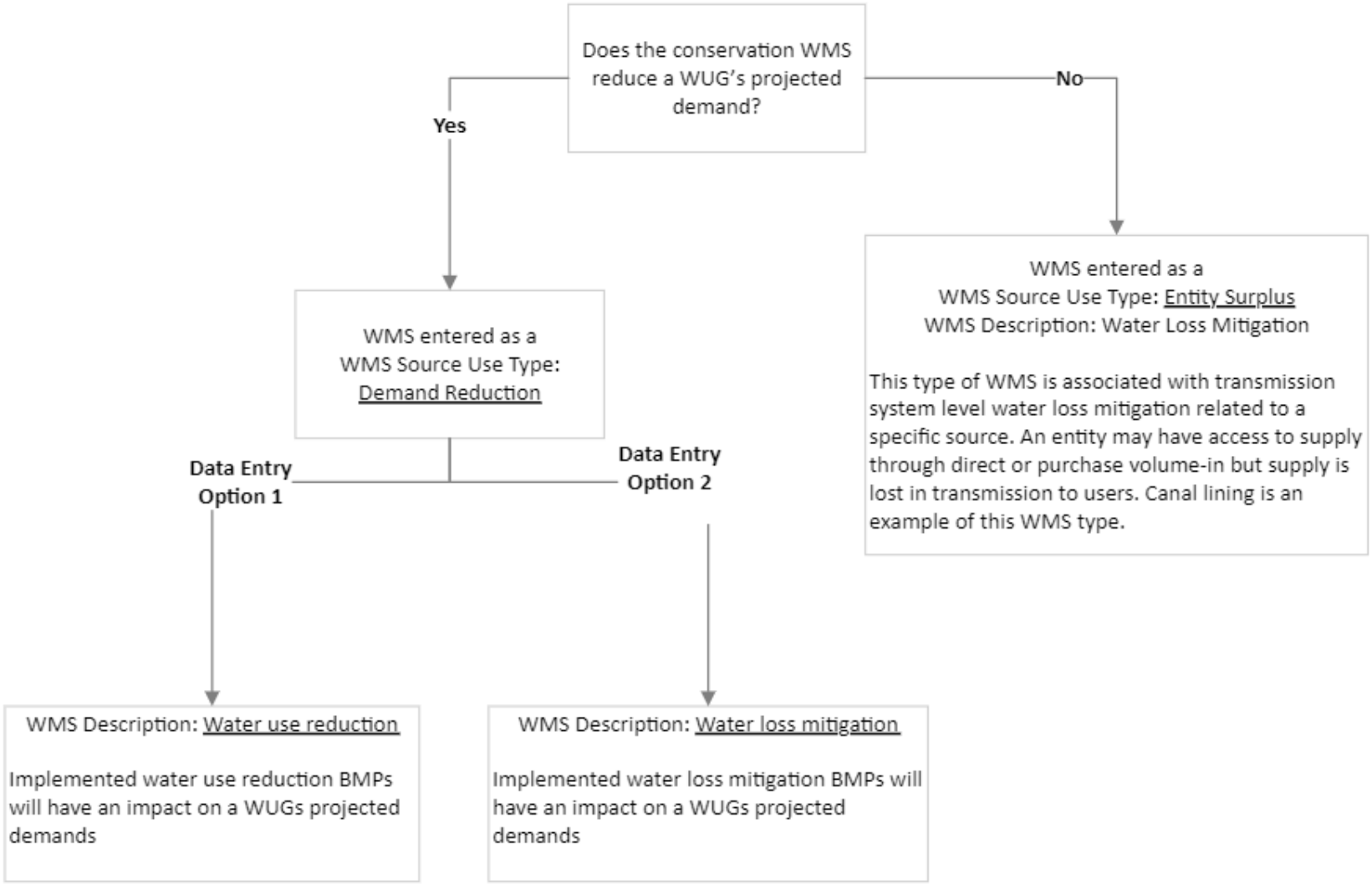
- Conservation analysis and planning
- Conservation coordinator
- Education and outreach
- Conservation ordinance planning and development
- Water conservation pricing
- Landscape irrigation conservation and incentives
- Water wise landscape design and conversion programs
- Custom conservation rebates
- Outdoor watering schedule
- Prohibition on wasting water
- Cropping and management practices
- Land management systems
- On-farm water delivery systems
- Scheduling practices
- Cooling systems management
- Industrial technology improving efficiency of water use (recirculation)
- Wholesale customer contract requirements to develop and implement water conservation and drought contingency plans
- Wholesale supplier collective purchase and direct distribution of water conservation equipment

Appendix 18
WMS Description Guidance

Table 6

WMS Description Value	When to Select
Conservation - water use reduction	WUG is benefiting from a demand reduction strategy that reduces water consumption. See Appendix 17 for examples of this conservation type.
Conservation - water loss mitigation	WUG is benefiting from a strategy that mitigates water loss. See Appendix 17 for examples of this conservation type.
Drought management	WUG is benefiting from a strategy that relies upon demand reduction strategies enacted only during drought conditions.
New major reservoir	WUG is getting water from a new major reservoir source, this value is selected. See Sections 3.3.2 and 3.3.3 for more information on this source type.
New minor reservoir	WUG is getting water from a new minor reservoir source, this value is selected. See Sections 3.3.2 and 3.3.3 for more information on this source type.
Rainwater collection system	WUG is benefiting from a strategy that collects and stores rainwater or stormwater in a containment system or structure. This does not include rainwater stored in an ASR, AR project, or new reservoir project. See Section 3.3.6 for more information on this source type.
Aquifer storage and recovery (ASR)	WUG is benefiting from a strategy that relies upon water stored in an ASR project. See Section 3.4.2 for more information on this source type.
Aquifer Recharge (AR)	WUG is benefiting from a strategy that relies upon AR to replenish the aquifer. See Section 3.4.1.4 for more information on this source type.
Desalination required, not used in new reservoir or ASR or AR project	WUG is benefiting from a strategy that relies upon the water being desalinated. If the desalinated supply is stored in an ASR or reservoir source, then the supply should be labeled as that and not desalination. Please note in the source detail of the ASR or reservoir source record that the supply was desalinated before being stored.
Reuse not used in future reservoir or ASR project	WUG is benefiting from reuse supply not being stored in an ASR project. Reuse can include direct/indirect reuse or water recycling. If the reuse supply is being stored in a new major or minor reservoir, please contact WSSA staff and they will assist you with the database allocations of the supply. See Section 3.5 for more information on this source type.
Weather modification	WUG is benefiting from supply associated with weather modification activities.
Brush management	WUG is benefiting from supply associated with brush management activities.
Surface water yield enhancement	WUG is benefiting from supply made available through a surface water yield enhancement like raising the conservation pool of an existing reservoir.
Existing surface water and groundwater availability requiring only conventional treatment and/or conveyance.	This label should be selected for just existing surface water and groundwater supply not covered in the previous categories. For this type of strategy supply, the surface or groundwater source exists and is being transferred without requiring new infrastructure (Example: WUG is increasing their contract with a WWP, and no new infrastructure is required) or to access the supply, the WUG requires additional infrastructure (Example: WUG plans to drill another well so that they can pump and transport additional supply).

Appendix 19
Conservation WMS Description Diagram


Does the conservation WMS reduce a WUG's projected demand?
Yes
No
WMS entered as a
WMS Source Use Type: Demand Reduction
Data Entry Option 1
Data Entry Option 2
WMS entered as a
WMS Source Use Type: Entity Surplus
WMS Description: Water Loss Mitigation
This type of WMS is associated with transmission system level water loss mitigation related to a specific source. An entity may have access to supply through direct or purchase volume-in but supply is lost in transmission to users. Canal lining is an example of this WMS type.
WMS Description: Water use reduction
Implemented water use reduction BMPs will have an impact on a WUGs projected demands
WMS Description: Water loss mitigation
Implemented water loss mitigation BMPs will have an impact on a WUGs projected demands