From:	Laura Ziemer
To:	Mohr, Jason
Cc:	Eloise Kendy; "stephenson@dmsnaturalresources.com" (stephenson@dmsnaturalresources.com)
Subject:	RE: WPIC request for information
Date:	Thursday, October 22, 2015 10:21:21 AM
Attachments:	GW Mit Bank Concept Paper Sept 17 2015.pdf

Hi Jason,

Thanks for your note and request for information for WPIC. WPIC may be interested in the model that a broad stakeholder group of water users is trying to develop in the Gallatin Valley for a Water Exchange to facilitate the transfer of water from one use to another. The Gallatin Valley Water Exchange is described in the attached concept paper, and two people knowledgeable of the effort are Eloise Kendy in Helena, and Deborah Stephenson in Bozeman, with their contact information below.

I'd be happy to provide additional information if this effort is of interest to the WPIC.

Best regards, Laura Ziemer

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From: Jason Mohr [mailto:jmohr2@mt.gov]
Sent: Wednesday, October 21, 2015 3:52 PM
To: Laura Ziemer
Subject: WPIC request for information

All,

The Water Policy Interim Committee is seeking information for its interim study of Water Availability and Supply. Specifically, the committee seeks to evaluate four diverse cases of what you think works well and what doesn't related to supplying water for growing

communities. For example, issues associated with the development of a subdivision next to city limits and the subsequent decision to use either individual groundwater wells or a municipal water supply.

Please tell the committee what you think works well, what doesn't, and what the issue is. Suggested, knowledgeable contacts with phone number and/or email address would be appreciated.

The WPIC hopes to use these case studies to explore how the Legislature might support successes and address issues, so feel free to provide suggestions, even if you don't have a specific case study.

The Water Policy Interim Committee is a bipartisan, eight-member committee that meets to discuss water issues and has oversight of state agencies where the primary concern is the quality and quantity of water. The committee's next meeting is Jan. 11-12.

To suggest a potential case study, please contact WPIC staffer Jason Mohr at jasonmohr@mt.gov or 444-1640.

September 2015

Gallatin Valley Groundwater Mitigation Bank

Concept Paper

MARS
MONTANA AQUATIC RESOURCES SERVICES

CITY OF BOZEMAN
1883
GALLATIN CO. MONTANA

TROUT UNLIMITED

The Nature Conservancy

DMS
NATURAL RESOURCES

Project Overview

Executive Summary

Gallatin County's rapid growth is placing increasing pressure on its water resources. The Gallatin Valley Groundwater Mitigation Bank (GVGMB) is a much needed water resource project being developed by Montana Aquatic Resources Services (MARS) in collaboration with the City of Bozeman (Bozeman) and a variety of stakeholders. The mission of GVGMB is to ensure the sustainability of the Gallatin River basin's aquatic wildlife habitat, protect agricultural water rights, and facilitate the availability of water to meet projected urban and residential demand. The GVGMB project will foster water resource conservation management, as well as rational water right transfers in the Gallatin River basin. GVGMB services will streamline the arduous permitting process for entities seeking new groundwater appropriations.

GVGMB will acquire or lease water from existing senior surface water right holders, typically agricultural irrigators, move the water rights through the change-of-use process to a mitigation purpose, and then sell mitigation credits to new groundwater users, such as developers or the City of Bozeman. To mitigate, or offset, these new water uses, GVGMB will convey the acquired water to infiltration galleries or natural streambeds to recharge water into the aquifer. New groundwater users will be spared the challenge of independently locating willing water right sellers and navigating the complex regulatory process. Senior water right holders and environmental agencies will be ensured that all new non-exempt water appropriations in the valley are properly mitigated.

Project Motivation

Gallatin County is the fastest-growing area in Montana and in 2014 was ranked one of the ten fastest growing micropolitan (between 10,000 and 50,000 people) areas in the nation, on par with North Dakota's oil and gas boom country.[i] High urban growth in the City of Bozeman, proliferation of permit-exempt wells in Gallatin County, and a strong agricultural economy has led to water resource conflicts between senior surface water rights and new users. Gallatin County is now faced with balancing the increasing demands on its water supply with senior users and environmental quality.

Water issues in the area have become particularly pressing as a result of an October 2014 Montana First Judicial District Court ruling regarding permit-exempt groundwater wells, which decided a case brought by the Clark Fork Coalition, senior water rights holders, and other groups against the Department of Natural Resources and Conservation (DNRC). The ruling changed the definition of a 'combined appropriation', determining that a project or development with one or more wells that together use more than 35 gallons per minute or 10 acre-feet per year must go through water rights permitting—even if the wells are not physically piped together.[ii] The ruling limits the ability for new subdivisions to rely on exempt wells, but increases the permitting burden for new water users and the DNRC.

The complexity of the DNRC's permitting process creates an additional hurdle to resolving water conflicts and ensuring sustainable use.[iii] Groundwater Permit applicants are faced not only with finding senior surface water rights for mitigation, but also with an arduous change-of-use permitting process that can often stretch over multiple years. As part of that process, new appropriators must show that their mitigation recharges the aquifer in a manner that ensures no adverse impact to other water users, and that has considered the timing, volume, and location of depletion to surface water due to new groundwater pumping.[iv] By undergoing the regulatory process ahead of time, GVGMB will offer a streamlined process, sparing new water users the time and expense of complying with these regulations independently.

Benefits to the Gallatin Valley

The GVGMB will provide the following benefits to the Gallatin Valley:

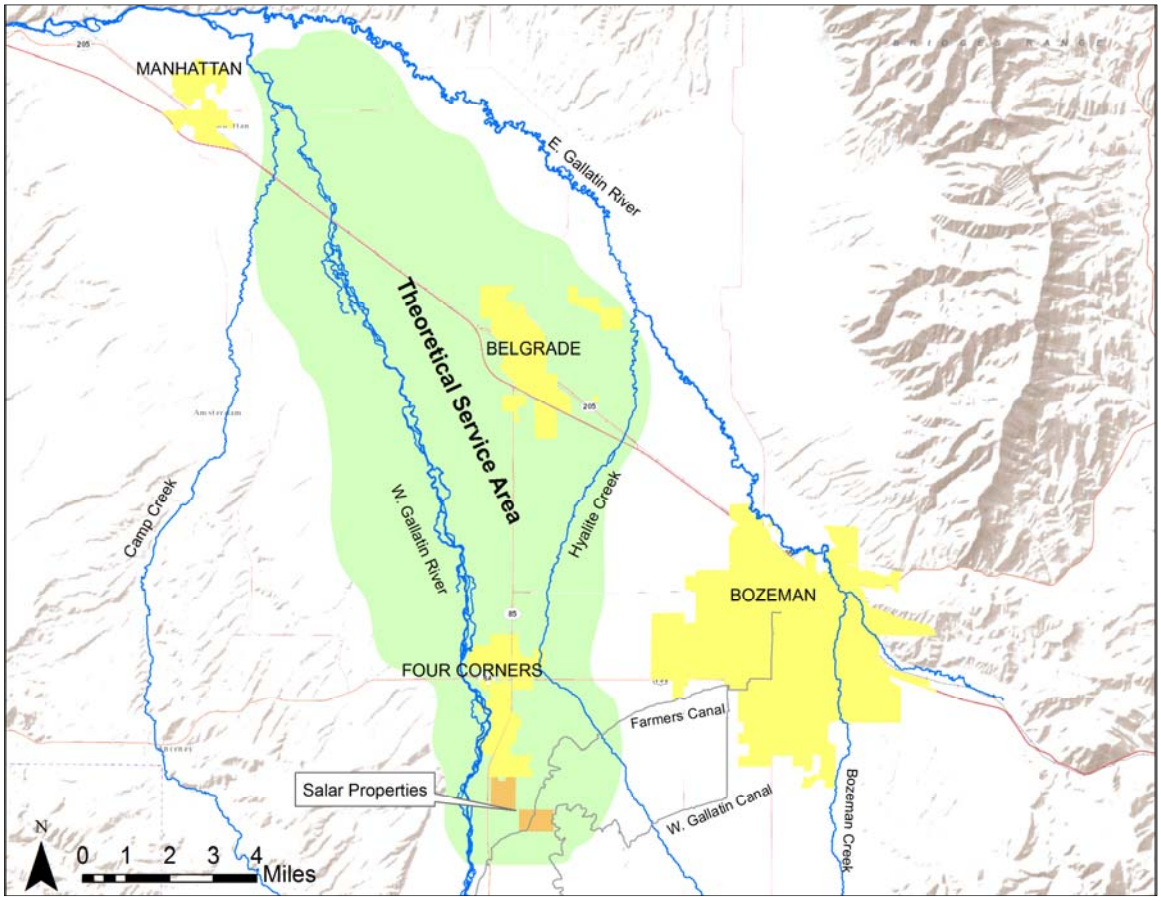
- **Enhance watershed sustainability.** The West Gallatin River currently experiences water shortages in dry years. Mitigating for new groundwater withdrawals protects both streamflow and senior water rights.
- **Preserve and realize value for senior water rights:** The GVGMB provides an opportunity for senior water right holders to lease or sell their rights to other water users. As former agricultural land is developed for residential use, GVGMB provides an opportunity for water right holders to obtain revenue for their water assets while limiting their marketing and regulatory costs.
- **Enhance viability of agricultural sector:** Agricultural infrastructure including canals and ditches will be maintained and improved to provide conveyance for mitigation water while ensuring sustainable, reliable, and continued delivery of irrigation water.
- **Provide a cost-effective solution for municipal and residential water supply.** Water supply development can be costly for municipalities and unincorporated subdivision developments. Water right acquisitions, infrastructure development, and regulatory costs all present financial burdens for new water users. By participating in the GVGMB, end users will have access to a reliable source of mitigation water and minimize transaction costs associated with developing additional water supplies and securing groundwater permits.

Project Participants

The effort to create the GVGMB has received interest and support from a range of stakeholders. Local project participants include Montana Aquatic Resources Services, Inc. (MARS) and The City of Bozeman (Bozeman). MARS, a nonprofit entity located in Bozeman, will serve as the GVGMB's administrator. Bozeman is anticipated to be a buyer of mitigation water from GVGMB. Bozeman is currently pursuing the use of large groundwater wells to provide additional municipal supply required to meet projected future water demands. Bozeman's development of groundwater is dependent upon adequate sources of mitigation water, which GVGMB could supply.

Multiple senior water right holders in the region have been contacted and are actively interested in the project; the Association of Gallatin Agricultural Irrigators, the Gallatin County Conservation District, and the Gallatin Local Water Quality District have all been briefed on the GVGMB and are supportive of the project. In addition, the Gallatin Valley Realtor's Association and the Southwest Montana Building Industry Association (SWMBIA) have been contacted to discuss the project. DMS Natural Resources is a water right consulting firm managing project development. The Nature Conservancy (TNC), Trout Unlimited (TU) and the University of California Santa Barbara's Bren School of Environmental Science & Management are also helping to facilitate the project's development.

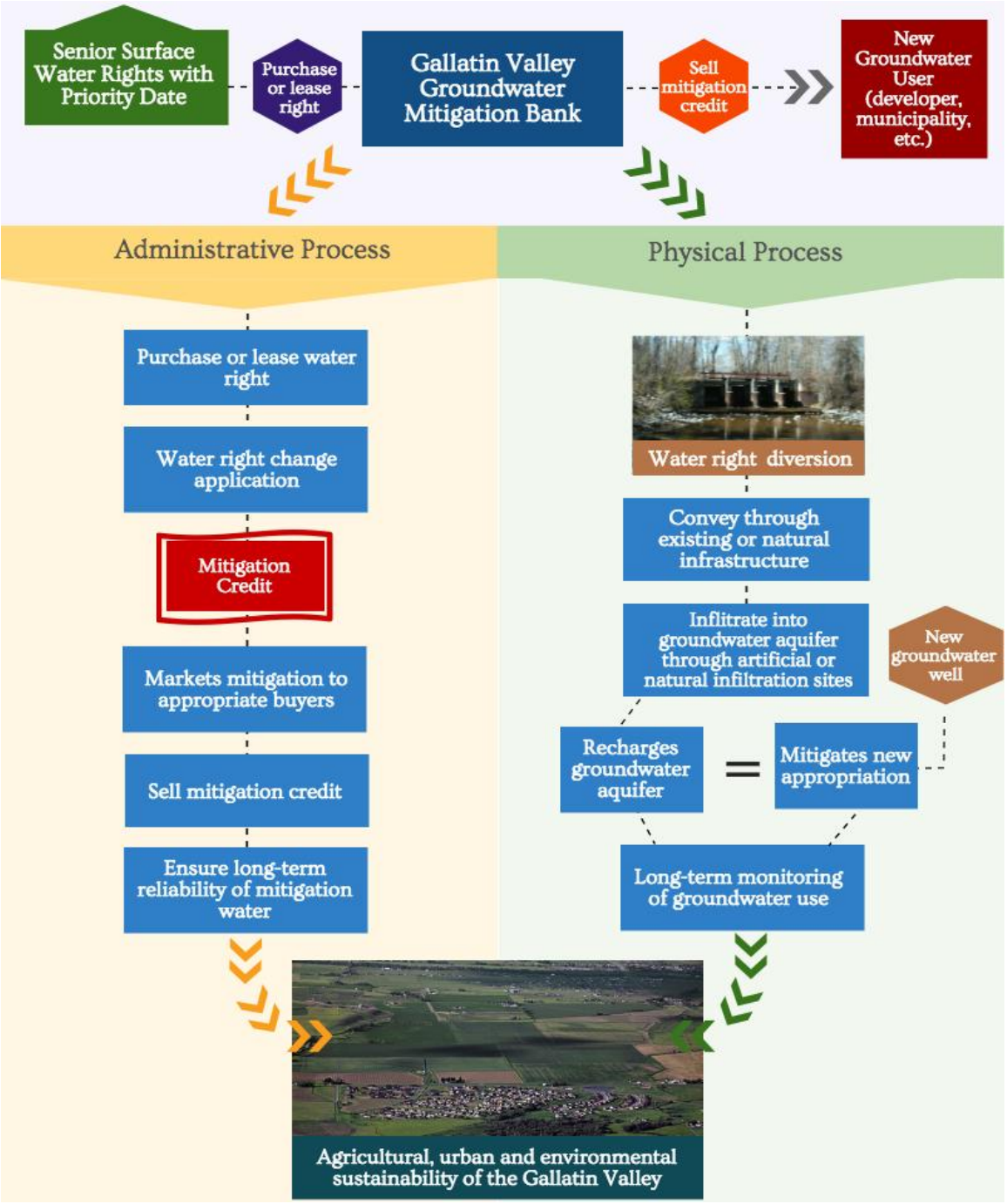
Project Location



Map of Gallatin Valley Groundwater Mitigation Bank project location, including theoretical service area.

Project Elements

Below is a schematic of the administrative and physical functions of the GVGMB. Further description of the administration, aquifer recharge, conveyance, and regulatory components of the project are provided below.



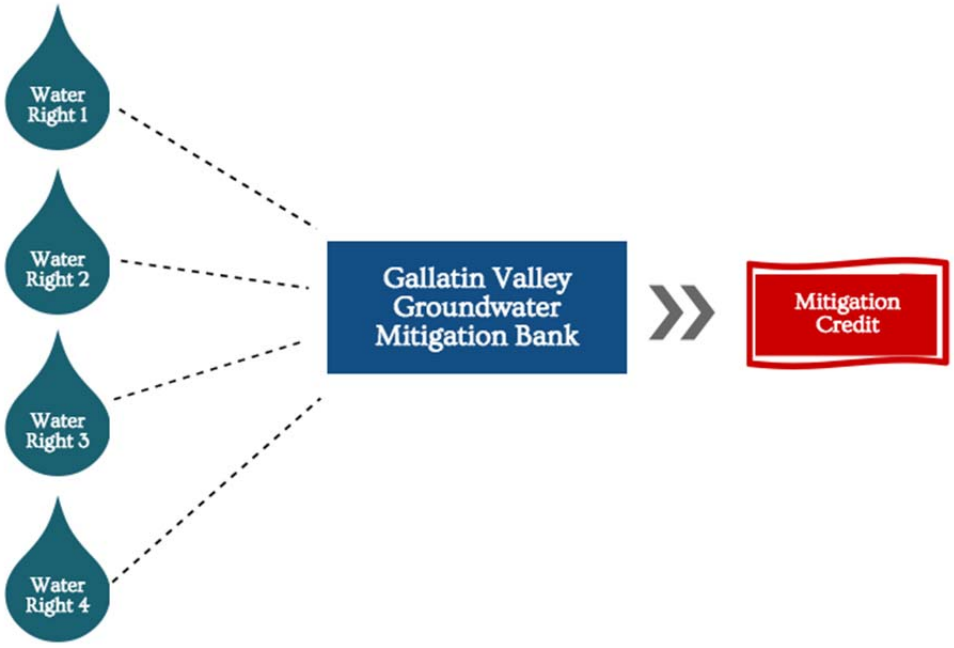
Administrative and physical depiction of the Gallatin Valley Groundwater Mitigation Bank operations.

Administration

MARS is currently seeking private investor, foundation, and grant support for its role as the GVGMB's long-term administrator. MARS already administers a similar process for wetland mitigation across the state of Montana and has the expertise to facilitate the GVGMB. As a nonprofit organization, MARS will provide full transparency about the accounting process. MARS will only pass through costs to mitigation credit buyers and will not charge a profit.

The GVGMB will acquire or lease water from existing water right holders, typically agricultural irrigators, move the water rights through the change-of-use process to a mitigation purpose, and then sell mitigation credits to applicants for new groundwater uses, such as subdivision developers or the City of Bozeman. It will facilitate all regulatory processes including the submission of a change application to convert existing water rights to mitigation water and aquifer recharge to meet streamflow requirements.[v]

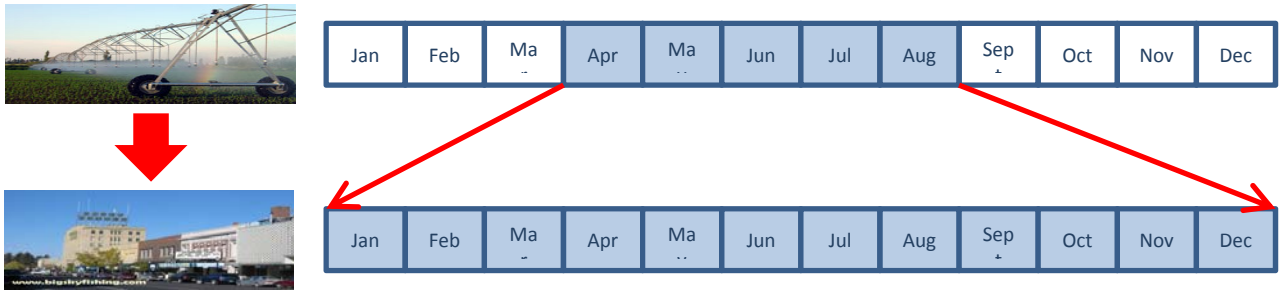
When an end user purchases a credit, the GVGMB will retire a portion of a water right from agricultural use and convey the water to a recharge location to infiltrate into the groundwater aquifer. As depicted below, prospective groundwater users will simply need to purchase a mitigation credit to account for their new use, rather than purchasing a water right and engaging in the regulatory process independently. The mitigation credits will be available to anyone seeking new appropriations, including municipalities, developments, industrial users, conservation organizations, and irrigators.



Individual water rights are pooled together and then transferred to mitigation credits.

Aquifer Recharge

The DNRC does not permit water transfers that change seasonal streamflow patterns. This presents a technical challenge as irrigation water rights typically deplete streamflow during the summer irrigation season, whereas municipal and industrial appropriations deplete streamflow year-round. In order to avoid altering current streamflow patterns, particularly in the winter months when irrigation water was not historically used, the bank's acquired water will be artificially recharged into the groundwater aquifer through infiltration basins or natural streambeds. This will allow for existing irrigation water rights, historically diverted and applied in the summer months, to be available for new uses on an annual basis.



Change in time of use from historical irrigation to new year-round mitigation.

The GVGMB is in the process of identifying recharge sites. Aquifer recharge site suitability is based on:

1. The capacity of existing irrigation canal or natural infrastructure to convey water to the site;
2. The infiltration capacity of the site to artificially recharge the underlying aquifer; and
3. The sites' ability to mitigate for new groundwater users based on expected location of new wells and the hydrogeologic conditions that affect the volume, timing, and location of groundwater flow back to the West Gallatin River and its tributaries.

A Ground Water Investigation Program Project with the Montana Bureau of Mines and Geology (MBMG) is pending approval and will assist with this effort by delineating and characterizing potential recharge sites. Further, the project proposed in partnership with MBMG is to eventually develop a user-friendly decision-making hydrologic model that predicts the rate, timing, and location of aquifer drawdown and streamflow depletion for any ground water pumping proposed within the study area.

One site, Salar Properties, LLC. (Salar), has been identified as a potential recharge location. The owner of the Salar property has completed a conceptual design and cost estimate for underground storage and aquifer recharge through an infiltration gallery on the Salar site.

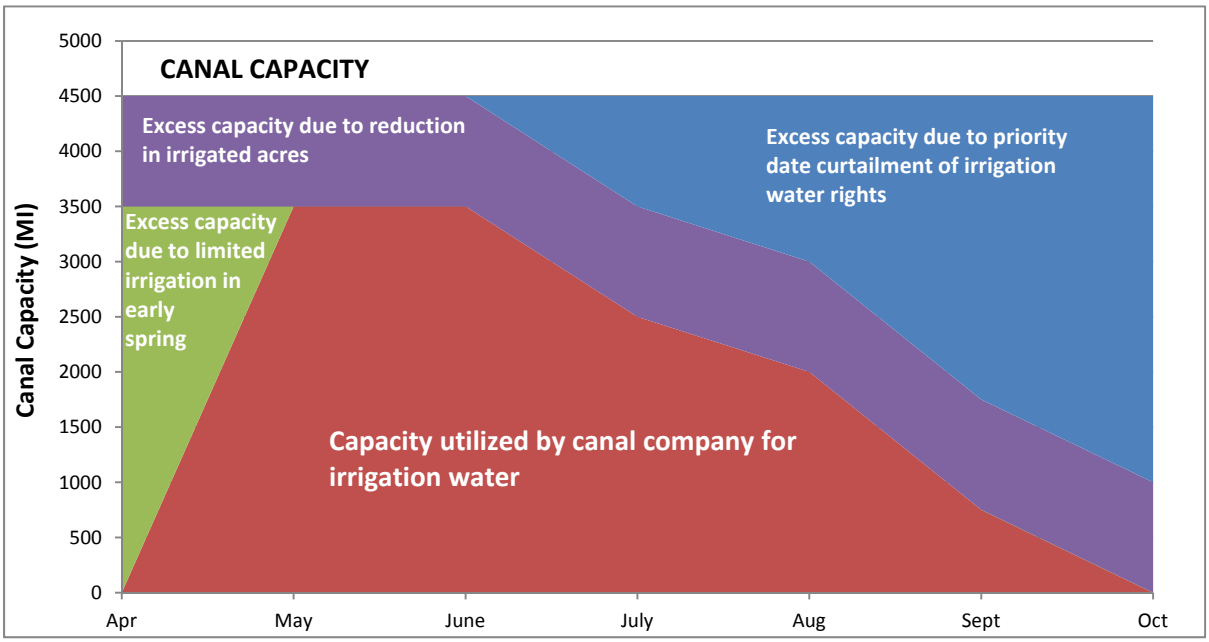
In addition to constructed recharge locations, GVGMB will investigate the suitability of ephemeral stream channels and existing canal ditches to recharge the aquifer. Utilizing natural and existing features to infiltrate water could help maintain the ecological and critical habitat function of these areas in the Gallatin River watershed.

Conveyance

To transport purchased water from its point of diversion to aquifer recharge locations, the water could be conveyed through existing canals and ditches or natural infrastructure such as the West Gallatin River and its tributaries.

Local canals have provided irrigation water to the southeastern portions of the Gallatin Valley for many years. As the region has developed, land use and irrigation practices have evolved, resulting in changes to the canals' operation and maintenance requirements. The canal structures and easements, however, are still intact, and could be used to convey both agricultural and mitigation water.

These canals have varying degrees of excess capacity at different times of the year. The graph below shows theoretical excess capacity in a canal. The excess capacity is dependent on many factors, and will vary based upon time of the year and specific canal utilized. It is anticipated that additional canal improvements and possibly canal capacity enlargements or lining may be required to convey water to the recharge sites. These improvements will benefit agricultural users as well as the GVGMB.



Theoretical excess capacity of canals. 40 MI equals 1 cubic feet per second.

Regulatory Process

To meet the statutory and administrative requirements for the DNRC's change application process, the GVGMB will create a facilitated exchange in which the specific end users are not identified upfront at the time of the water right purpose and change application, but instead the water rights are changed to mitigation for a general "service area." The service area is a

hydrologically-connected region in which the end users can purchase mitigation credits to offset stream depletions resulting from their water withdrawals.

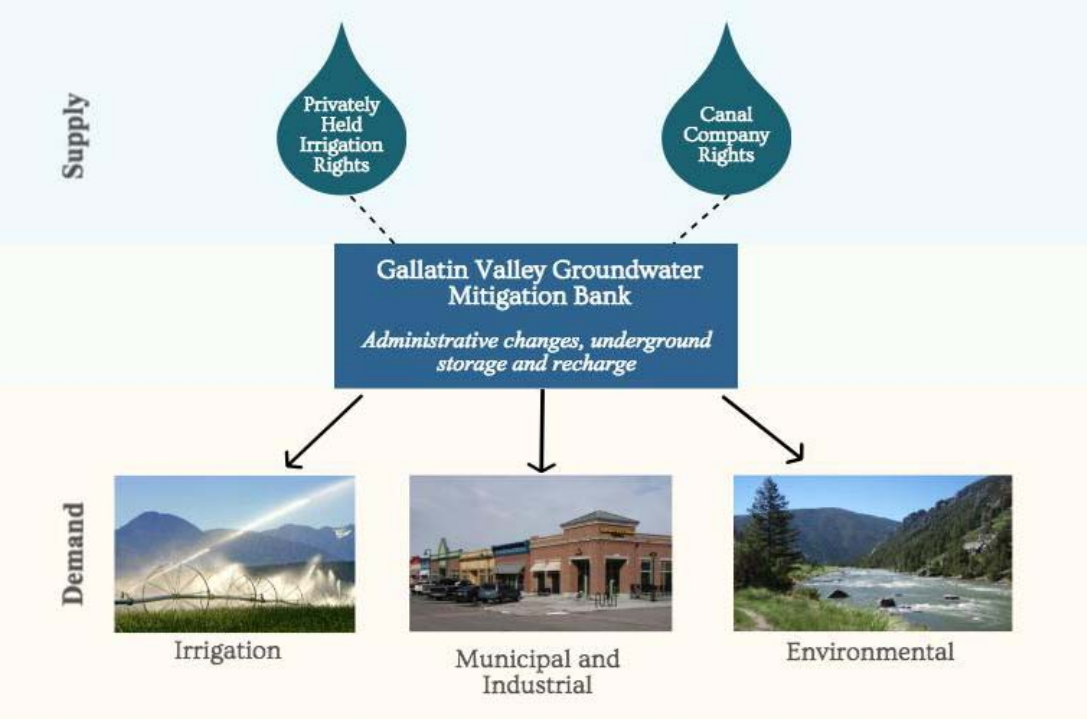
In March 2011, the Montana legislature passed House Bill 24 (HB 24) that revised the DNRC change application rules surrounding mitigation water and enabled a facilitated water exchange to be implemented in Montana. HB 24, codified at Montana Code Annotated § 85-2-420, amended two key elements of the Montana Water Code relating to water right changes:

1. Under the HB 24 amendments, only a proposed place of use, or service area, needs to be identified at the time of the change application. If a water right holder is planning to market the water for mitigation purposes, the applicant is exempt from identifying a specific end user (including quantities and location) at the time of the change application.
2. The changes under HB 24 also allow the water right holder to continue to use the water right for the existing use (irrigation) until a portion of or all of the water right is sold or marketed (as mitigation for new groundwater development). As portions of the right are sold or marketed, the water is retired from the existing use in the apportioned amount.

The advantage of a facilitated exchange is that the supply of mitigation water is made available prior to the identification of all mitigation credit buyers. The mitigation water is then available at the time, place, and volume necessary to offset net depletions resulting from new uses. Additionally, a facilitated exchange minimizes the high transaction costs associated with water transfers by completing one change-of-use application for many end-users.

Water Supply & Demand

Water will be stored and reallocated through the GVGMB.[vi] This water will be acquired or leased from privately held irrigation rights and/or canal company water rights.



Water supply and demand in the Gallatin Valley.

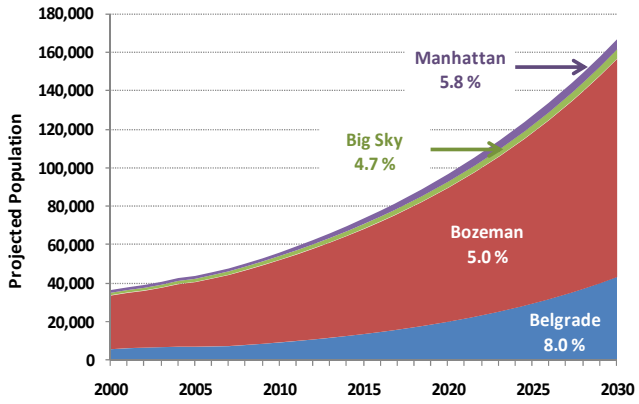
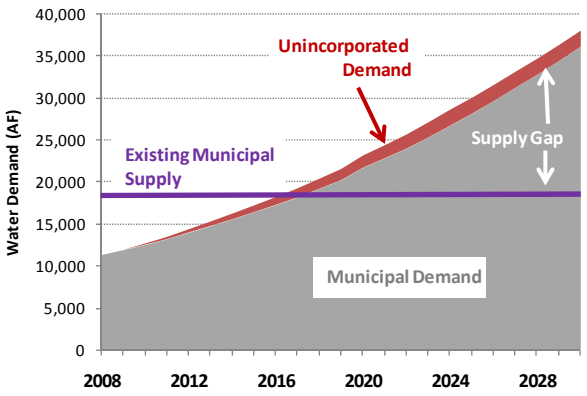
The water stored and transferred in the GVGMB could be utilized by multiple end users to:

- Offset new groundwater appropriations in Bozeman, Belgrade, Manhattan and unincorporated areas;
- Provide supplemental water to farmers looking to expand or firm up irrigation supplies; and,
- Augment in-stream flows in the West Gallatin River and its tributaries to benefit aquatic habitat and wildlife.

Water supply represents the primary constraint on economic and property development growth in many of the highly populated markets in the western United States. The primary water demand drivers in the Gallatin County are population growth and center pivots increasingly employed by farmers. Gallatin County's population was estimated at 97,308 in 2014.[vii] The average annual population growth rate in Gallatin County was 2.9 percent in 2014 and the county is estimated to reach 136,970 people by 2030.[viii]

Existing municipality planning documents indicate that demand will exceed current water supply for Bozeman by 2025 and for Belgrade and Manhattan by 2019. These municipalities, local water and sewer districts that serve unincorporated areas, and subdivision developments plan

to permit and drill new groundwater wells to meet future water demands.[ix] The majority of these proposed wells do not have water rights and will require mitigation credits.

Gallatin County Municipal Population Forecast	*Gallatin County Growth Projection High, Low Scenarios*
	
Source: Belgrade' Water Master Plan 2007; City of Bozeman Water Facility Plan; Big Sky's Water System Source Capacity Plan, Census Bureau population estimates.	*Source: Belgrade' Water Master Plan 2007; City of Bozeman Water Facility Plan; Big Sky's Water System Source Capacity Plan, Total Manhattan Annual Water Budget Sept 11,2008.*

Gallatin County population projections and potential water supply gap.

GVGMB anticipates that the City of Bozeman, the largest municipality in the county, will be the primary mitigation credit buyer. The City of Bozeman has identified its 50-year water balance gap (the difference between supply and demand) to be 17,750 acre-feet under a high-growth scenario; mitigated new groundwater appropriations are expected to meet a portion of this demand.[x] The City of Bozeman has informally confirmed its interest in the GVGMB and its intention to sign a Memorandum of Understanding (MOU) with MARS before the end of 2015.

Contact Us

We look forward to hearing from community members and project participants. Interested parties are invited to contact Deborah Stephenson, DMS Natural Resources, at 406-582-4988 or stephenson@dmsnaturalresources.com.

[i] *Bozeman Daily Chronicle,* Eric Dietrich (March 26, 2015) http://www.bozemandailychronicle.com/news/city/gallatin-county-among-fastest-growing-in-nation/article_63b13f02-c08b-53eb-932d-98de3bda2e6c.html. Additional Bozeman Daily Chronicle articles illustrate the rapid growth across every sector: "Statewide Economic Report Shows Gallatin Out in Front," (February 2, 2015); "Bozeman Leads State in Utility Hookups," (Aug 2, 2013); "Gas Electric Connections Up as Bozeman Growth Continues." (Jan 2, 2015); "New Utility Hookups Continue Rising for Bozeman," (April 3, 2015). The City's 2013 Integrated Water Resource Plan (IWRP) identified a significant water supply gap for the City of Bozeman. The adopted IWRP recommendation to develop groundwater resources for the City of Bozeman will require mitigation water, further supporting the need for Mitigation Bank due to rapid growth.

[ii] Clark Fork Coalition et al v. Tubbs et al, Cause No. BDV-2010-874 (MT, October 17, 2014)

[iii] *Changing Changes: A Roadmap for Montana's Water Management*, Laura Ziemer, Stan Bradshaw, and Meg Casey, 14 University of Denver Water Law Review 47-95 (Fall 2010).

[iv] Mont. Code Ann. §§ 85-2-360 to 362 (2009).

[v] Mont. Code Ann. § 85-2-420 (2014) provides the statutory authority to change a water right to a mitigation purpose and allows the creation of a mitigation bank.

[vi] Value based on Gallatin Gateway groundwater contribution of 5,810 AF from the City of Bozeman Integrated Water Resources Plan (2013), Appendix D, Table 15, and an estimated additional volume of 200 AF of water for unincorporated development.

[vii] United States Census Bureau. State and County Quick Facts for Gallatin County, Montana. (2015) http://quickfacts.census.gov/qfd/states/30/30031.html

[viii] Business Reallocation and Resource Guide for Gallatin and Park Counties, Montana (2013) https://bozemanchamber.com/uploads/pdf/2013_Business_Relocation_Guide-economic_profile.pdf and Dietrich, E. (2014, December 14). Montana's mountains, plains contrast in migration study. *Bozeman Daily Chronicle.* http://www.bozemandailychronicle.com/news/economy/montana-s-mountains-plains-contrast-in-migration-study/article_863e7186-8807-11e4-9194-3f7042809e3b.html

[ix] Gallatin Triangle Planning Study (2014). http://www.bozeman.net/Smarty/files/62/621e8e8c-63c3-4681-adff-196ebb540876.pdf.

[x] The City of Bozeman Integrated Water Resources Plan (2013). https://www.bozeman.net/Departments/Public-Works/Water-Conservation/Resources/Residential/City-of-Bozeman-s-Integrated-Water-Resources-Plan.

Images on pages 5, 6 and 10 were created using Piktochart.