



Discharge of Treated Wastewater

Ensuring water quality... Returning water to the aquifer

Of 100 gallons of water delivered to a home for indoor use, 95 to 98 gallons returns to the groundwater system after treatment as effluent discharge.

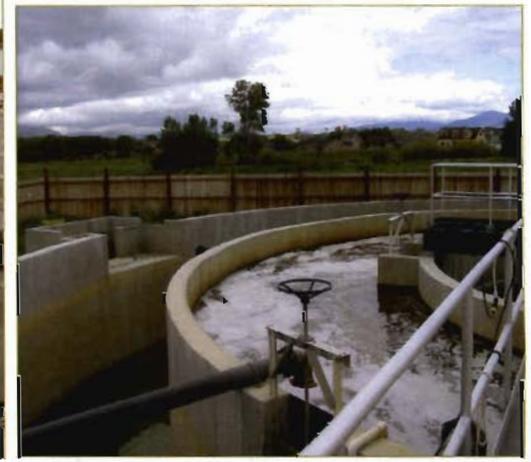
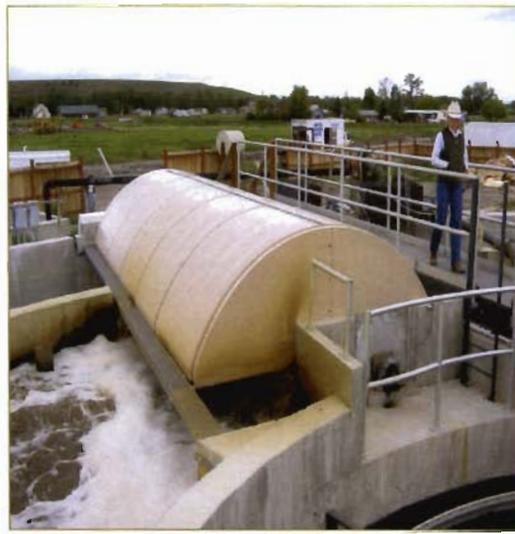
Utility Solutions, LLC discharges treated effluent under a groundwater discharge permit issued by the Montana Department of Environmental Quality (permit - MTX000110). The permit requires monthly effluent monitoring for 10 different parameters...flow rate, total suspended solids, biological oxygen demand, fecal coliform bacteria, chloride, total phosphorus, nitrate + nitrite, ammonia, total kjeldahl nitrogen, and total nitrogen.

The treatment system used by Utility Solutions provides additional treatment for nitrogen and phosphorus. The total nitrogen concentrations in the effluent during calendar year 2006 were below 10 mg/L, and the total phosphorus concentrations were below 1.0 mg/L during the same period.



In comparison, a conventional individual septic/drainfield system is expected to discharge total nitrogen at a concentration of approximately 50 mg/L and a phosphorus concentration of approximately 10.6 mg/L. An advanced level 2 individual wastewater system is expected to reduce total nitrogen to 24 mg/L.

The Utility Solutions' permit requires monitoring of two down gradient groundwater monitoring wells for three of its four outfalls (discharge sites). The wells are monitored for static water level, fecal coliform bacteria, nitrate, and chloride on a quarterly basis.



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News Around the Corner

is an informational newsletter published by Double-Tree, Inc. and distributed in the Four Corners Area of Gallatin County, Montana.

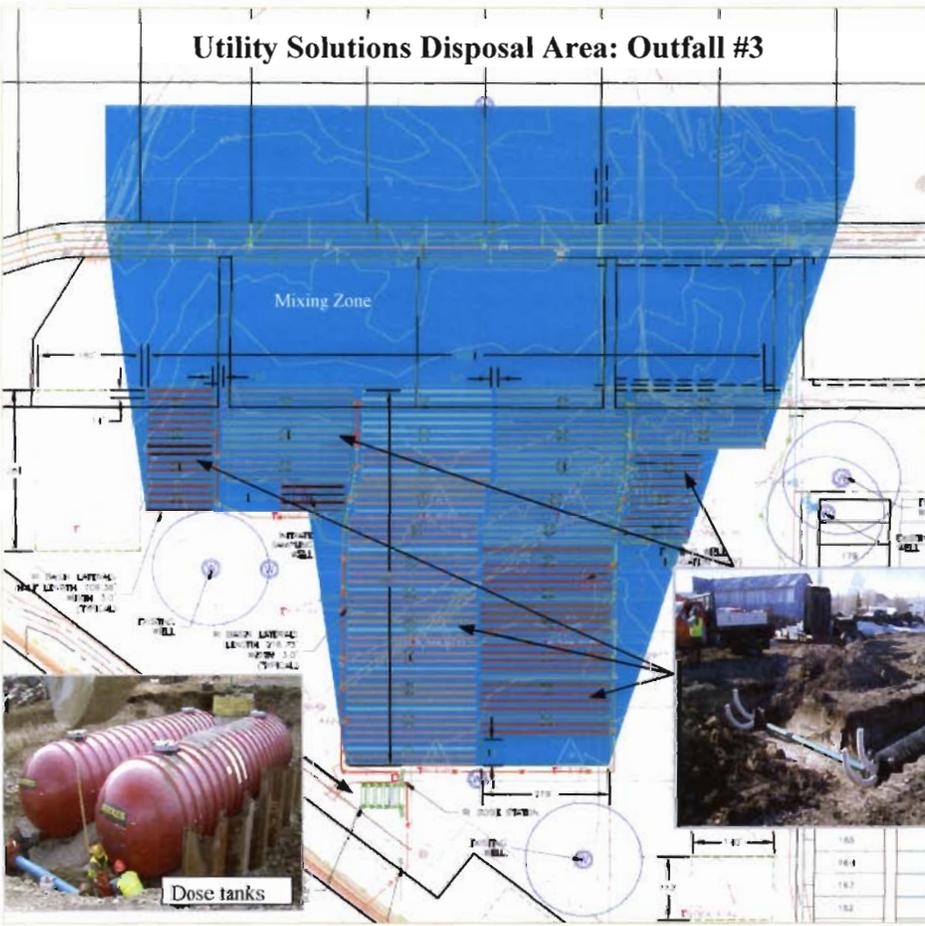
Discharge of Treated Wastewater

The Utility Solutions, LLC, wastewater treatment facility is an Oxidation Ditch activated sludge treatment system. The facility consists of an extended aeration process with aerobic sludge digesters and secondary clarification.

The effluent generated by secondary clarification is disposed of using Infiltration/Percolation (IP) or Rapid

Infiltration (RI) cells in subsurface infiltration chambers.

Waste sludge is treated by aerobic digestion and disposed of by land application as a soil enhancement or fertilizer. The combined treatment process is controlled by an operator licensed with the State of Montana and test results are required for the discharge permit to ensure compliance.



Frequently Asked

Question:

Who gets to decide if Utility Solutions' plans and facilities are adequate and meet all environmental and safety concerns?

Utility Solutions must meet stringent state and federal regulations for both its water supply and wastewater collection and treatment systems.

Extensive approval and permitting procedures require the company to submit detailed engineering plans and environmental data, and the company's applications are subject to extensive review and, when necessary, modifications may be ordered to the specifications and other system details as determined by the regulatory agencies in charge of the process.

The Montana Department of Natural Resources and Conservation (DNRC) oversees the process for permitting the water supply, while the Montana Department of Environmental Quality (DEQ) is in charge of issuing approvals for the water and wastewater systems and permitting of wastewater discharge.

The public has opportunities to express any environmental or other concerns during the permit processes as laid out by state statute and regulation.

Facility Planning...

...Looking to the Future

In January 2007, the Montana Department of Environmental Quality, approved the second update to the Utility Solutions, LLC Wastewater Facility Plan. That document defines a 20 year service area of approximately 15, 000 square acres extending from Blackwood Road on the south, Love Lane on the east,

Cameron Bridge Road on the north and the Gallatin River on the west.

The Utility Solutions' service area lies within the Four Corners Neighborhood Planning and proposed Zoning area. The Town of Belgrades's service area borders to the north.

The City of Bozeman's service area

borders to the east. Rae Water and Sewer District borders a portion on the south and east.

The US Wastewater Facility Plan anticipates expansion of, and extensions to, existing facilities to serve an estimated 15,000 to 25,000 population.

Gallatin County: Focus on managing growth

The Gallatin County population is one of the fastest growing in the State of Montana. By the year 2030, the Gallatin County population is expected to exceed 116,000, representing a 30-year increase of nearly 50,000 people. (Gallatin County Growth Policy).

The Gallatin County Commission and the Gallatin County Planning Department are proactive in addressing growth issues related to public services including water and sewer service to new subdivisions. In, 2003, the Commission appointed a Gallatin County Water Task Force to specifically address water issues in the county. The task force recommendations endorsed centralized water and sewer systems as the preferred alternative to individual wells and septic systems.

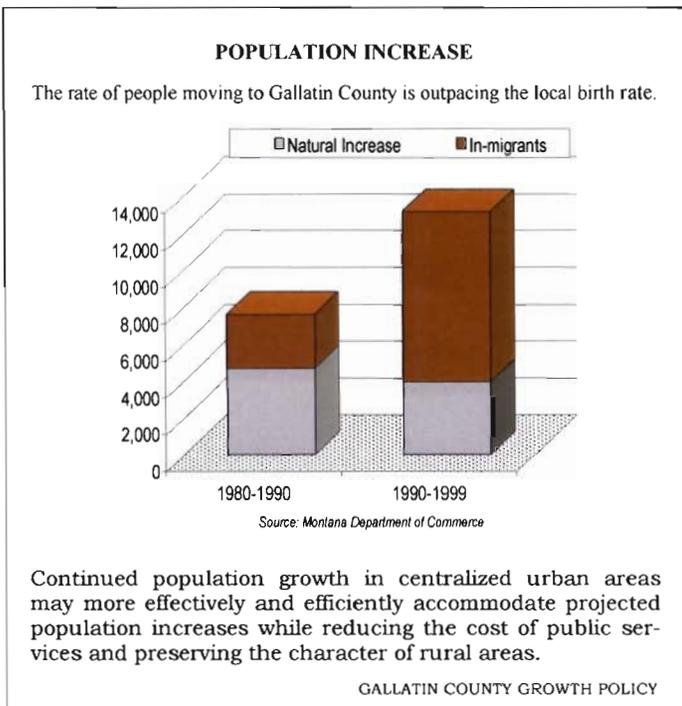
The Gallatin County Commission now routinely includes a requirement for central water and sewer service in preliminary plat approvals for major subdivisions

In 2006, the Gallatin County Commission authorized a Regional Wastewater Study to explore the feasibility of various regional wastewater management concepts. That study, completed in January 2007, concluded that full regionalization of the heavily populated growth area in the "growth triangle" between and including the City of Belgrade, the City of Bozeman, and Four Corners, was not economically or technically feasible. That growth area (the triangle) in fact is nearly all included in a service area of one of the established central sewer service providers which includes: City of Bozeman, City of Belgrade, Rae Water and Sewer District,

and Utility Solutions, LLC.

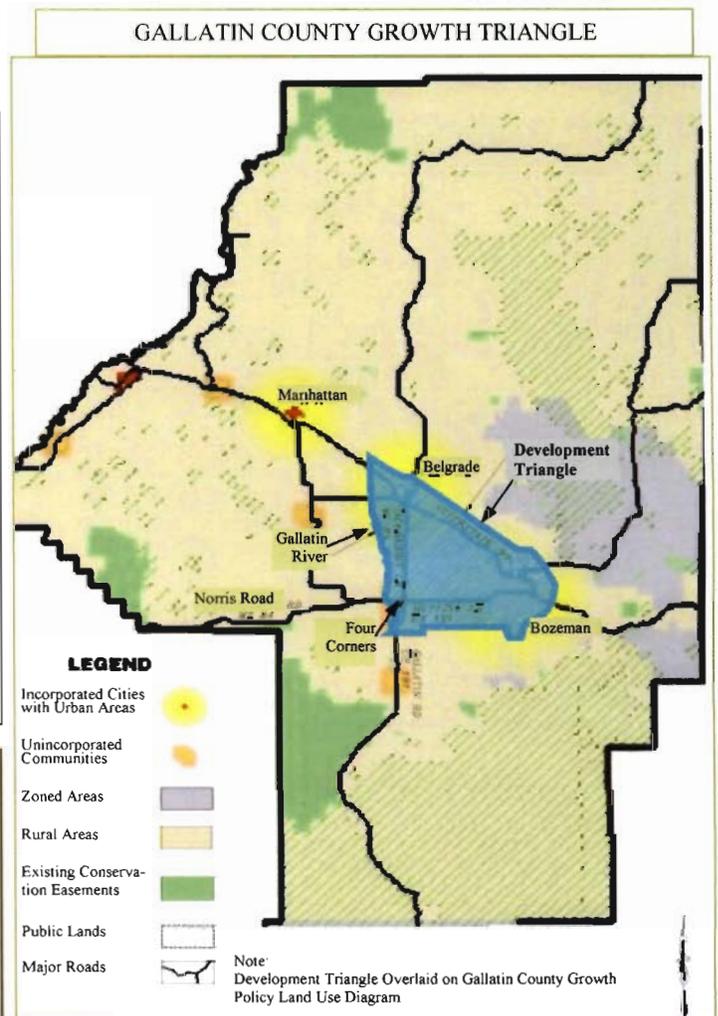
To encourage growth where central services exist the County Commission looked at county wide zoning or the implementation of a Gallatin County Transfer of Development Rights (TDR) program in 2004.

In April 2005 the TDR Feasibility Committee presented its final recommendations for implementation of a TDR program. The Commission is continuing to pursue a TDR program that will identify areas of the county where high density growth may occur and areas where like growth may not occur. The "triangle" between Belgrade, Bozeman, and Four Corners will continue to be targeted for higher density development in the Gallatin County Growth Policy.



Pharmaceutical Study Grant Received by Local Water Quality District

The Gallatin Local Water Quality District and the Montana Bureau of Mines and Geology recently received a grant to look at the fate of pharmaceuticals and other chemical compounds in wastewater treatment systems and in ground waters and surface waters in the Gallatin Valley. The grant funded is being provided by the Montana Department of Natural Resources and Conservation (DNRC). Over the next two years water and wastewater samples will be collected throughout the Gallatin Valley to determine if ground water and surface water resources are being contaminated by pharmaceuticals via wastewater disposal. For more information, contact Alan English at 582-3148.



Aquifer Recharge...

...Erasing the Footprint

Water use has become a "front and center" issue in the development debate.

Everyone acknowledges the Gallatin Valley is changing. The footprints and marks of change are visible all around us; new subdivisions, road construction, school overcrowding, and the list goes on and on.

Our state and local government leaders struggle to keep pace with the difficult decisions growth demands. Just one of those compelling issues is water. How can the water rights that sustain our agricultural sector be protected? How can the river and the interests of sportsmen be protected? And, how can the water needed for growth and development be provided?

If a development consumes a bucket of water, the development needs to replace it with a bucket of water.

Utility Solutions, a public utility privately owned, has committed to provide environmentally protective and cost effective central water and central sewer service to the greater Four Corners area and the Gallatin River corridor. These are easy words to speak but a challenging task to complete.

The challenge of supplying water to development without

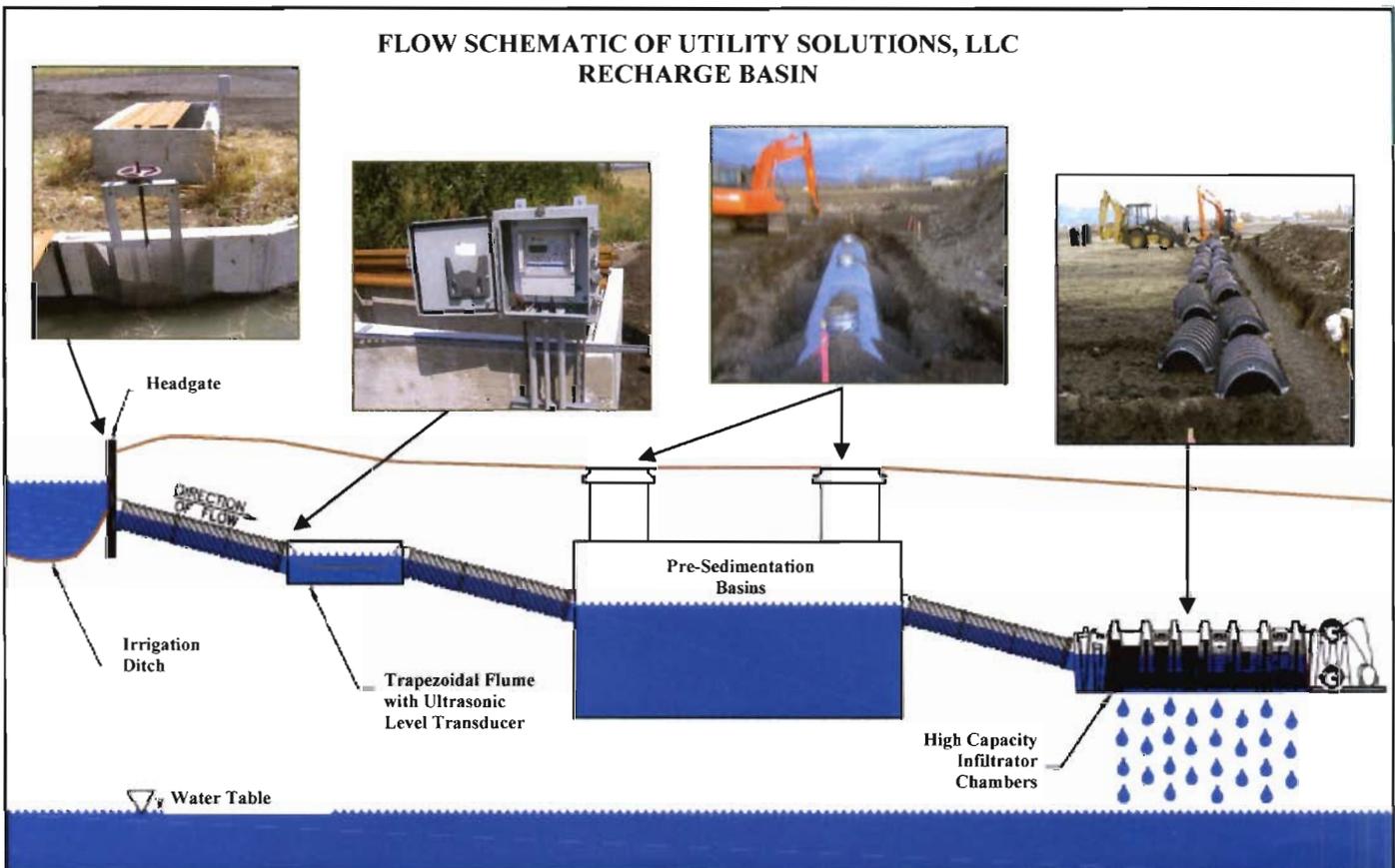
adversely affecting the river or other water rights has been met by an unlikely coalition of interests. Joining Utility Solutions in finding an answer was Trout Unlimited, AGAI (Association of Gallatin Agricultural Irrigators), MT Fish Wildlife and Parks, and the Montana Department of Natural Resources and Conservation.

The answer is aquifer recharge. Aquifer recharge is a simple replacement. If a development consumes a bucket of water, the development needs to replace it with a bucket of water.

The replacement water comes from changing existing water rights from their current use to aquifer recharge. For example, if an existing water right has been historically used to irrigate 100 acres of alfalfa, about 45 million gallons of water was consumed by the crop each year. If that same 100 acres is developed into homes, we know about 18 million gallons of water will be consumed each year by those households.

The irrigation right can be changed to aquifer recharge and the water can be left in the river or put back into the groundwater through infiltration galleries to erase the consumption of the development.

If the amount of water consumed by a development is replaced through aquifer recharge there is a net "zero" impact on the aquifer and the river.



Aquifer Recharge...

... A Cooperative Effort

Montana Trout Unlimited (TU)

"Rivers are the life-blood of our Montana landscape," said Laura Ziemer, Director of Trout Unlimited's Montana Water Project. "For agriculture, for animals, for families--not to mention fish--rivers and streams sustain us all," said Ziemer.

At the Double-Tree offices Laura Ziemer talked about what made the aquifer recharge plan being implemented by Utility Solutions unique, and something that a group as diverse as developers, irrigators, conservationists, and a state agency could all support.

The aquifer recharge plan by Utility Solutions, LLC, to mitigate impacts to the Gallatin River from its new groundwater development is supported by Montana Trout Unlimited, the Montana Department of Fish, Wildlife, and Parks, and the Association of Gallatin Agricultural Irrigators (see below).

"Utility Solutions' aquifer recharge plan is a common-sense approach

backed-up by top-notch science," explained Laura. "I think that the reason that we were able to find agreement on the aquifer recharge plan is that we started from the common sense notion that there should be 'bucket-for-bucket' replacement of water consumed, and then worked with some of the best scientists in the business to ensure that we got it right."

Two of the scientists involved in reviewing Utility Solutions' aquifer recharge plan, Dr. Eloise Kendy and Dr. John Bredehoeft, have written a peer-reviewed scientific paper based in part on their analysis of Utility Solutions' aquifer recharge plan. This paper, "*Transient Effects of Ground-water Pumping and Surface-Water Irrigation Returns on Streamflow*," has been accepted for publication by the most prestigious scientific journal in the country—and arguably the world—for water resources, called Water Resources Research.

"By strategically timing and locating artificial recharge within a basin, groundwater and surface water may be managed conjunctively to help maintain desirable streamflow conditions as land uses and irrigation practices change."

(Kendy, E., and J.D. Bredehoeft (2006), Transient effects of groundwater pumping and surface-water-irrigation returns on streamflow, *Water Resour. Res.*, 42, W08415, doi:10.1029/2005WR004792.)

"The acceptance of this paper by Water Resources Research is testimony to the careful approach and scientific agreement behind the Utility Solutions aquifer recharge plan," said Ziemer.



Laura Ziemer has been the Director of Trout Unlimited's Montana Water Project since 1998.

Association of Gallatin Agricultural Irrigators (AGAI)

In the Spring of 2004, 37 independent and separate irrigation companies met to discuss creating an organization that would represent the different ditches on water issues in the Legislature and before various state governmental agencies, including the Department of Natural Resources and Conservation.

A steering committee was appointed and continued to meet, formulating a mission statement and filing the necessary documents to form the non-profit "Association of Gallatin Agricultural Irrigators", or AGAI.

Emerging with the mission to be a "Guardian and Advocate of the Gallatin River" and to protect water rights and senior water use, AGAI has been an often heard voice on issues related to the rapid growth in Gallatin County, possible adverse effects on the Gallatin River, and



Walt Sales, AGAI director

the connection between that surface water and the valley's groundwater.

Walt Sales, 4th generation Gallatin County rancher and director of AGAI, explained that "While not fundamentally opposed to development, the irrigators are concerned about changes in the use of water, and want to ensure that water rights are protected." Sales expressed that development and how it occurs is of paramount importance to the

future of local agricultural landowners, but not at the cost of the water resource.

This philosophy brought AGAI to the table as a participant in the development of Utility Solutions' plan to replace its consumptive use of groundwater in the Four Corners area of Gallatin County.

According to Sales, AGAI's position in the process was that "It is necessary to start now to preserve and protect the water resource and maintain groundwater levels through recharge, which is more valuable at this site than leaving it in-stream."

AGAI's endorsement of Utility Solutions' aquifer recharge plan is evidence of the cooperative effort being made to fulfill its mission as guardian and advocate of the Gallatin River.

Balancing the Water Budget

...Supporting All Needs

"I'm often asked ...is there enough water in the valley to meet everybody's needs? ...the simple answer is yes."

Alan English, District Manager

Gallatin Local Water Quality District.

When posed directly with the question "Is there enough water in the Gallatin Valley to support population growth and new development and continue to support agricultural interests?", English's response, while more elaborative, is the same.

He explains, "Yes, if we jointly manage our use of both surface waters and ground waters. This management

must focus on minimizing declines in ground water levels due to new ground water pumping and loss of artificial recharge from historic irrigation practices. At the same time we must also protect existing agricultural water rights and our rivers, streams, and wetlands.

In the Gallatin Valley there are sufficient agricultural surface water rights that can be transferred to new domestic uses or used to augment new ground water pumping for domestic purposes to achieve our overall goal of all water users while supporting new growth."

Alan English, August 8, 2007.

Approximate Annual Water Budget for the Gallatin Valley (in acre/feet/year)



GALLATIN VALLEY WATER BUDGET NARRATIVE

By Alan English, Manager, Gallatin Local Water Quality District

An estimate of the annual amount of water that moves into and out of the Gallatin Valley was made using existing information available in 2001. Water flow into the valley comes from the West Gallatin River, tributary streams, ground water flow, and direct precipitation. With few exceptions, almost all of the water that leaves the valley exits as surface water flow at Logan, enters the atmosphere by evaporation, or is evapotranspired by native plants and crops. The budget assumes that in the long-term ground water levels remain fairly constant and ground water recharge and discharge are in balance.

The amount of water flowing into the valley from the West Gallatin River is well documented by the USGS gaging station at Gateway. Surface water flow out of the valley is well documented by the USGS gaging station at Logan. The USGS Water Resources report by Hackett (1960) was used to estimate tributary

flow, direct precipitation, and ground water flow into the valley.

Estimates of the amount of consumptive use of water by cities, towns, small public water systems, and private wells were based on information obtained from public water systems and from well records. The losses of water from the valley that are attributed to agriculture, native plants, and direct evaporation were based on the 1953 Water Resources Survey completed by the Montana State Engineers office (1953), and Hackett (1960).

Based on the estimates used, the overall water balance appears reasonable, with an error of about 1.5%. While the numbers used to develop the water budget have errors, and need updating, the budget still shows what the general magnitude of the different sources of water into and out of the Gallatin Valley are, and what the primary consumptive uses of water are.

Gaining Stream or Losing Stream?

...Aquifer Recharge Gives Same Result

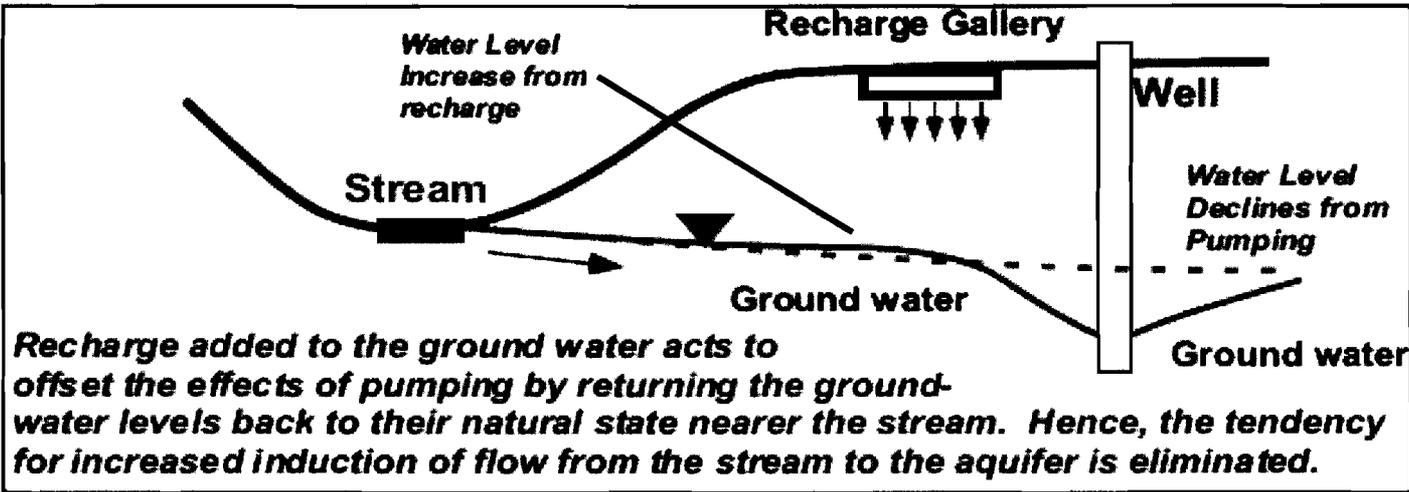
Overall the Gallatin River is a gaining river, meaning water from the underground aquifer system flows towards, and recharges the river. However, some specific reaches of the river can be losing reaches, meaning water from the river flows outwards to the groundwater.

To determine whether aquifer recharge effectively replaces depletions from groundwater pumping Dr Michael Nicklin modeled the Utility Solutions, LLC's Northstar well field using data that supports

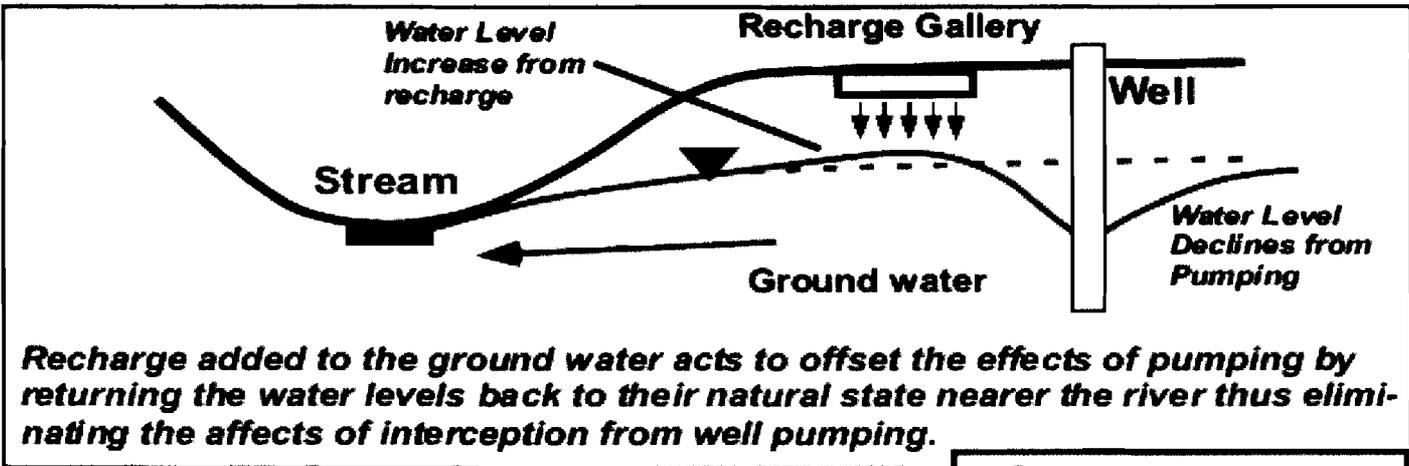
the adjoining Gallatin River reach is gaining. Then Dr Nicklin completed a model of the same reach using data points if the reach was a losing reach.

The results show that aquifer recharge, at the Utility Solutions recharge basins, produces a net gain or positive flow for the Gallatin River in either scenario. Gaining or losing reach....the result is the same. Aquifer recharge is an effective tool for mitigating depletions to surface water from groundwater pumping.

"The relative changes in flow are the same whether the stream is gaining or losing for a hydraulically connected stream."
Dr. Michael Nicklin, Nicklin Earth and Water, Bozeman, Montana



Aquifer Recharge for a Losing Reach of stream.



Aquifer Recharge for a Gaining Reach of stream.



Keeping Things in Perspective . . . *points to ponder*

How many "immeasurables" equal a "measurable"?

In the course of a recent discussion on the impact of development on the groundwater resource in Gallatin County, I stated that "The water consumed by a household is immeasurable compared to the volume of water carried in the Gallatin River."

An individual countered with "Yes, but a lot of immeasurables could equal a measurable."

He was referring to cumulative affect.

So, I set out to determine how many households consuming water could cumulatively cause a measurable affect on the Gallatin River.

There is one measuring device on the Gallatin River at the Axtell Bridge near Gallatin Gateway. That measuring device has the sensitivity to show a 10% increase or decrease in volume of the river. River level data has been recorded at that device for about 100 years.

We took the lowest recorded flow of the river, which occurred in

December, 2002, and estimated what volume of water would need to be removed from the river to show a 10% drop... a "measurable."

We then computed the number of households consuming water that it would take to create a "measurable" impact on the Gallatin River at its lowest recorded flow.

That number is 503,000 households.

Barbara Campbell

Crop Consumption of Water	VS	Household Consumption of Water
<ul style="list-style-type: none"> • 1 acre irrigated alfalfa • annual water consumption = 452,902 gallons <p>Source: MT Irrigation Guide, 153 irrigation days, 1.39 acft consumption rate</p>		<ul style="list-style-type: none"> • 1 acre with three 1/3 acre housing lots • annual water consumption = 185,688 gallons <p>Based on 40% turf @1.32 acft consumption, 3 households @37.5 gpd consumption</p>

DID YOU KNOW...

Utility Solutions, LLC is a public utility - privately owned and is therefore subject to jurisdictional approval for the establishment and implementation of rate structures.

• **Four Corners County Water and Sewer District**

A portion of the Utility Solutions, LLC service area is a duly formed Water and Sewer District. Within the boundaries of the District, rates and charges are authorized by action of the Board of Directors of the Four Corners County Water and Sewer District. Utility Solutions, LLC has contracted with the District to provide water and sewer service to the properties therein. The District has adopted, by Ordinance, a system of rates and charges that includes monthly user fees (based on usage) and tax levies (based on square footage of lots) to generate revenues sufficient to satisfy the contract with Utility Solutions.

• **Montana Public Service Commission**

The majority of the Utility Solutions, LLC service area is outside the jurisdictional boundary of the Four Corners County Water and Sewer District. For user areas outside the District, Utility Solutions, LLC must make application to the Montana Public Service Commission (PSC) for approval of rate tariffs. Utility Solutions, LLC received authorization from PSC for rate tariffs for the Elk Grove Subdivision in January 2006.