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Mr. Cordell Pool
Stahly Engineering and Associates, Inc.
7585 Shedhorn Drive
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Re Water Rights and Regional Wastewater Treatment Facility

Dear Cordell,

This letter answers your inquiries of March 1, 2010. The replies are segregated according to your discrete questions.

1. *Under what conditions can a regional system accept wastewater from an existing development with a water system supplied by local groundwater wells and replace an aging community wastewater system discharging to the groundwater or surface water nearby the development?*

Response: There are no water right constraints per se for moving one's point of discharge, except for a very limited number of new water rights reflected by water use permits issued by the DNRC. According to the terms of those permits, one cannot move the point of discharge without complying with the standards generally imposed upon any change of water right For the reasons hereinafter detailed, it would not be an easy matter to change the point of discharge significantly downstream.

Water rights are administered according to the rule of first in time, first in right. Accordingly, the most junior user is the first to be shut off whenever there is insufficient supplies of water to meet more senior demand.

All groundwater is ultimately tributary to surface water, and at least in the Bozeman-Belgrade area, all that groundwater is tributary to the Gallatin.[1] Thus, the use

[1] Montana, unlike most Western states, has not as yet adopted any standard under which some aquifers are deemed too remotely tributary to be administered in accordance with surface water priorities. However, since the existing groundwater uses use alluvial resources, and most other anticipated development in this area is likely to similarly use groundwater at relatively shallow depths, all such groundwater is probably tributary to Gallatin flows in the sense that these new uses are subject to surface water priorities.

of groundwater from wells can affect the amounts of water available to more senior users on the Gallatin and/or its tributaries.

The effect of the groundwater use on such senior users depends on where the point of discharge is located. Wells intercept groundwater that would otherwise flow into the Gallatin and/or its tributaries along certain sections of that River or its tributaries, or wells on occasion can actually induce a discharge of water from the Gallatin and/or its tributaries along a certain node of those surface flows. If the discharge to groundwater is at or upstream of the point at which the wells deprive the river or creek of water, the effect of the use generating this discharge on surface water rights is just the difference between the amounts pumped and the amounts discharged.[2] After all, for the same reasons that the wells deplete the River, the amounts discharged are also tributary, and offset the total depletion pumping the groundwater would otherwise create.

Given this context, it is evident that when the point of discharge is situated such that waters accruing therefrom enter the River downstream of the point of diversion of senior water rights that in turn are affected by the withdrawal of water from the wells, the wells create a depletion to those senior surface water users that is defined by the total amount of water pumped, and not just the difference between the amounts pumped and the amounts discharged. This is so because the discharged water is not available at the headgates of the senior users. Thus, moving the point of discharge creates the risk that the wells will impact senior surface water users in amounts that would not otherwise occur if the point of discharge is upstream of or conterminous with the wells.

The new water use permits issued by the DNRC for new groundwater uses in the Gallatin drainage all reflect discharges that are upstream or coterminous with the nodes of the River that the wells affect. Thus, the effect of these uses on the water rights of the Gallatin is limited to the net depletion arising from these uses, or the difference between the amounts pumped and the amounts discharged.

This net depletion is in turn offset by retiring from use a water right to Gallatin River flows in amounts that historically produced the same depletions to those flows that arise under the new groundwater use. By "augmenting" or "mitigating" in this fashion, the new groundwater use has no effect on the water rights to Gallatin River flows.

Should the point of discharge of these water rights be moved significantly downstream such that those discharged waters now flow into the Gallatin at a point downstream of surface water priorities that are affected by the wells, the augmentation or mitigation that underlies those uses will no longer be sufficient in amount. The intervening priorities are in these circumstances deprived of water in amounts that relate to the total quantity pumped, and therefore the point of discharge could not be moved downstream in this fashion without augmenting or mitigating the total quantity pumped.

Please note that while only these new water use permits expressly regulate the location of the point of discharge, the same principles inform the impact of any well in the area on the priorities to Gallatin River flows. In a typical year, one would have to be senior to an 1890 priority date to stay in priority after spring snowmelt runoff on the Gallatin. This context means that virtually every well in this area of the Gallatin is

[2] This is the maximum depletive effect. Montana has not taken any definitive position on whether incidents of development that save water, such as impervious streets that create stormwater discharge, are credited against this depletion.

operating out-of-priority to the extent that the use consumes or uses up any water, as the technologies for deeper wells and turbine pumps was not developed until after that date.

It is unclear when the junior priorities of those wells will be folded into the administration of water rights on the Gallatin and its tributaries, although virtually all Western states ultimately seek such integration. Moreover, of course, any senior water right holder on the Gallatin could at any time seek judicial relief against any junior groundwater uses that deprive him of water. When these events occur, it is significant where the point of discharge is located. If the water from the point of discharge is accruing to the River at a node downstream of the senior's point of diversion that is being deprived of water by the operation of the well, the groundwater use can stay in priority only if he augments or mitigates the depletive effect of his wells, and this effect will be measured in accordance with the total amount of water pumped.[3]

It is important to note the qualifying assumption in this analysis. Moving the point of discharge will create additional depletions to senior surface users only where the wells create a depletion to the River at points upstream of where the discharged waters accrue to the River. In certain sections of the Gallatin closer to Belgrade, Gallatin River water may be discharging into groundwater. In that context, the impact of the wells themselves to Gallatin River flows may not be manifested for miles downstream of the wells. Should this be true empirically, moving the point of discharge downstream does not inherently mean that there is an increase in the depletive effect of such wells.

For these reasons, where the point of discharge is located can make a difference for virtually any groundwater user, but the significance of the location of the wells and the location of the discharge point depends upon the geohydrology of the reach of the River involved.

2. *Most of the regional wastewater would be generated by new development. What are the implications to new development planned to utilize the regional wastewater system? Does this limit future development's ability to provide its own community water system?*

Response: New developments from groundwater in the Bozeman-Belgrade area are likely to take water otherwise required to meet more senior demand. Under the terms of the statutes governing such new uses, mitigation is expressly authorized for new uses whose depletive effect would otherwise cause adverse effect to senior surface water uses. For the reasons given in the preceding response, this mitigation requirement is much more onerous in the event that the point of discharge is located at a point that bypasses senior priorities the groundwater use otherwise adversely affects. To put the issue in a practical context, not more than 5% of the amounts of water pumped for potable purposes, that is, exclusive of the water requirements for lawns and gardens, is consumed or used up. This is why of course wastewater treatment is central to new development. However, this also means that the mitigation requirement is 100% if the amount pumped

[3] The priority date of the existing groundwater use may define the reach and scope of the mitigation required throughout the year, particularly if it is senior to instream flow rights. However, if the wells affect surface stream users above the point on the Gallatin which is traversed by the I-90 bridge, some mitigation is likely to be required for existing irrigation rights in the summer months.

for these uses in the event that the water is discharged downstream, as the intervening users are deprived of this entire amount.

3. *To what scale are the withdrawal and discharge points typically allowed to be separated? Does such a regional wastewater treatment facility essentially require a regional water system utilizing groundwater withdrawn near the point of wastewater discharge?*

Response: The scale is defined by the nature of the issue. The issue is not whether the Gallatin is being depleted per se. The issue is whether a particular senior water right is being deprived of water at a particular point of diversion.

Implicit in this question is the recognition that groundwater is not tributary to surface streams in the same way surface water is. While a surface stream flows into another source at a particular point, groundwater is likely to flow into a river along a particular node of the River. Accordingly, when a well pumps groundwater, its effect is not confined to a particular point on the River, but rather a particular stretch. Likewise, water discharged after treatment accretes to the River along particular stretches of the River. Identifying these reaches of course becomes more difficult with increasing distances between the River and the well.

While the reaches of these nodes cannot be described definitively given the uncertainties implicit in geohydrology, any significant mismatch where the accretion from the discharge occurs significantly downstream from the node at which the water pumped by the well would have otherwise recharged the River is likely to be significant. Accordingly, if the discharge point is at near Belgrade, a new use upstream thereof is likely to be faced with mitigating or augmenting the entirety of the amounts pumped, unless such wells are at a substantial distance from the River.

4. *Are there any conditions that would allow the treated wastewater to be legally available for reuse, such as irrigation or hydro-electric power generation by discharge in the Missouri River at Trident.*

Response: You can always add a wholly nonconsumptive use, like the production of hydroelectricity, to a use, as that added use does not cause a reduction in amounts available to any other user. However, if that additional use changes the point of discharge, it creates the same concern as having the point of discharge well down-gradient from the point of pumping.

You can't use the water discharge for irrigation, at least where it is only the net depletion that is augmented or mitigated. Irrigation, after all, is consumptive, so that in the event that it is the net depletion that is augmented or mitigated, using the effluent for irrigation just increases the amounts that one is required to augment or mitigate. Having said that, in the event that the gross pumping volumes are augmented or mitigated, there is nothing wrong with consuming all of the wastewater flow, as in that event its consumption has already been augmented.

I hope this is responsive to your questions. If you need further explanation, please advise.

Sincerely,

Matt Williams