

Groundwater Advisory Committee
Options Paper
for
November 15 Ballot

Date: November 13, 2007

From (list GAC members): Todd Ambs

Title (Subject): Modifications to Groundwater Protection Areas

DISCUSSION:

Presently, groundwater protection areas are defined by a specified distance from a designated water body. This approach provides the regulated community a clear line of demarcation when submitting high capacity well applications. Applicants have a sense of certainty that their proposed well will be approved if sited outside of a groundwater protection area. Conversely, they also know that if the well is located within a groundwater protection area, additional review will be necessary. Although the well may still be approved, or approved with conditions, it is also possible that it may be denied to ensure protection of the surface water.

It has been argued that the current criteria of 1,200' is too close and that high capacity wells can cause significant adverse impacts to surface waters even if the wells are located outside of the groundwater protection area. For that reason, it has been suggested the existing framework be abandoned and that all applications for approval of high capacity wells be reviewed to determine if impacts to sensitive water resources could result. If there is potential for significant impacts to occur, additional data collection could be required and a more comprehensive environmental review would be conducted as part of the approval process.

RECOMMENDATION:

The following proposal is intended to strike a balance between the two approaches. Its basic components include:

- Increase the GPA distance to 4,000'
- Retain the current scope of protected waters (trout streams, ORW and ERW)
- Retain the existing screening criteria in Ch. NR 820
- Add another screening mechanism to initially identify those proposed wells within groundwater protection areas requiring additional review prior to issuance of an approval.
- The proposed criteria would specify that if $\text{Pumping Capacity (gpm)} \div \text{Separation Distance (ft.)} \geq 0.3$ then the proposed well needs additional review and a more thorough assessment of potential impacts. This may include analysis of local geologic/hydrogeologic conditions as well as collection of site-specific information, potentially including pumping tests and stream flow measurements.

The specific numerical criteria were derived from analysis of protected surface water impacts caused by wells of varying capacity and distance. The worst case scenario evaluated drawdown resulting from a large irrigation well in the sand plains area operating 24 hours per day at a rate of 1,200 gpm for 120 consecutive days. Operation of such a well would result in less than 1' of groundwater drawdown at a point 4,000' from the well and simulation of the same well operating only 12 hours per day would yield a drawdown of less than 6 inches at the same point. Thus, 4,000 feet was determined to be a reasonable distance for designating a GPA in that it is likely

Groundwater Advisory Committee
Options Paper
for
November 15 Ballot

that most high capacity wells located greater than 4,000 feet from a protected water will not individually result in significant impacts to the surface water.

Expansion of the GPA to 4,000 feet would likely be an increase in the number of wells proposed within GPAs. Not all high capacity wells sited within 4,000 feet of a protected water body present the same potential for impact and therefore do not warrant the same level of review. In addition to geologic conditions, the potential for impact is driven mainly by the pumping rate and the separation distance between the well and surface water. Wells with large pumping capacity generally have the potential to result in impacts to surface waters at greater distances. The pumping capacity/separation distance ratio was selected as an appropriate screening criteria because it should be relatively easy to understand and also uses 2 factors in well siting and operation for which the owner has greater control. The specific numerical value of 0.3 was derived based on review of impacts from wells of varying sizes and distances from surface water bodies. In most scenarios evaluated, the resulting drawdown from wells with ratios less than 0.3 would be within the range of 0.5 – 1.0 feet.

In terms of how this alternative would be applied, applicants for high capacity well approvals would understand that there is presumption that siting wells within 4000' of a protected water should be avoided. However, if a well must be sited within that area, the applicant has some assurance of getting the well approved by applying the pumping capacity/separation distance ratio criteria. The applicant has flexibility to select a pumping capacity and separation distance such that no additional review, beyond the normal well construction review, will be necessary. The concept is fairly simple - the more water you want to use, the farther away you need to be; but you can choose to use less and stay closer.

In those situations where the applicant does not have the flexibility to site a well that falls below the 0.3 ratio trigger, the proposed well must undergo more extensive review prior to approval. This review could include assessment of local geologic conditions including the presence of effective aquitards, evaluation of site-specific projected drawdown and depletion of the surface water resources. In addition, site specific evaluation including pumping tests, stream flow measurements and groundwater modeling may also be needed in certain cases.

This alternative represents a scientific, yet practical regulatory approach. Application of the screening criteria gives the applicants some flexibility in siting their wells and will enable the department to focus its attention on those wells that pose the greatest threat. By retaining a GPA approach based on a specified distance most of the existing law and rule will not require revision. Specifically, the other screening criteria in NR 820 will remain in place, the existing mitigation system will remain but will be expanded and the balancing test for approval of municipal wells also remains in tact.