

**Presentation to
the North Dakota Legislative Council
Interim Natural Resources Committee
Bismarck, North Dakota**

By
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Mr. Chairman and members of the Interim Natural Resources Committee. I am William Schuh, hydrologist with the State Water Commission's Water Appropriation Division.

2007 N.D. Sess. Laws ch. 46, § 11 directed the State Water Commission to study, develop, and recommend policies for assessing the impact of tile drainage on the beneficial use of water by prior water appropriators. The legislation directed that the report be completed by July 1, 2008. I am here to report on the findings of the directed study.

I am providing each of you with a copy of the full study. Additional copies can be obtained on the web at a site described on the first page of your report. This morning I will summarize our results for you from an abbreviated summary provided with this testimony. A more detailed (six page) Executive Summary is provided in the front of the Report. The topics covered in the main report can be viewed in the Table of Contents.

SUMMARY

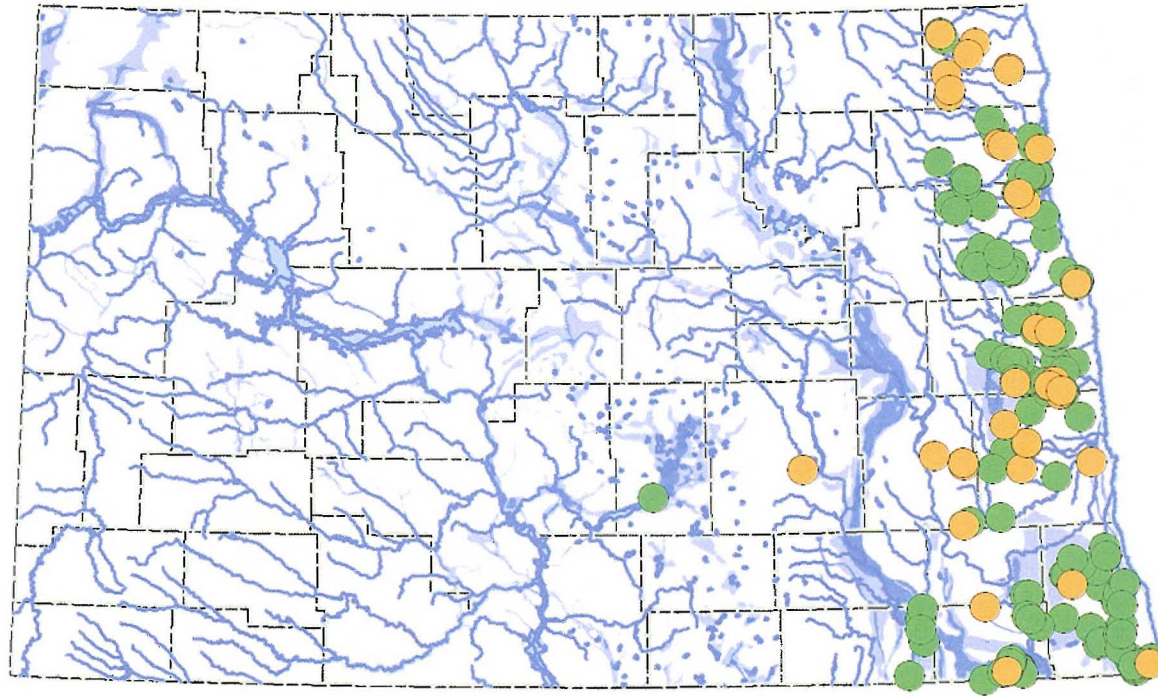
We here present a two-page brief summarizing the most important findings and recommendations in fulfilling the mandate of Senate Bill 2020 of the North Dakota 60th Legislative Assembly, 2007, that the Water Commission provide a study of potential impacts of tile drainage on the beneficial use of water by prior appropriators. For those wishing a more detailed summary, we have provided a six-page Executive Summary of findings before the table of comments in the full report. For full discussion of all of the issues investigated, we have provided a full report, titled: Potential Effects of Subsurface Drainage on Water Appropriation and the Beneficial Use of Water in North Dakota.

- As of June, 2008, there were a total of 131 approved permits for tile-drained fields, and 34 permit applications pending approval. All approved permits were distributed within eleven counties, and all except one were near or within the Red River Valley. Estimated state-wide drained acreage from the North Dakota Water Commission Database is 22,963 acres.
- The State Engineer requires that a drainage permit be obtained for subsurface drains. However, some Water-Resource Districts are reticent to enforce the permit requirement for tile drains because of concern that the requirement may not be supported by the language in state law. The State Engineer is currently seeking clarification from the Attorney General regarding the authority for requiring drainage permits for tile drains.
- Potential conflict between tile drainage and pumping for beneficial use of water could occur only when tile drainage is implemented over aquifers. About 20% of all current tile-drain permits are located over glacial aquifers. About 35% of the land overlying aquifers consists of potentially drainable soils, so the maximum net percent of all potentially drainable lands that might be in conflict with ground-water appropriators would be about 7%.
- Using a 20th century precipitation distribution, tile drains would be estimated to flow in 15% to 35% of the years. The actual percent would vary with tile depth, and local crop, soil and management conditions. The years in which tile-drains would flow would be those with the most plentiful water, some of which would have excess water and flooded conditions. Times of potential conflict with ground-water appropriators are thus limited.
- Drainage is usually targeted to waterlogged areas. Natural recharge and discharge in areas of high water table overlying glacial aquifers, is highly transitory. Most recharged waters in shallow water-table areas are removed naturally through runoff or evaporation within one or two years. They are thus not available for long-term storage and use for appropriation and beneficial use in dry years.
- Because properly designed wells have deeper placement in the aquifer, they capture ground water more efficiently than tile drains, and as a result have the capability to dewater tile drains that may be competing with them.

- Tile drainage can cause a reduction in the saturated thickness of surficial unconfined aquifers which, in turn, may cause a small decrease in pumping rate within nearby well fields. This would only be significant in areas of very thin aquifers. Thin surficial aquifers would be a poor choice of location for a high-capacity well field.
- In most cases, even in thin aquifer areas, small effects on prior appropriators caused by decreased saturated thickness could be offset by constructing additional efficiently designed wells.
- In the specific case of the Traill Rural Water System, the maximum estimated effect of large-scale tile drainage near the well field on pumping capacity from the well field would be less than 2%.
- The only current law related to water appropriation and subsurface drainage in states neighboring North Dakota is a specific exemption of tile drainage from requiring a water permit in the state of Minnesota.

RECOMMENDATIONS

1. The potential negative effects of tile drainage on prior ground-water appropriators using wells are limited to rare circumstances, and are small and potentially remediable when and where they may occur. We recommend no changes in state law regarding potential conflicts between the beneficial use of water by prior appropriators and tile drainage.



North Dakota State-wide distribution of approved (green) and pending (orange) tile-drainage permits (SWC database, June 2008).