

Upper Elkhorn Voluntary IMP: Proposed Controls

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Nebraska Department of Natural Resources

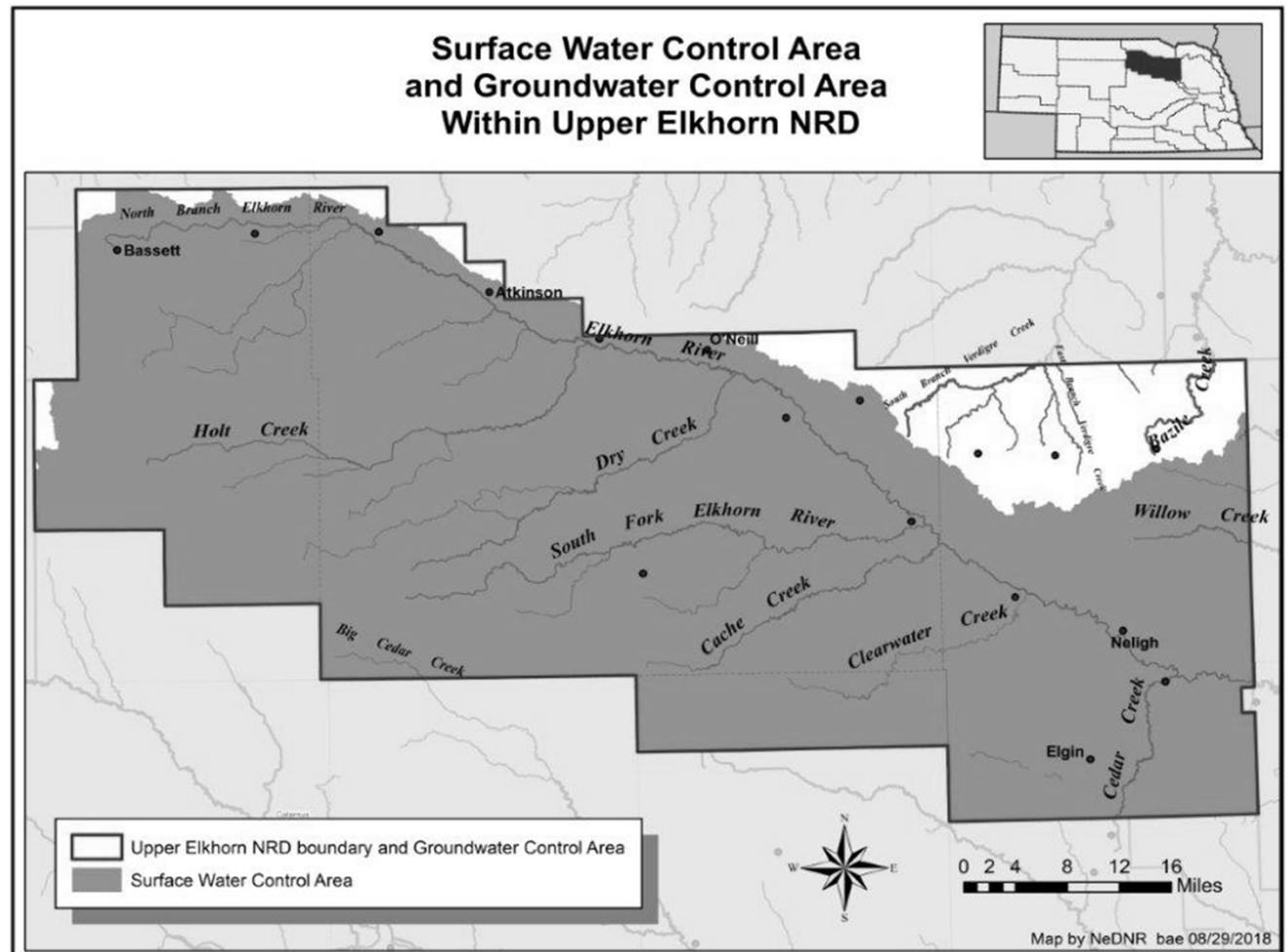
Dennis Schueth, General Manager

Upper Elkhorn Natural Resources District

August 29, 2018

Control Areas

- GW control area: entire district
- SW control area: portion of Elkhorn River and Loup River basins (Lower Platte) included within District boundaries



Controls

Groundwater Controls (LENRD)

- District will limit new groundwater uses to 50% of the annually available stream depletion over the Basin Plan's first five-year increment, which concludes on December 31, 2021

Controls

Surface Water Controls (NeDNR)

- Department will limit new surface water uses to 50% of the annually available stream depletion over the Basin Plan's first five-year increment, which concludes on December 31, 2021

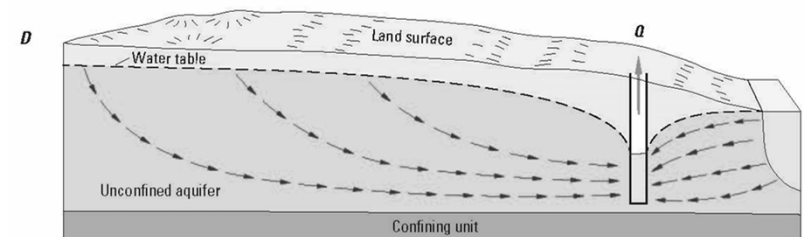
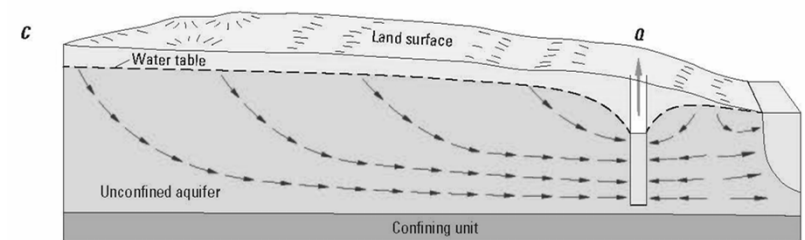
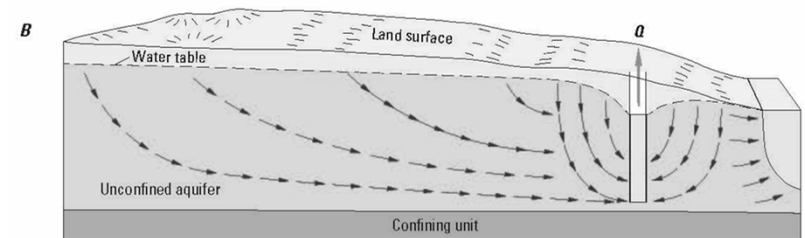
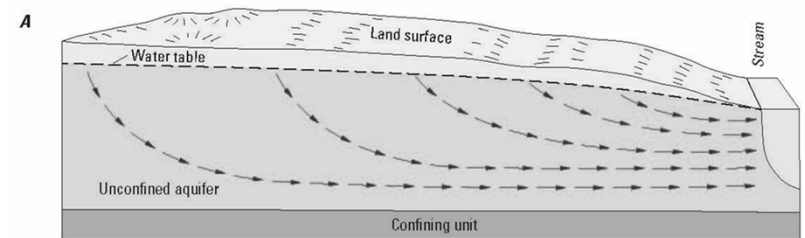
Stream Depletions 101

A. Pre-development conditions

B. Pumping from aquifer storage

C. Interception of groundwater baseflow

D. Interception of groundwater baseflow and induced infiltration

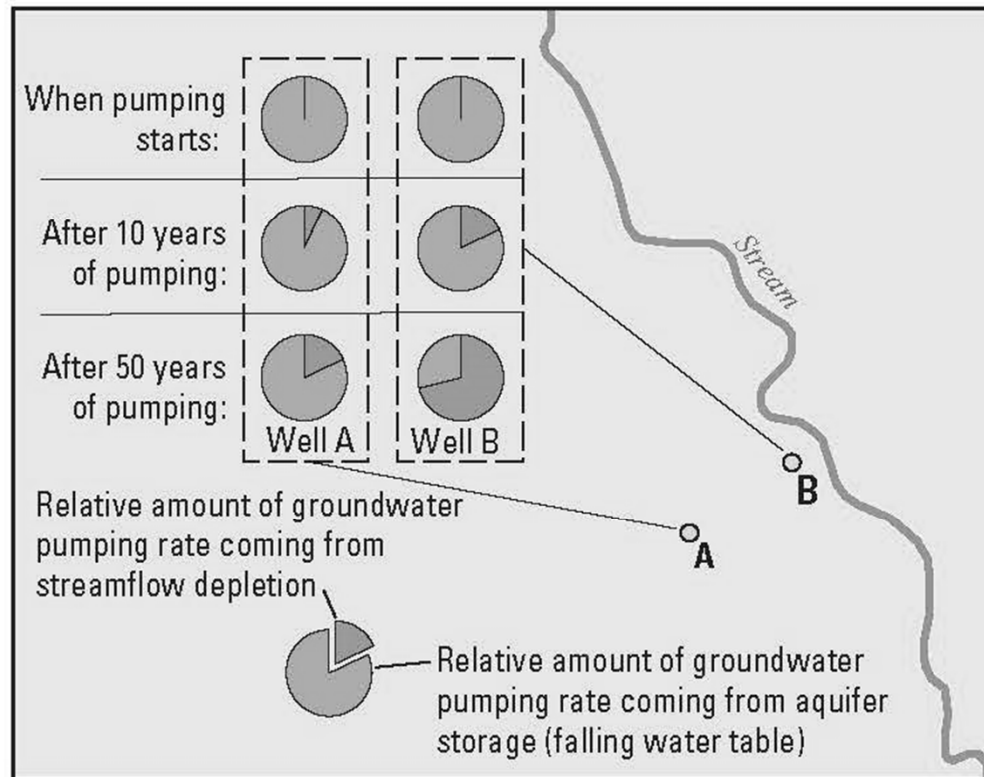


Stream Depletions 101

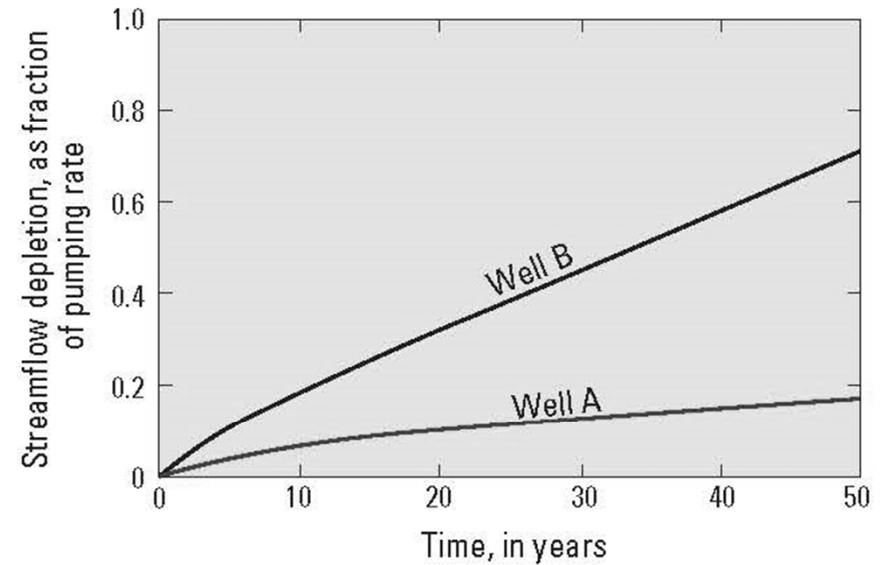
- Factors that affect timing, rates, and locations of streamflow depletion:
 - Geology and hydraulic properties of the aquifer
 - Aquifer size/volume
 - Geometry of stream
 - Well location (vertical and horizontal distance from the stream)
 - Pumping rates and operational characteristics

Stream Depletions 101

A



B



How allocations are calculated

Starting total allocation (both NeDNR and LENRD) = 1,504 AF

| | NeDNR Portion | NRD Portion |
|--|----------------|-------------|
| Allocations | 752 AF | 752 AF |
| Permits issued 2016-2017 | 0 AF | 110 AF |
| | TOTAL = 110 AF | |
| New allocations through 2021 = 50% of (total allocation – total used) = .5 x (4514 AF – 340 AF = 4174 AF) | 697 AF | 697 AF |
| (Example) permits issued 2018 | 50 AF | 150 AF |
| | TOTAL = 200 AF | |
| New allocations through 2021 = .5 x (4174 AF – 400 AF = 3774 AF) | 597 AF | 597 AF |