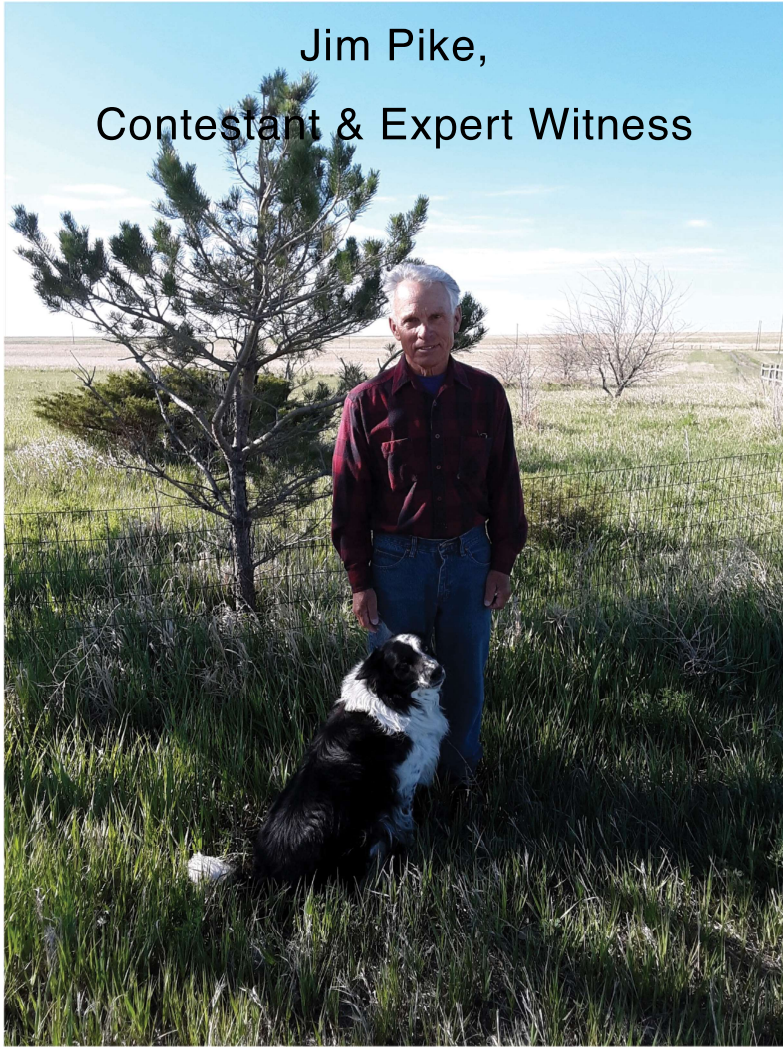


Lerwick Contested Case Hearing— Cheyenne, Wyoming

Groundwater & Surface Water and the Law

REBA D. EPLER, JAMES T. PIKE, STAN LEAKE

Jim Pike,
Contestant & Expert Witness



Stan Leake, Hydrologist



Reba D. Epler, Attorney





Near Cheyenne
Wyoming,
17 ranchers,
farmers and
landowners
contested a new
groundwater
development
that would dry
up their wells
and creeks.

High Plains Aquifer “Ogallala Aquifer”

2 Water-Level and Recoverable Water in Storage Changes, High Plains Aquifer, Predevelopment to 2015 and 2013–15

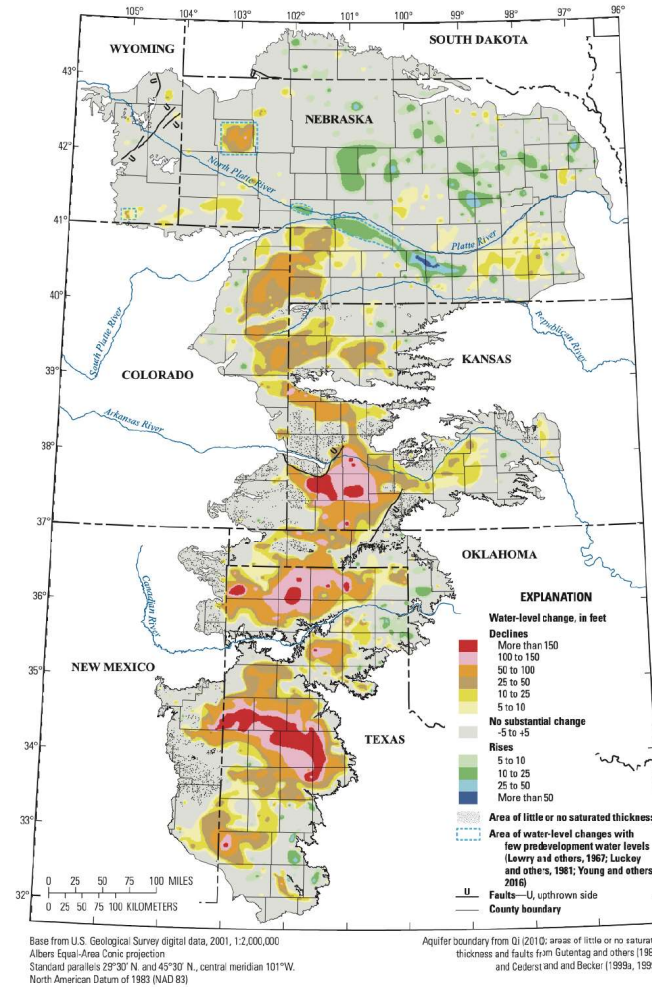
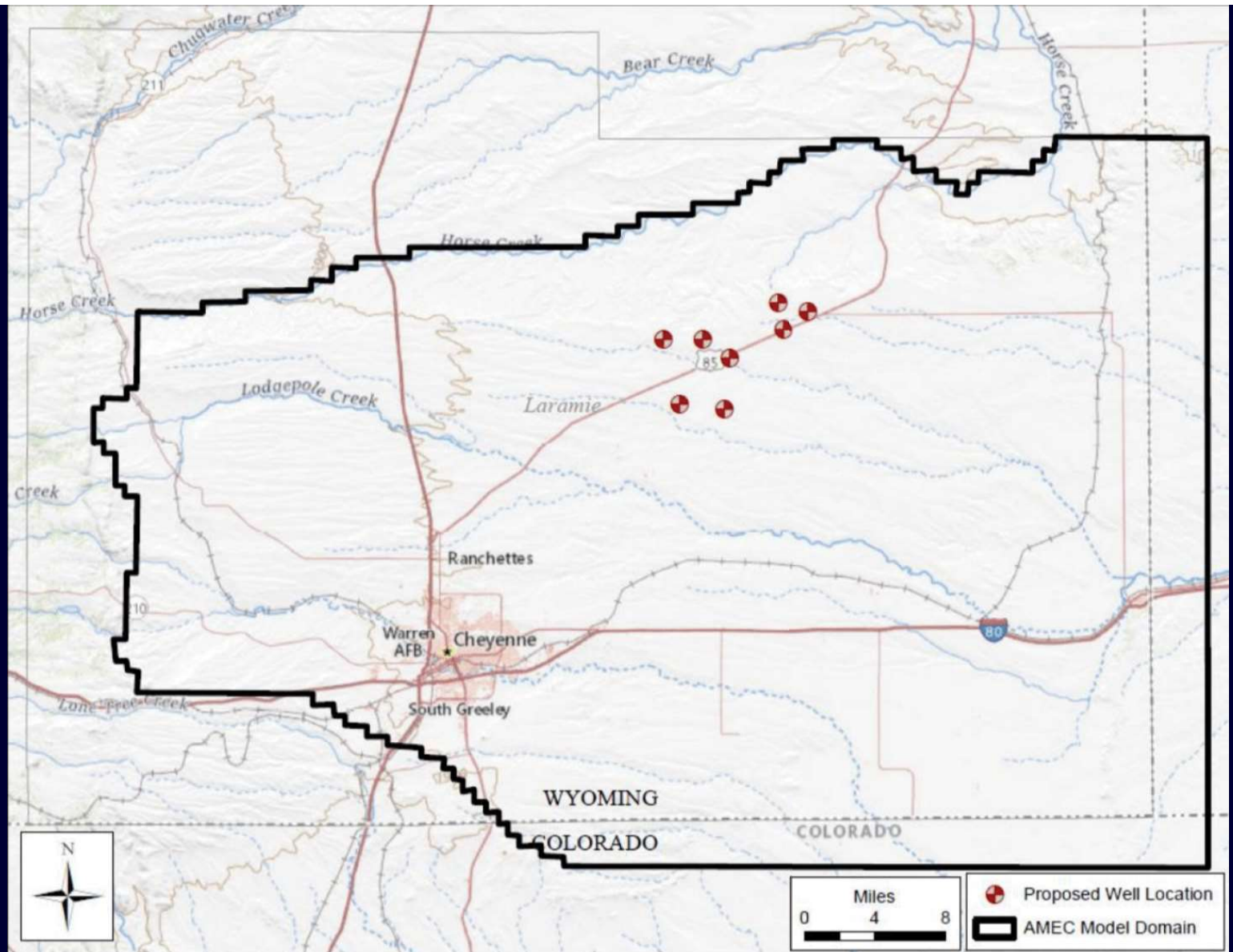
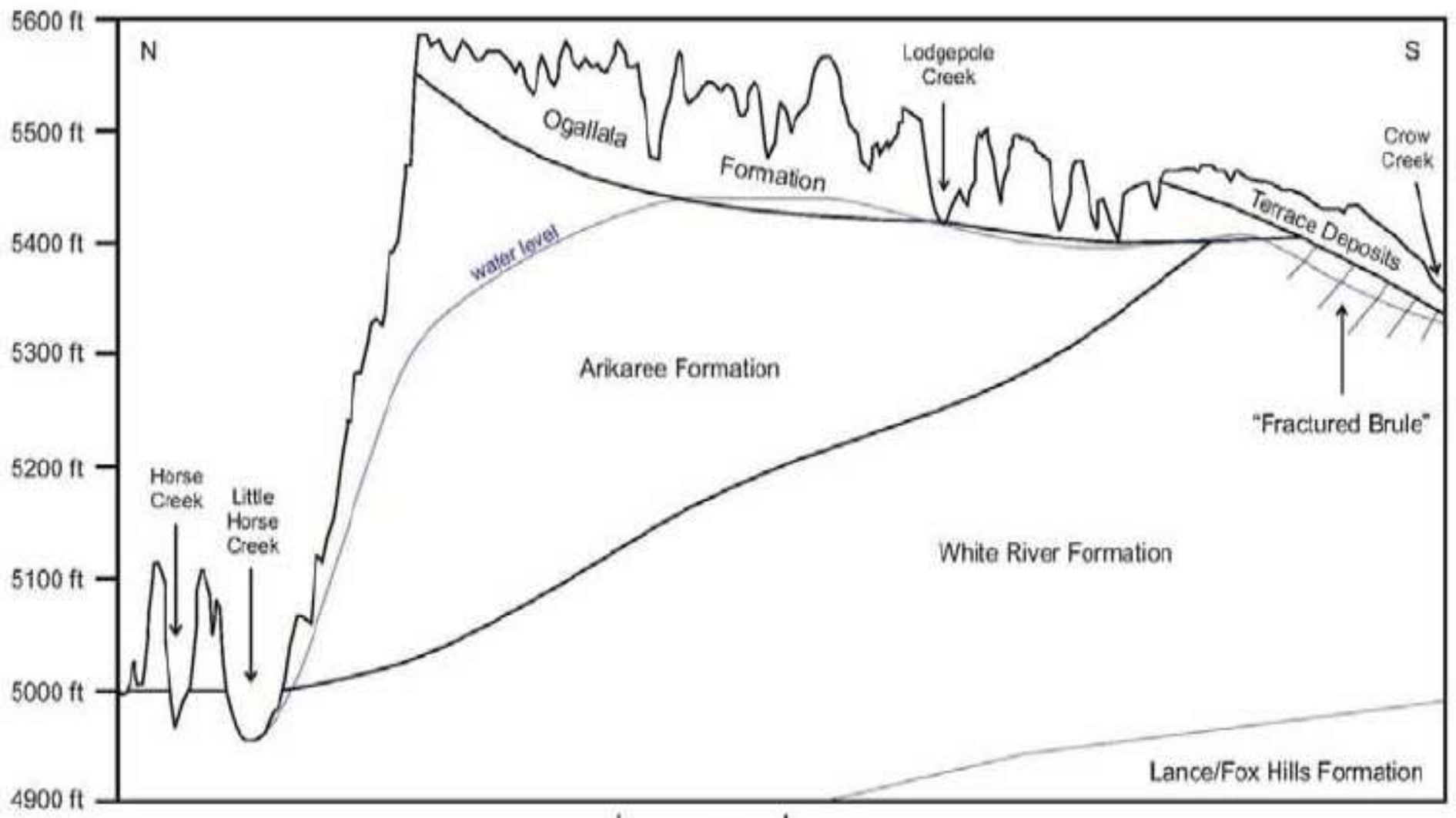


Figure 1. Water-level changes in the High Plains aquifer, predevelopment (about 1950) to 2015.

Figure 10. Photo from: McGuire, V.L., 2017, Water-level and recoverable water in storage changes, High Plains aquifer, predevelopment to 2015 and 2013–15: U.S. Geological Survey Scientific Investigations Report 2017–5040, 14 p., <https://doi.org/10.3133/sir20175040>.

Location of Proposed Wells In the Control Area





Vertical Exaggeration 160x

5 mi

Overview of Contested Wells

Well Permit Applications

- TL #1 Well – 1200 gpm – 240 AF – 160 acres
 - TL #2 Well – 1200 gpm – 480 AF – 320 acres

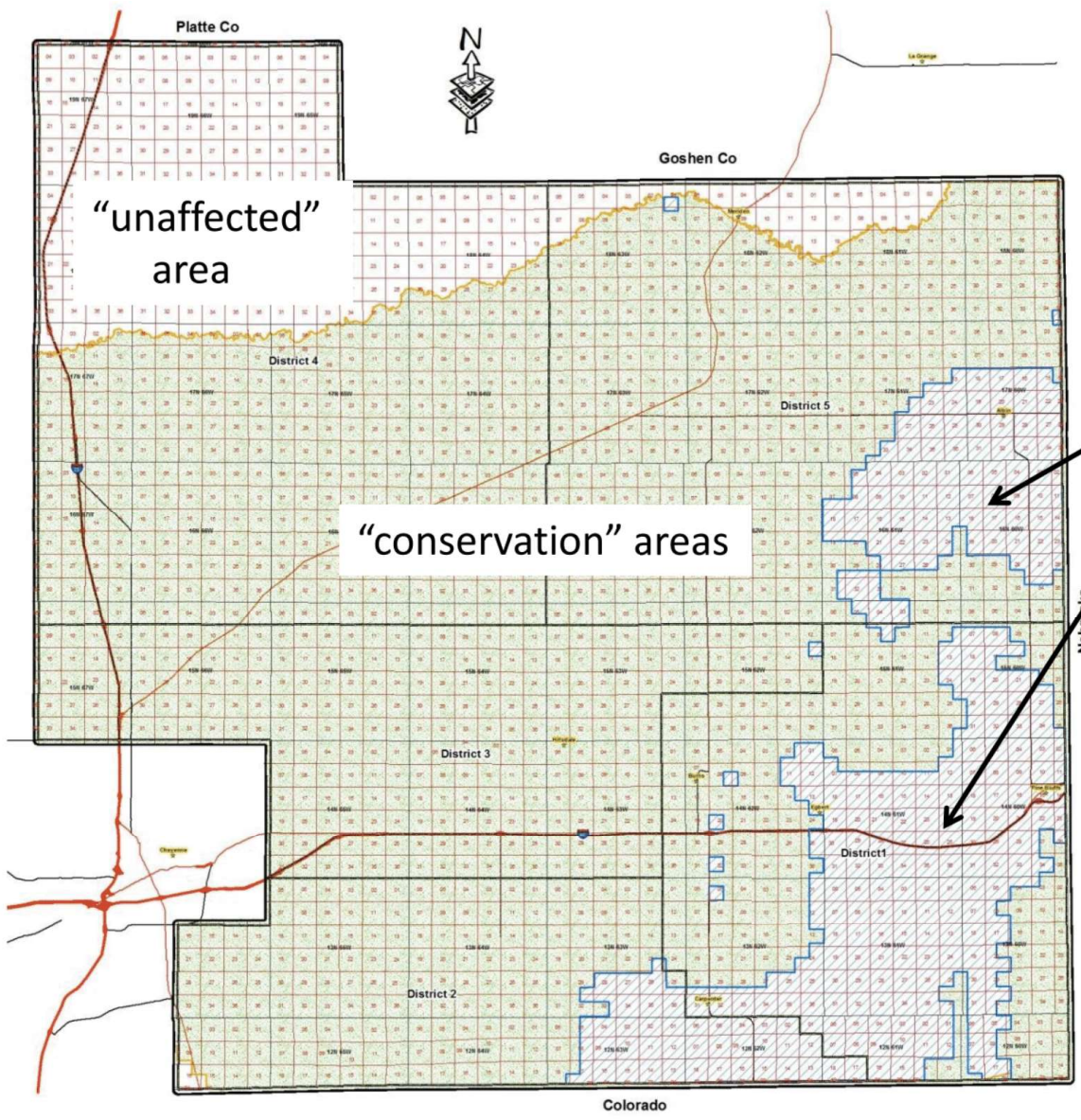
 - KL #1 Well – 1200 gpm – 630 AF – 420 acres
 - KL #2 Well – 1200 gpm – 712.5 AF – 475 acres
 - KL #3 Well – 1200 gpm – 660 AF – 460 acres

 - R&JL #1 Well – 1200 gpm – 720 AF – 480 acres
 - R&JL #2 Well – 1200 gpm – 600 AF – 400 acres
 - R&JL # 3 Well – 1200 gpm – 600 AF – 400 acres
- TOTAL 9600 gpm – 4642.5 AF – 3115 acres**

Dahlgren
Consulting, Inc.



Laramie County
 "Control Area"
 Est. 1981
 Modified 2015



Legend

- Laramie County Control Area Boundary
- Laramie County Control Area District Boundaries
- Drawdown Area
- Groundwater Model Boundary
- Conservation Area
- Unaffected Area
- Townships

"drawdown" areas

Order of the State Engineer
 Laramie County Control Area
 April 1, 2015

Figure 1



This GIS map was created using information and records from the Wyoming State Engineer's Office, and was designed solely for informational purposes to be used in conjunction with the Order of the State Engineer, Laramie County Control Area, April 1, 2015. This map was not designed for any other purpose and the State does not warrant the accuracy of this map for any other use, and no decision involving a risk of loss or injury should be made in reliance thereon. The Wyoming State Engineer's Office will determine whether a groundwater appropriation falls within any defined area based on its records and information.

Reasons for Establishing Control Area

- ✓ The use of underground water is approaching a use equal to the current recharge rate;
 - ✓ The groundwater levels are declining or have declined excessively;
 - ✓ Conflicts between users are occurring or are foreseeable;
 - ✓ The waste of water is occurring or may occur;
 - ✓ Other conditions exist or may arise that require regulation for the protection of the public interests.
-

“The goal of a control area is to protect the interests of existing appropriators by providing a regulatory framework to address the reasons for which the control area was formed. The Laramie County Control Area was formed in 1981 to address declining water levels and related conflicts. Water level measurements indicate that additional significant withdrawals of ground water would produce detrimental effects on water levels throughout large areas of eastern Laramie County.”

Former Wyoming State Engineer Patrick T. Tyrrell, May 3, 2012

The application shall be granted and the permit issued only if the state engineer finds, after receiving the advice of the control area advisory board, that:

- there are unappropriated waters in the proposed source,
- that the proposed means of diversion or construction is adequate,
- that the location of the proposed well does not conflict with any well spacing or well distribution regulation,
- and that the proposed use would not be detrimental to the public interest.

W.S. § 41-3-932 (c)

Status of the Contested Case

- Applications in 2019—Contested by 17 neighbors;
- 3 day trial held June, 2021;
- Laramie County Advisory Board voted to recommend denial of all permits: September, 2021;
- November 2, 2021 Proposed Order GRANTING all wells.
- December 17, 2021 Responses in OPPOSITION to the Proposed Order
- Awaiting final decision of the Wyoming State Engineer.

2022 WY Legislature – Improvement to Groundwater Law



Environmental attorney Reba Epler thanks Gov. Mark Gordon for signing a bill Monday, March 21, 2022, meant to hold the applicant and petitioners responsible for proving well drilling will not harm residents with rights to water.
Jasmine Hall/Wyoming Tribune Eagle



- Amended W.S. § 41-3-932 to clearly place burden of proof on the applicant.
- Burden of proof is clearly on the applicant now, rather than placing that burden on senior water right holders trying to protect their property rights.
- Supported by Wyo Stock Growers Assn., Wyo. Farm Bureau Federation, Wyo Wheat Growers, Powder River Basin Resource Council, Cheyenne Area Landowners Coalition and numerous Laramie County residents.



17 Laramie County Ranchers, Farmers and Landowners Contested the Wells

- Impact to Senior Surface Water Rights
 - Impact to Springs
 - Impact to Senior Preferred Water Rights (Stock, Domestic)
 - Detrimental to the Public Interest
 - Environmental Impacts
 - Speculation of Groundwater and Monopoly
 - Negative Climate Impacts
-

Alan Kirkbride, Kirkbride Bros.

Horse Creek:
“May the
Horse be
With You”





Horse Creek, Wyoming



Kaylee Wilson, Petsch Ranch

Kaylee Wilson, family member at the Petsch Ranch, stands for a photo in front of the Y6 brand and barn. (Angus M. Thuermer, Jr./WyoFile)



Little Horse Creek

Photo by Peter Arnold



Springs in Horse Creek Valley

A man wearing a grey baseball cap with '4RIVER' on it, sunglasses, a blue and white plaid short-sleeved shirt, and blue jeans stands in a grassy field. He is looking towards the right. The background features green trees and a clear blue sky. The scene is outdoors and appears to be a natural setting.

Sprager Creek

Alan Kirkbride explains the value of Sprager
Creek in the Laramie County Control Area

Photo taken by Mr. Alan Kirkbride

Sparager Creek Valley in the Horse Creek Valley



A woman with long blonde hair, wearing a wide-brimmed straw hat with a blue band and a purple and white striped button-down shirt, stands in profile looking towards the left. She is positioned in front of a pond filled with lily pads. The background is a dense line of green trees under a blue sky with scattered white clouds. The text "5th generation rancher talks about her future on Donahue Springs on her family's ranch." is overlaid in white at the top left of the image.

5th generation rancher talks about her future on Donahue Springs on her family's ranch.

Dalle Rutledge



Very special day on the land with members of the Arapaho, Shoshone and Navajo tribes.



Photos taken by Mr. Russ Dahlgren

FORM U.W. 816
MILING FEE SCHEDULE
ON REVERSE SIDE

STATE OF WYOMING

STATE ENGINEERS OFFICE
HERSCHLER BLDG., 1-E CHEYENNE, WYOMING 82002
(307) 777-6163

APPLICATION FOR PERMIT TO APPROPRIATE GROUND WATER

APPLICATION FOR WELLS AND SPRINGS

Note: Only springs flowing 25 gallons per minute or less, where the proposed use is domestic and/or stock, will be considered as groundwater appropriations.

FOR OFFICE USE ONLY

Temporary Filing No. U.W. _____
NOTE: Do not fold this form. Use typewriter or print neatly with black ink. ALL ITEMS MUST BE COMPLETED BEFORE APPLICATION IS ACCEPTABLE.

PERMIT NO. U.W. _____
WATER DIVISION NO. _____ DISTRICT _____
U.W. DISTRICT _____

NAME AND NUMBER OF WELL OR SPRING TL #1 Well

1. Name of applicant(s) Ty Letwick Phone _____
2. 2936 Road 144, Cheyenne, WY 82009
(MAILING ADDRESS) (CITY) (STATE) (ZIP) (e-mail) _____
3. Name of agent Wyoming Water Rights Consulting, Inc. Phone 307-347-8329
c/o Todd Rhodes, President, PO Box 316, Worland, WY 82410 todd@wywaterights.com
(MAILING ADDRESS) (CITY) (STATE) (ZIP) (e-mail) _____

4. Use in which the water will be applied:
- Domestic: Household use and watering of lawns and gardens for noncommercial family use totaling one acre or less. Domestic use is limited to a flow rate of 25 gallons per minute. Number of houses served? _____
 - Stock: Normal livestock use. Water use in commercial feedlots is a miscellaneous use. Stock use is limited to a flow rate of 25 gallons per minute. Number of stock tanks? _____
 - Irrigation: Watering of any lands for agricultural purposes not covered by the definition of domestic use (large-scale lawn watering of golf courses, equestrian areas, etc.), or miscellaneous use.
 - Municipal: Use of water in incorporated towns and cities. Note: Use of water in unincorporated towns, subdivisions, improvement districts, mobile home parks, etc., is not permitted. If the well will be connected to a public water supply, the WDEQ's rules and regulations apply.
 - Industrial: Use of water to manufacture a product or for power generation, power plant, etc. (See WDEQ's rules and regulations in REMARKS.)
 - Miscellaneous: Any use not covered under the above categories. Describe in REMARKS. Note: A permit may be required by the WDEQ if the well will be classified as a public water supply under the WDEQ's rules and regulations.
 - Coalbed Methane: Water produced during development of coalbed methane gas. Note: Wells used in the production of coalbed methane gas are a permit under the Wyoming Oil and Gas Conservation Commission.
 - Monitor, Observation: A WDEQ permit is required. Tear W-1 (Describe in REMARKS).

5. Location of the well or spring (to be shown on the plat) _____
6. Estimated production interval is _____ feet to _____ feet.
7. MAXIMUM instantaneous flow rate to be developed and used is _____ gpm.
8. MAXIMUM volumetric drawdown rate is _____ gpm per foot of drawdown.
9. Note the point(s) or area(s) of use in the tabulation box below. Note: The upper row refers to the quarter or quarter-section.

TWP	RANGE	SECTION	NE 1/4	N 1/2	S 1/2	SW 1/4	SE 1/4	TOTAL
10E	15E	23						

Permit No. U.W. _____ Book No. _____ Page No. _____

EXHIBIT 1

9. If for irrigation use:
a. Describe MAXIMUM acreage to be irrigated in each 40-acre subdivision in the tabulation box above.
b. Land will be irrigated from this well only.
c. Land is irrigated from existing water right(s) with water from this well to be additional supply. Describe existing water right(s) under REMARKS.
10. If for irrigation use, describe method of irrigation, i.e. center pivot, sprinkler, flood, etc.: Center Pivot
11. The well or spring is to be constructed on lands owned by Applicant. (The granting of a permit does not constitute the granting of a right-of-way. If any easement or right-of-way is necessary in connection with this application, it should be understood that the responsibility is the applicant's. A copy of the agreement should accompany the application, if the land is privately owned and the owner is not the co-applicant.)
12. The water is to be used on lands owned by Applicant. (If the landowner is not the applicant, a copy of the agreement relating to the usage of the appropriated water on the land should be submitted to this office. If the landowner is included as a co-applicant on the application, this procedure need not be followed.) NOTE: Water rights attach to the area(s) and/or point(s) of use.

REMARKS: _____

Under penalty of perjury, I declare that I have examined this application and to the best of my knowledge and belief it is true, correct and complete.
Todd Rhodes 4/9 2019
Todd A. Rhodes, President
Wyoming Water Rights Consulting, Inc. (Agent)

THE LEGALLY REQUIRED FILING FEE MUST ACCOMPANY THIS APPLICATION

DOMESTIC AND/OR STOCK USES	\$40.00
COAL BED METHANE USE	\$50.00
IRRIGATION, MUNICIPAL, INDUSTRIAL, AND MISCELLANEOUS USES	\$75.00
MONITOR (for water level measurements or chemical quality sampling) or TEST WELL USES	No Fee

IF WELLS WILL SERVE MULTIPLE USES, SUBMIT ONLY ONE (THE HIGHER) FILING FEE. THIS SECTION IS NOT TO BE COMPLETED BY APPLICANT.

THE STATE OF WYOMING
STATE ENGINEERS OFFICE
HERSCHLER BLDG., 1-E CHEYENNE, WYOMING 82002
(307) 777-6163

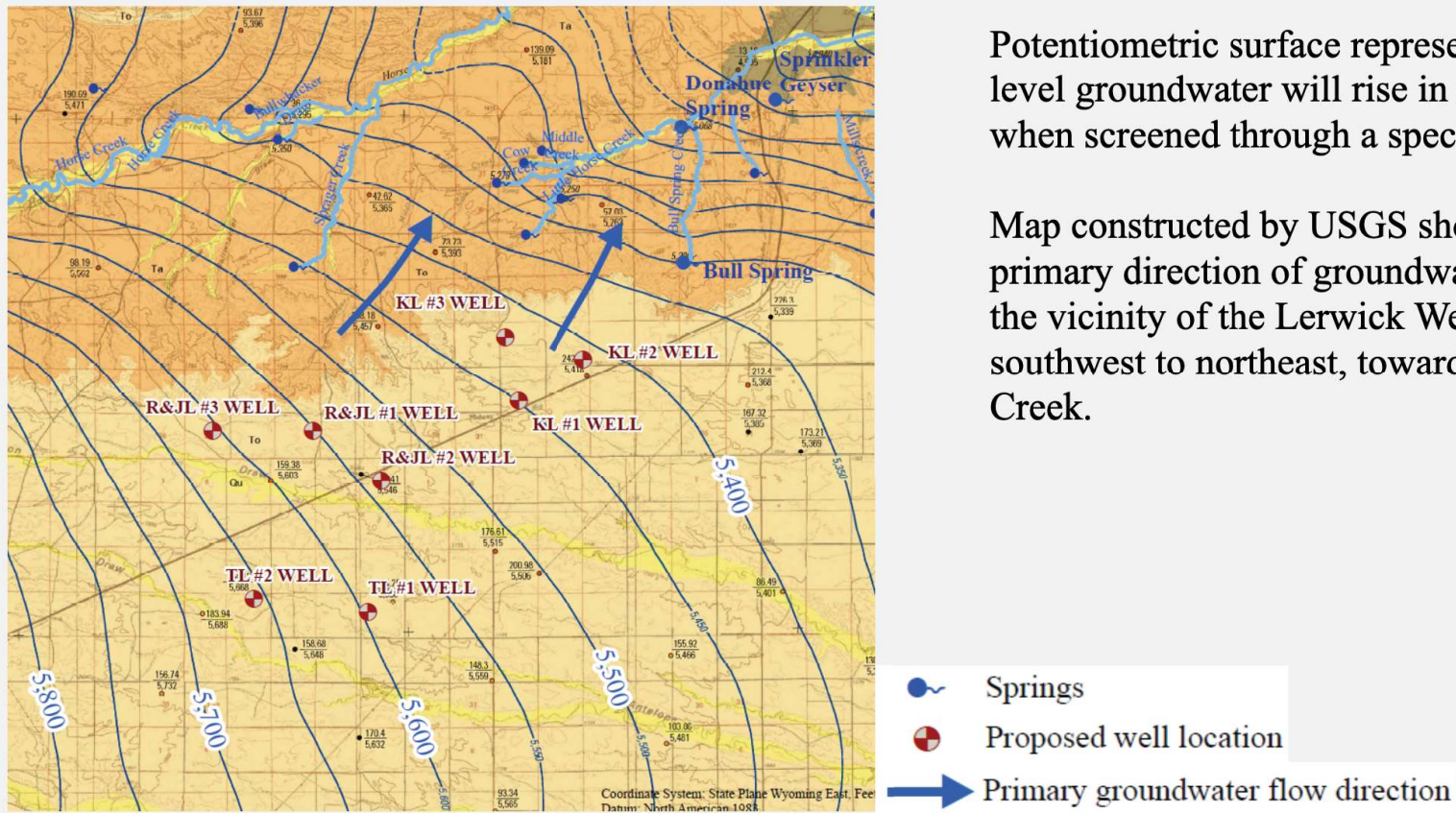
THIS IS TO CERTIFY that I have examined the foregoing application and do hereby grant the same subject to the following terms and conditions:
1. The applicant shall comply with the provisions of the Wyoming Water Rights Act, Chapter 2-10, Wyoming Statutes, and any amendments thereto.
2. The applicant shall comply with the provisions of the Wyoming Oil and Gas Conservation Act, Chapter 2-11, Wyoming Statutes, and any amendments thereto.
3. The applicant shall comply with the provisions of the Wyoming Surface Water and Groundwater Act, Chapter 2-12, Wyoming Statutes, and any amendments thereto.
4. The applicant shall comply with the provisions of the Wyoming Groundwater Act, Chapter 2-13, Wyoming Statutes, and any amendments thereto.
5. The applicant shall comply with the provisions of the Wyoming Water Conservation Act, Chapter 2-14, Wyoming Statutes, and any amendments thereto.
6. The applicant shall comply with the provisions of the Wyoming Water Rights Act, Chapter 2-10, Wyoming Statutes, and any amendments thereto.
7. The applicant shall comply with the provisions of the Wyoming Oil and Gas Conservation Act, Chapter 2-11, Wyoming Statutes, and any amendments thereto.
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14. The applicant shall comply with the provisions of the Wyoming Groundwater Act, Chapter 2-13, Wyoming Statutes, and any amendments thereto.
15. The applicant shall comply with the provisions of the Wyoming Water Conservation Act, Chapter 2-14, Wyoming Statutes, and any amendments thereto.

A complete form of Statement of Compliance with Filing, shall be submitted to the State Engineer's Office within 90 days of the date of this permit.
The amount of the filing fee which has been paid is hereby acknowledged in full.
Witness my hand and the seal of this office this _____ day of _____, 2019.

PATRICK T. TYRRELL, State Engineer

“For a \$75 application fee, they have everything to gain, and we have everything to lose.” Alan Kirkbride

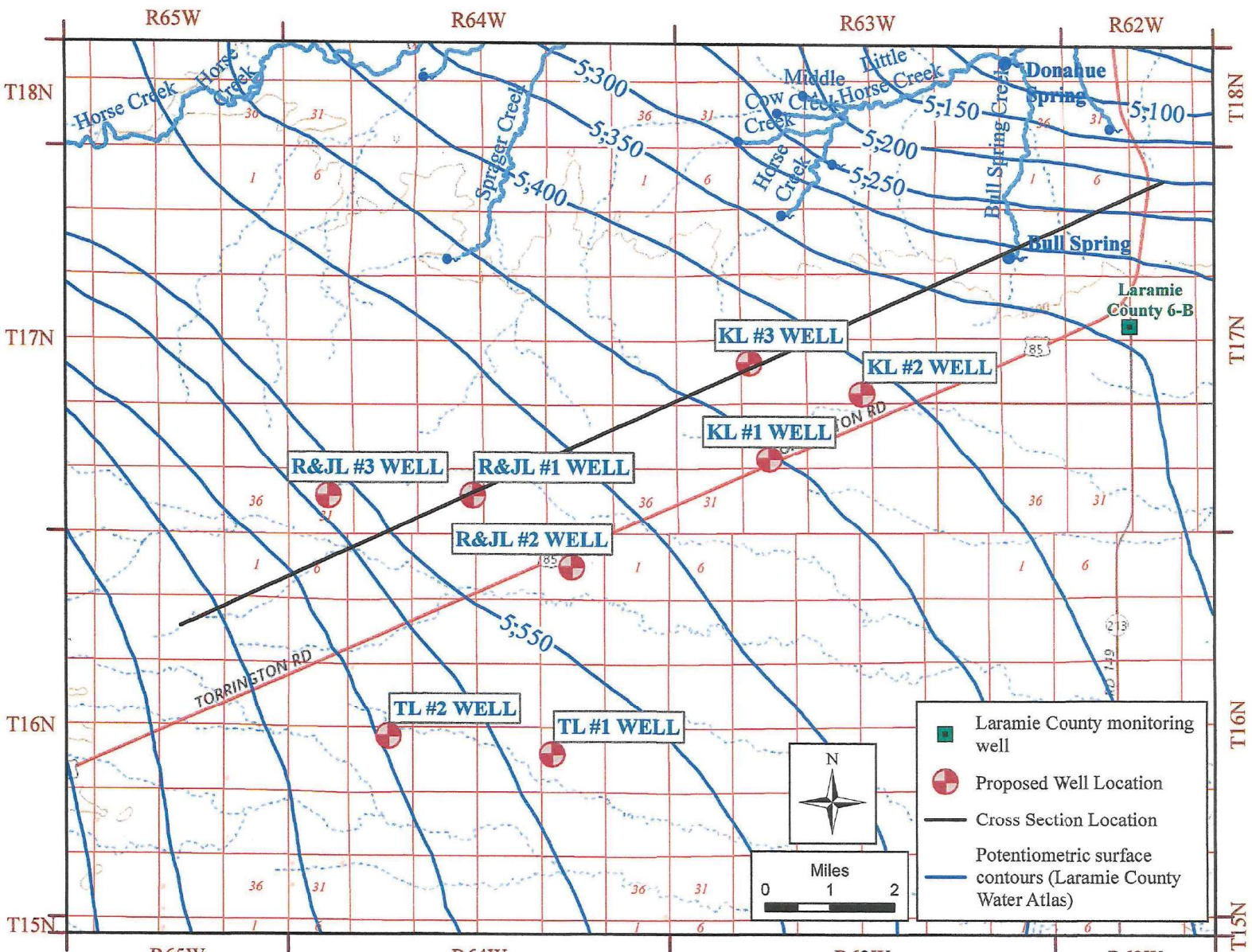
POTENTIOMETRIC GROUNDWATER SURFACE

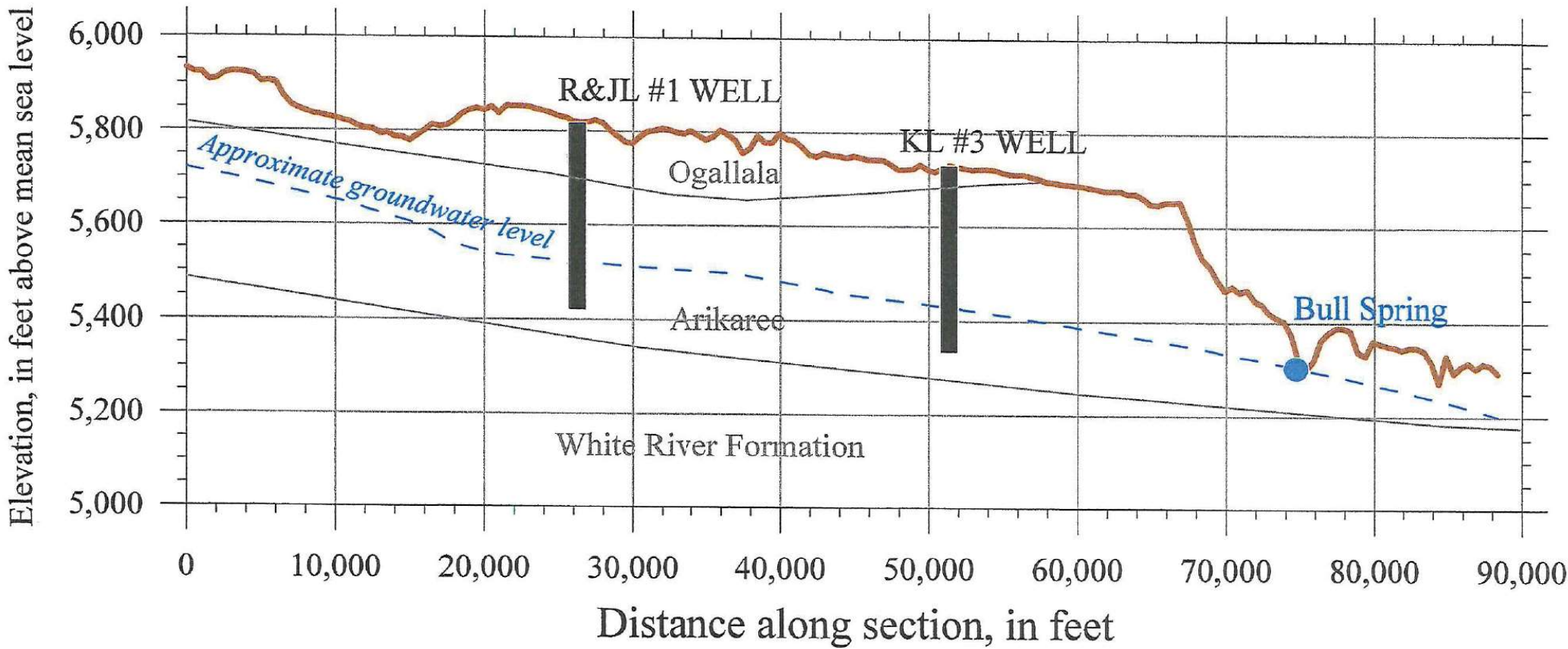


Potentiometric surface represents the level groundwater will rise in a well when screened through a specific aquifer.

Map constructed by USGS show the primary direction of groundwater flow in the vicinity of the Lerwick Wells is southwest to northeast, toward Horse Creek.

Figure 2. Potentiometric surface in the vicinity of the Lerwick Wells (Bartos and Hallberg, 2011)



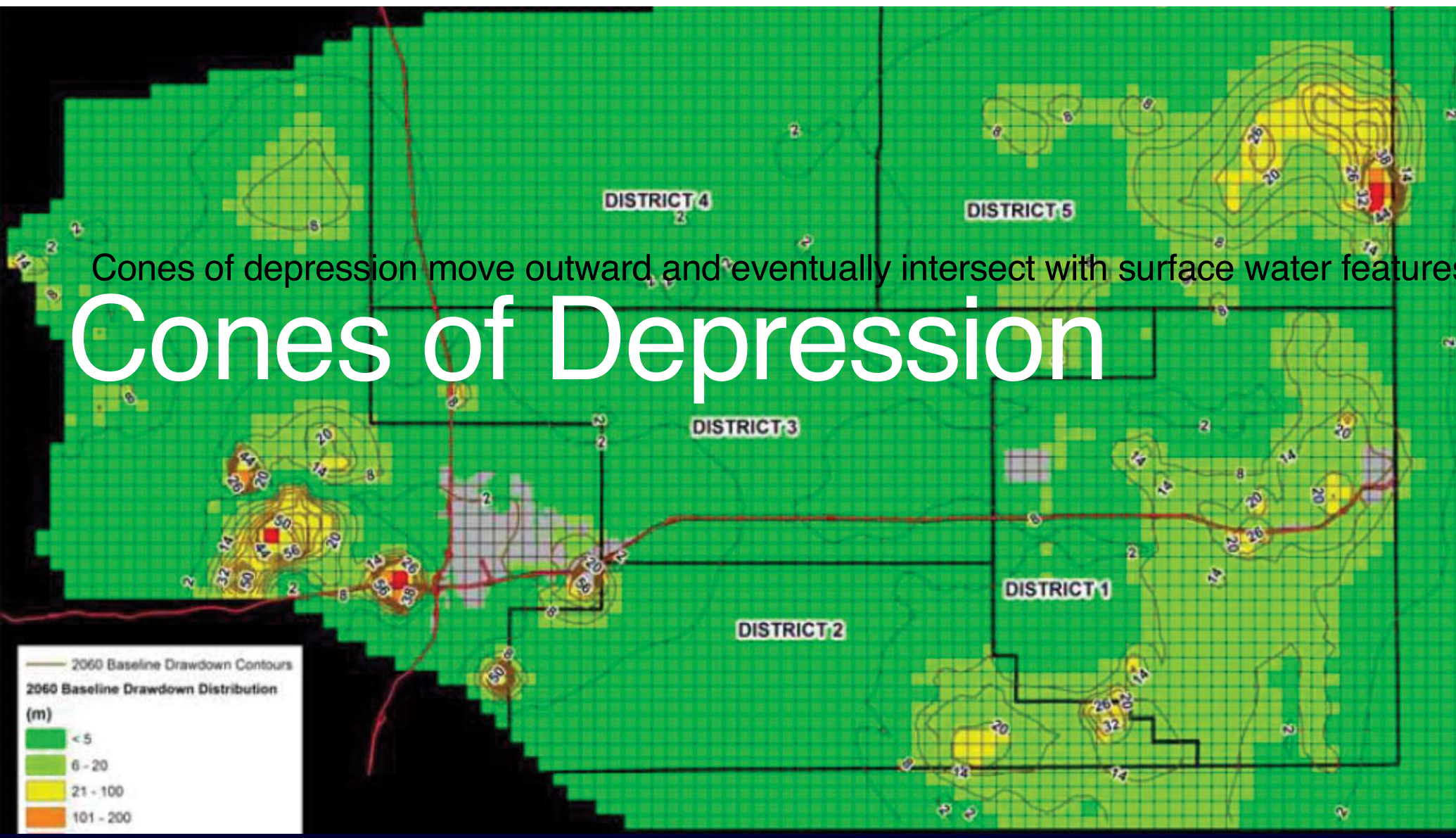


Concern about lowering water table and drying springs



Cones of depression move outward and eventually intersect with surface water features

Cones of Depression

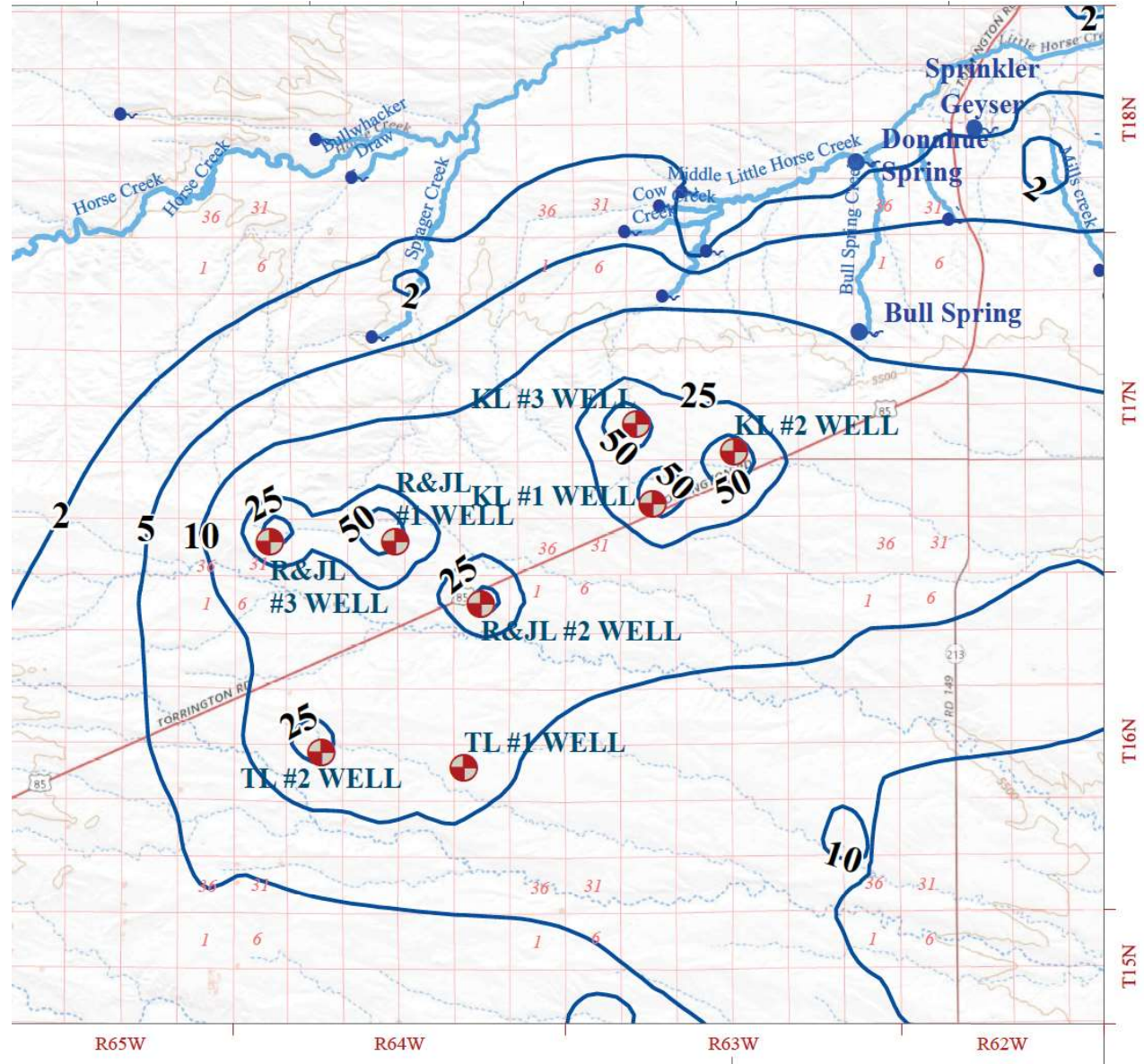


Cones of Depression

Combined Effects of Existing Wells
and Proposed Wells

Cones of Depression

- Radiating outward for many miles.
- Intersecting surface water.
- Lowering water table in the area.



Little Horse Creek & Horse Creek

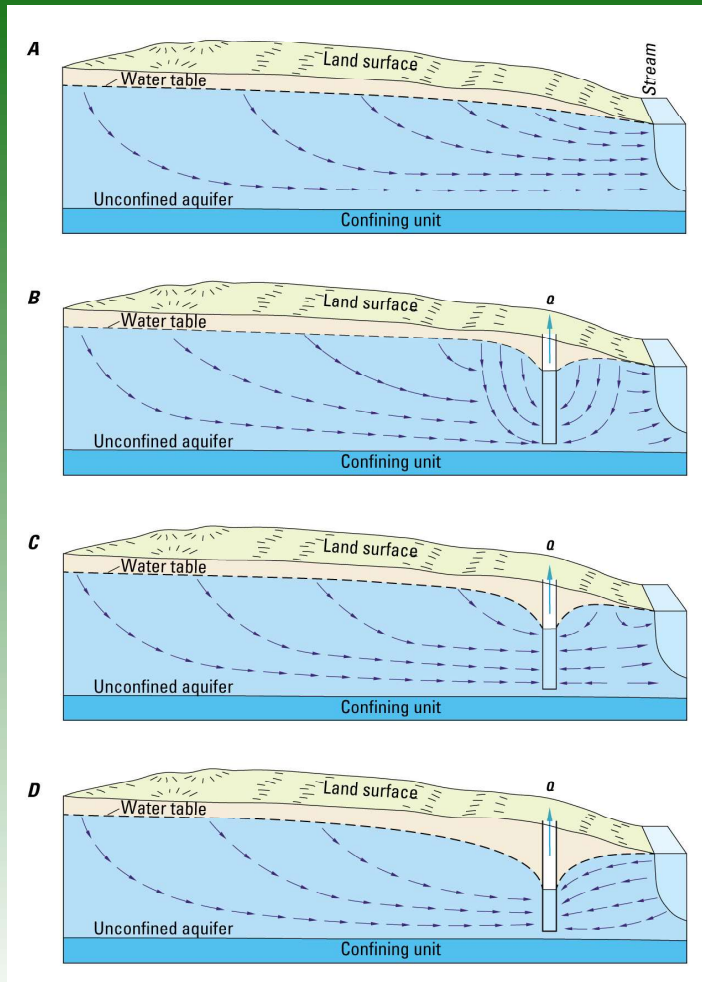
Photo taken by Mr. Peter Arnold

Water rights est. in late 1800's

Impact to Senior Surface Water Rights

Hydrologic connection
between
groundwater and surface
water.

Sources of Water to a Pumped Well



A. *Prepumping conditions*

B. *Aquifer storage predominates*

C. *Captured groundwater discharge*

D. *Captured groundwater discharge and induced infiltration*

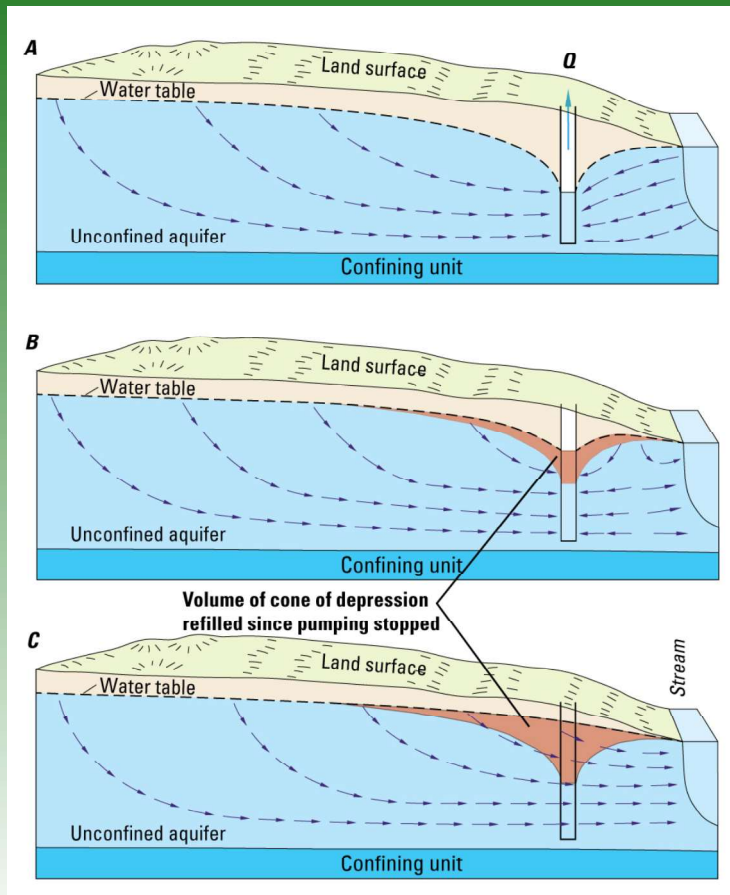
From USGS Circular 1376, figure 7



A Question Regarding Streamflow Depletion by Wells

When a well or wells stop pumping,
does streamflow depletion stop
immediately?

When a well or wells stop pumping, does streamflow depletion stop immediately?



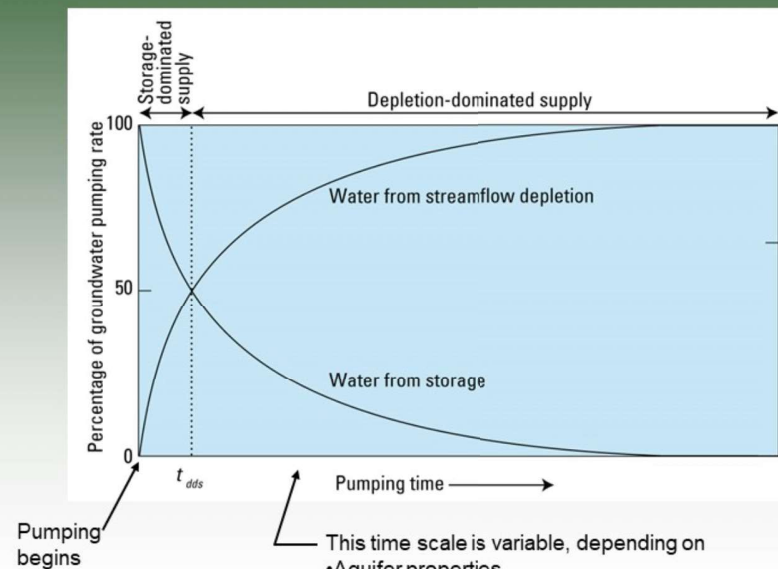
Answer: **No**, unless the well is very close to the stream or river. Depletion from pumping continues after pumping stops. In fact, the maximum rate of depletion can occur after pumping stops. Time to full recovery depends on

- aquifer properties
- distance to stream
- time well was pumped

From USGS Circular 1376, figure 32

Hydrologic connection between groundwater and surface water.

Sources of Water to a Pumped Well



This time scale is variable, depending on

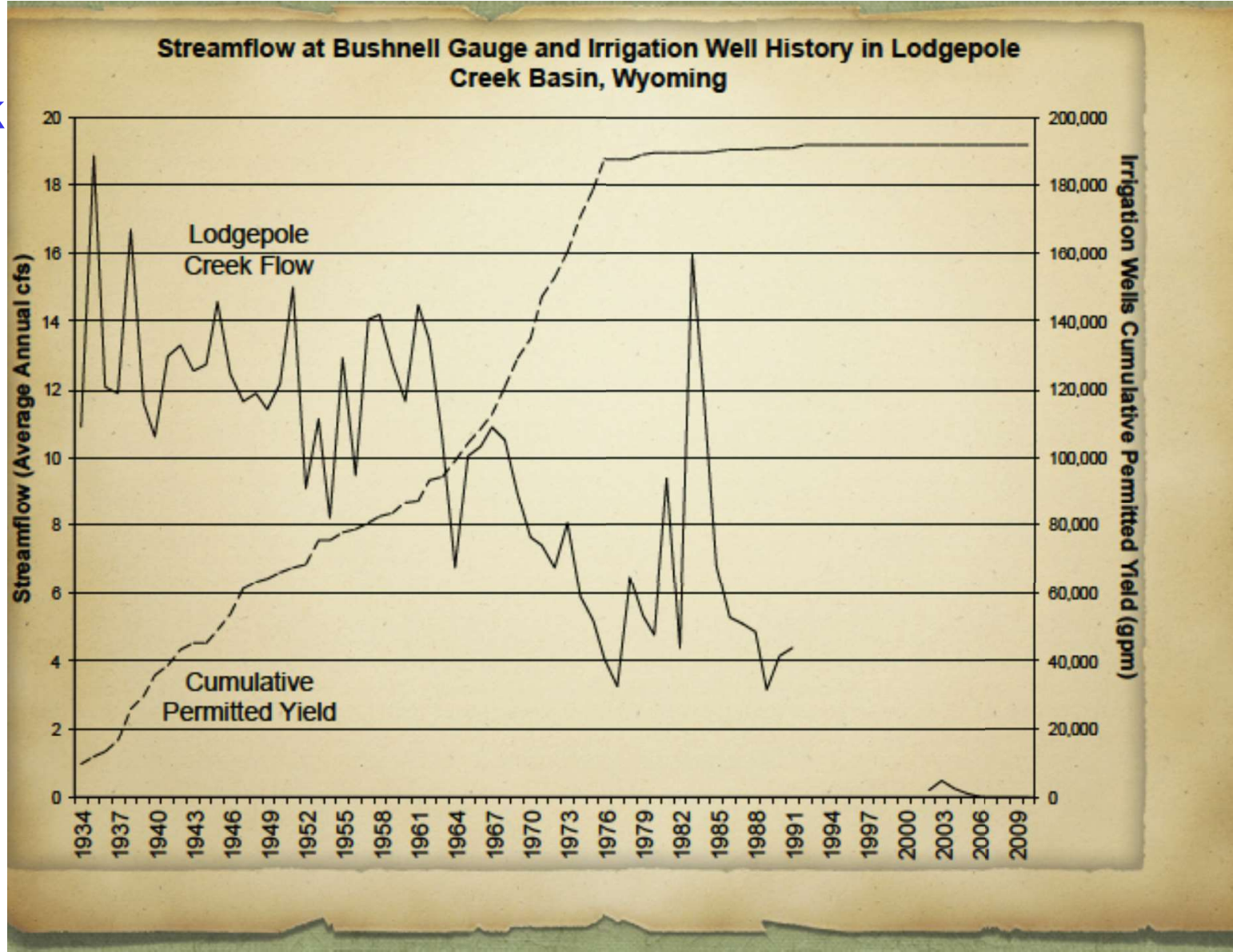
- Aquifer properties
- Distance from well to connected surface-water features

From USGS Circular 1376, figure 9

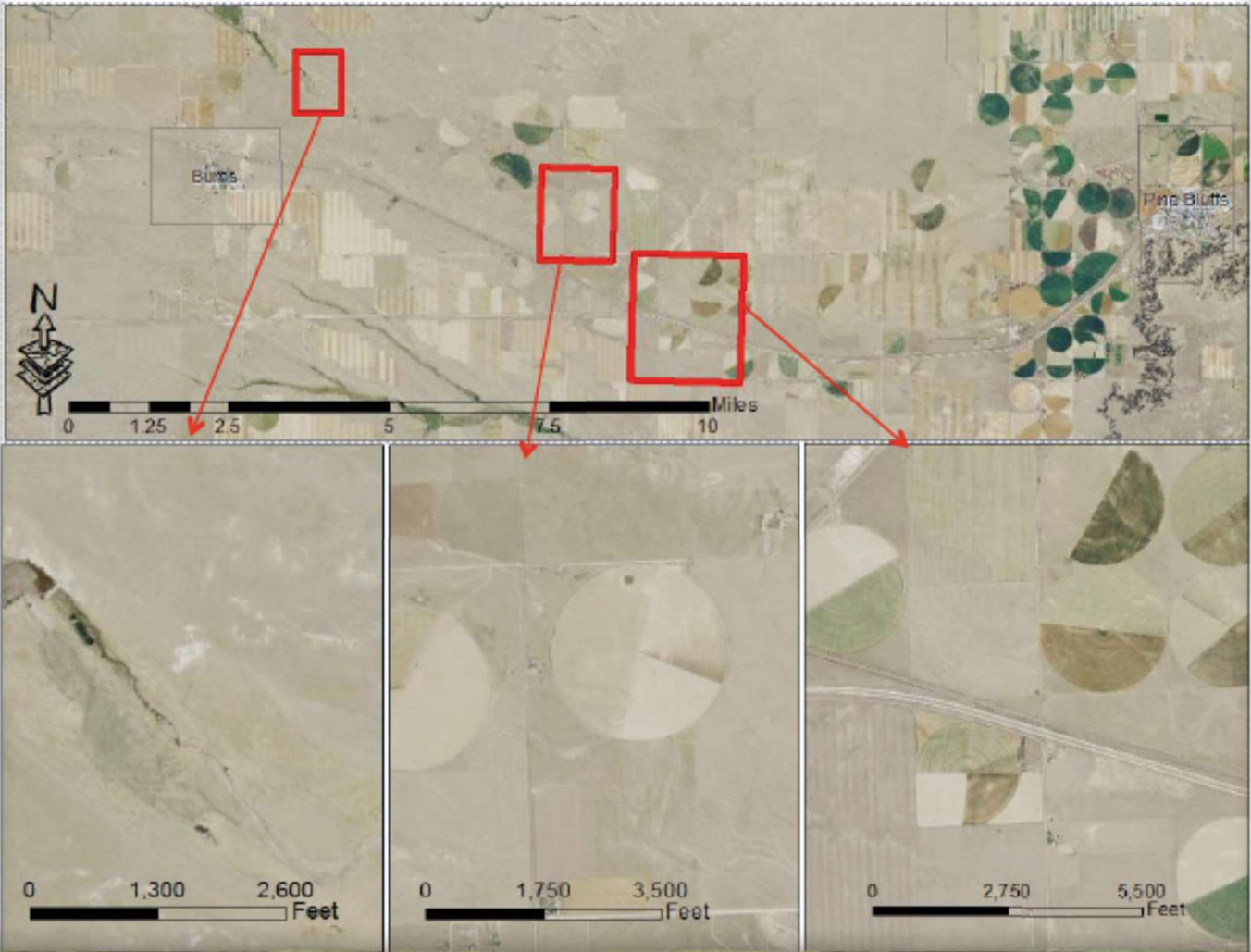
Lodgepole Creek



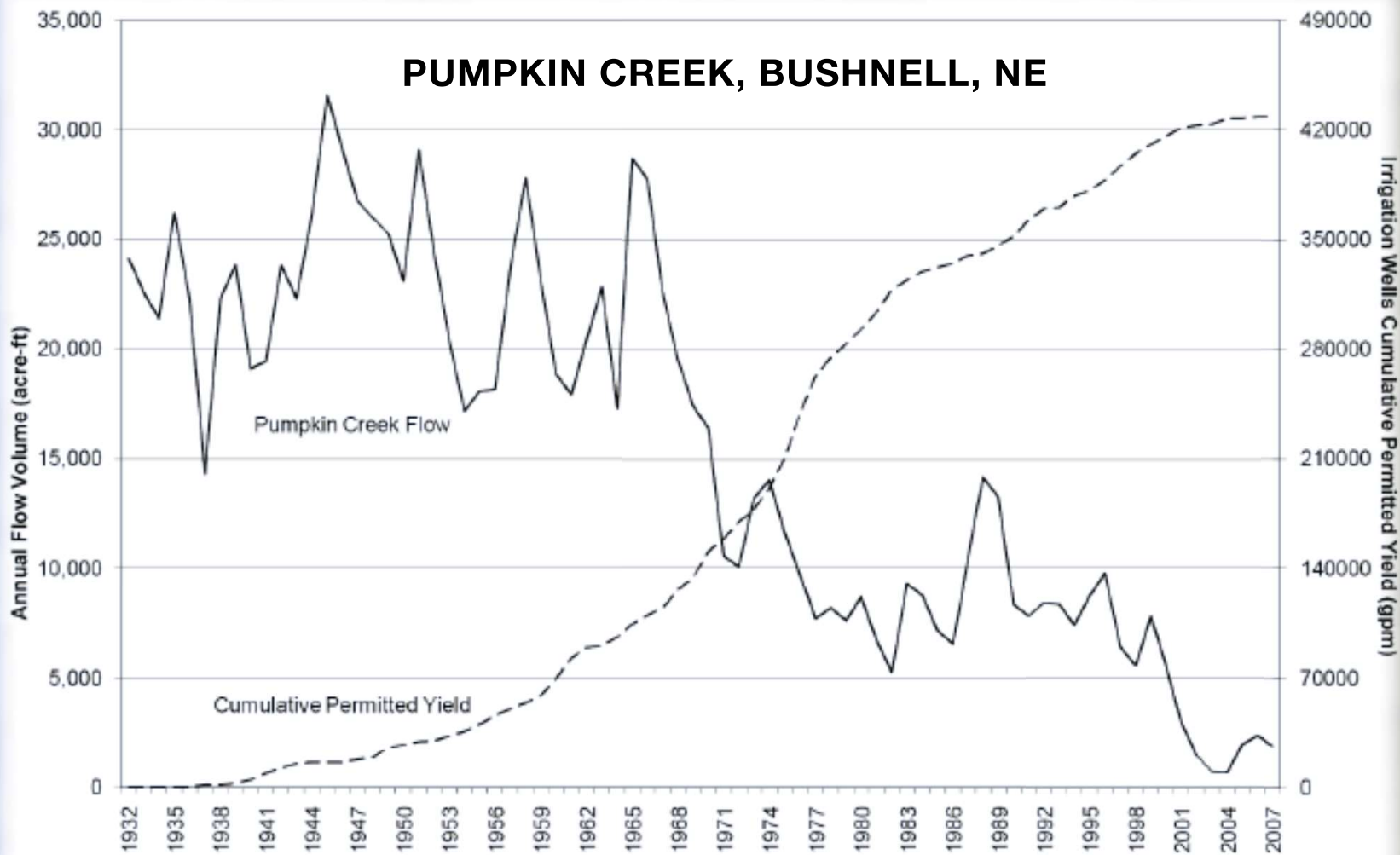
July 13, 2021
Dry North of
Hillsdale, WY



Lodgepole Creek



PUMPKIN CREEK, BUSHNELL, NE



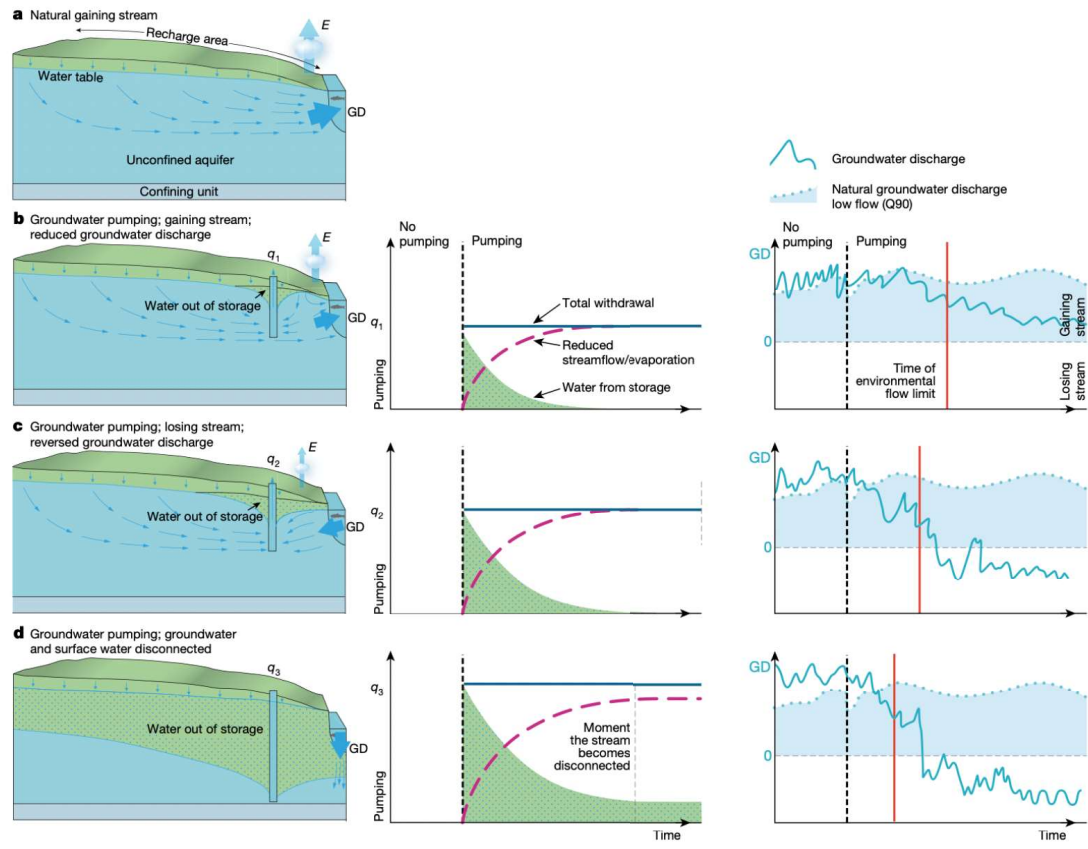


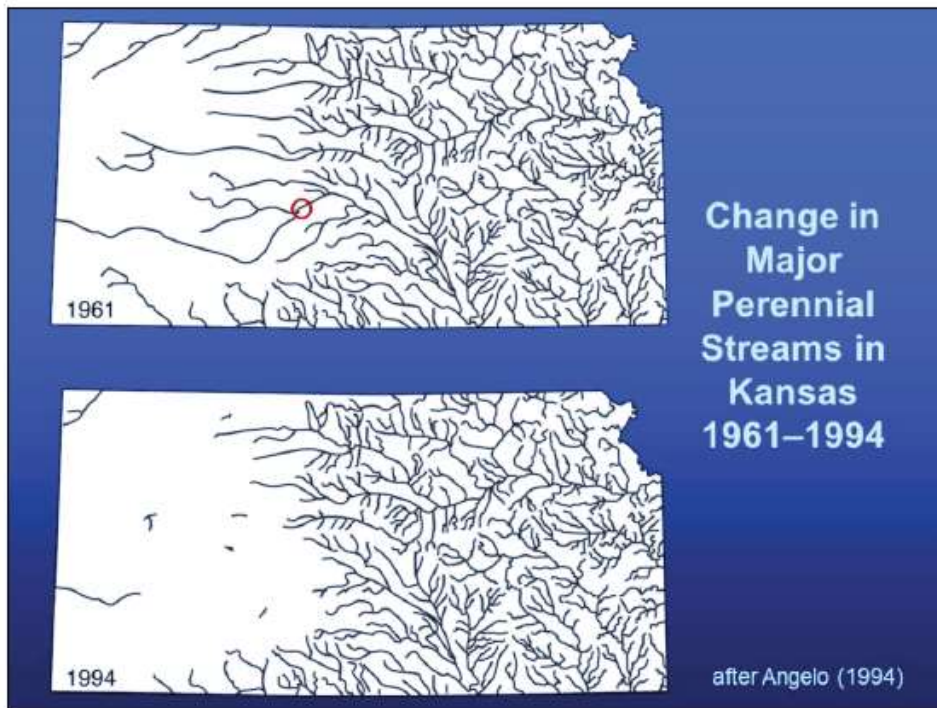
Fig. 3 | Effect of groundwater pumping on groundwater discharge, groundwater storage change, reaching environmental critical streamflow and possibly regime changes. a, A natural gaining stream. b, Left, limited pumping rate (q_1), reducing groundwater discharge (GD). At first, groundwater is taken out of storage. Middle, eventually a new equilibrium is reached where all pumped water comes from reduced groundwater discharge and evaporation. Right, streamflow is reduced and environmentally critical streamflow can be exceeded, but the stream is still gaining. c, Left, higher pumping rates (q_2), reversing groundwater discharge. Middle, more groundwater is taken out of storage, but again a new equilibrium is reached. Right, pumping instead results in surface

water infiltration. d, Left, even more intense pumping rates (q_3), leading to a disconnection of the groundwater and surface water systems. Surface water infiltration reaches a maximum, independent of groundwater depth. Middle panel, groundwater is persistently taken out of storage leading to a continuous lowering of the water table at a faster rate if pumping rates are higher than surface water infiltration and diffuse recharge over the depression cone. Right panel, further declines in groundwater level will not affect streamflow further. Left and middle panels of a–d are modified from United States Geological Survey (USGS) publications^{24,25}. E, rate of evapotranspiration.

Even though riparian and wetland areas only make up 4% of the state, they support over 80% of Wyoming's wildlife. Recent studies have estimated that between 15-21% of watersheds that experience groundwater pumping have slipped past a critical ecological threshold, and by 2050, that number could skyrocket to somewhere between 40-79%. It is not in the long term economic interest of the state to allow creeks and rivers to go dry because of the harm to wildlife, agriculture, tourism, and future generations. We must carefully steward our water and land resources.

Groundwater needs to be carefully stewarded because it is a limited resource, and too much pumping does have a negative impact. Water is a common resource that we all share. Water decisions are important and affect everyone.

Figure 3. from de Graaf, I.E.M., Gleeson, T., (Rens) van Beek, L.P.H. et al. *Environmental flow limits to global groundwater pumping*. "Nature" 574, 90–94 (2019) at 266 of *Combined Exhibits*.



Declines in groundwater levels underlying streams across the High Plains aquifer cause a decrease in groundwater discharge to the streams until finally no discharge occurs and the streams go dry. Bob Angelo of KDHE illustrated the change by showing perennial stream channels in 1961 and 1994. Included in the disappearing streams is the Arkansas River channel, which extended across the state in 1961 but now no longer flows for over 100 to about 200 miles depending on the precipitation for a particular year. For example, the Arkansas River downstream of Larned is represented by the red circle on the 1961 map.



Much of the last three decades the channel of the Arkansas River near Larned is dry as shown in this photo. People often navigate down the river here in their ATVs.

An Overview of Aquifers in Kansas
 Don Whittemore, Jim Butler, and Brownie Wilson

KU KANSAS GEOLOGICAL SURVEY
 The University of Kansas

KDHE Geology & Well
 Technology Virtual Fall Seminar
 October 2020


An aerial photograph of a wide, flat landscape. A winding river flows through the center, surrounded by lush green grass. Scattered trees, some bare and some with sparse leaves, are visible along the riverbanks. A dirt road runs parallel to the river on the left side. The background shows a vast, open plain under a blue sky with light clouds.

Photo taken by Mr. Peter Arnold

Considering the “Public Interest”

“Priority of appropriation for beneficial uses shall give the better right. No appropriation shall be denied except when such denial is demanded by the public interests.”

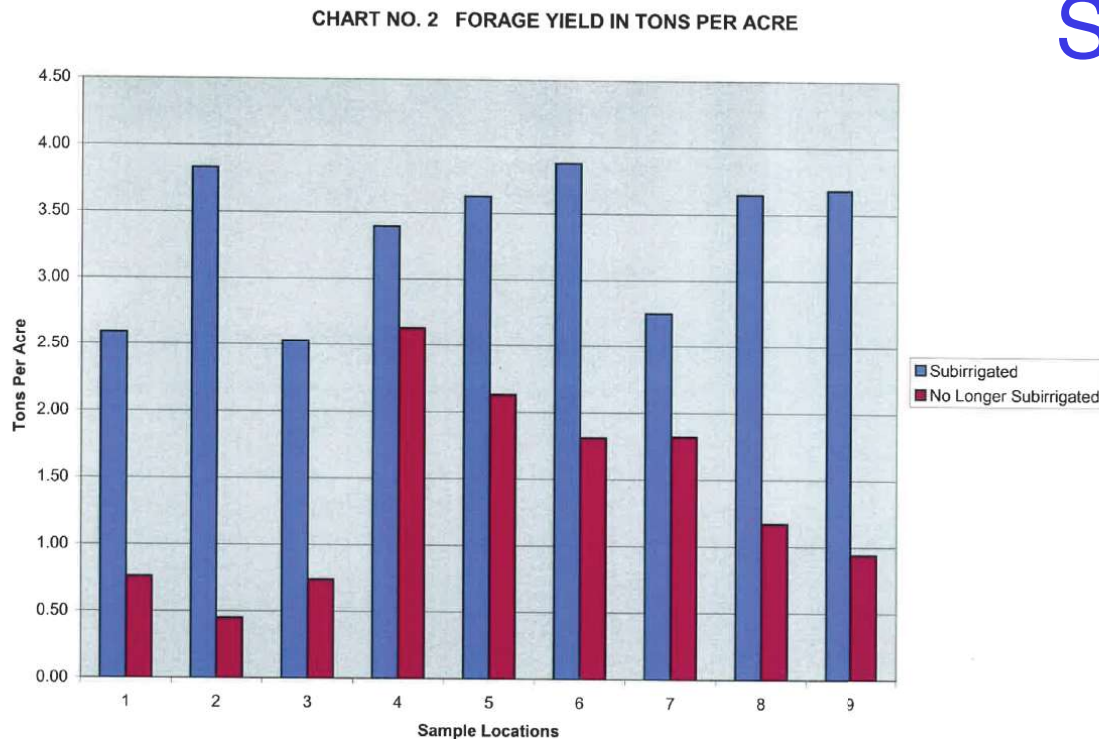
Wyoming Constitution Art. 8, § 3. Priority of Appropriation

The permit shall not be granted if the proposed use would be detrimental to the public interest.

W.S. § 41-3-932 (c)

Impact to sub-irrigated meadows

Significant loss of yield!



- Comparison of productivity of formerly sub-irrigated meadows to presently sub-irrigated meadows.
- Exhibit from the Spear T Ranch v. Knaub lawsuit in Nebraska.

Figure 6. Comparison of forage yield from land that is sub-irrigated to lands that were formerly sub-irrigated on the Spear T. Ranch.

Temporary
Water Use
Agreements
cause concern
for “speculation
of water rights.”



State Engineer's Office

HERSCHLER BUILDING, 4-E CHEYENNE, WYOMING 82002
(307) 777-6150 FAX (307) 777-5898

MATTHEW H. MEAD
GOVERNOR

PATRICK TYRRELL
STATE ENGINEER

Policy Memorandum

To: State Engineer's Office, Ground Water and Surface Water Administrators

From: Pat Tyrrell, State Engineer

A handwritten signature in blue ink, appearing to read "Patrick Tyrrell", is written over the printed name.

Date: February 24, 2012

Re: Issuance of Temporary Water Use Agreements (TWUAs) in Ground Water Control Areas
- Revised (This Policy Memorandum supersedes and replaces the Policy Memorandum
issued February 12, 2010 and November 1, 2010)

The recent increase in requests for TWUAs using water wells within established Ground Water Control Areas (GWCAs) has caused us to revisit what should be the appropriate requirements for their issuance. Part of this concern stems from the receipt of agreements that purport to make use of a water right for a well that has scant or no recent historic use under its permit (typically irrigation). One of the requirements of W.S. 41-3-110 is that "Only that portion of a water right so acquired which has been consumptively used under the historic use made of the

Where it appears that an application is not made in good faith, is made for delay or speculative purposes, it shall be denied. This is an especially important consideration with respect to the public interest.

“In dealing with water, we cannot ignore the public interest and the relative rights to beneficial use in a regulated manner without encouraging monopoly and speculation.” *Lake De Smet Reservoir Co. v. Kaufmann*, 292 P.2d 482, 486 (Wyo. 1956). Speculation and monopoly of water rights is impermissible. *Id* (citing *Schreck v. Nickols*, 95 P.2d 74, 78).

Speculation of water is detrimental to the public interest. As stated in *Toohey v. Campell*, no one should be able to get control of any part of a water right for mere future speculative profit or advantage. 60 P. 396 (Mont. 1900).

“When the application does not match the science the SEO should consider the application for agricultural use as a possible scheme to obtain water rights for other future uses.” Jim Pike

“Speculation of Water Rights”

Summary—Why This Matters for All of Us!

Granting these wells promotes out of control groundwater development. No regard for impact.

Protecting Public Interests.

Preventing speculation of water rights.

Wildlife, wetlands, streams and springs. Climate!

Consideration of future interests and needs.

Water administration in the reality of hydrologic connection.



Reba D. Epler, Law & Real Estate

Land Water Energy Law

“Representing People”

University of Wyoming, B.S. and J.D.

www.rebaepler.com

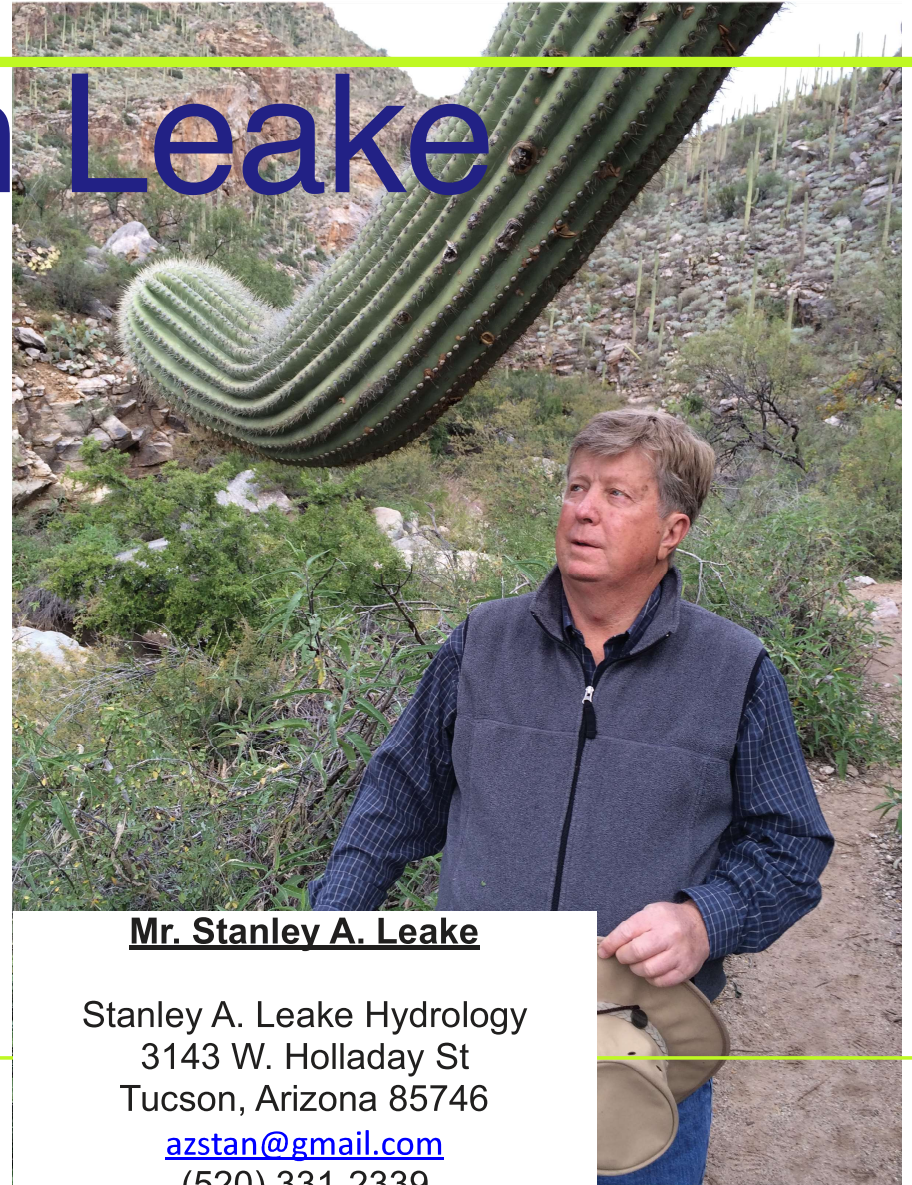
307-701-1073

Attorney Licensed in WY & NM (CO exp. 2022)

Wyo. Real Estate Licensee (Broker exp. 2022)

Mr. Stan Leake

Stan Leake is a hydrologist who worked for the U.S. Geological Survey for 42 years. Much of his research there focused on the interaction of groundwater and surface water. He is an author and co-author of many papers and reports, including the popular USGS Circular entitled “Streamflow Depletion by Wells.” Since retiring from the USGS, Stan provides his expertise as a consultant on a part-time basis.



Mr. Stanley A. Leake

Stanley A. Leake Hydrology
3143 W. Holladay St
Tucson, Arizona 85746
azstan@gmail.com
(520) 331-2339

Science behind Streamflow Depletion by Pumped Wells

Stanley A. Leake

Retired from a 42-year career at the U.S. Geological Survey

Owner of Stanley A. Leake Hydrology





Most concepts and figures presented here are from U.S. Geological Survey Circular 1376, published in 2012. Authors are Paul M. Barlow and Stanley A. Leake.



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- US Dept. of Agriculture.
 - District Conservationist in Laramie County, WY, focusing on groundwater conservation.
 - Utilizing Farm Bill programs, Jim was able to reduce groundwater pumping from the Ogallala aquifer by one billion gallons annually and restore permanent vegetation on 10,000 acres of highly erodible farmland.
 - Since retirement, Jim has focused on protecting our groundwater resources from irresponsible development through legal and legislative processes.
 - Jim also provides technical assistance to first time farm and ranch owners.
 - Jim continues to implement conservation on his farm and ranch land in Wyoming.
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The application shall be granted and the permit issued only if the state engineer finds, after receiving the advice of the control area advisory board, that:

- there are unappropriated waters in the proposed source,
- that the proposed means of diversion or construction is adequate,
- that the location of the proposed well does not conflict with any well spacing or well distribution regulation,
- and that the proposed use would not be detrimental to the public interest.

W.S. § 41-3-932 (c)

Mr. Pike's analysis of feasibility of proposed wells.

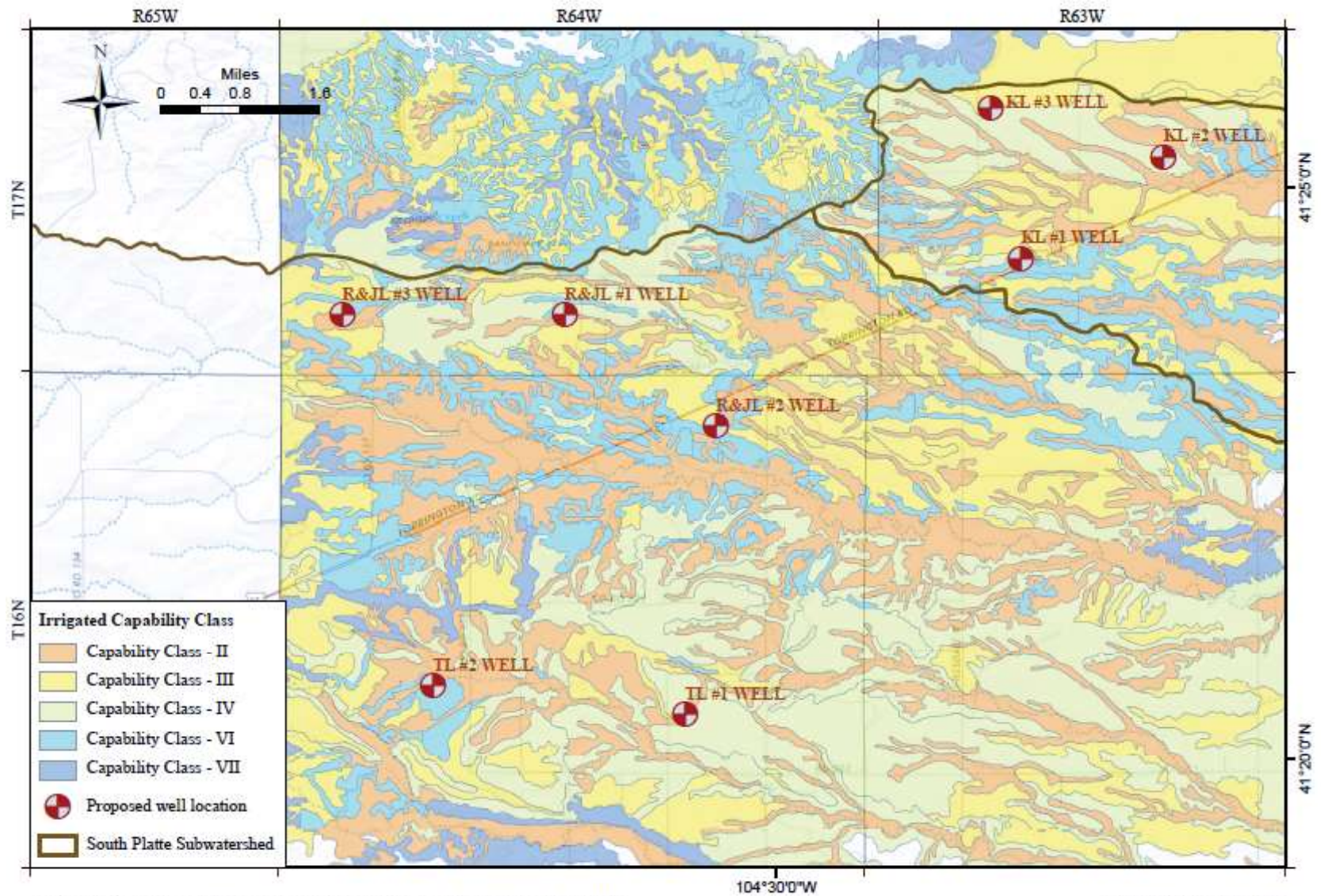
✓ The amounts of water applied for in the Lerwick applications in relation to the area to be irrigated meets less than 50 percent of the peak consumptive use of crops grow in Laramie County as determined by NRCS.

✓ As applied for the Lerwick applications, in terms of gallons per minute per acre, equate to 2.5 gallons. The requirement for crops grown in Laramie County under irrigation at peak consumptive use range from 5.6 gallons per minute per acre for millet to 7.6 gallons per minute per acre for alfalfa.

✓ The majority of the land area as legally described in the Lerwick applications is

comprised of soils that are Class III, IV, VI and VII. A description of and criteria for assessing soil classifications is provided in the USDA Agricultural Handbook No. 210 Land Capability Classification.

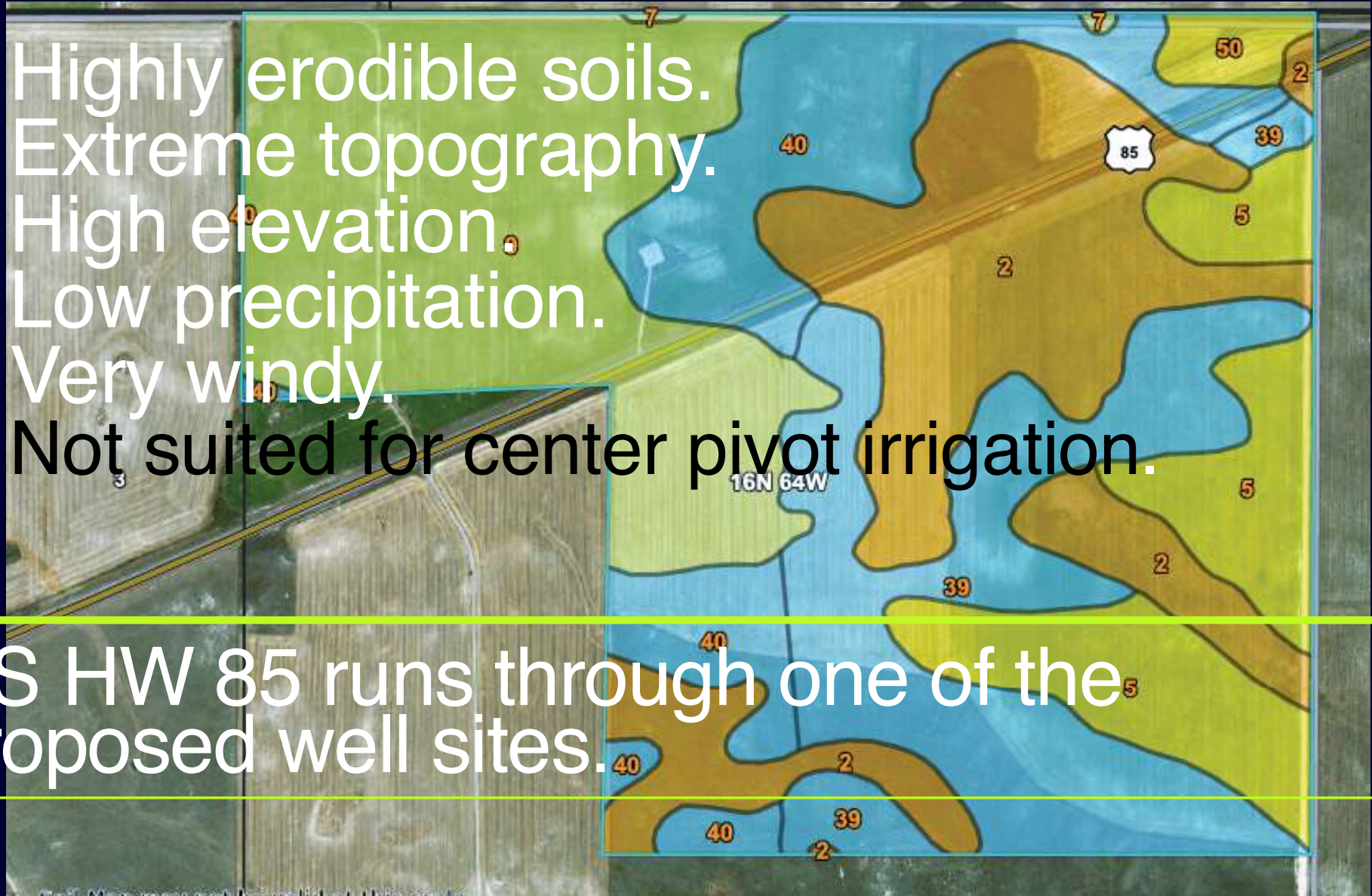
✓ In terms of crop production Class III and IV soils have severe and very severe limitations respectively. Class VI soils are generally unsuited for cultivation and Class VII soils are unsuited for cultivation. The Capability Subclass for all soil map units in the Lerwick applications is “e” which indicates that the main hazard is the risk of erosion unless close-growing plant cover is maintained.



Irrigated Capability Classes in vicinity of proposed wells

Highly erodible soils.
Extreme topography.
High elevation.
Low precipitation.
Very windy.
Not suited for center pivot irrigation.

US HW 85 runs through one of the proposed well sites.



Much of the land in this proposed area is classified as “unsuitable for cultivation” or “severely limited”



“Unsuitable for Cultivation”

✓ During my professional career I encountered several proposals across Wyoming similar to the Lerwick's current proposal application. When an attempt is made to irrigate soils that have severe limitations or are unsuitable for cultivation coupled with a water supply that does not meet crop requirements, production will be marginal. The result is that the water source suffers depletion, the health of the soil resource is damaged and other agronomic inputs such as fuel, electricity and agricultural chemicals are spent on production that does not warrant the costs. This is not an isolated loss to the farmer as agriculture is not bound by the same economic rules that most privately held

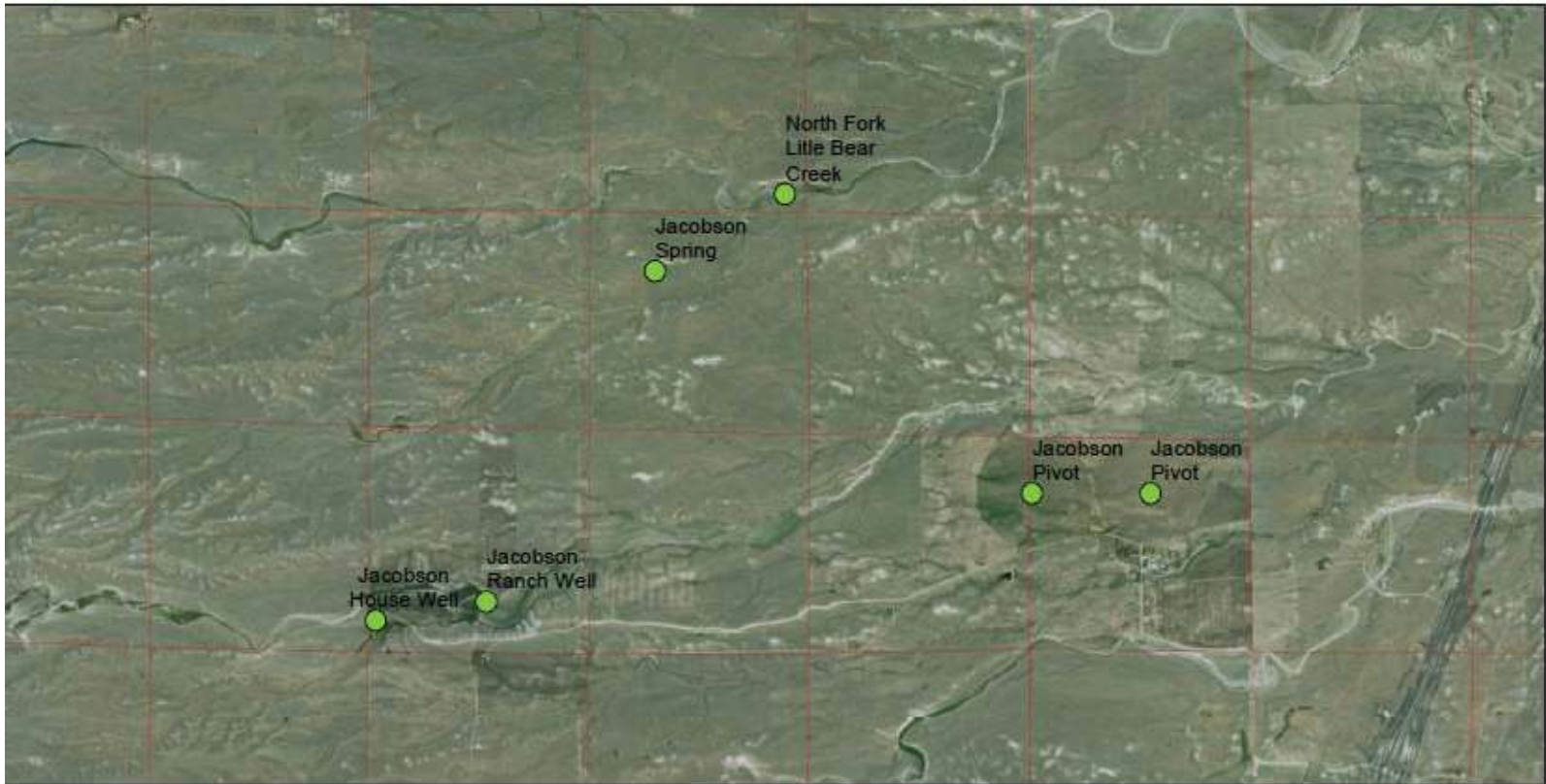
businesses in our county operate under. Marginal and poorly managed farming operations avoid bankruptcy by collecting massive amounts of taxpayer funded crop insurance. This practice is often referred to as "farming the government".

✓ I believe the SEO should evaluate groundwater applications for irrigation based on predictable science based outcomes. When the application does not match the science the SEO should consider the application for agricultural use as a possible scheme to obtain water rights for other future uses. Placing restrictions on change of use can reduce such schemes.

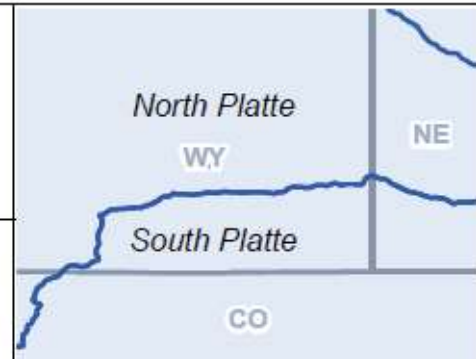
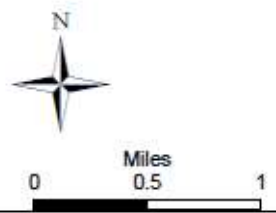
✓ The Lerwick applications are very similar to the now abandoned use of groundwater on the Jacobsen Ranch in terms of soils and climatic conditions in relation to cropping systems. The Jacobsen Ranch is located approximately nineteen miles to the north east of the Lerwick applications. The two Jacobsen pivots were permitted in the 1970's. Over time the water production from the well declined resulting in reduced forage yields from the pivots. In addition, the owners were concerned about the impact they suspected the pivots had on 1) a well located on property owned by the Dayton's located southwest of the pivots 2) a spring located approximately 1.5 miles northwest of the pivots and 3) stream flows in the North Fork of Little Bear creek directly north of the pivots. All three sources of water were dry when I visited the ranch in 2009.

✓ Utilizing the AWEP program, the Jacobsen's abandoned the pivots and within three years the previously mentioned spring was flowing and intermittent flow had returned to the North Fork of Little Bear Creek thus returning the historical benefits to wildlife, livestock and aquifer recharge in the Bear Creek drainage. Measurements of the static water level in the well had risen by 21 feet. To this day the Jacobsen's maintain that utilizing the AWEP program to abandon their irrigation well was the correct decision for their family operation.

✓ Due to the negative agronomic issues associated with soil and water as discussed, I cannot accept any explanation or defense that the intended use of groundwater proposed by the Lerwick applications provides any beneficial use to the State and citizens of Wyoming.



Jacobson Wells Map
T18N R68W



Service Layer Credits: Esri, USGS, NOAA, WYSEO

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- ✓ Soils within the application area are unsuitable for irrigation as classified by USDA/NRCS.
 - ✓ The amount of water applied for does not meet the requirement of any crops grown in Laramie County based on NRCS Irrigation Water Requirements/Crop Data Summaries for Laramie County, Wyoming.
 - ✓ Case study of the effects of the Jacobsen Ranch irrigation well on ground and surface water in the Little Bear Creek drainage and the resulting benefits from abandoning the water right.

Conclusion: For the foregoing reasons I conclude the following:

1. That the proposed means of diversion or construction are not adequate as the amount of water applied for in relation to the acres requested in the Lerwick applications is inadequate for crops grown in Laramie County.
 2. That the proposed use of groundwater is not beneficial use due to the soil classifications that comprise the land units contained in the Lerwick applications.
 3. The applications for groundwater are speculative based the scientific evidence supporting conclusion statements 1 and 2.
 4. That granting applications for irrigation wells is contrary to the desires of the landowners living in the LCCA. In addition it diminishes the benefits gained by the AWEP program.
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Objectives:

- ★ More work and projects helping people, communities and the land.
 - ★ Support for continuing efforts in Lerwick.
 - ★ Grow the movement.
 - ★ Work with us!
 - ★ Meet new allies and partners.
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