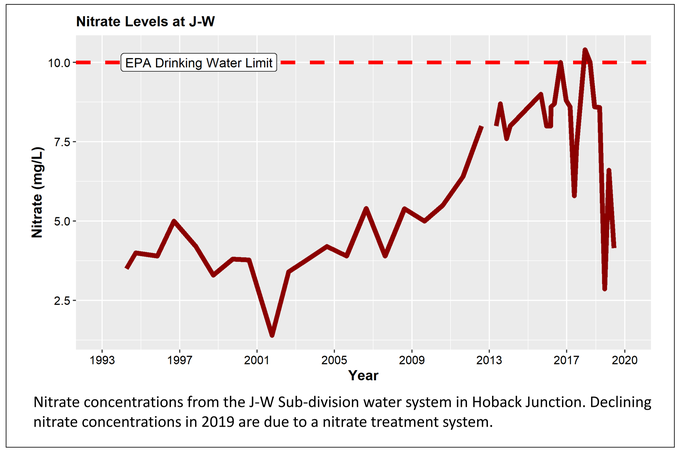
Hoback Drinking Water: Background

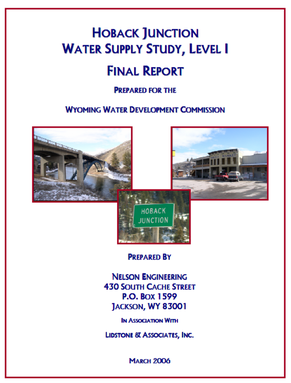
Drinking Water

Public drinking water data shows increasing nitrate concentrations over the past 30 years.



Nitrate concentrations from the J-W Sub-division water system in Hoback Junction. Declining nitrate concentrations in 2019 are due to a nitrate treatment system.

In 2006, a Level 1 Water Supply Study looked at the water system potential for southern Teton County.



But, no special district was formed and no further study was completed.

The need for nitrate treatment in water sources is now common from the Hoback River north to Horse Creek.

Sulfur, bacteria, and water quantity present additional challenges in this vicinity.

Community Action

September 2018: Teton County and Teton Conservation District held a meeting to present information and solicit public input.

December 2018: Teton Conservation District, Teton County Health Department, and the Board of Health jointly informed the Teton County Board of County Commissioners of a growing health concern in Hoback Junction – nitrate.

February 2019: Teton County requested that Teton Conservation District initiate a process to establish recommendations to address drinking water concerns.

A 'Steering Committee' was formed, consisting of Teton County Engineering, Public Health and Teton Conservation District. LegacyWorks Group was hired to facilitate meetings and establish a stakeholder process.

LegacyWorks group

TETON COUNTY WYOMING HEALTH DEPARTMENT

Teton Conservation District Est. 1946

August 2019: A survey was mailed to 400+ residents of southern Teton County about water issues, interest in public water, and being a stakeholder.

Stakeholder Process

Stakeholder Selection: The Steering Committee and LegacyWorks Group use the following selection criteria:

- Spatial representation
- Interest and lack of interest in public water
- Type of stakeholder (homeowner, renter, business owner, water system operator)
- Previous history on the topic
- Response to the survey

Monthly stakeholder meetings to-date include:

December 2019

- Topic background
- Agency presentations

January 2020

- Nitrate health concerns
- Special District formation
- Engineering alternatives for water

February 2020

- Recommendation discussion meeting
- Public meeting on recommendations (February 24, 2020)

Forthcoming:

March 2020

Stakeholders will consider public input and draft final recommendations to be submitted to Teton County and Teton Conservation District.

Hoback Drinking Water: Health

Nitrate

What is Nitrate?

Nitrate is a chemical compound and nutrient that is necessary for the growth of plants. It is, therefore, an important component of fertilizers. Certain bacteria also convert chemicals commonly found in wastewater, such as ammonia, to nitrate.

Sources of Nitrate in Drinking Water

Nitrate in drinking water can originate from natural processes. But, when the concentrations exceed 2 mg/L, it is often the result of wastewater (e.g. septic systems) or runoff from fertilized agricultural fields.

Health Effects

Methemoglobinemia (also known as blue baby syndrome) is the most cited health effect due to high levels of nitrate. When consumed, nitrate reduces the blood's ability to transport oxygen, resulting in symptoms of oxygen deprivation. Infants and small children are most affected.

Recent research has focused on cancers and birth defects. Some studies have found an association between increased levels of nitrate in drinking water and risk for cancers and birth defects, while other studies have not shown this to be the case.

Treatment: Ion exchange, reverse osmosis, dilution.
Water with nitrate can be used for cleaning, showering, and even cooking. Boiling does not eliminate nitrate.

Bacteria

Which Bacteria Are We Concerned About?

The bacteria usually tested for in drinking water are a broad category known as coliform bacteria. These bacteria are found in the environment and within the digestive tracts and feces of warm-blooded animals. Most coliform bacteria are harmless to humans, but a small subset called *E. coli* can sometimes cause disease.

Source of Bacterial Contamination

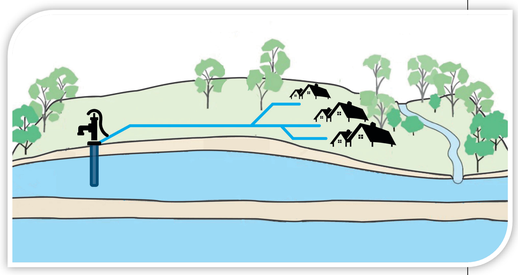
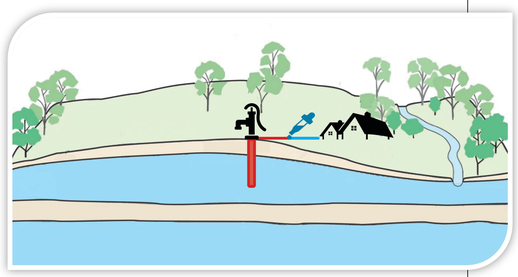
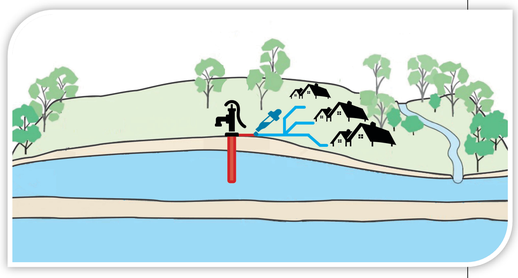
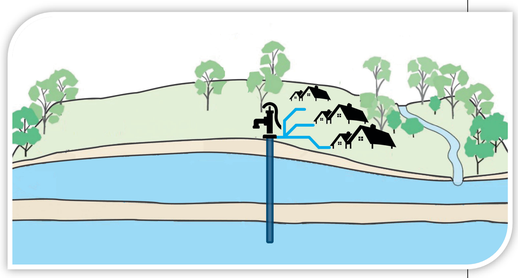
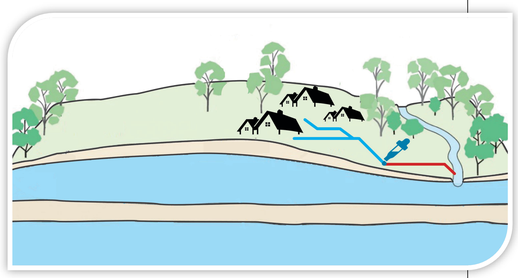
When a part of a drinking water system, such as a well, is not sufficiently protected against flooding or has been damaged, bacteria such as *E. coli* are able to enter the water. The risk is increased during wet times of year when there is more water to carry the bacteria into the systems.

Health Effects

Symptoms of *E. coli* infection include fever, nausea, vomiting, and diarrhea that may be bloody. Some types of *E. coli* known as Shiga toxin-producing *E. coli* can cause a life-threatening condition known as Hemolytic Uremic Syndrome. This can result in kidney failure and may require a kidney transplant. The condition is sometimes fatal.

Treatment: Chlorine shock, boiling, well head protection.
Bacteria contamination is the most common well contaminant and can indicate that a well is not protected from surface influence.

Hoback Drinking Water: Water Source Options

Option	Advantages	Disadvantages
 New Community Well / No Treatment / Outside of Hoback	+ Eliminates treatment requirement + Can also solve quantity issue + Less EPA oversight than treatment options + Possible coordination with Hog Island and Horse Creek areas + More funding options + Better known groundwater sources outside of Hoback area	- Long transmission line, requiring easements/ rights of way, coordination with WyDOT - Would require WWDC assistance - Would require District formation - Greater pumping costs to deliver water from longer distances - More complicated to implement and coordinate involving multiple parties
 Individual Well Point of Use Treatment	+ Relatively simple to implement + Can be specifically catered to the water quality + Does not require formation of a + District to operate and maintain the system + Limited EPA oversight + No construction of new distribution or transmission lines	- Cost per user can be high - Maintenance a question - No oversight in the design and implementation - Questions about long term effectiveness - Can be stigma that affects property values - Does not address quantity issues - Brine waste disposal adds to cost - Typically no funding assistance - Quality issues with the addition of salts
 New Deep Community Well / No Treatment / Hoback Junction Area	+ Eliminates treatment requirement + Can also solve quantity issue + Less EPA oversight than treatment options + Reduces need for long transmission line	- Would require financial assistance from the WWDC - Would require formation of a District - High TDS a potential creating other quality issues - Well options in Hoback Junction area appear to be limited based upon 2007 Level I Report - Well construction costs can be significant - Well siting and easements can be an issue
 Community Well Treatment	+ Relatively simple to implement + Can be specifically catered to the water quality + Fewer distribution and transmission line extensions required	- Cost per user can be high - Requires qualified operator for public systems - Does not address quantity issues - Brine waste disposal adds to cost - Requires District for funding options - Less funding available than non-treatment options - EPA oversight on public systems - Quality issues with the addition of salts, disinfection by-products
 Surface Water Supply and Treatment at Hoback Junction	+ Plentiful supply to solve quantity issue + Raw water quality generally good + Reduces requirement for extensive transmission lines	- Long term operation and maintenance costs for treatment system - No WWDC funding for treatment - Requires higher level qualified operator - Extensive EPA oversight - Complicated river intake system to address high and low water flow conditions - Potential complications during winter surface water freezing - Filter backwash disposal costs - Disinfection by-products more common

Text was presented to the Stakeholder Group by Bob Ablondi (01/13/2020)

Hoback Drinking Water: Draft Recommended Options

Public Input

The Hoback Drinking Water Stakeholder Group is providing the following recommendations for public review and input. Verbal (in-person or phone), written (mail or e-mail), and survey communications received prior to March 8, 2020 will be considered before final recommendations are submitted to Teton County and Teton Conservation District.

2020 Actions:

Teton County officials will work with local residents to ensure adequate availability of clean drinking water in the short-term.

Recommendation 1: Any Teton County resident with nitrate concentrations over 10 mg/L and proven financial need will have a water treatment system installed/paid for with public assistance.

Teton County and Teton Conservation District will begin to pinpoint the source(s) of the nitrate contamination in the area and will work to limit additional nitrate contamination of the aquifer.

Recommendation 2: Teton County will conduct or commission mandatory septic inspections at nitrate hot spots to ensure wastewater systems are functioning properly. If a system has an identified problem, the county will implement cost-share measures to eliminate those problems.

Recommendation 3: Teton County and Teton Conservation District will conduct further studies to try to understand the source of the nitrate contamination. An isotope study is the most likely route.

Recommendation 4: Teton County will formally recognize and enforce the housing density regulations applicable to the area and recognize the potential impacts to water quality that additional density will bring to the area.

Begin first steps of forming a special district to provide a community water system to local residents. Local residents will determine the type of special district suited for this task and will determine district boundaries. Teton County, as a likely district member, will participate and assist in this.

Recommendation 5: Teton County will help source public funds to pay for some portion of the special district formation costs, based upon: A) there is public health issue affecting the community, B) the county has interest as a landowner, and C) the county will be a member of the special district.

2021 Actions:

The newly formed special district will apply for financial support from the Wyoming Water Development Commission (WWDC) to complete a Level 2 study and determine the most likely/viable water source and precise cost estimates.

Recommendation 6: Once formed, the special district will pursue through a Level 2 study to understand the specific costs of developing the water source with the assumption that if the costs are reasonable, the district will move forward with a Level 3 implementation.

2022 Actions:

Once the WWDC Level 2 study is complete and full costs are understood, the special district will reconsider its boundaries. Should the anticipated costs be too expensive to be realistically implemented, the special district will seek additional funding support at both a local and state level.

Recommendation 7: Teton County will consider a Special Purpose Excise Tax (SPET) measure to support the costs of building out the public water system, should it move forward, and will support the special district's applications for state funding.

2023 Actions:

The special district will apply to WWDC for Level 3 implementation to build out the water system.

Anticipated completion date: 2026

<u>Outstanding questions:</u>

1) Location of water source: well near Hoback or Hog Island?
2) What type of special district: water, water and sewer, ISD?
3) Financing: district fees, WWDC, State Land and Investment, SPET?