

**HASTINGS CITY COUNCIL
WORKSESSION AGENDA**

**Hastings Municipal Airport
3300 W. 12th Street
May 19, 2025
6:00 PM**

ROLL CALL:

PLEDGE OF ALLEGIANCE:

MOTION TO ADOPT CURRENT AGENDA for May 19, 2025 Worksession.

PUBLIC NOTICE - Official Notice of the Worksession was published in the Hastings Tribune on Friday, May 16, 2025. Pursuant to Nebraska Revised Statute Section 84-1412, the public is advised that a copy of today's agenda and all reproducible written material which will be discussed at today's meeting is available for public review and a current copy of the Nebraska Open Meetings Act is posted and accessible to members of the public.

CITIZEN COMMUNICATIONS: (Only for agenda items.)

DISCUSSION ITEMS

1. Agenda 101.
2. Presentation on Nitrates.
3. Presentation on Highway 6 Project.

ADJOURN:

The Mayor and City Council reserve the right to enter into an executive session at any time during the meeting, in accordance with the Nebraska Open Meetings Act, even though the closed session may not be indicated on the agenda.

It is the intention of the Mayor and City Council to take up the items on the agenda in sequential order. However, the Mayor and City Council reserve the right to take up matters in a different order to accommodate the schedules of the city council members, person having items on the agenda, and the public.

Worksession meetings are intended to allow for communication and discussion amongst the elected officials. At the prerogative of the presiding officer of the worksession, city staff, consultants or citizens may be requested or allowed to address specific items on the worksession agenda.



Nitrate Legacy: Sustainability, Public Health, and Future Liability

**“Passing it onto the next
generation”**

What will you do today?

Marty Stange; Environmental Director
Hastings Utility Advisory Board Meeting May 8, 2025

Lessons learned and your future

- **Defining the Nitrate problem**
- **Short term management – Aquifer Storage and Restoration**
- **Long term management issues – Best Management Practice**
- **Public Health Impacts**
- **Who pays for cleaning up the Nitrate Legacy – Debt and future costs left to the next generation to address**
- **What will you do to manage the nitrate legacy**

Regional Groundwater Recharge

- **Platte River** supplies approximately **50%** of the total groundwater recharge impacting our municipal wells (50-year travel time)



Regional Groundwater Recharge

- Recharge from **Rainfall** is approximately **25%**
- Recharge from **Irrigation** return is approximately **25%**
- **50%** of the recharge passes through the **Root Zone**

With the increased use of center pivots the amount of irrigation return is decreasing – critical to nitrate management



Municipal Well Nitrate Isotope Sampling

Nitrate Isotope Testing 08/01/2008

Well #	NO ₃ -N mg/l	N ¹⁵ N-NO ₃ %	Comments
33	8.5	8.42	Indicates Commercial Fertilizer
28	3.1	5.69	Indicates Commercial Fertilizer
26	5.2	4.7	Indicates Commercial Fertilizer
16	7.0	5.88	Indicates Commercial Fertilizer

15N-NO₃ Results of -5 to +5 indicate commercial fertilizer (NH₄)

15N-NO₃ Results of +10 to +30 indicate animal wastes

Was told the problem was due to the feed lots and we should leave the farmers alone as it is not their problem

Groundwater Contamination

- Some areas within the Hastings Wellhead Protection Area have Nitrates **7.5** times the MCL of 10 mg/l (10 ppM)
- Some areas have Uranium **10** times the MCL of 30 ug/l (30 ppB)
- Collected over 1,000 water samples

FINAL

HASTINGS WELLHEAD PROTECTION GROUNDWATER MANAGEMENT AREA ACTION PLAN

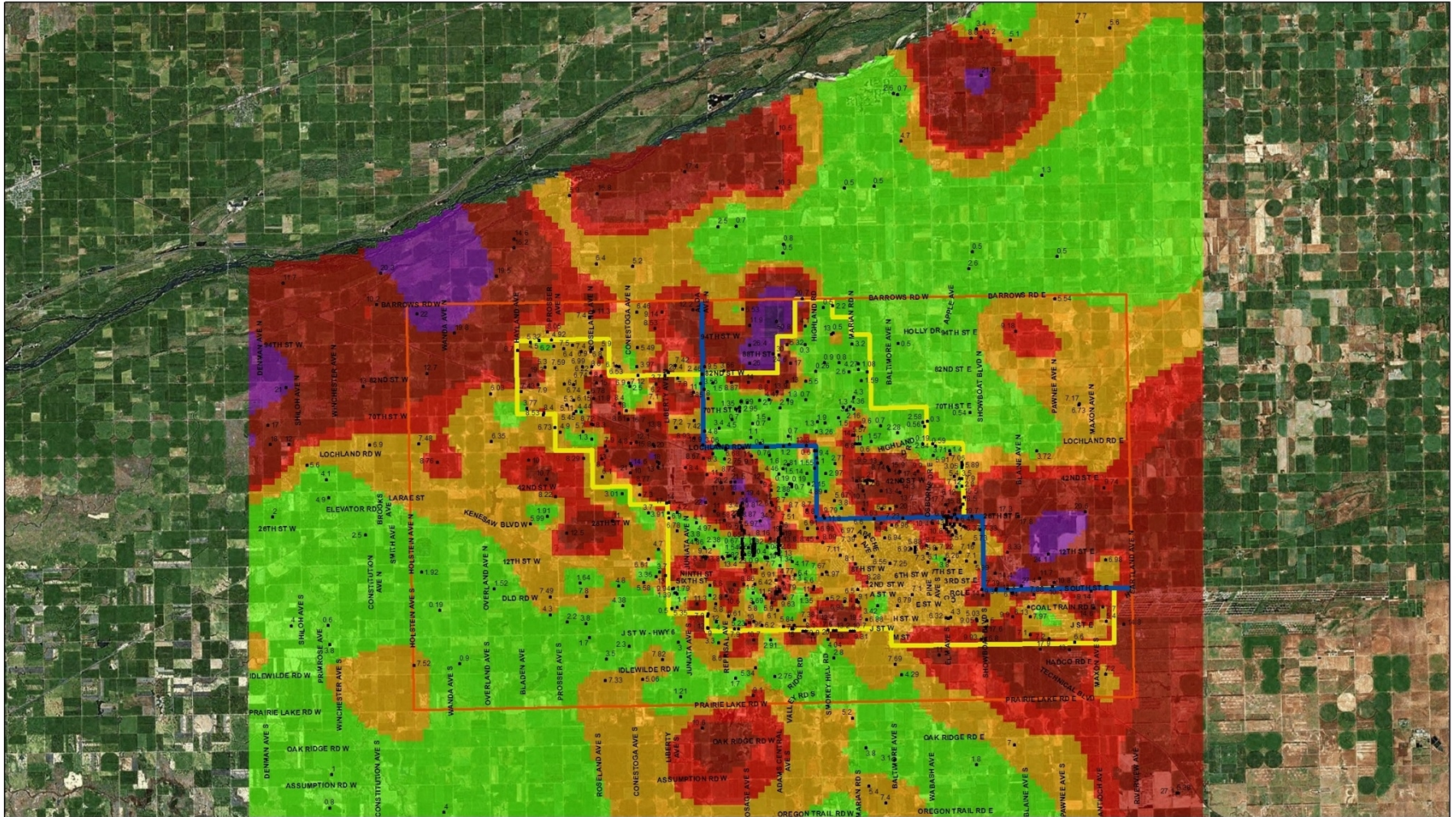
Little Blue Natural Resources District
Upper Big Blue Natural Resources District
City of Hastings

Effective Date - July 1, 2012

Adopted: February 28, 2012, Terminates: December 31, 2025



2011 Nitrate Map



2011 Nitrate Sampling Plume



↘ Direction of groundwater flow

2011 Hastings Wellhead Protection Area - Nitrate Sampling Map

Path: Z:\Projects\Hastings Wellhead Protection\MXD\2011_Sampling_Area_v2.mxd

Date: 8/22/2011

All results in mg/l (ppm)

Nitrate Contamination – Water Supply Loss

- When wells exceeds the 10 mg/l MCL for nitrates the wells are shut down
- To date 8 wells have been taken out of service at a current cost of \$600,000 per well - \$4,800,000 of lost capital



Well 33 Shut Down due to Nitrates

Nitrate Contamination – Water Supply Loss

- More losses due to industrial contamination - between 1986 and 2008 spent a present worth exceeding \$25,000,000 addressing Superfund Issues

The legacy issues addressed by the Water Department makes it difficult to compare Water Rates with other communities as they may not be burden by these historical costs

2010 Vadose Zone Study

UNL 2010 Vadose Zone Study

- 2010 Vadose Zone sampling indicates **500 to 2000** lbs of Nitrogen per acre is located below the Root Zone and above the Aquifer – Future Contamination Source
- Isotope sampling indicates the source of Nitrates is Commercial Fertilizer – Anhydrous Ammonia



2016 Vadose Zone Study

Average nitrate-N under cropland

- Included 23 of the 32 sites

Averages:

- 2011: 400 ± 140 lbs-N/Acre
- 2016: 520 ± 280 lbs-N/Acre
- Estimated nitrate-N increased by ~30%



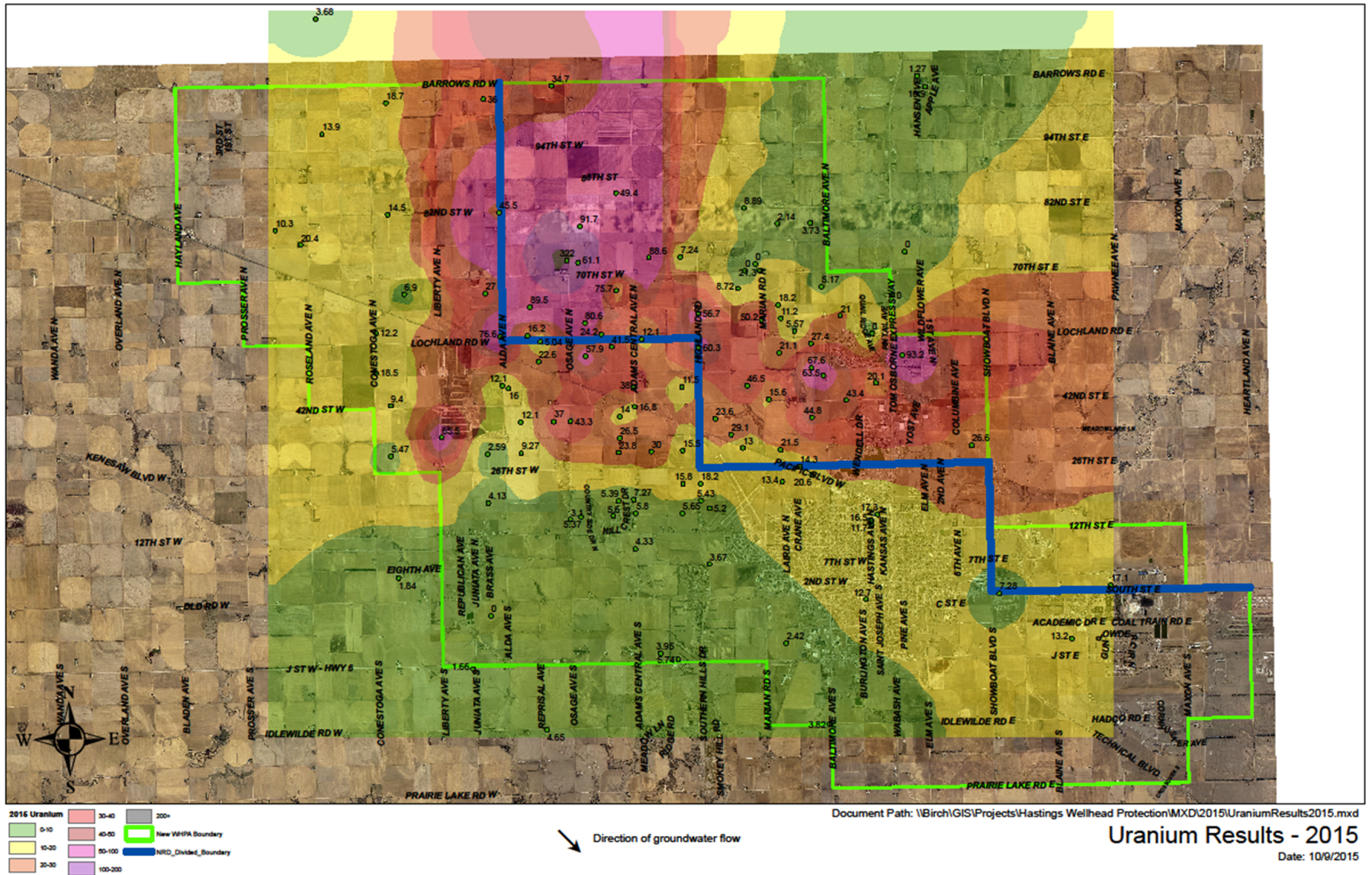
2016 Vadose Zone Study

Average nitrate-N under urban land use

- Included 5 of the 32 sites
- Irrigated via manual/underground sprinklers and hoses
- Averages:
 - 2011: 480 ± 440 lbs-N/Acre
 - 2016: 270 ± 200 lbs-N/Acre
- Estimated nitrate-N decreased by $\sim 44\%$

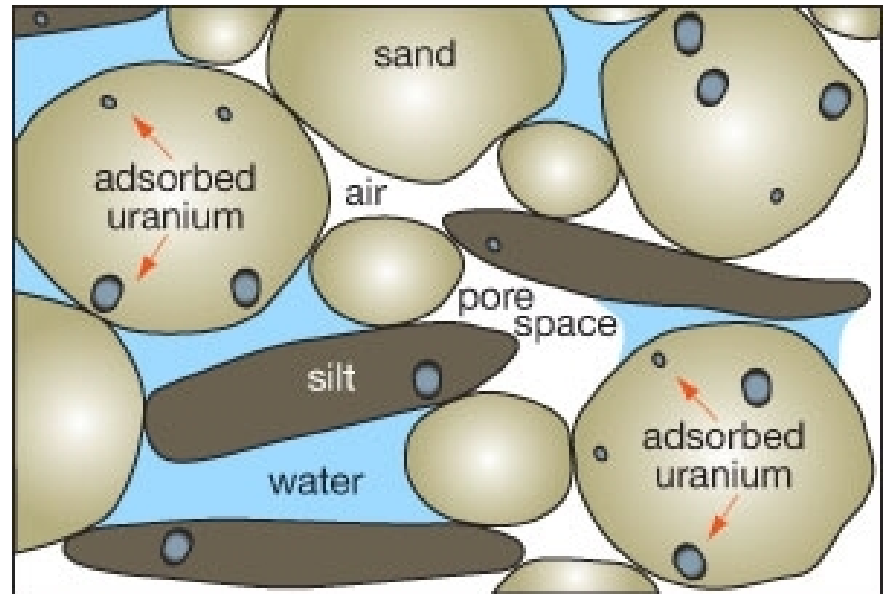


2015 Uranium Map



Uranium Source

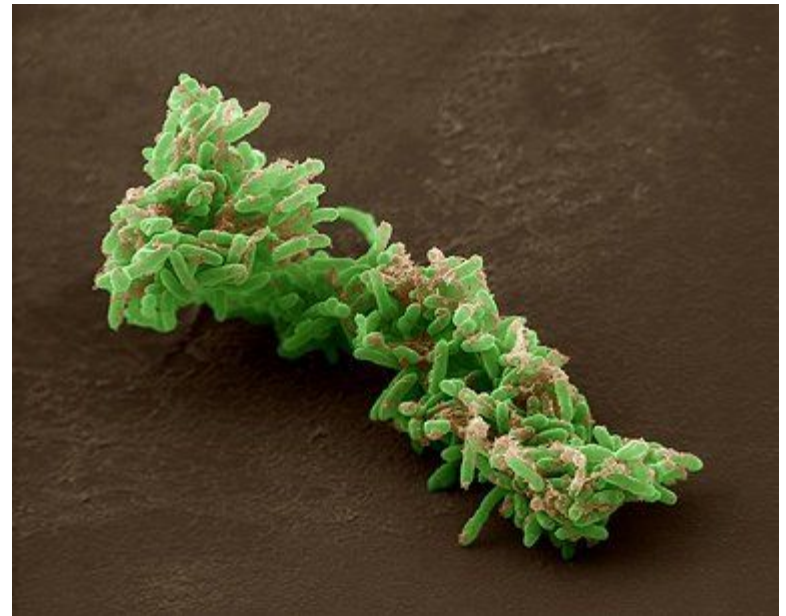
- Uranium is naturally occurring in the geologic formation
- Uranium is not normally mobile in the Hastings Area
- Generally understood by researchers that Uranium was a Platte River issue due to deposits of geological sediments



Aquifer Material and Pore Space

Uranium Investigation

- UNL conducted studies in Hastings and Alda that indicated that Uranium is being released due to nitrates
- Nitrates found in the aquifer and vadose zone promote microbial growth
- Uranium is being released due to microbial respiration



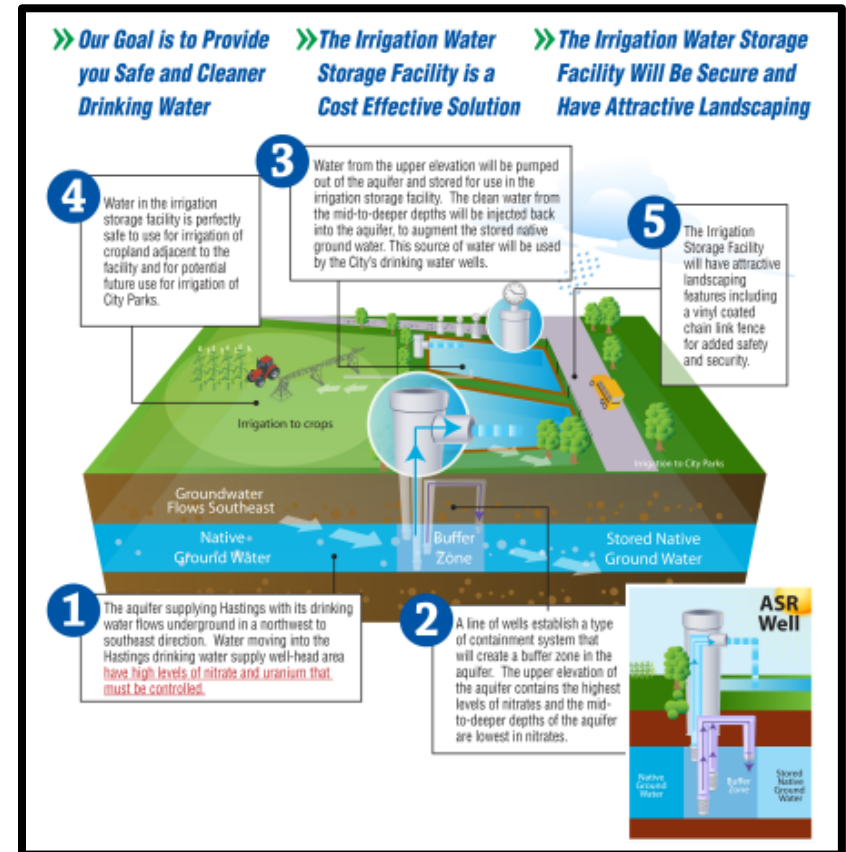
Uranium Eating Bacteria

Uranium Contamination – Water Supply Impacts

- High levels of uranium found in rural areas – rural residents unaware of uranium in their drinking water
- Uranium is being pumped from the aquifer and used for irrigation and livestock watering
- Hastings water currently below Uranium MCL of 30 ug/l
- Concern that Uranium is moving into the northern portion of the Hastings municipal well field – Future Costs

Wellhead Protection Plan – Short Term Action Plan

- **Hastings Wellhead Protection Plan** identified that nitrate and uranium contamination was so **extensive** that watershed controls would not protect the Hastings drinking water supply in a timely manner without a **short-term plan** to implement water treatment



Aquifer Storage and Restoration Project



5 Prong Solution

- Dual Pumping
- Focused Water Treatment
- Aquifer Storage and Restoration
- Irrigation Management
- Blending and Storage

COMBINATION OF ALL APPROACHES
Potential to Substantially Reduce
Capital Investments in Infrastructure
and Operating Costs

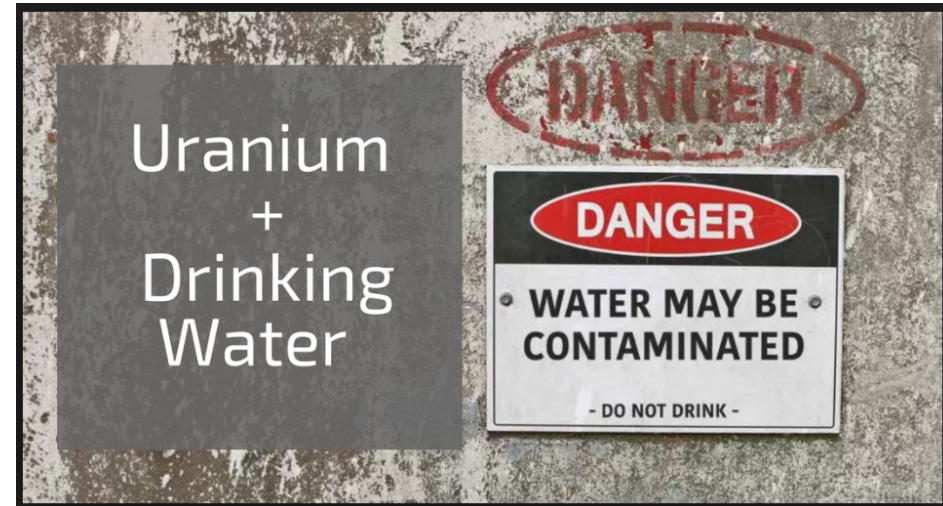
ASR Project estimated to cost \$46,000,000 including Uranium treatment and disposal – Currently Spent \$15,000,000

Water Quality Effects on Health and Crop Production



Nitrates in Drinking Water:

- ✓ Blue Baby Syndrome
- ✓ Birth Defects
- ✓ Cancer in Adults



Nitrate Contamination of Drinking Water

Blue Baby Syndrome - An illness that begins when large amounts of nitrates in water are ingested by an infant and converted to nitrite by the digestive.



www.onlinehomemedies.com

- The baby turns blue due to a lack of oxygen and could die if not treated
- Concern for adults that have respiratory issues as oxygen is displaced by nitrites in the blood - Methemoglobinemia

Nitrates – Cancer and Birth Defects

- **New health risk studies are showing evidence that Nitrates may be contributing to an increase in Cancer and Birth Defects**

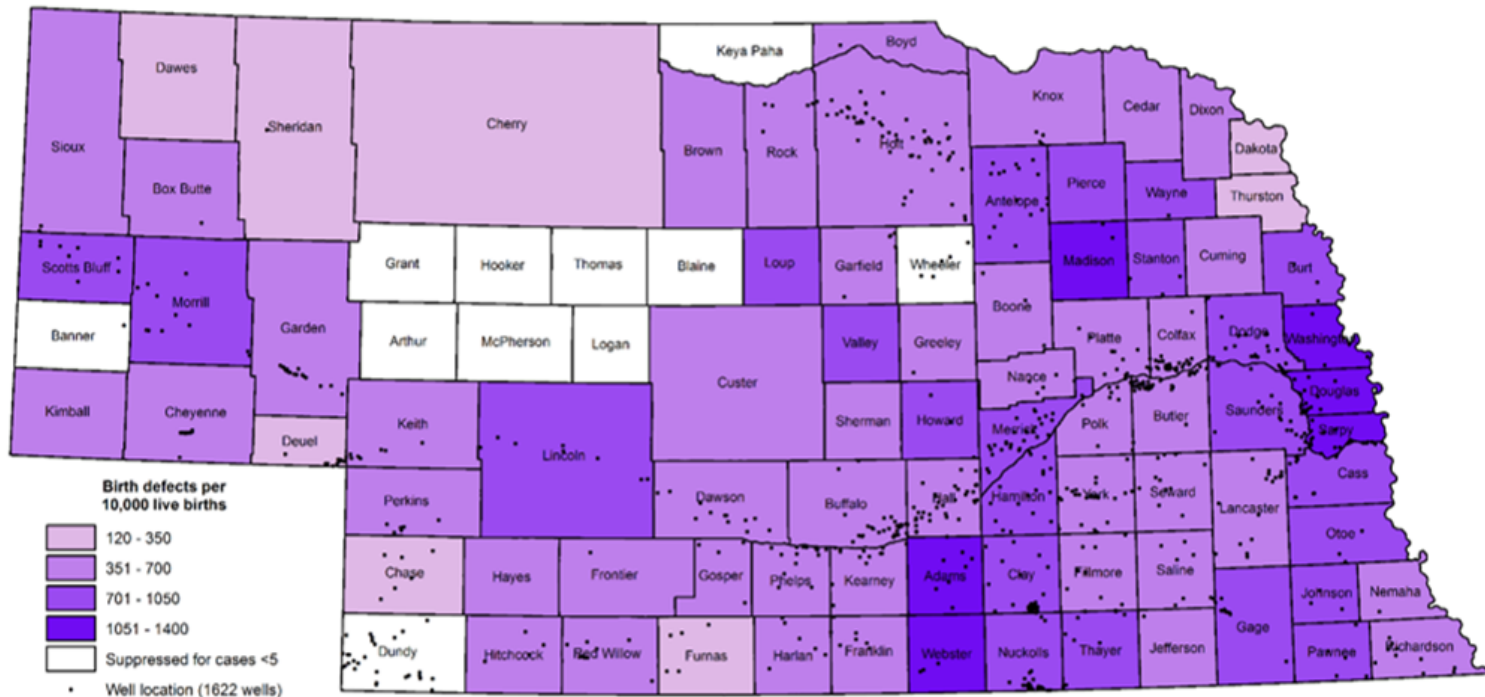


"The researchers examined data from across the United States and found a correlation between certain types of cancer and nitrates. This is the first time the correlation has been quantified."

Kara Nell, Ph.D.
University of Minnesota Morris

Health Concerns

Nebraska birth defect rates by county and wells positive for nitrate + nitrosatable agrichemical



Birth defect rates 2005-2014. Source: Nebraska Department of Health and Human Services

Source for well data: Quality-Assessed Agrichemical Contaminant Database for Nebraska Groundwater (queried Fall 2015)



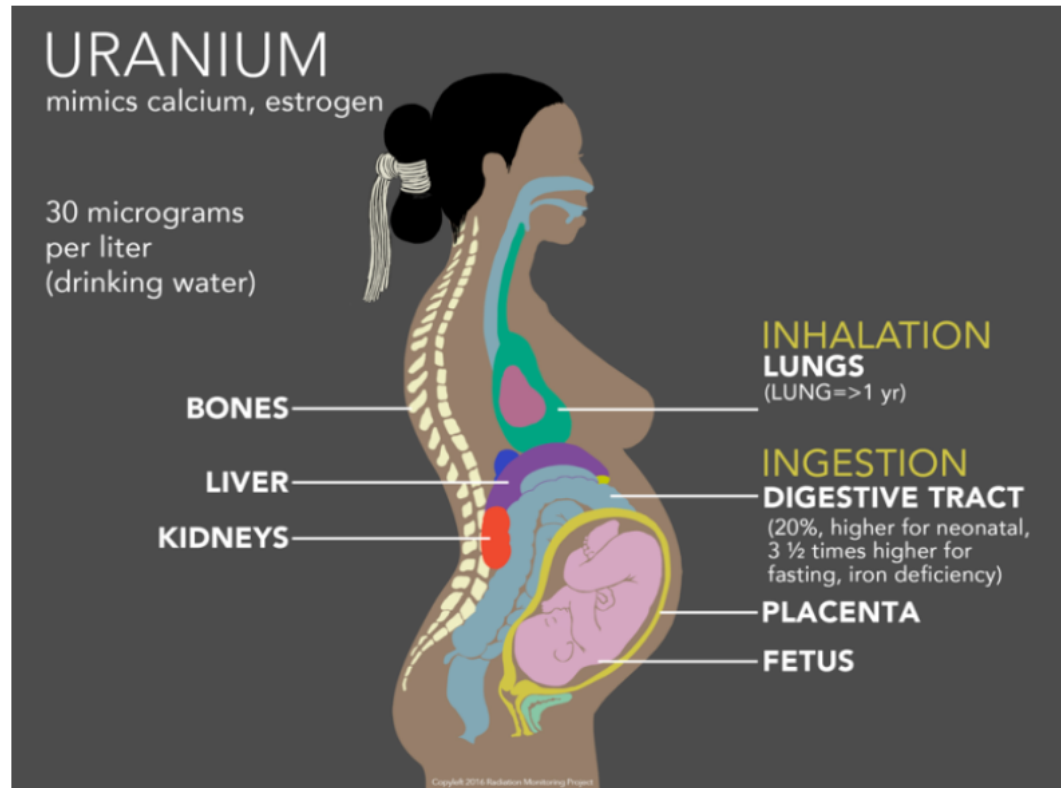
Does Uranium and Nitrates increase Cancer Risk

- Determining cause of increased health risk is difficult. Health risk due to multiple exposure path was is not additive but like $1 + 1 = 3$
- Influence of increased uranium due to nitrates has yet been fully studied – Finding the money is a problem

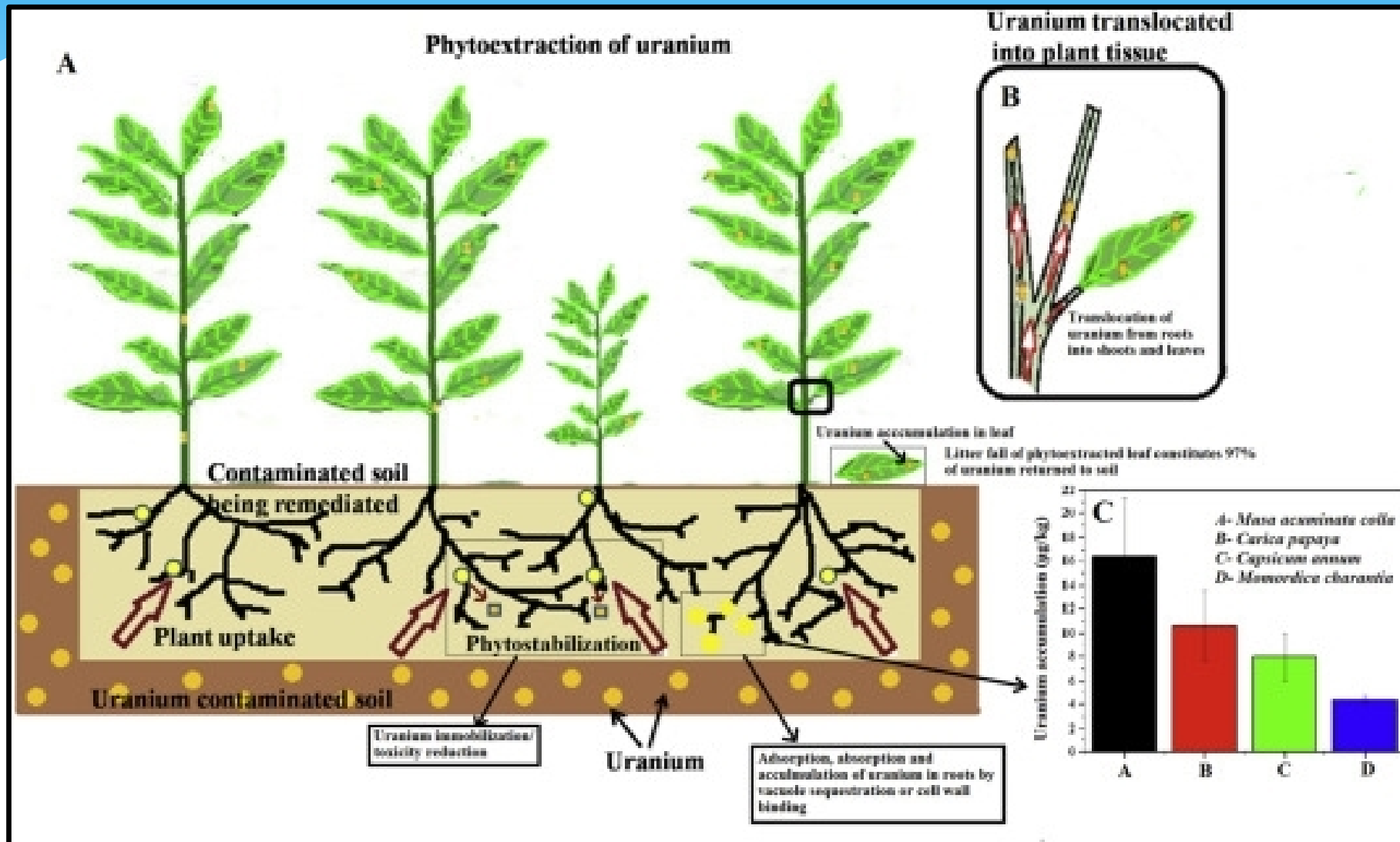
What is the financial and human cost of ignoring health risk?

Uranium Contamination of Drinking Water

- Uranium mimics Calcium and is stored in the body
- Uranium is radioactive and can cause Cancer as well as Liver, Kidney, and Bone Disease



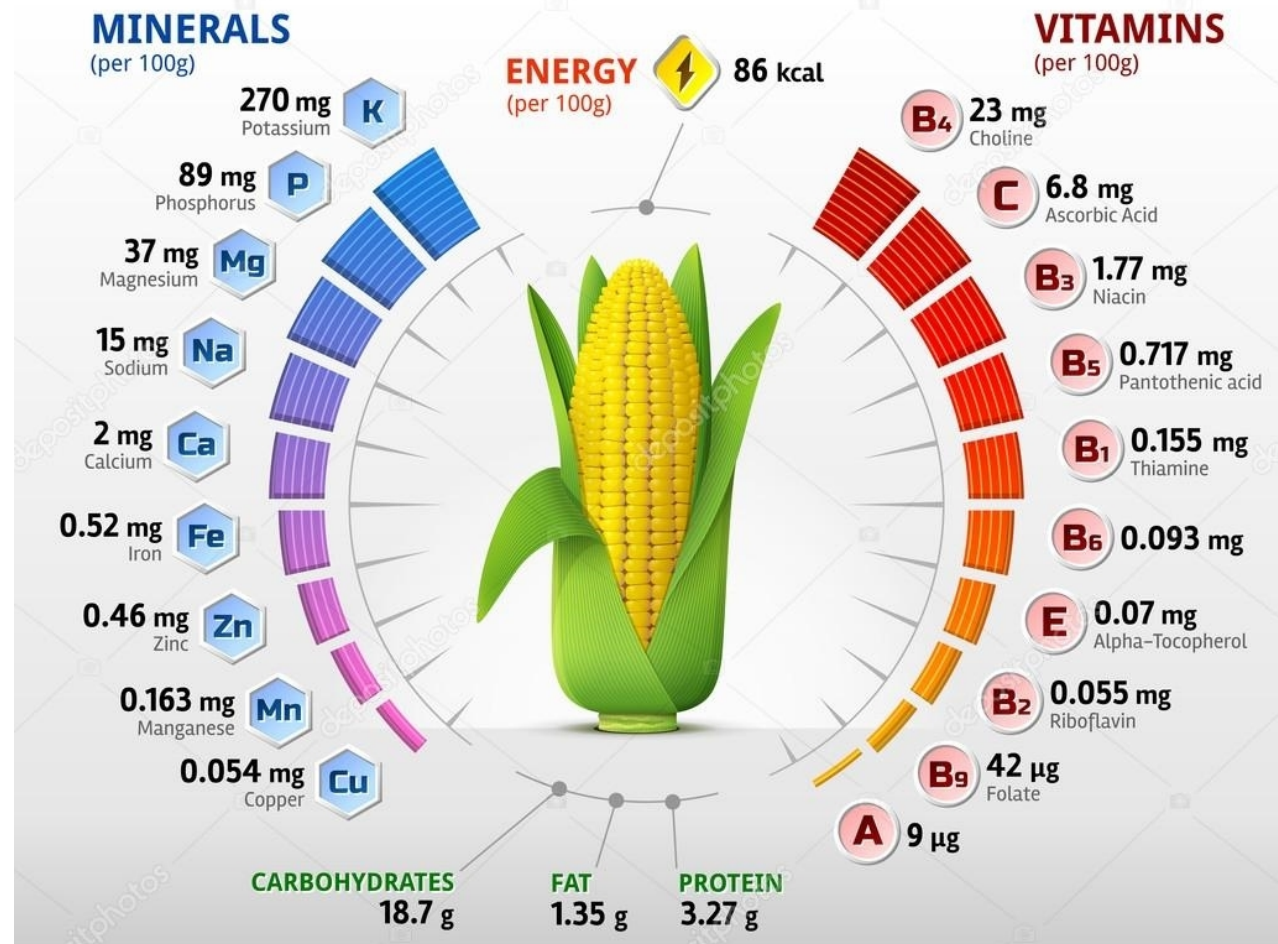
Uranium and Crop Production



Uranium Contamination of Irrigation Water



- Uranium mimics Calcium and interferes with the uptake of Calcium by the plant
- Uranium in the soil will reduce Crop Yields



What is Best Management Practice?

- Is reducing fertilizer use sufficient BMP to address nitrates?
- Excess irrigation is causing the nitrogen to be carried into the aquifer – 25% of recharge. Is water conservation a Nitrate BMP? Producers do not want their water metered.
- Can improved soil health and soil testing reduce nitrogen loss from the root zone?

No one process is going to adequately manage the nitrate legacy

Which Ear is a more profitable?



Assume no concerns related to pollination

Questions to Consider

- Is the filling out the ear wasting Nitrogen dollars for the added bushels (diminishing returns) – Is the full ear evidence of a potential loss of profit
- Does the full ear only provide bragging rights but not real profit and potentially a loss of profit?

What is the correct understanding?

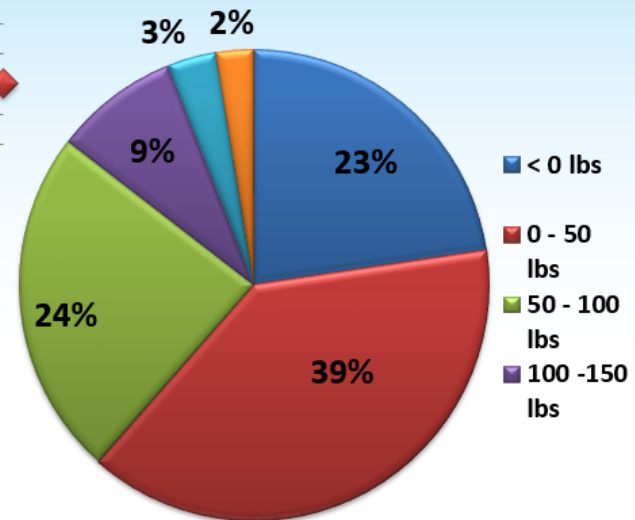
Data from UENRD

Distribution of Over Application

N Over Application

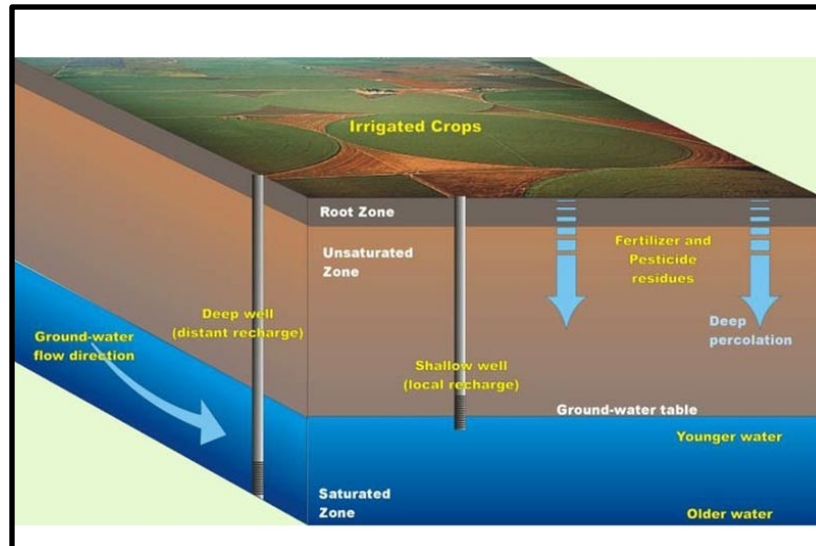


77% of fields are receiving too much Nitrogen

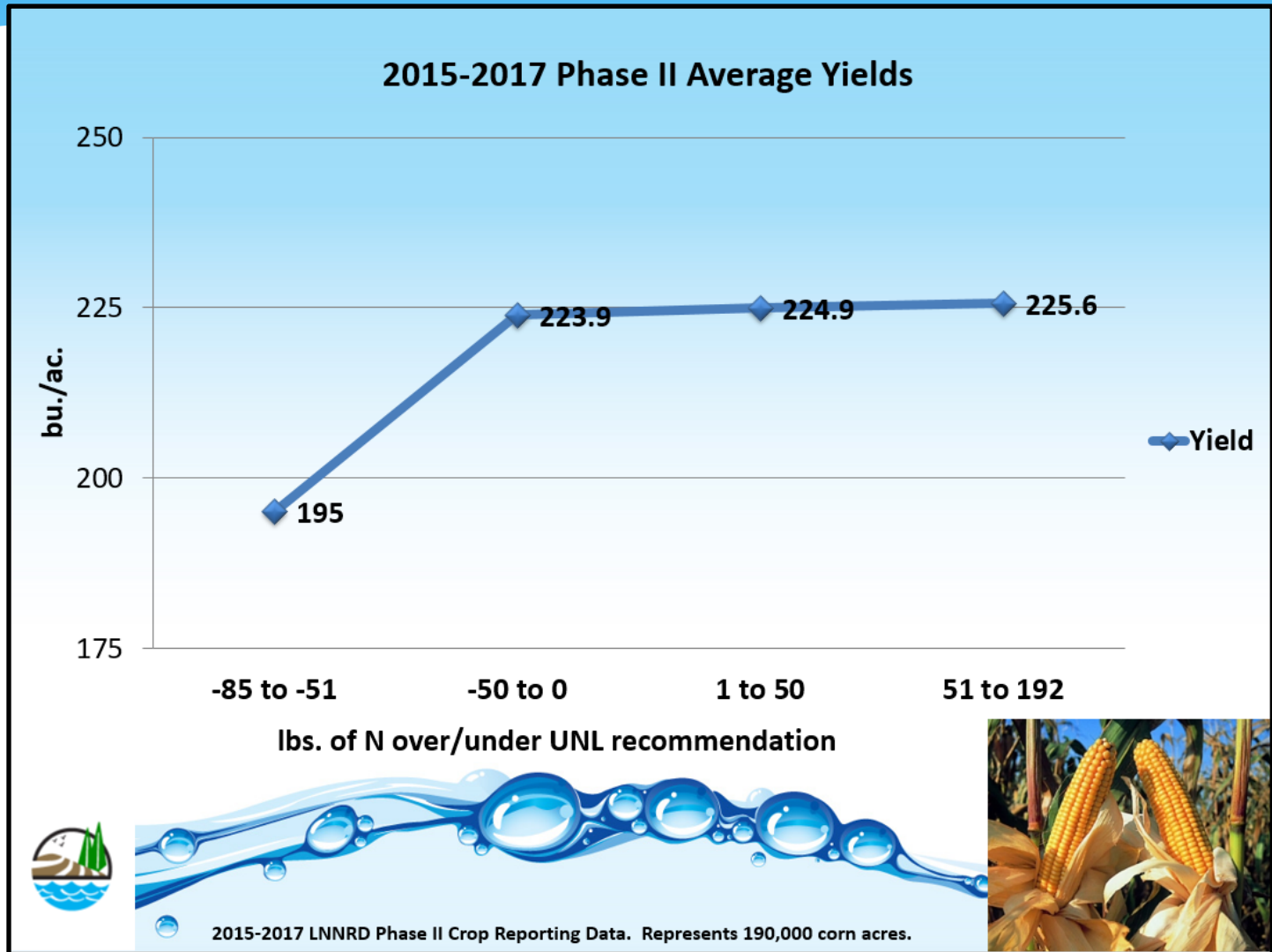


Questions to Consider

- Are producers willing to share nitrate application data?



Data from LNNRD



Loss of Profit - LNNRD

- Base upon \$800 / Ton Ammonia and \$4.50 / Bu. Corn
- At an Average 25 Lb / Ac. Excess Ammonia application for a 1 Bu. Increase in yield this represents a **\$5.50 / Ac Loss of profit**
- At an Average 121.5 Lb / Ac. Excess Ammonia application for a 1.7 Bu. Increase in yield this represents a **\$40.95 / Ac Loss of profit**

What is the incentive to apply excess Ammonia?

Questions to Consider

- If this information is correct does this mean the farmers with the largest yields have the greatest potential to be over applying Nitrogen?
- Is this potentially Less Profit and more Environmental damage
 - Lower Rate of Return on Investment

How do we get factual information from the producer - good production records?

Corn production without Nitrogen – USDA 30 Year Study



**Corn every
Year**

**Corn – Soybean
Rotation**

**Corn every
Fourth Year**

Cover Crop without drilling

- Being told that planting cover crop is expensive, and cost of a drill is too much to justify!
- Is anyone considering planting instead of drilling?

How to encourage innovative methods?

Planter verses Drill



**Planter with laser
cut plates?**

Good Seed Distribution



**Mixed seed on
15-inch rows**

Crop Rotation and Soil Health



- How much can crop rotation be used to reduce Nitrogen use and to maintain a positive Return on Investment?

How to encourage using natural systems to improve yield with less commercial fertilizer

Implementing Action Items – Who Pays and Implements Control

- **Developing the Hastings Wellhead Protection Plan and implementing Short Term - Action Items is expensive and has taken Hastings more than 15 years to complete**
- **The next hurdle is to determine who pays for implementation and takes responsibility for existing and future nitrate and uranium contamination of our aquifer (Nitrate Legacy) – You generation or is this your children’s burden?**

This is not just a Hastings Problem but is common for other Wellhead Protection Areas

Who Pays for Safe Drinking Water

- **Should the Polluter Pay – Use of Nitrogen by Agriculture is the means for Farmers to make a Profit (Currently still polluting as some producers putting more than 10% excess nitrogen on the field to get maximum yields – nitrate insurance)**
- **Should the NRD Pay – They have jurisdiction and obligation to protect the groundwater (NRD Boards slow to enact rules and had not effectively monitored groundwater – Private Sampling Failed)**
- **Should the City Pay – They are responsible for providing Potable Drinking Water (Currently financing most of the Short -Term Action Items)**

Who Pays for Safe Drinking Water

- **Should the Federal Government Pay – As they have Implemented Cheap Food policies to try and feed the World which has caused demand for increased yields – It is your tax dollars they will use to pay**
- **Should Countries that benefit from our Food Production pay for the Environmental Damage caused by the Production of Crops that “Feed the World” - Are we selling food below the actual production cost? Should national security must be considered?**

Who Pays for Safe Drinking Water

- **Increased Production may benefit the Farmer on the short term to increase income but ends up with even larger surpluses. This starts a cycle of overproduction and reduction in crop prices. Should Government pay farmers to not produce – Agricultural Welfare? It is your tax dollars.**



Who Pays for Safe Drinking Water

- **Should the Fertilizer Companies pay as they gain profit with more fertilizer used – Problem of Fox watching the Hen House as they may make recommendation for fertilizer applications**
- **Should the Food Consumer Pay as they benefit from Cheap Food Prices – Would the public be willing to pay more for food?**
- **Should foreign countries we sell corn and soybean to pay to clean up our environment – Reduces demand**
- **Should it be a combination of responsible parties**

Getting the Public and Responsible Parties to Find a Solution

- **How do we get the Public Involved to Address a Complex and Difficult Issues when there are many other Important Issues that need our Help – No One Person can Fix the Problem**
- **How do we get the message out without seeming like we are “Crying Wolf”**
- **How do you get factual information to the decision makers especially when costs drive decision – Drinking Water users verses Agricultural Production (Cost of Water verse Income)**

Getting the Public and Responsible Parties to Find a Solution

- How do you Convince the Public that Governmental Regulations are Necessary when a Public Sector is impacting the Health and Financial Stability of another Public Sector that does not want Governmental Regulations (Urban verses Rural)
- How do we implement Social Behavior Change to Protect Groundwater without Regulations or Taxes
- How do you combat the “Tyranny of small decisions”

As you can see there is no good answer to these problems it will take all of us working together to protect our groundwater

Burden on your generation or future generations?

- The nitrate legacy is not going away it will continue to be a problem for several generations or longer if no action is taken
- Failure to find solutions is allowing the contamination to become worse. Future costs increasing.
- What will be the human cost if we do not address this issue?

Hope that it gets better is not a solution

Will you take action now or place burden on future generations?

- Past and current generations have caused the problem, but today we are faced with finding equitable solutions or you may decide to pass it entirely onto the next generation
- Tyranny of small decisions caused the problem, but it will also be small decisions that manage the problem
- Will you be willing to continue supporting academic research with labor and funding?

What will you do?

Addressing Nitrates has been a Unified team of agencies



Many more organizations not listed



Hastings SE Project

May 19, 2025

Hastings SE Project

Council Approvals

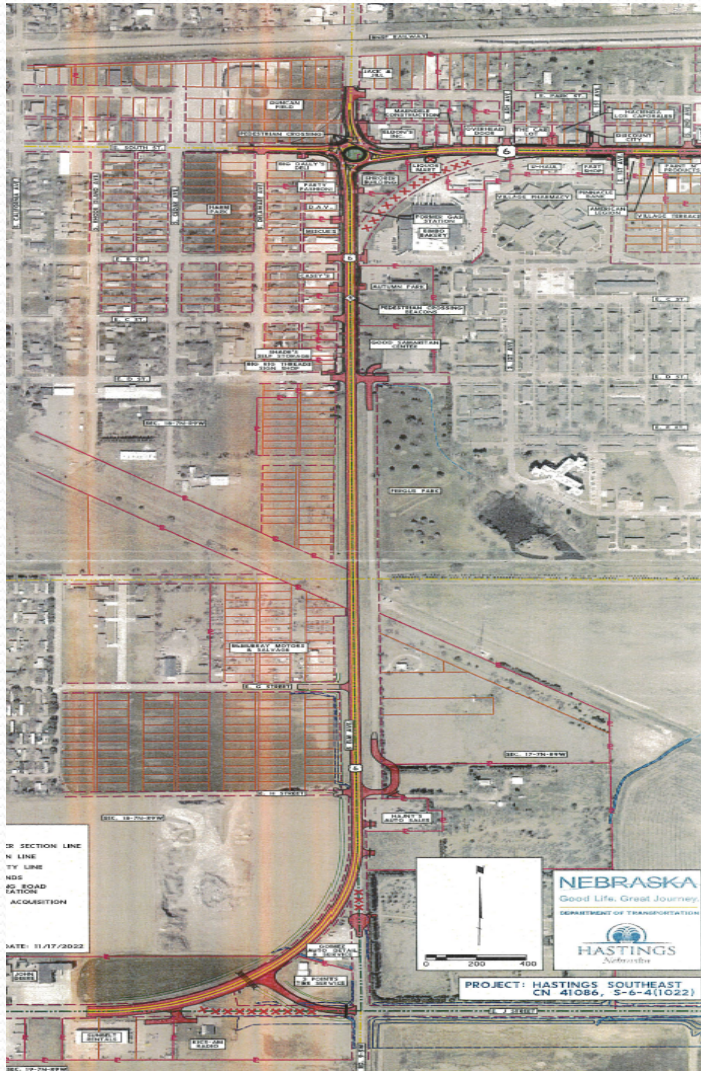
- Agreement for 5-Lane project
 - Approved July 11, 2016
 - 80% paid by NDOT, 20% paid by City

- Resolution of Support for 3-Lane Project with Roundabout
 - Approved April 10, 2023

- Supplemental Agreement No. 1
 - Approved February 10, 2025
 - Updated project scope to 3-Lane project

- Project to be bid fall 2025 with construction 2026 – 2027

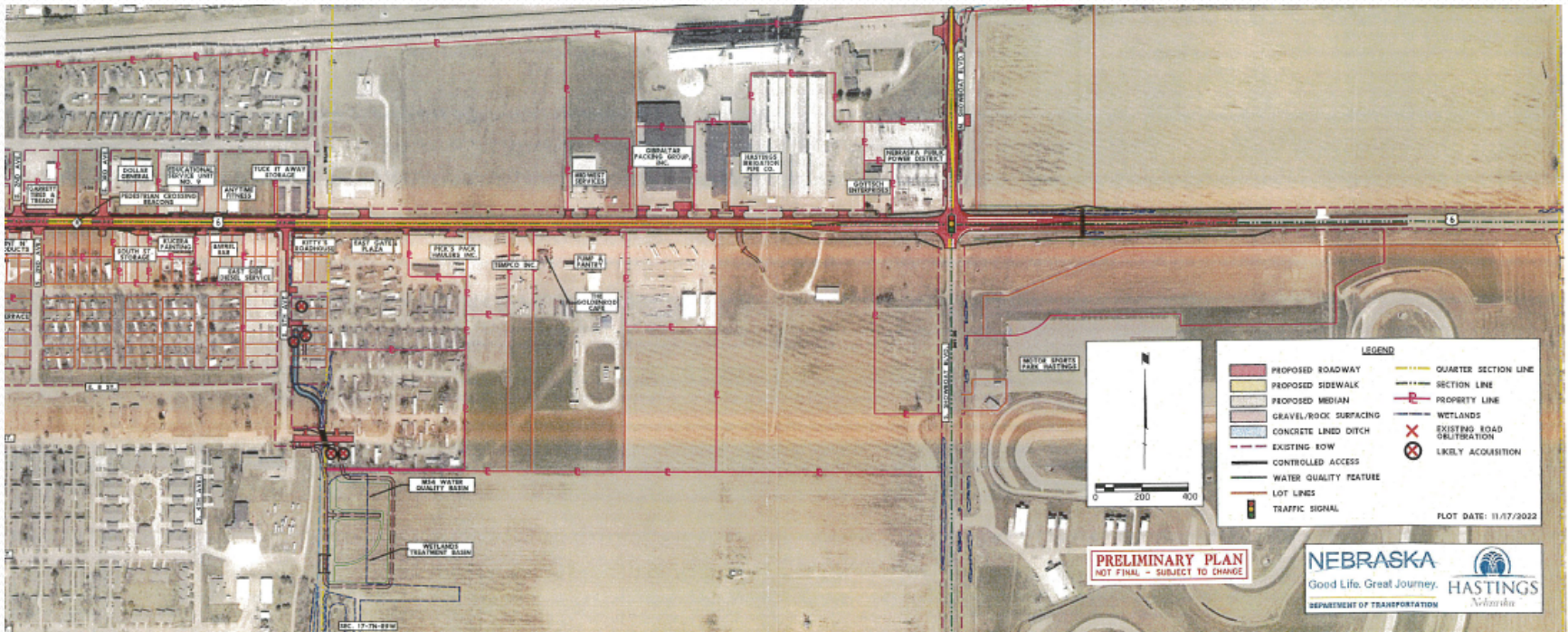
Hastings SE Project



- Phase 1 - 2026
 - J Street
 - Elm Ave
 - Roundabout at Elm Ave and South St
 - 5th Ave

Hastings SE Project

- Phase 2 - 2027
 - South Street
 - Showboat Blvd intersection



Hastings SE Project

Utility Relocation Work

- Phase 1 area completed by January 1, 2026

- Phase 2 completed by January 1, 2027

- Utility relocation due to conflicts with:
 - Storm sewer
 - Drainage
 - Roadway realignment
 - Age of manholes

Hastings SE Project

Utility Relocation Work

Electric

- Work has begun on Park Street/Duncan Field area
- Overhead line on South St. will be underground
- Contractor for all duct installation

Gas

- Work has begun in South St and Elm area, along with 5th Avenue Area
- Relocation of 8" beltline on J Street and 5th Avenue

Hastings SE Project

Utility Relocation Work

Water

- Two phases of water construction all by Contractor
- Currently bidding Phase 1

Sewer

- Bosselman's area by a contractor
- Most of sewer work is part of NDOT contract

Hastings SE Project

Utility Relocation Work

Cost Estimate Breakdown

Electric	\$5,055,923
Gas	\$718,342
Water	\$3,389,602
- Betterment	\$-326,088
Sewer	<u>\$735,344</u>
Total	\$9,573,123

□ NDOT 80% reimbursement estimated at \$7,658,498



Questions

?