

BOONE COUNTY BOARD OF COMMISSIONERS

MINUTES OF THE NOVEMBER 20, 2023 MEETING

The Boone County Board of Commissioners met in regular session at 9:00 AM on Monday, November 20, 2023 in the Connie Lamar Meeting Room located on the main floor of the Boone County Annex Building at 116 W. Washington Street, Room 105, Lebanon, IN 46052 with the following personnel in attendance:

Donnie Lawson	Commissioner, President
Jeff Wolfe	Commissioner, Vice President
Tim Beyer	Commissioner
Bob Clutter	County Attorney
Kaylee Jessie	Executive Administrator

DETERMINATION OF QUORUM AND PLEDGE TO THE FLAG

Commissioner Lawson opened the meeting at 9:10 AM with a quorum of all three (3) Commissioners present and led the Pledge to the Flag in unison.

IN THE MATTER OF MINUTES

Meeting Minutes for November 6, 2023 were tabled.

IN THE MATTER OF LEGAL ISSUES

Attorney Bob Clutter presented the following items:

- 1) The request to release the Irrevocable Letter of Credit for Jackson Run North Phase 2 for \$650,000.00.

The Boone County Surveyor's Office recommends approval.

Commissioner Wolfe moved to approve the release of the Irrevocable Letter of Credit for Jackson Run North Phase 2. Motion seconded by Commissioner Beyer; motion passed unanimously 3-0.

- 2) The request to accept the following bonds:

- a. Performance Bond for Trailside Section 3 for Erosion Control (\$77,278.00) and Storm Sewer (\$855,938.00) totaling \$933,216.00.

- b. Maintenance Bond for Erosion Control for Gateway Dental totaling \$6,173.00.

The Boone County Surveyor's Office recommends approval.

Commissioner Beyer moved to approve the acceptance of the bonds presented. Motion seconded by Commissioner Wolfe; motion passed unanimously 3-0.

- 3) Veridus Group Letters of Recommendation for ratification:

- a. Letter of Recommendation 030 for IGH Steele Fabrication Inc Quotation for bracket installation totaling \$650.00
- b. Letter of Recommendation 033 – Total combined amount to be drawn from GMP Owner contingency: \$493,095.00
- c. Letter of Recommendation 034 – Total combined amount to be drawn from GMP Owner contingency: \$7,346.00

- d. Letter of Recommendation 035 – Total combined amount to be drawn from GMP Owner contingency: \$49,147.00
- e. Letter of Recommendation 036 – Total combined amount to be drawn from GMP Owner contingency: \$11,260.00

Commissioner Beyer moved to approve the Veridus Group Letters of Recommendation as presented. Motion seconded by Commissioner Wolfe; motion passed unanimously 3-0.

- 4) Received a request from the City of Lebanon relating to a building located on Thompson Street that has been on the tax sale list for many years. The City is requesting the County to transfer the tax liability associated with the property to them. This will allow the City to do some environmental cleanup and use this property for storage of maintenance equipment. County Attorney Clutter proposed scheduling a public hearing on January 2, 2024 at 9 AM.

Commissioner Wolfe moved to set a public hearing on January 2, 2024. Motion seconded by Commissioner Beyer; motion passed unanimously 3-0.

IN THE MATTER OF BID OPENING FOR EMPLOYEE BENEFITS BROKER SERVICES RFP

COMPANY	DATE/TIME BID RECEIVED
Apex Benefits	11/17/2023 @ 4:30 PM
Henriott	11/17/2023 @ 8:57 PM
NFP	11/17/2023 @ 7:41 AM
Sherrill Morgan	11/20/2023 @ 7:38 AM
USI Insurance Services	11/17/2023 @ 2:46 PM
WalkerHughes Insurance	11/17/2023 @ 4:32 PM

Commissioner Beyer moved to take the bids received under advisement for review by HR Director and Insurance Committee. Motion seconded by Commissioner Wolfe; motion passed unanimously 3-0.

IN THE MATTER OF BID OPENING FOR PROJECT 2022-18, REPLACEMENT OF SMALL STRUCTURE WA-030

COMPANY	DATE/TIME BID RECEIVED	TOTAL BID
Milestone Contractors	11/17/2023 @ 8:00 AM	\$188,997.00
H.I.S. Constructors Inc	11/17/2023 @ 3:00 PM	\$239,258.00
Morphy Construction Inc	11/20/2023 @ 7:55 AM	\$182,000.00
Crider & Crider	11/20/2023 @ 8:08 AM	\$197,940.00
Conxeco Inc	11/20/2023 @ 8:12 AM	\$147,800.00
United Construction Services	11/20/2023 @ 8:14 AM	\$178,000.00
Howard Companies	11/20/2023 @ 8:15 AM	\$223,342.00
Olco Inc	11/20/2023 @ 8:15 AM	\$178,784.00

Commissioner Beyer moved to take the bids received under advisement for review by the Boone County Highway Department. Motion seconded by Commissioner Wolfe; motion passed unanimously 3-0.

**IN THE MATTER OF BID OPENING FOR PROJECT 2023-04,
CRACK SEALING IN VARIOUS TOWNSHIPS**

COMPANY	DATE/TIME BID RECEIVED	BASE BID	TOTAL BID BASE + ALTERNATES
Pavement Solutions Inc	11/15/2023 @ 10:13 AM	\$28,318.80	\$140,092.80
Freehill Asphalt	11/17/2023 @ 9:18 AM	\$30,000.00	\$105,179.98
DC Construction Services Inc	11/17/2023 @ 12:38 PM	\$39,183.61	\$187,502.24
Allstar Paving Inc	11/17/2023 @ 3:04 PM	\$23,200.00	\$101,975.00
Scodeller Construction Inc	11/20/2023 @ 7:55 AM	\$37,919.18	\$168,769.21
Hasco	11/20/2023 @ 8:10 AM	\$34,166.02	\$168,288.50
Howard Companies	11/20/2023 @ 8:15 AM	\$22,257.00	\$106,286.00

Commissioner Wolfe moved to take the bids received under advisement for review by the Boone County Highway Department. Motion seconded by Commissioner Beyer; motion passed unanimously 3-0.

IN THE MATTER OF WITHAM BOARD OF TRUSTEES BOARD APPOINTMENT

John Brand, Board Chairperson, and Kelly Braverman, President/CEO of Witham, presented the request to appoint Michael Hornbecker, MD as a member of the Board of Trustees effective January 1, 2024 for a four-year term. Jack Jones wishes to forgo reappointment for another term. Commissioner Wolfe thanked Jack Jones for his twenty-eight years of dedicated service on the board. Commissioner Wolfer also congratulated Kelly Braverman on her honor received this week.

Commissioner Wolfe moved to approve appointing Michael Hornbeck, MD to the Board of Trustees. Motion seconded by Commissioner Beyer; motion passed unanimously 3-0.

IN THE MATTER OF AT&T AGREEMENT – BOONE COUNTY E911

Mike Beard, Chief Deputy Sheriff, presented the AT&T Agreement to extend services for the Boone County E911 – VESTA remote positions – for another year.

Commissioner Beyer moved to approve the AT&T Agreement to extend services for the Boone County E911. Motion seconded by Commissioner Wolfe; motion passed unanimously 3-0.

IN THE MATTER OF LEBANON HIGH SCHOOL MADRIGALS

Gwen Schoeff, Director of Choirs, emailed a request for the Lebanon High School Madrigals to come and sign at the courthouse for employees and visitors on Thursday, December 21, 2023 around 11 AM.

Commissioner Wolfe moved to approve the Lebanon High School Madrigals performance. Motion seconded by Commissioner Beyer; motion passed unanimously 3-0.

IN THE MATTER OF HELPING HANDS COMMERCIAL CLEANING SERVICES AGREEMENT

Max Mendenhall, Director of Capital Investments, presented the Helping Hands Commercial Cleaning LLC services agreement for the Boone County Courthouse and Annex Building. They will come in and clean after 4PM two nights per week. The rate is \$1,695.00 per month for the two buildings. County Attorney Clutter had a few minor revisions to the contract. He recommends approval subject to the changes being accepted.

Commissioner Beyer moved to approve the Helping Hands Commercial Cleaning LLC services agreement with the condition of the changes being accepted. Motion seconded by Commissioner Wolfe; motion passed unanimously 3-0.

IN THE MATTER OF ETICA GROUP INC COURTHOUSE WINDOW REPLACEMENT CONTRACT

Max Mendenhall, Director of Capital Investments, presented the Etica Group, Inc. Contract for the courthouse window replacement project totaling fifty-six thousand dollars (\$56,000).

Commissioner Beyer moved to approve Etica Group, Inc. Contract. Motion seconded by Commissioner Wolfe; motion passed unanimously 3-0.

IN THE MATTER OF LAND USAGE RIGHTS

Jon Schrock, Regional Field Director at The John Birch Society, presented a PowerPoint presentation on Land Usage and Rights. (See Appendix #2 for PowerPoint. Recording of presentation: 0:25:12 - 0:37:58.)

IN THE MATTER OF ORDINANCE 2023-09 AMENDING THE TRAFFIC CODE

County Attorney Clutter presented Ordinance 2023-09 amending the Traffic Code of the County of Boone, State of Indiana and read it aloud in pertinent parts pursuant to state law. The County Highway Superintendent and County Engineer as well as Todd Stout, PE, American Structurepoint (design engineer for the improvements performed on County Road 150 West (Witt Road) recommends establishing a speed limit of thirty-five (35) mile per hour speed limit for County Road 150 West (Witt Road), between County Road 450 North and State Road 47, in Boone County, Indiana. Including establishing a stop sign for southbound traffic on County Road 150 West (Witt Road) at County Road 450 North.

Commissioner Beyer moved to approve Ordinance 2023-09 amending the Traffic Code. Motion seconded by Commissioner Wolfe; motion passed unanimously 3-0.

IN THE MATTER OF CLARK DIETZ, INC. PROFESSIONAL SERVICES AGREEMENT

Nick Parr, Director of Highways, presented the Clark Dietz, Inc professional services (PE) agreement for the design of the bridge replacement for Project 2022-24, Bridge 139. This bridge was built in 1925, is weight rated

at 12 tons, has 16’ of clear width, and is in poor condition. The total not to exceed (NTE) for right-of-way and design is \$134,680.

Commissioner Beyer moved to approve the Clark Dietz, Inc Professional Services Agreement. Motion seconded by Commissioner Wolfe; motion passed unanimously 3-0.

IN THE MATTER OF MATTINGLY CONCRETE, INC. SERVICE AGREEMENT

Nick Parr, Director of Highways, presented the Mattingly Concrete, Inc. construction agreement for Project 2023-05, sidewalk replacement project. The total not to exceed (NTE) of the agreement is \$340,488.36. This project will replace many sidewalk segments that are not ADA compliant.

Commissioner Wolfe moved to approve the Mattingly Concrete, Inc. construction agreement. Motion seconded by Commissioner Beyer; motion passed unanimously 3-0.

IN THE MATTER OF OMEGA TESTING AGREEMENT

Michael Nance, Executive Director of Community Corrections, presented the Omega Testing Agreement for the analysis of hair samples and oral fluid samples. We have used this vendor for a number of years through our partnership with Witham. When Witham shut down their tox lab it closed our account. We can work directly with Omega. Their prices direct are less than what we were paying Witham, so we’ll be saving money. The reason this is pressing is because Magistrate Berish ordered a hair test yesterday which has been collected. County Attorney recommends approval of the contract subject to the approval of his minor changes.

Commissioner Wolfe moved to approve Omega Testing Agreement subject to the approval of the changes. Motion seconded by Commissioner Beter; motion passed unanimously 3-0.

IN THE MATTER OF LIDAR SCANNING AND 3D MAPPING PRESENTATION

Paul Sanders with Genesis Factor, LLC presented a demonstration of the LiDAR scanning and 3D Mapping services offered by their company. Commissioner Wolfe encouraged Mr. Sanders to connect with the County Engineer to review services available.

IN THE MATTER OF OLD BUSINESS

BOONE COUNTY JUSTICE CENTER PROJECT UPDATES

Michael Nielsen, Project Manager, presented the following updates for the Boone County Justice Center project:

Safety	● 183 days without a recordable incident. ● Daily and weekly safety meetings continue. ● Hagerman will make sure proper lighting is on the roadway. ● Working with Lebanon Fire Department for tower access during road surface. ● Steel installation is occurring and as well as paving so all need to be vigilant.
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Issues	● NO current tissues.
Milestones accomplished since last update	● Unit B steel installation is underway. ● Asphalt placement is underway on the East side. ● Masons working on Unit A priority walls. ● Sally Prot Demo Completed.
Schedule milestones to be accomplished	● Should start paving the outer road today. ● Steel installation is two weeks total in building B. ● Masons begin to work in the Juvenile office area. ● Foundation for building C to be started this week. Walls will begin on 11/27. ● Steel coming for building A on 12/6 ● Roofing for Building B starting on 12/4
Utilities	● Completed ● Last storm structure has been installed

TIMECLOCK PLUS PROJECT UPDATES

Michael Nielsen, Project Manager, presented the following updates for TimeClock Plus (TCP):

- Phase one – implementation complete.
- We continue to work on TCP to CYMA interface.
- We have been testing the integration into CYMA and the testing has been going well.
- Next payroll will officially be sent via TCP date into CYMA for the Prosecutors Office, Highway, and the Extension Office. Auditor Crum has been intimately involved in testing and sent out a note to these department heads last week.

K2M 20 YEAR NEEDS ASSESSMENT PROJECT UPDATES

Michael Nielsen, Project Manager, presented the following updates for K2M 20 Year Needs Assessment Project:

- Compiling and working through all the data that has been retrieved through the interviews, physical walkthroughs, digital plans, and etc.
- The plan is to present the final report to the Commissioners at a January 2024 meeting and to the Council at their February 2024 meeting.

IN THE MATTER OF STAFF REPORTS

- APC – Stephen Elkins
- Capital Investments / Facilities – Max Mendenhall
- Health Department – Lisa Younts / Abby Messenger
- Highway Department – Nick Parr
- Human Resources – Megan Smith
- IT Support – GUTS
- Other Elected Officials

Stephen Elkins, Director of Area Plan presented the following item(s):

- 1) A reminder that the Overlay Project will be on the APC December 6, 2023 Agenda, 6pm start time. The meeting will be held in the Connie Lamar Room at the Annex Building.

Dr. Herschell Servies, Health Department presented the following item(s):

- 1) Flu and Covid Vaccines are available at the Boone County Health Department.

Nick Parr, Director of Highways presented the following item(s):

- 1) Construction in right-of-way permit (#202310140) for the Boone County Surveyor's Office at CR 75 W, north of CR 600 S for small structure HA-009 replacement. The Boone County Highway Department recommends approval and waive the bond.

Commissioner Beyer moved to approve the construction in right-of-way permit (#202310140) for Boone County Surveyor. Motion seconded by Commissioner Wolfe; motion passed unanimously 3-0.

- 2) Construction in right-of-way permit (#202310141) for the Boone County Surveyor's Office at CR 750 N, west of CR 800 E and south of CR 750 N for the Carroll Tile reconstruction. The Boone County Highway Department recommends approval and waive the bond.

Commissioner Beyer moved to approve the construction in right-of-way permit (#202310141) for the Boone County Surveyor's. Motion seconded by Commissioner Wolfe; motion passed unanimously 3-0.

- 3) Construction in right-of-way permit (#202310142) for Comcast at 10885 E 800 N for underground construction. The Boone County Highway Department recommends approval of the permit with a \$20,000 bond.

Commissioner Wolfe moved to approve Construction in right-of-way permit (#20231010142) for Comcast. Motion seconded by Commissioner Beyer; motion passed unanimously 3-0.

- 4) Construction in right-of-way permit (#202310143) for Frontier Communications at S Pearl/Serum Plant Road for underground construction. The Boone County Highway Department recommends approval of the permit with a \$40,000 bond.

Commissioner Beyer moved to approve the construction in right-of-way permit (#202310143) for Frontier Communications. Motion seconded by Commissioner Wolfe; motion passed unanimously 3-0.

- 5) Construction in right-of-way permit (#202310144) for Charter Communications at Build OH02E south of Lebanon – CR 200 E to SR 39 for various permit types. The Boone County Highway Department recommends approval with conditions of the Surveyor's approval and plan revisions. There is a blanket bond on file.

Commissioner Wolfe moved to approve the construction in right-of-way permit (#202310144) for Charter Communications with conditions. Motion seconded by Commissioner Beyer; motion passed unanimously 3-0.

- 6) Construction in right-of-way permit (#202310145) for AT&T at CR 375 N for Eli Lilly to bore under roadway. The Boone County Highway Department recommends approval of the permit with a \$5,000 bond.

Commissioner Beyer moved to approve Construction in right-of-way permit (#202310145) for AT&T. Motion seconded by Commissioner Wolfe; motion passed unanimously 3-0.

- 7) Construction in right-of-way permit (#202310146) for Charter Communications at Build OH16E west of Lebanon to CR 425 W from CR 200N to Middle Jamestown Road for various permit types. The Boone County Highway Department recommends approval with conditions of the Surveyor's approval and plan revisions. There is a blanket bond on file.

Commissioner Wolfe moved to approve the construction in right-of-way permit (#202310146) for Charter Communications with conditions. Motion seconded by Commissioner Beyer; motion passed unanimously 3-0.

- 8) Construction in right-of-way permit (#202310147) for Charter Communications at CR 150 S and Mt Zion Road for power supply installation. The Boone County Highway Department recommends approval. There is a blanket bond on file.

Commissioner Beyer moved to approve the construction in right-of-way permit (#202310147) for Charter Communications. Motion seconded by Commissioner Wolfe; motion passed unanimously 3-0.

- 9) Construction in right-of-way permit (#202310148) for Kent Shaffer at 663 Russell Lake East Drive for sewer main tie in. The Boone County Highway Department recommends approval of the permit with a \$10,000 bond.

Commissioner Wolfe moved to approve the construction in right-of-way permit (#202310148) for Kent Shaffer. Motion seconded by Commissioner Beyer; motion passed unanimously 3-0.

- 10) Construction in right-of-way permit (#202310149) for Promontory of Zionsville, LLC at CR 1000 E and CR 200 N for roadway improvements. The Boone County Highway Department recommends approval of the permit with a \$10,000 bond.

Commissioner Beyer moved to approve the construction in right-of-way permit (#202310149) for Promontory of Zionsville, LLC. Motion seconded by Commissioner Wolfe; motion passed unanimously 3-0.

- 11) Construction in right-of-way permit (#2023101450) for Charter Communications at 5767 W 650 N for underground construction. The Boone County Highway Department recommends approval. There is a blanket bond on file.

Commissioner Beyer moved to approve the construction in right-of-way permit (#2023101450) for Charter Communications. Motion seconded by Commissioner Wolfe; motion passed unanimously 3-0.

- 12) Construction in right-of-way permit (#202310151) for C&J Well Co. at 628 Lake View Drive for a tap pit and open cut. The Boone County Highway Department recommends approval of the permit with a \$5,000 bond.

Commissioner Wolfe moved to approve the construction in right-of-way permit (#202310151) for C&J Well Co. Motion seconded by Commissioner Tim; motion passed unanimously 3-0.

- 13) Road closure permit (#202310123) for the Boone County Surveyor's Office at CR 75 W, north of CR 600 S (HA-009). The date of the closure is for 11/20/2023 – 11/21/2023. The Boone County Highway Department recommends approval.

Commissioner Beyer moved to approve the road closure permit (#202310123). Motion seconded by Commissioner Wolfe; motion passed unanimously 3-0.

- 14) Road closure permits for the Boone County Surveyor's Office:

- a. (#202320024) CR 750 N from US 421 to CR 800 E – Date of closure TBD
- b. (#202320025) CR 750 N from US 421 to CR 800 E – Date of closure TBD
- c. (#202320026) CR 800 E from CR 750 N to CR 650 N – Date of closure TBD

The Boone County Highway Department recommends approval.

Commissioner Wolfe moved to approve the road closure permits as presented. Motion seconded by Commissioner Beyer; motion passed unanimously 3-0.

- 15) Butler Fairman & Seufert (BFS) Task Order #37 to perform parttime construction inspection for Spectrum Fiber Build 0C08E, the total not exceed is \$10,000. This project includes 9,393' of underground duct and cable placement and 42,144' of aerial cable placement in the Big Springs area east of US 421 and North of SR 32. The cost of the inspection services will be reimbursed by the contractor.

Commissioner Wolfe moved to approve the BFS Task Order #37. Motion seconded by Commissioner Beyer; motion passed unanimously 3-0.

- 16) Butler Fairman & Seufert (BFS) Task Order #38 to perform parttime construction inspection for Spectrum Fiber Build 0H02E, the total not to exceed is \$30,000. This project includes 61,996' of underground duct and cable placement and 82,569' of aerial cable placement in the area generally south of Lebanon to the County Line between 200 E and SR 39. The cost of the inspection services will be reimbursed by the contractor.

Commissioner Wolfe moved to approve the BFS Task Order #38. Motion seconded by Commissioner Beyer; motion passed unanimously 3-0.

11) Other Highway Items for Information/Discussion:

- Lilly Project updates
 - CR 300 N is still limited to east bound traffic only, anticipated to open 11/29 weather permitting.
 - The new CE032 structure has been placed on 375 N west of SR 39, anticipated to open to local traffic 11/29.
 - Bridge 102 deck pour is scheduled for 11/18/2023.

IN THE MATTER OF DOCUMENT SIGNING

- 1) Affidavit for payment for GM Development Companies, LLC per Construction Draw Request 012 in the amount of \$2,462,104.64 for ratification.

Commissioner Beyer moved to approve the affidavit for payment for GM Development Companies, LLC. Motion seconded by Commissioner Wolfe; motion passed unanimously 3-0.

- 2) Claims Dockets – regular, prepaids, payroll, and insurance.

Commissioner Wolfe moved to approve Budgetary Claims presented from the Auditor's Office. Motion seconded by Commissioner Beyer; motion passed unanimously 3-0.

IN THE MATTER OF PUBLIC COMMENT

Dave Myers thanked the Commissioners for the platform to discuss paper ballots and election integrity. They have struggled to get on the Election Board Agenda and meet with them. The IFA was able to get on the agenda at last meeting and was limited to a fifteen (15) minute presentation. Those who attended the meeting are disappointed there were no questions from the board or opportunity for public comment. Eric Crouse commented on the risk limiting audits and why he believes it is not a true audit. Commissioner Beyer commented that he attended the Election Board meeting and confirmed public comments were not welcomed. He has heard concerns of people clicking straight ticket for a party. Some individuals believe that they are voting for all the candidates registered for the party on the ticket, but it does not select all of the At-Large or

School Board candidates on the ballot. *(Note: If you select a straight party [republican/democrat] ticket during the Primary Election and there is a contested race, the machine will not select both candidates. You must manually pick the candidate you choose to vote for during that election. Only non-contested seats will default for straight tickets. For example, if you have two Republicans running for a commissioner seat and only one seat is up for election, you can only select one candidate. The machine is unable to determine which candidate you wish to select without a manual vote. Therefore, if you do not select one, it will remain unmarked.)*

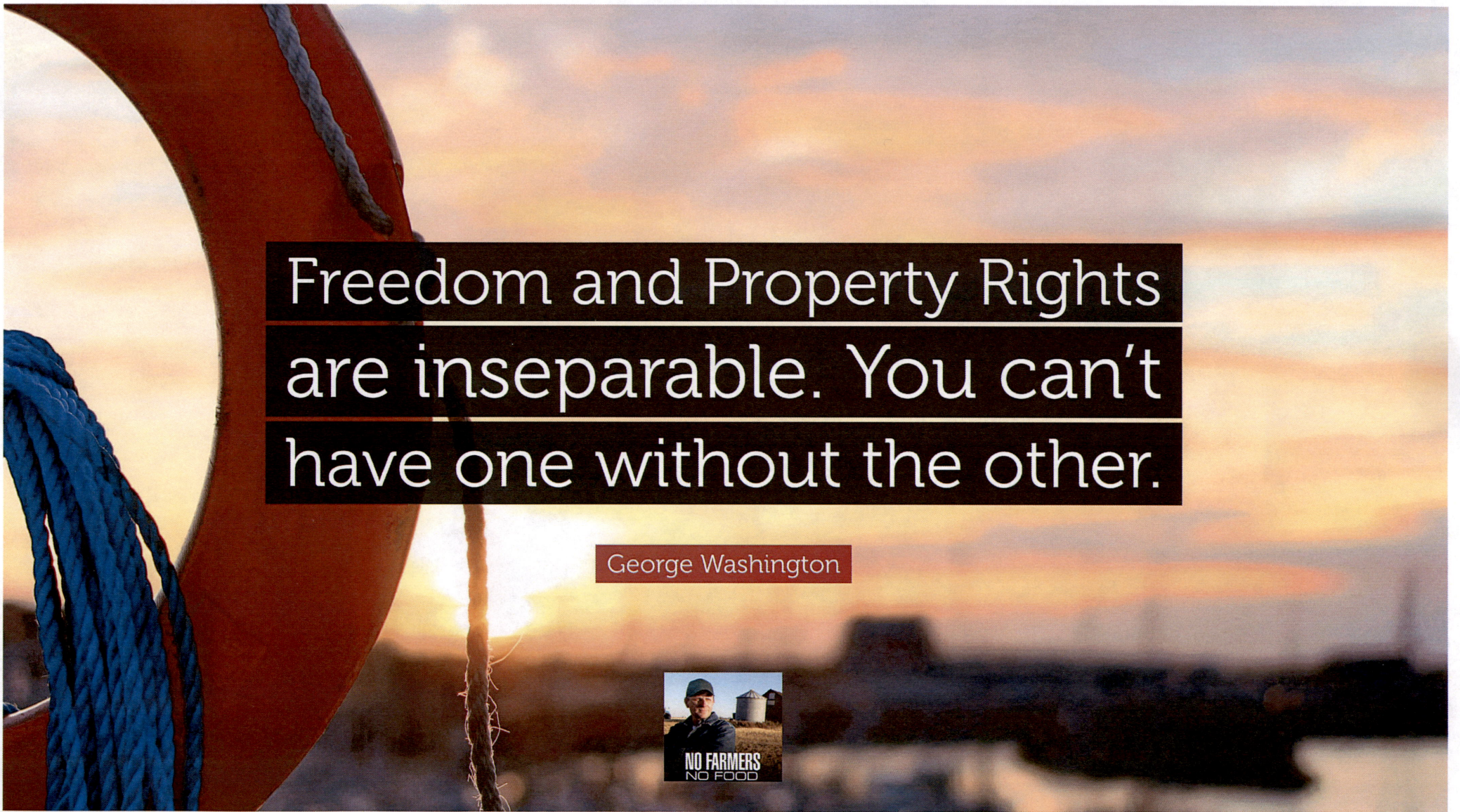
Commissioner Beyer believes the Election Board should hold another public meeting in the near future to take public comment.

IN THE MATTER OF MAIL

See **(Appendix #3)** for a list of mail opened by the Commissioners on this date.

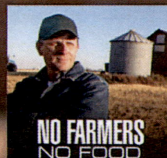
IN THE MATTER OF ADJOURNMENT

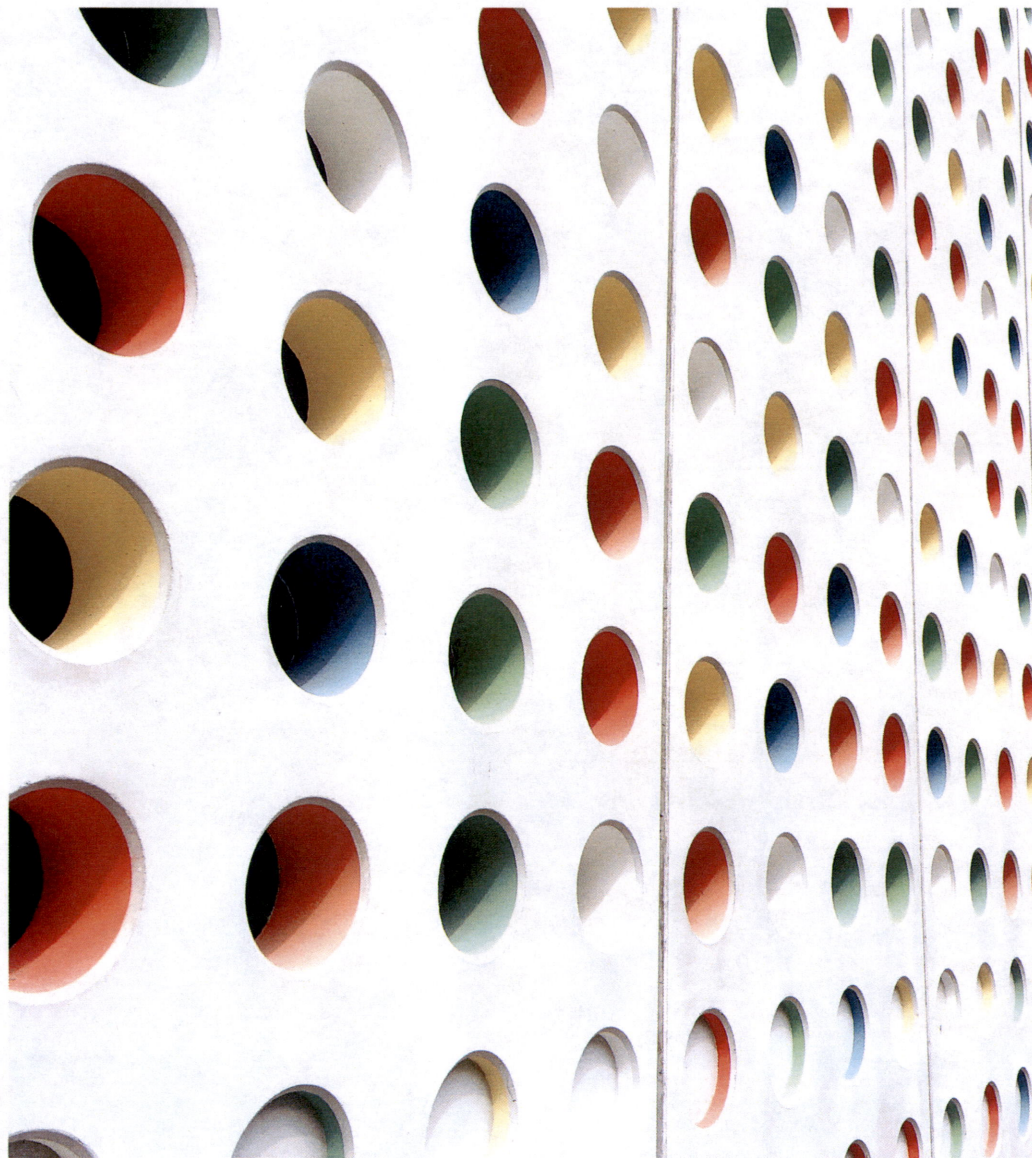
With no further business, Commissioner Beyer moved to adjourn the Boone County Commissioners' Meeting at 10:42 AM on Monday, November 20, 2023. Motion seconded by Commissioner Wolfe; motion passed unanimously 3-0.

A large red life preserver with blue rope is positioned on the left side of the image. The background is a sunset or sunrise scene with a bright sun low on the horizon, casting a warm glow over a body of water and distant land. The text is overlaid on a dark horizontal band across the center of the image.

Freedom and Property Rights
are inseparable. You can't
have one without the other.

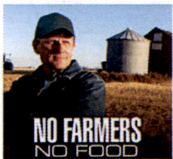
George Washington





Global Agenda; Hometown Effects

How I can do something about it.



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The Paris Agreement is a **legally binding international treaty on climate change**. It was adopted by 196 Parties at the UN Climate Change Conference (COP21) in Paris, France, on 12 December 2015. It entered into force on 4 November 2016.

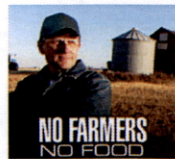
pre-industrial levels.

However, in recent years, world leaders have stressed the need to limit global warming to 1.5°C by the end of this century.

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GWER Home
Basic Information
Research Areas
Ground Water
Ecosystems
Climate Change
A to Z Subject Index

U.S. ENVIRONMENTAL PROTECTION AGENCY

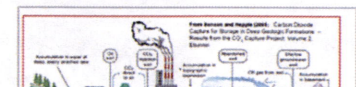
Ground Water and Ecosystems Restoration Research

You are here: [EPA Home](#) » [Research & Development](#) » [Risk Management Research](#) » [Ground Water & Ecosystem Restoration Research](#) » [Climate Change Research](#) » [Geologic Sequestration of Carbon](#)

Geologic Sequestration of Carbon

Introduction

Geologic sequestration (GS) is recognized as the injection and subsequent long-term trapping of gaseous, liquid, or supercritical carbon dioxide (CO₂) in subsurface media, primarily saline formations, depleted or nearly depleted oil and gas reservoirs, and coal seams. Carbon capture, transport, and storage via GS from stationary sources of CO₂ (such as refineries, and coal-fired electric, ethanol, cement, and fertilizer plants) could allow continued use of fossil fuels in a manner that greatly reduces CO₂ emissions until alternative energy sources are deployed on a large scale in the coming decades.



Leakage through transmissive faults (and associated fractures) and well penetrations could result in:

- Intrusion of CO₂ or brine into underground sources of drinking water
- Release of CO₂ to the vadose zone and the atmosphere
- Intrusion of CO₂ into buildings

Leakage of CO₂ into groundwater could result in decreased pH, increased mineral dissolution, and possible release of metal and metalloid contaminants. On the other hand, increases in CO₂ concentrations could result in increased attenuation of certain metals and act to retard contaminant migration. Release of CO₂ into the vadose zone could be accompanied by compositional changes in soil gas and flux to the atmosphere. Release of CO₂ into buildings could result in increased CO₂ and potential reduction in oxygen in indoor air.

Environmental Science and Technology, 44: 4821–4827.

[Understanding Geochemical Impacts of Carbon Dioxide Leakage From Carbon Capture and Sequestration – Science in Action Fact Sheet \(PDF\)](#) (2 pp, 772 KB) (EPA/600/F-09/003) 2009

[Use of Soil-Gas, Gas-Flux, and Ground Water Monitoring to Evaluate Potential Leakage to Underground Sources of Drinking Water, the Atmosphere, and Buildings During Geological Sequestration of Carbon Dioxide – Science in Action Fact Sheet \(PDF\)](#) (2 pp, 768 KB) (EPA/600/S-09/030) 2009

Schnaar, G. and D.C. DiGiulio. (2009). "Computational Modeling of the Geologic Sequestration of Carbon Dioxide." *Vadose Zone J.*, 8: 389–403. doi:10.2136/vzj2008.0112.

Presentations

DiGiulio, D.C. (2009). "[Geological Sequestration of CO₂: A Brief Overview and Potential for Application for Oklahoma \(PDF\)](#)." (36 pp, 5.08 MB) Presentation, 18th Annual Oklahoma Clean Lakes and Watersheds Association, April 1–3.

DiGiulio, D.C. (2009). "[Overview of Internal Research on Geological Sequestration of CO₂ at ORD \(PDF\)](#)." (26 pp, 2.74 MB) Presentation, Midwest Carbon Sequestration Conference, Angola, Indiana, July 28–29.

an underground location. This reduces the amount of carbon dioxide (a greenhouse gas) in the atmosphere. Underground Injection Control Program

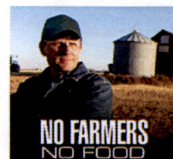


Figure 1

Proportion of Foreign Held Agricultural Land to
All Privately Held Agricultural Land in the U.S.
as of December 31, 2020

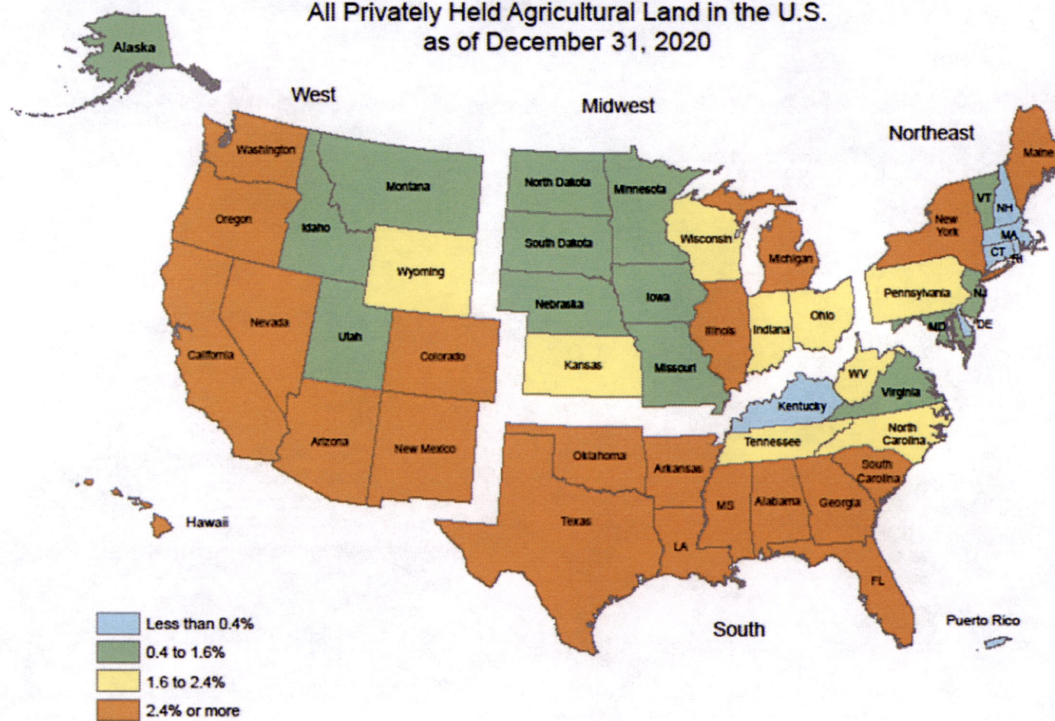
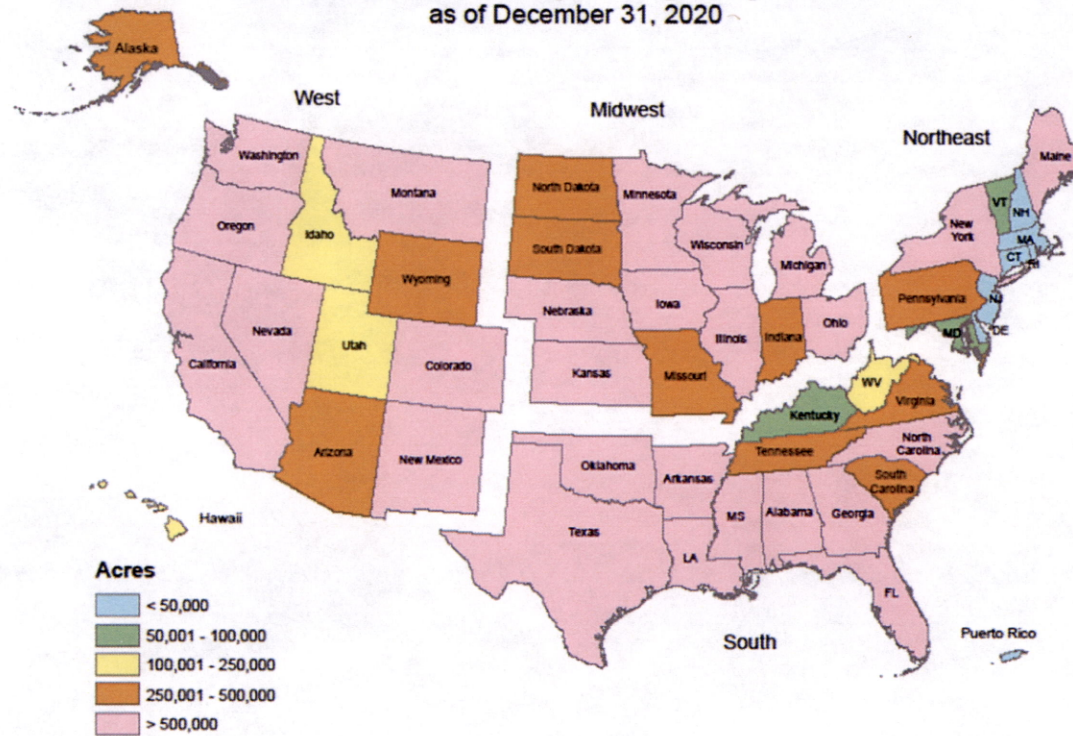
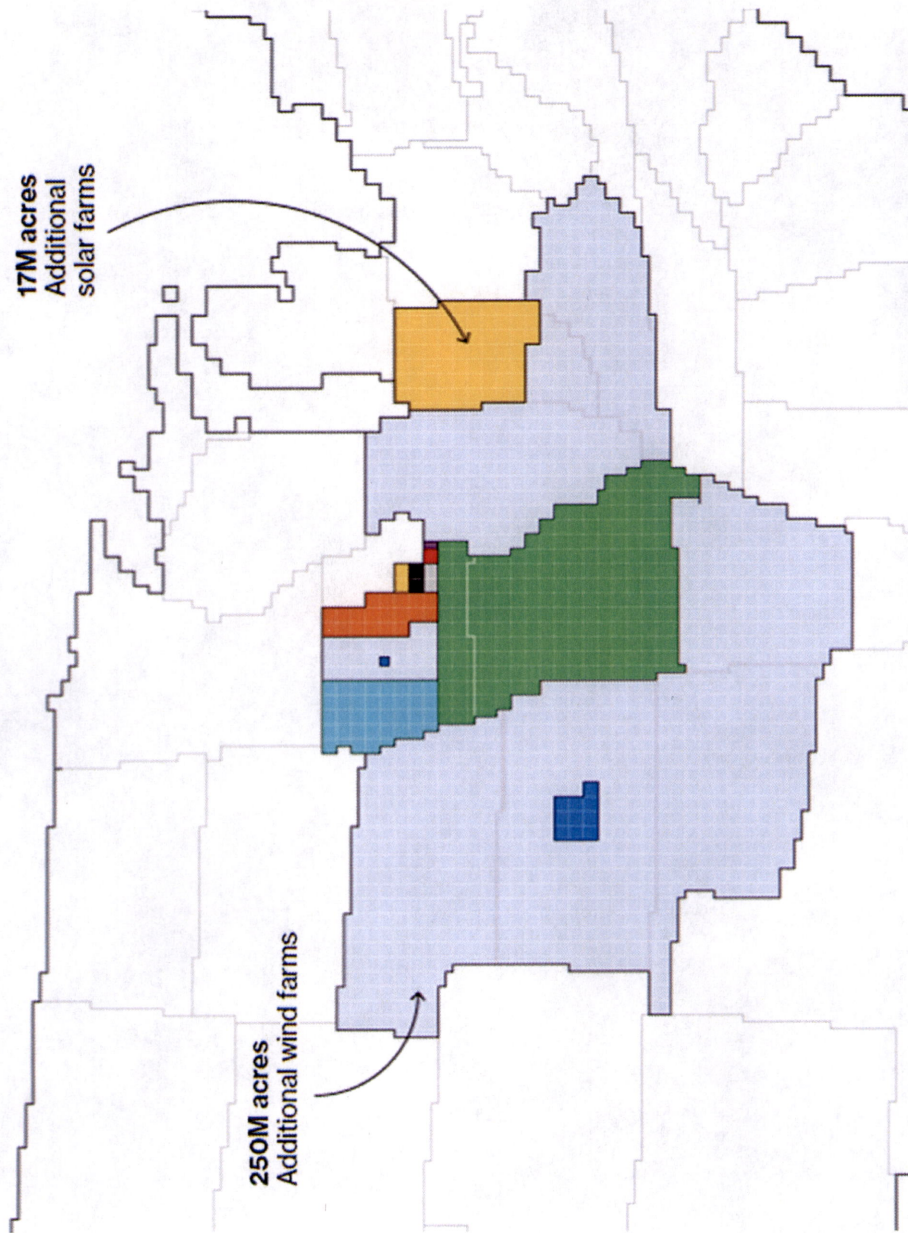


Figure 2

**State Concentration of Foreign Holdings of Agricultural Land
as of December 31, 2020**





Total area of land in United States farms from 2000 to 2022 (in 1,000 acres)*

Loss of 50 MILLION Acres since 2000

