

**Information Pertinent to State Review
of
BNSF's Sovereign Land Permit Application
No. S-2095**

Part III

Appendixes

**Submitted to the Department of Water Resources
Public Meeting
January 20, 2023**



**FORB – Friends of the Rail Bridge
Established 2018 Burleigh and Morton County (701) 220-4513
1015 East Bowen Avenue
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APPENDIX A

FORB Memo to the U.S. Coast Guard

**Law and Evidence Relating to Ownership of the
1883 Northern Pacific Railway Bridge**

April 4, 2022



FORB – Friends of the Rail Bridge

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Memorandum

To: The United States Coast Guard (USCG)
From: Friends of the Rail Bridge (FORB) and FORB's in-house General Counsel and Board Member, Lyle Witham, North Dakota Bar ID # 04118
Re: Law and Evidence relating to Ownership of the 1883 Northern Pacific Railway Bridge
Date: April 4, 2022

1.0 Introduction: Background History for the Location of the Historic Bridge, as well as for the Equal Footing Doctrine and U.S. Const. Article IV, Section 3, Clause 1.

On March 11, 2022, Burlington Northern Santa Fe railroad (BNSF), the permit applicant and project proponent for replacement of the historic rail bridge between Bismarck and Mandan, North Dakota, under the National Historic Preservation Act (NHPA) and the National Environmental Policy Act (NEPA), sent its response to FORB's February 8, 2022, memorandum and follow up letters. BNSF's response set forth the facts and legal arguments supporting FORB's position that the State and people of North Dakota own the historic 1883 Northern Pacific Railway Bridge, rather than BNSF. As FORB expected, BNSF responded with a memorandum that essentially is an initial trial brief citing various statutes and case law. Worse, BNSF's memorandum ignores and fails to address the controlling black letter law¹ that governs the outcome of this case, the Equal Footing and Public Trust Doctrines. FORB raised and cited these fundamental doctrines in its memorandum and follow up letters. FORB also cited and discussed the 1864 Northern Pacific Railway Act creating the Northern Pacific railroad that BNSF solely relies on in its memo as its evidence of ownership. Between those two – the Equal Footing and Public Trust Doctrines versus the 1864 Act – the Equal Footing Doctrine is clearly the controlling law for the issues FORB has raised in this case for the reasons discussed below.

The Equal Footing Doctrine was established black letter law for decades prior to the 1864 Act that created the Northern Pacific. The proponents of the 1864 Act ignored the Equal Footing Doctrine at their peril when they approached Congress and secured passage of the Bill at a harrowing point in the Civil War without addressing the issue of ownership of the riverbeds the railroad right-of-way would cross. The Northern Pacific Railroad ignored it again when they surveyed the crossing at the Missouri River and all other river crossings on navigable rivers in Dakota Territory further west (under the protection of Lt. Colonel George A, Custer and the U.S. Army troops stationed at Fort Lincoln) without addressing the issue of ownership of the

¹ Black letter laws are the well-established legal rules no longer subject to reasonable dispute.

riverbeds that the railroad right-of-way would cross. Then once again Northern Pacific Railroad ignored ownership of the riverbed when they constructed the 1883 Northern Pacific Railway Bridge (a/k/a Historic Bridge) between Bismarck and Mandan without first establishing that the railroad owned the Historic Bridge on a riverbed whose ownership was reserved to a future state under the Public Trust and Equal Footing Doctrines. Now BNSF ignores it at their peril by attempting to destroy the historic 1883 Northern Pacific Railway Bridge as its own personal property, rather than having to comply with and pay for the costs to “avoid, minimize, and mitigate” the impacts of the proposed project on the Historic Bridge, as required of the project proponent under NHPA and its implementing regulations.

BNSF has attempted to get a permit to destroy the Historic Bridge without submitting evidence into the NHPA or NEPA administrative record that BNSF owns it. Ownership of the historic property in question is always the first and most fundamental question to be addressed in any federal action (in this case getting a permit from USCG) that proposes to impact a historic property of national significance under the National Register of Historic Places, such as the 1883 Northern Pacific Railway Bridge. BNSF is responsible for any delay caused by BNSF’s fundamental failure to address ownership of the Historic Bridge at the beginning of BNSF’s permit application process with USCG, not FORB.

To understand why the Equal Footing and related Public Trust Doctrines are the controlling law in this case, it is first necessary to discuss in detail the history and background that makes those doctrines the controlling black letter law, as well as the history of the occupation and ownership of the river crossing where the Historic Bridge is located.

The underlying principle is this: “Equality of constitutional right and power is the condition of all the States of the Union, old and new.”² Prior to the Constitutional Convention in 1787, several States already had ceded to the United States their overlapping and disputed western territories to the United States as shown on the map below. Georgia and Virginia ceded their western territories upon the condition that new states be formed from all this land and admitted to the Union on an “equal footing” with the original states.³ Based in part on that understanding, the language of U.S. Const. Article IV, Section 3, Clause 1, was included in the Constitution:

New States may be admitted by the Congress into this Union; but no new State shall be formed or erected within the Jurisdiction of any other State; nor any State be formed by the Junction of two or more States, or Parts of States, without the Consent of the Legislatures of the States concerned as well as of the Congress.

Before the Constitutional Convention in 1787 in Philadelphia but after the Revolutionary War had ended September 3, 1783, (when Britain accepted American independence in the Treaty of Paris), the Continental Congress had tried to figure out how to organize the federal union that was to become the United States. A significant obstacle to forming that union was that lands west of the original 13 States were held by only seven of the states, Massachusetts, Connecticut, New York, Virginia, North and South Carolina, and Georgia (Figure 1).⁴

² *Escanaba Co. v. City of Chicago*, 107 U.S. 678, 689 (1883).

³ See *Pollard v. Hagan*, 44 U.S. (3 How.) 212, 221 (1845).

⁴ See 17 Journals of the Continental Congress, 806-08 (Sept. 1780) (Gaillard Hunt ed. 1910); C. Perry Patterson, *The Relation of the Federal Government to the Territories and the States in Landholding*, 28 Tex. L. Rev. 43, 46 (1949);

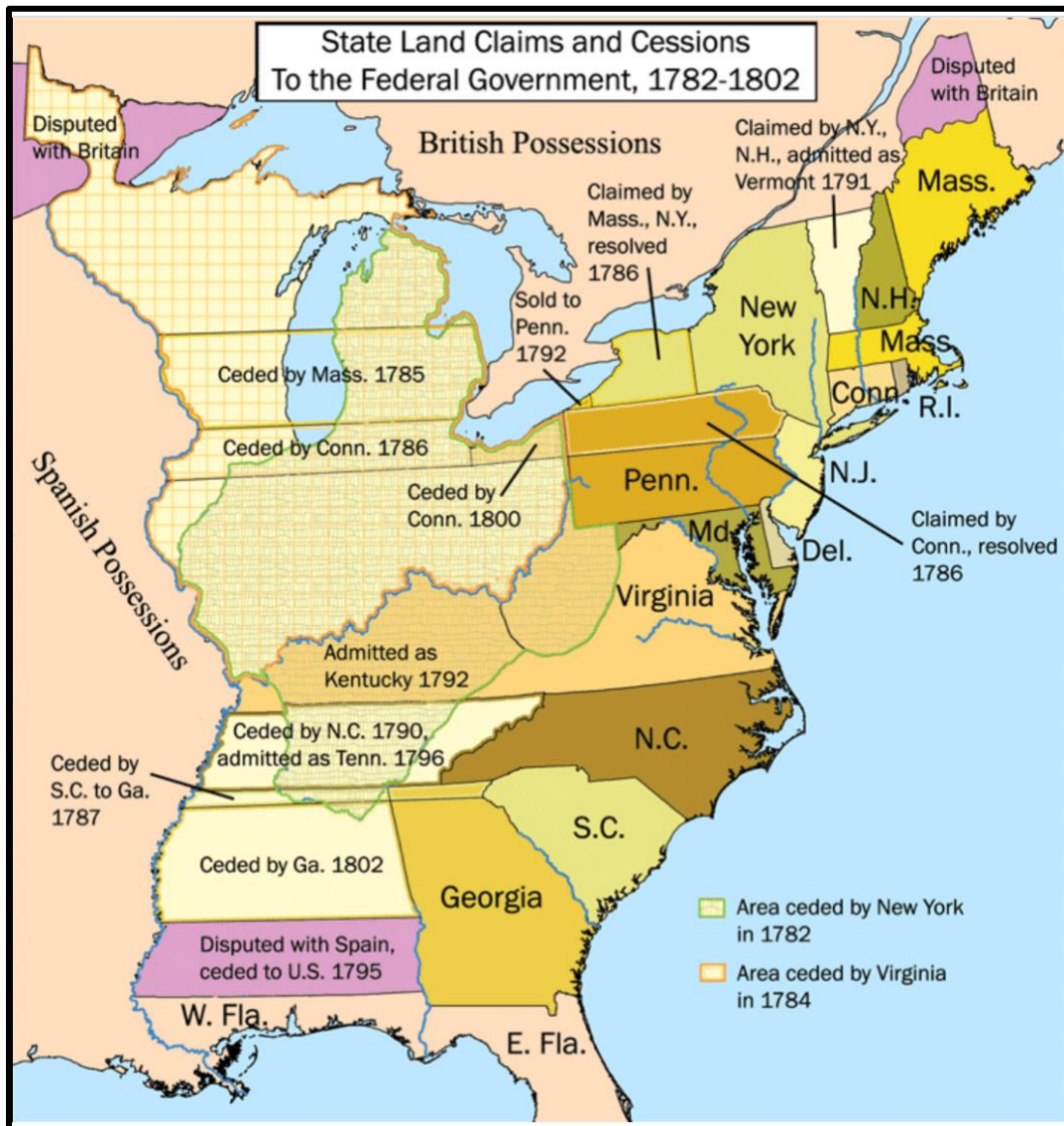


Figure 1: State Land Claims and Concessions to the U.S. Federal Government, 1782-1802.

Led by Maryland, the non-landholding states argued that the original 13 states all had made enormous sacrifices to liberate the western territories and thus the whole of those territories should be ceded to the United States for the common benefit of all.⁵ Following Maryland's example, New Jersey refused to ratify the Articles of Confederation until the Western territories

Eugene R. Gaetke, *Refuting the "Classic Property Clause" Theory*, 63 N.C. L. Rev. 617, 624 (1985); John Hanna, *Equal Footing in the Admission of States*, 3 Baylor L. Rev. 519 (1951); and Paul W. Gates, *History of Public Land Law Development* p. 49 (Written for the Public Land Law Review Commission, Washington Government Printing Office 1968).

⁵ 14 Journals of the Continental Congress 621 (May 1779) (Worthington Chauncy Ford ed. 1909) (arguing that the western territories were "wrested from the common enemy by the blood and treasure of the thirteen states [and] should be considered as common property"). See also 17 Journals of the Continental Congress, 806-08 (Sept., 1780) (Gaillard Hunt ed. 1910).

were recognized as the property of the confederation.⁶ This issue was raised before the Continental Congress in response to the concern that if the western territories held by the seven states were redistributed among all the states, and all the states together allowed private landholding companies to buy, sell, and redistribute that land, the individuals and land holding companies who redistributed the land stood to make huge profits.⁷

As the primary target of Maryland and New Jersey's complaints, Virginia responded that the complaints were the result of more cynical motives. The legislatures of Maryland and New Jersey were both heavily influenced by prominent individuals who had invested in land companies and speculative land ventures. Something similar to this would happen in Dakota Territory under the unprincipled and sometimes corrupt influence of the Northern Pacific Railroad when North Dakota became a State.⁸

After considering the issue, the Continental Congress recommended to the legislatures of the seven western landholding States that those seven States each pass legislation to “cede their western territories to the confederation.”⁹ All seven States eventually did so. Figure 1 shows where these lands were, and when they were ceded to the United States.

Thomas Jefferson played an instrumental role in the Continental Congress in moving these debates between the original 13 States from the discussion stage to passage of one of the most important statutory laws enacted by the Continental Congress.¹⁰ Jefferson headed up the congressional committee within the Continental Congress that was established to develop the form of territorial government and the conditions under which a territory was to become a state.¹¹

The first use of the term “equal footing” was in the Ordinance of 1784, which states that “whenever any of the said states shall have, of free inhabitants as many as then shall be in any one the least numerous of the thirteen original States, such State shall be admitted by its Delegates into the Congress of the United States, on an equal footing with the said original States.” That number was changed to 60,000 free inhabitants in the Northwest Ordinance enacted by the Continental Congress in 1787¹² (at approximately the same time that the U.S. Constitution was being drafted in Philadelphia while Jefferson was away in France).

Upon recommendation of the committee that had drafted it (first led by Jefferson in 1784), the Continental Congress enacted the Northwest Ordinance on July 13, 1787; the Northwest Ordinance provided that when each of the designated states in the territorial area west of the

⁶ 11 Journals of the Continental Congress 650 (June 1778) (Worthington Chauncy Ford ed. 1908) (“It was ever the confident expectation of this State [New Jersey], that the benefits derived from a successful contest, were to be general and proportionate; and that the property of the common enemy, falling in consequence of a prosperous issue of war, would belong to the United States, and would be appropriated to their use.”).

⁷ See Paul W. Gates, *supra*, footnote 3, at pp. 50-51.

⁸ See the law review by former North Dakota Supreme Court Justice Robert Vogel, *Sources of the 1889 North Dakota Constitution*, 65 N.D. Law Rev. 331 (1989); Derrick Jensen and George Draffan, *Railroads and Clearcuts: Legacy of Congress’s 1864 Northern Pacific Land Grant*, (Inland Empire Public Lands Council 1995).

⁹ 17 Journals of the Continental Congress 807 (Sept. 1780) (Gaillard Hunt ed. 1910); Gates, *supra*, footnotes 3-4, at p. 51.

¹⁰ 26 Journals of the Continental Congress 113, 118 (March 1784) (Gaillard Hunt ed. 1928)..

¹¹ 26 Journals of the Continental Congress, *supra*, at 113, 118.

¹² 26 Journals of the Continental Congress, *supra*, at 113, 118.

original 13 States achieved a population of 60,000 free inhabitants it was to be admitted “on an equal footing with the original States, in all respects whatever.”¹³ The Northwest Ordinance addressed the land north of the Ohio River and west of Pennsylvania, then called the Northwest Territory, which was a large and ill-defined territory ceded by Great Britain to the U.S. at the end of the Revolutionary War, and which in turn later became all or part of the States of Ohio, Indiana, Illinois, Michigan, Wisconsin, and Minnesota as shown on the map below (Figure 2).¹⁴



Figure 2: The 1787 Boundaries of the Northwest Territory.

The Northwest Ordinance is the first time that the language “equal footing,” after which the Equal Footing Doctrine is named, was used and enacted into a federal law. And, because it was enacted while the Constitution also was being drafted in 1787 to replace the Articles of Confederation, the “equal footing” language of the Northwest Ordinance was the law and understanding that the Framers had when they included in the Constitution the article that governs how new States are admitted to the Union – U.S. Const. Article IV, Section 3, Clause 1.

The members of the Constitutional Convention, sometimes referred to as “the Framers,” signed the final draft of the Constitution in Philadelphia on September 17, 1787, two months and four days after the Northwest Ordinance was enacted by the Continental Congress. This issue – how new States from the western territories under the still-being-drafted Constitution were to be admitted to the Union – was an instrumental step, perhaps the instrumental step, that allowed the Framers to reach agreement and sign the Constitution. Admission of new States, including

¹³ An Ordinance for the Government of the Territory of the United States Northwest of the River Ohio, Art. V, 5 Journals of Congress 752–754 (1823 ed.), reprinted in C. Tansill ed., Documents Illustrative of the Formation of the Union of the American States, H. Doc. No. 398, 69th Cong., 1st Sess. (1927), 47, 54.

¹⁴ See Wikipedia maps at https://en.wikipedia.org/wiki/Historic_regions_of_the_United_States#Former_organized_territories (March 18, 2022).

whether new States would be “slave states” or “free States,” was an issue of contentious debate dividing not only the Continental Congress and the Constitutional Convention, but also the nation. When the Continental Congress enacted the Northwest Ordinance in City Hall in New York on July 13, 1787, they achieved one of the necessary steps that allowed the Framers to reach agreement on the final draft of the Constitution signed in Philadelphia in September 1787.

The Civil War would be fought later to address the underlying issues that the Constitution left unresolved, slavery and the meaning of the Supremacy Clause of the Constitution being chief among them. During the Civil War, the southern slave States and their Senators that previously blocked passage of the laws that would open settlement of the western territories of the United States were no longer part of Congress. That allowed Congress to enact three of the laws most important to settlement of the western United States:

- 1) the Homestead Act of 1862;¹⁵
- 2) the Pacific Railway Act of 1862¹⁶ that allowed construction of the first transcontinental railroad and telegraph between Omaha, Nebraska, and Sacramento, California, from 1862-69; and
- 3) the 1864 Act¹⁷ that created the Northern Pacific Railroad and allowed construction of the second transcontinental railroad between Duluth, Minnesota, and two ports near present day Seattle, Washington and Portland, Oregon. It was supposed to be completed from 1864-1872 but was not completed until 1883 (with completion of the 1883 Northern Pacific Railway Bridge between Bismarck and Mandan as one of its final major steps).¹⁸

1.1 Equal Footing Doctrine as applied to Lands included in the Louisiana Purchase in 1803

When Tennessee was admitted to the union in 1796, Congress included in the Act admitting Tennessee, under U.S. Const. Article IV, Section 3, Clause 1, the same “equal footing” language used in every instance since then when admitting a new State to the Union, including North Dakota. The Equal Footing Clause does exactly what it says: it admits each State into the Union on “equal footing.” The language of the Equal Footing Clause used for Tennessee and for each new State admitted to the Union after that defines each State’s relationship to the federal government and to all other States. The Equal Footing Clause provides that each new State enters the Union “*on an equal footing with the original States in all respects whatever.*”¹⁹

¹⁵ Act of May 20, 1862 (Homestead Act), Public Law 37-64 (12 STAT 392); 5/20/1862; Enrolled Acts and Resolutions of Congress, 1789 – 2011. See footnote 14 above.

¹⁶ Act of July 1, 1862 (Pacific Railroad Act), 12 STAT 489, which established the construction of a railroad and telegraph line from the Missouri River to the Pacific Ocean.; 7/1/1862; Enrolled Acts and Resolutions of Congress, 1789 – 2011.

¹⁷ Act of July 2, 1864 (13 Stat. at L. 365, chap. 217) referred to throughout this memorandum as the 1864 Act.

¹⁸ A chapter of Eugene V. Smalley’s *History of the Northern Pacific Railroad*, published in 1883, supra, footnote 4, is almost entirely devoted to the construction of the historic Northern Pacific Railway Bridge between Bismarck and Mandan at issue in this case as the final major step in completing the second transcontinental railroad across the United States in 1883, eleven years past the statutory deadline set by the 1864 Act. See Smalley, supra, Chapter XLIII, pp. 388-97.

¹⁹ 1 Stat. 491 (1796). Prior to Tennessee’s admission, Vermont and Kentucky were admitted with different but conceptually similar terminology. 1 Stat. 191 (1791); 1 Stat. 189 (1791).

With the admission of Louisiana to the Union in 1812, the Equal Footing Clause – “on an equal footing with the original States in all respects whatever”²⁰ – first extended equal footing and status to a State created out of territory purchased under treaty from a foreign power rather than land ceded from one of the original 13 States. In Louisiana’s case, *as in the part of North Dakota where the Historic Bridge is located*, this territory was purchased by treaty from France through the signing of the Louisiana Purchase Treaty on April 30, 1803.²¹ Admission of Louisiana as a State for the benefit of the “inhabitants of the ceded territory” was one of the requirements of the Louisiana Purchase Treaty. Article III of the Louisiana Purchase Treaty provides:

The inhabitants of the ceded territory shall be incorporated in the Union of the United States and admitted as soon as possible according to the principles of the federal Constitution to the enjoyment of all these rights, advantages and immunities of citizens of the United States, and in the mean time they shall be maintained and protected in the free enjoyment of their liberty, property and the Religion which they profess.

When Louisiana became a State in 1812, the inhabitants of European descent were given the full “advantages and immunities of citizens of the United States” as required by Article III of the 1803 Treaty. Prior to that, in 1804, all the Louisiana Purchase south of the 33rd parallel became the “Territory of Orleans,” which in turn became the State of Louisiana in 1812. The remainder of the Louisiana Purchase territory became the District of Louisiana, which was essentially all the drainage basin of the Mississippi and Missouri Rivers west of the Mississippi River. The District of Louisiana was later renamed the Territory of Louisiana, and in 1812 when the Territory of Orleans became the State of Louisiana, the Territory of Louisiana was renamed the Missouri Territory (Figure 3).

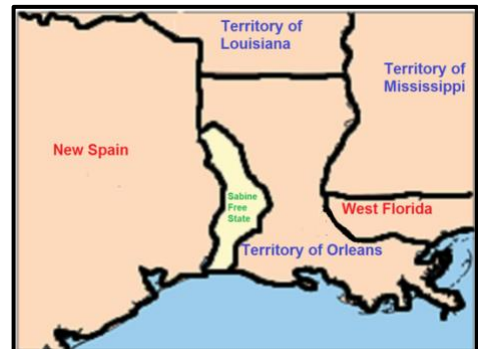


Figure 3: Map of Territories in the Louisiana Purchase, 1804-1812 (taken from Wikipedia)

The “inhabitants of the ceded territory” referred to in the Louisiana Purchase Treaty included not only the inhabitants of European descent who were to be given the full “advantages and immunities of citizens of the United States” when Louisiana was admitted to the Union in 1812, but also the people in the tribal nations that are described in Article VI of the Louisiana Purchase Treaty:

The United States promise to execute Such treaties and articles as may have been agreed between Spain and the tribes and nations of Indians until by mutual consent of the United States and the said tribes or nations other Suitable articles Shall have been agreed upon.

²⁰ 2 Stat. 701, 703 (1812).

²¹ The Louisiana Purchase Treaty of 1803 is available online through the National Archives at <https://www.archives.gov/milestone-documents/louisiana-purchase-treaty#:~:text=In%20this%20transaction%20with%20France,Mississippi%20River%20for%20%202415%20m>.

The peoples of the tribal nations that were “inhabitants of the ceded territory” that first became the “Territory of Louisiana” and then “Missouri Territory” did not obtain the “advantages and immunities of citizens of the United States” required by Article III of the Louisiana Purchase Treaty for another 121 years, when, under the Snyder Act of 1924,²² Native Americans born in the United States were finally given full U.S. citizenship, including the right to vote. Although the Fifteenth Amendment, passed in 1870, granted all U.S. citizens the right to vote regardless of race, it wasn't until the Snyder Act that Native Americans began to enjoy the rights granted by the Fifteenth Amendment as well as Article VI of the Louisiana Purchase Treaty, which had required that the “inhabitants of the ceded territory” receive full “advantages and immunities of citizens of the United States” in 1803.

1.2 Summary of the Historical Background and Maps that Connect the Fort Laramie Treaty of 1851 to the 1883 Northern Pacific Railroad Bridge Crossing Site, and How, as a Senate Ratified Treaty, the 1851 Treaty is a Congressional Act that precedes the 1864 Act in Time and Right

It took less time, 48 years from 1803 to 1851, for the United States to fulfill Article VI of the 1803 Louisiana Purchase Treaty's “promise to execute Such treaties and articles as may have been agreed between Spain and the tribes and nations of Indians until by mutual consent of the United States and the said tribes or nations other Suitable articles Shall have been agreed upon,” for the tribal nations of the upper Missouri Territory west of the Missouri River. “Early in 1851, the Congress of the United States authorized holding a great treaty council with Plains Indians to assure peaceful relations along the Overland Trails. Fort Laramie was chosen as the meeting place and various Indian tribes were invited to come by September 1st. More than 10,000 Plains Indians (men, women and children) gathered to sign the treaty causing the location to move to Horse Creek since Fort Laramie could not accommodate the crowd.”²³ The Fort Laramie Treaty of 1851 was signed on September 17, 1851, between the United States treaty commissioners and representatives among the 10,000 from the Cheyenne, Lakota Sioux, Arapaho, Crow, Assiniboine, Mandan, Hidatsa, and Arikara Nations and set forth the territories allocated to each of these tribal nations.²⁴

Article 5 of the 1851 Treaty²⁵ describes by metes and bounds the whole of areas 529 and 620, and the part of area 621 south of the Missouri River as shown on Figure 4. Article 5 also reserves to all tribal nation signatories to the treaty: “the aforesaid Indian nations do not hereby abandon or prejudice any rights or claims they may have to other lands; and further, that they do not surrender the privilege of hunting, fishing, or passing over any of the tracts of country heretofore

²² Act of June 2, 1924, Public Law 68-175, 43 STAT 253, which authorized the Secretary of the Interior to issue certificates of citizenship to Native Americans.

²³ See National Park Service website, <https://www.nps.gov/articles/000/horse-creek-treaty.htm>

²⁴ *Report to The President By The Indian Peace Commission*, ¶ 69, (January 7, 1868).

²⁵ Available online at <https://indianlaw.mt.gov/docs/fortpeck/treaties/laramie-treaty-1851.pdf>

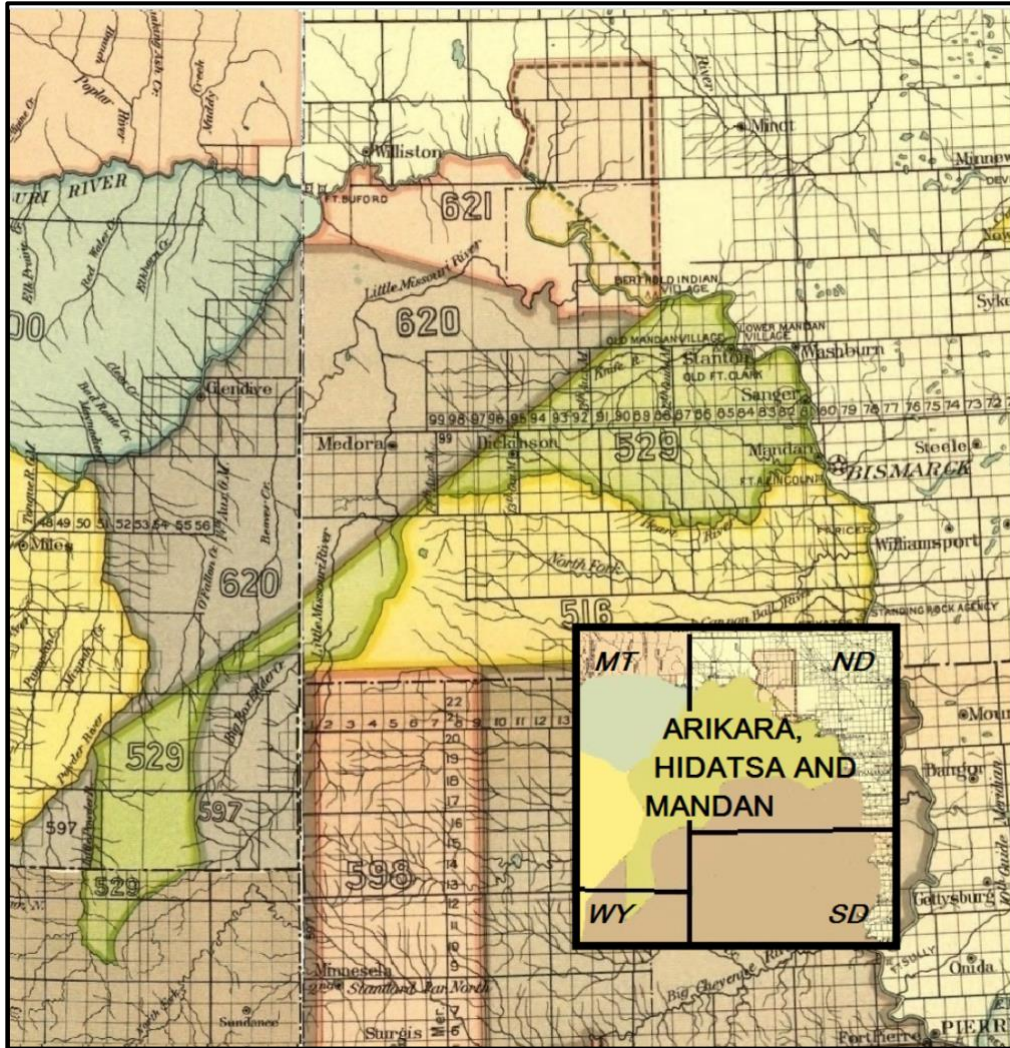


Figure 4: 1851 Fort Larimer Treaty Areas 529, 620, and 621 Allocated to the Mandan, Hidatsa, and Arikara Tribes.

described.” In 2019, *Herrera v. Wyoming*,²⁶ held that off-reservation treaty hunting rights remain intact even after diminishment of a reservation and statehood under the 1868 Fort Laramie Treaty, a different Treaty than the 1851 Treaty that involved only the Lakota Sioux and Crow tribal nations. This raises the question of what else is preserved under the language of Article 5 of the 1851 Treaty that uses similar language to the language at issue in *Herrera v. Wyoming*. Section IA of the Court’s opinion in *Herrera v. Wyoming* provides an excellent summary of the relevant background history, which is identical in many respects to the history for the Mandan, Hidatsa, and Arikara tribal nations as it relates to the 1851 and 1868 Laramie Treaties, so it is quoted in its entirety below.

The Crow Tribe first inhabited modern-day Montana more than three centuries ago. *Montana v. United States*, 450 U. S. 544, 547 (1981). The Tribe was nomadic, and its members hunted game for subsistence. J. Medicine Crow, From

²⁶ 139 S. Ct. 1686 (2019).

the Heart of the Crow Country 4–5, 8 (1992). The Bighorn Mountains of southern Montana and northern Wyoming “historically made up both the geographic and the spiritual heart” of the Tribe’s territory. Brief for Crow Tribe of Indians as Amicus Curiae 5.

The westward migration of non-Indians began a new chapter in the Tribe’s history. In 1825, the Tribe signed a treaty of friendship with the United States. Treaty With the Crow Tribe, Aug. 4, 1825, 7 Stat. 266. In 1851, the Federal Government and tribal representatives entered into the Treaty of Fort Laramie, in which the Crow Tribe and other area tribes demarcated their respective lands. Montana, 450 U. S., at 547–548. The Treaty of Fort Laramie specified that “the tribes did not ‘surrender the privilege of hunting, fishing, or passing over’ any of the lands in dispute” by entering the treaty. *Id.*, at 548.

After prospectors struck gold in Idaho and western Montana, a new wave of settlement prompted Congress to initiate further negotiations. See F. Hoxie, *Parading Through History* 88–90 (1995). Federal negotiators, including Commissioner of Indian Affairs Nathaniel G. Taylor, met with Crow Tribe leaders for this purpose in 1867. Taylor acknowledged that “settlements ha[d] been made” upon the Crow Tribe’s lands and that their “game [was] being driven away.” Institute for the Development of Indian Law, *Proceedings of the Great Peace Commission of 1867–1868*, p. 86 (1975) (hereinafter *Proceedings*). He told the assembled tribal leaders that the United States wished to “set apart a tract of [Crow Tribe] country as a home” for the Tribe “forever” and to buy the rest of the Tribe’s land. *Ibid.* Taylor emphasized that the Tribe would have “the right to hunt upon” the land it ceded to the Federal Government “as long as the game lasts.” *Ibid.*

At the convening, Tribe leaders stressed the vital importance of preserving their hunting traditions. See *id.*, at 88 (Black Foot: “You speak of putting us on a reservation and teaching us to farm. . . . That talk does not please us. We want horses to run after the game, and guns and ammunition to kill it. I would like to live just as I have been raised”); *id.*, at 89 (Wolf Bow: “You want me to go on a reservation and farm. I do not want to do that. I was not raised so”). Although Taylor responded that “[t]he game w[ould] soon entirely disappear,” he also reassured tribal leaders that they would “still be free to hunt” as they did at the time even after the reservation was created. *Id.*, at 90.

The following spring, the Crow Tribe and the United States entered into the treaty at issue in this case: the 1868 Treaty. 15 Stat. 649. Pursuant to the 1868 Treaty, the Crow Tribe ceded over 30 million acres of territory to the United States. See Montana, 450 U. S., at 547–548; Art. II, 15 Stat. 650. The Tribe promised to make its “permanent home” a reservation of about 8 million acres in what is now Montana and to make “no permanent settlement elsewhere.” Art. IV, 15 Stat. 650. In exchange, the United States made certain promises to the Tribe, such as agreeing to construct buildings on the reservation, to provide the Tribe members

with seeds and implements for farming, and to furnish the Tribe with clothing and other goods. 1868 Treaty, Arts. III–XII, id., at 650–652. Article IV of the 1868 Treaty memorialized Commissioner Taylor’s pledge to preserve the Tribe’s right to hunt off reservation, stating:

“The Indians . . . shall have the right to hunt on the unoccupied lands of the United States so long as game may be found thereon, and as long as peace subsists among the whites and Indians on the borders of the hunting districts.” Id., at 650.

A few months after the 1868 Treaty signing, Congress established the Wyoming Territory. Congress provided that the establishment of this new Territory would not “impair the rights of person or property now pertaining to the Indians in said Territory, so long as such rights shall remain unextinguished by treaty.” An Act to Provide a Temporary Government for the Territory of Wyoming (Wyoming Territory Act), July 25, 1868, ch. 235, 15 Stat. 178. Around two decades later, the people of the new Territory adopted a constitution and requested admission to the United States. In 1890, Congress formally admitted Wyoming “into the Union on an equal footing with the original States in all respects,” in an Act that did not mention Indian treaty rights. An Act to Provide for the Admission of the State of Wyoming into the Union (Wyoming Statehood Act), July 10, 1890, ch. 664, 26 Stat. 222. Finally, in 1897, President Grover Cleveland set apart an area in Wyoming as a public land reservation and declared the land “reserved from entry or settlement.” Presidential Proclamation No. 30, 29 Stat. 909. This area, made up of lands ceded by the Crow Tribe in 1868, became known as the Bighorn National Forest. See App. 234; *Crow Tribe of Indians v. Reppis*, 73 F. 3d 982, 985 (CA10 1995).

The Mandan, Hidatsa, and Arikara tribal nations were signatories to the 1851 Fort Laramie Treaty, unlike the 1868 Fort Laramie Treaty, which was limited to the Crow and Lakota Sioux tribal nations; however, the above summary from *Herrera v. Wyoming* captures many of the same the experiences of other tribal nations of the Upper Great Plains in those decades.²⁷

The 1851 Fort Laramie Treaty was ratified by the Senate on Sept. 17, 1851, at 11 Stat. 749. In 1866, Newton Edmunds, Governor and *ex-officio* Superintendent of Indian Affairs of Dakota Territory; Major General S. R. Curtis, Orrin Guernsey and Henry W. Reed, commissioners appointed on the part of the United States to make treaties with the Indians of the

²⁷ See also North Dakota Studies Website, Section 3: “The Treaties of Fort Laramie, 1851 & 1868,” which is part of the curriculum for North Dakota studies for all 8th graders in North Dakota at https://www.google.com/search?q=https%3A%2F%2Fwww.ndstudies.gov%2Fgr8%2Fcontent&rlz=1C1CHBF_enUS893US893&sxsrf=APq-WBvT71dTIBo_aMDXuad7wQsQcspWqg%3A1648658211192&ei=I4dEYsKrC83E0PEPmr2kGA&ved=0ahUKEwiCyaK4ou72AhVNIjOIHZoeQOMQ4dUDCA4&uact=5&oq=https%3A%2F%2Fwww.ndstudies.gov%2Fgr8%2Fcontent&gs_lcp=Cgndnd3Mtd2l6EAM6BwgjEOoCECdKBAhBGAFKBAhGGABQjPkBWLaaA2C1rwNoA3AAeACAAWCIAWCSAQExmAEOAEOAEB0AECsAEKwAEB&sclient=gws-wiz.

Upper Missouri; and the chiefs and headmen of the Arickaree tribe of Indians signed an agreement²⁸. It stated:

States may desire to connect a line of stages with the river, at the salient angle thereof about thirty miles below this point, and may desire to establish settlements and convenient supplies and mechanical structures to accommodate the growing commerce and travel, by land and river, the chiefs and headmen of the Arickarees, Gros Ventres [Hidatsa], and Mandans, acting and uniting also with the commissioners of the United States aforesaid, do hereby convey to the United States all their right and title to the following lands, situated on the northeast side of the Missouri River, to wit: Beginning on the Missouri River at the mouth of Snake River, about thirty miles below Ft. Berthold; thence up Snake River and in a northeast direction twenty-five miles; thence southwardly parallel to the Missouri River to a point opposite and twenty-five miles east of old Ft. Clarke; thence west to a point on the Missouri River opposite to old Ft. Clarke; thence up the Missouri River to the Place of beginning.

Area 529 shown on the map below was diminished without compensation by executive order of President Grant, and not by the Senate, on April 12, 1870, six years after the 1864 Act. Then again, ten years later, Area 620 (see Figure 4), more than 6 million acres, was diminished without compensation by executive order of President Hayes, and not by the Senate, on July 13, 1880, sixteen years after the 1864 Act.²⁹ The following short excerpt from the North Dakota Studies Website, “Creating the Fort Berthold Reservation,” describes the circumstances of the 1880 Hayes executive order:

In 1880, an executive order signed by President Hayes again reduced the size of the Fort Berthold Reservation. When the Northern Pacific Railway (NPRR) reached the reservation in the 1870s, the company asked the federal government to reduce the size of the reservation. The army officers at Fort Stevenson were asked their opinion. Colonel Dan Huston responded that the NPRR had asked for land that was in the traditional and treaty lands assigned to the three tribes for hunting. However, General Nelson A. Miles responded that the tribes had never occupied or hunted on that land. General Alfred H. Terry also supported the railroad’s request.

The Commissioner of Indian Affairs, Roland E. Trowbridge argued that taking the lands from the three tribes would bring hardship to the people of the three tribes. He wrote that “the land west of the Missouri was better for farming and

²⁸ Agreement at Fort Berthold, 1866, July 27, 1866, Unratified Indian Office, “Treaties, box 3, 1864-1866.”

²⁹ See both Grant’s and Hayes’s Presidential executive orders and the summary of the formation of the Fort Berthold Reservation at North Dakota Studies Website, “Creating the Fort Berthold Reservation,” which again is part of the curriculum for North Dakota studies for all 8th graders in North Dakota at <https://www.ndstudies.gov/gr8/content/unit-iii-waves-development-1861-1920/lesson-1-changing-landscapes/topic-4-reservation-boundaries/section-4-creating-fort-berthold-reservation#:~:text=In%201880%2C%20an%20executive%20order,the%20size%20of%20the%20reservation> (March 26, 2022).

had more timber.” His statements were ignored, and President Rutherford B. Hayes signed the executive order on July 13, 1880.³⁰

President Hayes was given a 930-acre farm north of Bismarck on Hay Creek as a gift from the Northern Pacific Railroad soon after he became President in 1877, which he later sold after his Presidency ended. Whether there was a quid pro quo for removing Area 620 from the Fort Berthold Reservation has not been explored by historians.³¹

Figure 4 shows Areas 529, 620, and the part 621 south of the Missouri River that were identified as Arikara, Hidatsa and Mandan tribal nation territories in the Fort Laramie Treaty of 1851.³²

Area 529 of Figure 4 is bounded by the Heart River all the way to the Missouri River as its southern boundary. The map also shows that area 529 includes both the Missouri River itself and all land west of the Missouri River where the Northern Pacific Railroad constructed the Historic Bridge between Bismarck and Mandan as well as the railroad’s right-of-way west of there through the rest of Dakota Territory. This means that *if* all the riverbed up to the ordinary high-water mark at the location of the Historic Bridge was not held in trust as navigable territorial waters to be transferred to the State of North Dakota under the Equal Footing and Public Trust Doctrines when North Dakota became a State on November 2, 1889, *then* the transfer of that same riverbed to the Arikara, Hidatsa, and Mandan peoples under the Fort Laramie Treaty of 1851 is a federal transfer prior in right and time (under both the Louisiana Purchase Treaty of 1803 and the Fort Laramie Treaty of 1851) to any arguable transfer of the riverbed at the Historic Bridge’s location under the 1864 Act, 13 Stat. at L. 365, chap. 217, that created the Northern Pacific in 1864.

BNSF cannot cherry-pick one federal statute involving its predecessor, Northern Pacific, and ignore other federal actions, such as the 1851 Treaty, which is prior both in right and time to the 1864 Act. Northern Pacific was well aware of the distribution of tribes, as evidence by the Pacific Railroad map of 1855 (Figure 5).

³⁰ North Dakota Studies Website, “Creating the Fort Berthold Reservation,” supra, footnote 21, at <https://www.ndstudies.gov/gr8/content/unit-iii-waves-development-1861-1920/lesson-1-changing-landscapes/topic-4-reservation-boundaries/section-4-creating-fort-berthold-reservation#:~:text=In%201880%2C%20an%20executive%20order,the%20size%20of%20the%20reservation> (March 26, 2022).

³¹ See Presidential Property North of Bismarck --(Dakota Datebook) Friday, September 15, 2006, at <https://www.facebook.com/groups/2030822207183428/posts/2619780344954275> (March 25, 2022). Also see generally the following story from Indian Country Today on President Hayes’s policies regarding Native Americans: Alysa Landry, Rutherford B. Hayes: Introduces Allotment and Dreaded Boarding Schools, Indian Country Today (May 10, 2016, updated Sep. 13, 2018) at <https://indiancountrytoday.com/archive/rutherford-b-hayes-introduces-allotment-and-dreaded-boarding-schools?redir=1>

³² Map from *Eighteenth Annual Report of the Bureau of American Ethnology*, part 2, 1896-97 (Government Printing Office 1899). Available online at: [https://commons.wikimedia.org/wiki/File:Arikara,_Hidatsa_and_Mandan_1851_treaty_territory\(Area_529,_620_and_621_south_of_the_Missouri\).png](https://commons.wikimedia.org/wiki/File:Arikara,_Hidatsa_and_Mandan_1851_treaty_territory(Area_529,_620_and_621_south_of_the_Missouri).png) (March 26, 2022).



Figure 5: Tribal Distribution on Pacific Railroad Office Map from Lt. Warren's Report of Military Reconnaissances in the Dakota Country, 1855 (from Culbertson 1952: Map 1).

Further, as will be addressed in the next section of this memorandum, under the rules of constitutional and statutory construction that apply, 1) ownership of the riverbed up to the ordinary high-water mark is held by the State of North Dakota, 2) the right of the Arikara, Hidatsa, and Mandan peoples to fish, travel, and do other activities on the Missouri River as set forth in the Fort Laramie Treaty of 1851 is retained, and 3) the right of the Northern Pacific and its successors to maintain a right-of-way for purposes of maintaining and operating a railroad, are not inconsistent under the law.

Thus, as discussed further below regarding the Public Trust Doctrine, under the rules of construction favored by the law to construe these laws – the Equal Footing and Public Trust Doctrines, the 1851 Treaty and its aftermath, and the 1864 Act – each may be given effect.

1.3 Summary of the Connection of the Lewis & Clark Expedition to the Historic Bridge

When the Lewis and Clark Expedition embarked from St. Charles, Missouri, on May 21, 1804, it had among its purposes to map, explore, and establish jurisdiction over the land transferred to the United States under the 1803 Louisiana Purchase Treaty as well as to find a practical route through the land to the west of the headwaters of the Missouri River to the Pacific

coast. Eugene Smalley's *History of the Northern Pacific Railroad*, published in 1883, states: "To Thomas Jefferson belongs the honor of planning and setting on foot the enterprise of exploring the interior continental region on the line now followed by Northern Pacific Railroad."³³ Another purpose of the Expedition was to learn and report back the whereabouts, military strength, lives, activities, and cultures of the various Native American tribal nations that inhabited the newly acquired Louisiana Territory of the United States through the Louisiana Purchase, as well as in the northwest in general.

The Expedition spent the winter of 1804–05 at Fort Mandan, east of the mouth of the Knife River, and across the river to the north and east of the Hidatsa and Mandan villages near Stanton, North Dakota, and about 30-40 miles upriver from the future location of the 1883 Northern Pacific Railway Bridge between Bismarck and Mandan. While there over the winter of 1804-05, Lewis and Clark often met in council with Mandan and Hidatsa chiefs and met the French-Canadian fur trapper his young Shoshone wife, Sacagawea, who both served as the Expedition's primary translators and guides for the remainder of their exploratory journey. One of the Mandan Chiefs Lewis and Clark met at Fort Mandan, Sheheke, went with Lewis and Clark on their return journey in 1806 to St. Louis, and then to Washington, D.C., to meet with President Thomas Jefferson.³⁴

Starting on October 22, 1804, Clark's journal has several entries regarding the area that was to become Bismarck and Mandan, which cities are both also deeply tied to the Historic Bridge crossing (e.g., Bismarck became the Capital of Dakota Territory in 1883 because of the bridge built at this crossing point). But in 1804, the future crossing of the Historic Bridge was the location of six abandoned Mandan villages near the mouth of the Heart River where the Mandan had lived for hundreds of years prior to that, but which the Mandan people had recently abandoned primarily because of a smallpox epidemic and warfare with the Lakota Sioux. This is evidenced in the Lewis and Clark Journals:

"we passed a War party of Tetons on their way as we Supposed to the Mandans of 12 men on the L. S. [left side] we gave them nothing and refused to put them across the river, passed 2 old Villages at the mouth of a large Creek L. S and a Small Island at the head of which is a bad place, an old Village on the S. S. [starboard side] and the upper of the 6 Villages the Mandans occupied about 25 years ago this village was entirely cut off by the Sioux & one of the others nearly, the Small Pox distroyed great Numbers" (October 22, 1804, Journal Entry).

"Some Snow, passed 5 Lodges (of) fortified the place the two french men were rob[b]ed Those are the hunting Camps of the mandans, who has latterly left them. we camped on the L. S." (October 23, 1804, Journal Entry).

"Cloudy Some little Snow (my Rhumetism Continue, not So bad as the 2 last days,) a butufull Countrey on both Sides, bottoms covered with wood, we See no

³³ Smalley's *History of the Northern Pacific Railroad*, supra, footnote 4, Chap. III, p. 20.

³⁴ See, e.g., Stephen Ambrose, *Undaunted Courage: Meriwether Lewis, Thomas Jefferson, and the Opening of the American West* (Touchstone 1996); Tracy Potter, *Sheheke: Mandan Indian Diplomat—The Story of White Coyote, Thomas Jefferson, and Lewis and Clark* (Farcountry Press 2003).

game to day, passed an old [village] of a Band of Me ne tarres Called Mah har ha where they lived 40 year ago on the L. S. Came too on an Island Caused by the river cutting through a narrow point 7 years ago, on this Island we wer visited by the grand Chief of the mandans a 2d Chief and Some other, who wer Camped on the Island, those Chief met our Ricarra Chief with great Corduallity, & Smoked together Cap Lewis Visited the Camps 5 Lodges, and pro-ceeded on & Camped near a 2d Camp of Mandans on the S. S. nearly opposit the old Ricara & Manden Village which the Ricarras abandaned in the year 1789” (October 24, 1804, Journal Entry).³⁵

These entries from Clark’s journals help to illustrate the deep connection the Mandan, Hidatsa, and Arikara peoples had to the riverbed and the land on both sides of the Missouri River near the mouth of the Heart River for hundreds of years prior to the 1864 Act, as well as in the preceding decades before construction of the Historic Bridge by the Northern Pacific from 1880-82. This area north of the Heart River was recognized as land belonging to the Mandan, Hidatsa, and Arikara peoples under the Laramie Treaty in 1851. In fact, it was the principal location of Mandan villages for hundreds of years before that (Figure 5). Thus, the land west of the Historic Bridge’s crossing of the Missouri River was thus allotted to them under the 1851 Treaty as shown on the map above. Any claim in the late 1870’s (when the Northern Pacific asked President Hayes to diminish the Forth Berthold Reservation by Executive Order after he became President in 1877) that is premised on a claim that the Mandan people had not occupied, hunted, grown crops and otherwise lived on the land near the Historic Bridge or the Heart River valley and Dakota Territory to the west (see General Miles’ statement accompanying footnote 22 above) was unsupportable at that time.

It remains unsupportable to this day. BNSF cannot destroy the 1883 Northern Pacific Railway Bridge under a permit granted by USCG to BNSF based primarily on a claim by BNSF under the 1864 Act that BNSF owns the equivalent of fee simple title to the riverbed and the bridge while ignoring other equal or superior Acts of Congress like the 1851 Treaty. Other treaties and laws also apply as related in more detail below. All this history is relevant to determining ownership and preservation of the Historic Bridge under the NHPA and federal and state law, including the Equal Footing and Public Trust Doctrines as the controlling law (again, as discussed in more detail below).

1.4 Summary of the History and Importance of the Equal Footing Doctrine to All Land Covered by the Louisiana Purchase, including Dakota Territory and the 1883 Northern Pacific Crossing Site

In its March 11, 2022, memo, BNSF relies on out of context language from the 1864 Act, as well as an 1891 Supreme Court decision that is easily distinguishable both on the law and under the facts from this case, as BNSF’s primary legal arguments for why BNSF owns the Historic Bridge. Before addressing those arguments in in the context of the controlling law that refutes them, it is helpful to trace the chain of events and actions by Congress and the Executive Branch

³⁵ See *Journals of the Lewis & Clark Expedition*, entries for October 22-24, 1804, online at <https://lewisandclarkjournals.unl.edu/item/lc.jrn.1804-10-24> (March 24, 2022)

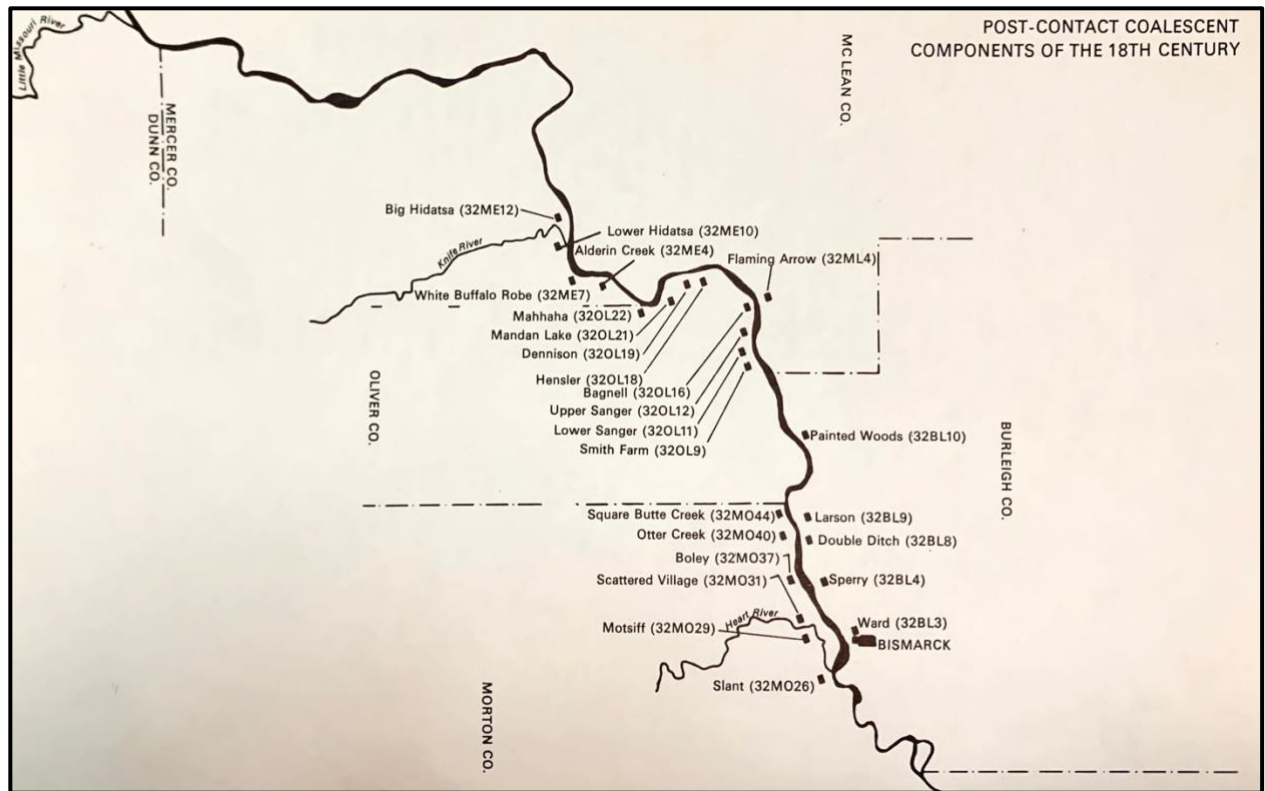


Figure 6: Earthlodge Villages of the Mandan, Hidatsa and Arikara after 1675 (taken from Lehmer 1971:132).

that constitute the “chain of title and legal ownership” of the riverbed of the Missouri River beneath the Historic Bridge back to the Louisiana Purchase Treaty of 1803. Just as title to any property originally surveyed and transferred under the Homestead Act of 1862 goes back to the original patent issued by the United States, so too does the ownership in the riverbed beneath the Historic Bridge up to the ordinary high-water mark go back to the original documents and transactions from which it is derived – in this case the Louisiana Purchase Treaty.

The actual territory transferred by France to the United States under the Louisiana Purchase Treaty of 1803 is described in Article I of the treaty:

Whereas by the Article the third of the Treaty concluded at St Ildefonso the 9th Vendémiaire an 9 (1st October) 1800 between the First Consul of the French Republic and his Catholic Majesty it was agreed as follows.

"His Catholic Majesty promises and engages on his part to cede to the French Republic six months after the full and entire execution of the conditions and Stipulations herein relative to his Royal Highness the Duke of Parma, the Colony or Province of Louisiana with the Same extent that it now has in the hand of Spain, & that it had when France possessed it; and Such as it Should be after the Treaties subsequently entered into between Spain and other States."

And whereas in pursuance of the Treaty and particularly of the third article the French Republic has an incontestible title to the domain and to the possession of

the said Territory--The First Consul of the French Republic desiring to give to the United States a strong proof of his friendship doth hereby cede to the United States in the name of the French Republic for ever and in full Sovereignty the said territory with all its rights and appurtenances as fully and in the Same manner as they have been acquired by the French Republic in virtue of the above mentioned Treaty concluded with his Catholic Majesty.³⁶

Article I of the Louisiana Purchase Treaty of 1803 transfers to the United States the “Colony or Province of Louisiana” shown mostly in white on Figure 7, which France had re-acquired from Spain less than three years before under the Treaty of St Ildefonso on October 1, 1800. This Territory consisted of almost all the drainage basins of the Mississippi and Missouri Rivers west of the Mississippi River, and this transfer nearly doubled the size of the United States. Prior to that, the territory of the United States was almost entirely the land east of the Mississippi River ceded by Great Britain in 1783 to the Original 13 States under the Treaty of Paris. See the brown area on the map below. As discussed above, all the Louisiana Purchase south of the 33rd parallel became the “Territory of Orleans,” which in turn became the State of Louisiana in 1812. The remainder of the Louisiana Purchase territory became the District of Louisiana, later renamed the Territory of Louisiana, then Missouri Territory.



Figure 7: The Louisiana Purchase Treaty of 1803 (National Archives).

After Louisiana was admitted to the Union in 1812, all or parts of 14 other states as shown on the map above were formed from the Louisiana territories: Arkansas, Missouri, Iowa, Oklahoma, Kansas, Nebraska, Minnesota, North Dakota, South Dakota, New Mexico, Texas, Montana, Wyoming, and Colorado. All were admitted on equal footing under the Equal Footing Clause discussed in detail above: “*on an equal footing with the original States in all respects whatever.*”

³⁶ The Louisiana Purchase Treaty of 1803, Article I, available online through the National Archives as shown at footnote 14.

When Congress created Dakota Territory on March 2, 1861,³⁷ it consisted of the northernmost part of the land acquired in the Louisiana Purchase in 1803 (land in white on Figure 7), as well as the southernmost part of “Rupert’s Land” (land in dark blue on Figure 7) which the United States acquired in 1818 when the northern boundary of the United States from Lake of the Woods to the western edge of the territory acquired under the Louisiana purchase was changed to the 49th parallel. See generally the map of United States territorial acquisitions above. Dakota Territory was formed from parts of two other territories, Minnesota Territory and Nebraska Territory. Again, it is easier to show these steps with maps, rather than attempting to describe these transactions in words only.³⁸

The Territory of Minnesota existed from March 3, 1849, until May 11, 1858, when the eastern portion of Minnesota Territory was admitted to the Union as the State of Minnesota (Figure 8)

When Minnesota became a state in 1858, the leftover area between the Missouri River and the new State of Minnesota's western boundary became “unorganized” territory. When Congress created Dakota Territory on March 2, 1861, the western boundary of the new State of Minnesota largely became the eastern boundary of Dakota Territory when created in 1861 (Figure 9 brownish-beige area).



Figure 8: Minnesota Territory.

The rest of Dakota Territory as first created in 1861 was formed from part of Nebraska Territory. See yellow areas on Figures 9 and 10. The Territory of Nebraska existed from May 30, 1854, until March 1, 1867, when the remaining part of what had been the much larger Territory of Nebraska was admitted to the Union as the State of Nebraska. Nebraska Territory had been created by the Kansas–Nebraska Act of 1854 and was a huge territory that encompassed areas of what is today the States of Nebraska, Wyoming, South Dakota, North Dakota, Colorado, and Montana. See map of Nebraska Territory below.

³⁷ Act creating the Territory of Dakota, 12 Stat. 239 (March 2, 1861).

³⁸ The three maps below were created by Wikipedia, and are accessible from the page on Wikipedia that has links to each former U.S. territory that the United States was formed from, as well as maps showing each of those territories: https://en.wikipedia.org/wiki/Historic_regions_of_the_United_States#Former_organized_territories (March 25, 2022).

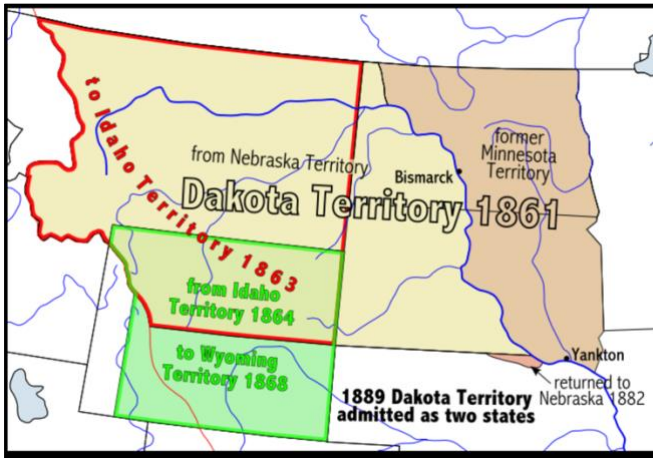


Figure 9: 1861 Map of Dakota Territory showing Former Minnesota Territory.

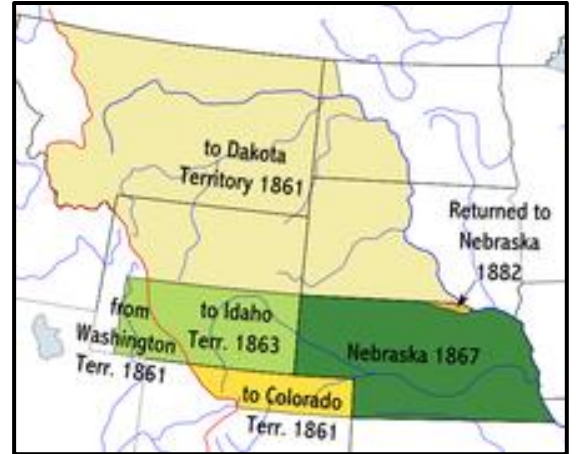


Figure 10: Map Showing Changes in Dakota Territory 1861-1867.

As the map of Dakota Territory above shows, the part of Dakota Territory west of the current western borders of North and South Dakota in turn was made a part of the Territory of Idaho as created by Congress in 1863 (Figure 10), before it was changed by Congress again (Figure 11). As all this arranging and rearranging of the territories of the western United States was occurring, the Civil War raged on; Congress's focus on creating new States and expanding the United States to the Pacific Ocean was essential to creating whatever the United States was to be after the Civil War ended, which, at the time that all this shuffling of territories to create new States was occurring, was yet to be determined.

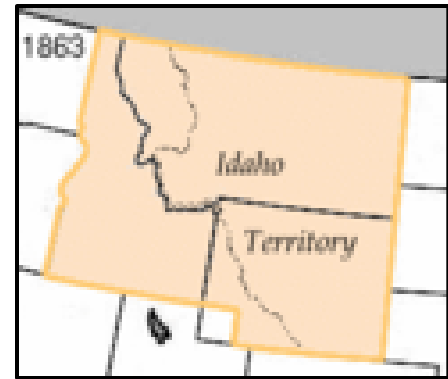


Figure 11: 1863 Map of Idaho Territory.

This post-1863 Dakota Territory did not change again from 1863-1889 after the western part of the original 1861 Dakota Territory was diminished by transferring the western part of Dakota Territory to Idaho Territory in 1863 (Figure 10). This smaller Dakota Territory is the Dakota Territory in existence when the 1864 Act creating the Northern Pacific was enacted by Congress, and when this smaller 1863-89 Dakota Territory was split into the two States of North Dakota and South Dakota and admitted to the Union on "equal footing" with all other States, on November 2, 1889.

In summary, the Equal Footing Doctrine was and is the essential doctrine that admits each new State to the Union on "equal footing" with all other States, including the original 13 States. For the reasons discussed above, if the Equal Footing Doctrine had not become the law of the land, the Constitution may never have been signed, and the Union that the Constitution created may never have been formed.

When the Constitution was signed in Philadelphia on September 17, 1787, a large amount of the “commerce” between the States, and with both tribal and foreign nations, occurred on the navigable waters of the United States up to their ordinary high-water mark. Thus, almost all cases first decided by the United States Supreme Court under the Commerce Clause³⁹ of the Constitution – which gives Congress the power “to regulate commerce with foreign nations, and among the several states, and with the Indian tribes” – dealt almost exclusively with the authority between States and the Federal government over who had supremacy to regulate commerce on these navigable waterways. In Jefferson’s first term as President, *Marbury v. Madison*⁴⁰ had established the principle of judicial review under which courts have authority to strike down laws and statutes that violate the Constitution, and to “say what the law is” under the Separation of Powers Doctrine that makes courts the final arbiters that define the boundaries of authority between the legislative, executive, and judicial branches of the government. So, for example, a local, state, or federal law can be struck down under the Commerce Clause if it unlawfully interferes with, or discriminates against, interstate commerce.

In the early United States, the “main highways of commerce” were the harbors, navigable lakes, and navigable rivers where interstate commerce primarily occurred. Thus, the first major case decided by the Supreme Court under the Commerce Clause, *Gibbons v. Ogden*, held that Congress’s power to regulate interstate commerce under the Commerce Clause included not only the power to regulate the interstate trading of goods, but also encompassed the power to regulate navigation. (“The power of Congress, then, comprehends navigation, within the limits of every State in the Union; so far as that navigation may be, in any manner, connected with ‘commerce with foreign nations, or among the several States’.”).⁴¹

When *Martin v. Waddell's Lessee*⁴² established the Public Trust Doctrine for the first time under United States law, it did not change the authority of Congress to regulate navigable waterways under the Commerce Clause to keep them open for interstate commerce as established in *Gibbons v. Ogden*. Rather *Martin v. Waddell's Lessee* addresses a related issue: whether the original 13 States continued to own and have the right to regulate the riverbeds and shores of navigable waterways up to their ordinary high-water mark as recognized in the common law of both the United States and England at the time that the original 13 States drafted and signed the Constitution.

As discussed in more detail in the next section of this memorandum, the Public Trust Doctrine holds in trust the original 13 States’ ownership and right to regulate the riverbeds and shores of navigable waters, subject only to the federal government’s authority under the Commerce Clause to keep those waterways open for the purpose of navigation. The Equal Footing Doctrine extends the rights of ownership and control given to the original 13 States under the Public Trust Doctrine to all States admitted to the Union after the original 13 States, thus giving all States the same ownership in riverbeds and shores of their navigable waterways as the original 13 States. For the reasons discussed below, this includes ownership of the riverbed

³⁹ Article 1, Section 8, Clause 3 of the U.S. Constitution.

⁴⁰ 5 U.S. (1 Cranch) 137 (1803).

⁴¹ 22 U.S. (9 Wheat.) 1, 197-98 (1824).

⁴² 41 U.S. 367 (1942).

up to the ordinary high-water mark of the 1883 Northern Pacific Railway Bridge between Bismarck and Mandan.

Before discussing the Equal Footing and Public Trust Doctrines as the controlling black letter law that determine ownership of the riverbed in this case, it is helpful to summarize the fundamental underlying common law principles relating to riverbeds and shorelines that underlie the Public Trust Doctrine.

1.5 Summary of common law principles that underlie the Public Trust Doctrine

The Public Trust Doctrine set forth in *Martin v. Waddell's Lessee* is one of the oldest and most established principles of the common law. The principle of sovereign ownership and control of land under navigable waters began under Roman law. Justinian in *The Institutes* stated that "all of these things are by natural law common to all: air, flowing water, the sea and, consequently, the shores of the sea."⁴³ Justinian's original "Public Trust" doctrine was cited and developed in the common law of England (i.e., the written decisions of courts in contested cases), then summarized in various treatises cited by courts in their written opinions deciding those cases. Among the most important of these early treatises was Bracton's mid-thirteenth century treatise *On the Laws and Customs of England*, in which Bracton relied on Justinian's *The Institutes* for the ancient common law doctrine that the sea and seashore were held by the sovereign for the common good of all.⁴⁴ So did Lord Chief Justice Hale's treatise *De Jure Maris et Brachioirem Ejusdem* (Concerning the Law of the Sea and its Arms), written around 1666 but not published until 1786.⁴⁵ Thus, the common law doctrine that underlies the ownership of seashores and riverbeds up to the ordinary high-water mark is one of the oldest and most established principles under the common law, and, as will be discussed below, under the U.S. Constitution and Supreme Court case law.

The first case applying an early version of the Public Trust Doctrine under the common law was *Arnold v. Mundy*,⁴⁶ an 1821 decision by the New Jersey Supreme Court. The case arose when Robert Arnold claimed that Benajah Mundy had unlawfully trespassed on his oyster bed and stolen his planted oysters. The primary issue was whether Arnold possessed a valid title to the oyster bed through conveyances that dated back to a royal charter from Charles II, King of England, under which the king had granted title to the tidewater along the Coast of New Jersey to his brother, the Duke of York, thereby excluding the general public from entering and gathering oysters from that commonly held public resource (in this case oysters in a tidewater zone).⁴⁷

Arnold v. Mundy determined that the validity of Arnold's title depended on the King's power to convey such title. *Arnold v. Mundy*'s central finding was that title to land under navigable water was placed in the hands of the sovereign "to be held, protected, and regulated for the common use and benefit." The decision in *Arnold v. Mundy* held that the crown could not grant

⁴³ *The Institutes*, 2.1.1-5.

⁴⁴ 2 H. Bracton, *On the Laws and Customs of England*, at pp. 39-40 (S. Thome trans., 1968).

⁴⁵ See, e.g., Patrick Deveney, *Title, Jus Publicum, and the Public Trust: An Historical Analysis*, 1 Sea Grant Law Journal 13 (1976).

⁴⁶ 6 N.J.L. 1 (N.J. 1821).

⁴⁷ *Arnold*, 6 N.J.L. at 65-78.

land under navigable water, rejecting Hale's statement in *De Jure Maris et Brachioirem Ejusdem* that "the king may grant fishing within a creek of the sea, and that he may also grant a navigable river that is an arm of the sea, with the water and soil thereof." *Arnold v. Mundy* held instead that prior to Magna Charta the crown had made such grants to private individuals, but after Magna Charta the crown had no right to grant land under navigable waters and was obligated to hold such lands "as a trustee to support the title for the common use." Thus, the holding in *Arnold* was that Arnold's grant was void and the Court discharged the trespass claim against Mundy.⁴⁸

Arnold v. Mundy was discussed in *Martin v. Waddell's Lessee* as part of the majority opinion,⁴⁹ and in the dissent by Justice Thompson, where he states inconsistently with the reasoning of his dissent, that "the power which may be exercised by the sovereignty of the state, is nothing more than what is called the jus regium. The right of regulating, improving, and securing the same, for the benefit of every individual citizen. The sovereign power itself, therefore, cannot consistently with the principles of the law of nature and the constitution of a well-ordered society, make a direct and absolute grant of the waters of the state, divesting all the citizens of a common right. It would be a grievance which never could be long borne by a free people."⁵⁰

In England, the sovereign was the crown; in contrast, in the United States the ultimate sovereign under the Constitution is the people – as made clear in the Preamble to the Constitution which famously begins: "We the People." Thus, the holding in *Arnold v. Mundy* that the "sovereign" held tidelands "as a trustee to support the title for the common use" points in the direction the United States Supreme Court would go 21 years later in *Martin v. Waddell's Lessee* when the Supreme Court first enunciated what has come to be known as the Public Trust Doctrine. *Martin v. Waddell's Lessee* would call this obligation of the sovereign to hold submerged lands under navigable waters up to the ordinary high-water "as a trustee to support the title for the common use" a "public trust."⁵¹

James Kent, an American, published in 1828 the authoritative four-volume treatise under both United States and English law on rights to tidelands and the fishery. Kent summarized the common law in both England and the United States as it existed in 1828 as follows:

It is a settled principle in the English law, that the right of soil of owners of land bounded by the sea, or on navigable rivers, where the tide ebbs and flows, extends to the high-water mark; and the shore below common, but not extraordinary high-water mark, belongs to the public; and in England the crown, and in this country the people, have the absolute proprietary interest in the same, though it may, by grant or prescription, become private property.⁵²

⁴⁸ *Arnold*, 6 N.J.L. at 65-78.

⁴⁹ 41 U.S. at 417.

⁵⁰ 41 U.S. at 420.

⁵¹ *Martin v. Waddell's Lessee*, 41 U.S. at 413.

⁵² 3 James Kent, *Commentaries on American Law*, p. 344 (1828). Kent's four-volume work went through 14 editions and was last published in 1896.

2.0 Issues to be resolved in this case regarding ownership of 1) the riverbed beneath the Historic Bridge and 2) ownership in the Historic Bridge itself.

Prior to walking through the Supreme Court cases that govern ownership of the riverbed below the historic 1883 Northern Pacific Railway Bridge, and ownership of the bridge itself, it is useful to state what the legal issues are:

1. Between the Equal Footing and Public Trust Doctrines versus the 1864 Act that created the Northern Pacific, which law governs who has superior title to the riverbed up to the ordinary high-water mark beneath the Historic Bridge, and what kind of ownership interest, if any, did the Northern Pacific acquire under the 1864 Act?
2. If the State of North Dakota owns the riverbed beneath the historic 1883 Northern Pacific Railway Bridge under the Equal Footing and Public Trust Doctrines, what ownership was transferred to the State of North Dakota in the structures and fixtures that were attached to that riverbed when North Dakota became a State on November 2, 1889?

As noted previously, in its March 11, 2022, memorandum BNSF relies on out of context language from the 1864 Act, as well as an 1891 Supreme Court decision that is easily distinguishable both on the law and under the facts from this case, as BNSF's primary legal arguments for why BNSF owns the Historic Bridge. Just as title to any property originally surveyed and transferred under the Homestead Act of 1862 goes back to the original patent issued by the United States, so too does the ownership in the riverbed beneath the Historic Bridge up to the ordinary high-water mark go back to the original documents and transactions from which that ownership is derived – in this case the Louisiana Purchase Treaty as discussed in detail above.

Having gone through the above steps to provide the context for understanding why the Equal Footing Doctrine is the controlling law in this case, this memo will next discuss the related and intertwined Public Trust Doctrine.

Once ownership of the riverbed is established under the Equal Footing Doctrine and Public Trust Doctrines, this memo will then discuss the next question, which is ownership of the fixtures attached to the riverbed at the time that the riverbed up to its ordinary high-water mark was transferred to North Dakota when it became a State on November 2, 1889.

2.1 Between the Equal Footing and Public Trust Doctrines versus the 1864 Act that created the Northern Pacific, the Equal Footing and Public Trust Doctrines (and the rules of construction that apply to those doctrines under Supreme Court precedent) give ownership of the riverbed up to the ordinary high-water mark to North Dakota when it became a State on November 2, 1889. Further, construing these laws to give effect to each, the ownership interest transferred to the Northern Pacific under the 1864 Act was only a right-of-way easement to build, maintain, and operate a railroad; the 1864 Act does not give Northern Pacific title or ownership to the riverbed beneath the Historic Bridge.

The issue of public versus private ownership of land under navigable waters of the United States was not addressed by the United States Supreme Court until 1842 in *Martin v. Waddell's Lessee*,⁵³ which established the Public Trust Doctrine for the first time under United States law.

Martin v. Waddell's Lessee, like *Arnold v. Mundy* discussed above, involved not only oyster beds located on mudflats in the Raritan River near the port of Perth Amboy, New Jersey, but in fact “a very large territory, extending along the Atlantic coast from the river St. Croix to the Delaware bay,”⁵⁴ which King Charles had granted to his brother, the Duke of York. Ownership of the shorelines of all the original colonies that became the States had similar disputes. Thus, the decision in *Martin v. Waddell's Lessee* would determine not only who had the right to harvest oysters and fish from the shore of a very large portion of the New Jersey shoreline, but also for the shoreline of navigable waters over much of the rest of the United States.

When looking at whether Charles II’s grant to the Duke was valid, the *Martin v. Waddell's Lessee* Court stated that it would “inquire into the character of the right claimed by the British crown in the country discovered by its subjects, on this continent; and the principles upon which it was parceled out and granted.”⁵⁵

Deciding who owned the shoreline up to the ordinary high-water mark in New Jersey, the State or the oyster bed’s “proprietor,” the *Martin v. Waddell's Lessee* Court based its decision on the “right of discovery” doctrine, which gave title to the shoreline to the original European colonists of New Jersey – that is, the shoreline of New Jersey was not held by the crown to dispose of as private property (in this case, the King to his brother), but rather the shoreline was held in trust by the crown for the benefit of the colonists who had discovered it. The “right of discovery” doctrine was summarized by the *Martin v. Waddell's Lessee* as follows:

The English possessions in America were not claimed by right of conquest but by right of discovery. For according to the principles of international law, as then understood by the civilized powers of Europe, the Indian tribes in the new world were regarded as mere temporary occupants of the soil, and the absolute rights of property and dominion were held to belong to the European nation by which any particular portion of the country was first discovered. Whatever forbearance may have been sometimes practi[c]ed towards the unfortunate aborigines, either from humanity or policy, yet the territory they occupied was disposed of by the governments of Europe at their pleasure, as if it had been found without inhabitants. The grant to the Duke of York, therefore, was not of lands won by the sword; nor were the government or laws he was authorized to establish intended for a conquered people.⁵⁶

The “right of discovery” doctrine under international law at the time of colonization of the United States underlies not only who owned the ocean shoreline of New Jersey, but also who owned almost all the rest of the land acquired by the United States under various treaties and purchases. For example, the “right of discovery” doctrine was the legal basis under international

⁵³ 41 U.S. 367 (1842). See footnote 49 above and accompanying analysis.

⁵⁴ 41 U.S. at 408.

⁵⁵ 41 U.S. at 409.

⁵⁶ 41 U.S. at 409.

law under which Great Britain, France, and Spain each claimed title to various parts of the Mississippi and Missouri River basins; it was also why those nations claimed title to those areas over the Native American nations that inhabited those territories. The “right of discovery” doctrine was also, for example, why Thomas Jefferson labelled the Lewis & Clark Expedition “The Corps of Discovery” and required Lewis and the rest of the Corps to keep extensive journals of the expedition: by doing so, Jefferson was establishing title in the United States under international law through the “right of discovery” doctrine to not only the upper reaches of the Missouri River, but also to the land to the west of there that had not yet met the legal test under developing international law at that time of being “discovered.”

The “right of discovery” doctrine, as further explained in *Martin v. Waddell's Lessee*, goes on to say that lands acquired under that doctrine are “held by the king in his public and regal character as the representative of the nation, and *in trust* for them.”⁵⁷ (Emphasis supplied.) The *Martin v. Waddell's Lessee* Court further explains the “right of discovery” doctrine as follows:

The [“right of discovery” doctrine] is clearly stated in the case of *Johnson v. McIntosh*, 8 Wheat. 595 ... [which] after stating it to be a principle of universal law that an uninhabited country, if discovered by a number of individuals who owe no allegiance to any government, becomes the property of the discoverers, proceed to say that, “If the discovery be made and possession taken under the authority of an existing government which is acknowledged by the emigrants, it is supposed to be equally well settled that the discovery is made for the benefit of the whole nation; and the vacant soil is to be disposed of by that organ of the government which has the constitutional power to dispose of the national dominions; by that organ, in which all territory is vested by law.”⁵⁸

It is the authority of the United States as the “organ of the government which has the constitutional power to dispose of the national dominions” noted above in *Martin v. Waddell's Lessee* that underlies, to this day, the United States’ ownership and power to dispose of the millions of acres of federal lands in the western United States; it was, more importantly to this case, also the authority that underlay the transfer of all original patents granted by the United States to homesteaders under the Homestead Act of 1862 as well as the transfer of the riverbed of the Missouri river beneath the 1883 Northern Pacific Railway Bridge up to its ordinary high-water mark when North Dakota became a State *because* that property had been held in trust for North Dakota as navigable territorial waters under the Public Trust Doctrine.

Martin v. Waddell's Lessee holds that under the common law, as modified by the “right of discovery” doctrine discussed above, that “dominion and property in navigable waters, and in the lands under them, [were] held by the king *as a public trust*.”⁵⁹ (Emphasis supplied.) This holding was part of a longer rhetorical question, and is worth repeating: “the shores, and rivers, and bays, and arms of the sea, and the land under them, [are] held as a public trust for the benefit of the whole community, to be freely used by all for navigation and fishery, as well for shell-fish as floating fish.”⁶⁰ The answer to the rhetorical question, which is also the underlying holding in

⁵⁷ 41 U.S. at 409.

⁵⁸ 41 U.S. at 409-10.

⁵⁹ 41 U.S. at 413.

⁶⁰ 41 U.S. at 413.

Martin v. Waddell's Lessee, is that the transfer of the shoreline by King Charles to his brother, the Duke of York, was governed by the “right of discovery” doctrine and the Public Trust Doctrine as set forth in *Martin v. Waddell's Lessee*, rather than being converted by “the charter” between Charles II and his brother, the Duke of York, “into private property, to be parcel[ed] out and sold by the duke for his own individual emolument.”⁶¹ Similarly, the riverbed under the Historic 1883 Bridge between Bismarck and Mandan was held in trust under the Public Trust Doctrine for North Dakota for when it became a State; it was not transferred to the Northern Pacific to be parceled out and sold for the railroad’s own individual emolument under the 1864 Act.

It is from the public “public trust” language in *Martin v. Waddell's Lessee* that the Public Trust Doctrine derives its name. Since then, the Public Trust Doctrine has been firmly embedded in American constitutional law in, for example, *Pollard v. Hagan*,⁶² *Illinois Cent. R.R. v. Illinois*,⁶³ *Shively v. Bowlby*,⁶⁴ *United States v. Holt State Bank*,⁶⁵ and *Utah v. United States*.⁶⁶ It is this long-established black letter law version of the Public Trust Doctrine, that the states own the submerged soil and the shorelines of all navigable bodies of water up to their ordinary high-water mark, that is the controlling black letter law in this case. FORB is not relying in this case on the newer, highly contested version of the public trust doctrine that tries to expand the black-letter Public Trust Doctrine first enunciated in *Martin v. Waddell's Lessee*. This newer version of the public trust doctrine attempts to expand upon the “all of these things are by natural law common to all: air, flowing water, the sea and, consequently, the shores of the sea” concept as first announced by Justinian in *The Institutes* as a core principle of the Roman common law.⁶⁷

In this memorandum, FORB is relying on the black letter law version of the Public Trust Doctrine first enunciated in *Martin v. Waddell's Lessee*. The Public Trust Doctrine as enunciated in *Martin v. Waddell's Lessee* gave the original 13 States title to the submerged soil and the shorelines of all navigable bodies of water up to their ordinary high-water mark in part because,

when the Revolution took place, the people of each state became themselves sovereign; and in that character hold the absolute right to all their navigable waters and the soils under them for their own common use, subject only to the rights since surrendered by the Constitution to the general government. A grant made by their authority must therefore manifestly be tried and determined by different principles from those which apply to grants of the British crown.⁶⁸

⁶¹ 41 U.S. at 413.

⁶² 44 U.S. (3. How.) 212, 221 (1845).

⁶³ 146 U.S. 387 (1892).

⁶⁴ 152 U.S. 1 (1894).

⁶⁵ 270 U.S. 49 (1926).

⁶⁶ 403 U.S. 9 (1971).

⁶⁷ *The Institutes*, 2.1.1-5; see, e.g., the seminal article from 1970, Joseph L. Sax, *The Public Trust Doctrine in Natural Resource Law: Effective Judicial Intervention*, 68 Mich. L. Rev. 471 (1970), and the flurry of law reviews in the 1980s that were its progeny, e.g., Richard J. Lazarus, *Changing Conceptions of Property and Sovereignty in Natural Resources: Questioning the Public Trust Doctrine*, 71 Iowa L. Rev. 631, 633-34 (1986); Harrison C. Dunning, *The Public Trust Doctrine and Western Water Law: Discord or Harmony?*, 30 Rocky Mtn. Min. L. Inst. 17 (1985); James L. Huffman, *Trusting the Public Interest to Judges: A Comment on the Public Trust Writing of Professors Sax, Wilkinson, Dunning and Johnson*, 63 Den. U. L. Rev. 565 (1986).

⁶⁸ 41 U.S. at 410-11.

Three years later, in *Pollard v. Hagan*,⁶⁹ the Supreme Court expanded the application of the Public Trust Doctrine enunciated in *Martin v. Waddell's Lessee*, which had applied only to the original 13 States who had fought in the Revolution, to all other States admitted to the Union under the Equal Footing Doctrine, which, for that reason, was discussed in detail in the first part of this memorandum.

Unlike the question of New Jersey's title in *Martin v. Waddell's Lessee*, which dealt with the power of the crown to transfer tidewaters to an individual rather than hold them in trust, Alabama's ownership in *Pollard v. Hagan* depended on the power of the United States, rather than the crown, to own or convey land under navigable waters. The issue in *Pollard v. Hagan* was whether the United States could retain or reserve for itself at the time of statehood land under navigable waters within Alabama, then grant that land to private individuals. Would Alabama, like New Jersey, begin statehood with clear title to its shorelines up to their ordinary high-water mark? To address this issue, *Pollard v. Hagan* used the Equal Footing Doctrine for the first time in any decision by the Supreme Court to address whether the Public Trust Doctrine applied only the original 13 States that had fought in the Revolution, or also applied to new States admitted to the union after the original 13 States.

Pollard v. Hagan framed this issue broadly, addressing whether the United States had any power to convey prior to statehood, or to retain after statehood, any land under navigable waters or shorelines up to the ordinary high-water mark. *Pollard v. Hagan* articulated for the first time and applied the Equal Footing Doctrine in a case before the Court, discussing how under the deeds of cession executed by Virginia and Georgia, and under the Northwest Ordinance, any new states created out of the ceded territory must enter the Union on an equal sovereign footing with the original 13 states.⁷⁰ Since Alabama was formed from land ceded by Georgia to the United States, the Court then stated that for Alabama to enter the Union on an equal footing, Alabama must succeed to "all the rights of sovereignty, jurisdiction, and eminent domain which Georgia possessed at the date of the cession, except so far as this right was diminished by the public lands remaining in the possession and under the control of the United States, for the temporary purposes provided for in the deed of cession [i.e., from Georgia to the United States], and the legislative acts connected with it."⁷¹ As soon as any temporary purposes in the deed of cession from Georgia to the United States were accomplished, "the power of the United States over these lands, as property, was to cease."⁷²

Alabama is therefore entitled to the sovereignty and jurisdiction over all the territory within her limits, subject to the common law, to the same extent that Georgia possessed it before she ceded it to the United States. To maintain any other doctrine, is to deny that Alabama has been admitted into the Union on an equal footing with the original States, the constitution, laws, and compact, to the contrary notwithstanding.⁷³

⁶⁹ 44 U.S. (3. How.) 212, 221 (1845).

⁷⁰ 44 U.S. at 221-22.

⁷¹ 44 U.S. at 223.

⁷² 44 U.S. at 224.

⁷³ 44 U.S. at 228-29.

The Court in *Pollard v. Hagan* emphasized that the United States had no right at all "to transfer to a citizen the title to the shores and the soils under the navigable waters."⁷⁴ "To give to the United States the right to transfer to a citizen the title to the shores and the soils under the navigable waters, would be placing in their hands a weapon which might be wielded greatly to the injury of State sovereignty."⁷⁵ The controlling law in applying the Equal Footing Doctrine to riverbeds and shorelines of territorial waters held in trust by the United States under the Public Trust Doctrine is this: "The right of the United States to the public lands, and the power of Congress to make all needful rules and regulations for the sale and disposition thereof, conferred no power to grant to the plaintiffs the land in controversy in this case"⁷⁶ (i.e., land under navigable waters up to the ordinary high-water mark). The Court also emphasized the distinction between the navigation servitude and the other sticks in the bundle that make up ownership of the shoreline and riverbeds. While the navigational servitude had been granted by the states to the United States in the Constitution, the Court was emphatic that "the shores of navigable waters, and the soils under them, were not granted by the Constitution to the United States, but were reserved to the States respectively."⁷⁷

Martin v. Waddell's Lessee, decided in 1842, and *Pollard v. Hagan*, decided in 1845, were long-established black letter law when the 1864 Act that created the Northern Pacific Railroad was enacted. If the 1864 Act is the equivalent to a "deed" upon which BNSF is attempting to rely as the evidence for BNSF's ownership of the 1883 Northern Pacific Railway Bridge between Bismarck and Mandan, then *Martin v. Waddell's Lessee* and *Pollard v. Hagan* are the controlling black letter law that govern how that "deed," the 1864 Act, is to be interpreted. As such, any ambiguity about whether the 1864 Act overrides the Public Trust Doctrine, which held the riverbed up to the ordinary high-water mark for North Dakota until it became a State, must be construed in favor of the people of North Dakota as the ultimate owners of this historic landmark. As the long-established black letter law when the 1864 Act became law, "[t]he right of the United States to the public lands, and the power of Congress to make all needful rules and regulations for the sale and disposition thereof, conferred no power to grant to the [Northern Pacific] the land [now in 2022] in controversy in this case."⁷⁸ This means that the land under navigable waters up to the ordinary high-water mark was transferred under the Equal Footing and Public Trust Doctrines to the State of North Dakota when it became a State on November 2, 1889, including the riverbed beneath the 1883 Northern Pacific Railway Bridge between Bismarck and Mandan, as well as the bridge itself as a fixture attached to that land at the time when transfer of ownership and title was made to North Dakota.

Since the Public Trust and Equal Footing Doctrines as enunciated in *Martin v. Waddell's Lessee* and *Pollard v. Hagan* come up only in rare cases like this one involving ownership of riverbeds of navigable waters, it is useful to use an analogy to explain them in terms of real estate property law that can be more easily understood, in this case, a contract to purchase a lot and build a new house.

⁷⁴ 44 U.S. at 230.

⁷⁵ 44 U.S. at 230.

⁷⁶ 44 U.S. at 230.

⁷⁷ 44 U.S. at 230.

⁷⁸ 44 U.S. at 230.

The analogy is this: a contract to purchase a yet to be built house usually identifies the land to be transferred after the house is built, and often includes a sidewalk in the plat drawing to accommodate the easement given to the public to cross that property for as long as that house and neighborhood are there. When the newly constructed property is transferred to its first owner by deed after construction of the house and sidewalk are completed, both the house and sidewalk are transferred to the new owner as his or her property. The easement to pass over the property does not give the public ownership of the sidewalk, which is a fixture attached to the real estate that is transferred to and owned by the new owner of the lot when the deed transfers ownership – in the same way that the house is transferred. That is the case here. The Public Trust Doctrine is like the contract to purchase the lot and all fixtures attached to it, including the house and sidewalk (in this case, the historic 1883 bridge between Bismarck and Mandan). The 1864 Act helps define the extent of the right-of-way easement given to the Northern Pacific, but it does not give the Northern Pacific, or its successor BNSF, either ownership of the riverbed up to its ordinary high-water mark, or of the 1883 Northern Pacific Railway Bridge itself, both of which were transferred to the State of North Dakota on November 2, 1889, when North Dakota became a State on equal footing with the 38 other States admitted to the Union before North Dakota.

In summary, both the riverbed and the bridge as a fixture deeply attached to the riverbed were transferred to North Dakota at the time of statehood; that is, North Dakota owns both the riverbed, and the 1883 Northern Pacific Railway Bridge transferred to North Dakota as a fixture attached to that riverbed, under the Equal Footing and Public Trust Doctrines, which were in 1864, and remain today, the controlling black letter law, as first enunciated in *Martin v. Waddell's Lessee* and *Pollard v. Hagan*, for the reasons discussed in excruciating detail above.

2.1.1 Construing the extent of the easement transferred to Northern Pacific under the 1864 Act.

Martin v. Waddell's Lessee also stated for the first time the most important rule of legal construction that applies under the Public Trust Doctrine in determining the nature and extent of the right-of-way easement given for the Northern Pacific's original railway line across all the western territories of the United States west of Bismarck and Mandan (historically referred to as the "Gateway to the West"; see territorial maps in section 1.4 of this memorandum above for the various territories that the transcontinental railway crossed under the 1864 Act). The rule of construction that applies to the Northern Pacific's right-of-way easement under the Public Trust Doctrine, as first set forth in *Martin v. Waddell's Lessee*, is quoted in and followed in *Shively v. Bowlby*.⁷⁹

All grants of the Crown are to be strictly construed against the grantee, contrary to the usual policy of the law in the consideration of grants; and upon this just ground, that the prerogatives and rights and emoluments of the Crown being conferred upon it for great purposes, and for the public use, it shall not be intended that such prerogatives, rights and emoluments are diminished by any grant, beyond what such grant by necessary and unavoidable construction shall take away.⁸⁰

⁷⁹ 152 U.S. 1 (1894).

⁸⁰ *Shively v. Bowlby*, 152 U.S. at 10.

In the same place in the opinion cited above, *Shively v. Bowlby* quotes from the 1837 case, *Proprietors of the Charles River Bridge v. Proprietors of the Warren Bridge*,⁸¹ which held that a "state ought never to be presumed to surrender..." those powers which the "whole community have an interest in preserving... undiminished." Such is the case with preserving the historic 1883 bridge between Bismarck and Mandan under the NHPA (National Historic Preservation Act). Under the *Martin v. Waddell's Lessee* rule of construction that is restated in *Shively v. Bowlby*, whatever property interest in the right-of-way that was transferred to the Northern Pacific in the 1864 Act cannot be construed "beyond what such grant by necessary and unavoidable construction shall take away."⁸² In the case of the Historic Bridge between Bismarck and Mandan, the transfer of the riverbed below the Historic Bridge as well as the bridge itself were transferred to North Dakota at Statehood, leaving to the Northern Pacific (and BNSF) a right-of way easement as the limited transfer implied under the rule of construction that limits transfers under the Public Trust Doctrine to nothing "beyond what such grant by necessary and unavoidable construction shall take away."⁸³

As noted in FORB's February 8th memorandum, *Shively v. Bowlby* summarizes the application of the Equal Footing and Public Trust Doctrines to navigable territorial waters:

The congress of the United States, in disposing of the public lands, has constantly acted upon the theory that those lands, whether in the interior or on the coast, above high-water mark, may be taken up by actual occupants, in order to encourage the settlement of the country, but that the navigable waters and the soils under them, whether within or above the ebb and flow of the tide, shall be and remain public highways; and, being chiefly valuable for the public purposes of commerce, navigation, and fishery, and for the improvements necessary to secure and promote those purposes, shall not be granted away during the period of territorial government, but, unless in case of some international duty or public exigency, shall be held by the United States in trust for the future states, and shall vest in the several states, when organized and admitted into the Union, with all the powers and prerogatives appertaining to the older states in regard to such waters and soils within their respective jurisdictions; in short, shall not be disposed of piecemeal to individuals, as private property, but shall be held as a whole for the purpose of being ultimately administered and dealt with for the public benefit by the state, after it shall have become a completely organized community.⁸⁴

In 1971, seventy-seven years after *Shively v. Bowlby* restated the rule of construction that applies to the Public Trust Doctrine (as first set forth in 1842 in *Martin v. Waddell's Lessee*), the Court in *Utah v. United States*⁸⁵ restated in even more exacting terms the rule of construction that applies to the Public Trust Doctrine:

⁸¹ 36 U.S. (11 Pet.) 420, 546-48 (1837).

⁸² *Shively v. Bowlby*, 152 U.S. at 10.

⁸³ *Shively v. Bowlby*, 152 U.S. at 10.

⁸⁴ *Shively v. Bowlby*, 152 U.S. at 86.

⁸⁵ 403 U.S. 9 (1971).

The principles articulated in *Shively* have been applied a number of times by this Court, and in each case we have consistently acknowledged congressional policy to dispose of sovereign lands only in the most unusual circumstances It follows from this that disposals by the United States during the territorial period are not lightly to be inferred, and should not be regarded as intended unless the intention was definitely declared or otherwise made very plain. We have stated that [a] court deciding a question of title to the bed of a navigable water must ... begin with a strong presumption against conveyance by the United States, and must not infer such a conveyance unless the intention was definitely declared or otherwise made very plain, or was rendered in clear and especial words, or unless the claim confirmed in terms embraces the land under the waters of the stream.⁸⁶ (Citations omitted.)

There are several points to make for each part of this clarified rule of construction as it relates to the 1883 historic bridge between Bismarck and Mandan under the 1864 Act:

- First, “the most unusual circumstances” do not exist in this case. The holding of *Martin v. Waddell's Lessee* established the Public Trust Doctrine as it applies to navigable waterways. The holding of *Pollard v. Hagan* extended the Public Trust Doctrine to new States like North Dakota admitted to the Union. These doctrines are not inconsistent with the overall intent of the 1864 Act, which was to 1) connect the westernmost point of the St. Lawrence seaway at Duluth to Pacific ports near Seattle and Portland, and 2) to facilitate settlement on both sides of the railway by giving the Northern Pacific the ability to issue “railroad patents” to homesteaders for odd numbered sections of land for twenty miles on each side of the right-of-way in the states and forty miles in the territories to pay for building a second transcontinental railroad during the darkest days of the Civil War.

These multiple purposes and intents under the Public Trust and Equal Footing Doctrines are not inconsistent; rather they can be construed together to give intent to each by recognizing the ownership of the riverbed and its fixtures granted to North Dakota at the time of statehood under the Public Trust Doctrine, while also recognizing the right-of-way easement granted to the railroad for the explicit and implicit purposes just mentioned: to connect the two northern seacoasts of the United States and to settle the interior territories of the United States with enough inhabitants to qualify them to become new States during the throes of the Civil War and afterwards.

- Second, “disposals by the United States during the territorial period are not lightly to be inferred, and should not be regarded as intended unless the intention was definitely declared or otherwise made very plain.” From 1) the time Fort Lincoln was established as an infantry and cavalry post in 1872-73 (primarily to protect the surveyors that were surveying the tracts of land on each side of the proposed railroad right-of-way to allow homesteading and to fund the building of the right-of-way as well as grow the population of the territory enough to meet the population thresholds for Dakota Territory to become one or more States, to the time 2) when Fort Lincoln was abandoned in 189 after the

⁸⁶ 403 U.S. at 197-98 (quoting *United States v. Holt State Bank*, 270 U.S. 49, 55 (1926)) (internal quotations omitted). See also *Montana v. United States*, 450 U.S. 544, 552 (1981) discussed later in this memorandum.

Historic Bridge between Bismarck and Mandan was completed and the last miles of track were finished in Montana. During that whole time, and for more than a decade afterwards, the “Port of Bismarck” on the eastern bank of the Missouri River just below the Historic Bridge was the principal place where goods and people embarked on steamboats to the interior plains close to the river between Bismarck and the Rocky Mountains and points beyond.

Ownership of this important historical port located just below the Historic Bridge was reserved for the settlers of the future States of North Dakota and Montana under the Public Trust Doctrine, then granted to North Dakota when it became a State. Transfer to the railroad, under the 1864 Act, of anything more than a right-of-way easement “*should not be regarded as intended unless the intention was definitely declared or otherwise made very plain.*” (Emphasis supplied.) There is no such language in the 1864 Act.

Further, the Public Trust Doctrine was well established black letter law in 1864. There is no language in the 1864 Act that references this commonly understood black letter law, or that transfers, explicitly or implicitly, the land below the Historic Bridge.

Nor does the 1864 Act show any intent to transfer to the railroad the key shoreline along the Missouri River that was to become the Port of Bismarck. The railroad did build a track down to the Missouri River to unload goods onto the steamboats (see photographs from the Archives below); but building the right-of-way and laying track to the edge of the shoreline did not convert ownership of the riverbed up to the ordinary high-water mark to the railroad. In fact, that would have defeated the whole purpose of bringing the railroad right-of-way to Bismarck at that time. The port of Bismarck became the central distribution point of goods and people through the Port of Bismarck below the Historic Bridge to much of the Upper Great Plains along the Missouri River and its tributaries. There is no such declaration in the 1864 Act that transferred to the railroad any ownership of the land which was to become the Port of Bismarck, or the bed of the Missouri River where the Historic Bridge was yet to be located.

- Third, to infer that the intent under the 1864 Act was to transfer the shoreline below the Historic Bridge (that was to become the Port of Bismarck) to the railroad under language of the 1864 Act, “[a] court deciding a question of title to the bed of a navigable water must ... begin with a strong presumption against conveyance by the United States, and must not infer such a conveyance unless the intention was definitely declared or otherwise made very plain, or was rendered in clear and especial words, or unless the claim confirmed in terms embraces the land under the waters of the stream.” There is no language in the 1864 that overcomes this strong presumption.
 - The intention to override the Public Trust Doctrine through the 1864 Act was *not* “definitely declared or otherwise made very plain” in the Act.
 - The intention to override the Public Trust Doctrine through the 1864 Act was *not* “rendered in clear and especial words” in the Act.
 - The intention to override the Public Trust Doctrine through the 1864 Act was *not* “confirmed in terms [that] embrace[d] the land under the waters of ” the Missouri

River below the location of the Historic Bridge, or the shorelines below the Historic Bridge, where the Ports of Bismarck and Mandan were located on each side of the river, and connected by a ferry (from where the stagecoaches, among other things, would depart). See the historic photographs from the National, State, and local archives below that show all these facts.

The “strong presumption against conveyance by the United States” of the waterway beds and shorelines of navigable waters in the territories of the United States, before those territories became States, is not overcome by the language in the 1864 Act. This strong presumption against transfer of property reserved for future States under the Public Trust Doctrine is restated in numerous other cases, for example: *Montana v. United States*, 450 U.S. 544, 552 (1981) (ruling that Montana owned the bed of the Big Horn River within the exterior boundaries of the Crow Tribe Reservation); *United States v. Holt State Bank*, 270 U.S. 49, 57-59 (1926) (ruling that Minnesota owned title to the bed of Mud lake within the Red Lake Indian Reservation); *Summa Corp. v. California ex rel. State Lands Comm'n.*, 466 U.S. 198, 205 (1984) (“[An ordinary federal patent purporting to convey tidelands located within a State to a private individual is invalid, since the United States holds such tidelands only in trust for the State.”); *United States v. Aranson*, 696 F.2d 654, 664-66 (9th Cir. 1983) (ruling that the easterly half of the Colorado River bed had not been conveyed as part of the Colorado River Indian Reservation), cert. denied, 469 U.S. 982 (1983); *Skokomish Indian Tribe v. France*, 320 F.2d 205 (9th Cir. 1963) (concluding that tidelands adjacent to Skokomish tribe's reservation had passed to the State of Washington), cert. denied, 376 U.S. 943 (1964); *Taylor v. United States* 44 F.2d 531, 536 (9th Cir. 1930) (holding that the Presidential order setting aside for the Quileute Indian tribe land bordering on navigable river did not reserve submerged lands), cert. denied. 283 U.S. 820 (1931); *Wisconsin v. Baker*, 524 F. Supp. 726, 734 (W.D. Wis. 1981) (rejecting tribal claim to regulate hunting and fishing in navigable waters lying within the exterior boundaries of the Lac Courte Oreilles Reservation), modified by 698 F.2d 1323 (7th Cir. 1983), cert. denied, 463 U.S. 1207 (1983); and *Massachusetts v. New York*, 271 U.S. 65, 89 (1926) (concluding that “grants [of soil under navigable waters] are peculiarly subject to the rule, applicable generally, that all grants by or to a sovereign government, as distinguished from private grants, must be construed so as to diminish the public rights of the sovereign only so far as is made necessary by an **unavoidable construction**”) (emphasis supplied; citations omitted).

There is no “unavoidable construction” of the 1864 Act that overcomes the strong presumption *against* reading into the Act an intent to transfer the bed of the Missouri River below the Historic Bridge to the railroad; rather, under the Public Trust and Equal Footing Doctrines, the riverbed continued to be held in trust for North Dakota until statehood.

The cases that BNSF cites in its March 11, 2022, memorandum – *Montana v. United States*, 450 U.S. 544, 555 (1981); *Idaho v. United States*, 533 U.S. 262, 273 (2001); *United States v. Alaska*, 521 U.S. 1, 33–34 (1997) (holding that Congress can reserve submerged lands under federal control for an appropriate public purpose); *United States v. City of Anchorage, Alaska*, 437 F.2d 1081 (9th Cir. 1971) (holding that title to tidal and submerged lands adjacent to federally owned and operated railroad line and terminal remained in United States after Alaska was admitted as a state) – are all distinguishable from this case. Nothing in the 1864 Act had any language whatsoever that reserved submerged lands or dealt with the Public Trust Doctrine,

which had been established black letter law for two decades. The fact that Congress can reserve such interests is overcome by the fact that, in the 1864 Act, Congress did not make any such reservation or extinguishment of riverbeds and shorelines reserved in trust for future States under the Public Trust Doctrine. Without express language in the 1864 Act expressing such intent, no such interest was reserved.

In summary, when the Public Trust and Equal Footing Doctrines are construed together with the language of the 1864 Act, the only reasonable construction that gives effect to each is that the riverbed below the Historic Bridge was held in trust for the State, then transferred to North Dakota at statehood; the interest given to the railroad under the 1864 Act was, as discussed by Darwin Roberts in his law review below, the same special kind of right-of-way easement given to all other railroads under previous and subsequent Acts creating railroads. Darwin Roberts' review largely deals with who, among the federal government, the railroad, and private landowners (but not the State under the Public Trust Doctrine), owns abandoned rail lines. Nevertheless, Roberts' review describes and summarizes the type of ownership given to railroads in all federal laws creating railroads from the 1830s on, which is the equivalent of a right-of-way easement. Just as there is an easement under the common law for navigation over the waterways, and over sidewalks for pedestrians, a similar easement was created by Congress for railroads beginning in the 1830s over the territorial lands of the western United States to build the railways that gradually displaced the primary role that waterways had played (over decades) for transport of goods and people in interstate commerce.

Thus, Roberts notes that, beginning in the 1830s, Congress granted railroads thousands of miles of rights-of-way across territories of the western United States and other public lands. Those rights-of-way, however, were consistently granted in language that created the equivalent of an easement that neither extinguished federal ownership of the land subject to that right-of-way, nor changed state ownership of riverbeds up to the ordinary high-water mark under the Equal Footing and Public Trust Doctrines when a new State was admitted into the Union.

The evidence actually indicates that throughout the nineteenth century, beginning in the 1830s, Congress followed consistent policies with respect to its railroad rights-of-way. Despite characterizing them as "easements" or similar to easements, it viewed them as property over which the United States retained continued ownership and control. Moreover, because Congress viewed railroad right-of-way grants as separate from its railroad land subsidy grants, Congress did not intend to change rights-of-way in 1871 when it ceased granting land subsidies.⁸⁷

Later in his review of the case law and statutory enactments of Congress relating to railroad rights-of-way, Darwin continues:

Over the course of the nineteenth century, Congress acted consistently when it granted railroad rights-of-way through the federal public lands. Congress settled on legal terminology in the late 1830s, early in the development of American

⁸⁷ Darwin P. Roberts, *The Legal History of Federally Granted Railroad Rights-of-Way and The Myth of Congress's "1871 Shift,"* 82 *Colo. Law Rev.* 85, 93 (2011).

railroads, and used that terminology with relatively little variation throughout the rest of the century. Congress repeatedly referred to its granted rights-of-way as “easements” or as similar to easements. But it viewed federally granted railroad rights-of-way as very different from mere common-law easements. Congress considered rights-of-way appropriations of public lands for a public purpose, which made those lands unavailable for subsequent settlement or acquisition. Through its enactments and in its debates, Congress indicated its consistent intent that the land underlying rights-of-way was owned by the government, which was either implicitly or explicitly subject to reversion if the purpose of the appropriation terminated. Finally, Congress confirmed this view of the property by asserting the right to revoke and forfeit railroad grants back to the United States and to regulate the disposition of forfeited and abandoned railroad rights-of-way.⁸⁸

In summary, as noted above, the overwhelming weight of the precedent and case law shows that the Historic Bridge was held in trust for the State, then transferred to North Dakota at statehood; the interest given to the railroad under the 1864 Act was the same special kind of right-of-way easement given to all other railroads under previous and subsequent Acts creating railroads. This is confirmed by the language of the 1864 Act and the cases cited in BNSF, in its March 11, 2022, memorandum:

- The first case BNSF cites in its March 11th memorandum is *Northern Pac. Ry. Co. v. Townsend*, 190 U.S. 267 (1903), which is both irrelevant and inapposite to the issues raised in this case for several reasons:

The facts of *Townsend* show that it involves an issue of adverse possession involving 1) a patent issued to a homesteader under the 1862 Homestead Act versus 2) land within 10 miles of the railroad right-of-way which the railroad had in *Townsend* that the railroad had “acquired ... by purchase at a sale under foreclosure of certain mortgages under section 3 of the 1864 Act.” The land in question was part of the land which, under Section 3 of the 1864 Act, “created a large land grant to secure the construction and continuous maintenance of the road.” *Townsend*, supra, 190 U.S. at 267-68. The four-hundred-foot-wide right-of-way was built through land that the homesteader had received by patent under the Homestead Act. The Court in *Townsend* stated that the issue was “whether an individual, for private purposes may, by adverse possession, under a state statute of limitations, acquire title to a portion of the right of way granted by the United States for the use of this railroad.” 190 U.S. at 270. This is not an issue of fact or law raised regarding the historic 1883 bridge between Bismarck and Mandan.

Based on the facts and law discussed in *Townsend*, it clearly does not involve the issue of ownership of a riverbed of a navigable river at a railroad crossing, the State or the railroad, which is the issue raised in this case regarding the Historic Bridge. Thus, *Townsend* is distinguishable on both the facts and the issues of law raised by the Historic Bridge crossing, making *Townsend* both irrelevant and inapposite to the issues raised in

⁸⁸ Darwin P. Roberts, supra, *The Legal History of Federally Granted Railroad Rights-of-Way and the Myth of Congress’s “1871 Shift,”* 82 Colo. Law Rev. at 149-50.

this case – which involve ownership of the riverbed beneath the historic 1883 bridge between Bismarck and Mandan, as well as the bridge itself, under the Equal Footing and Public Trust Doctrines versus the 1864 Act as addressed in detail in FORB’s memorandum above.

- BNSF’s March 11th memorandum also cites, and highlights language quoted in *Townsend*, 190 U.S. at 190, from Section 2 of the 1864 Act. Section 2 of the 1864 Act “grant[s] to said Northern Pacific Railroad Company, its successors and assigns” “the **right of way through the public lands** ... for the construction of a railroad and telegraph as proposed; and the right, power, and authority ... to take from the public lands, adjacent to the line of said road, material of earth, stone, timber, and so forth, for the construction thereof.” (Emphasis supplied.) This language, on its face, grants only a “**right of way through the public lands** ... for the construction of a railroad” plus “the right ... to take from the public lands, adjacent to the line of said road, material of earth, stone, timber, and so forth, for the construction thereof.” That is, as discussed in Roberts’ law review above, what the Northern Pacific received under Section 2 of the 1864 Act was a “**right of way through the public lands**,” not ownership of the underlying land, plus “the right ... to take material of earth, stone, timber, and so forth, for the construction thereof.” This actually supports FORB’s position in this case, which is that BNSF under the 1864 Act owns only a right-of-way easement, not the riverbed up to the ordinary high-water mark, or the bridge itself.
- BNSF’s March 11th memorandum also cites and highlights language from Section 7 of the 1864 Act dealing with “Eminent Domain.” It is elementary that “[e]minent domain is the right of the people or government to take **private property** for public use.”⁸⁹ The construction of the Historic Bridge between Bismarck and Mandan did not involve taking private property by eminent domain, but rather navigable territorial waters owned by the United States that were reserved for North Dakota under the Public Trust and Equal Footing Doctrine, and then transferred to North Dakota at the time of statehood. Thus, Section 7 of the 1864 Act, which involves taking private property through eminent domain, is irrelevant to the issue of ownership of the Historic Bridge.
- BNSF has no “patent” showing original title for the riverbed up to the ordinary high-water mark for river crossing under the Historical Bridge between Bismarck and Mandan. All BNSF has is the language of Section 2 of the 1864 Act, which, by its plain terms, grants to the Northern Pacific, and BNSF as Northern Pacific’s successor, only a mere “**right of way through the public lands** ... for the construction of a railroad” plus “the right ... to take from the public lands, adjacent to the line of said road, material of earth, stone, timber, and so forth, for the construction thereof.” In BNSF’s March 11th memorandum, BNSF tries to “bootstrap” itself out of this lack of a document showing any original title by citing language from *St. Paul & P.R. Co. v. Northern Pac. R.R. Co.*, 139 U.S. 1, at 6 (1891) and *Northern Pac. R.R. Co v. Walker*, 47 F. 681, 682–83 (C.C.N.D. 1891), that it can rely on “would be **evidence** (emphasis by BNSF) that, as to that portion of the road, the conditions of the grant had been complied with, and that it

⁸⁹ See, e.g., <https://thelawdictionary.org/?s=eminent+domain>

was thus freed from any liability to forfeiture for a disregard of them. They would also obviate the necessity of any further evidence of the grantee's title.”

BNSF also suggests that evidence of how the property was surveyed is evidence that BNSF owns the Historic Bridge crossing; but BNSF has in hand no patent from the U.S. government, or any deed or condemnation judgment secured through eminent domain through the railroad's ability to take private property by means of the eminent domain process, because they do not exist for the Historic Bridge. BNSF tries to ignore and fails to address in its memorandum either the Public Trust or the Equal Footing Doctrine, each of which apply to riverbeds of navigable territorial waters up to the ordinary high-water mark. Under those doctrines, the riverbed of a navigable territorial water, such as the Missouri River below the Historic Bridge, was held by the United States in trust for North Dakota until it became a State, then transferred by the United States to North Dakota at the time of statehood on November 2, 1889.

Further, the special rules of construction that apply to the Historic Bridge in this case under the Equal footing and Public Trust Doctrines, as set forth and developed in *Martin v. Waddell's Lessee*, *Shively v. Bowlby*, *Utah v. United States* – and the numerous other Public Trust doctrine cases (cited and discussed in detail above) that apply to ownership of the beds of navigable territorial waters of the United States – clearly show that the State of North Dakota owns the riverbed and attached fixtures under the Historic Bridge up to the ordinary high-water mark in 1889, and BNSF owns only a mere “**right of way through the public lands** ... for the construction of a railroad” plus “the right ... to take from the public lands, adjacent to the line of said road, material of earth, stone, timber, and so forth, for the construction thereof.” That is what the evidence shows in this case.

- Next, in Section 1.C. of BNSF's March 11th memorandum, BNSF claims ownership under the surveying process that occurred at the Historic Bridge before it was built. For the reasons discussed in the bullet above, mere surveying of the bridge crossing does not give BNSF any ownership of the Historic Bridge. Again, under the special rules of construction that apply to the Historic Bridge under the Equal footing and Public Trust Doctrines, as set forth and developed in *Martin v. Waddell's Lessee*, *Shively v. Bowlby*, *Utah v. United States*, and the numerous other Public Trust doctrine cases (cited and discussed in detail above) that apply to ownership of the beds of navigable territorial waters of the United States, the State of North Dakota owns the riverbed and attached fixtures under the Historic Bridge up to the ordinary high-water mark in 1889, and BNSF owns only a mere “**right of way through the public lands** ... for the construction of a railroad” plus “the right ... to take from the public lands, adjacent to the line of said road, material of earth, stone, timber, and so forth, for the construction thereof.”
- Next, in Section 1.D. of BNSF's March 11th memorandum, BNSF claims that “The 1864 Act of Congress Conferred Upon Northern Pacific Railroad a Right to Build and Maintain Bridges Across Navigable Waterways.” As the plain language of this heading states, all that the 1864 Act gave to the Northern Pacific, and BNSF as its successor, was a mere “**Right to Build and Maintain Bridges Across Navigable Waterways**” – not

ownership of the navigable waterway or the bridge itself. As *Union Pac. R.R. Co. v. Hall*, 91 U.S. 343, 352 (1875), as cited by BNSF, states:

“the bridge over the river, built by the railroad company, is a part of their railroad, and required by law to be so operatedThe acts chartering the company manifest no intention to distinguish between the bridge over the Missouri River and other bridges on the line of their road. If it is not a part of their road, neither is any bridge between the Missouri and the western boundary of Nevada; for the power to build all bridges was given in the same words.”

Again, FORB does not contest that the Historic Bridge “is a part of [BNSF’s] railroad . . . [or, that BNSF’s railroad is] required by law to be so operated [as a railroad].” Northern Pacific, and BNSF as its successor, have an easement to maintain and operate BNSF’s railroad over the Historic Bridge – but it does not follow that BNSF owns either the riverbed beneath the bridge or the bridge itself (see the more easily understood analogy above discussing the easement pedestrians have to walk over a sidewalk owned by the owner of the adjacent house). Again, it is not true, and it does not follow, that the Northern Pacific, or BNSF as its successor, owned or own the riverbed beneath the Historic Bridge or the Bridge itself for the reasons discussed throughout FORB’s memorandum.

Thus, BNSF owns only a mere “***right of way through the public lands*** . . . for the construction of a railroad” plus “the right . . . to take from the public lands, adjacent to the line of said road, material of earth, stone, timber, and so forth, for the construction thereof,” plus a right to operate and maintain the Historic Bridge as “a part of their railroad.” Ownership of the riverbed beneath the Historic Bridge, as well as the bridge as a fixture attached to it, however, is held by the people of the State of North Dakota, under the special rules of construction that apply to the Historic Bridge under the Equal footing and Public Trust Doctrines, as set forth and developed in *Martin v. Waddell’s Lessee*, *Shively v. Bowlby*, *Utah v. United States*, and the numerous other Public Trust doctrine cases (cited and discussed in detail above) that apply to ownership of the beds of navigable territorial waters of the United States, as passed to North Dakota at statehood on November 2, 1889.

The same analysis applies to *Hughes v. Northern Pac. Ry. Co.*, 18 F. 106, 114–15 (C.C.Or. 1883) and *Northern Pacific Railroad Co. v. Walker*, 47 F. 681, 685 (C.C.N.D. 1891): BNSF owns only a mere “***right of way through the public lands***” plus a “***Right to Build and Maintain Bridges Across Navigable Waterways***”; it does not follow that BNSF owns the riverbed beneath the Historic Bridge or the bridge itself. Under the rules of construction set forth in *Martin v. Waddell’s Lessee*, *Shively v. Bowlby*, *Utah v. United States*, and the numerous other Public Trust doctrine cases (cited and discussed in detail above), both the riverbed beneath the Historic Bridge and the bridge itself belong to the people of the State of North Dakota.

Finally, BNSF cites *Northern Pacific Railroad Co. v. Carland*, 3 P. 134, 138–39 (Mont. Terr. 1884), which “discuss[es] the exemption of Northern Pacific’s right of way from

taxation” under the 1864 Act, as evidence that it owns the property beneath the right-of-way easement. *Northern Pacific Railroad Co. v. Carland* is distinguishable under both its law and its facts from this case involving ownership of the Historic Bridge under the Equal Footing and Public Trust Doctrines. *Northern Pacific Railroad Co. v. Carland* deals with the issue of whether the right-of-way of the railroad in Montana Territory can be taxed by the Territory of Montana. It concludes, under Montana Territory tax law, that it can be. *Northern Pacific Railroad Co. v. Carland* does not address the issue of ownership of the riverbed up to its high-water mark and the bridge as a fixture attached to that property under the Equal Footing and Public Trust Doctrines – which are the issues we are addressing with regard to the historic 1883 bridge between Bismarck and Mandan. In 1884, the riverbeds beneath the Missouri River in Montana were still being held in trust under the Public Trust Doctrine for when Montana became a State in 1889, the same time as North Dakota. And, like North Dakota, those riverbeds and any fixtures attached to them in 1889 became the property of the people of Montana at the time of Montana’s statehood on November 8, 1889, six days after North Dakota.

Thus, *Northern Pacific Railroad Co. v. Carland* is irrelevant to and distinguishable from this case involving the Historic Bridge for two reasons: 1) it involves ownership of the right-of-way under territorial tax law, rather than territorial real estate law, which can be different (for example, the holder of a contract for deed may have to pay the real estate taxes, even though that holder does not yet have legal title); and 2) it does not raise or address the issue of ownership of the riverbed under navigable territorial waters, which in 1884 in Montana Territory was being held in trust by the United States under the Public Trust Doctrine for when Montana achieved statehood on November 8, 1889. Thus, its relevance to the dispute over ownership of the Historic Bridge between Bismarck and Mandan is very limited, if not totally irrelevant.

- Next, in Section 1.E. of BNSF’s March 11th memorandum, BNSF claims that **“BNSF Has Maintained its Ownership Interest in the Bismarck Bridge Through Its Continued Use of the Structure.”**

First, as discussed throughout FORB’s memorandum, the “ownership interest” that BNSF has in the riverbed beneath the Historic Bridge, and the bridge itself, is a “right-of-way easement” that allows it to operate and maintain its railway over the Historic Bridge, but under which BNSF does not own either the riverbed beneath the Historic Bridge, or the bridge itself. For the reasons discussed throughout this memorandum, ownership of the riverbed beneath the Historic Bridge and the bridge itself passed to the people of the State of North Dakota upon statehood on November 2, 1889.

Second, it is true that “[t]he right-of-way grant made by the 1864 Act has ... [in some cases] been described as a limited fee upon an implied condition of reverter.” See *Townsend*, 190 U. S. at 271, and the two other cases cited by BNSF (one just in a footnote as dicta). This language describing the “ownership interest” held by BNSF – “a limited fee upon an implied condition of reverter” – is just a convoluted and confusing way of saying that what was granted to the Northern Pacific under Section 2 of the 1864 Act was a mere **“right of way through the public lands ... for the construction of a**

railroad” plus “the right ... to take from the public lands, adjacent to the line of said road, material of earth, stone, timber, and so forth, for the construction thereof,” plus a right to operate and maintain the Historic Bridge as “a part of their railroad.” Another way of putting it is this language means that Northern Pacific received a right-of-way easement that the United States could cancel upon certain conditions. Either way, this special limited transfer of a right-of-way interest does not give BNSF ownership of the underlying riverbed or the bridge itself.

Third, *Townsend*, 190 U. S. at 271, is, as discussed above, an “adverse possession” case brought by the railroad against a private landowner who had acquired what he thought was valid title under the Homestead Act, but which the U.S. Supreme Court, in overturning a decision by the Minnesota Supreme Court, determined that the foreclosed mortgage the railroad had “acquired ... by purchase at a sale under foreclosure of certain mortgages under section 3 of the 1864 Act” gave it superior title to the adverse possession claim by the homesteader. (See discussion of the facts of *Townsend* above.)

The State of North Dakota is not a private landowner as in *Townsend*. Nor is North Dakota the one claiming ownership by adverse possession. Rather, North Dakota became the owner at the time of statehood under the Equal Footing and Public Trust Doctrines for the reasons set forth in detail above in discussing *Martin v. Waddell's Lessee* and *Pollard v. Hagan*, under which the United States had no right at all "to transfer to a citizen the title to the shores and the soils under the navigable waters,"⁹⁰ and under which “[t]he right of the United States to the public lands, and the power of Congress to make all needful rules and regulations for the sale and disposition thereof, conferred no power to grant to the plaintiffs the land in controversy in this case,”⁹¹ i.e., in this case, the land under navigable waters up to the ordinary high-water mark beneath the historic 1883 bridge between Bismarck and Mandan. “[T]he shores of navigable waters, and the soils under them, were not granted by the Constitution to the United States, but were reserved to the States respectively.”⁹² In 1977, the United States Supreme Court made this clear in *Oregon v. Corvallis Sand and Gravel Co.*:

Our analysis today leads us to conclude that our decision to apply federal common law in *Bonelli* was incorrect Although federal law may fix the initial boundary between fast lands and the riverbeds at the time of admission to the Union, the State's title to the riverbed vests absolutely as of the time of a State's admission and is not subject to later defeasance by operation of any doctrine of federal common law.⁹³...

Once the equal footing doctrine had vested title to the riverbed in Arizona as of the time of its admission to the Union, the force of that doctrine was spent; it did not operate after that date to determine what effect on titles the movement of the river might have. Our error, as we now see it, was to

⁹⁰ 44 U.S. at 230.

⁹¹ 44 U.S. at 230.

⁹² 44 U.S. at 230.

⁹³ 429 U.S. 363, 370-71 (1977).

view the equal footing doctrine enunciated in *Pollard's Lessee v. Hagan* as a basis upon which federal common law could supersede state law in the determination of land titles. Precisely the contrary is true.⁹⁴

Thus, the issue in this case with regard to adverse possession is whether the Northern Pacific and BNSF acquired ownership of the Historic Bridge by adverse possession through use of the 1883 bridge as a railway for the last 139 years. The answer to that question is clear under North Dakota law.

The most fundamental law in North Dakota, its Constitution, does not allow adverse possession against the State:

No law shall ever be passed by the legislative assembly granting to any person, corporation or association any privileges by reason of the occupation, cultivation or improvement of any public lands by said person, corporation or association subsequent to the survey thereof by the general government. No claim for the occupation, cultivation or improvement of any public lands shall ever be recognized, nor shall such occupation, cultivation or improvement of any public lands ever be used to diminish either directly or indirectly, the purchase price of said lands.

N.D. State Const. Art. IX, Sec. 9.

The State Constitution for North Dakota was subject to significant influence from the Northern Pacific Railroad when it was drafted in 1889. See Robert Vogel, *Sources of the 1889 North Dakota Constitution*, 65 N.D. Law Rev. 331 (1989). Nothing in the North Dakota Constitution, however, diminishes State ownership of the riverbed of the Missouri River up to the ordinary high-water mark. On the contrary, N.D. State Const. Art. IX, Sec. 9, prohibits North Dakota's legislature from diminishing or extinguishing such interests, and, as shown by the highlighted language above, does not allow adverse possession against the State of North Dakota.

In summary, nothing in the 1864 Act by Congress that created the Northern Pacific Railroad creates anything more than a right-of-way easement across the Missouri River at the crossing for the Historic 1883 Northern Pacific Railway Bridge between Bismarck and Mandan, Act of July 2, 1864, ch. 217, 13 Stat. 365; nor is there any language in chapter 217 that terminates or extinguishes the ownership interest in the riverbed up to the ordinary high-water held in trust by the United States until it was transferred to North Dakota when it became a State. The same is true for the Enabling Act that created the State of North Dakota. 25 U.S. Statutes at Large, ch. 180, p 676 (February 22, 1889).

As noted by BNSF at the beginning of its March 11, 2022, memorandum, the "first section of the 1864 Act incorporated the Northern Pacific Railroad and empowered it to '**construct and maintain a continuous railroad** from a point on Lake Superior to some point on Puget sound.' *Northern Pac. Ry. Co. v. Townsend*, 190 U.S. 267, 267 (1903)." This language did not extinguish the future interest of North Dakota in the navigable

⁹⁴ 429 U.S. at 371.

territorial waters up to its ordinary high-water mark beneath the Historic Bridge, which were held in trust under the Public Trust Doctrine until statehood, then transferred to North Dakota when it became a State on November 2, 1889.

- Finally, in Section 4 of BNSF’s March 11th memorandum, BNSF claims “Any Action to Divest BNSF of Title to the Bismarck Bridge Would Be Barred By the Equitable Defense of Laches.” This action is not trying to divest BNSF of any title, but rather to recognize and enforce the title to the riverbed below the Historic Bridge, and the bridge itself, that was transferred to North Dakota at Statehood.

If there was any “laches,” it was on the failure on the part of the Northern Pacific, and BNSF as its successor, to address ownership of the riverbed and shoreline of the Missouri River for the reasons discussed at the beginning of this memorandum, because the Equal Footing and Public Trust Doctrines were long-established black letter law when the 1864 Act was enacted by Congress. By failing to address the Equal Footing and Public Trust Doctrines as set forth in this memorandum, the railroad has been guilty of laches by not addressing the ownership issues raised by those doctrines from the time the 1864 Act was written, through the current application by BNSF to get a permit from USCG to destroy the Historic Bridge, with hardly a nod to the bridge’s history and importance as an historical landmark, for example:

- The proponents of the 1864 Act that created the Northern Pacific Railroad were guilty of laches when they ignored the long-established Equal Footing and Public Trust Doctrines when they went to Congress and secured passage of the 1864 Act without addressing the issue of ownership of the riverbeds that the railroad right-of-way would cross.
- The Northern Pacific was guilty of laches when it surveyed (in Dakota territory, under the protection of Lt. Colonel Custer and the U.S. Army troops stationed at Fort Lincoln) the crossing at the Missouri River, and all other river crossings over navigable rivers in Dakota Territory further west, again without addressing the issue of ownership of the riverbeds that the railroad right-of-way would cross.
- The Northern Pacific again was guilty of laches when it ignored it constructed the 1883 Northern Pacific Railway Bridge between Bismarck and Mandan without first establishing that the railroad owned the Historic Bridge on a riverbed whose ownership was reserved to a future state under the Public Trust and Equal Footing Doctrines.
- And BNSF is again guilty of laches by attempting to destroy the historic 1883 Northern Pacific Railway Bridge as its own personal property, without first addressing the issue of whether BNSF owned the bridge, and without having to comply with and pay for the costs to “avoid, minimize, and mitigate” the impacts of the proposed project on the Historic Bridge, as required of the project proponent under NHPA and its implementing regulations.

Finally, in its March 11, 2022, memorandum, BNSF fails to acknowledge and address the primary issue raised by FORB in FORB’s February 8th memorandum and follow up letters to USCG. BNSF ignores and fails to address the Public Trust and Equal Footing Doctrines in its March 11th memorandum, apparently hoping that no one would notice. Those doctrines,

however, were the means by which title and ownership of the Historic Bridge passed to North Dakota at statehood. All of BNSF's March 11th memo, and cases and laws cited therein, are essentially irrelevant and inapposite because they do not address the central issue raised by FORB, which is, whether the Equal Footing and Public Trust Doctrines transferred ownership of the riverbed beneath the Historic Bridge, and the bridge itself, to North Dakota at the time of Statehood. FORB's response in this memorandum has addressed the issues BNSF raised in its March 11th memorandum. But BNSF has yet to acknowledge and address the Equal Footing and Public Trust Doctrines, and whether under their plain language, and the rules of construction that apply to them, ownership of the Historic Bridge was transferred to North Dakota on November 2, 1889.

In summary, North Dakota became the owner of the riverbed beneath the Historic Bridge, and the Bridge itself, at statehood. As Stated in Section 2 of the 1864 Act, the railroad was granted only a "***right of way through the public lands*** ... for the construction of a railroad" plus "the right ... to take from the public lands, adjacent to the line of said road, material of earth, stone, timber, and so forth, for the construction thereof," plus a right to operate and maintain the Historic Bridge and the rest of its right-of-way as "a part of their railroad." As stated in *Oregon v. Corvallis Sand and Gravel Co.* discussed above, "the State's title to the riverbed vests absolutely as of the time of a State's admission and is not subject to later defeasance by operation of any doctrine of federal common law."⁹⁵

2.2 The evidence is overwhelming that all four piers of the Historic Bridge, as well as the embankment west of the Historic Bridge, all were within the riverbed of the Missouri river up to its ordinary high-water mark when North Dakota became a State in 1889. Thus, they were transferred as fixtures attached to the land when North Dakota became a State on November 2, 1889.

Under both federal and state common law, as well as North Dakota statutory law, fixtures that are part of the real property are transferred with the land. As noted in *Oregon v. Corvallis Sand and Gravel Co.*:

Once the equal footing doctrine had vested title to the riverbed [of a State] as of the time of its admission to the Union, the force of that doctrine was spent; it did not operate after that date to determine what effect on titles the movement of the river might have.⁹⁶

Thus, State law determines ownership of the bed of a river and its shorelines, and anything affixed to it as a fixture, after North Dakota was admitted to the Union.

The following provisions of the North Dakota Century Code are the law that applies to the transfer of fixtures to the land, and thus to the Historic Bridge, after statehood. Further, all of

⁹⁵ 429 U.S. at 370-71.

⁹⁶ 429 U.S. at 371.

the provisions of the North Dakota Century Code are consistent with federal and state common law and territorial law when North Dakota achieved statehood on November 2, 1889.

- NDCC § 47-01-02 divides all property into two categories: “Property is: 1. Real or immovable; or 2. Personal or movable.”
- NDCC § 47-01-03 defines “real property”: “Real or immovable property consists of:
 1. Land;
 2. That which is affixed to land...;
 3. That which is incidental or appurtenant to land; and
 4. That which is immovable by law.
- NDCC § 47-01-04 defines “Land” as “the solid material of the earth, whatever may be the ingredients of which it is composed, whether soil, rock, or other substance.”
- NDCC § 47-01-05. Fixtures defined. A thing is deemed to be affixed to land when it is attached to it by roots, as in the case of trees, vines, or shrubs, or imbedded in it, as in the case of walls, or permanently resting upon it, as in the case of buildings, or permanently attached to what is thus permanent, as by means of cement, plaster, nails, bolts, or screws.

Current North Dakota State Geologist Edward Murphy’s 1995 article on the history of the construction and upgrades to “The Northern Pacific Railway Bridge at Bismarck” provides much of the information needed to determine whether each of the four piers that support the Historic 1883 Northern Pacific Railway Bridge, as well as the embankment west of the bridge were located on the riverbed below the ordinary high-water mark at the time ownership of the riverbed was transferred to North Dakota in November 1889. A copy of this article was attached to FORB’s February 8th memorandum to USCG. The last photograph in Ed Murphy’s 1995 article shows, with the long white dashes west of the river, where the western ordinary high- water shoreline of the bridge and embankment were in the 1880s:



Figure 12: Aerial Photograph of the Missouri River, Taken Looking North Towards the Historic Bridge. White Lines Mark the Western Ordinary High-Water Line in the 1880s (taken from Murphy 1995).

Murphy writes of this photograph (Figure 12):

Recent photo [in 1995] looking north along the Missouri River to the Bismarck Railroad Bridge, with the Grant Marsh Bridge on I-94 in the background. The line of long dashes outlines the approximate position of the west bank of the Missouri River prior to Morison's dike. The open arrow flower (right) points to the 1951 cut and track realignment; short dashes trace the old track alignment; the solid arrow {center right} points to the city of Bismarck water reservoirs. The line change and landslide work required removing 760,000 cubic yards of soil from this area (Photo courtesy of the North Dakota Geological Survey).

The navigability of the Missouri River at the crossing for the Historic 1883 Northern Pacific Railway Bridge should be an uncontested issue of fact. As discussed in detail earlier in this memorandum, it is documented, for example, in Lewis & Clark's Journals for their 1804-06 expedition to explore the territory transferred to the United States under the Louisiana Purchase and the areas west of Louisiana territory to the Pacific Ocean. It is also documented by, for example, the journey of the Far West steamboat up the Missouri River after the Battle of the

Little Bighorn on June 25, 1876, as well as countless books and historical documents that document and recount steamboat traffic on the Missouri River from St. Louis, Missouri, to Fort Benton in Montana until more than a decade after the 1883 Northern Pacific Railway Bridge was completed, including maps and logs of riverboat captains in the North Dakota State Historical Society of North Dakota archives.

All four piers of the Historic Bridge were permanently affixed to the land (river bottom) when constructed in 1881 and 1882 as described in Edward Murphy's attached article. For example, the "caisson for pier 2 was bottomed forty-six feet below the base of the river; the caisson for pier 3 was sunk thirty-nine feet" into the sandstone bedrock (Murphy 1995:8). The western pier of the historic bridge – the pier Murphy labels as pier 4 – was permanently affixed to the riverbed on 161 timber piles on a part of the channel altered by a dike to build up the riverbed below the ordinary high-water mark of the river before the bridge was constructed (Murphy 1995:6-10). The eastern pier (labeled by Murphy as pier 1) was located on property below the high-water mark that was also regularly flooded.

The 1883 *History of the Northern Pacific Railroad* by Eugene V. Smalley, earlier discussed in this memorandum, provides a comprehensive history of the Northern Pacific Railroad from early exploration to completion of the Historic Bridge between Bismarck and Mandan⁹⁷ as one of the last steps in finishing the transcontinental railroad. Smalley describes in detail how the Historic Bridge was designed and constructed between 1880-82, including the location of all four piers below the ordinary *low-water* mark of the river:

The bridge proper consists of three through spans, each measuring 400 feet between centres [in original] of end pins, and two approach spans, each 113 feet. It is a high bridge, the bottom cord of the three main spans being placed fifty feet above the level of the highest summer flood, thus giving head room to pass steamboats at all navigable stages of the river. The head room above the extreme high water of 1881 is 42 feet; but this water was an exceptional result of an ice gorge, which necessarily put a stop to all navigation. Practically the bridge gives four feet more head room than many of the bridges on the lower river. The variable channel and the high bluff on the east side were alone sufficient reasons for adopting the high bridge plan in preference to a low bridge with a draw. The violent action of the ice and the excessive height of the ice floods were, however, the controlling elements in the selection of the high bridge plan. The east end of the east approach span is supported by a small abutment of granite masonry, founded on the natural ground of the bluff. The west end of the west approach span is supported by an iron bent resting on two Cushing cylinders, which are supported by piles driven into the sand bar. The three long spans are supported on four granite piers. *Pier 1, the easterly pier, rests on a concrete foundation, the base of which is twenty feet below ordinary low water and sixteen feet below the estimated extreme low water due to ice gorges.* [italics, underlining, and bold type added for emphasis] Piers 2 and 3, which are in the channel of the river, are

⁹⁷ Smalley states that the bridge was "formally opened" on October 21, 1882, with four engines crossing from east to west, followed by eight crossing from west to east, after which a passenger train was sent over. Eugene V. Smalley, *History of the Northern Pacific Railroad*, G.P. Putnam's Son's (New York 1883), p. 394.

founded on pneumatic caissons, sunk into the underlying clay to the depth of about fifty feet below *ordinary low water* [italics added] and ten feet below the surface of the clay.⁹⁸ Pier 4 is situated *on the sand bar on the west side of the river below the protection of the dike*, [italics added] and rests on a foundation of 160 piles, which were driven with a Nasmyth steam hammer.⁹⁹

Emphasis in the above paragraph is placed on the language documenting that Pier 1, the easterly pier, rests not only below the ordinary high-water mark but also below the ordinary low-water mark. There is less historic photographic evidence documenting spring flood levels on Pier 1 in the North Dakota archives (in part because most historic photos at that time were taken from the eastern bluffs of the river). This paragraph shows that all four piers of the historic bridge were not only below the ordinary high-water mark in 1889, but also below the ordinary low-water mark, thus making them unequivocally part of the riverbed transferred to North Dakota on November 2, 1889, under the Equal Footing and Public Trust Doctrines.

The reason all four piers were sunk deep below the ordinary low water marks was to protect them from the erosion and shifting of the river during spring flooding on the Missouri River floodplain between Bismarck and Mandan before the Missouri River mainstem dams were constructed in the 1930s and 1940s (whose purposes included protecting cities like Bismarck and Mandan from often extreme spring flooding along the Missouri and Mississippi Rivers all the way to the Gulf of Mexico). Eugene Smalley describes how a dike was built from the west shore of the Missouri River to attempt to confine the river to the Historic Bridge future location:

The report of July, 1880, proposed to cross the river with a bridge consisting of three spans of 400 feet each, resting on solid piers of granite masonry. A dike was to be built from the west shore to within 1000 feet of the east shore, which is here a high bluff of extremely hard clay, thus confining the river within a width favorable to the maintenance of a fixed channel. The bridge was to be located about 500 feet below the dike, and, to provide for contingencies, was made 200 feet longer than the width of the confined river. This plan of operations was afterward carried out, and the completed work differs in no essential respect from plans contemplated in the report of July, 1880.

The construction of the dike was begun in the fall of 1880. Unfortunately, while waiting for materials, *the main navigable channel of the river moved over to the west shore, and when work was actually begun it was found necessary to leave this channel open for navigation.*¹⁰⁰

Figure 13 is from the National Archives and shows the Historic Bridge in 1883 shortly after construction was completed.

⁹⁸ Current State Geologist Edward Murphy in his 1995 article on the history of the construction of the bridge refers in some places in his article to this lower harder clay as bedrock. See previous memoranda recently sent to the USCG on this issue. Likely this is just a terminology or labelling issue referring to the same harder layer of clay and sandstone underneath the eastern side of the river at this location. Since the eastern side of the river at this location is also a documented fossil site, it follows that the underlying harder “clay” is likely a fossil bearing rock of some sort.

⁹⁹ Smalley, *History of the Northern Pacific Railroad*, at pp. 392-93.

¹⁰⁰ Smalley, *History of the Northern Pacific Railroad*, at pp. 390-91.



Figure 13: Photograph of the Recently Completed Historic Bridge in 1883 with Original Superstructure (Photo courtesy of the National Archives).

At the bottom of this photograph, and to the east of the easternmost pier of the Historic Bridge, Pier 1, the railroad tracks for loading the riverboats at the Port of Bismarck can be seen. All are clearly below the ordinary high-water mark, and all are obviously fixtures attached to the riverbed that were transferred to North Dakota at statehood on November 2, 1889.

This is confirmed in the following 1887 photograph of the Historic Bridge taken two years before statehood. It shows the passengers and goods being transferred from the Northern Pacific Railroad to a steamboat for transport upriver. It also shows that Pier 1 is clearly within the ordinary high-water mark and near the edge of the river in 1887.



Figure 14: 1887 Photograph Showing Transfer of Goods from the Steamboat in Foreground to the Historic Bridge in Background with Pier 1 Within the Ordinary High Water Mark.

Figure 15 was taken on October 21, 1882, on the date the bridge was tested to see if it could safely bear the weight of eight steam engines, as discussed in Ed Murphy's 1995 article. It shows the eastern pier within the ordinary high-water mark of the Missouri River.

Figure 16 was also taken on October 21, 1882, while the bridge was being tested, again to see if it could safely bear the weight of eight steam engines. This photo shows that both the westernmost pier and the trestle are both clearly built on the riverbed of the Missouri River below the ordinary high-water mark.

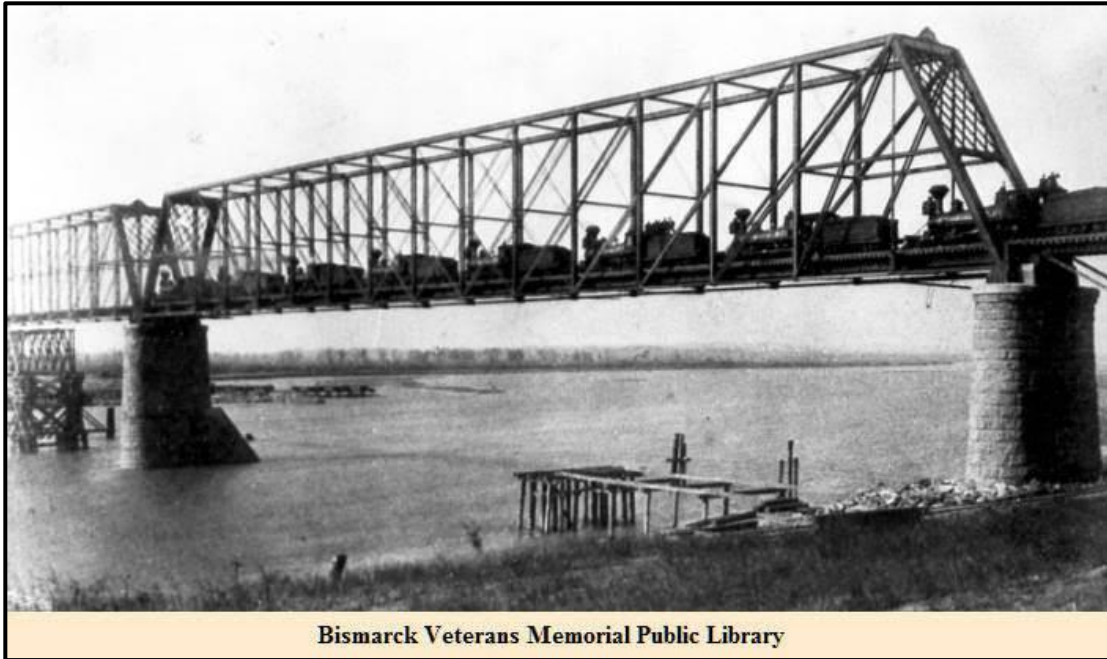


Figure 15: Photograph Taken during Weight Test of Historic Bridge on October 21, 1882, Showing Eastern Pier Within the Ordinary High-Water Mark (Murphy 1995).

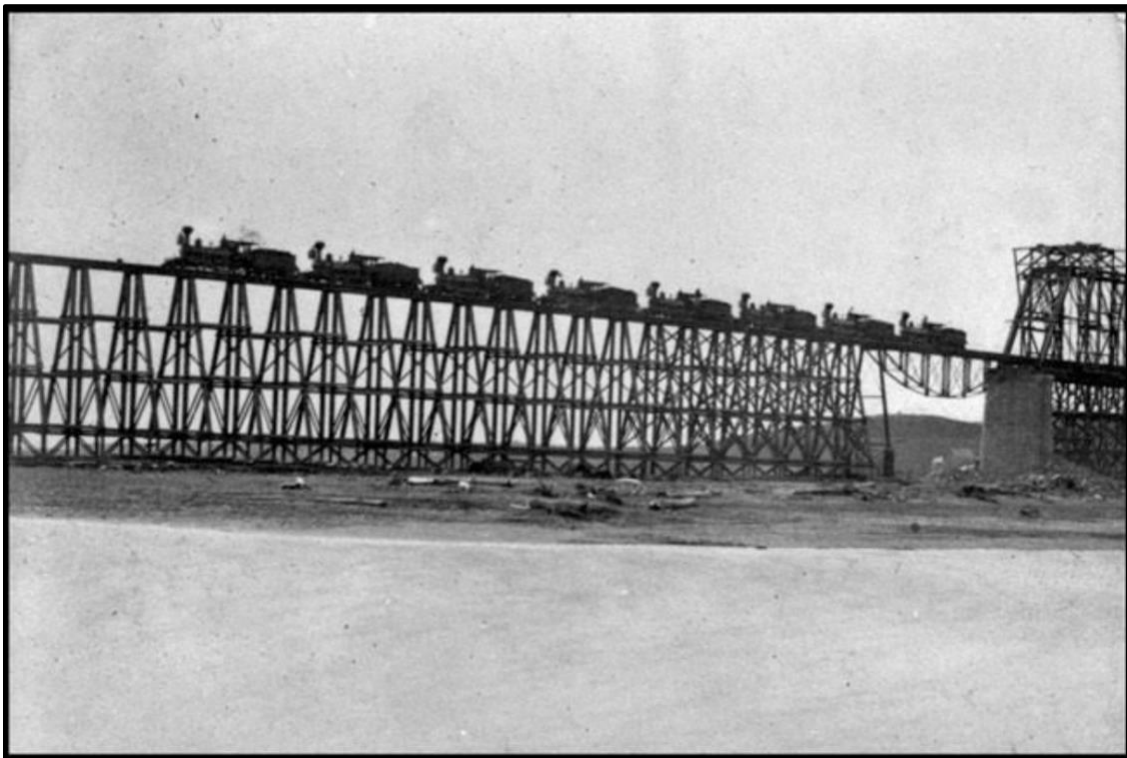


Figure 16: Photograph Taken during Weight Test of Historic Bridge on October 21, 1882, Showing Western Pier and Trestle Within the Ordinary High-Water Mark (Murphy 1995).

Extreme Missouri River flooding during the decades before mainstem dams Fort Peck and Garrison Dam were completed is shown in this 1884 photograph from Murphy's article. It shows that less than a year after bridge construction was completed, all four piers of the Historic 1883 Northern Pacific Railway Bridge were covered by the waters of the Missouri River to within a few feet of their tops.



Figure 17: Missouri River Flooding in 1887 Inundating All Four Historic Bridge Piers (Murphy 1995).

Like the 1884 photo of Missouri River spring flooding levels from Ed Murphy's 1995 article, the 1887 photo below (Figure 18) shows spring flooding of Missouri River high enough to cover the base of all piers at the high-water mark that year. Again, as discussed in FORB's February 8th memorandum and attachments, the relevant factual issue is the ordinary high-water mark, not the extreme high-water mark, defines the bed of the Missouri River at the time North Dakota became a State. But the two instances of flooding within 5 years before statehood is additional evidence. This, combined with the other photographs and other evidence cited above, definitively document that the ordinary high-water mark at the time of Statehood (November 2, 1889) included all four piers and the trestle on the western side of the Missouri River at the Historic Bridge crossing.

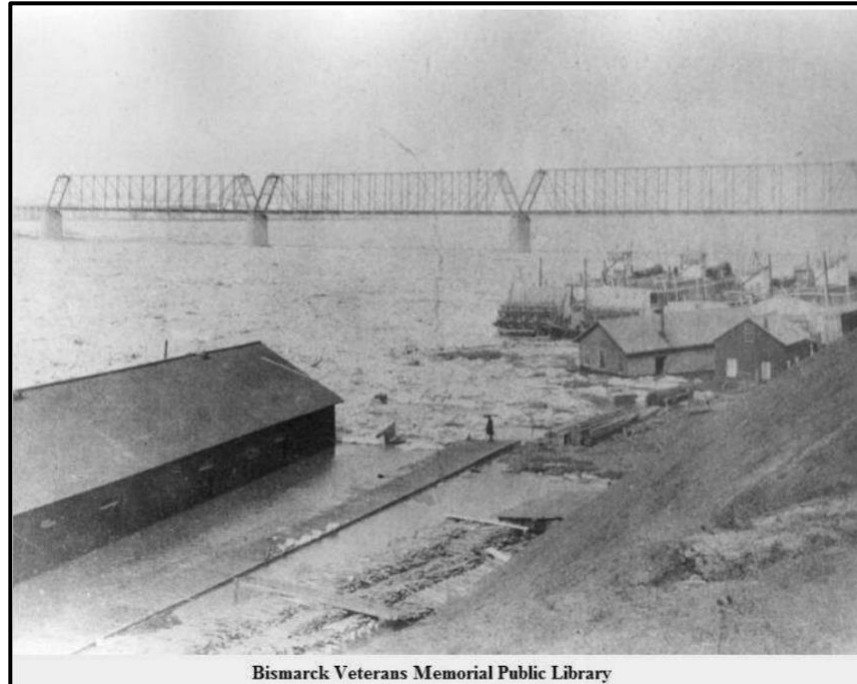


Figure 18: Photograph Taken in 1887 of Missouri River Flooding at the Historic Bridge, Looking North (Courtesy of the Bismarck Veterans Memorial Public Library).

In summary, the evidence is clear and overwhelming that the bed of the Missouri River up to the ordinary high-water mark was very wide and continually shifting when the Historic Bridge was constructed. It includes not only the four piers of the Historic Bridge but also the embankment and embedded wooden trestle west of the historic bridge up to the point of the ordinary high-water mark. Under federal common law, the law of Dakota Territory, and the statutes and case law of North Dakota, all of these fixtures attached to the riverbed up to its ordinary high-water mark were transferred as permanent fixtures attached to the land under the Public Trust and Equal Footing Doctrines when North Dakota became a State on November 2, 1889.

For the same reason, North Dakota continues to own both the Historic Bridge, the embankment west of the Historic Bridge, and the land north of the Historic Bridge and west of the river as shown in the 1995 photograph from the Murphy article above. Again,

[a]lthough federal law may fix the initial boundary between fast lands and the riverbeds at the time of admission to the Union, the State's title to the riverbed vests absolutely as of the time of a State's admission and is not subject to later defeasance by operation of any doctrine of federal common law.¹⁰¹

2.3 When considering whether to grant a permit to destroy the Historic Bridge, the history of the bridge in the context of other Acts of Congress enacted during the Civil War for the same purpose, as well as the history of the bridge as it fits in with

¹⁰¹ 429 U.S. at 370-71.

the history of the rest of the transcontinental railroad built under the 1864 Act must also be considered.

The 1864 Act must be construed with the two other intertwined laws enacted by Congress during the Civil War 1) to bind the country together with transcontinental railways and telegraph lines crossing the whole of the western territories of the United States and 2) to encourage homesteaders to settle the unsettled areas in between. The three Acts are:

- 1) the Homestead Act of 1862;¹⁰²
- 2) the Pacific Railway Act of 1862¹⁰³ that allowed construction of the first transcontinental railroad and telegraph between Omaha, Nebraska, and Sacramento, California, from 1862-69; and
- 3) the 1864 Act¹⁰⁴ that created the Northern Pacific Railroad and allowed construction of the second transcontinental railroad between Duluth, Minnesota, and two ports near present day Seattle, Washington and Portland, Oregon, that was supposed to be completed from 1864-1872, but which was not completed until 1883 (with completion of the 1883 Northern Pacific Railway Bridge between Bismarck and Mandan as one of its final major steps).¹⁰⁵

The general rules of statutory construction that apply under North Dakota law and federal law are well established for interpreting any ambiguities in the 1864 Act not addressed in the analysis above. “If a statute is ambiguous, the court, in determining the intention of the legislation, may consider among other matters: ... The consequences of a particular construction.”¹⁰⁶ The Historic Bridge is deeply tied to the history of the Mandan-Bismarck community, the region of North Dakota where it is located, and the United States. Therefore, the consequences of the particular construction that the railroad has given to the 1864 Act throughout its 160-year history is relevant to how the 1864 Act should be interpreted in this case. The Historic Bridge is a structure of national historic significance for the reasons discussed throughout this memorandum.

It is useful to summarize the Homestead Act and the Act that recreated the Union Pacific Railroad in 1862, to understand how those two Acts compare to, and fit in with, the 1864 Act.

¹⁰² Act of May 20, 1862 (Homestead Act), Public Law 37-64 (12 STAT 392); 5/20/1862; Enrolled Acts and Resolutions of Congress, 1789 – 2011. See footnote 14 above.

¹⁰³ Act of July 1, 1862 (Pacific Railroad Act), 12 STAT 489, which established the construction of a railroad and telegraph line from the Missouri River to the Pacific Ocean.; 7/1/1862; Enrolled Acts and Resolutions of Congress, 1789 – 2011. See footnote 15 above.

¹⁰⁴ Act of July 2, 1864 (13 Stat. at L. 365, chap. 217) again, referred to throughout this memorandum, as the 1864 Act. See footnote 16 above.

¹⁰⁵ Again, as noted at footnote 17 above, chapter XLIII of Eugene V. Smalley’s *History of the Northern Pacific Railroad*, published in 1883, *supra*, footnote 4, is almost entirely devoted to the construction of the historic Northern Pacific Railway Bridge between Bismarck and Mandan at issue in this case as the final major step in completing the second transcontinental railroad across the United States in 1883, eleven years past the statutory deadline set by the 1864 Act. See Smalley, *supra*, pp. 388-97.

¹⁰⁶ NDCC § 1-02-39.

The National Archives has a useful and concise summary of the Homestead Act of 1862:

Passed on May 20, 1862, the Homestead Act accelerated the settlement of the western territory by granting adult heads of families 160 acres of surveyed public land for a minimal filing fee and five years of continuous residence on that land.

The Homestead Act, enacted during the Civil War in 1862, provided that any adult citizen, or intended citizen, who had never borne arms against the U.S. government could claim 160 acres of surveyed government land. Claimants were required to live on and “improve” their plot by cultivating the land. After five years on the land, the original filer was entitled to the property, free and clear, except for a small registration fee. Title could also be acquired after only a six-month residency and trivial improvements, provided the claimant paid the government \$1.25 per acre. After the Civil War, Union soldiers could deduct the time they had served from the residency requirements.

Although this act was included in the Republican party platform of 1860, support for the idea began decades earlier. Even under the Articles of Confederation, before 1787, the distribution of government lands generated much interest and discussion.

The act, however, proved to be no panacea for poverty. Comparatively few laborers and farmers could afford to build a farm or acquire the necessary tools, seed, and livestock. In the end, most of those who purchased land under the act came from areas quite close to their new homesteads (Iowans moved to Nebraska, Minnesotans to South Dakota, and so on). Unfortunately, the act was framed so ambiguously that it seemed to invite fraud, and early modifications by Congress only compounded the problem. Most of the land went to speculators, cattle owners, miners, loggers, and railroads. Of some 500 million acres dispersed by the General Land Office between 1862 and 1904, only 80 million acres went to homesteaders. Indeed, small farmers acquired more land under the Homestead Act in the 20th century than in the 19th.¹⁰⁷

The consequences of the 1864 Act, for example, that required the claimant to pay the government \$2.50 per acre, rather than \$1.25 per acre, for both homestead and railroad patents issued for 40 miles on each side of the Northern Pacific right-of-way across Dakota territory then the State of North Dakota was, is one example of the consequences of interpreting the 1864 Act that was devastating to early settlers of Dakota Territory.

The National Archives also have a useful and concise summary of the **Pacific Railway Act of 1862**:

This act, passed on July 1, 1862, provided Federal subsidies in land and loans for the construction of a transcontinental railroad across the United States.

The question of "internal improvements" was frequently before Congress in the 19th century: Should Congress assist in improving the country's transportation

¹⁰⁷ National Archives website, *Homestead Act (1862)*, at <https://www.archives.gov/milestone-documents/homestead-act> (April 3, 2022).

system? One such improvement was the dream of constructing a railroad that would cross the entire country.

In the 1850s, Congress commissioned several topographical surveys across the West to determine the best route for a railroad, but private corporations were reluctant to undertake the task without Federal assistance. In 1862, Congress passed the Pacific Railway Act, which designated the 32nd parallel as the initial transcontinental route, and provided government bonds to fund the project and large grants of lands for rights-of-way. The Act aided in the construction of a railroad and telegraph line from the Missouri River to the Pacific Ocean and secured the use of that line to the government.

The legislation authorized two railroad companies, the Union Pacific and the Central Pacific, to construct the lines. Beginning in 1863, the Union Pacific, employing more than 8,000 Irish, German, and Italian immigrants, built west from Omaha, NE; the Central Pacific, whose workforce included over 10,000 Chinese laborers, built eastward from Sacramento, CA. Each company faced unprecedented construction problems, severe weather, and conflict with American Indians, whose ancestral lands were transected by the railroads.

On May 10, 1869, the last rails were laid and the last spike was driven in during a ceremony at Promontory, UT. The completion of the transcontinental railroad shortened a journey of several months to about one week. Congress eventually authorized four transcontinental railroads and granted 174 million acres of public lands for rights-of-way.¹⁰⁸

The fact that the Union Pacific and the Central Pacific Railroads could together build their transcontinental railway in less than half the time and with less than half the land grant than the Northern Pacific under the 1864 Act is telling.

In April of 1924, Congress authorized an investigation into the 1864 and 1870 laws that created and financed the Northern Pacific. The hearings lasted five years and involved dozens of witnesses. The reasons for this 5-year investigation included a determination that while railroad construction between 1864 and 1883 had cost the Northern Pacific \$70 million, sales of the “railroad patents” given to Northern Pacific to transfer to homesteaders to fund the building of the right-of-way and other structures necessary to complete the railroad totaled more than \$136 million, a profit of about \$66 million. See letter from U.S. Department of Agriculture Secretary Wallace to President Coolidge, Feb. 19, 1924 (*New York Times* Feb. 26, 1924); Derrick Jensen and George Draffan, *Railroads and Clearcuts: Legacy of Congress’s 1864 Northern Pacific Land Grant*, supra at pp.16-19. The cost of building the 1883 Northern Pacific Railway Bridge and trestle west of the river on the Mandan side to its ordinary high-water mark was approximately \$1 million of the \$70 million total cost for building the transcontinental railroad between Duluth and Seattle (in 1883 dollars). See Eugene V. Smalley, *History of the Northern Pacific Railroad*, p. 395 (G.P. Putnam’s Sons 1883).

¹⁰⁸ National Archives website, Act of July 1, 1862 (Pacific Railroad Act), 12 STAT 489, which established the construction of a railroad and telegraph line from the Missouri River to the Pacific Ocean.; 7/1/1862; Enrolled Acts and Resolutions of Congress, 1789 - 2011; General Records of the United States Government, Record Group 11; National Archives Building, Washington, DC.

This means that the sale of the “railroad patents” to homesteaders at \$2.50 per acre for the odd numbered sections twenty miles on each side of the right-of-way across all of Dakota Territory under the 1864 Act largely, if not totally, paid for the cost of building the right-of-way and its underlying structures across Dakota Territory, including the 1883 Northern Pacific Railway Bridge and right-of-way across Dakota Territory. Thus, the early homesteaders who received “railroad patents,” rather than the “U.S. patents” received by homesteaders under the 1862 Homestead Act (also passed in the throes of the Civil War after the southern democratic Senators who were using the Senate filibuster to block passage of the Homestead Act before the Civil War), are the ones who ultimately paid for the Historic Bridge between Bismarck and Mandan through the money they had to pay to the Northern Pacific to receive their “original patent” from the United States through the railroad as a middleman to give the Northern Pacific the money to build the railroad right-of-way. Those “railroad-patent homesteaders” literally bought and paid for the right-of-way, and structures like the Historic Bridge, with the sweat of their brow.

In 1929, after the 5-year Congressional investigation was completed, the 1929 Congress voted, with President Hoover’s approval, to request that the U.S. Attorney General bring an action to declare either part or all the land given to the Northern Pacific under the 1864 Act be forfeited. This action was subsequently brought in federal court and ultimately reached the U.S. Supreme Court in *United States v. Northern Pacific*, 311 U.S. 317, 335-58 (1940), where the following issues relating to forfeiture were addressed before remand:

- Northern Pacific had not sold stock to the public, as had been required by Congress;
- Northern Pacific had not built the railroad according to the Congressionally mandated schedule;
- Northern Pacific did not open its lands to settlement and preemption as required by Congressional Mandate;
- More than a million acres had been fraudulently classified as mineral lands, so that Northern Pacific could claim prime agricultural or timber land in lieu;
- Northern Pacific wrongfully received 13.3 million acres located within Native American reservations (as discussed earlier in this memorandum, over 6 million acres was taken from the Fort Berthold Reservation by executive order of President Hayes, rather than by an act of Congress, which had approved the Treaty creating the Fort Berthold Reservation);
- Northern Pacific had illegally diverted funds from the main line to the building of branch lines; and
- Northern Pacific had delayed surveying vast portions of the land grant to avoid paying real estate and other taxes.

All the history and law discussed in this memorandum is relevant under the rules of statutory construction that apply to resolve any ambiguities in law or statutory text regarding who owns the riverbed beneath the Historic Bridge up to the ordinary high-water mark under the Equal Footing and Public Doctrines versus the language of the 1864 Act. It also is relevant for showing why the destruction of this national landmark would be an irreparable and unreplaceable loss to the Bismarck and Mandan communities, the people of the State of North, and to an accurate

historical understanding of key core principles underlying the strength and health of our constitutionally created democracy, for the reasons discussed throughout this memorandum.

3.0 Conclusion

For the reasons discussed throughout this memorandum, between the Equal Footing and Public Trust Doctrines versus the 1864 Act that created the Northern Pacific, the Equal Footing and Public Trust Doctrines (and the rules of construction that apply to those doctrines under Supreme Court precedent) give ownership of the riverbed up to the ordinary high-water mark to North Dakota when it became a State on November 2, 1889, as well as the Historic Bridge itself.

Further, construing these laws to give effect to each, the ownership interest transferred to the Northern Pacific under the 1864 Act was only a right-of-way easement to build, maintain, and operate a railroad; the 1864 Act does not give Northern Pacific title or ownership to the riverbed beneath the Historic Bridge, or to the bridge itself.

It is still FORB's hope and wish that BNSF, the State of North Dakota, the communities of Bismarck and Mandan, and FORB can resolve these issues without litigation; however, if litigation becomes necessary, it is likely that many of these key issues can be resolved by summary judgment motion, brought under a legal action under one or more of the following laws:

- 42 U.S.C. §§ 1981, et seq,
- the federal Declaratory Judgment Act, 28 U.S. Code § 2201, or, alternatively,
- the North Dakota Declaratory Judgment Act, NDCC ch. 32-23, and NDRCivP 38, 39, and 57,
- any action to compel performance of a non-discretionary duty (i.e., responses to FOIA or to open Records requests, or to protect an historic property owned by the State), or
- in any appeal of the final EIS to U.S. District Court if issued by the USCG.

Further, whether any undue influence was exercised by BNSF by constantly asserting to USCG, North Dakota state and local officials, and FORB that those public and private entities would have to pay for BNSF's costs to "avoid, minimize, and mitigate" the impacts of the proposed project on the Historic Bridge under NHPA and its implementing regulations, if they wanted to save the Historic Bridge, must also be addressed. There is no such requirement under the NHPA, and to constantly assert that may constitute undue influence on state and local officials under the NHPA and the laws cited above as possible avenues for legal action.

APPENDIX B

The Northern Pacific Railway Bridge at Bismarck

by

Edward C. Murphy

The Northern Pacific Railway Bridge at Bismarck

by Edward C. Murphy

In 1864 President Abraham Lincoln signed into law a bill granting forty alternate sections of public land per mile in the Dakota, Montana, Idaho, and Washington Territories and twenty alternate sections per mile in Minnesota and Oregon along the northern route of the transcontinental railway as a means of supporting its construction. A few years later, the Northern Pacific Railway Company purchased the charter, and provisions were made that allowed the land holdings along the route of the railroad to be extended up to fifty miles in the territories and thirty miles in the states.¹ The Northern Pacific Railway Company began laying track eastward from Kalama, Washington, in March 1871 and westward from near Duluth, Minnesota, in July 1871. The eastern segment of track reached Bismarck (then a small village named Edwinton) in June 1873.²

The financial panic of 1873 caused economic depression across the country. The panic was brought about by many factors, the chief one being the large investment that business houses in both the United States and Europe had made in railroads which showed no promise of immediate returns. Many businesses declared bankruptcy, including the Northern Pacific, which halted construction of the eastern segment at Bismarck with 1,500 miles remaining to be completed. It would be six years before construction would begin again in earnest west of Bismarck.³ During that hiatus, the Northern Pacific reorganized and began a renewed campaign to advertise the West as a means of increasing passenger and freight travel and stimulating sales of their land holdings to raise capital to pay for the resumed construction of the transcontinental railway.⁴

From its beginning, the Northern Pacific suffered a shortage of capital to finance the \$85 to \$120 million estimated cost to complete construction of the northern route.⁵ Congress had mandated both a starting and a completion date for construction on the line, neither of which would be met by the Northern Pacific. After the Northern Pacific missed the July 4, 1879, completion date, they operated under the constant threat that their charter might be revoked by Congress. Proponents of the Northern Pacific and proponents of the Union

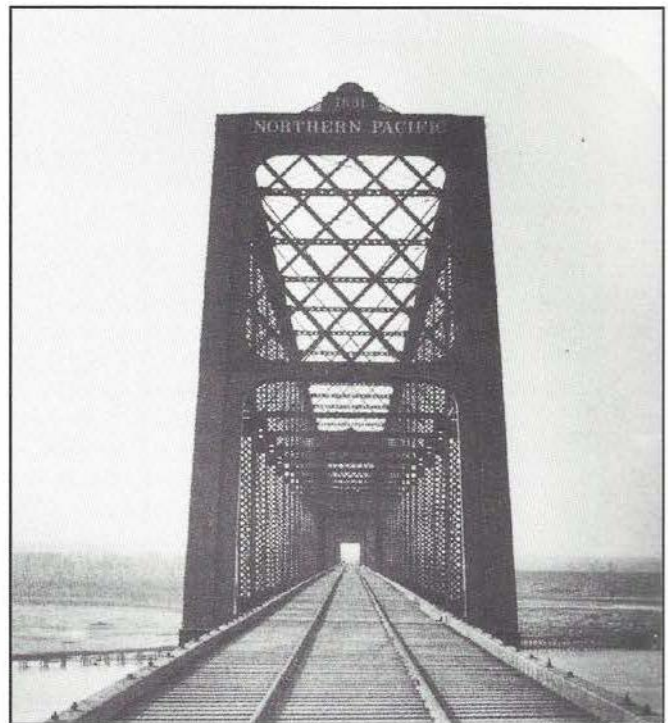
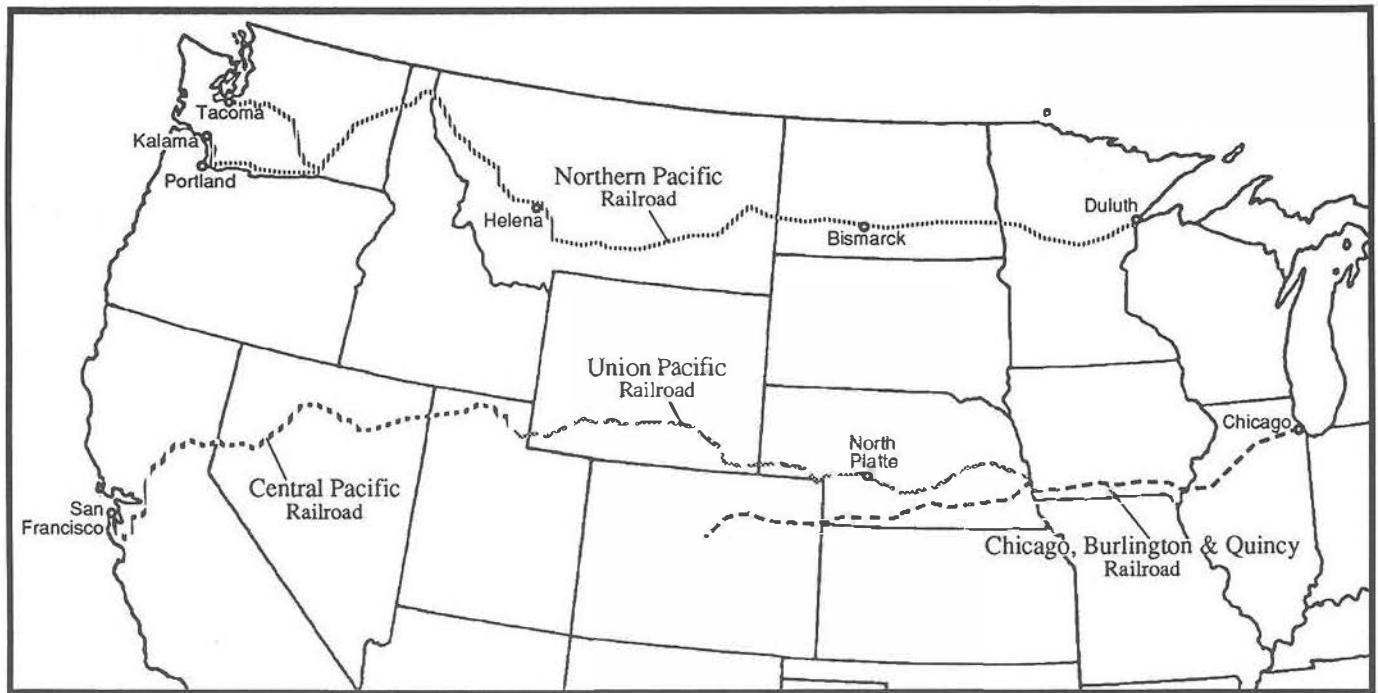


Photo of recently completed Northern Pacific Railway bridge, looking west through the east end of the bridge. This photo likely taken by F. Jay Haynes in 1882 or 1883.

Pacific, which had completed the central portion of the transcontinental railroad from Chicago to San Francisco in 1869, deadlocked in Congress. Northern Pacific supporters were attempting to get the deadline extended, and Union Pacific supporters were attempting to get the charter revoked.⁶ These conditions prompted Northern Pacific to determine that they could no longer afford to delay and had to expend the significant amount of money it would take to cross the Missouri River near Bismarck.

The Missouri River was a major obstacle to the transportation of railroad construction materials west. Boxcars loaded with equipment and supplies had to be



The routes of the northern and central transcontinental railways. On May 10, 1869, the westbound Union Pacific Railway met the eastbound tracks of the Central Pacific to complete the first transcontinental railway at Promontory Point, Utah. The northern route would not be completed by the Northern Pacific Railway until 1883 near Gold Creek, Montana. The central route took six years to construct, while the northern route took twelve years. Map by Brian R. Austin.

ferried across the river on transfer steamers, causing delays of many hours, if not days.⁷ At times, high water and ice prevented the transfer steamers from operating altogether, and construction materials piled up on the east bank until conditions improved. A temporary solution was achieved when workers laid railroad tracks on the frozen Missouri River during the coldest months in 1878, 1879, and 1880.⁸ The railroad had to find a permanent means of crossing the Missouri River that would meet the immediate need of allowing trains and supplies to move freely as well as meet its projected needs when the transcontinental railway was completed. The railroad considered tunneling under the Missouri River but decided to build a bridge instead,

due to the great expense of a tunnel, the problem of smoke accumulation in a declining-grade tunnel, and the potential for flooding during high spring melt.⁹

It is ironic that the transfer steamers at Bismarck did a brisk business transporting men and materials to build the railroad, which hastened the demise of steamboat travel on the upper Missouri River. The completed bridge signaled the end of a ten-year partnership between the Northern Pacific and the steamships hauling supplies to settlements in Montana. The decline in steamboat traffic was, of course, inevitable in that the relatively short boating season of seven months on the Upper Missouri would eventually not be enough to provide the materials needed by the ever-increasing

1. Charles R. Wood, *The Northern Pacific, Main Street of the Northwest* (Seattle: Superior Publishing Company, 1968), p. 19.

2. Edward R. Nolan, *Northern Pacific Views, The Railroad Photography of F. Jay Haynes, 1876-1905* (Helena: Montana Historical Society Press, 1983), pp. 31-38; G.F. Bird and E.J. Taylor, *History of the city of Bismarck, North Dakota--the first 100 years* (Bismarck: Bismarck Centennial Association, 1972).

3. Wood, p. 23.

4. Nolan, pp. 33-38. In 1876 the Northern Pacific signed a contract with photographer Frank J. Haynes that enabled them to use his photos in promotions to attract settlers and tourists to the West. This agreement would last for thirty years. Haynes operated a studio in Moorhead, 1876-1879, and in Fargo, 1879-1889, before moving to St. Paul. Haynes's photos provide the best documentation of NP railroad construction in North Dakota, especially of the Bismarck bridge,

which was said to have intrigued him.

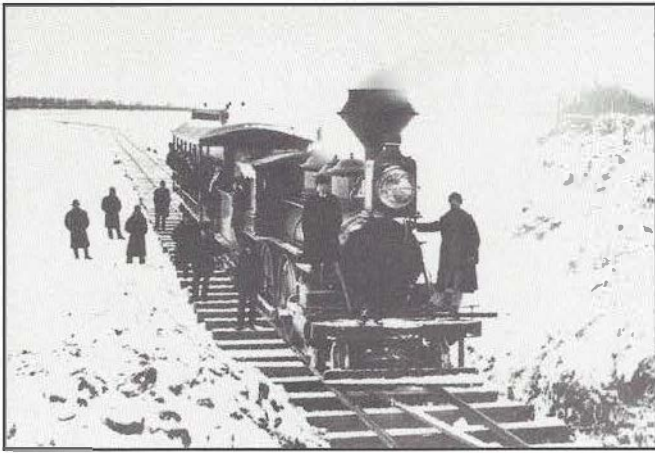
5. Eugene V. Smalley, *History of the Northern Pacific Railroad* (New York: Arno Press, 1975) p. 155; Wood, p. 15.

6. Wood, pp. 23-24.

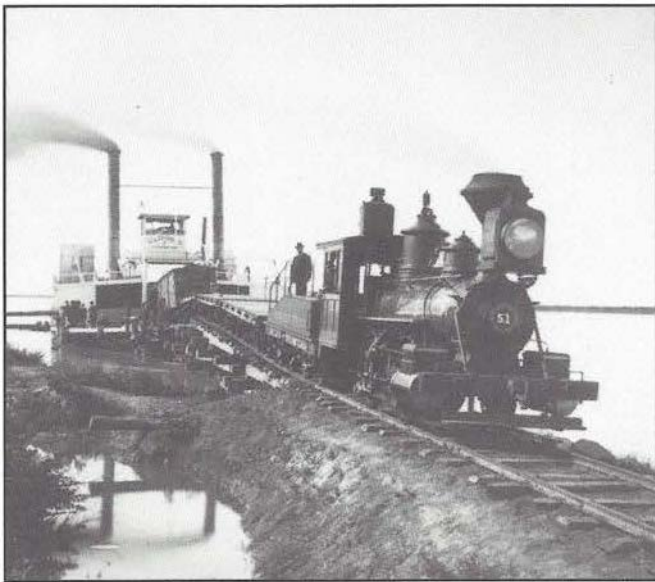
7. *Bismarck Tribune*, December 3, 1880, p. 1. On November 20, 1880, the NP steamer transferred twenty-four loaded boxcars in what was noted as a remarkably good time of one hour and eighteen minutes. The steamer carried six boxcars at a time. *Bismarck Tribune*, July 16, 1880, p. 8. It was reported that 75 to 150 boxcars of supplies were arriving in Bismarck daily for shipment west. *Bismarck Tribune*, October 22, 1880, p. 8. By this date, track had been laid 155 miles west of Bismarck, and two construction trains were heading west from Bismarck daily.

8. Nolan, pp. 36-37.

9. *Ibid.*, p. 43.



Above: A temporary solution to winter deliveries across the Missouri River was provided by Northern Pacific Division Chief Engineer Thomas L. Rosser. Tracks were placed over the ice near the present site of the bridge—the first time this had been attempted in the United States. During January and February in the years 1879-1881, trains hauled supplies over the frozen Missouri on the "bridge of ice." Photo by F. Jay Haynes taken in 1879. Below: The Northern Pacific transfer steamer was used to ferry railcars across the Missouri River at Bismarck when it was free of ice. Slow and inefficient, this method was at the mercy of the unpredictable Missouri. Photo by F. Jay Haynes taken in 1880. Both photos are courtesy of Haynes Foundation Collection, Montana Historical Society, Helena, Montana.



population in the territories.¹⁰

In the spring of 1880, with almost ninety miles of track laid west of Bismarck, the Northern Pacific Railway requested George Shattuck Morison, a selfmade civil engineer, to investigate the area and to recommend the most advisable method by which the river could be crossed near Bismarck.¹¹ Morison determined the only practical solution to this dilemma was a permanent

bridge, and he surveyed for potential localities along a ten-mile stretch of the Missouri River north of Fort Abraham Lincoln. Three sites were chosen: the Fort Lincoln site, a site near the present location of the Memorial Bridge on U.S. Highway 10, and the present site of the railroad bridge. Morison believed the Fort Lincoln site offered the best location for bridge construction because the river channel in this area was only a thousand feet wide. He advised against it, however, because it required laying seven to eight additional miles of track. The Memorial Bridge site was not chosen because borings indicated that the depth to bedrock was too great, requiring deep foundations or footings beneath the piers. Morison settled on the present location of the bridge, just north of the upper steamboat warehouses on the Bismarck side, because it provided the shortest route between the existing tracks on both sides of the river. He also determined the bedrock cliffs near the east bank of the river at this site would resist river erosion and offer a high approach for the tracks, negating the need for an east trestle. The main disadvantage to this site was the width of the river, three times the width of the river at the Fort Lincoln site, and which he decided would have to be narrowed by engineering methods.¹²

The Northern Pacific Railway Company immediately followed the recommendations made by Morison in his report of July 1880, and in September the company began construction on a dike to narrow the river at the future site of the bridge. William H. Fuller supervised the initial construction, and Major Thomas J. Mitchell, of Mandan, was awarded the contract to supply the brush matting for the dike.¹³ The impact that the Northern Pacific's decision would have on Bismarck was not lost on the *Bismarck Tribune* which wrote,

Many have been deterred from making Bismarck their residence on account of the uncertainty of this crossing, arguing that wherever the road crossed the river, there would be the coming city. Many business men have been restrained from constructing substantial brick buildings on account of this same uncertainty. The final settlement upon the crossing at Bismarck will lend a fresh impulse to thousands of capital [from people] waiting the decision of this question before investment, and establishes thorough confidence in the future of Bismarck.¹⁴

On December 16, 1880, the board of directors of the Northern Pacific Railway appointed George Morison engineer and superintendent of the Bismarck bridge with the instructions that the work was to be carried forward with all possible speed. Morison was uniquely qualified for this position, although this is not readily apparent from a review of his formal education. He earned a law degree from Harvard and practiced law in New York for a year before abandoning that practice in

1867 and entering the field of civil engineering, a profession for which he had no formal education. His initial training came during construction of a large bridge over the Missouri River at Kansas City. He so impressed the chief engineer of that project, Octave Chanute, that Chanute appointed Morison his principal assistant when he became chief engineer for the Erie Railroad. Both of these endeavors provided him with valuable experience in railroad bridge design that he put to use in later projects. In 1875 Morison organized the bridge contracting firm of Morison, Field, and Company of New York. In 1880 he withdrew from the firm and devoted his time to consulting. Morison lived in New York, except for the period 1887-1898 when he lived in Chicago.

The Missouri River was regarded by many as the most treacherous river in the country to bridge and the Northern Pacific showed great confidence in Morison when they chose him to design and supervise the building of the first bridge to span the upper Missouri River. Following completion of the Bismarck bridge, Morison designed and supervised the building of a number of great railroad bridges in rapid succession over the Missouri River at Sioux City, Blair, Omaha, Rulo, Nebraska City, Atchison, and Leavenworth, and over the Mississippi River at Winona, Burlington, Alton, St. Louis, and Memphis, as well as numerous other bridges across the country. Morison sat on a number of boards and commissions, including the Isthmian Canal Commission from 1899 to 1901, and his powerful argument for the Panama route, backed by a detailed study, was a determining factor in the decision on the location of the Panama Canal. Morison was held in high regard by his peers as demonstrated by his selection to give the presidential address at the annual meeting of the American Society of Civil Engineers in 1895. At the time of his death on July 1, 1903, at the age of sixty-one, Morison was regarded by many to be the leading bridge engineer in America, if not the entire world.¹⁵

The Northern Pacific awarded contracts for the construction of the bridge during the early months of 1881. There were few firms in Dakota Territory or the surrounding area that had workers trained in the required skills of major construction, so most of the contracts went to eastern firms. The proposals for both the piers and the bridge spans were opened in New York. Northern Pacific officials awarded the contract for the pier



George Shattuck Morison (1842-1903), one of the country's greatest and most respected engineers, designed and supervised the construction of the Northern Pacific Railway Bridge at Bismarck.

work to Saulpaugh and Company of Rock Island, Illinois, and the contract for the superstructure work to Detroit Bridge and Iron Works. Saulpaugh and Company subcontracted the construction and sinking of the caissons to Rust and Coolidge of Chicago. The construction of the timber trestle for the west approach went to Winston Brothers of Minneapolis. A local firm, Bel-lows, Fogarty, and Company of Mandan, was granted the contract for grading the east and west approaches. Charles W. Thompson of Bismarck was responsible for providing the riprap stone that was used in the project.¹⁶ Carpenters quickly went to work at the boat landing south of the bridge constructing an office for Morison and his assistants and a boardinghouse for some of the 500 workers who were anticipated to be working on the bridge that spring.¹⁷

10. Wood, pp. 37-38. *Bismarck Tribune*, November 19, 1880, p. 1. The boating season on the upper Missouri River in 1880 began on April 15 and ended on November 16, during which time 35 million pounds of freight was transported. Lewis F. Crawford, *History of North Dakota* (Chicago: The American Historical Society, 1931), pp. 208-209. By 1887 the extension of the railroad into Helena, Montana, had practically put an end to steamboating on the upper Missouri River. By 1931 only one boat was running between Bismarck and Fort Benton.

11. George S. Morison, *Bismarck Bridge*, a report to A. Anderson

Engineer in Chief Northern Pacific Railroad, 1884, p. 1. North Dakota State Archives; *Bismarck Tribune*, June 11, 1880, p. 1.

12. Morison, p. 1.

13. *Bismarck Tribune*, September 24, 1880, p. 1.

14. *Ibid.*

15. Dumis Malone, ed., *George Shattuck Morison in Dictionary of American Biography* (New York: Charles Scribner's Sons, Vol. 13, 1934) pp. 191-192.

16. Morison, p. 1.

17. *Bismarck Tribune*, January 28, 1881, p. 1.

The Dike

The major drawbacks for the bridge site were the great width of the channel (approximately 3,000 feet), the tendency for rapid development of sandbars, and the unpredictable migration of the main river channel across this wide expanse. Morison believed that by constricting the width of the channel to 1,000 feet, he would increase the flow of the river in this area, thereby encouraging scouring and discouraging the development of sandbars beneath the bridge. To achieve this goal, Morison recommended the construction of a 2,000-foot-long, east-west trending dike approximately 500 feet north of the bridge site on the west side of the river. The dike had a dual role, to reduce the width of the river and to constrain the river against its east bank beneath the future site of the bridge. Morison designed the dike low so that the initial spring floods would flow over it, rather than through it, and deposit silt behind it, eventually depositing a permanent sandbar between the dike and the west end of the bridge.

Construction of the dike was itself a monumental undertaking and was beset with numerous problems. The dike consisted of bundles of brush collected from the bottomland that were wired together, weighted down with logs, and reinforced with sandbags. Approximately 33,000 tons of stone—boulders collected from the prairies surrounding Bismarck and Mandan—were placed along the top and sides of the dike in an attempt to keep it from washing away. This effort was only partially successful. As the dike progressed eastward, track was laid on top of it to enable transport by rail of materials to build the dike. A barge was also used to transport dike materials.

One of the more serious problems arose during initial construction of the dike and was addressed without the benefit of Morison's supervision. Morison's report, completed in July 1880, recommended that construction of the dike begin on the west bank and proceed eastward. By the time work began that fall, a large sandbar had developed at the bridge site in the middle of the Missouri that split the river into two channels. The workers decided to take advantage of the dry land afforded by the sandbar, and they built the middle portion of the dike first. This work aggravated the situation by encouraging the river to shift to the west bank rather than the east. As a result, when Morison

took over supervision of the dike in early January, the river was in the opposite position he wanted, and there was no water flowing beneath the site where the bridge would stand. It took two years of work on the dike to get the river stabilized in the desired position.¹⁸

Bridge Construction

Morison designed the bridge with four piers spaced approximately 400 feet apart. The eastern and westernmost bridge piers were located on dry land. During the spring thaw, Morison noted the tremendous size and power of ice jams that formed in the Missouri River near Bismarck. Some of these ice jams were reportedly twenty feet thick. Morison decided against designing a cheaper, low draw bridge due to the potential damage to the bridge spans from ice jams. To further address these concerns, Morison designed two of the bridge piers with metal-coated edges on the upstream side so that they could, in effect, serve as plows, breaking through ice jams and discouraging their development.¹⁹

Construction on the piers began September 1, 1881, and was completed June 3, 1882. The eastern pier (pier 1) was placed on a twenty-foot-thick concrete foundation which bottomed in bedrock claystones at a depth of forty feet below the surface. The depth to bedrock was too great at the westernmost pier (pier 4), so it was placed on 161 timber piles, which had been driven 25 to 30 feet into the sand by a steam hammer, thus transferring the load to a greater depth in the sand.²⁰ The two middle piers (pier 2 and pier 3) were located in the river and, therefore, posed a more difficult construction problem. The excavations for these two piers were made possible by the use of pneumatic caissons, much like giant diving bells, which enabled the men to work below the water line. Although caissons had been used widely in Europe, they were relatively new to this country. Caissons were first used in the United States in 1869 during construction of the Eads Bridge at St. Louis and the Brooklyn Bridge.²¹

The Bismarck bridge caissons were constructed of two to three layers of wood plank and braced with timbers that were bolted together with wrought iron. The caissons measured 74 feet in length, 25 feet in width, and 17 feet in height. A wrought-iron cutting edge was attached to the base of the caissons to make it

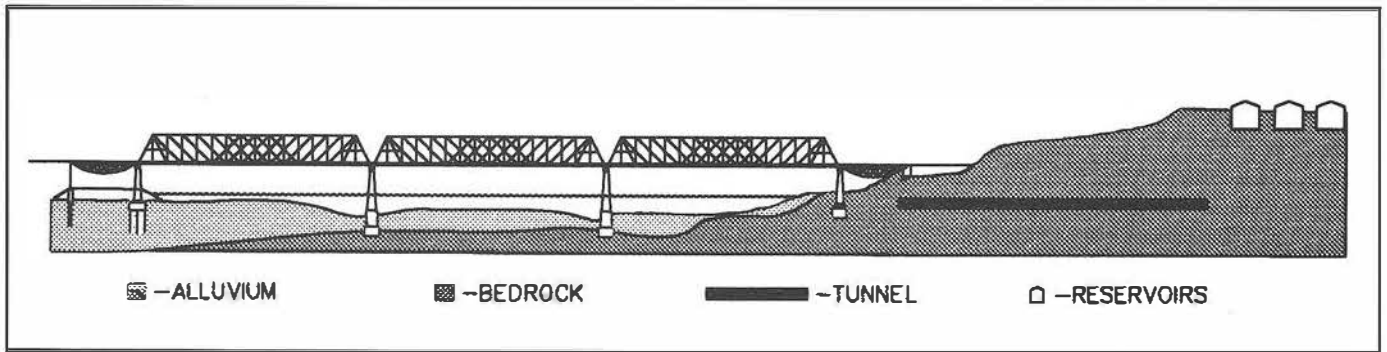
18. Morison, pp. 4-6; *Bismarck Tribune*, May 6, 1881, p. 8. No mention is made in either the *Tribune* article or in Morison's final report of obtaining permission from any agency concerning the construction of the dike. It appears that little, if any, paperwork was required to obtain permission, if indeed permission was sought. No mention of the dike, the bridge, or the respawning of the bridge is contained in the 1879-1882 or 1905-1906 Annual Reports to Congress of the Chief of the Engineers of the U.S. Army Corps of Engineers. A similar venture today would require a permit from both the U.S. Army Corps of Engineers and the North Dakota State Water Commis-

sion.

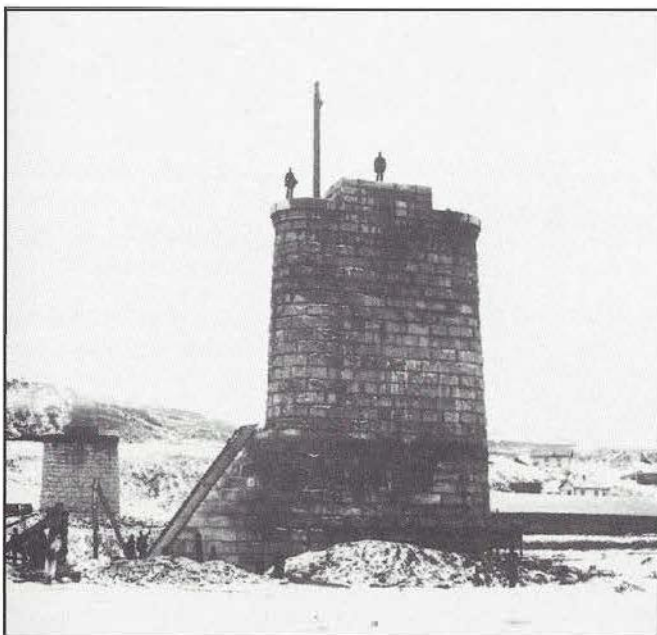
19. Morison, p. 2. Railroad drawbridges were later built over the Missouri River west of Trenton and over the Yellowstone River west of Cartwright.

20. *Ibid.*, p. 11. Morison noted that they experienced a slight delay when the locomotive that was supplying steam for the pile hammer was disabled by the burning of the roundhouse at Bismarck on December 20, 1881.

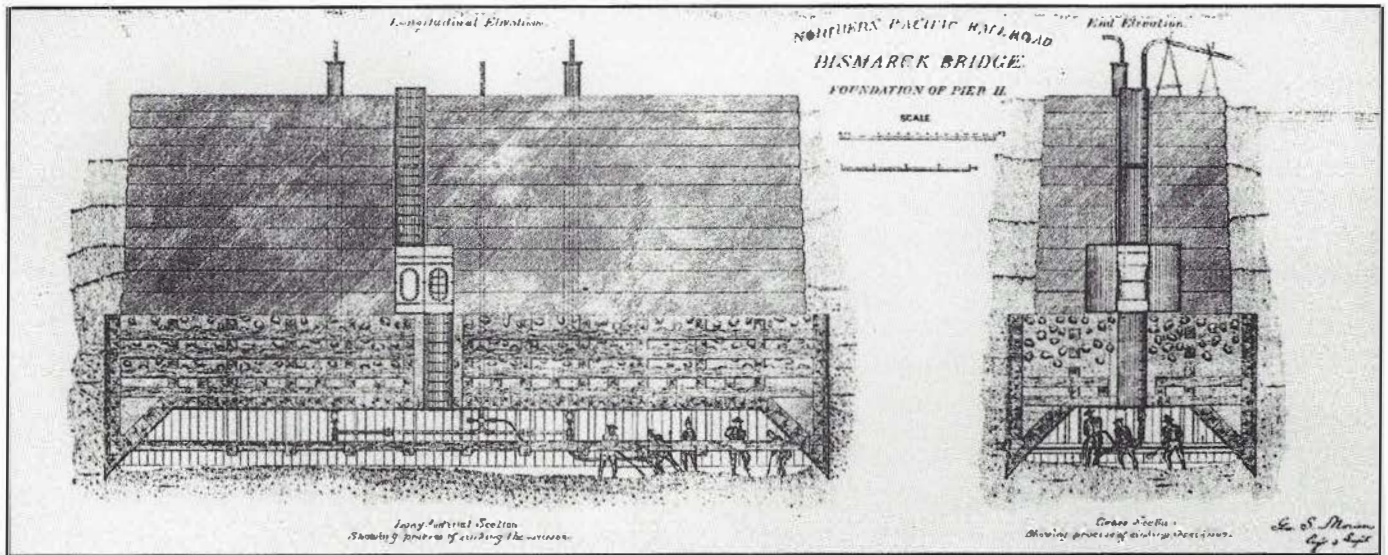
21. Archibald Black, *The Story of Bridges* (New York: Whittlesey House, 1936), p. 82.



Above: Morison sank more than forty borings around the bridge and excavated two deep pits to accurately define the geology beneath the site so he could determine the appropriate design for his piers. The westernmost pier (pier 4, far left) was placed on piles or footings because the bedrock was too deep there; the other pier foundations were placed in bedrock. Despite his intensive study, Morison did not anticipate that the east slopes of the river might become unstable, a situation that later caused many problems for the bridge. Morison's drawing was modified by the author. Right: Initial construction of the Northern Pacific Bridge at Bismarck. Masonry is being laid on the pier 2 caisson as it is excavated into the river substratum. A derrick boat and machinery barge are moored west of the pier. In the right foreground is the partially completed pier 1. In the background, the pier 3 caisson awaits transport to its proper position. Morison's dike is visible northwest of the pier 3 caisson. Photo by F. Jay Haynes in October 1881. Courtesy of Haynes Foundation Collection, Montana Historical Society, Helena, Montana.



Left: Workers add the finishing touches on pier 2 by attaching the steel nosing plate; a completed pier 1 (furthest east) stands in the background. The base of the pier 2 caisson is approximately forty-six feet below the surface. Photo by F. Jay Haynes in February 1882. Courtesy of Haynes Foundation Collection, Montana Historical Society, Helena, Montana.



Morison's drawings of the front and side view of the base of pier 2 and its underlying caisson. Men are shown removing sand from the base of the caisson floor with pumps which sucked the soft Missouri River sand from beneath the caisson and expelled it at the surface, thus enabling the caisson to sink under its own weight. The intake and outtake lines as well as the air-lock chamber are depicted on the drawings. Morison's drawings depict pier 2 at approximately one-fourth of its final height.

easier to sink them into position. The caissons, fitted with false floors, were towed into their proper position by a steamer and sunk. With the caisson in position, concrete was pumped into the upper half of the structure for ballast, and the false floor was removed. Air compressors, mounted on an adjacent barge, supplied air to the working chambers located at the base of the caisson, and a three-foot-square shaft and air-lock system kept the working area pressurized to prevent water from seeping in. The air-lock consisted of two six-foot diameter chambers that sat on top of the caisson. As the men entered or left the caisson, they would close the door leading into that air-lock chamber before opening the outer door of the other chamber, thereby preventing air from escaping the caisson.

The air compressors also drove sand pumps that were connected to hoses and used by the men in the caissons

to suck the loose sand from the caisson floor. Later, when claystone was encountered below the sand, it had to be pick-and-shoveled into bags and hauled to the surface through the air-lock, a strenuous and time-consuming endeavor. As the men in the base of the caisson removed the sediment and lowered the structure, men on the surface laid the masonry for the pier on the top of the caisson. The caulking used to seal the interior of the caissons was extremely flammable, and fire was of major concern for the men working in these dark confines, lit only by lanterns and torches. In one recorded instance, fire broke out in the pier 2 caisson but was put out by flooding the interior, with little damage to the structure. The caisson for pier 2 was bottomed forty-six feet below the base of the river; the caisson for pier 3 was sunk thirty-nine feet.²²

There was another risk for workers in the caissons.

22. Morison, pp. 8-11.

23. Black, pp. 167-168.

24. *Ibid.*, p. 168; Mary J. Shapiro, *A Picture History of the Brooklyn Bridge* (New York: Dover Publications, 1983), pp. 22-31.

25. Morison, p. 8; *Bismarck Tribune*, June 24, 1881, p. 8. It was reported that the pressure on the men working in the caissons was estimated to be twenty-five pounds per square inch. David McCullough, *The Great Bridge* (New York: Simon and Schuster, 1972), pp. 174, 186, 209, and 564. Normal atmospheric pressure is 14.7 pounds per square inch. The pressure in the Eads Bridge caissons was estimated at thirty-three pounds per square inch and twenty-three pounds per square inch in the Brooklyn caisson. The Eads caissons extended to depths greater than seventy feet. During construction of the Brooklyn Bridge, the Brooklyn caisson extended to forty-four and a half feet and the New York caisson to a depth of

seventy-eight and a half feet. The chamber between the doors in the access tunnel was designed large enough to hold all the men working on the caisson at any one time in case of accident.

26. *Bismarck Tribune*, November 19, 1880, p. 1. It was reported that Fred Starr, one of the pile-driving crew for the dike approaches, was killed on November 12 when he was crushed between a boat and a pile. The body was never recovered from the river. The fact that Morison did not note this fatality raises the question that he may have chosen to ignore fatalities and injuries in his final report. On the other hand, this fatality occurred before Morison took charge of construction, and in his final report, he does not include the costs for this period of construction because it was not done under his supervision.

27. *Daily Pioneer* [Mandan], October 21, 1882.

28. Morison, p. 22.

29. *Ibid.*, pp. 9-11.

Sudden movement from an area of compressed air into an area under atmospheric conditions results in the formation of nitrogen gas bubbles in the bloodstream which adversely affects muscles or joints and can be fatal. This decompression sickness was alternately called "caisson disease" or "the bends" because of its effects on the worker's limbs. Doctors often did not immediately diagnose this disease because the symptoms did not generally occur until sometime after the worker left the pressurized environment.²³ As a result, a number of workers died or suffered permanent injuries from caisson disease while constructing both the Eads and Brooklyn Bridges.²⁴

Despite the fact that workers in the Bismarck caissons toiled fifty to sixty feet below the surface of the Missouri River, Morison makes no mention of illness due to caisson disease. This does not necessarily mean there was none. He does note in his report that the weight of the caissons and masonry were often not enough to sink the caisson into the underlying substratum without relieving the air pressure inside the working chamber. To remedy this situation, the air pressure was decreased until the caisson settled approximately two feet and then was increased again. This process reportedly lasted about five minutes and, to save time, was performed while the men remained inside the working chamber.²⁵ If any fatalities or injuries occurred during the construction of the Bismarck bridge, they were not noted in Morison's final report.²⁶

The laying of masonry on a sinking caisson provided a special problem to the masons who could not follow their normal routine of leveling the stones to keep the pier straight. As a result, the workers had to devise special methods to insure the stones were level.²⁷ The granite slabs or stones are approximately twenty-eight inches thick. The specifications for the piers required every third face-stone—that is, a stone which has an

edge that faces the outside of the pier—measure at least five feet in length. The face-stones within the ice-breaker intervals of piers 2 and 3 were pinned into the underlying and overlying layers with iron bar to further strengthen the pier against the forces exerted by ice jams.²⁸ When the caissons reached the appropriate depths, the air-lock systems were dismantled and the working chamber and exit ways were filled with concrete. Masonry work then continued until the desired height of the pier was reached. As a result, the piers are solid granite except for that portion of the pier that was constructed while the caisson was in use which, therefore, contains the concrete-filled, six-foot-diameter, working chamber. The caisson excavation took place from September 1881 to January 1882. It took workers almost three months to excavate caisson 2 to the proper depth and two months for caisson 3. The masonry for pier 2 was completed a week after the caisson was filled with concrete; the masonry for pier 3 was not completed until the following spring due to delays from ice jams.²⁹

Morison could find no nearby source of masonry stone for the piers, the closest being two quarries (Watab and Rock Island) near Sauk Rapids, Minnesota. Initially, both gray and red granite from the Watab Quarry were used for the bases of piers 1, 2, and 4. Morison discontinued using Watab stone after he discovered that it broke easily while being worked, making clean cuts difficult. As a result, the upper portions of piers 1, 2, and 4, and all of pier 3 were faced with blue-gray granite from the Rock Island Quarry. The red granite is highly visible on the ice breaker portion of pier 2 and forms a checkerboard pattern with the gray granite. In his final report, Morison noted that a single Watab stone was also visible at ground level on the east side of pier 1.³⁰ Today, the ground surface is four to five feet higher around pier 1, and the Watab stone is no

Morison designed the tracks of the bridge to stand fifty feet above his predicted high water level for the Missouri. When the river flooded much of this area in the spring of 1884, the embankment north of the bridge successfully protected the west trestle, and the bridge did not sustain any damage. A portion of the trestle was filled with clay in 1889, and, in 1895, the remaining portion was filled in.



longer visible. Slabs and pieces of both Watab and Rock Island granite litter the area below pier 1. A number of slabs are also present on the hillside above the water treatment plant and mark the area used by Morison to unload the construction material as it arrived by rail.

The superstructure of the bridge was constructed primarily of steel and wrought iron. At this point in history, most railroad bridges were being built solely with wrought iron; Morison was a pioneer in the use of steel. Morison designed the bridge spans after carefully calculating the stresses that would occur due to the weight of the rolling trains. He attempted to predict the future weights of locomotives and railcars and designed the bridge to handle these increases. The original spans were trapezoidal and remained in existence until 1905.

The difficulty in finding good workers was another problem for Morison. He noted that ordinary laborers were paid, on average, \$2.00 a day, and that

the labor in this country was of an inferior character, and very difficult to control, the men generally being indifferent as to whether they worked or not, and entirely ready to be discharged. It frequently happened that gangs of men sent out from St. Paul to work on the bridge disappeared almost as soon as they arrived.³¹

This may best be illustrated by the recollections of James Melarvie, a local pioneer who worked for four days on the bridge caissons as a cement mixer:

I was wheeling cement on a wheel-barrow out to the mixer about seventy-five or one hundred feet. The wind was blowing a gale up the river and the planks we were wheeling over had so much spring they would go up and down. That was too much for me as it made me dizzy. I saw if I tried to keep on I would be taking a bath in the river so I let go of the wheel-barrow and over it went into the water. I walked back to shore and went to the boarding house and gave the man my time sheet and quit. That was the last I heard of it. I didn't go back after my pay

for fear they would ask me what I did with that wheel-barrow load of cement.³²

Workers completed major construction of the bridge on October 18, 1882, ten months before the northern route of the transcontinental railway was finished.³³ On October 21, a committee of engineers tested the soundness of the bridge by slowly transferring eight locomotives onto each of the three spans and measuring the deflection of each span under the accumulated weight. The Northern Pacific provided free transportation from Bismarck and Mandan to view the event, and the crowd reportedly numbered in the thousands. Upon the successful completion of the one-and-a-half-hour test, all eight locomotives blew their whistles and were joined by the whistles of the steamboats below the bridge, much to the delight of the spectators. Participants and special guests who had come from throughout the country were guests at a large luncheon at the Inter-Ocean Hotel in Mandan and later that evening at a banquet at the Sheridan House in Bismarck, reported to be the most notable ever held in Dakota Territory.³⁴ It is interesting to note that the Mandan newspapers at that time referred to the bridge as the Mandan Bridge while the Bismarck newspapers called it the Bismarck Bridge. Although major construction was now completed, and trains could use the bridge unimpeded, finishing touches, such as painting, were left. As a result, the bridge was not officially turned over to the operating department of the Northern Pacific Railway Company until August 1, 1883. Morison placed the total cost of the bridge at \$1,079,000. This amount included the cost for construction of the dike after January 1, 1881, when he took over as engineer and superintendent.³⁵

Slide Activity

The hill slope east of the bridge began failing shortly after the bridge was completed, and pier 1 (the easternmost pier) began moving west towards the river. The pier moved an average of 3 to 3.6 inches per year from

30. *Ibid.*, pp. 11-12.

31. *Ibid.*, p. 19; *Bismarck Tribune*, May 13, 1881, p. 1. What labor was available in this area was likely employed in one of the 2,000 jobs available for laying track to the west. *Bismarck Tribune*, May 20, 1881, p. 8. Bellows, Fogarty, and Company paid \$1.75 a day for shovelers and \$4.00 a day for a man and team of horses. The *Tribune* noted that, at the exorbitant rates being charged for boarding of stock such as \$1.50 for a bushel of oats, the shoveler got the better deal.

32. James Melarvie, *Reminiscences*, n. d., p. 7. General Information File. North Dakota State Archives.

33. Nolan, p. 63. The last spike was driven on August 2, 1883. The grand opening ceremony took place on September 8, 1883, near Gold Creek, Montana.

34. *Bismarck Tribune*, October 27, 1882, p. 2; *Daily Pioneer* (Mandan),

October 21, 1882, p. 1; October 27, 1882, p. 1.

35. Morison, p. 20.

36. Office of Bridge Engineer, Bismarck Slide-General Summation, [St. Paul: Northern Pacific Railway, July 15, 1948], p. 7, North Dakota State Archives.

37. Ben L. Crosby was listed as assistant engineer to Morison in Morison's final report. In 1904 railroad documents list Crosby as principal assistant engineer in Tacoma, Washington.

38. Office of Bridge Engineer, pp. 8-10.

39. *Ibid.*, pp. 10-15.

40. A.N. Marquis, ed., *Who's Who in America* (Chicago: A.N. Marquis Co., 1931), p. 1518. Edwin Harrison McHenry held several positions with the Northern Pacific 1883-1901 in St. Paul and later worked for the Canadian Pacific and other railroads.

Official testing of the Northern Pacific Bridge by a committee of engineers on October 21, 1882. The crib work was to be removed shortly after this photo was taken but much of the base filled in with sand and could not be removed. It was subsequently swept away from the bridge during the next spring breakup of ice. An area of the river was left open between two of the piers during construction to allow steamships to navigate. The wooden trestle on the west approach (left) was eventually filled in with dirt.



1883 to 1887.³⁶ Morison had not expressed concern for slope stability in his final report, and it is assumed that the failure of the east slope caught him by surprise. He returned to Bismarck from his New York headquarters in July 1885 to examine firsthand the condition of pier 1. By August 24, 1888, pier 1 had moved an additional 7.9 inches, and a crack developed in the structure. In September 1888 it was reported by Morison's assistant, Ben Crosby, that the pier was moving approximately one inch per week.³⁷ Crosby attributed movement to one of four events: weighting of the hillside with earth wasted from the railroad cut; Morison's diversion of the river to the east bank; vibrations from passing trains; and cracks opened by this movement allowing more water to infiltrate and lubricate the slide. Absent from Crosby's conclusions was any discussion of the possible contributions from the Bismarck Water Company's reservoirs or pipeline which had recently located in this area.³⁸

In October 1888 Morison was once again summoned to the site, where he arranged for several additional measures to take the pressure off the pier. These measures included: the excavation of a large pit to the northeast of pier 1 to isolate the pier from the slide; the depositing of the sediment from the pit on the west side of the pier to prevent it from moving in this direction; and the attachment of two large concrete slabs, called keys or dowels, at the base of the slide to bind the sediments above and below the slide together thus slowing or halting the slide. Morison returned to the bridge in September 1890 and felt that the previous corrective measures had been successful and that there would be no further problems with pier 1.³⁹

In 1897 Chief Engineer E. H. McHenry sent Morison

a plan which called for attaching an eight-foot thick vertical slab or column of concrete to pier 1 and deepening the foundation below the sliding zone.⁴⁰ Morison objected, likely basing part of his disagreement on the effect such a plan would have on the aesthetics of the bridge. Morison proposed instead that the pier be dismantled and reassembled in its proper location. After several letters, Morison agreed to McHenry's proposal to slide the pier back into position. It took nearly eight months of careful preparations, including the excavation of a large pit around the pier, to ready the pier for relocation. Steel rails were embedded in the base of the pier and the top of the new foundation, and a bed of two-inch steel rollers was situated between the rails to enable the pier to be slid back into its original position. Huge screws attached to large wooden levers run through capstan heads were to supply power to the pier. Finally, on May 29, 1898, the pier was moved back into position onto an enlarged and deepened foundation. During the first ten minutes that power was applied to the pier, it moved an inch. The gradual movement of the pier caused a large crack to develop on the west edge of the excavated pit. Workers in the pit scrambled up the side as it became evident that the slope was going to fail. In short order, a landslide developed in this area sending a mass of earth crashing into the west side of the pier. Onlookers and workers scurried for their lives as the landslide quickly pushed the pier back into its proper position. The relocation of the pier without dismantling it was a significant engineering feat.⁴¹ By 1902, however, pier 1 had moved four inches since its relocation, and leakage from the adjacent water reservoirs was being blamed by many of the railroad engineers as the culprit.⁴²

City Reservoirs

The pipe and pump house for the Bismarck Water Company were located just south of the bridge and went into service just as the bridge was being completed. The ten-inch main crossed under the tracks near pier 1 and ran up the hill 300 feet north. The pipe was reported to be leaking immediately after it was installed, but it was not known whether slope failure had caused the pipe to leak or if the leaking pipe had contributed to the initial movement of the slope.⁴³ Whatever the case, the pipeline crossed the area of slope failure, and leakage from the pipeline undoubtedly added instability to an already unstable area.

In 1886 the Bismarck Water Company constructed three one-million-gallon reservoirs on the top of a hill approximately 750 feet northeast of pier 1. In May 1894 Chief Engineer E. H. McHenry warned that the Bismarck Water Company's pumping station, leaking pipeline, and reservoir were greatly endangering the bridge.⁴⁴ Speculation was that the reservoirs were leaking 50,000 to 60,000 gallons of water daily. Since the water company had not completed purchase of the land from the railroad, it was directed to remove its intake and pipe to a new location and to repair the reservoir. By November of that year, McHenry noted that the reservoirs had

been repaired.⁴⁵

Ben Crosby's 1888 report on possible causes for the movement of pier 1 did not mention the reservoirs as a possible contributor to slope instability in this area. This was a curious omission because many of the engineers and geologists employed by the railroad were pointing their fingers at the water company. As Morison's assistant, Crosby no doubt consulted with Morison before he sent out his report. In 1898 Morison admitted to having a financial interest in the Bismarck Water Company, noting he had recently sold it. It was later reported that Morison and Mr. Corthel (or Corthill) oversaw construction of the waterworks.⁴⁶ Morison's financial stake in the Bismarck Water Company certainly would explain his reluctance to blame the reservoirs and pipeline for the slope stability problems. This is unfortunate, because early action by the water company might have increased slope stability in this area and saved the Northern Pacific a considerable amount of money.

In 1899 a frustrated Chief Engineer McHenry urged legal action against the water company. A railroad report states that efforts to take care of the leakage from the reservoirs met with the usual promises, evasions, and postponements from the Bismarck Water Company. Therefore, in the fall of 1902, the engineering department of the Northern Pacific took it upon them-



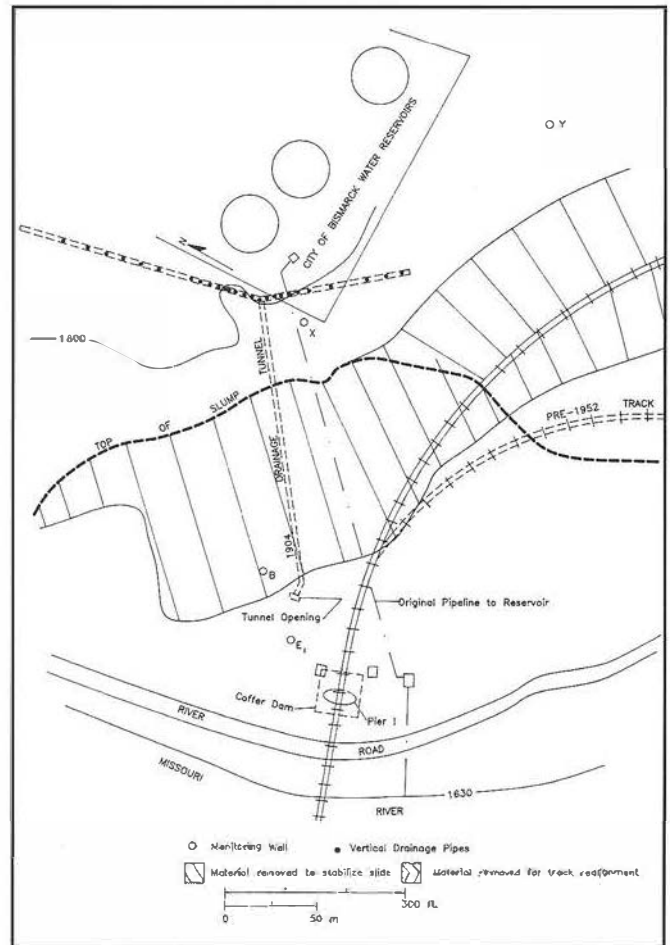
The Northern Pacific Railway Company posted a watchman at the east end of the bridge from its completion in 1883 until the replacement of its spans in 1905. The watchman's shack is on the right side of the track and his house is on the left side. Below the house are a toolshed and the pumphouse for the Bismarck Water Company. As designed by Morison, the tracks took a sharp turn before entering the east side of the bridge. In 1951 the Northern Pacific reduced the curvature in this area by making a deep cut into the hillside east of the bridge and rerouting the tracks. This reportedly made it much easier for large locomotives to negotiate this curve. Photo ca. 1890s.

selves to look for possible relocation sites for the reservoirs. The railroad found what they thought would be an acceptable location northeast of the existing site and estimated the cost of relocation at \$46,500.⁴⁷

By this time, Alexander McKenzie, also known as the Boss of North Dakota, Alexander the Great, and the Bismarck Boomer, had become the principal owner in the water company. The story of how McKenzie and a few close friends acquired title to the Bismarck Water Company is surrounded by mystery and intrigue. It reportedly involved the mysterious disappearance of an official record book from the office of the Burleigh County Register of Deeds and the return of the title with names other than the originals.⁴⁸ It is generally believed that the Bismarck Water Company had little or no available capital, despite the fact that McKenzie was regarded as one of the wealthiest men in the Dakotas. In 1903 a test was made at McKenzie's request that demonstrated the reservoirs were leaking approximately 18,000 gallons a day. Six months later, McKenzie discounted or ignored these findings and was once again insisting that the reservoirs were not leaking.⁴⁹ The following year, Chief Engineer E. J. Pearson noted that the walls of the reservoirs were severely cracked down to a depth of eight and perhaps ten feet as a result of ice damage.⁵⁰

The reluctance of the railroad to take the Bismarck Water Company to court may have resulted from the close ties between McKenzie and the heads of the Northern Pacific Railway Company and the railroad's possible dependence upon him to supply water for its steam locomotives. It was reported that McKenzie did provide free water to "his old cronies at the Northern Pacific Railway."⁵¹ But even more importantly, McKenzie had been an agent for the Northern Pacific and was an important political ally for the railroad, often serving as their "special" representative in matters involving federal, state, and local governments.⁵²

McKenzie died in 1922. One year later, following a



In 1904 a drainage tunnel, which branched in two directions below the reservoirs, was constructed to stabilize the area by intercepting water leaking from the Bismarck Water Company reservoirs. Construction of the tunnel began in January and was completed late in the summer. Little water was accumulated in the tunnel so numerous boreholes were drilled down from the surface into the tunnel to assist with the drainage. This map was modified from Peck's report.

41. *Bismarck Tribune*, May 30, 1898, p. 3. The *Tribune* reported that a landslide was responsible for moving the pier out of its proper location, and a landslide was responsible for moving it back.

42. Office of Bridge Engineer, pp. 18-20.

43. George E. Burgess, N.P.R.R. Topographical Map of East Bank of Missouri River at Bismarck Bridge (St. Paul: Office of Chief Engineer, May 31, 1894), plate 1, North Dakota State Archives.

44. Office of Bridge Engineer, p. 15.

45. *Ibid.*, p. 15.

46. *Ibid.*, p. 11; J.M. Edgerley, Letter to Alexander McKenzie, May 10, 1888.

47. Office of Bridge Engineer, pp. 15-21.

48. David B. Baglien, *The McKenzie Era, A Political History of North Dakota From 1880 to 1920* (Fargo, North Dakota: unpublished master's thesis, North Dakota Agricultural College, 1955), p. 13. Joseph A. Jackson, *Bismarck Boomer: The Amazing Career of Alexander McKenzie* (unpublished manuscript, North Dakota State Archives, 1954), pp. 105 and 280. Jackson states that on May 27, 1886, the Bismarck Water

Company was organized by McKenzie, Eber H. Bly, Richard B. Mellon, Alexander Hughes, Daniel B. Decker, and James H. Marshall. J.M. Edgerley (Joel), letter to Alexander McKenzie, May 10, 1888, (McKenzie Collection, State Historical Society of North Dakota), pp. 61 and 62. According to this document, the certificates of stock for the Water Company were originally issued to a Colonel Monroe and assigned by him to Morison and Corthill. They apparently gave the certificates to Captain Hughes and asked him to have the stock transferred on the company's books and new certificates issued in their names. Hughes, in turn, gave the certificates to Eber Bly who held the stock, claiming Morison and Corthill had not fulfilled their contract in the construction of the waterworks and therefore were not entitled to the stock. This may be the incident that Jackson refers to in his manuscript. On the other hand, a book which contains at least two transactions involving the Bismarck Water Company is missing from the Burleigh County Register of Deeds Office. It may be that Jackson is partly correct; that is, that the document was stolen but that it was never returned. Additional documents in the Burleigh

long and bitter litigated battle between the city and the Bismarck Water Company, the city purchased the water system.⁵³ The city assumed responsibility for the reservoirs, and records seem to indicate the Northern Pacific's engineers enjoyed a better relationship with city officials than they had with the Bismarck Water Company; however, leakage from the reservoirs continued. In 1951 a study determined that the reservoirs were leaking at a rate of 6,050 gallons per day.⁵⁴ In 1960 the city relined the base of the east and west reservoirs with cement; all three are operating today with no reported leakage.

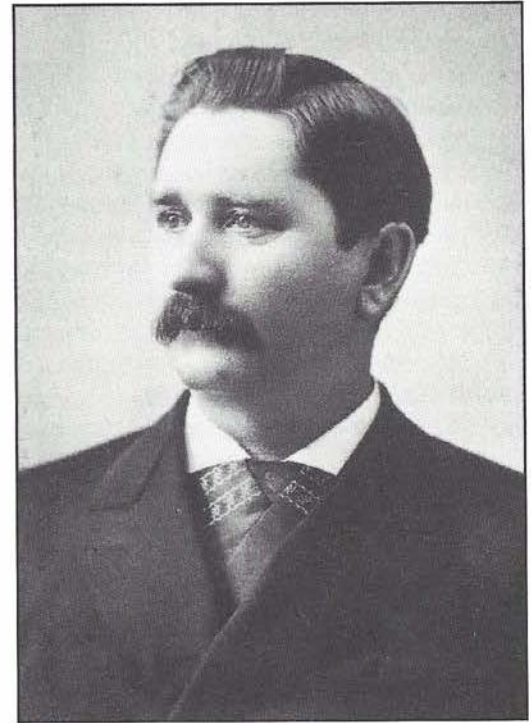
The Tunnel

That the waterworks were involved in the deterioration of the east bank was the opinion of at least one turn-of-the-century engineer who recommended two different approaches to alleviate the problem. In 1903 Robert Moore, a consulting engineer from St. Louis, concluded that all of the previous efforts to stop the slide on the east bank had been fruitless, and the Northern Pacific should turn its efforts to removing the cause. Moore strongly believed that the only permanent solution was removal of the waterworks to a hill approximately 1,500 feet east of the present location, at a cost of \$60,000. He also recommended the immediate construction of a tunnel into the hill beneath the reservoirs to intercept and draw out all groundwater on the east side of the bridge.⁵⁵

The Northern Pacific opted for his second recommendation, and crews, consisting of two miners, one or two laborers, and a carpenter, hand dug a four-foot by six-foot, timber-lagged mine tunnel, using a horse to haul out the rock. The crews generally worked two shifts and averaged four feet a day. The workers had to alternately contend with poorly cemented rock that caved in and areas of well cemented rock that had to be blasted. The tunnel entrance was north of pier 1 and extended at a slight upward grade for 483 feet in the direction of the reservoirs, ending approximately 65 feet from the side of the nearest reservoir. Two lateral tunnels were extended at the end of this tunnel, one extending north and the other southeast.⁵⁶

Very little water was initially picked up by the tunnel so eighteen perforated pipes were driven down from the surface into the lateral tunnels at forty-foot spacings. Later eleven pipes were added. What little water seepage there was from the tunnel roof and walls ceased upon completion of the additional drains, and the general consensus at this time was that the project was

Alexander
McKenzie,
1886



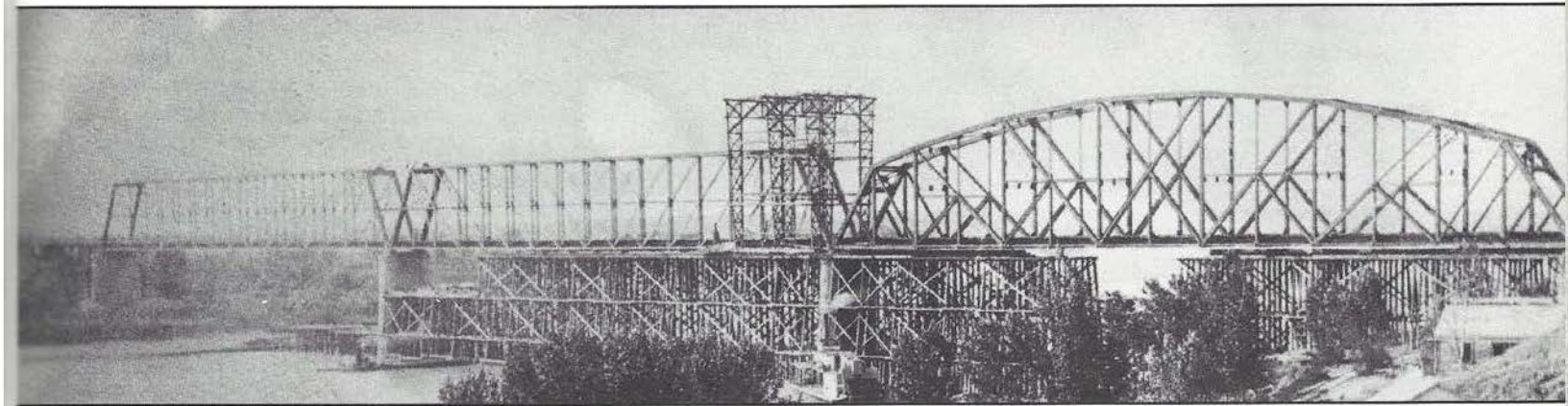
successful. At one time, the drainage system carried 7,000 to 14,000 gallons of water a day from the area. Although, in general, the tunnel was poorly maintained over the years, many of the framing timbers were replaced in 1911 and again in 1937 due to decay and damage from shifting within the tunnel caused by slope failure. Records indicate that outflow from the tunnel was seasonal. The water that was collected by the drainage pipes was carried from the tunnel through a wooden drain box under the floor. An inspection in 1929 found that a significant amount of water was leaking out of this drain box and no flow was observed exiting the tunnel.⁵⁷ By 1950 flow from the tunnel had been reduced to 1,800 to 2,700 gallons a day. The reduced flow was believed to result primarily from the clogging of the perforated pipes which were driven without any surrounding filler material.⁵⁸

The contribution of the tunnel to slope stability seems to have received a mixed review from the engineers involved in this active landslide. In 1929 Howard E. Stevens, a Northern Pacific Railway engineer from St. Paul, expressed the general feeling:

It occurs to me that we are continuing to maintain this tunnel because no one cares to take the responsibility of saying nothing would

County Register of Deed's office indicate that the Bismarck Water Company authorized the issuance of bonds through the Central Trust Company of New York on June 14, 1887. At this time, Eber H. Bly was listed as president of the Bismarck Water Company and Alexander

Hughes as secretary. On May 23, 1896, a judgment was made in District Court requiring the Bismarck Water Company and Central Trust Company of New York to sell the waterworks to the highest bidder. The plaintiffs in this case were Alexander McKenzie, George



Above: The bridge spans were replaced April-December 1905. Here, the east span had been replaced and work was just beginning on replacement of the middle span. Sufficient room was left between the cribbing for steamships to pass beneath the bridge during construction. In the fall, however, shifting sandbars plugged the opening under the east side of the bridge, and the railroad had to remove the cribbing from another area to enable navigation to continue. Below: Workers driving spikes while laying track on the newly replaced east end approach span of the Northern Pacific Bridge. The base of the new east truss (replaced in September 1905) is visible in the background. The small track to the left was built to guide the construction derrick. Photo taken between November 22, 1905, and January 15, 1906. Courtesy of the Northern Pacific Railway Company Records, Minnesota Historical Society, St. Paul, Minnesota.

happen if it was abandoned. There has always been considerable question in my mind if the tunnel served any useful purpose. . . . on account of the clay nature of this soil I doubt if we catch water from any considerable distance on either side of the tunnel bore.⁵⁹

In fact, the tunnel was a favorite place for local boys to play and explore until it was abandoned in 1951.⁶⁰

Replacement of Bridge Superstructure

By 1904, despite Morison's initial attempt at predicting the future weights of trains, it had become clear that the original spans were no longer adequate for the



A. Hughes, and Eber H. Bly. According to an article in the April 23, 1896 issue of the *Bismarck Tribune* the suit was brought to determine the priority of lien, whether local creditors (such as McKenzie et al) should be reimbursed before the Central Trust Company was reimbursed. On December 10, 1897, Ernest N. Morison (presumed to be George Morison's nephew), John S.T. Waters, and Miles White, Jr. purchased the works for \$37,000. On February 9, 1898, Morison, Waters, and White sold the waterworks to the Bismarck Water Supply Company for \$57,250.

49. Office of Bridge Engineer, p. 21.

50. E.J. Pearson, Letter to General Manager H.J. Horn, Chief Engineer, Northern Pacific Railway Co., May 9, 1904, p. 4, North Dakota State Archives.

51. *Bismarck Tribune*, Farwest Supplement, December 17, 1977, pp. 12-14.

52. Jackson, pp. 137, 141-142. One example of his value to the railroad was his attempt in 1893 to get Burleigh County to forgive \$32,000 in back taxes owed by the Northern Pacific.

53. *Bismarck Tribune*, December 17, 1977, pp. 12-13.

54. Ralph B. Peck, *Report on stability of slope; east bank of Missouri River, Bridge 196, Northern Pacific Railway Co., Bismarck, North Dakota* (Urbana: Department of Civil Engineering, University of Illinois, 1951), p. 48, North Dakota State Archives.

55. Office of Bridge Engineer, pp. 22-23.

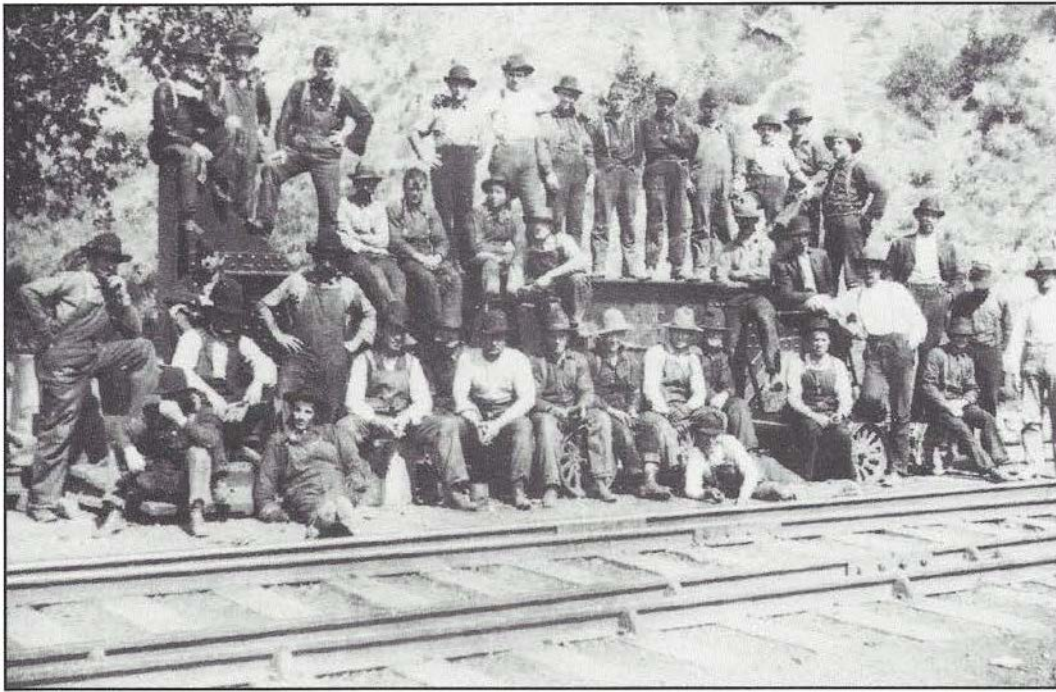
56. W.C. Smith, Series of letters to Acting Chief Engineer E.J. Pearson, Division Engineer (St. Paul: Northern Pacific Railway Co., January 20 - April 27, 1904), North Dakota State Archives.

57. Office of Bridge Engineer, p. 34; H.F. Brown, Letter to Bernard Blum, District Engineer, St. Paul, Minn., March 27, 1930, pp. 1-3; H.F. Brown, Memo, District Engineer, St. Paul, Minn., March 22, 1937, p. 1, North Dakota State Archives.

58. Office of Bridge Engineer, p. 6.

59. *Ibid.*, p. 35.

60. Interviews with Chester Perry and Robert Olgeirson, Bismarck, North Dakota. They recall playing in the tunnel as boys in the 1920s and 1930s. In an interview with Rodney Feldman, a professor of geology at Kent State University, he reported playing in the tunnel in 1945-1950 and said it was a great place to catch garter snakes.



Thirtyeight members of the crew respanning the Northern Pacific Bridge posed on one of the trusses loaded on a car ready to be rolled onto the bridge and placed in position. It was reported that in July 1905 twelve men arrived at the bridge claiming to be experienced bridge erectors. It quickly became apparent that they were not what they claimed so bridge foreman N. P. Togerson was sent to Chicago where he enlisted the services of thirty-six good bridge workers. Photo taken between September 20 and October 20, 1905. Courtesy of the Northern Pacific Railway Company Records, Minnesota Historical Society, St. Paul, Minnesota.

heavier locomotives, and a decision had to be made regarding the Bismarck bridge. The railroad engineers reviewed the whole question of slope and bank stabilization and bridge relocation. They explored several options, including the construction of a new, heavier bridge in another location, increasing the width of the river beneath the bridge and adding an additional bridge span, and replacing or reinforcing the existing bridge spans. The railroad dismissed expansion of both the river and the bridge because their engineers felt it would increase the danger of ice jams forming beneath the bridge. Instead, the railroad decided to replace the spans on the existing bridge, and Ralph Modjeski, a consulting engineer from Chicago, was hired to design the new spans.

The Northern Pacific could not afford to have the bridge closed to traffic during the eight months it would take to replace the spans. Therefore, railroad engineers designed wooden cribbing or falseworks which not only supported each span as it was replaced but was also able to support the weight of passing trains. This resulted in the unprecedented feat of allowing trains to continue running with little or no delay while the bridge was

under construction. One of the main concerns for the engineers at this time was to keep an area under the bridge open for navigation, a task made more difficult by the shifting sandbars.⁶¹ The new trusses were bow-strings, in contrast to their trapezoidal predecessors, enabling old photos of the bridge to be readily identified as pre- or post-1905. The new trusses were entirely made of steel, unlike the previous ones which contained both steel and iron pieces. The bridge spans were replaced at a cost variously calculated from \$274,000 to \$500,000, depending on the source. The new bridge was reported to be designed to carry twice the weight of the old bridge which enabled it to support the anticipated increases in railcar weight long into the future.⁶² Judging from the fact that the bridge has remained relatively unchanged for the last ninety years, the engineers certainly met or exceeded their goal.

Few local men applied for the available jobs during the respanning of the bridge, and most of the workforce came from Duluth, Minneapolis, Chicago, St. Louis, and Omaha. No serious accidents were reported during this time. One worker did fall from the bridge into the river but returned to work within a week.⁶³

61. *Bismarck Weekly Tribune*, March 9, 1906, p. 1; Resident Engineer Nickerson, final report to Consulting Engineer Ralph Modjeski, (Bismarck: Northern Pacific Railway Co.), January 24, 1906, p. 17.

62. *Bismarck Weekly Tribune*, March 9, 1906, p. 1. The *Tribune* estimated cost of respan at \$500,000; Nickerson, pp. 14-18. Most of the old bridge was salvaged for repair parts in other bridges throughout the country. The timber from the cribbings was also salvaged. Timber piles were cut off at the water line and the remnants can be

seen today on or below the east and west ends of the bridge.

63. Nickerson, p. 21.

64. Nelson Handsaker, Report on Inspection of Cofferdam, Bridge 196, Bismarck (St. Paul: Office of Bridge Engineer, Northern Pacific Railway Co., August 10, 1948), p. 2.

65. Ralph B. Peck, Letter to E.C. Murphy, Civil Engineer: Geotechnics, Albuquerque, New Mexico, May 12, 1994, pp. 1-2.

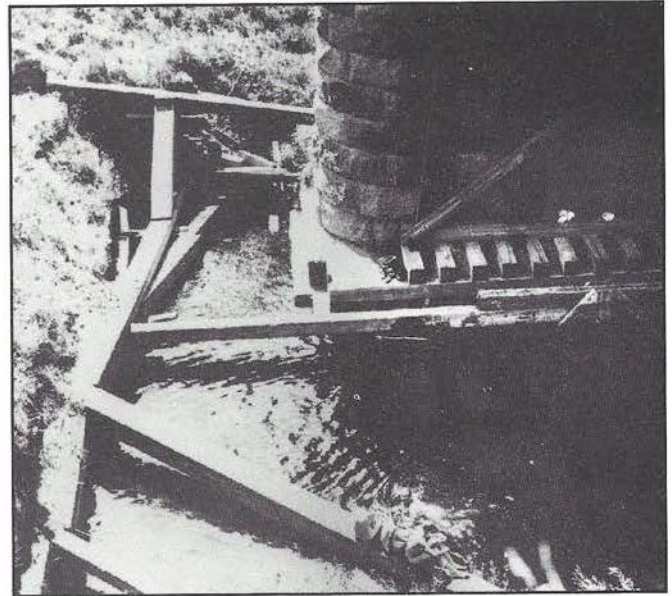
66. Ralph B. Peck and H.O. Ireland, *Investigation of Stability*

The Final Solution

During the years, the east slope continued to move, undergoing an accelerated period of movement from 1947 to 1950. For some time, the Northern Pacific had contemplated realigning the tracks on the east side of the bridge. In 1951 they decided it would be a good time to reassess the slide, especially in light of the advances that had been made in understanding slope movement.⁶⁴ During this sametime, the Association of American Railroads had a contract with the University of Illinois to investigate stability problems at the request of the various railroads in the United States and Canada. As a result of this contract, Dr. Ralph B. Peck, a widely respected engineering professor at the University of Illinois, investigated the slide to determine a solution to eliminate or greatly reduce the slope failure in this area, thus retarding the movement on pier 1. Coincidentally, Dr. Peck's parents homesteaded in the Dakota Territory near Mitchell, South Dakota, and one of his father's first assignments as a railroad bridge engineer was to design the steel tail-span on the east end of the Bismarck bridge in 1907.⁶⁵ In 1991 the east tail-span was replaced with three sets of steel piles.

Dr. Peck evaluated the seventy years of information and hypotheses from the site and concluded that Morison's alteration of the river channel and trimming of the hillside were the main causes for failure of this slope. From his study of the area, Peck surmised that the slopes along the east side of the bridge were likely unstable prior to bridge construction. Therefore, the slope would not require much disturbance during bridge construction to start it moving. Peck determined that the only way to obtain stability at this site was to remove a substantial amount of the hillside above the bridge and to recontour the base of the slope. The Northern Pacific concurred with Peck's recommendations, and dirt work began in the fall of 1951 and was completed the following year.⁶⁶ Even after these efforts, the slide continued to move, albeit at a much reduced rate. In 1963, the year the railroad discontinued keeping records on the site, the slide was moving at a rate of approximately one-third of an inch a year.

The Bismarck bridge was originally built for a cost of \$1.1 million. In 1905 the original spans were replaced at a cost of \$274,000-\$500,000. No estimates are available of the cost to the Northern Pacific to repair and maintain pier 1 and the slopes adjacent to the east end of the



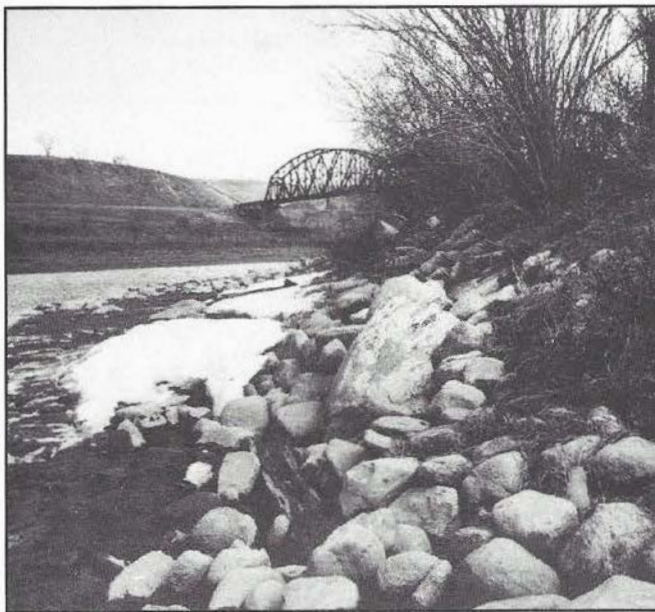
In 1918 a cofferdam, consisting of a large pit, braced with thick timbers, and excavated down to the base of the foundation, was placed around pier 1 to protect it from the sliding hillside. The cofferdam succeeded in slowing movement on the pier but had to undergo major repairs in 1923 and again in 1940 due to damage caused by pressures placed on it by the landslide. The cofferdam periodically filled with water and was a favorite swimming hole for area youth.

bridge from 1883 to 1952, but it likely involved hundreds of thousands of dollars. What impact, if any, the relocation of the water reservoirs might have had on the stability of the east end of the bridge will never be known. As Dr. Peck pointed out in his report, the hillside began moving at least two or three years prior to completion of the reservoirs, so they could not be blamed for initiating the movement, although they may have added to it later. Morison's involvement with the Bismarck Water Company likely resulted from his recognition of a dire need of the citizens of Bismarck for water and his ability to draw on his engineering experience to help fill that need.⁶⁷ Railroad documents suggest that Morison kept his involvement with the Bismarck Water Company a secret until after he sold his interest in it. It is not known how much the mounting opposition against the reservoirs by the railroad engineers influenced his decision to sell. What is known is

Problems, (Proceedings of the American Railway Engineering Association, 1953), Vol. 54, pp. 1125-1127; and Elmer W. Brooker and Ralph B. Peck, *Rational Design Treatment of Slides in Over Consolidated Clays and Clay Shales* (Canadian Geotechnical Journal, September, 1993), Vol. 30, pp. 533-534.

67. *Bismarck Tribune*, January 28, 1881, p. 1, and February 4, 1881, p. 1. The need for a Bismarck waterworks was front page news when Morison arrived in Bismarck to supervise construction of the bridge.

The *Tribune* pledged to keep the issue in the paper until a decision was made. Merchants concerned about fire danger argued that their insurance premiums would be cut by nearly one half if a water system was built. The city commission set up a committee comprised of Carland, Halloran, and Meserve to look into the matter. There was some disagreement among the citizens as to whether the source of the water should be groundwater or the river.



the frustration of some of these same engineers, who were convinced that the reservoirs were harming the bridge but were unable to get Alexander McKenzie to act or to prompt Northern Pacific officers into forcing McKenzie into action.⁶⁸

For nearly forty years, the Northern Pacific Bridge stood as the only crossing over the Missouri River in this area. With its dark spans, tall masonry piers, and sleek ice breakers, the Bismarck railroad bridge is arguably the most majestic of the four bridges that now span the Missouri River at Bismarck. The bridge stands today as a testament to George Morison and the men who built it, especially those brave souls who toiled in the dimly lit caissons. Perhaps Morison himself summoned up their accomplishment best when he said, "Peace hath her victories, no less renowned than war."⁶⁹

ND

Acknowledgments

The author would like to thank Dr. Ralph Peck, Professor Emeritus, University of Illinois; Todd Strand and Jim Davis, State Historical Society of North Dakota; Mel Bullinger and Brad Wright, Engineering Department, City of Bismarck; Steve Nielsen, Minnesota Historical Society; Laurie Morrow, Montana Historical Society; Trent Heinemeyer, Bismarck, and Gerald Knudson, Mandan, for providing material for this article.

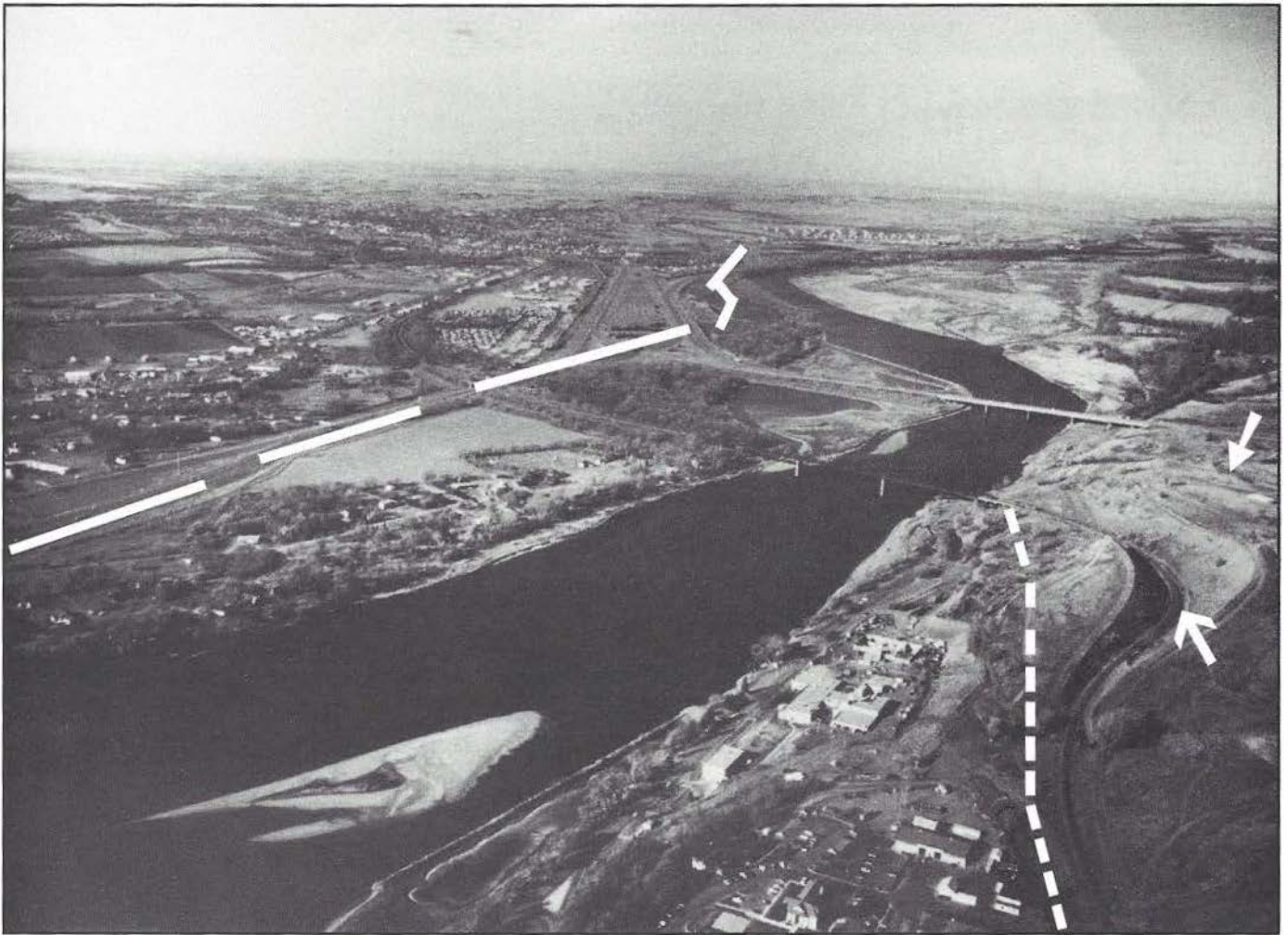
About the Author

Edward C. Murphy is a geologist with the North Dakota Geological Survey. A native of Bismarck, he earned an associate of arts degree from Bismarck State College, and bachelor's and master's degrees in geology from the University of North Dakota. This article resulted from an ongoing investigation of slope stability in the Bismarck-Mandan area.

68. J.M. Edgerley, letter to Alexander McKenzie, Alexander McKenzie Papers, May 18, 1888, p. 69, North Dakota State Archives. An interesting and perhaps insightful example of how McKenzie and the Bismarck Water Company operated is provided by Edgerley's letter which describes an incident in which the Bismarck Water Company almost turned off the water to the territorial governor. The governor had previously complained that his water bill was too high and was delinquent in his payments. One of McKenzie's associates with the Water Company, Eber H. Bly (of the Sheridan House), gave orders for the water to be shut off at the governor's residence but Edgerley intervened and resolved the matter before the water was turned off. It was reported that Bly was trying to get even with the

governor for a bill concerning committee room rent that "went into the wastebasket" during the last legislative session. Following the incident Bly reportedly went around Bismarck sarcastically remarking the Governor "is a hell of a nice man, too mean to pay his water bill."

69. *Bismarck Tribune*, October 27, 1882, p. 2; Nolan, p. 36. Morison concluded his remarks at the banquet given the evening of the successful testing of the bridge with those words. The phrase was apparently borrowed from a Northern Pacific advertisement brochure written in 1871 by Jay Cooke of the NP Land Grant and Immigration Department.



Opposite page, top: Classification of sediment cuttings obtained from boreholes during a geotechnical investigation of slope stability at the east pier. Pictured second from the left is Ralph Peck, a member of the investigative team from the University of Illinois. Photo taken July 1951, courtesy of Ralph B. Peck.

Opposite page, bottom: Boulders eroding out of Morison's dike along the west bank of the Missouri River. The east end of the bridge is visible in the background. The specifications for the dike required that all of the stones weigh at least fifty pounds and at least one-half had to exceed five hundred pounds. Photo taken April 1994, courtesy of the North Dakota Geological Survey.

Above: Recent photo looking north along the Missouri River to the Bismarck Railroad Bridge, with the Grant Marsh Bridge on I-94 in the background. The line of long dashes outlines the approximate position of the west bank of the Missouri River prior to Morison's dike. The open arrow (lower right) points to the 1951 cut and track realignment; short dashes trace the old track alignment; the solid arrow (center right) points to the city of Bismarck water reservoirs. The line change and landslide work required removing 760,000 cubic yards of soil from this area. Courtesy of the North Dakota Geological Survey.



STATE
HISTORICAL
SOCIETY
OF NORTH DAKOTA

APPENDIX C

Ackerman Estvold Flood Analysis



**REVIEW OF HYDRAULIC MODELING
MISSOURI RIVER BNSF BRIDGE – BISMARCK / MANDAN, ND**

September 18, 2020



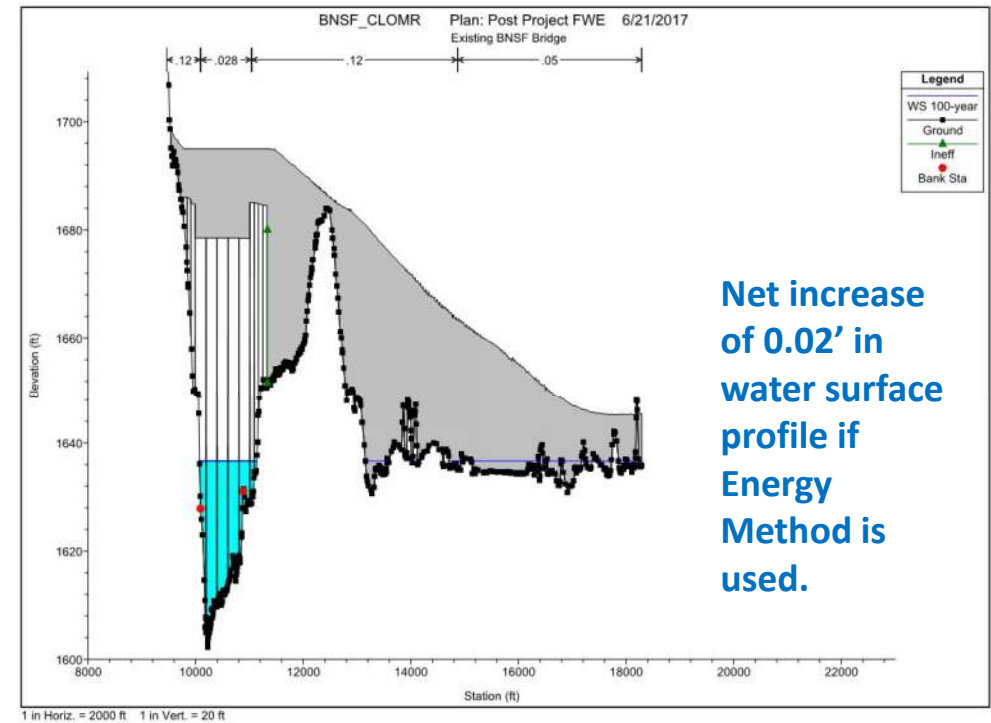
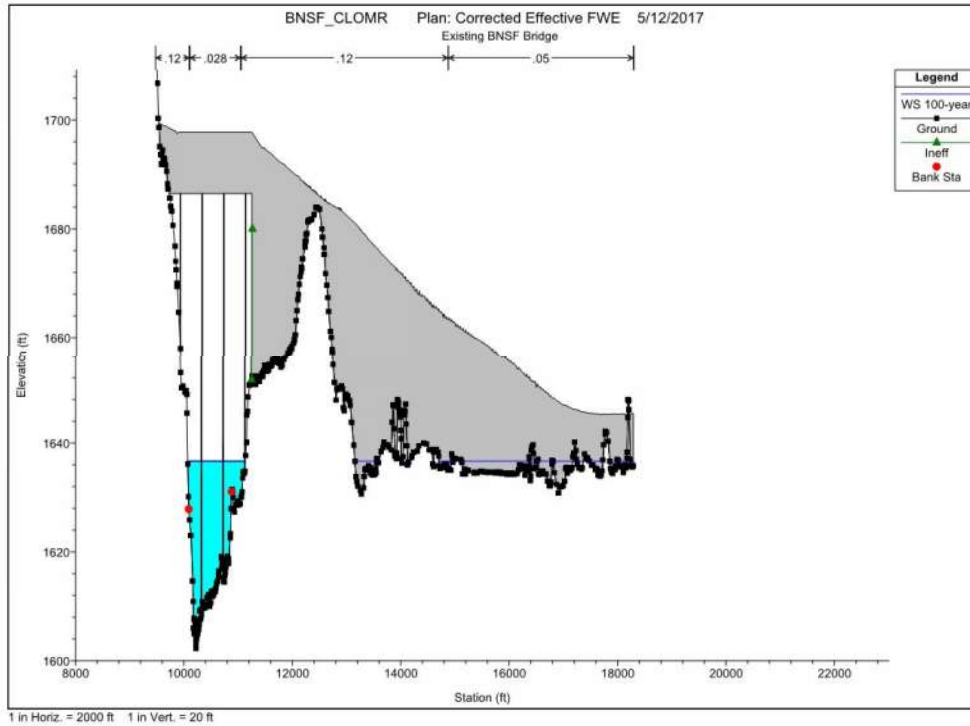
OUTLINE OF OBSERVATIONS

- ❖ Review of Conditional Letter of Map Revision (CLOMR) Submittal to FEMA
- ❖ Review of BNSF Concept 3 – Existing Bridge Remains / New Bridge 42.5 Feet Upstream
- ❖ BNSF Concept 3 Impact Mitigation
- ❖ Alternative Hydraulic Modeling Approach (2-Dimensional Modeling)

Review of Conditional Letter of Map Revision (CLOMR) to FEMA

- ❖ CLOMR computations based on HEC-RAS model used by FEMA for Flood Insurance Study
- ❖ Appears to be two submittals:
 - ❖ Submittal 1 - indicated 0.02-foot rise with 64 structures impacted
 - ❖ Submittal 2 - compares BNSF preferred option to existing conditions to indicate 'no rise'
- ❖ Notable difference is in how bridge losses are computed (1 – Energy Equation; 2 – Yarnell Equation)
- ❖ Submittal 2 uses **Yarnell K=1.15 for Existing Bridge** and K=1.05 for BNSF Preferred Option
 - ❖ This means that the model treats the preferred option as a more hydraulically efficient option than the existing option (lower K values indicate lower friction losses)

Review of Conditional Letter of Map Revision (CLOMR) to FEMA



❖ Existing Conditions

- ❖ Gross width of piers is 40 feet in water

❖ Proposed Conditions

- ❖ Gross width of piers is 60 feet in water after existing bridge is removed

Review of Conditional Letter of Map Revision (CLOMR) to FEMA

Because the BNSF Preferred Option has more blockage, the only way the Yarnell method will show “no rise” is to choose Yarnell coefficients where with the coefficient for the existing bridge is higher (less efficient) than the Preferred Option.

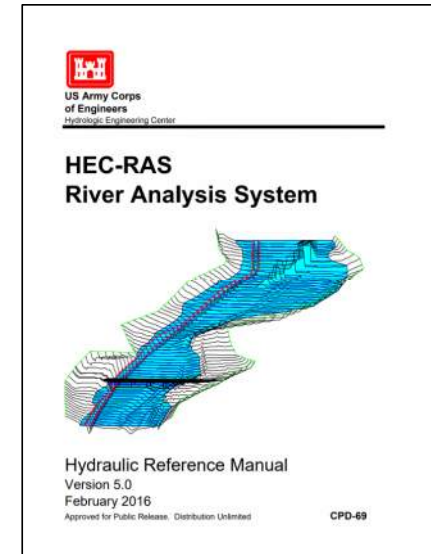


Table 5-4

Yarnell's pier coefficient, K , for various pier shapes

Chapter 5— Modeling Bridges

Pier Shape	Yarnell K Coefficient
Semi-circular nose and tail	0.90
Twin-cylinder piers with connecting diaphragm	0.95
Twin-cylinder piers without diaphragm	1.05
90 degree triangular nose and tail	1.05
Square nose and tail	1.25
Ten pile trestle bent	2.50

Review of Conditional Letter of Map Revision (CLOMR) to FEMA

The CLOMR states that the existing piers have a semi-circular tail and that "while the nose incorporates a sharp ice nose form, it is relatively wide with potential to act as a square nose, and is not vertical to the surface of the water." This is used in the CLOMR to justify a less efficient K coefficient of 1.15.

Table 5-4

Yarnell's pier coefficient, K, for various pier shapes

Chapter 5- Modeling Bridges

Pier Shape	Yarnell K Coefficient
semi-circular nose and tail	0.90
Twin-cylinder piers with connecting diaphragm	0.95
Twin-cylinder piers without diaphragm	1.05
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Square nose and tail	1.25
Ten pile trestle bent	2.50



The Yarnell equation is as follows (Yarnell, 1934):

$$H_{3-2} = 2K(K + 10\omega - 0.6)(\alpha + 15\alpha^4) \frac{V_2^2}{2g} \quad (5-4)$$

Where: H_{3-2} = Drop in water surface elevation from section 3 to 2

K = Yarnell's pier shape coefficients

ω = Ratio of velocity head to depth at section 2

Term that includes pier width → α = Obstructed area of the piers divided by the total unobstructed area at section 2

V_2 = Velocity downstream at section 2

❖ An argument can be made that the existing pier configuration is more hydraulically efficient than what is proposed

Review of Conditional Letter of Map Revision (CLOMR) to FEMA

Preferred Option piers could be less efficient than existing piers.

If $K=1.00$ for existing bridge, $K=1.05$ for Preferred Option, Preferred Option will cause a 0.01-ft rise



Table 5-4

Yarnell's pier coefficient, K , for various pier shapes

Chapter 5— Modeling Bridges

Pier Shape	Yarnell K Coefficient
Semi-circular nose and tail	0.90
Twin-cylinder piers with connecting diaphragm	0.95
Twin-cylinder piers without diaphragm	1.05
90 degree triangular nose and tail	1.05
Square nose and tail	1.25
Ten pile trestle bent	2.50

Review of BNSF Concept 3 – Existing Bridge Remains / New Bridge 42.5 Feet Upstream

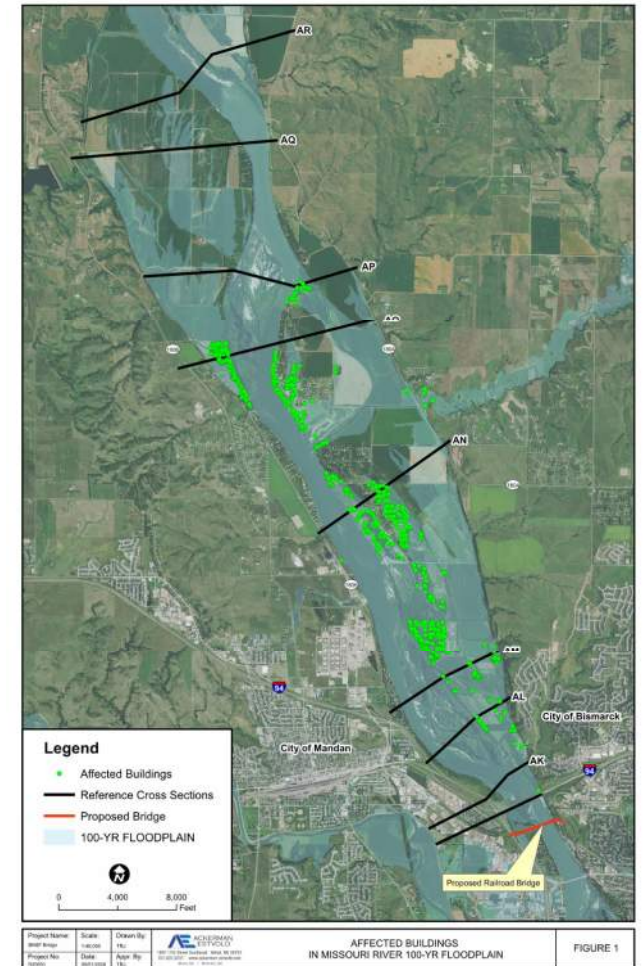
Concept 3: 200ft Spans, Piers 42.5ft Upstream

- ❖ Possible compromise solution
- ❖ Able to accept two new tracks
- ❖ Results in 0.03-ft upstream rise based on One-Dimensional HEC-RAS model
- ❖ Increased construction cost and schedule



Review of BNSF Concept 3 – Existing Bridge Remains / New Bridge 42.5 Feet Upstream

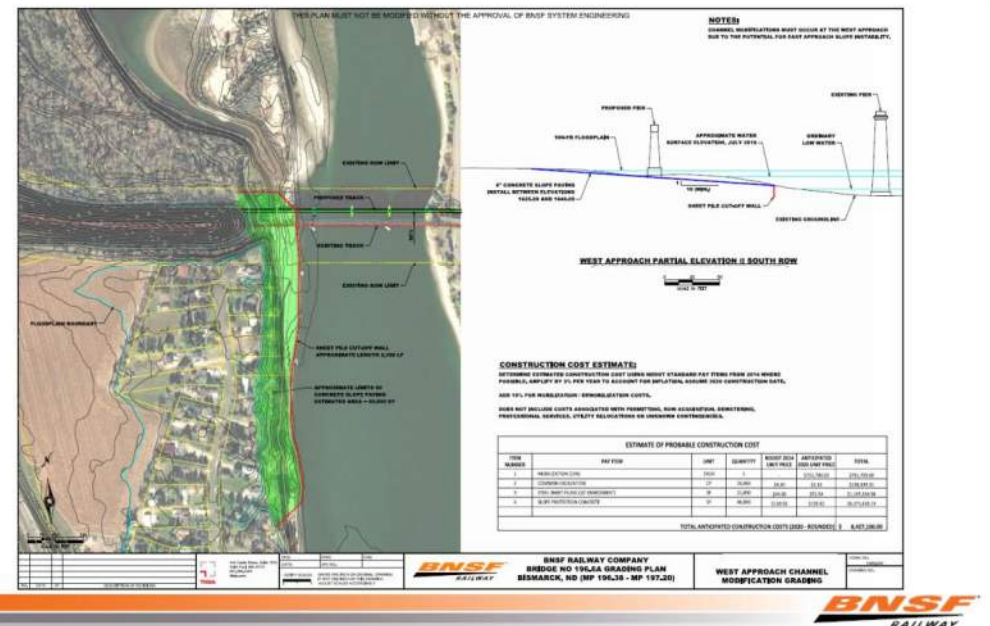
- ❖ Results of One-Dimensional HEC-RAS Modeling & Mapping
 - ❖ 0.03-ft upstream rise upstream of bridge
 - ❖ 552 structures potentially affected
 - ❖ All 552 structures are currently in the 100-year floodplain
 - ❖ 317 structures the rise is less than 3/8 inch
 - ❖ 235 structures the rise is less than 1/4 inch



BNSF Concept 3 Impact Mitigation – BNSF Mitigation Concept

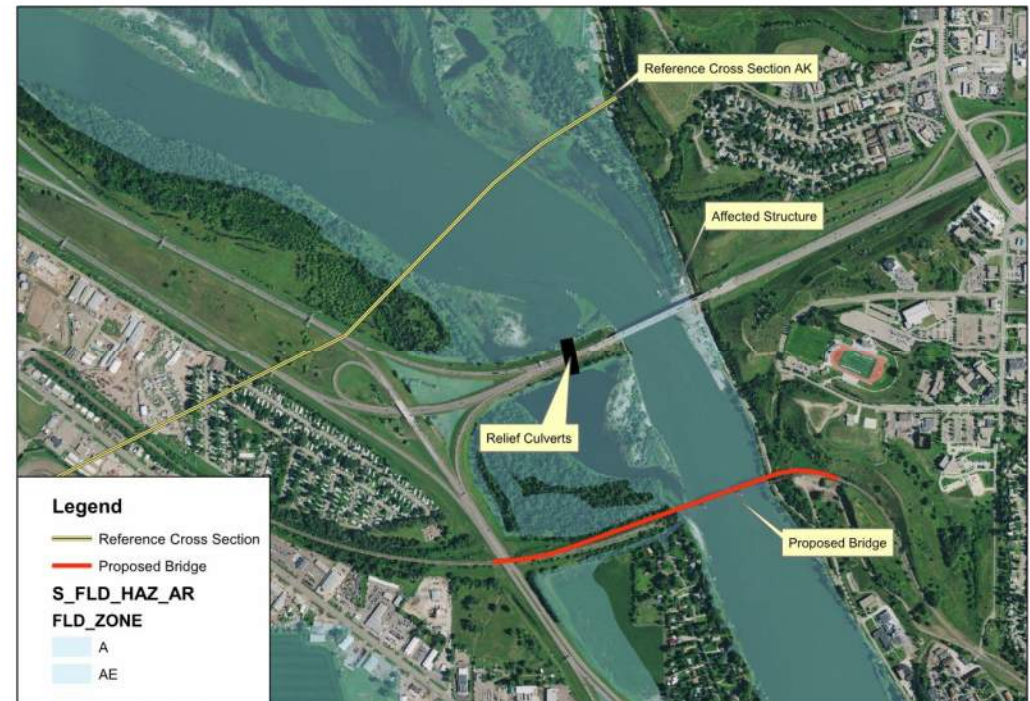
- ❖ Reduce water surface profile to eliminate modeled rise
- ❖ BNSF evaluated solution to pave ¼ to ½ mile of beach to mitigate 0.02' rise
- ❖ ~\$8.4 M Cost
- ❖ More expensive to mitigate 0.03' rise
- ❖ Likely socially and environmentally unacceptable

Case B Mitigation – Base Flood Elevation Rise 0.02'



BNSF Concept 3 Impact Mitigation – Alternative Mitigation Concept

- ❖ Results Based on One-Dimensional HEC-RAS Model
 - ❖ Reduce water surface profile to eliminate modeled rise
 - ❖ Provide three 12-ft relief culverts through Interstate 94 embankment
 - ❖ Cost \$5M to \$10M
 - ❖ Enhance floodplain hydraulics
 - ❖ Provide wildlife passage across I-94 corridor
 - ❖ Possibly affect 1 structure – increase BFE less than 1/2-inch on posts of deck/boat dock



Alternative Hydraulic Modeling Approach (2-Dimensional Modeling)

2D Modeling Advantages:

- The flow path of the water, for all events, does not have to be known to develop the model. However, the extent of the flooding does need to be correctly defined.
- The direction of the flow can change during the event. Water can move in any direction, based on energy and momentum of the flow.
- Velocity, momentum, and the direction of the flow are more accurately accounted for with 2D modeling. This accountability is especially true for flow going over roads, levees, barriers, structures, around bends, and at flow junctions/splits. Additionally, 2D models can be used to analyze eddy zones within the flow field. Around bends, 2D models produce accurate water surface elevations, but velocity distributions might be erroneous due to the existence of helical flow.
- Energy and force losses due to contractions and expansions, etc. are directly accounted for, and do not require empirical coefficients, increased roughness, or user defined ineffective flow areas.
- The mapping of the inundated area, as well as velocities, and flood hazards (depth x velocity) is more accurate.
- Detailed modeling of hydraulic structures, in a full 2D modeling approach, can provide more insight into the flow distribution approaching, going through, and coming out of a structure.



US Army Corps
of Engineers
Hydrologic Engineering Center

Modeler Application Guidance for Steady vs Unsteady, and 1D vs 2D vs 3D Hydraulic Modeling

August 2020

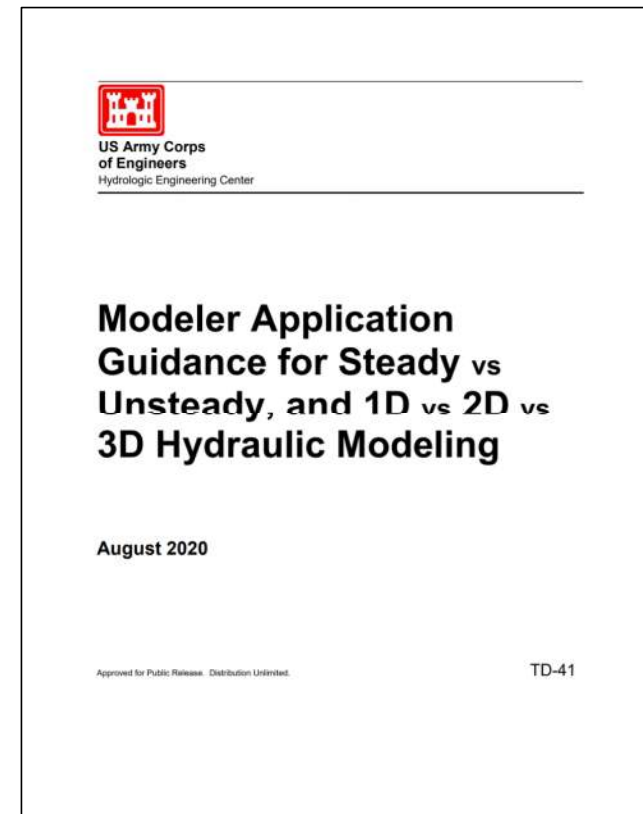
Approved for Public Release. Distribution Unlimited.

TD-41

Alternative Hydraulic Modeling Approach (2-Dimensional Modeling)

2D Model Disadvantages:

- More accurate and detailed terrain models are required in order to develop an accurate 2D model. The terrain must include the details of the channels at all locations within the model as well as correctly capturing features such as roads, berms and levees. Overly filtered LiDAR data sets or data sets that have been processed at too large of a grid size may not properly resolve these key terrain features that influence flow behaviors and patterns.
- Defining and modifying roughness values requires more spatial definition, and can be more difficult and time consuming during the calibration process.
- Requires significantly more computational time and/or computational resources. May require the purchase of a very high level computer (many cores, fast CPU's, lots of RAM, and fast hard disk), or utilizing HPC and cloud computing solutions.
- May require using larger grid sizes than desirable for the problem, in order to reduce the run times to a manageable amount of time.
- May not really produce better results, if the data used to perform the modeling (terrain, channel data, and roughness) do not support the level required for accurate 2D modeling.



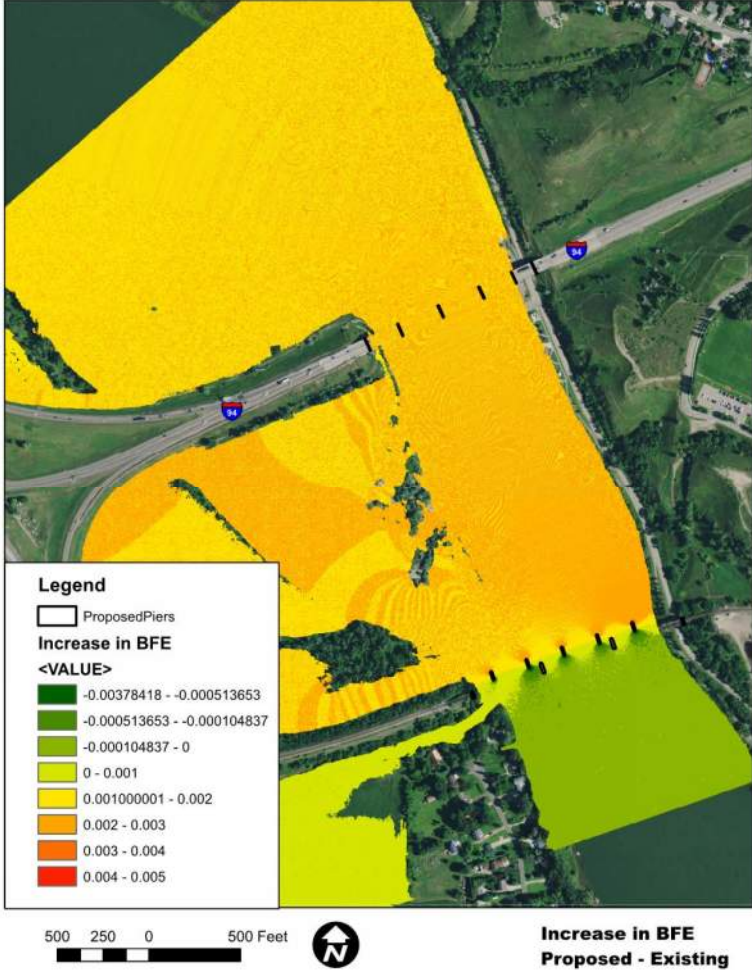
Alternative Hydraulic Modeling Approach (2-Dimensional Modeling)

Existing Bridge and New Bridge 42.5-feet Upstream - Two-Dimensional Modeling



Alternative Hydraulic Modeling Approach (2-Dimensional Modeling)

- ❖ Shows less than 0.003-ft upstream rise (1/32 of an inch)



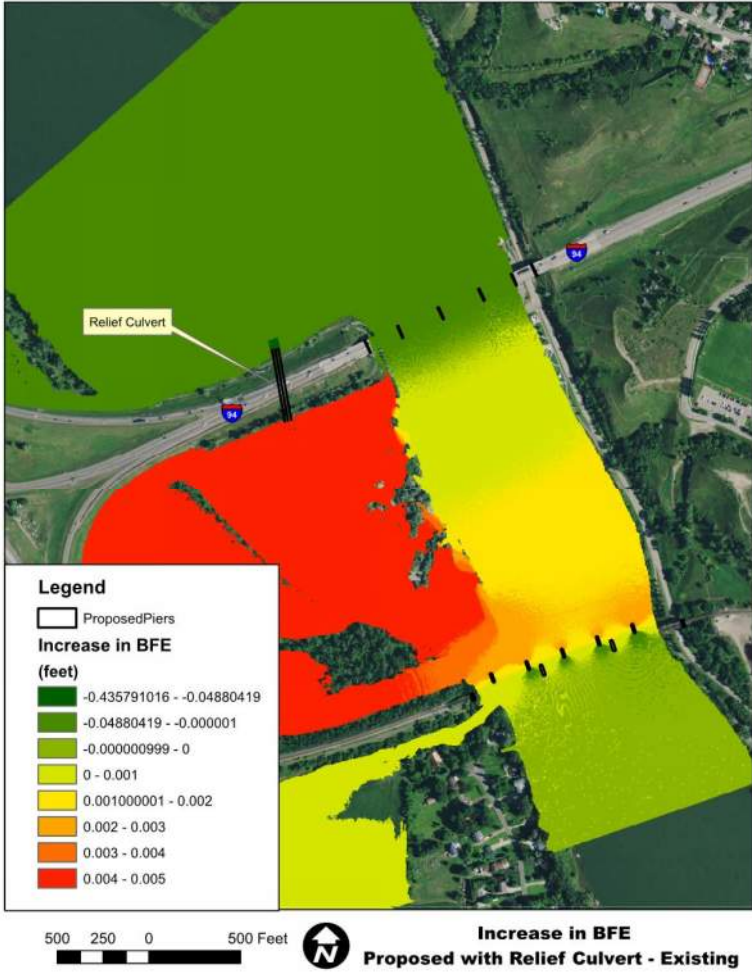
Alternative Hydraulic Modeling Approach (2-Dimensional Modeling)



❖ Relief culverts allow flow on the west floodplain and mitigates rise upstream of Interstate 94

Alternative Hydraulic Modeling Approach (2-Dimensional Modeling)

- ❖ Single relief culvert mitigates rise upstream of Interstate 94



CONCLUSIONS

- ❖ The BNSF proposed option, when using the one-dimensional HEC-RAS model, seems to mitigate rise through increasing the K-factor for the existing bridge above published values
- ❖ The FORB preferred option, when using the one-dimensional HEC-RAS model, indicates a rise of 0.03 feet, potentially affecting 552 structures already located within the 100-year floodplain
- ❖ Relief culverts through the Interstate 94 embankment can mitigate the rise
- ❖ Two-dimensional modeling indicates a modest rise of 0.003 feet (1/32 of an inch) for the FORB preferred option without any additional mitigation measures (relief culvert)
- ❖ FEMA has not yet indicated if a two-dimensional model would be accepted. They indicated that the local floodplain administrators (Bismarck and Mandan) should be consulted.



1907 17th Street Southeast
Minot, ND 58701
701.837.8737
www.ackerman-estvold.com

MEMORANDUM

To: Friends of the Rail Bridge

From: Ackerman-Estvold

Date: September 17, 2020

Re: 2-Dimensional Modeling of Existing and Proposed Conditions

Ackerman-Estvold conducted 2-Dimensional HEC-RAS modeling as an alternate method to determine BFE increases due to installation of a new BNSF Railroad Bridge upstream of the existing historic BNSF Bridge that crosses the Missouri River between Bismarck and Mandan, North Dakota. The purpose of this effort was to show the effects of the additional bridge on the Base Flood Elevation (BFE) immediately upstream of the bridges.

Method

HEC-RAS 2-D was used to model the effect of installing the additional bridge. The study area was limited to the vicinity of the bridge due to the limited availability of bathymetric information and computational effort.

Terrain was used to model the effect of the bridge piers. Polygons representing the piers were converted to a 0.1-ft raster at elevation 1670. Bathymetry for the channel was developed from HEC-RAS cross sections that have incorporated BNSF underwater survey information as well as original unmodified HEC-RAS cross sections. This information was joined with LiDAR data to create a Terrain surface needed for the 2-D modeling.

Piers for existing and proposed conditions were located by georeferencing the project plans for Bridge Number 196.6A dated February 2017. The proposed piers were located such that the center of the downstream proposed rail would be 42.5 feet upstream of the center of the existing rail. Piers were modeled within the 2-D mesh by adding break lines along the edge of the pier so that the cell edges would be placed on the edge of the pier. In addition to the top elevation of 1670 discussed above, an extremely high Manning's n coefficient ($n=1$) was used for the mesh cells inside the pier.

Normal Depth with a slope of 0.0001 was used for the downstream conditions. The inflow hydrograph included gradually rising discharges to the steady state discharge at 94,000 cfs (100-year discharge).

The model was executed for the existing conditions and proposed conditions cases.

Results

HEC-RAS 2-D results indicate that the water surface elevation at the downstream boundary is 1637.94 NAVD 88 as compared to 1637.89 NAVD 88 at cross section 131475 from the 1-dimensional CLOMR HEC-RAS Model, assuming a datum conversion of 1.34-ft. The downstream conditions are therefore assumed to be adequate.

The upstream conditions indicate a water surface elevation of 1638.63 NAVD 88 as compared to 1638.94 at cross section 131585 in the CLOMR model. Although there is a 0.31-foot discrepancy in the two methods, because the effort is intended to compare existing and proposed conditions, this discrepancy should not make a difference in the comparison. Calibration of the channel Manning's coefficient could improve the consistency between the methods.

The water surface elevation was exported from the HEC-RAS 2-D model for existing and proposed conditions and compared. Figure 1 shows the comparison graphically. The 2-dimensional model shows that the effect of adding the additional bridge 42.5-feet upstream of the existing bridge is less than 0.003-feet. The upstream extents of this have not been determined due to the limited extents of modeling effort.

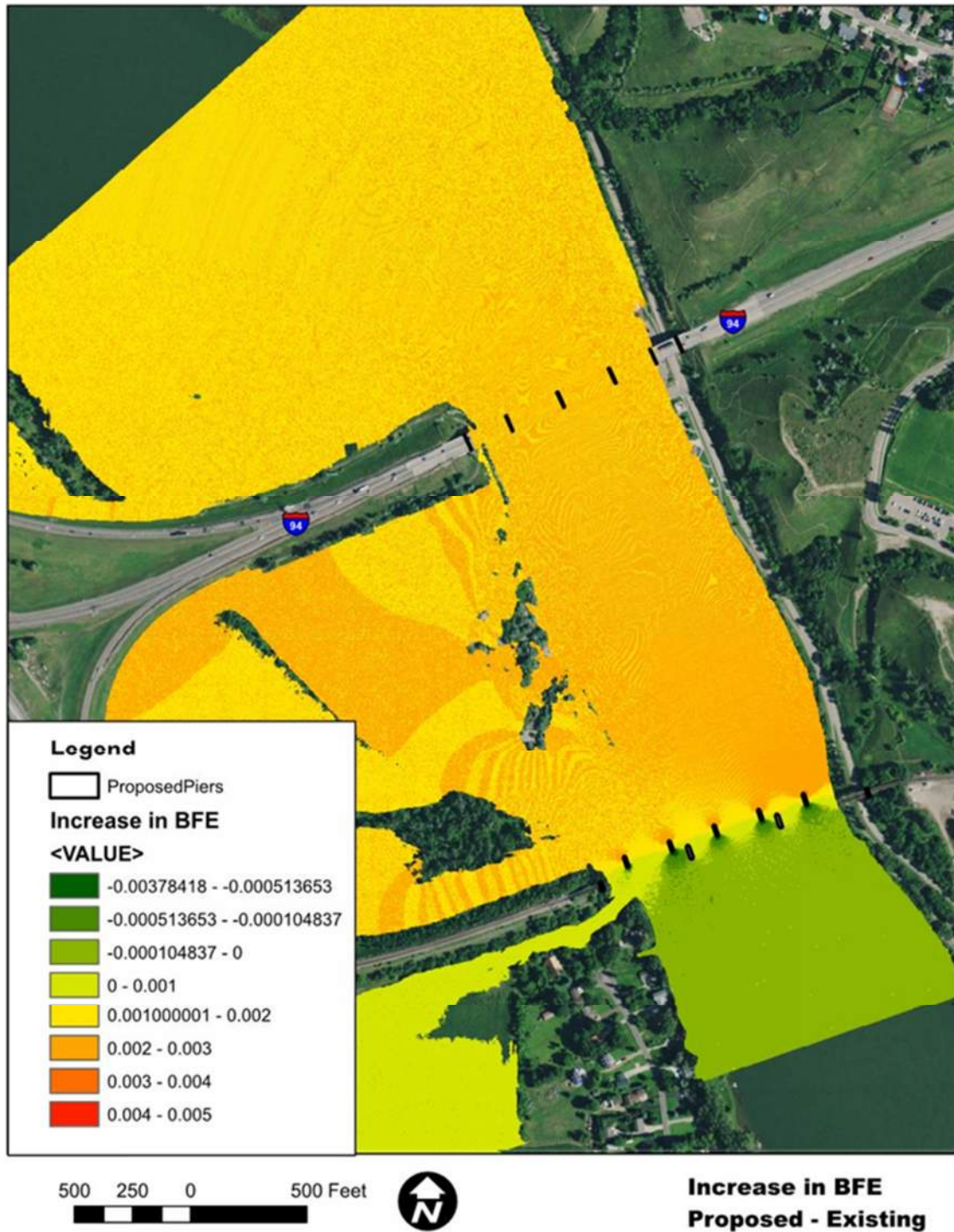


Figure 1: BFE Increase due to Additional Bridge Piers

As part of the 2-Dimensional HEC-RAS modeling, visualization videos were produced. A link to these videos will be sent under separate cover. The visualization shows the streamlines flowing around the piers. Figures 2 and 3 are screen captures of these videos.



Figure 2: Existing Conditions



Figure 3: Proposed Conditions

Effect of Mitigation

The HEC-RAS 2-D model was used to test the effectiveness of adding “relief culverts” through the west embankment of the Interstate 94 (Grant Marsh) bridge. The addition of single 12-foot diameter culvert and three 12-foot diameter culverts was tested. Figure 4 shows the difference in water surface elevation when comparing the proposed conditions (existing BNSF bridge plus the proposed BNSF bridge) to the proposed conditions with a single 12-foot relief culvert. The results show no increase in water surface upstream of the Interstate 94 bridge.

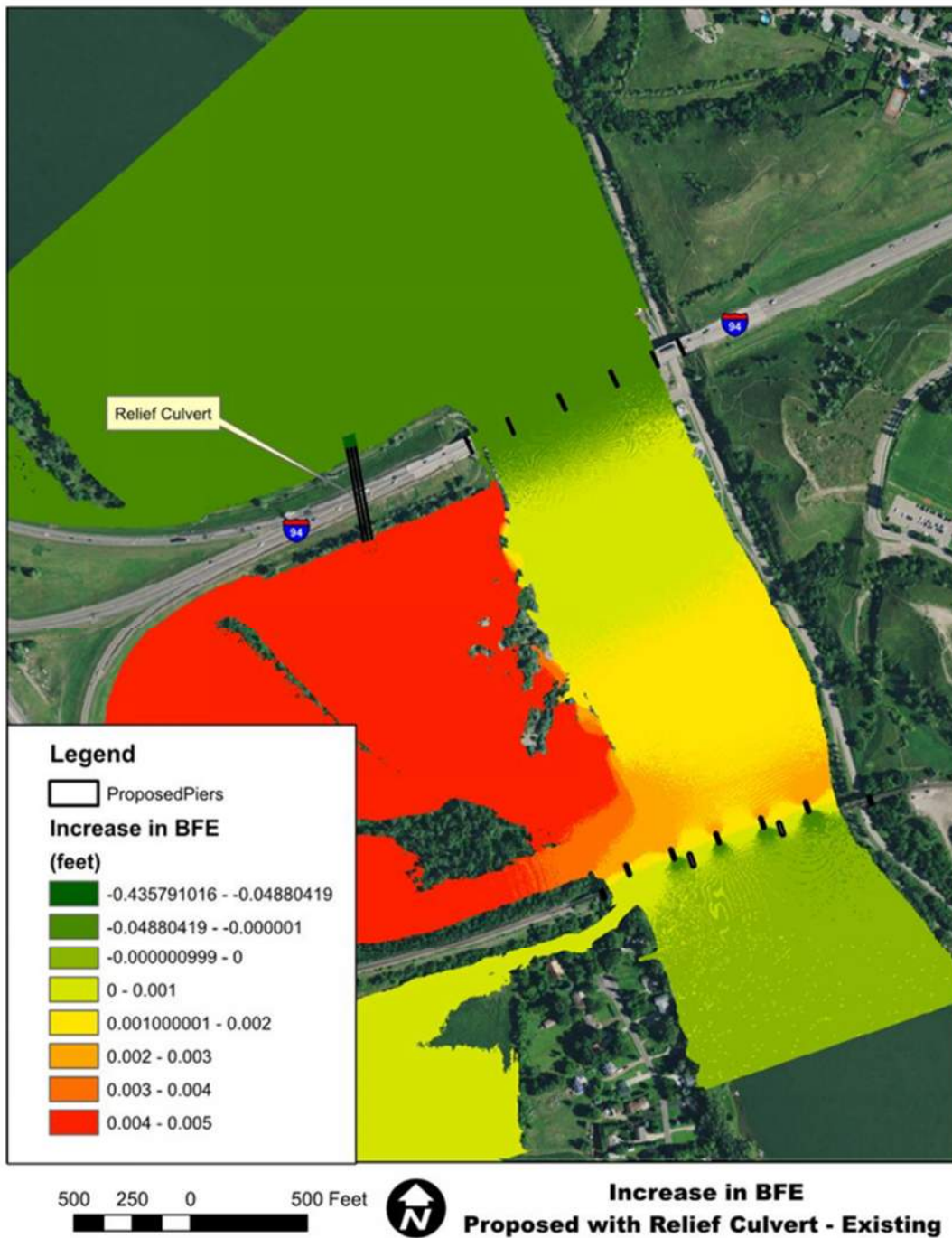


Figure 4: BFE Mitigation - Single 12-foot Diameter Relief Culvert



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MEMORANDUM

To: Friends of the Rail Bridge

From: Ackerman-Estvold

Date: September 1, 2020

Re: Task 1 – Data Review and Alternatives Evaluation

Ackerman-Estvold was retained by the Friends of the Rail Bridge to provide hydraulic evaluation and modeling services regarding the installation of a new BNSF bridge that crosses the Missouri River. Ackerman-Estvold evaluated existing information provided by BNSF and the Federal Emergency Management Agency (FEMA). This memo represents the results of Task 1, specifically evaluation of BNSF's data and modeling effort as well as review of hydraulic alternatives that could allow the historic BNSF bridge to remain in place.

Review of CLOMR

BNSF is planning to replace the existing historic rail bridge that spans the Missouri River between Bismarck and Mandan, North Dakota. Because this effort will require fill in the regulatory floodway (piers), BNSF submitted a Conditional Letter of Map Revision (CLOMR) to FEMA for review and comment on the bridge replacement. The purpose of the CLOMR was to show that the bridge replacement would not increase the Base Flood Elevation (BFE) upstream of the bridge or would not result in insurable structures being impacted by a BFE increase.

Review of the CLOMR did not reveal any major discrepancies or errors with the submittal. Meeting the requirement of no increase in upstream flood elevation for Post-Project conditions did require some manipulation of the input parameters. The model and the submittal were, however, accepted by FEMA. Concerns / minor discrepancies with the CLOMR include:

1. The results were rounded to the nearest 0.01-foot. This conveniently masks upstream increases from 0.004-0.007-feet. The State of North Dakota has in the past interpreted the 44 CFR 60.3(d3) requirement that "proposed encroachment would not result in any increase in flood levels within the community during the base flood discharge" to mean no rise greater

than 0.001 to 0.002-foot. Although the increase of 0.007-ft does not affect any upstream structures, smaller upstream increases do affect structures. Examination of the upstream floodplain indicates that there are approximately 550 structures in the upstream floodplain that would be affected by this increase. This partly is dependent on the required precision to determine if no-insurable structures are affected.

2. Bridge losses were changed from "Energy Only" in the Duplicate Effective Model to "Yarnell Equation" losses in the Corrected Effective Model. The justification for this is the HEC-RAS Reference Manual states that this method "should only be used at bridges where the majority of the energy losses are associated with piers." The K coefficient for the proposed piers was chosen based on the type of proposed pier and the information in Table 5-4 of the HEC-RAS Reference manual. This K coefficient for the proposed bridge was correctly chosen to be 1.05 based on the pier shape described as "90-degree triangular nose and tail." The CLOMR states that the existing piers have a semi-circular tail and that "while the nose incorporates a sharp ice nose form, it is relatively wide with potential to act as a square nose, and is not vertical to the surface of the water." This is used in the CLOMR to justify a less efficient K coefficient of 1.15. The reasoning that the width of the piers should justify a higher coefficient and therefore a higher upstream water surface for the existing bridge is incorrect because the width is already accounted for in the Yarnell Equation (see Figure 1).

The Yarnell equation is as follows (Yarnell, 1934):

$$H_{3-2} = 2K(K + 10\omega - 0.6)(\alpha + 15\alpha^4) \frac{V_2^2}{2g} \quad (5-4)$$

Where: H_{3-2} = Drop in water surface elevation from section 3 to 2

K = Yarnell's pier shape coefficients

ω = Ratio of velocity head to depth at section 2

Term that includes pier width $\rightarrow \alpha$ = Obstructed area of the piers divided by the total unobstructed area at section 2

V_2 = Velocity downstream at section 2

Figure 1: Yarnell Equation (From HEC-RAS Hydraulic Reference Manual)

In addition, the fact that the upstream nose of the piers "incorporates a sharp ice nose" and "is not vertical to the surface of the water" should make the pier more efficient than a vertical "90 degree triangular nose and tail" pier as the existing pier could "plow" river flow much as agricultural equipment can "plow" sod. Table 5-4 of the HEC-RAS Hydraulic Reference Manual includes a coefficient of 0.90 for piers with a semi-circular nose and tail. It is likely that the

existing piers may be more efficient than this configuration. If a K value of 1.00 is used for the existing piers, the proposed bridge would result in an increase in the upstream BFE of 0.002 to 0.015-feet. If it is assumed that the existing piers are as efficient as the proposed piers and the value $K = 1.05$ is used for both the existing and proposed conditions, the proposed bridge would result in an increase of the upstream BFE of 0.001 to 0.012 feet.

3. The cHECK-RAS software package is frequently used by FEMA to check the HEC-RAS modeling. cHECK-RAS output was submitted with the initial submittal but not with the final submittal. Examination of the initial CLOMR submittal and the final CLOMR submittal indicated that the contraction and expansion coefficients for the existing and proposed bridge were changed from 0.3 and 0.5 (which is standard bridge modeling procedure) to 0.1 and 0.3. This change allowed for a reduction in the computed flood profile. If the proper contraction and expansion coefficients are included in the modeling, there is a rise of in the upstream BFE is 0.002 to 0.013-feet.

In summary, the final CLOMR submittal made three changes that allowed the Post Project conditions to show a no rise due to the construction of the proposed bridge.

1. Use of Yarnell equation and choosing a larger coefficient for the existing conditions than warranted given the pier shape.
2. Roundoff masking differences less than 0.01-feet
3. Reduction of the contraction and expansion coefficients from standard modeling practice.

If the precision of 0.001-feet is used and a more appropriate Yarnell coefficient is used, the Post-Project conditions do not show "no-rise."

Evaluation of Mitigation Alternatives

Evaluations of alternatives requires the development of a Corrected Effective Model, Existing Conditions Model, Project Conditions Model, and Alternatives Models. The purpose of this analysis is to develop alternatives that would allow the existing BNSF bridge to remain in place while allowing BNSF to install a new bridge similar in configuration to the BNSF preferred alternative.

Revised Corrected Effective Model

The Corrected Effective Model and Existing Conditions Model are the same. The revised Corrected Effective Model was developed from the CLOMR Corrected Effective model previously submitted to FEMA as part of the CLOMR. The changes include two corrections:

1. As stated above the Yarnell K coefficient for the existing piers is likely lower than the K value chosen for the CLOMR. The value of K was chosen to be 1.05.

2. The contraction and expansion coefficients through the bridge were chosen to be 0.3 and 0.5, which is consistent with standard modeling practice.

In addition, the Interstate 94 (Grant Marsh Bridge) was included in the revised Corrected Effective Model using the HEC-RAS bridge routine. Inclusion of this information is important because modifying this bridge is a method of mitigation. The LiDAR information was merged with the underwater channel information from the existing cross sections. This model is used as a baseline to test the effect of mitigation measures.

The I-94 bridge deck and piers were added based on the existing FEMA model, the bridge as-built plans, and LiDAR information. In addition, cross-sections were modified to incorporate LiDAR data.

In summary, the changes made to develop the Corrected Effective model as compared to the Duplicate Effective Model include:

1. Use of Bridge Modeling routine and the Yarnell method to model the Existing BNSF Railroad Bridge
2. The use of the Bridge Modeling routine and Energy Method to model the Grant Marsh (I-94) bridge.
3. Addition of CLOMR cross sections 131475 and 131525 which include surveyed bathymetric information.
4. Use of modified CLOMR cross sections at sections 13499, 13500, 13501, and 13502 which include bathymetric survey.
5. Use of contraction / expansion coefficients of 0.3 and 0.5 at bridges.

In addition, cHECK-RAS was run on the file and the comments were fixed as needed within the reach of the modifications. The reach of the modifications is from Section 131474 to 131585. Comments upstream and downstream of this reach were not addressed.

Proposed Conditions Model - Two Bridges

The CLOMR included modeling of the existing railroad bridge and the preferred option railroad bridge. Computations including both bridges together were not included in the CLOMR submittal or in information provided by BNSF. The CLOMR information was used to develop a model that included both the existing railroad bridge and a bridge similar to the preferred option bridge located just upstream (42.5 feet) of the existing bridge. This is equivalent to Concept 3 as presented on in the November 6, 2019 BNSF Presentation (Figure 2 below) without removing the existing bridge.

Because the two bridges would be located in such close proximity, it is likely that the affect of both bridges would be "seen by the river" as a single bridge with 12-piers. Because the Yarnell Method is used it is assumed that the losses of both bridges affect the water surface profile concurrently.

Concept 3: 200ft Spans, Piers 42.5ft Upstream



11/6/2019

BNSF
RAILWAY

Figure 2: Bridge Pier Location for Existing and Proposed Railroad Bridge

According to the BNSF the June 10, 2019 presentation, this will result in a 0.03-foot rise in the flood profile. If proper contraction and expansion coefficients are used, the addition of the new Railroad Bridge will result in a 0.034-foot of rise in the flood profile. The alternatives were developed to mitigate this rise.

Mitigation Alternatives

It should be noted that the only mitigation alternative developed by BNSF and presented in a June 10, 2019 presentation included paving $\frac{1}{4}$ to $\frac{1}{2}$ mile of beach along the west side of the Missouri River. The cost of this was estimated to be \$8,400,000. In addition, this method of mitigation would likely result in unacceptable social and environmental impacts.

Although federal regulations (44 CFR 60.3d3) states that a community must "*Prohibit encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway unless it would not result in any increase of flood levels*", 44 CFR 65.12 allows for BFE increases via the CLOMR and LOMR process. This regulation states however that a

CLOMR/LOMR must include *"certification that no structures are located in the areas which would be impacted by the increased base flood elevation."* As a result of the Mandan flood control facilities, there are no insurable structures between the BNSF bridge and the upstream Interstate 94 bridge. Alternatives were examined that could be used to reduce the losses through the Interstate 94 bridge by 0.04 feet to mitigate the rise downstream.

The Interstate 94 embankment extends for 1,500 to 2,000 feet into the west floodplain of the Missouri River. Aerial photography suggests that this embankment bisects a floodplain lake. There are some environmental / floodplain functionality advantages of providing relief culverts or a relief bridge through this embankment west of the existing bridge. Relief culverts / bridge could provide wildlife passage and recreational passage through the Interstate 94 corridor.

Alternative Mitigation – Three 12-foot diameter "relief culverts."

This alternative involves placing three 12-foot diameter, 485-foot long culverts through the I-94 embankment west of the existing bridge. Figure 3 shows a possible location for these culverts, but they could be spread further apart along the embankment.

For this preliminary analysis, culverts were placed at the low flow water level (1622 – 1622.5). These culverts could, however, be placed at various elevations to provide floodplain connectivity for the aquatic or terrestrial wildlife. The culvert computations included the assumption that the bottom of the culverts would be filled with concrete to provide a flat surface on the bottom of the pipe.

Because of the computation methods used by the software, the preliminary modeling shows an increase in water surface just upstream of the Grant Marsh bridge, but mitigates the 0.03-foot rise farther upstream. There is one building affected by this increase. This building is a recreational facility that services river boat tours. According to the elevation certificate, the lowest floor of this building and HVAC equipment is above the flood elevation and will not be affected by the slight rise in the BFE. The lowest adjacent grade and the grade under the attached deck and boat dock are lower than the BFE. In accordance with FEMA, the slight flood increase on boat dock piers is classified as an impact on the structure. Farther upstream, however, no structures will be affected.

FEMA has been contacted for a determination whether permission from the owners of the building will be acceptable to wave the "no impacted structures" requirement.

These 12-foot diameter culverts could be tunneled through the embankment. It is estimated that the cost of the installation of the culverts could be as much as \$5,000,000 - \$10,000,000.

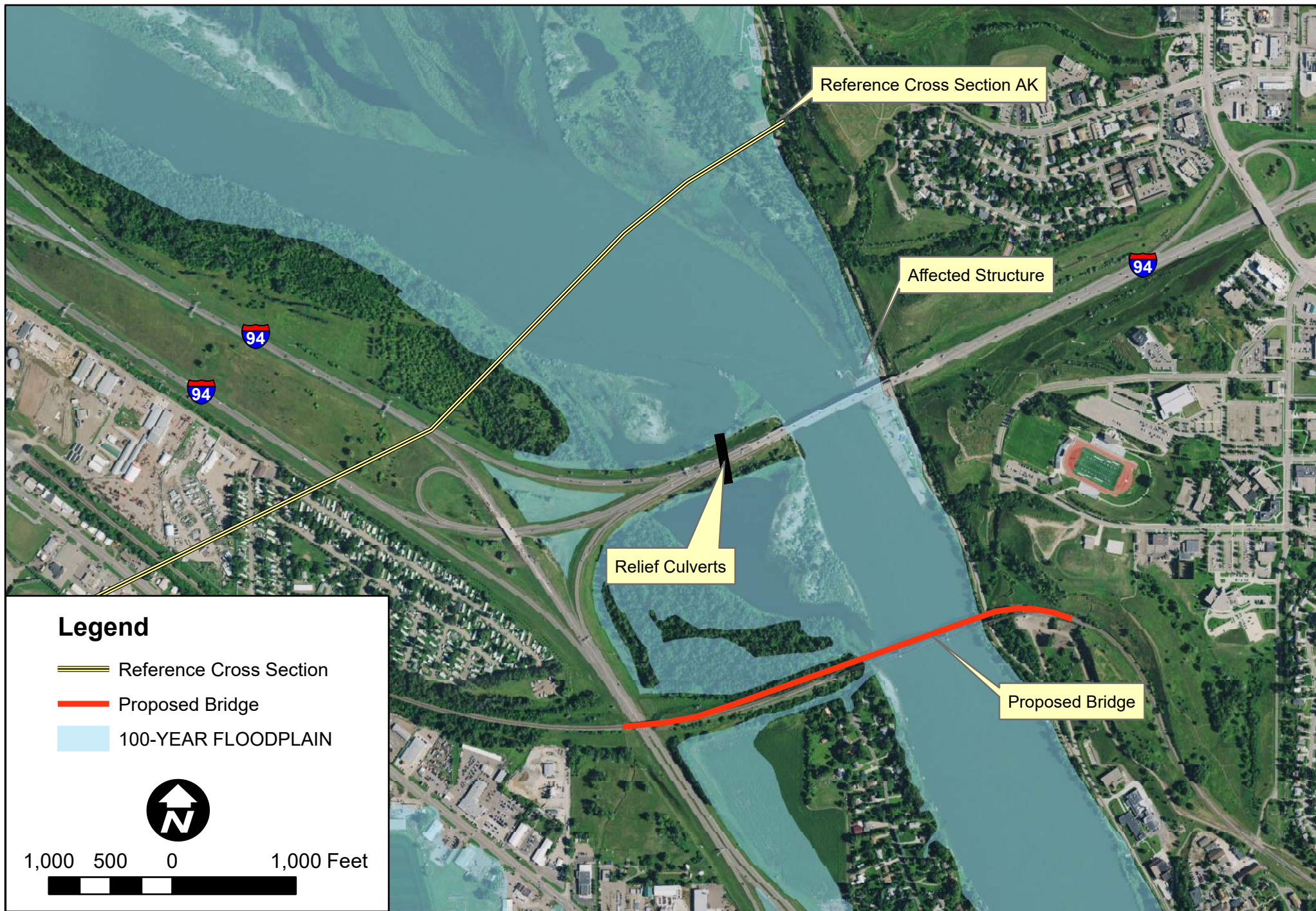


Figure 3: Three 12-ft Diameter Relief Culverts

Other I-94 Embankment Conveyance Mitigation Methods

Preliminary hydraulics for other methods of providing conveyance through the Interstate 94 embankment were conducted. These include:

1. Two 14-foot by 12-foot box culverts
2. Construction of relief bridge
3. Extension of Existing Interstate 94 bridge

All of these alternatives would require open cutting of the embankment requiring a substantial traffic control effort. These alternatives were not advanced as the cost could likely be as much as \$10,000,000 to \$15,000,000.

Floodplain Storage

The use of floodplain storage as a mitigation strategy has been suggested. This is not practical due to the order of magnitude of the volume of water and the large peak discharge. To mitigate the effect of installation of the new BNSF bridge in addition to the existing historical bridge, the 100-year peak discharge in the Missouri River would need to be reduced by approximately 1,000 cfs (from 94,000 cfs to 93,000 cfs). The duration of the flood would affect the storage volume required.

For example, it is assumed that that the flood water would need to be reduced by 1,000 cfs for one week, this is equivalent to approximately 14,000 acre-feet of water. That is, to meet the required reduction in discharge, the equivalent of 14,000 acres would need to be flooded an additional foot. This does not mean that 14,000 acres of floodplain could be dredged one foot to meet the requirement, because this volume in the floodplain would fill at the beginning of the flood before the flood peak arrives and have no impact. The volume would need to be available at or near the peak flood elevation.

A technically possible solution would be to reduce the discharge from Lake Sakakawea. This would require the modification of the operating plan for the facility and the upstream lakeside residents to accept higher water levels during a flood event. To store the equivalent amount of water of 1,000 cfs for a week in Lake Sakakawea, the flood level of the entire lake would need to be raised an average of ½ inch.

Encroachment into Wildlife Area

Under current conditions, the toe of the westerly BNSF embankment is located at the Right of Way boundary. Review of the BNSF preliminary plans for the "Preferred Alternative" and the existing embankment grades indicate that the "Preferred Alternative" would likely encroach 30-feet into the Missouri River Natural Area. Installing this bridge just upstream of the existing bridge (alternative described above) would likely increase that encroachment to 50-feet.

Conclusions

1. Replacement of the existing BNSF bridge with the BNSF “Preferred Alternative” may result in an increase in the one-dimensional HEC-RAS modeled upstream BFE rather than the “no rise” conclusion stated in the approved CLOMR because:
 - a. Roundoff masks increases
 - b. Incorrect choice of the Yarnell K coefficient for the existing bridge
 - c. Incorrect contraction and expansion coefficients chosen for the bridge routines
2. Installation of the BNSF “Preferred Alternative” bridge just upstream of the existing BNSF bridge could result in BFE increases of as much as 0.04-feet.
3. Tunneling relief culverts through the Interstate 94 highway embankment in the west overbank could be used as a mitigation strategy resulting in no upstream BFE increases at upstream structures.
4. Relief culverts in the west Interstate 94 embankment could be considered an environmental enhancement for the natural areas in the west floodplain of the river by providing wildlife connectivity.
5. Adding additional floodplain storage is not likely a practical method to mitigate the effects of adding an additional bridge.
6. The “Preferred Alternative” or installation of the new bridge upstream of the existing bridge will both result in encroachment into the Missouri River Natural Area.

Steps forward

If the relief culverts concept is to be pursued, the following tasks should be conducted:

1. Confirmation from FEMA that consent from the owners of the structure located on the east overbank just upstream of Interstate 94 is adequate mitigation for the BFE increase at that location.
2. Obtain floodplain and bathymetric survey of the area between the existing BNSF bridge and the Interstate 94 bridge embankment.
3. Obtain floodplain and bathymetric survey in the vicinity of the Interstate 94 bridge.
4. Develop Preliminary Construction Plans in enough detail to obtain more accurate cost estimates.
5. Develop CLOMR (Conditional Letter of Map Revision) soliciting FEMA review and comment.

References

1. Federal Emergency Management Agency (2018), *Conditional Letter of Map Revision (CLOMR) 17-08-1412R*. Approved July 16, 2018.
2. BNSF (2019), *BNSF Br. 196.6 Replacement, Design Concepts Considered*, November 6, 2019.
3. BNSF (2019), *BNSF Br. 196.6 Hydraulic Modeling (Bismarck ND)*, June 10, 2019.
4. Appendix E, NFIP Regulations. Code of Federal Regulations for National Flood Insurance Program 44 CFR Parts 59, 60, 65 and 70.
https://www.fema.gov/pdf/floodplain/nfip_sg_appendix_e.pdf
5. US Army Corps of Engineers, Hydrologic Engineering Center (2019). *HEC-RAS 5.0.7*, March 2019.
6. US Army Corps of Engineers, Hydrologic Engineering Center (2016). *Hydraulic Reference Manual, Version 5.0*. February 2019.



1907 17th Street Southeast
Minot, ND 58701
701.837.8737
www.ackerman-estvold.com

MEMORANDUM

To: Friends of the Rail Bridge

From: Ackerman-Estvold

Date: September 1, 2020

Re: Task 2 – Assessment of Physical Impacts

Ackerman-Estvold was retained by the Friends of the Rail Bridge to provide hydraulic evaluation and modeling services regarding the installation of a new BNSF bridge that crosses the Missouri River. Ackerman-Estvold evaluated existing information provided by BNSF and the Federal Emergency Management Agency (FEMA). This memo represents the results of Task 2, specifically evaluation of structures that could be affected by installation of a new bridge and the historic BNSF bridge to remain in place.

Impacted Structures

BNSF is planning to replace the existing historic rail bridge that spans the Missouri River between Bismarck and Mandan, North Dakota. Because this effort will require fill in the regulatory floodway (piers), FEMA requires certification of that no structures will be impacted by a Base Flood Elevation (BFE) increase. A proposed conditions HEC-RAS model was developed as part of Task 1, to determine the effect of construction of a new railroad bridge in addition to the existing railroad bridge regarding the Base Flood Elevation. The addition of the new Railroad Bridge will result in a 0.034-foot rise at the bridge, but the affect would diminish to 0.006-feet further upstream.

The additional depth of flooding due to the addition of the new railroad bridge at each upstream structure located in the 100-year floodplain was evaluated using the HEC-RAS results. Structures were located using the City of Bismarck's GIS information (file labeled Building_Footprints.shp) and 2019 aerial photography. It was determined that 552 structures are located within the Missouri River 100-year floodplain in Burleigh and Morton county upstream of the proposed BNSF railroad bridge. These structures would therefore be potentially affected by a BFE increase. Because HEC-RAS provides results at specific locations (cross sections) along the river, structures were grouped according to

these cross sections providing a range of BFE increases for each group. This information is provided in Table 1 below. The structure locations as well as the 100-year floodplain are shown in Figure 1.

Table 1: BFE Increase and Affected Structures

Cross Section	BFE Increase (feet)	BFE Increase Range (inch)	Number of Affected Structures
131501 (BNSF Bridge)	0.034		
		0.40-0.41	0
131553 (Interstate 94)	0.033		
		0.36-0.40	1
131585 - AK	0.030		
		0.32-0.36	16
131678 - AL	0.027		
		0.31-0.32	33
131678 - AM	0.026		
		0.23-0.31	267
131988 - AN	0.019		
		0.18-0.23	177
132249 - AO	0.015		
		0.16-0.18	56
132368 - AP	0.013		
		0.13-0.16	2
132553 - AQ	0.011		
		0.11-0.13	0
132679 - AR	0.009		
		0.07-0.11	0
132864 - AS	0.006		
		Total	552

As shown in Table 1, a total of 552 structures are located within the 100-year floodplain and therefore would be affected by any BFE increase. Of these structures, the increase is less than ½ inch for 317 structures and less than ¼ inch for 235 structures. All of these structures are currently subject to flood insurance requirements. No additional structures would be brought into the 100-year floodplain by the installation of the BSNF railroad bridge.

Regulatory Requirements

Construction of the new BNSF bridge results in fill in the regulatory floodway (piers). With regard to fill in the floodway, federal regulations state in 44 CFR 60.3d3 that a community must “Prohibit

encroachments, including fill, new construction, substantial improvements, and other development within the adopted regulatory floodway unless it would not result in any increase of flood levels". 44 CFR 65.12, however, allows for BFE increases via the CLOMR and LOMR process. This regulation states however that a CLOMR/LOMR must include "*certification that no structures are located in the areas which would be impacted by the increased base flood elevation.*" The State of North Dakota has previously interpreted these rules to mean 0.001-0.002 feet as an acceptable "no rise."

Because the BFE increases resulting from the installation of the new BNSF bridge without removal of the existing bridge are quite small (less than ½ inch) but greater than 0.001-foot, Ackerman-Estvold contacted FEMA in July 2020 to ask if acceptance of these small increases by the affected structure owners is an acceptable method of mitigation. This question was specifically asked regarding a single structure, but we assume could be applied to all 552 structures.

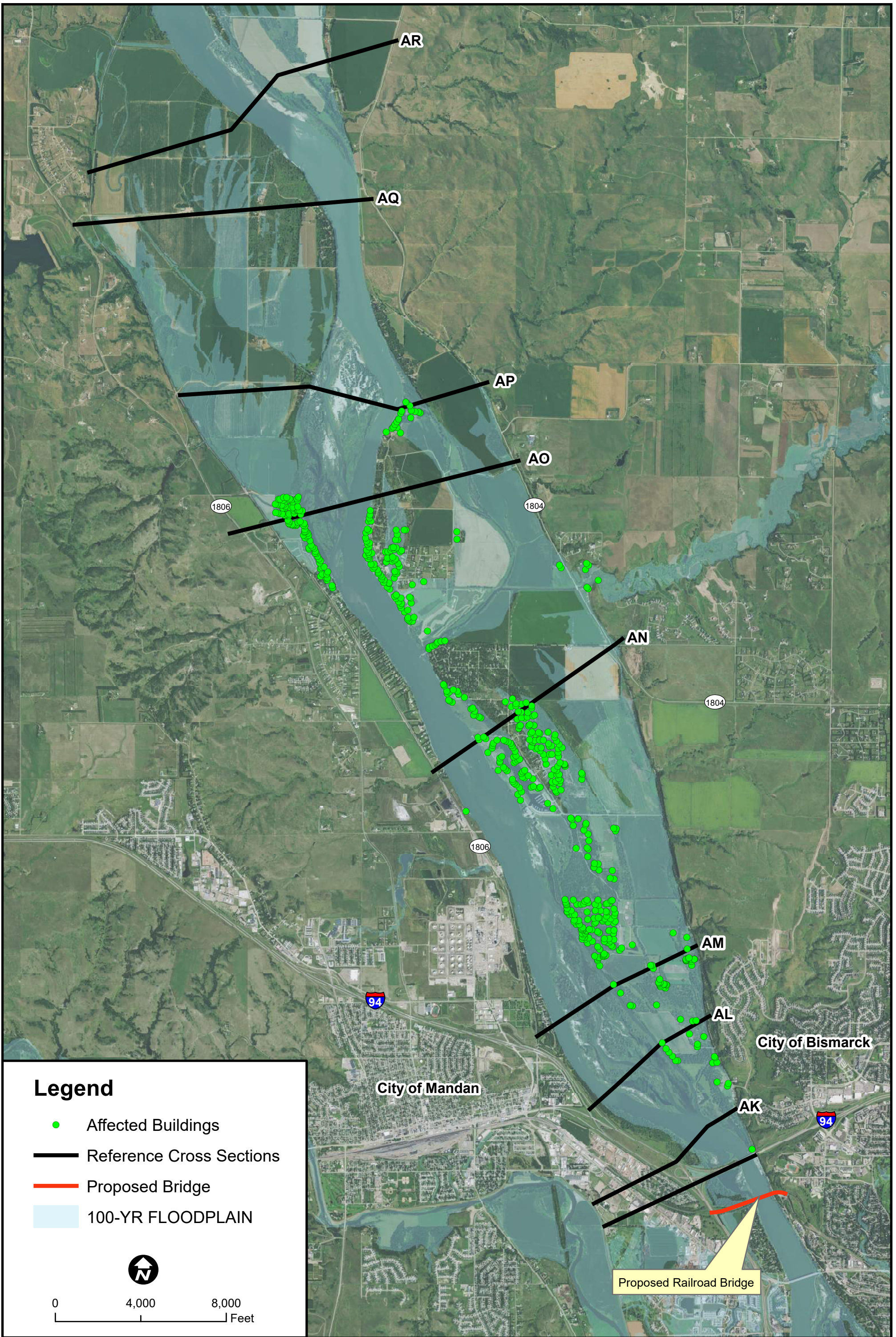
The response from FEMA is included in the attached e-mail train and states that FEMA Region 8 cannot make this decision. This question has been forwarded to FEMA Headquarters.

Conclusions

1. The piers need to build a new BNSF railroad bridge are considered "fill" in the regulatory floodway. Therefore the applicable portions of the Code of Federal Regulations (CFR) apply.
2. 44 CFR 60.3d3 states that such activity would "*not result in any increase of flood levels*" and 44 CFR 65.12 requires "*certification that no structures ... which would be impacted by the increased base flood elevation.*"
3. Installation of a new BNSF railroad bridge while allowing the existing historic railroad bridge to remain in place will result in an increase of the Missouri River Base Flood Elevations as much as 0.034-feet (less than ½ inch).
4. Five Hundred Fifty-Two (552) structures are currently located in the 100-year floodplain upstream of the proposed BNSF bridge. These structures are potentially affected by any BFE increase.
5. FEMA Region 8 has been asked to determine if acceptance of a BFE increase by structure owners is acceptable mitigation for the increase.
6. FEMA Region 8 has forwarded this question to FEMA Headquarters.

References

1. Appendix E, NFIP Regulations. Code of Federal Regulations for National Flood Insurance Program 44 CFR Parts 59, 60, 65 and 70.
https://www.fema.gov/pdf/floodplain/nfip_sg_appendix_e.pdf
2. US Army Corps of Engineers, Hydrologic Engineering Center (2019). *HEC-RAS 5.0.7*, March 2019.



Project Name: BNSF Bridge	Scale: 1:48,000	Drawn By: TRJ	 ACKERMAN ESTVOLD 1907 17th Street Southeast · Minot, ND 58701 701.837.8737 · www.ackerman-estvold.com Minot, ND Williston, ND	AFFECTED BUILDINGS IN MISSOURI RIVER 100-YR FLOODPLAIN	FIGURE 1
Project No: R20051	Date: 09/01/2020	Appr. By: TRJ			

Thomas Johnson

From: Birney, Thomas <thomas.birney@fema.dhs.gov>
Sent: Tuesday, September 1, 2020 8:42 AM
To: Thomas Johnson; Brady, Marijo
Subject: RE: BNSF project

Good morning Thomas,

Marijo is out but is checking emails so I don't know if she has provided an update to you on this or not.

In speaking with the MT-2 manager, this proposed solution he has not seen before and is something that the Region cannot approve. The decision must be made at FEMA HQ. We have made our recommendation but will have to see what FEMA HQ comes back with. Once we hear, we will let you know. Thanks.

Tom

From: Thomas Johnson <Thomas.Johnson@ackerman-estvold.com>
Sent: Thursday, August 27, 2020 3:40 PM
To: Brady, Marijo <Marijo.Brady@fema.dhs.gov>
Cc: Birney, Thomas <thomas.birney@fema.dhs.gov>
Subject: RE: BNSF project

Marijo,
I have also Thomas Birney per your Out of Office notification. You may want to contact him to avoid duplication of efforts.
Thanks.
Regards,

Thomas Johnson, PE, CFM
Ackerman-Estvold
1907 17th Street SE
Minot, ND 58701
Office: 701.837.8737
Direct: 701.857.9142

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From: Brady, Marijo <Marijo.Brady@fema.dhs.gov>
Sent: Thursday, August 27, 2020 4:33 PM
To: Thomas Johnson <Thomas.Johnson@ackerman-estvold.com>
Cc: Brady, Marijo <Marijo.Brady@fema.dhs.gov>
Subject: RE: BNSF project

Thomas,

My apologies; I thought I had responded to you. I am coordinating internally to get a final response. I will be checking email intermittently while I am off, to ensure I get a response to you as quickly as I can. Thanks for your patience.

Marijo

Marijo Brady, P.E.
Floodplain Engineer
FEMA Region VIII
Mitigation Division
303-235-4835 (office)
303-241-5278 (cell)
Marijo.Brady@FEMA.dhs.gov

From: Thomas Johnson <Thomas.Johnson@ackerman-estvold.com>
Sent: Thursday, August 27, 2020 12:44 PM
To: Brady, Marijo <Marijo.Brady@fema.dhs.gov>
Subject: RE: BNSF project

Marijo,

I spoke to you in late July about the possibility of obtaining permission from affected property owners in lieu of a “no rise” certificate for fill in the floodway. The fill in this case are bridge piers.

The problem I am working on is our client would like to save a historic 130-year old bridge. The bridge owner has received a CLOMR to build a new bridge, but intrinsic to the CLOMR is the removal of the historic. If both bridges are kept in place, the maximum rise in the BFE is 0.03-feet. I have developed a few mitigation options that are extremely costly and may not be practical.

The question is basically is: If permission to increase the BFE on all affected structures is obtained from the owners, this this an effective / legal mitigation / regulatory option for fill (bridge piers) placed in the floodway?

Regards,

Thomas Johnson, PE, CFM

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From: Brady, Marijo <Marijo.Brady@fema.dhs.gov>

Sent: Tuesday, July 28, 2020 2:04 PM

To: Thomas Johnson <Thomas.Johnson@ackerman-estvold.com>

Cc: Brady, Marijo <Marijo.Brady@fema.dhs.gov>

Subject: BNSF project

Thomas,

Could you please send me the elevation certificate for the river boat building and attached dock?

Marijo

Marijo Brady, P.E.
Floodplain Management Engineer
FEMA Region VIII
Mitigation Division
Floodplain Management and Insurance
DFC, Building 710
Denver, CO 80225

303- 235-4835

303-241-5278 (cell)

Marijo.Brady@FEMA.dhs.gov

For FEMA Region VIII NFIP Technical Assistance:

FEMA-R8-FMI-TA@FEMA.dhs.gov

APPENDIX D

FORB Comments on Clean Water Act Section 401 Water Quality Certification

November 21, 2022



FORB – Friends of the Rail Bridge

Established 2018 | Burleigh & Morton County | (701) 220-4513

1015 East Bowen Avenue

Bismarck ND 58504

friendsoftherailbridge@gmail.com

November 21, 2022

Peter Wax, Special Projects
ND DEQ, Division of Water Quality
918 East Divide Avenue
Bismarck, ND 58501-1947

RE: Draft Section 401 Water Quality Certification, Construction of New Rail Bridge /
Destruction of Existing Historic Rail Bridge Linking Morton and Burleigh Counties at Bismarck
and Mandan, North Dakota.

Dear Mr. Wax,

Thank you for the opportunity to comment on the Draft Section 401 Clean Water Act Water Quality Certification for both construction of a proposed new rail bridge and destruction of the existing, 1883 Northern Pacific Rail Bridge (Historic Bridge) over the Missouri River. The Friends of the Rail Bridge (FORB) has numerous concerns with the draft water quality certification.

First, under “General Conditions for Construction and Deconstruction,” the requirement for obtaining a Construction General Stormwater Permit from North Department of Department of Environmental Quality (ND DEQ) is listed; however, any entity seeking permission to construct a project within Sovereign Lands of North Dakota also requires authorization from the North Dakota Department of Water Resources prior to construction. Sovereign Lands are defined as those areas, including the beds and islands, lying within the high-water mark of navigable lakes and streams (NDCC § 61-33-01). BNSF applied for a Sovereign Lands Permit in 2017, but the North Dakota Department of Water Resources still has that permit under consideration.

Ownership of the riverbed beneath the Historic Bridge up to the ordinary high-water mark makes the Historic Bridge, which Burlington Northern Santa Fe (BNSF) proposes to destroy, subject to *North Dakota Century Code* (NDCC) § 55-02-07 whether or not the Historic Bridge itself (as a permanent fixture in existence at the time of transfer) was transferred to North Dakota at the time of statehood (November 2, 1889):

Any historical or archaeological artifact or site that is found or located upon any land owned by the state or its political subdivisions or otherwise comes into its custody or possession and which is, in the opinion of the director of the state

historical society, significant in understanding and interpreting the history and prehistory of the state, may not be destroyed, defaced, altered, removed, or otherwise disposed of in any manner without the approval of the state historical board, unless section 55-02-07.2 applies to the site. Notification of the director's opinion of significance must be communicated to the appropriate governing official. The state historical board through the director, within sixty days of written notification to it by the appropriate governing official of the state or political subdivision's desire, need, or intent to destroy, alter, remove, or otherwise dispose of a significant artifact or site, shall provide the governing official written direction for the care, protection, excavation, storage, destruction, or other disposition of the significant artifact or site. The state and its political subdivisions shall cooperate with the director in identifying and implementing any reasonable alternative to destruction or alteration of any historical or archaeological artifact or site significant in understanding and interpreting the history and prehistory of the state before the state historical board may approve the demolition or alteration (NDCC § 55-02-07) (emphasis supplied).

We request that Section 401 Clean Water Act Water Quality Certification be delayed until the Sovereign Lands permit issue, as well as the other issues discussed below, are resolved.

Second, the project proposes to place three piers (designated as Proposed Piers 5, 6, and 7) within the main channel of the Missouri River while removing the two existing main channel piers (designated as In-place Piers 7 and 8). Per the supplemental information provided to you by TKDA, dated 9/27/22, removal of the existing masonry piers is proposed only to a depth of 2 feet below the existing channel bottom. The substructure of the two main channel existing piers, based on historical records, extends approximately 39-46 feet below the riverbed, to underlying claystone bedrock. USGS Report 2013-5087 contains results of multibeam echosounder measurements collected in this reach of the Missouri River during the 2011 flood. Scour depths of up to 11 feet were measured at the Expressway Bridge, 9 feet at the Memorial Highway Bridge, and 21 feet at the Grant Marsh Bridge on Interstate 94; therefore, it can be expected that during flood events sediment transport through this reach would be significantly impacted by the three proposed new piers and their foundation elements in combination with the foundation elements of the existing piers. The fact that the new piers are proposed to be placed between old piers is likely to create conditions that favor upstream deposition.

Maintenance of a navigation channel will require increased dredging within this reach at taxpayer expense, and turbidity from which will impact water quality over the future lifespan of the new bridge. It does not appear this long-term impact was considered in the proposed issuance of the Conditional Section 401 Permit. Multiple beneficial uses may be negatively impacted, including municipal and private domestic water intakes increasing the complexity and cost of water treatment, as well as recreational use of these waters above and below the existing historical Historic Bridge and the proposed new bridge.

Third, the definitions relating to water pollution, water quality, and water use are very broad under North Dakota law, and encompass much more than the narrower considerations you are considering under 40 CFR Part 121 relating to state certification of activities requiring a federal

license or permit. Several provisions of North Dakota law make clear that protections of public use and access to the Missouri River for recreational and other uses are part of what is protected under NDCC chapter 61-28 and related laws quoted below:

- It is hereby declared to be the policy of the state of North Dakota to act in the public interest to protect, maintain, and improve the quality of the waters in the state for continued use as public and private water supplies, propagation of wildlife, fish and aquatic life, and for domestic, agricultural, industrial, recreational, and other legitimate beneficial uses, to require necessary and reasonable treatment of sewage, industrial, or other wastes and to cooperate with other agencies in the state, agencies of other states, and the federal government in carrying out these objectives (NDCC § 68-28-01). (Emphasis supplied).
- ‘Pollution’ means the manmade or man-induced alteration of the physical, chemical, biological, or radiological integrity of any waters of the state (NDCC § 68-28-02(7)). (Emphasis supplied).
 - ‘Pollution’ means such contamination, or other alteration of the physical, chemical, or biological properties, of any waters of the state, including change in temperature, taste, color, turbidity, or odor. Pollution includes discharge of any liquid, gaseous, solid, radioactive, or other substance into any waters of the state that will or is likely to create a nuisance or render such waters harmful, detrimental, or injurious to public health, safety, or welfare; domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses; or livestock, wild animals, birds, fish, or other aquatic biota. (ND ADC § 33.1-16-02.1-04(9)). (Emphasis supplied).
- ‘Waters of the state’ means all waters within the jurisdiction of this state, including all streams, lakes, ponds, impounding reservoirs, marshes, watercourses, waterways, and all other bodies or accumulations of water on or under the surface of the earth, natural or artificial, public or private, situated wholly or partly within or bordering upon the state, except those private waters that do not combine or effect a junction with natural surface or underground waters just defined (NDCC § 68-28-02(15))¹.
- ‘Water usage’ The best usage for the waters shall be those uses determined to be the most consistent with present and potential uses in accordance with the economic and social development of the area. Present principal best uses are those defined in subdivisions a, b, c, d, and e. These are not to be construed as the only possible uses...

c. Recreation. Primary recreational waters are suitable for recreation,

¹ See also ND ADC § 33.1-16-02.1, App. I, classifying the Missouri River as a Class I water under North Dakota law.

where direct body contact is involved, such as bathing and swimming, and where secondary recreational activities such as boating, fishing, and wading are involved. Natural high turbidities and physical characteristics of banks and streambeds of many streams are factors that limit their value for bathing (ND ADC § 33.1-16-02.1-04(12)). (Emphasis supplied).

The above statutes and rules make clear:

- 1) That the purpose of North Dakota’s water quality statute, NDCC chapter 61-28, includes protecting, maintaining, and improving the quality of the waters in the state for “recreational, and other legitimate beneficial uses,” and that the Department of Environmental Quality must cooperate with other agencies in the state and the federal government in carrying out these objectives;
- 2) That water pollution includes physical alterations that impact domestic, recreational, or other legitimate “beneficial uses”; and
- 3) That the “beneficial uses” protected under ND ADC § 33.1-16-02.1-04 “shall be those uses determined to be the most consistent with present and potential uses in accordance with the economic and social development of the area,” and include for “[p]rimary recreational waters” like the Missouri River between Bismarck and Mandan for bathing, swimming, boating, fishing, and wading.

The reach of the Missouri River between Bismarck and Mandan is among the most publicly used water and shorelines along the Missouri River in North Dakota. Public uses include but are not limited to walking, biking, hiking, running, bathing, swimming, boating, fishing, and wading. The areas of public use and access include shorelines of the Missouri River up to the ordinary high-water mark, publicly owned roads, trails, boating ramps and easements (including any easements by prescription for trails and roads used by the public for more than 20 years) that allow public access and use of those shorelines, as well as boating ramps, historic sites, artistic works, and other associated public buildings, structures, which exist on both sides of the Missouri River between Bismarck and Mandan.

Public uses also include use of the riverbed of the Missouri River itself and the waters and surface of the Missouri River itself, including the areas under and around the Historic Bridge that have been used by the public for decades, and for which the permit applicant is seeking a Section 401 Water Quality Certification to address some of the issues of water pollution caused by tearing down the Historic Bridge and building a new replacement bridge.

As quoted above, ND ADC § 33.1-16-02.1-04(12) requires that “The best usage for the waters shall be those uses determined to be the most consistent *with present and potential uses in accordance with the economic and social development of the area*” (Emphasis supplied).

In May of 2021, the *Bismarck Tribune*’s Editorial Board’s interviewed Governor Doug Burgum about preserving the Historic Bridge that this CWA section 401 certification will play a necessary step in allowing the Historic Bridge to be torn down. The story of that interview appeared in the *Bismarck Tribune* on May 14, 2021, and quotes Governor Burgum as saying:

- In comments Friday to the Tribune Editorial Board, the second-term Republican governor and former downtown Fargo developer said the bridge dating to 1883 would be “an incredible asset for the state, for Burleigh County, for Morton County, for Mandan and for Bismarck to save.”
- The bridge could be a top attraction in the state, drawing potentially ‘hundreds of thousands of visitors a year,’ for walks, bicycle paths, farmers markets and views of the Missouri River, “and it could never be replicated,” the Governor said. He cited the Stone Arch Bridge in Minneapolis and the Pfluger Pedestrian Bridge in Austin, Texas.”
- "These things are so popular in terms of what they draw," Burgum said. "Is it going to be hard? Yes. Is it assured? No. Is it worth trying to figure out how to make it happen? I think yes, it is."
- But [Governor Burgum] pointed out several problems to solve without interrupting rail service, including engineering challenges such as the approaching tracks and how much the river would rise in planting pylons for a new bridge. Addressing liability with the Friends of the Rail Bridge group also must be resolved, he said.
- The governor also said new federal coronavirus aid could potentially “close the gap” on the bridge project, depending on what newly issued federal guidance intends for the money, which Burgum said has an emphasis for tourism. North Dakota's share of the federal American Rescue Plan aid is \$1.89 billion, which the Legislature intends to divvy up in the future.
- Burgum also said the bridge wouldn't "have to be hooked up to a trail system on day one. If you could just save the thing, you can spend the next 10 years fundraising and developing the tourism plans -- just not knock it down,” he said. “The bridge project “would be a fun one” to pursue and “worth us taking a look at it” now that the busy legislative session is over, [Governor Burgum] said. “I still think there's a way to make it work,” the governor said.”

A response to an open records request by FORB sent to Governor Burgum’s office revealed that shortly after this story appeared in the *Bismarck Tribune*, the CEO of BNSF had three separate conference calls with Governor Burgum and members of his staff putting extreme pressure on the Governor and his staff not to pursue the path that Governor Burgum had set forth in the May 14, 2021, *Bismarck Tribune* story.

Another open records request made by a FORB Board member revealed that local BNSF lobbyists had private interactions and conversations with local County Commissioners, City officials, and other local boards that undermined the open meetings requirements of North Dakota law and made the public meetings largely meaningless spectacles with predetermined outcomes. This subversion of the open meetings law effectively prevented any possibility of pursuing common-sense steps to consider measures to preserve the Historic Bridge outlined by Governor Burgum in his interview with the *Bismarck Tribune*. This lack of transparency through the worst kind of back-room wheedling and arm-twisting by BNSF has prevented the Bismarck-Mandan community and the people of North Dakota from having an honest look at the alternatives and costs of preserving the Historic Bridge and considering both the short-term and long-term costs and benefits of preserving the Historic Bridge.

The above statutes and rules require open consideration of these alternatives based on what the long-term “best usage” of this crossing may be for the Bismarck-Mandan community and the people of North Dakota – that is, consideration of the best alternative based on what ND ADC § 33.1-16-02.1-04(12) requires: “The best usage for the waters shall be those uses determined to be the most consistent *with present and potential uses in accordance with the economic and social development of the area.*”

NDCC chapter 61-28 and ND ADC chapter 33.1-16-02.1 together pave a path that will allow an open public process to consider the options for preserving the historic Historic Bridge in a way that provides notice and an opportunity for a hearing (i.e., due process) as required by both the United States’ and North Dakota’s Constitutions, before the irreparable harm of tearing down the historic Historic Bridge occurs without ever considering all of the factors and options Governor Burgum laid out in his interview with the *Bismarck Tribune* on May 14, 2021.

ND ADC §§ 33.1-16-02.-04(2) & (10) provide two ways of setting standards and practices that protect the “best usage” of waters for recreational and other “*present and potential uses in accordance with the economic and social development of the area*”, as quoted below:

- “Site-specific standards” mean water quality criteria developed to reflect local environmental conditions to protect the uses of a specific water body.
- “Best management practices” are methods, measures, or procedures selected by the department to control nonpoint source pollution. Best management practices include structural and nonstructural measures and operation and maintenance procedures.

North Dakota law also provides clear authority for the ND DEQ to conduct an investigatory hearing to consider the “best usage” issues outlined above and whatever “site-specific standards” may be necessary to protect the recreational and other uses of the Missouri River at the Historic Bridge crossing that have been in place for decades. The legal authority of the ND DEQ to conduct such an investigatory hearing is set forth in several related laws:

- A permit hearing conducted for purposes of receiving public comment or an investigatory hearing conducted under chapters 23.1-03, 23.1-04, 23.1-06, 23.1-08, 61-28, and 61-28.1 is not an adjudicative proceeding under chapter 28-32 and is not subject to the requirements of chapter 54-57 (NDCC § 23.1-01-07). (Emphasis supplied).
- The director of the department of environmental quality shall:
 1. Enforce all rules adopted by the department;...and [perform]
 8. Any other action, including the collection and distribution of environmental quality data, necessary and appropriate for the administration of this title and chapters 61-28, 61-28.1, and 61-28.2 (NDCC § 23.1-01-03). (Emphasis supplied).

- The department [DEQ] shall have and may exercise the following powers and duties:
 1. To exercise general supervision of the administration and enforcement of this chapter and all rules and regulations and orders promulgated thereunder...
 3. To advise, consult, and cooperate with other agencies of the state, the federal government, other states and interstate agencies, and with affected groups, political subdivisions, and industries in furtherance of the purposes of this chapter...
 5. To encourage, participate in, or conduct studies, investigations, research, and demonstrations relating to water pollution and causes, prevention, control, and abatement thereof as it may deem advisable and necessary for the discharge of its duties under this chapter.
 6. To collect and disseminate information relating to water pollution and the prevention, control, and abatement thereof...
 8. To hold such hearings, to issue notices of hearings and subpoenas requiring the attendance of such witnesses and the production of such evidence, to administer such oaths, and to take such testimony as the department deems necessary, and any of these powers may be exercised on behalf of the department by any members thereof or a hearing officer designated by it...
 11. To exercise all incidental powers necessary to carry out the purposes of this chapter.
 12. The department is hereby designated as the state water pollution control agency for all purposes of the Federal Water Pollution Control Act, as amended [[33 U.S.C. 1251 et seq.](#)], and is hereby authorized to take all action necessary or appropriate to secure to this state the benefits of that act and similar federal acts...
 15. The department, with the cooperation of the state water commission, shall formulate and issue standards of water quality and classification of water according to its most beneficial uses. Such standards of quality shall be such as to protect the public health and welfare and the present and prospective future use of such waters for public water supplies, propagation of fish and aquatic life and wildlife, recreational purposes, and agricultural, industrial, and other legitimate uses...
 20. To hold any hearings necessary for the proper administration of this chapter (NDCC § 61-28-04). (Emphasis supplied).

ND DEQ has clear authority under the above statutes to hold an investigatory hearing to consider “best usage” of waters at the Historic Bridge crossing of the Missouri River to determine recreational and other “*present and potential uses in accordance with the economic and social development of the area*” and whether any “site-specific standards” and “best management practices” are appropriate to protect that best usage. Failure to hold such a hearing will deprive the public of the notice and opportunity for a hearing required to satisfy procedural and substantive due process under both the Federal Constitution and North Dakota’s State Constitution.

Further, FORB requests that any hearing ND DEQ conducts to address the above issues be a joint hearing with the State Engineer and the North Dakota Department of Water Resources (ND DWR) as provided in NDCC § 61-28-04(15) quoted above. This hearing should not only address the “site-specific” water quality standards that should be put in place to protect the recreational use of the Missouri River and adjacent publicly owned lands, easements, and rights-of-way under and connected to the existing and proposed new railroad bridge crossing at the existing Historic Bridge crossing, but also the sovereign lands and ownership issues discussed throughout this comment letter.

For the reasons discussed above and below, the investigatory hearing should include the amended Sovereign Lands permit application recently submitted to the State Engineer and ND DWR. That hearing must address the issues of 1) ownership of the riverbed beneath the Historic Bridge (which in filings made with the United States Coast Guard BNSF claims belongs to the railroad under the 1864 Act that created the Northern Pacific Railroad); 2) approval under NDCC § 55-02-07 to tear down the Historic Bridge if the riverbed below the Historic Bridge is determined to belong to North Dakota; and 3) determination of whether the Historic Bridge in fact belongs to the people of North Dakota because it was transferred as a permanent attachment and fixture to the riverbed (up to its ordinary high-water mark) at the time the Missouri River riverbed was transferred to North Dakota under the Equal Footing and the (federal law) Public Trust doctrines that apply under the federal constitution to ownership of navigable waterways in territories of the United States when they become part of a newly admitted State.

Again, failure to provide notice and an opportunity to participate in a hearing addressing these issues of ownership, tearing down a historic structure located on state land (the riverbed of the Missouri River), and whether a Sovereign Lands permit should be issued, would violate the requirements of substantive and procedural due process under NDCC § 55-02-07, and N.D. State Const. Art. IX, Sec. 9.

The recently amended Sovereign Lands permit application submitted by BNSF to the State Engineer shows BNSF’s plan to build the new bridge approximately 30 feet north of the existing Historic Bridge. The existing Historic Bridge will remain in use during construction, then be torn down after construction is completed. All reports filed by BNSF show that the existing Historic Bridge remains structurally sound, and BNSF has justified tearing the historic Bridge down after the new bridge is completed based on vague claims that the existing Historic Bridge has reached the end of its “useful life.”

BNSF’s “purpose and need” statement for the Environmental Impact Statement claims that a new bridge is necessary because BNSF needs a bridge capable of supporting two tracks and a superstructure over the bridge that will allow transport of railcars with two shipping containers stacked on top. (Trains with railcars with two containers stacked on top regularly pass over the existing Historic Bridge, so this claim is nonsense.) At the same time, BNSF claims that it does not have to consider the environmental and economic impacts of converting the rail line through the Bismarck and Mandan to two rail lines because it has not decided yet whether or not it will ever run two lines through Bismarck. BNSF cannot justify:

- 1) tearing down the existing 1883 because it needs a bridge capable of carrying two rail lines and at the same time say that
- 2) it does not need to consider the environmental impacts and economic costs, such as the cost of converting each railroad crossing through Bismarck and Mandan and across the rest of eastern North Dakota (a cost usually paid for by the public, albeit usually with a high percentage of matching federal funds), because it has not decided whether or not BNSF will ever build two lines.

Legally, this is called “segmenting” the project for approval. Segmenting the project in this way is forbidden by the National Environmental Policy Act (NEPA, under which BNSF is seeking its federal permit). Further, this violates due process and equal protection doctrines because it fails to give the public notice and an opportunity participate in a hearing and process that considers the full impacts of the full project on the people and businesses that will ultimately suffer from the full project’s environmental, economic, social, and public health and safety costs and benefits, as well as the impact of tearing down the historic property (as summarized by Governor Burgum in his May interview with the Bismarck Tribune), which NEPA includes as an impact that must be considered under NEPA, as well as under the National Historic Preservation Act.

If BNSF decides at some point in the future that it needs two tracks through this area, it can apply at that time to build a bridge at this crossing capable of holding two tracks. BNSF’s federal and state permit applications seek to build a new bridge without adequate evidence that a new two-track bridge is, or ever will be, required. BNSF’s state and federal permit applications to build a new two-track bridge based on representations that BNSF may or may not at some point in the future need a second track (that, according to BNSF’s statements in the environmental impact statement, BNSF may or may not ever use) is both disingenuous and premature.

Further, as noted above, the amended Sovereign Lands permit application that BNSF has recently submitted to the State Engineer states that BNSF plans to build the new bridge approximately 30 feet north of the existing Historic Bridge. The investigatory hearing should address whether 30 feet is enough to allow both building a new bridge and preserving the Historic Bridge. Since the State of North Dakota owns the land on the western side of the Missouri River north of the embankment where the current track runs, land likely could be purchased or traded there to build the new bridge far enough north of the Historic Bridge to preserve it as well as allow the recreational and other “*present and potential uses in accordance with the economic and social development of the area*” as required by the statutes and regulations administered by ND DEQ and ND DWR discussed above.

BNSF has claimed publicly that it will cost BNSF an additional 50 to 90 million dollars to both build a new bridge capable of handling two tracks and preserve the existing Historic Bridge. Yet BNSF plans to continue to use the existing Historic Bridge during construction. There are several things that are unsupported by the evidence and/or unjustified by these claims:

- 1) If the existing Historic Bridge is safe and can be used while a new bridge is being constructed 30 feet to the north, the existing historic Bridge likely can be safely preserved for public use as a public pathway over the Missouri River that will support all the uses outlined by Governor Burgum in May 2021 after the new bridge is completed.

- 2) If public safety concerns show that more than 30 feet are required, then the costs and benefits of moving the new bridge far enough north to address those public safety concerns should be considered to preserve the recreational and other “*present and potential uses in accordance with the economic and social development of the area*” as required by the statutes and regulations administered by ND DEQ and ND DWR discussed above.
- 3) BNSF cannot vaguely say that such costs are 50 to 90 million dollars. The actual short-term and long-term costs and benefits of moving the proposed bridge north to preserve the existing Historic Bridge to BNSF, the Bismarck-Mandan community, and the people of North Dakota must be considered.
- 4) Ordinarily, the additional cost of modifying a project to preserve an historic structure or artifact is a cost of mitigation that is paid for by the project proponent. That additional cost, if any, is thus the responsibility of BNSF, unless BNSF can cite legal authority otherwise. BNSF lacks any legal basis to foist that additional cost of mitigation on the public and/or by FORB, as BNSF has attempted to do in this case through its lobbying and conversations with state and local public officials and in statement to the public itself. BNSF has unethically represented to the public throughout the permitting process that this mitigation cost must be paid by the public and/or by FORB. This is untrue.
- 5) As noted by Governor Burgum, matching federal funds to preserve the Historic Bridge is a project for which such funding is usually available because of the opportunity to preserve the unique local history and connect the multiple trails and riverfront shorelines that are irreplaceable recreational resources in the Bismarck-Mandan community. Matching federal funds are, in fact, regularly used to build or modify railroad crossings and underpasses (just as they are for interstate and state highways). If two rail lines are built through Bismarck, Mandan, and the rest of North Dakota through which this rail line passes, the public, with matching federal funds, will likely pay for much of those costs.
- 6) FORB has committed itself to seeking ways to fund, through public and private foundations and partnerships, the \$6.9 million dollars estimated by the North Dakota State University study FORB commissioned to estimate the cost to repurpose the Historic Bridge for public use. This usually is done after a decision to preserve the Bridge is made. Once a commitment to preserve the Historic Bridge is made, FORB can work with others to seek grants and form the public and private partnerships in ways similar to other preservation projects as mentioned in Governor Burgum’s May 2021 comments to the *Bismarck Tribune* quoted above. The amount of money in FORB’s bank account is irrelevant to whether such funding through private grants and matching federal funding is available. As noted by Governor Burgum in May 2021, that process takes time.
- 7) Finally, as noted in Governor Burgum’s May 2021 comments, there is no public health or safety need to immediately tear down the existing Historic Bridge after construction of the new bridge is completed. On the contrary, as stated by Governor Burgum, the existing Bridge can remain standing without danger to the public, just as the Historic Bridge will remain standing and in use while the new bridge is constructed. Section 401 Water Quality Certification for building the *new* bridge should be bifurcated from any section 401 Water Quality Certification *to tear down the existing Historic Bridge*. If and when the factual and legal issues outlined in these comments are resolved in BNSF’s favor, BNSF can then apply for section 401 Water Quality Certification to tear down the

existing Historic Bridge at that time. It is premature to grant such a permit before those issues are resolved.

In sum, for the reasons discussed above and below, the legal steps for tearing down the existing Historic Bridge have not been addressed, including whether to grant a Sovereign Lands permit, whether approval under NDCC § 55-02-07 has been received, and addressing the ownership of the riverbed beneath the Historic Bridge as well as the structure of the Historic Bridge itself. These issues must be addressed before a section 401 Water Quality Certification may be issued. BNSF cannot receive a permit to destroy an historic landmark when ownership of that historic structure is in dispute. Nor can ND DEQ, the State Engineer, or the ND DWR issue permits or certifications without addressing these issues, some of which arise under the North Dakota and U.S. Constitutions. To do so would violate substantive and procedural due process, as well as equal protection and the requirements of NDCC § 55-02-07 and N.D. State Const. Art. IX, Sec. 9.

FORB therefore requests and petitions ND DEQ, the State Engineer, or the ND DWR to hold an investigatory hearing to address the factual and legal issues discussed above and below that must be resolved before any permits or certifications may be granted by those agencies.

Fourth and finally, BNSF cannot receive permits to tear down the Historic Bridge before the State of North Dakota addresses the issues of ownership of the riverbed beneath the Historic Bridge as well as ownership of the Historic Bridge itself. The issues that must be resolved include both 1) current ownership of the riverbed and the Historic Bridge itself, which is primarily an issue of State law, and 2) ownership of the the riverbed up to its ordinary high-water mark and the Historic Bridge itself as a structure attached to that real estate at the time of transfer when North Dakota became a State, under the Equal Footing Doctrine of the United States Constitution and the “federal” Public Trust Doctrine (which holds in trust the ownership of riverbeds of navigable waterways located in territories of the United States for future States up to that waterway’s ordinary high-watermark). These second set of laws are the controlling applicable laws of what was transferred to North Dakota at the time North Dakota was admitted to the Union on November 2, 1889, including both the riverbed and what was attached as a fixture to the riverbed at that time.

BNSF claims ownership of the riverbed beneath the historic Bridge and the Historic Bridge itself under the 1864 Act that created the Northern Pacific Railroad. The 1864 Act, however, makes no reference to the Equal Footing and Public Trust Doctrines, and at most gave the Northern Pacific railroad an easement to build a bridge over the Missouri River, not ownership of the riverbed itself, or any structures attached to the riverbed that were transferred with the riverbed at the time that North Dakota became a State. The rules of construction that apply under federal law to the Equal Footing and federal Public Trust Doctrines are clear that transfers of riverbeds of navigable waterways “*should not be regarded as intended unless the intention was definitely declared or otherwise made very plain*” (*Utah v. United States*, 403 U.S. 9, 197-98 1971) (Emphasis supplied.) There is no such language in the 1864 Act. At most the 1864 creates an easement, which does not include the riverbed or structures attached to the riverbed at the time of transfer. Thus, North Dakota owns both the riverbed beneath the Historic Bridge, and the Historic Bridge

itself, as a structure attached to the riverbed at the time of transfer.

When BNSF made its original application to the State Engineer in 2017, the North Dakota State Historic Preservation Officer at that time concurred that the Historic Bridge is eligible for the National Register of Historic Places (Figure 1).

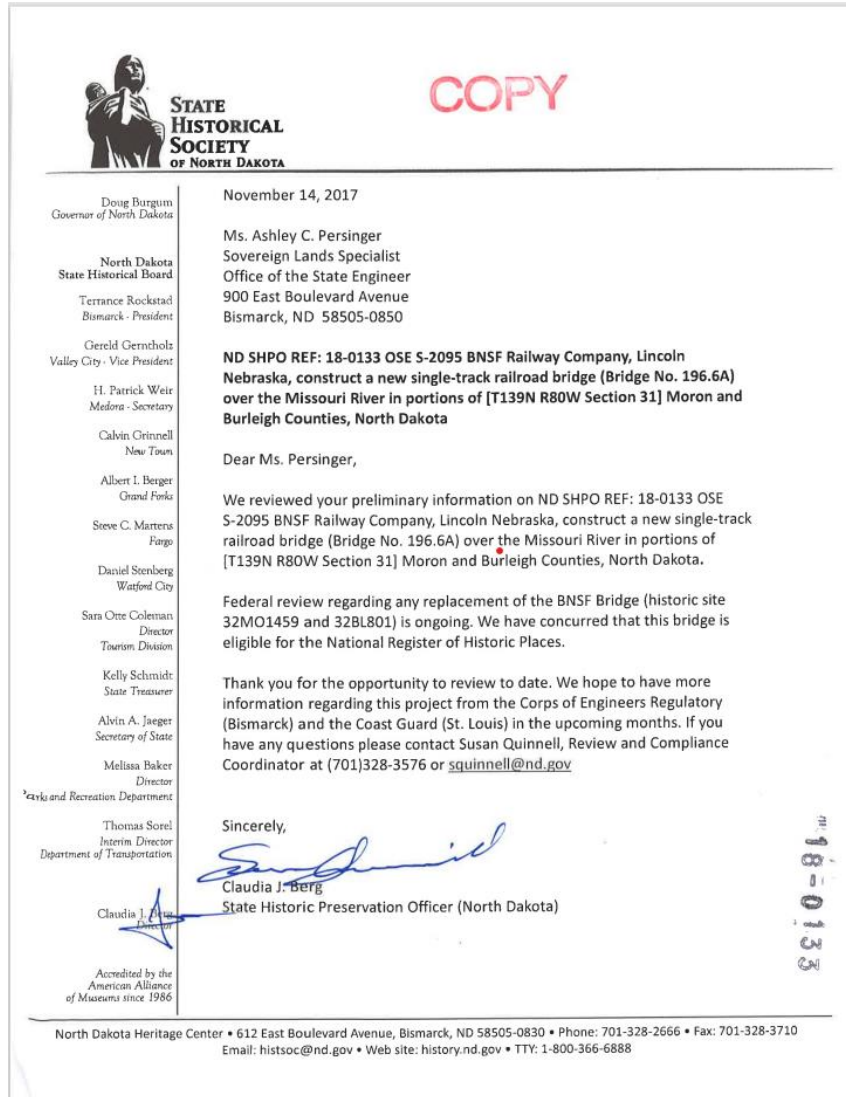


Figure 1: November 14, 2017, Letter from Claudia Berg, Director of the State Historical Society of North Dakota and State Historic Preservation Officer to Ashley C. Persinger, Office of the State Engineer.

Thus, the determination that the Historic Bridge is a structure that requires approval of the North Dakota State Historical Board under NDCC § 55-02-07 before a Sovereign Lands Permit can be issued by the North Dakota State Engineer. By applying for a Sovereign Lands permit under NDCC § 61-33-01, BNSF may be conceding that the riverbed beneath the historic 1883 was and is state-owned and that BNSF needs a Sovereign Lands permit before it can build a new bridge or tear down the existing Historic Bridge. But in filings with the United States Coast

Guard in the federal environmental impact statement and permit proceedings, BNSF has taken the opposite position that BNSF is the owner of the riverbed beneath the Historic Bridge and the Historic Bridge itself.

Ownership of the riverbed of the Missouri River riverbed in North Dakota has been a highly litigated issue in North Dakota, including several North Dakota Supreme Court decisions and a case between the Mandan, Hidatsa, and Arikara (MHA) Nation and North Dakota in federal district court in Washington, D.C., concerning ownership of the riverbed and minerals under the riverbed within the current boundaries of the MHA reservation.

Sorum v. State, 2020 ND 175, 947 N.W.2d 382, 396-97, summarizes both the Equal Footing Doctrine and the Public Trust Doctrine as enacted under North Dakota statutory law (which is different than the federal Public Trust Doctrine that reserves riverbeds of navigable waters for state ownership in territories of the United States before those territories become admitted as States):

[¶42] Under the equal-footing doctrine, North Dakota acquired title to the bed of the Missouri River up to its ordinary high water mark at the time North Dakota was admitted to the union. *Reep v. State*, 2013 ND 253, ¶ 14, 841 N.W.2d 664. Citing *Oregon ex rel. State Land Bd. v. Corvallis Sand & Gravel Co.*, 429 U.S. 363, 371-72, 376, 97 S.Ct. 582, 50 L.Ed.2d 550 (1977), the district court concluded that the equal-footing doctrine vested the State with title to the bed of the Missouri River *397 as it existed at the time of statehood, but that since statehood, the equal-footing doctrine does not determine how the changing footprint of the river over time affects title to the riverbed. Instead, how the changing riverbed affects the State's title is controlled by state law, including the public trust doctrine.

[¶43] The public trust doctrine was first recognized by this Court in *United Plainsmen v. N.D. State Water Conservation Commission*, 247 N.W.2d 457 (N.D. 1976). In *United Plainsmen*, this Court stated N.D.C.C. § 61-01-01 expresses the public trust doctrine. *Id.* at 462. Under the public trust doctrine, the State holds title to the beds of navigable waters in trust for the use and enjoyment of the public. This Court has said fostering the public's right of navigation is traditionally the most important feature of the public trust doctrine. *J.P. Furlong Enterprises, Inc. v. Sun Exploration and Production Co.*, 423 N.W.2d 130, 140 (N.D. 1988). We have also recognized other interests served by the public trust doctrine, such as bathing, swimming, recreation and fishing, as well as irrigation, industrial and other water supplies. *Id.* (recognizing that legislation may modify this common law doctrine).

Reep v. State, 2013 ND 253, ¶¶ 14 & 15, 841 N.W.2d 664, 671-72, further explains the Equal Footing and Public Trust doctrines under North Dakota law:

[¶ 14] The United States Supreme Court has recognized the equal footing doctrine is constitutionally based under an unbroken line of cases explaining that, upon entering the union on equal footing with established States, a newly-

admitted State receives absolute title to beds of navigable waters within the State's boundaries from high watermark to high watermark. *See PPL Montana, LLC v. Montana*, — U.S. —, 132 S.Ct. 1215, 1226–29, 182 L.Ed.2d 77 (2012); *Montana v. United States*, 450 U.S. 544, 551, 101 S.Ct. 1245, 67 L.Ed.2d 493 (1981); *Oregon v. Corvallis Sand & Gravel Co.*, 429 U.S. 363, 372–78, 97 S.Ct. 582, 50 L.Ed.2d 550 (1977); *Pollard v. Hagan*, 44 U.S. 212, 222–23, 3 How. 212, 11 L.Ed. 565 (1845). *See also Mills*, 523 N.W.2d at 539. In *PPL Montana*, at 1227 (quoting *Corvallis Sand & Gravel*, at 374, 97 S.Ct. 582), the United States Supreme Court explained that under the equal footing doctrine, “a State’s title to these lands [under navigable waters] was ‘conferred not by Congress but by the Constitution itself.’”

“As we explained in *Mills*, 523 N.W.2d at 539, “[b]efore North Dakota was admitted to the Union, the United States held the beds of navigable waters in the Dakota Territory from high watermark to high watermark in trust for the future state.” Under the constitutionally moored equal footing doctrine, the upland owners recognize that when “North Dakota joined the Union in 1889 ... [it] took title to the beds of the Missouri River under the equal footing doctrine up to the ordinary high watermark on each bank, including the shore zone.”

[¶ 15] After admission to the Union, a newly-admitted State, including North Dakota in 1889, was free to “allocate and govern those [shore zone] lands according to state law subject only to ‘the paramount power of the United States to control such waters for purposes of navigation in interstate and foreign commerce.’ ” *PPL Montana*, 132 S.Ct. at 1228 (quoting *United States v. Oregon*, 295 U.S. 1, 14, 55 S.Ct. 610, 79 L.Ed. 1267 (1935)). *See Mills*, 523 N.W.2d at 539–40. As we also explained in *Mills*, however, “North Dakota could not totally abdicate its interest [in the shore zone] to private parties because it held that interest, by virtue of its sovereignty, in trust for the public.” 523 N.W.2d at 540 (citing *Illinois Cent. R. Co. v. Illinois*, 146 U.S. 387, 13 S.Ct. 110, 36 L.Ed. 1018 (1892); *United Plainsmen Ass'n v. North Dakota State Water Conservation Comm'n*, 247 N.W.2d 457 (N.D. 1976)).

The facts and holding of *PPL Montana, LLC v. Montana*, supra (565 U.S. 576, 132 S.Ct. 1215, 1226–29, 182 L.Ed.2d 77 (2012)), cited in *Reep* above are easily distinguishable from the facts and holding in *PPL Montana*, which the U.S. Supreme Court summarized as follows:

The question is whether discrete, identifiable segments of these rivers in Montana were nonnavigable, as federal law defines that concept for purposes of determining whether the State acquired title to the riverbeds underlying those segments, when the State entered the Union in 1889. Montana contends that the rivers must be found navigable at the disputed locations. From this premise, the State asserts that in 1889 it gained title to the disputed riverbeds under the constitutional equal-footing doctrine. Based on its title claims, Montana sought

compensation from PPL Montana, LLC, a power company, for its use of the riverbeds for hydroelectric projects. The Montana courts granted summary judgment on title to Montana, awarding it \$41 million in rent for the riverbeds for the period from 2000 to 2007 alone.

The U.S. Supreme Court reversed the holding of the Montana Supreme Court in *PPL Montana* primarily based on the following principle:

To determine title to a riverbed under the equal-footing doctrine, this Court considers the river on a segment-by-segment basis to assess whether the segment of the river, under which the riverbed in dispute lies, is navigable or not. *Id.* at 565 U.S. at 593.

The Supreme Court in *PPL Montana* held that because the “segments” of the Missouri River at issue in that case had not been navigable at the time of Statehood, Montana did not acquire them under the Public Trust and Equal Footing doctrines when Montana became a State in 1889. This case, involving the “segment” of the Missouri River beneath and surrounding the Historic Bridge, is distinguishable on its facts from *PPL Montana* for two obvious reasons:

- 1) The Missouri River between Bismarck and Mandan, including the segment beneath the Historic Bridge, was unequivocally navigable at the time of Statehood in 1889, as set forth in detail in the April 4, 2022, memorandum FORB submitted to the U.S. Coastguard in response to BNSF’s March 11, 2022, memorandum to the Coastguard under which BNSF claimed it owned the riverbed beneath the Historic Bridge as well as the bridge itself. FORB’s April 4th, 2022, memorandum discussing these factual and legal issues are attached for your review and are incorporated by reference herein.
- 2) The privately-owned dams and hydroelectric facilities at issue in the *PPL Montana* were constructed and began operation long after Montana became a State. In this case, the Historic Bridge was constructed between 1881-83, and was, as a structure attached to the real estate, transferred to the State of North Dakota with the riverbed up to the ordinary high-water mark under the Equal Footing and federal Public Trust Doctrine, which held riverbeds of navigable waters in territories of the United States in trust for States, then transferred those riverbeds to each State where they are located at statehood.

As explained by the North Dakota Supreme Court in *Reep* above, and repeated here for emphasis, “The United States Supreme Court has recognized the equal footing doctrine is constitutionally based under an unbroken line of cases explaining that, upon entering the union on equal footing with established States, a newly-admitted State receives absolute title to beds of navigable waters within the State’s boundaries from high watermark to high watermark. ... As we explained in *Mills*, 523 N.W.2d at 539, ‘[b]efore North Dakota was admitted to the Union, the United States held the beds of navigable waters in the Dakota Territory from high watermark to high watermark in trust for the future state.’ Under the constitutionally moored equal footing doctrine, the upland owners recognize that when ‘North Dakota joined the Union in 1889 ... [it] took title to the beds of the Missouri River under the equal footing doctrine up to the ordinary

high watermark on each bank, including the shore zone.”(Reep , supra at 2013 ND 253, ¶¶ 14 & 15, 841 N.W.2d at 671-72).

It is a basic rule of the law of real property, including the federal law that will govern what property interests were transferred to the segment of the Missouri River where the Historic Bridge is located, is that the acquisition of property rights is governed by the law that is in effect at the time that the rights were acquired. *Hash v. United States*, 403 F.3d 1308, 1315 (Fed. Cir. 2005). *Hash* involves ownership of land originally transferred by patent under the 1862 Homestead Act. Between the railroad, the federal government, and the current owners of the land that traced their ownership back to the original patent, *Hash* held that the railroad owned only an easement, and between the federal government and the private owners who traced ownership back to the original patent, the private persons who traced ownership back to the original patent were the owners of the properties in question in the various categories of property at issue in that case. *Hash* states:

Although the government stresses that national policy today favors government ownership of land for environmental and conservation purposes, the property rights of these early landowners are governed by the law in effect at the time they acquired their land. *See Leo Sheep Co. v. United States*, 440 U.S. 668, 687–88, 99 S.Ct. 1403, 59 L.Ed.2d 677 (1979) (“This Court has traditionally recognized the special need for certainty and predictability where land titles are concerned, and we are unwilling to upset settled expectations to accommodate some ill-defined power to construct public thoroughfares without compensation.”) (footnote omitted); *Hastings v. Whitney*, 132 U.S. 357, 10 S.Ct. 112, 33 L.Ed. 363 (1889) (“The doctrine first announced in *Wilcox v. Jackson*, 13 Pet. 498, 10 L.Ed. 264, that a tract lawfully appropriated to any purpose becomes thereafter severed from the mass of public lands, and that no subsequent law or proclamation will be construed to embrace it, or to operate upon it, although no exception be made of it, has been reaffirmed and applied by this court in such a great number and variety of cases that it may now be regarded as one of the fundamental principles underlying the land system of this country.”). (403 F.3d at 1315).

This case involves not property transferred by the United States to the original patent holder under the 1862 Homestead Act, but property transferred to North Dakota under the Equal Footing and Public Trust Doctrines at the time of Statehood. More narrowly, it involves the issue of what kind of property interest was transferred to the Northern Pacific railroad under the 1864 Act compared to what property interest was transferred to North Dakota in the riverbed beneath the 1883 and in the Historic Bridge itself when North Dakota was admitted into the Union in 1889. FORB’s April 4, 2022, memorandum lays out in detail the facts and the laws that were in effect at the time of transfer of the riverbed and the historic 1883 as a structure attached to that riverbed in 1889 (enclosed). These are unique issues of fact and law that have not been determined under North Dakota and federal law. However, as the Supreme Court noted in the *PPL Montana* case, these are issues that must be determined on a case-by-case basis based on unique facts and circumstances that existed at the time of statehood for each segment of the Missouri River. That must be done in this case also.

Conclusion

For the reasons discussed in this comment letter, FORB requests that ND DEQ and ND DWR conduct an investigatory hearing to consider and determine these issues. FORB is requesting this hearing to make sure North Dakota fulfills its obligations under North Dakota statutory and administrative law, and to provide the public, including FORB, an opportunity for proper notice and an opportunity for a hearing on these matters to satisfy both procedural and substantive due process requirements. ND DEQ should decline to issue a section 401 Water Quality Certification to tear down the existing Historic Bridge at that time. It is premature to grant such a permit before the legal and factual issues set forth in this comment letter are resolved.

In addition, FORB urges consideration of all alternatives set forth in this comment letter and in the federal permitting process. One alternative considered in the U.S. Coast Guard's draft environmental impact statement was to construct the new bridge with 400-foot spans identical to the pier spacing of the existing bridge, with the new piers set parallel to the river flow from the existing piers. This alternative would be less likely to generate upstream sediment deposition than the proposed project would; therefore, wider pier spacing would not increase future frequency and extents of dredging operations in the channel. Other options that would avoid the detrimental water quality impacts entail construction of the new bridge in alternate locations, away from the multiple existing bridges in the Bismarck-Mandan area.

Sincerely,

/s/

Lyle Witham
FORB's In-House General Counsel
North Dakota Bar ID # 04118

Enclosure: FORB April Memorandum

cc:

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APPENDIX E

State Historical Society of North Dakota

Historic Bridge Significance

November 14, 2017



**STATE
HISTORICAL
SOCIETY
OF NORTH DAKOTA**

COPY

Doug Burgum
Governor of North Dakota

North Dakota
State Historical Board

Terrance Rockstad
Bismarck - President

Gerold Gerntholz
Valley City - Vice President

H. Patrick Weir
Medora - Secretary

Calvin Grinnell
New Town

Albert I. Berger
Grand Forks

Steve C. Martens
Fargo

Daniel Stenberg
Watford City

Sara Otte Coleman
*Director
Tourism Division*

Kelly Schmidt
State Treasurer

Alvin A. Jaeger
Secretary of State

Melissa Baker
Director

Parks and Recreation Department

Thomas Sorel
*Interim Director
Department of Transportation*

Claudia J. Berg
Director

*Accredited by the
American Alliance
of Museums since 1986*

November 14, 2017

Ms. Ashley C. Persinger
Sovereign Lands Specialist
Office of the State Engineer
900 East Boulevard Avenue
Bismarck, ND 58505-0850

**ND SHPO REF: 18-0133 OSE S-2095 BNSF Railway Company, Lincoln
Nebraska, construct a new single-track railroad bridge (Bridge No. 196.6A)
over the Missouri River in portions of [T139N R80W Section 31] Moron and
Burleigh Counties, North Dakota**

Dear Ms. Persinger,

We reviewed your preliminary information on ND SHPO REF: 18-0133 OSE
S-2095 BNSF Railway Company, Lincoln Nebraska, construct a new single-track
railroad bridge (Bridge No. 196.6A) over the Missouri River in portions of
[T139N R80W Section 31] Moron and Burleigh Counties, North Dakota.

Federal review regarding any replacement of the BNSF Bridge (historic site
32MO1459 and 32BL801) is ongoing. We have concurred that this bridge is
eligible for the National Register of Historic Places.

Thank you for the opportunity to review to date. We hope to have more
information regarding this project from the Corps of Engineers Regulatory
(Bismarck) and the Coast Guard (St. Louis) in the upcoming months. If you
have any questions please contact Susan Quinnell, Review and Compliance
Coordinator at (701)328-3576 or squinnell@nd.gov

Sincerely,

Claudia J. Berg
State Historic Preservation Officer (North Dakota)

18-0133

APPENDIX F

Bismarck Missouri River Bridge Historic Bridge Repurposing Feasibility Study

NDSU Architecture and Landscape Architecture

March 5, 2019

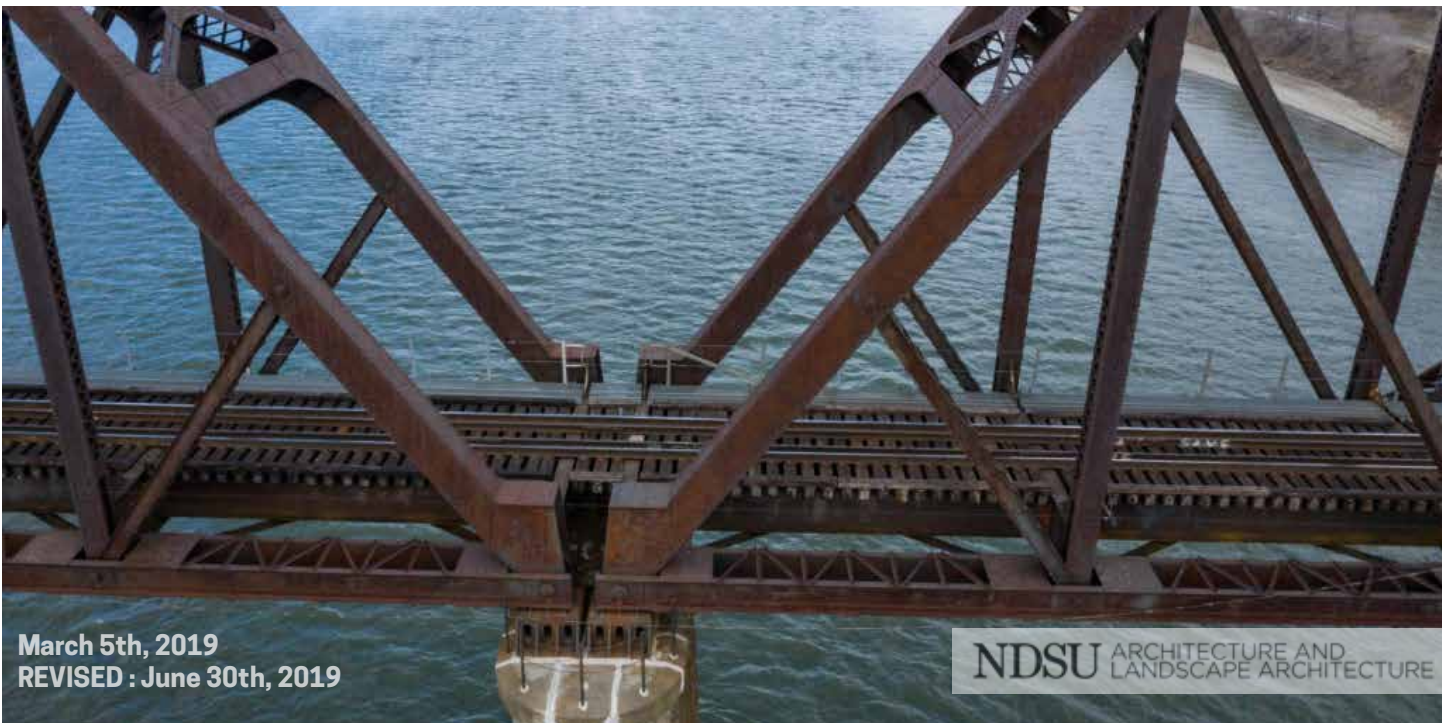


BISMARCK MISSOURI RIVER BRIDGE

Historic Bridge Repurposing Feasibility Study



National Trust for Historic Preservation
**America's 11 Most
Endangered Historic Places**



March 5th, 2019
REVISED : June 30th, 2019

NDSU ARCHITECTURE AND
LANDSCAPE ARCHITECTURE

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Acknowledgments

Bismarck Missouri River Railroad Bridge
Historic Bridge Repurposing Feasibility Study

Prepared for:

“The Bismarck Missouri River Railroad Bridge Steering Committee”

Prepared by:

North Dakota State University, Landscape Architecture



Acknowledgments:

The Bismarck Missouri River Railroad Bridge Steering Committee

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Assistant City Administrator, City of Bismarck

Dannette Welsh
Clerk of Captains Landing

Dave Mayer
Bismarck Parks and Recreation

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Fern Swenson
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Tim Nilsen
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Tony Geurholtz
Morton County Parks Board

Steve Saunders
Bismarck Mandan Metropolitan Planning Organization

Mike Herzog
BNSF

01

EXECUTIVE SUMMARY

SECTION 1 Executive Summary

1.1 Project Overview & Scope

North Dakota State University's Department of Architecture and Landscape Architecture, in collaboration with a steering committee local to the project area, is completing a study to consider whether it is feasible to repurpose the existing historic Northern Pacific Railroad bridge into a pedestrian and bicycle path with BNSF's proposed new bridge in place thirty feet to the north or, alternately, eighty feet to the north. An NDSU 4k drone inspection of the bridge occurred on December 21, 2018, with Federal Aviation Administration-approved



figure 1.0] aerial drone view of high bridge

pilot Dr. Meghan Kirkwood. Photos from this drone inspection informed the feasibility meetings. The first feasibility kickoff meeting was on January 11, 2019, Friday, from 11:30AM to 1:00PM (CST), held at Bismarck State College's National Energy Center of Excellence (NECE) Conference Room #335, 1500 Edwards Avenue, Bismarck, North Dakota.

The second feasibility meeting date was coordinated in conjunction with the understandably busy schedule of the BNSF Director of Bridge Construction. This meeting was initially scheduled for the end of

January, but was rescheduled so Mr. Herzog could attend on February 19, 2019, Tuesday, 11:30AM to 1:00PM (CST), and held at the Bismarck-Mandan Chamber of Commerce meeting room, 1640 Burnt Boat Drive, Bismarck, North Dakota. For those unable to physically attend the first or second meeting, NDSU made available the ability to call into the meetings and follow along with the Power Point slides via "Zoom."

In addition to considering repurposing the historic bridge, this feasibility study considers how a repurposed bridge would connect with the existing public trail systems on the east and west side of the Missouri River.

The historic bridge is recommended eligible for the National Register of Historic Places according to criteria A, B and C. It is our understanding that "a new railroad bridge is proposed 30' or 80' north of the existing bridge" and the conversion of the existing bridge to a pedestrian facility has been discussed during consulting party meetings with the United State Coast Guard (USCG) for the Federal law that are the Section 106 processes.

The project area, as noted in the Class II Cultural Resource Inventory, lies within one mile of 49 previously recorded cultural resources, and in alignment with the city centers of Bismarck and Mandan, ND.

This report presents the results of this study. Included in the study are governance and jurisdiction considerations, security and maintenance issues, and a discussion and opinion of probable costs to complete and maintain the project. Beyond the 1880s historic BNSF steel bridge structure, the study considers connections to established and heavily used trails and road connections and considerations for expanded and future trail connections.

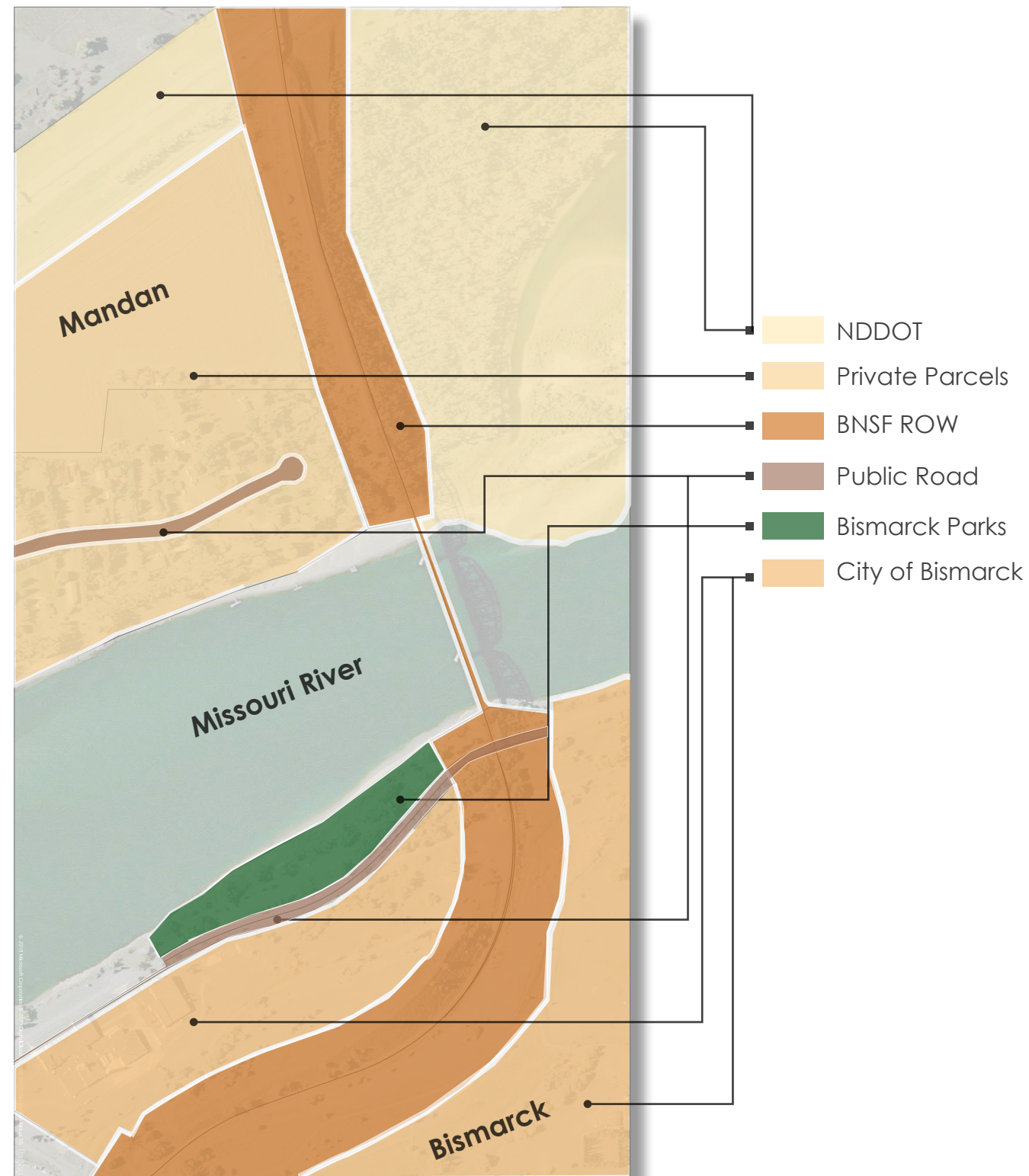


[figure 1.1] aerial drone view of high bridge

Environmental impacts, project costs, permitting, accessibility and preliminary design location and materials are also evaluated in this study.

1.2 Project Location

The project area is approximately 60 acres and includes BNSF right-of-way parcels, private parcels, City of Bismarck property and NDDOT property.



1.3 History of Similar Efforts

A cursory sample of successful efforts to repurpose historic bridges to pedestrian and bicycle trails is expansive and extends throughout all of the United States. The Rails-to-Trails Conservancy and the Historic Bridge Foundation have non-exhaustive lists of successful historic bridge preservation, restoration, and repurposing projects. Two case studies that inform this feasibility study include the Fairview Lift Bridge near Cartwright, North Dakota and the Stone Arch Bridge in Minneapolis, Minnesota. Also mentioned below is the Programmatic Agreement used to rehabilitate the historic Sorlie Bridge that spans the Red River of the North from East Grand Forks, Minnesota to Grand Forks, North Dakota.

Fairview Lift Bridge

The Fairview Lift Bridge constructed by Gerrick & Gerrick stretches 1,320 feet across the Yellowstone River. In its earlier days, the Fairview Lift Bridge not only accommodated rail traffic, but also vehicular traffic. Planking was placed between and outside the rails to accommodate automobiles. It was converted to a walking bridge in 2001. A summary of the history, largely given from the transcript of the Section 106 meeting number 8 on October 10th, 2018, 2:48 pm ET follows.

Ray Trumpower, Friends of the Fairview Bridge, "what we did was we talked to a 16-county economic development group in Eastern Montana and said, "Would you do this deal for us? And then when we get our 501(c)(3), you can then pass the property to us.'" Eastern Plains RC&D transferred ownership to the Friends of the Fairview Bridge. They also built an ADA accessible parking lot, using the IS-TEA program, the Intermodal Surface Transportation Efficiency Act funding. Under ISTEA, Transportation Enhancement Program funds could be used for the construction of pedestrian and bicycle facilities, such as pedestrian bridges with all modes of transportation working together efficiently."



[figure 3.0] State Historical Society of North Dakota, William E. (Bill) Shemorry Photograph Collection (1-75B-4-11)

The dual-purpose bridge was not an active rail line at the time of the purchase and conversion. The local group added a walkway and handrails for safety. Liability, since it is a publicly accessible site, is covered by the North Dakota Century Code, the same legislation that provides blanket coverage for public sites and outdoor recreation sites. BNSF also made a financial donation to the local nonprofit to assist the project. Mr. Trumpower noted that the interest gained on the account has allowed it to increase to approximately \$250,000. According to Kris Swanson of BNSF, the quit claim deed was signed in December 2001, along with a monetary transfer of \$150,000 from BNSF to Friends of the Fairview



[figure 4.1 & 4.2] views of fairview lift bridge
mckenzie county, north dakota

Sorlie Bridge

The Sorlie Bridge between Minnesota and North Dakota in Grand Forks utilized a Program Agreement (P.A.) that was handled under the Minnesota's historic bridge management plan. The state of North Dakota may also look to developing a statewide P.A.



[figure 5.0] sorlie bridge at night
grand forks, north dakota

Old Cedar Avenue Bridge

On February 21, 2019, Erin Hanafin Berg, Policy Director from Preservation Alliance of Minnesota, e-mailed the local Friends of the Rail Bridge non-profit group. Berg provided a link to another completed bridge project, this one automotive, the Old Cedar Avenue Bridge: <https://www.bloomingtonmn.gov/eng/old-cedar-avenue-area-project>

Berg said:

“This project was a long time in the making, and was not without its local detractors and skeptics. Ultimately, a determination by the involved Federal agencies (US Fish and Wildlife, FHWA/FTA, and/or US Army Corps of Engineers) that the Old Cedar Avenue Bridge could be successfully rehabilitated cleared the way for other essential partners to get on board. Let me know if you'd like more detailed information than the city's website provides and I can put you in touch with other people who were involved in the project.”

Following up with individuals within Federal agencies regarding this project could also be advantageous, and inform the compliance issues required through the United States Code of Federal Regulations.

Stone Arch Bridge

The Stone Arch bridge in Minneapolis, is a contemporary of the historic Northern Pacific Railroad Bridge. The Stone Arch bridge was purchased by the Minnesota Department of Transportation in the 1990s and is currently maintained by the Minneapolis Park District.



[figure 6.2 & 6.3] stone arch bridge
minneapolis, minnesota

Rails-With-Trails Examples

Although the successful examples listed above utilize corridors without active rail assets, there are over 350 completed project examples from over 41 states where rail-with-trail developments have satisfactorily addressed any concerns about risk and liability. A few photo examples are shown below.



The full list can be found at https://www.railstotrails.org/resourcehandler.ashx?name=americas-rails-with-trails-rail-with-trail-list&id=16685&fileName=Rail-with-TrailList%20spreadsheet_UPDATED%202019.01.11.pdf

1.4 Project Data

Summarized Costs

Maintenance Costs : **\$63,500 annualized**

Estimated Construction Costs :

Superstructure	\$150,000.00
Substructure	\$285,500.00
Railing & Fencing	\$457,600.00
Decking & Paths	\$926,000.00
Earthwork	\$3,150,000.00
Electrical	\$80,000.00
Inspection	\$94,000.00
Design + Management Serv.	\$600,000
Contingencies	\$1,148,620
Total	\$6,891,720.00*

*For itemized activity listing and costs, see Appendix E

Estimated Construction Duration : 14 months

ROW Involvement :

- Partial Property Acquisition or easement permit for City of Bismarck property on the east connection to the bridge and acquisition or permitted use of BNSF ROW (approximately 2 acres)

Possible Permits :

- Local Planning & Zoning Approval
- ACOE - Section 404 Permit
- Flood Management Certification

02

EXISTING CONDITIONS

2.1 Governance & Liability Issues

Governance and liability of repurposed railroad bridges or rehabilitated automotive bridges in North Dakota have several precedents from which to follow, including, the Fairview Lift Bridge in Cartwright, North Dakota, and the Sorlie Bridge that spans the Red River between East Grand Forks, Minnesota and Grand Forks, North Dakota.

Liability Issues :

The city, county, state, Federal and non-profit complex of heritage recreation resources along the Missouri River in central North Dakota is expansive and vast. It is a reflection of the interests of the residents and visitors to the area. The everyday lives of most North Dakota residents includes some form of outdoor recreation, from hiking and biking to snowshoeing and snowmobiling.

The North Dakota Century Code (NDCC) Chapter 53-08 provides liability reassurance for public and private lands leased or used for public recreation. As summarized by the North Dakota Parks & Recreation Department, 53-08 "protects landowners and local government by limiting the liability they may incur from public recreation on their property." Furthermore, "a landowner is not specifically required to keep the premises safe for recreational purposes regardless of the location and nature of the recreational activity and whether the entry (authorized or unauthorized) or use by others is for their own recreational purposes or is directly related to the recreational activity of other person. Landowners are also not required to warn users of dangerous condition, use structure or active on the property...Unless otherwise agreed in writing, owners leasing land to the state or political subdivisions for recreation are not required to keep the property safe for others or warn users of any hazardous conditions, uses, structures or activities."

Because the preservation of the bridge and access points are currently BNSF Right of Way, any entity that would own the bridge would consider and formulate a way in which the ownership of the bridge could be placed in the public domain so that it would be covered by NDCC Chapter 53-08.

The vast majority of the over 350 rails-with-trails projects are insured by an existing local umbrella policy, similar to most rail-trails and greenways. According to the Rails-to-Trails Conservancy, "the increasing adoption of rails-with-trails has the potential to further reduce collisions by providing safe and intentional alternative to trespassing on tracks. Americans increasingly demand that they be given balanced transportation options that include safe and healthy places to walk and ride. Taking full advantage of corridors to facilitate both rail and active transportation."

2.2 Agency & Jurisdiction Issues

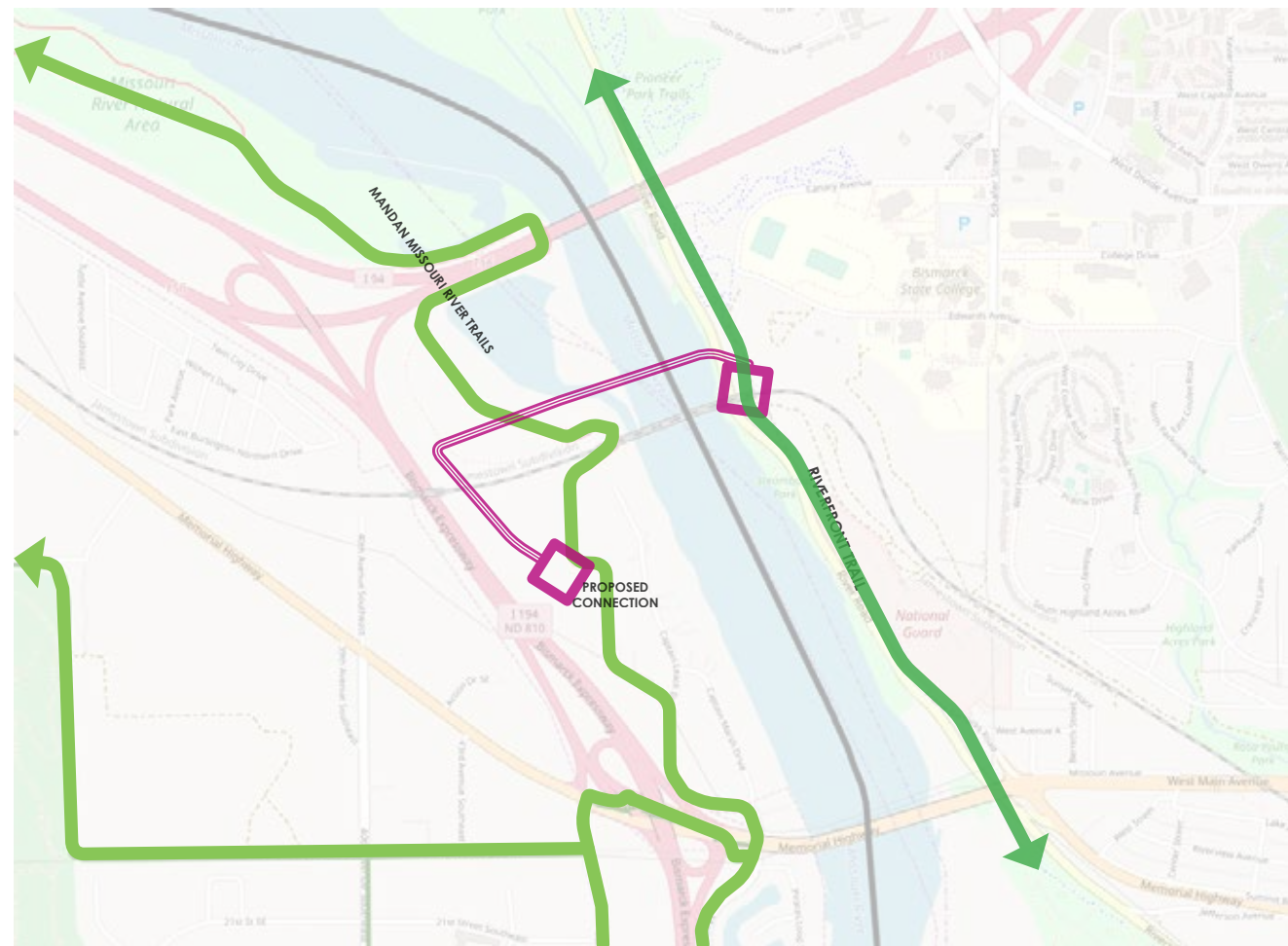
There are several agency and jurisdictional options for the Friends of the Rail Bridge (FORB) to move forward with a successful partnership with local and state entities. Following the Fairview Lift Bridge model between Montana and North Dakota, the Friends of the Rail Bridge could have ownership transferred either from BNSF directly, along with a monetary gift and potential 501c3 tax deduction. There are several commercial appraisers in the region, whose services would be needed to maximize this opportunity for both parties. Operations and maintenance of the bridge could be implemented by Bismarck Parks and Recreation and Morton County Parks or by the Friends of the Rail Bridge.

A second option, would be to follow the Stone Arch bridge model and have the BNSF Missouri River Railroad Bridge purchased by the North Dakota State Department of Transportation and maintained and operated by partnerships between Bismarck, Mandan, and Morton County Parks and the Friends of the Rail Bridge.

A third option would be to have a public agency, such as NDDOT or ND State Parks, actually own the historic bridge, and have an agreement in place where the non-profit such as Friends of the Rail Bridge raises funds toward an endowment, the interest of which would go toward maintaining the historic bridge.

2.3 Bismarck/Mandan, Morton County Trail Connections

The City of Bismarck Parks and Recreation District and the Morton County Parks District are both highlighted by excellent and abundant access to trails. They both have a dedication to innovative partnerships and involvement with the community and region. Bismarck State College, with approximately 3,800 students, the 3rd most populous student body within the 11 public universities in North Dakota, is immediately adjacent to the proposed historic 1883 rail bridge recreation trail." There is strong opportunity for connecting the rail bridge recreation trail to the Bismarck State College Campus, and further to the State Capitol Grounds, Downtown District, city and county trails in Morton and Burleigh County, Fort Abraham Lincoln State Park, and more broadly it would provide the only dedicated pedestrian and bicycle trail to span the Missouri River in central North Dakota



existing trails

proposed trails

[figure 8.0] Bismarck/Mandan and Morton County Trails as obtained from the G.I.S. databases of the City of Bismarck and Morton County (a portion of the Captain's Landing trail has been recently closed)

2.4 Railroad Security, Maintenance & Pedestrian Safety Improvements

The most recent Railroad Bridge Inspection Report, conducted on May 30th, 2018, confirmed the bridge in service has the capacity to safely carry traffic being operated over the bridge. The bridge is currently slated to be actively used by heavy rail traffic until 2022 or later.

As highlighted by the December 2017, Bismarck – Mandan Bicycle and Pedestrian Plan completed by Stantec, Bartlet and West and the University of Minnesota for the Bismarck Mandan Metropolitan Planning Organization. The plan calls for "several improvements to connect the downtown to the wider bicycle and pedestrian network, including a rails-with-trails connection to the riverfront trails along the south side of the existing railroad track....and utilizing the historic rail bridge."

Repurposing the bridge for bicycles and pedestrians would require a separate, secure, and safe access ramp. These estimates, including security fencing and new at-grade road crossings are included in this study.

In discussion with BNSF representatives a permit would be required to bring the existing bicycle trail under the bridge into compliance and make it a viable connecting point on the west side of the bridge. Maintaining this current trail at the same level of access it has enjoyed for the past decade is recommended, but is not critical to the repurposing of the bridge.

The repurposed bridge could be placed in a land trust or railbank which would require use, easement, and maintenance agreements between BNSF and the bridge's managing entity.

Pedestrian safety is of utmost importance to the feasible repurposing of the bridge. At a minimum, 54" metal railings would need to be provided along both edges of the bridge deck for the length of the bridge. The trail will descend from the ends of the truss spans and will require supplemental railroad separation fencing.

It is also common for heavy rail freight bridges that pass through urban areas to have remotely controlled security gates installed at each end of the bridge. This would also help provide positive separation and deter trespassers.

It is understandable that the BNSF would like to reduce bridges with fracture critical members for freight use. The repurposing of the bridge with a shared use trail or pair of trails would have live loading that is significantly less than the typical freight railroad loading. A structural inspection and structural analysis will be required to fully understand the load capacity.

As discussed in section 1.3 there are many examples of pin connected truss bridges repurposed to carry bicyclists and pedestrians. Several other fracture critical truss bridges identified by a similar feasibility study in Minneapolis include, Boom Island Railroad Bridge, Northern Pacific Railroad Bridge No. 9, and Hanover Bridge. Also mentioned in the April report are other similarities stated by the engineer.

“This report acknowledges these concerns, however since 2006 there have been significant developments in understanding and mitigation of structural concerns on fracture critical bridges.” Matthew D. Jensen, PE, April 12th, 2019.

Other risk mitigation strategies are available, and the most appropriate strategy would be identified during the next phase of the project.

03

**OPINION OF PROBABLE
CONSTRUCTION AND
MAINTENANCE COST**

3.1 Opinion of Probable Costs for Construction and Maintenance



Opinion of Probable Cost for the Conversion of the BNSF Missouri River Railroad Bridge to a Pedestrian Bridge

Date: 06/24/2019

OPINION OF PROBABLE COST FOR THE CONVERSION OF THE BNSF MISSOURI RIVER RAILROAD BRIDGE TO A PEDESTRIAN BRIDGE

MAINTENANCE		EXPECTED LIFE CYCLE	Unit	Qty	UNIT COST	Total	Annual Cost	
1.00	SUPERSTRUCTURE						\$12,750.00	
2.00	SUBSTRUCTURE						\$24,550.00	
3.00	RAILINGS/FENCING						\$5,400.00	
4.00	DECK/PATHS						\$7,800.00	
5.00	INSPECTION/OTHER						\$13,000.00	
							\$63,500.00	
CONSTRUCTION and DESIGN								
1.00	SUPERSTRUCTURE							<u>\$150,000.00</u>
	Patina Coating Truss Span	10	SF	20000	6	\$120,000.00	\$12,000.00	
	Spot Coat Truss Span	40	SF	5000	6	\$30,000.00	\$750.00	
2.00	SUBSTRUCTURE							<u>\$285,500.00</u>
	Clean masonry	15	SF	40000	3	\$120,000.00	\$8,000.00	
	Tuckpoint masonry joints	10	LF	10000	8	\$80,000.00	\$8,000.00	
	Crack injection	10	LF	1500	45	\$67,500.00	\$6,750.00	
	Crack sealing	10	LF	1500	12	\$18,000.00	\$1,800.00	
3.00	RAILINGS/FENCING							<u>\$457,600.00</u>
	Pedestrian Railings/Fencing		LF	3000	120	\$360,000.00		
	Safety/security fencing along trail		LF	2800	30	\$84,000.00		
	Security bollards		EA	1200	8	\$9,600.00		
	Emergency call pole		EA	2000	2	\$4,000.00		
4.00	DECK/PATHS							<u>\$926,000.00</u>
	Overlook decking	50	SF	5000	25	\$125,000.00		
	Bituminous pavement	15	SF	25000	20	\$500,000.00		
	Repair/replace expansion joints	25	SY	6000	3.5	\$21,000.00		
	Accessible Trail Ramps	50	SF	14000	20	\$280,000.00		
5.00	EARTHWORK							<u>\$3,150,000.00</u>
	Grading/Fill		CY	2.25	500000	\$1,125,000.00		
	Wall, Foundation		LF	10000	100	\$1,000,000.00		
	Wall, Finish Material, Premium		SF	25000	35	\$875,000.00		
	Landscape Plantings		SF	30	5000	\$150,000.00		
6.00	ELECTRICAL/LIGHTING							<u>\$80,000.00</u>
	Pedestrian lighting		EA	1500	40	\$60,000.00		
	Electrical		LS	1	20000	\$20,000.00		
7.00	INSPECTION/MAINTENANCE						\$0.00	
	Underwater Inspection & Report	5	LS	1	20000	\$20,000.00	\$4,000.00	
	Fracture critical inspection and report	4	LS	1	50000	\$50,000.00	\$12,500.00	
	Arm's length Masonry Inspection	10	LS	1	15000	\$15,000.00	\$1,500.00	
	Annual Inspection	1	LS	1	4000	\$4,000.00	\$4,000.00	
	Survey	10	LS	1	5000	\$5,000.00	\$500.00	<u>\$94,000.00</u>
Indirects	Design and Plan Preparation				8%			\$400,000.00
	Permitting, Agency, and Construction Services							\$200,000.00
							SUBTOTAL	\$5,743,100.00
							TOTAL *	\$6,891,720.00

* with 20% contingencies

3.2 Conceptual Alignments and R/W Needs for Connecting Trails



3.3 Connections to Existing Morton County Trails



[figure 11.1] west ramp connection



[figure 11.2] east ramp connection

3.4 Connecting to a Future Expansion of a Cultural Trail System

Trail Route : Option 1	Trail Distances	Typology	Trail Route : Option 1
Ramp Exit to Shafer Street	0.48 mi	trail	From Trailhead:
Shafer Street to Divide Avenue	0.89 mi	on-street	To Capitol Grounds 2.79 mi
Divide Avenue to Capitol Grounds	1.42 mi	on-street	To Bismarck Library 3.8 mi
Through Grounds to 5th Street	1.95 mi	shared-path	To Bismarck Train Depot 4.38 mi
5th Street to Bismarck Library	0.48 mi	on-street	To Riverfront Trail 5.08 mi
Bismarck Library to Train Depot			Loop Connection :
- Via 5th St. to Main Ave.	0.58 mi	on-street	Mandan Missouri River Mountain
Train Depot [9th Ave] to EXPWY	0.7 mi	on-street	Bike Trail 7.74 mi
EXPWY to Riverfront Trail			Trail Total 7.74 mi
- Via Main Ave.	2.66 mi	trail	
Trail Route : Option 2	Trail Distances	Typology	Trail Route : Option 2
Ramp Exit to Edwards Avenue	0.23 mi	trail	From Trailhead:
Edwards Avenue to Shafer Street	0.65 mi	on-street	To Capitol Grounds 3.34 mi
Shafer Street to Divide Avenue	1.04 mi	on-street	To Bismarck Library 4.35 mi
Divide Avenue to Capitol Grounds	1.42 mi	on-street	To Bismarck Train Depot 4.93 mi
Through Grounds to 5th Street	1.95 mi	shared-path	To Riverfront Trail 5.63 mi
5th Street to Bismarck Library	0.48 mi	on-street	Loop Connection :
Bismarck Library to Train Depot			Mandan Missouri River Mountain
- Via 5th St. to Main Ave.	0.58 mi	on-street	Bike Trail 8.29 mi
Train Depot [9th Ave] to EXPWY	0.7 mi	on-street	Trail Total 8.29 mi
EXPWY to Riverfront Trail			
- Via Main Ave.	2.66 mi	trail	

[figure 12.0] future cultural trail options and distances

FORB Cultural Trails Proposal
Bismarck, North Dakota

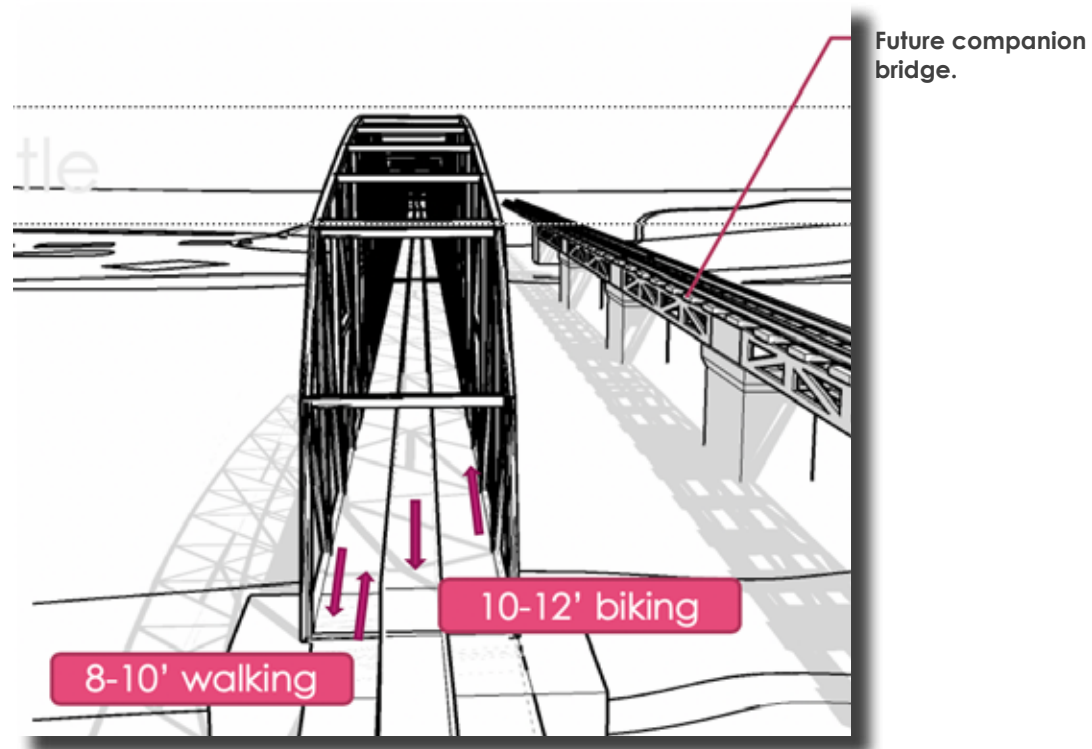
04

**ACTION PLAN
AND SCHEDULE**

4.1 Project Schedule and Timeline:

The Friends of the Rail Bridge will be the agency to lead the interest and coordination of partners for the potential repurposing of the BNSF Missouri River Railroad Bridge.

Potential Project Schedule:



[figure 13.0] bridge conceptual alignments, allows for several AASHTO compliant configurations - to be determined during design phase.

4.2 Potential Sponsors/Governance

Potential Partners for Funding, Ownership, and/or Maintenance :

- Bismarck Parks & Recreation District
- Morton County Parks District
- City of Bismarck
- City of Mandan
- North Dakota Department of Transportation
- Bismarck State College
- Northern Plains National Heritage Area
- The National Trust for Historic Preservation
- Friends of the Rail Bridge
- The Missouri Valley Heritage Alliance
- North Dakota State Historic Site
- North Dakota Department of Parks & Recreation

* This is not an exclusive list - many national funding sources are also available, due to the recent national visibility of the bridge.

4.3 Funding

Potential Funding Sources:

→	BNSF	Cost and tax savings payment to Friends of the Rail Bridge by avoiding demolition and tax-deductible sale of multi-million bridge asset
→	North Dakota Outdoor Heitage Fund	
→	Federal Lands Access Program	
→	US Fish and Wildlife Service	Through a Federal Land Transportation Program Grant
→	Bismarck Parks and Recreation District	One-time cash in lieu of maintenance payment
→	Morton County Parks District	One-time cash in lieu of maintenance payment
→	The Bush Foundation	Support for community organizations for several years of expenses. www.bushfoundation.org
→	The BNSF Railway Foundation	“primarily supports non-profits in communities located on our 32,500-mile rail network. The Foundation’s giving has expanded to help more and more communities.” www.bnsffoundation.org
→	FORB 501(c)3 Fundraising	Community support for capital campaigns has a strong record in the Bismarck Mandan community.
→	Philanthropic partner entities of the National Trust for Historic Preservation.	The trust has over 300,000 active members and an expansive network of philanthropists from across the nation and world. That the bridge is listed on the 2019 11 Most Endangered Places has elevated it to the audience and potential funders within this group.

*** This is not an exclusive list - many national funding sources are also available, due to the recent national visibility of the bridge.**

4.4 Public Input

The Section 106 consulting parties, the Friends of the Rail Bridge, The Advisory Council on Historic Preservation, The National Trust and The North Dakota State Historic Preservation Office have collaborated and prioritized stakeholder and public input. The Friends of the Rail Bridge conducted several public input and information meetings prior to this study.

Stakeholders Included :

- **City of Bismarck: Elected Officials and Staff**
- **Captain’s Landing Township Representatives**
- **Bismarck Parks and Recreation District**
- **Morton County Park Officials**
- **U.S. Coast Guard Officials**
- **Advisory Council on Historic Preservation**
- **Historic Bridge Foundation**
- **BNSF**

Further coordination to guide the evaluation and decision making process is needed and should include but is not limited to; genuine and meaningful consultation with tribal nations, including Tribal Historic Preservation Offices and other heritage stakeholders.

4.5 Summary of Findings and Opinion of Feasibility



Economic Feasibility:

The community support, historic value, National Trust for Historic Preservation designation as one of 11 most endangered properties, and improvement to the needs of the community have been well documented by multiple studies. In considering the feasibility of re-purposing the BNSF Missouri River Railroad Bridge for bicycle and pedestrian systems within an active, year-round outdoor recreation corridor, the largest impacts are agreements with BNSF, cost and environmental impacts of accommodating both a new rail line and keeping in place the historic bridge piers. Considering that the demolition cost of the rail bridge is comparable to that of accessibility and initial upgrade costs, re-purposing the bridge for bicycle and pedestrian use is feasible from a cost perspective. Furthermore, a market study update completed by Kadrmas Lee & Jackson of Bismarck, ND, RDG Planning and Design of Omaha, NE, and Agency MABU of Bismarck, ND show a need for a physical trail connection at the study location, and a market gap in excess of \$55 million dollars for the area directly west of the Missouri River Rail Bridge. The establishment of the Friends of the Rail Bridge entity, the market demand for development on both sides of the Missouri River Rail Bridge and the funding sources listed in Section 4.3 make the project economically feasible.

Cultural Feasibility:

As noted in the Class II Cultural Resource Inventory, the historic bridge lies within one mile of 49 previously recorded cultural resources, and in alignment with the city centers of Bismarck and Mandan, ND. If the rail bridge becomes the catalyst for a cultural trail linking the findings of the Mandan Memorial Highway Corridor Study and call for Riverfront development proposals by the City of Bismarck it is feasible that a surge in cultural and economic investments will follow. Similar cultural trail projects such as the Indianapolis Cultural Trail and the Minneapolis Stone Arch Bridge Trail have seen economic impacts in excess of \$1 billion and include the creation of 1,000s of new jobs.

From the Mandan Memorial Highway Corridor and Market Study, "The Corridor Study used a planning process focusing on community-based values and goals of all interest and stakeholders."

As recommended in the Corridor Study Figure 5.9 Alternate 1. "The new development connects to development on the other side of the Interstate (Captain's Landing area) via a pedestrian overpass." (pg. 70) This pedestrian overpass is in alignment with the Bismarck Missouri River Railroad Bridge and would provide a direct bicycle and pedestrian link as well as a truly unique experience of the Missouri River and sister cities.

Furthermore, from Cheryl McCormac's Bismarck Tribune article, Riverfront development a focus of Bismarck's call for projects, "Riverfront development appeared 'again and again' in the more than 1,100 responses Bismarck received when conducting its strategic plan survey last fall." And in the call for proposals "complete connectivity" encompasses

communications, walking and biking and neighborhood connections." Bismarck Mayor Bakken "wants the 1883 Burlington Northern Sante Fe Rail Bridge to be a part of the plan," according to Bismarck Tribune, January 21st, 2019.

Finally, The City of Bismarck adopted the Downtown Bismarck Sub-area Plan in December 2013 and this plan is supported by the December 2017 Bismarck – Mandan Bicycle and Pedestrian Plan completed by Stantec, Bartlet and West and the University of Minnesota for the Bismarck Mandan Metropolitan Planning Organization. The plan calls for "several improvements to connect the downtown to the wider bicycle and pedestrian network, including a rails-with-trails connection to the riverfront trails along the south side of the existing railroad track....and utilizing the historic rail bridge." The Bismarck Parks and Recreation District had a \$15,994,452 in general fund revenue in 2018 and \$376,505 in other financing sources. We agree with the findings of the 3 previously mentioned studies and find that the project is culturally supported and feasible.

Environmental Feasibility:

The environmental feasibility of re-purposing the historic rail bridge in addition to the construction of a new BNSF rail bridge would require a new Conditional Letter of Map Revision (CLOMR) 17-08-1412R. FEMA does not have the direct authority to issue a variance to local floodplain regulations. However, per FEMA's website; "FEMA's EHP experts provide specialized guidance and practical long-term planning assistance to communities across the county to ensure that proposed projects align with environmental planning and preservation requirements." This will be of great benefit for the Friends of the Rail Bridge entity moving forward.

Under 44 CFR 60.6, the community is the one to approve any exemptions from the National Flood Insurance Program (NFIP) floodplain management requirements, including those related to historic properties. Thus, Bismarck/Mandan or Friends of the Rail Bridge would need to submit updated engineering data.

Because FEMA does not mandate a particular engineering solution a new CLOMR request with appropriate supporting engineering data could make the project environmentally feasible. Alternatively, an application to determine a categorical exclusion for the purposes of the National Environmental Policy Act (NEPA) could be sought because the project and Cultural Resources Survey may satisfy criteria for actions listed in the Coast Guard's NEPA Implementing Instructions. (See appendix I. for a recent 2019 example).

Opinion of Feasibility:

This study finds sufficient evidence of support from both community stakeholders and outside experts for the local Floodplain Administrators to agree to participate in the re-evaluation of a scenario where a new BSNF bridge is constructed and the historic rail bridge is re-purposed as a bicycle and pedestrian crossing.

Given this evidence and the cultural and economic sources available in the Bismarck Mandan market it is the opinion of the study team that it is feasible to re-purpose the existing historic Northern Pacific Railroad bridge into a pedestrian and bicycle path with BNSF's proposed new bridge in place thirty feet to the north or, alternately, eighty feet to the north.

4.6 Disclaimer

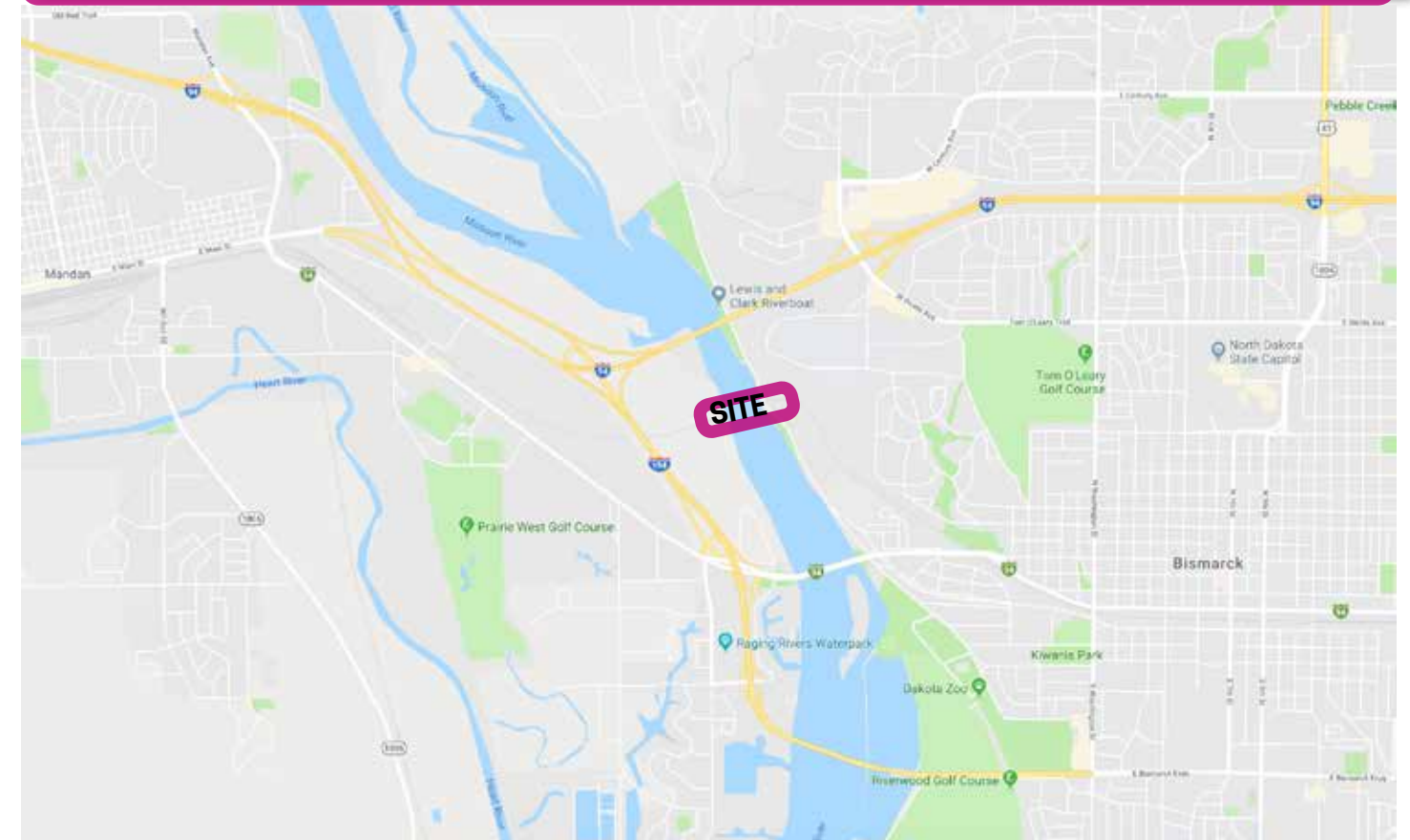
NDSU Landscape Architecture as part of its land grant mission was retained to perform this feasibility study according to a specifically stated scope of services. The contents of the report are based on compiled data from drone observations obtained from locations observed by the Landscape Architect. It is possible that all conditions were not visually detected by the Landscape Architect. This report is for the exclusive use of the client.

No warranty is made, express or implied, that deficiencies that may affect life or safety may not exist. Drawings included in this study are not for construction purposes.

APPENDICES A-I

A

APPENDIX A Location Map



APPENDIX B Photos

B



EXHIBIT B.1 - AERIAL VIEW FACING WEST

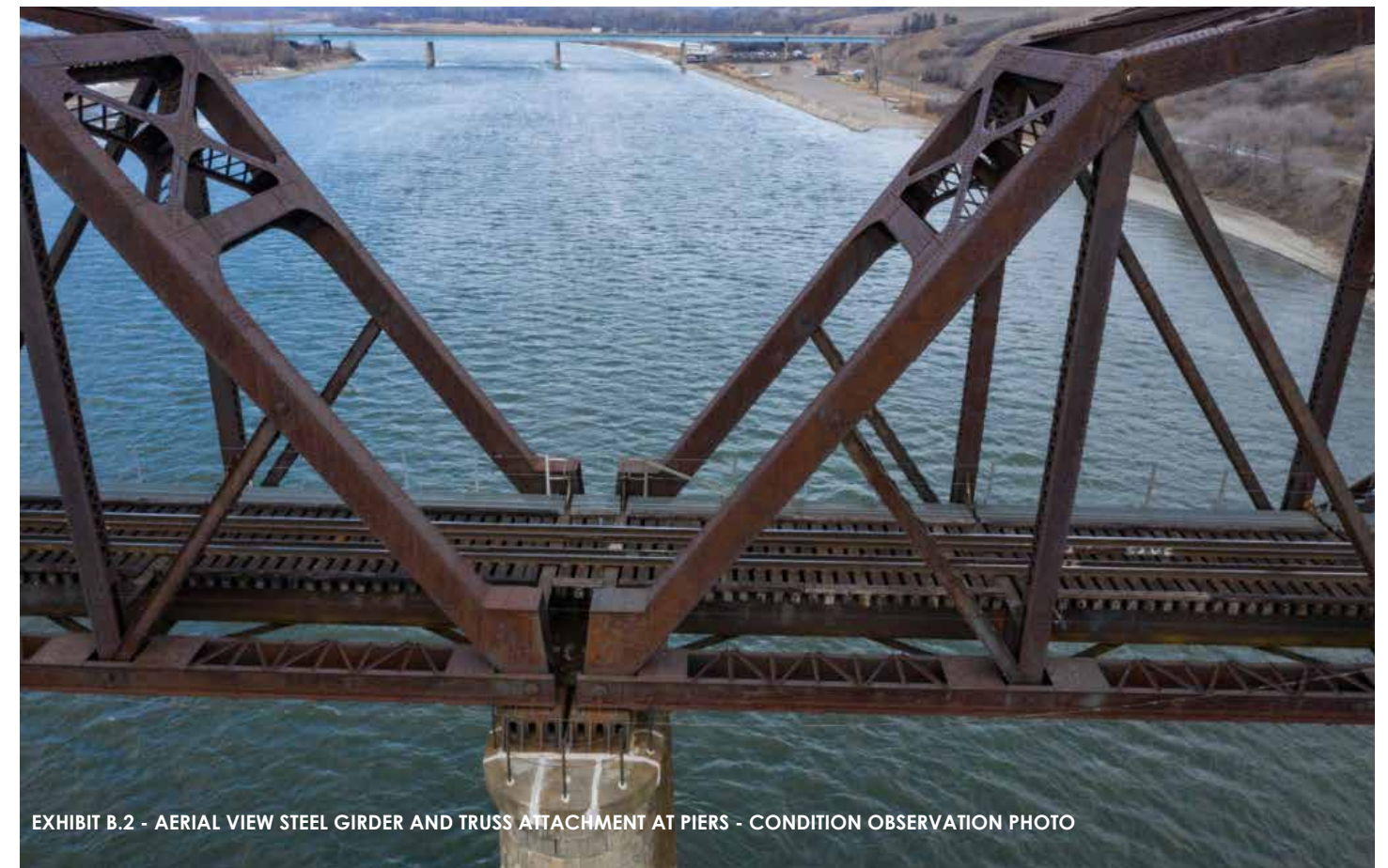


EXHIBIT B.2 - AERIAL VIEW STEEL GIRDER AND TRUSS ATTACHMENT AT PIERS - CONDITION OBSERVATION PHOTO



EXHIBIT B.3 - AERIAL VIEW FACING BSC



EXHIBIT B.5 - AERIAL VIEW SHOWING EAST ACCESS ROAD

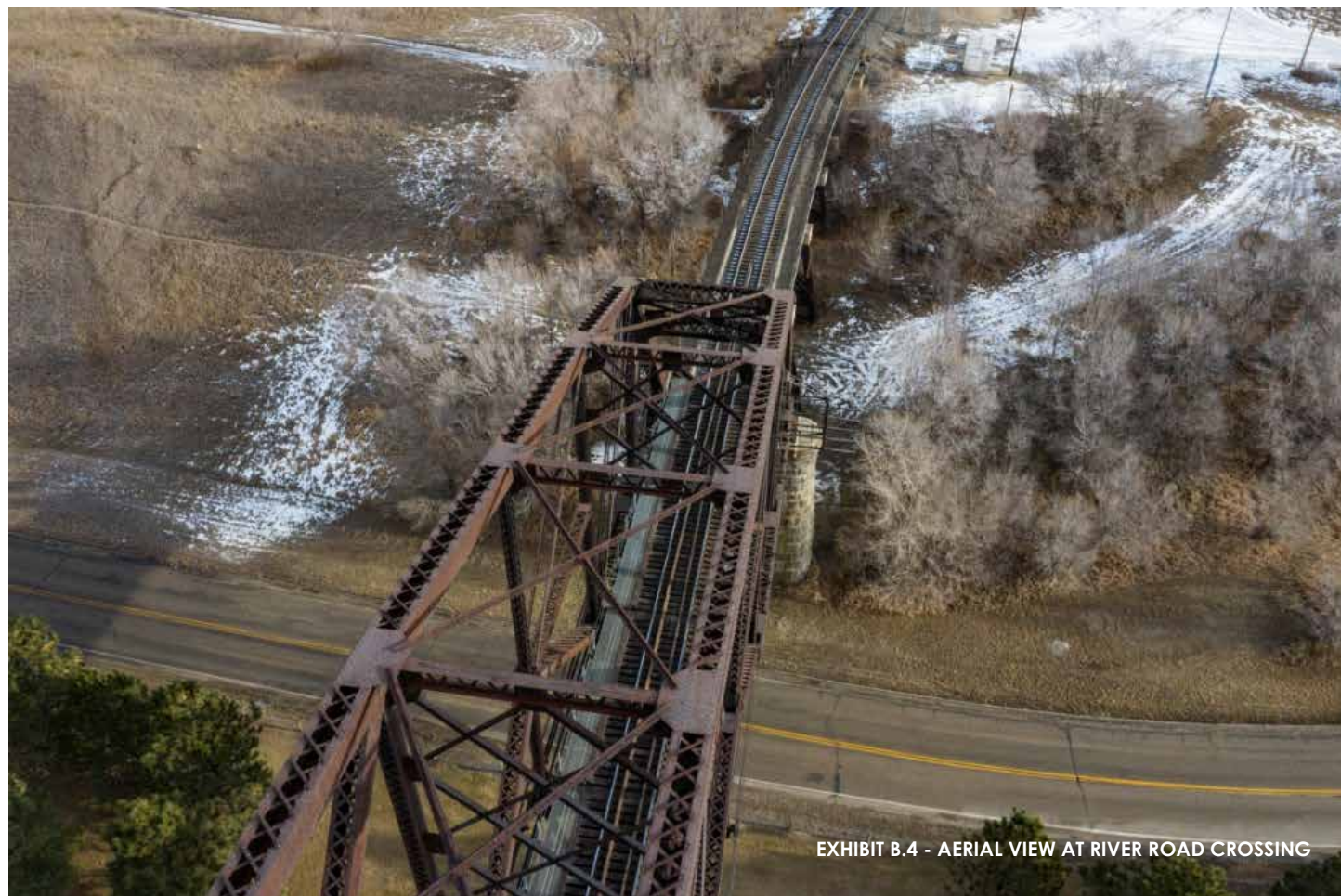


EXHIBIT B.4 - AERIAL VIEW AT RIVER ROAD CROSSING

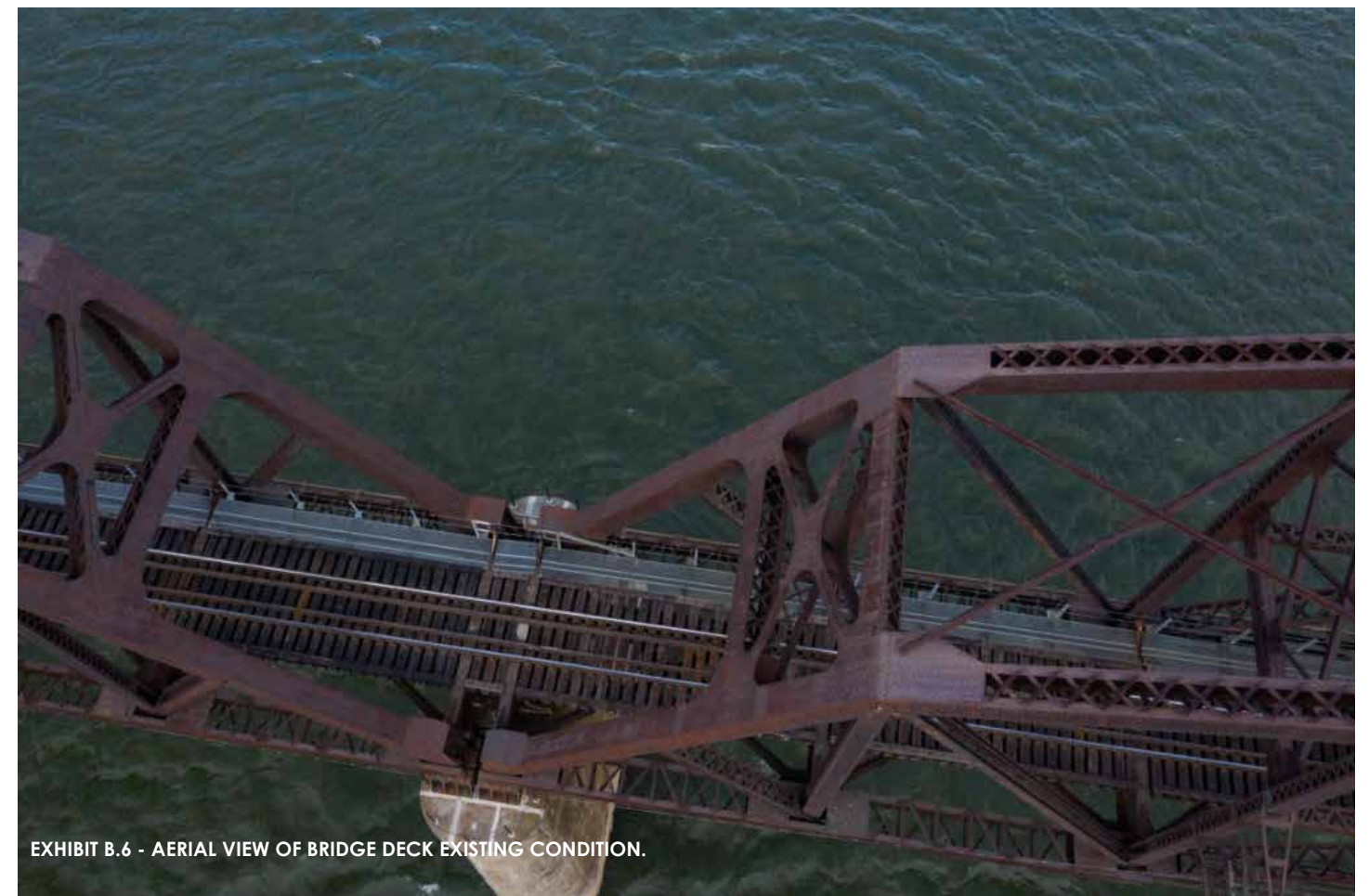


EXHIBIT B.6 - AERIAL VIEW OF BRIDGE DECK EXISTING CONDITION.

APPENDIX C Preliminary Site Plans



APPENDIX D Steering Review Committee Comments



1) Susan Wefald

After looking at the Draft Feasibility Study (75% complete) dated March 5, I have the following suggestion:

Bismarck State College with approximately 3,800 students is immediately adjacent to the proposed historic 1883 rail bridge recreation trail. Gateway to Science is planning a \$30 million new science center to educate children, young adults, and their parents to STEM activities west of the college bowl on the BSC campus. I suggest we include in our feasibility study the cost of connecting the rail bridge recreation trail to the Bismarck State College Campus. If well connected, students (including Gateway to Science students) could access the natural area on the west side of the bridge for STEM activities. Also, students could use the recreation trail for physical education training. In the report, we have not mentioned Bismarck State College or Gateway to Science as possible partners.

I thought of this concept when I recently visited Pensacola, Florida. The University of West Florida in Pensacola, Florida has established a partnership with a historic district in Pensacola Florida. The University of West Florida Historic Trust is dedicated to collecting, preserving, interpreting and sharing the history of NW Florida. The University of West Florida Historic Trust provides students an opportunity to live, work and study in a National Register Historic District. Perhaps something similar could be considered for BSC and the Northern Plains National Heritage Area, of which the historic rail bridge is an important part. But first, we need to see if it is feasible to connect the bridge to the BSC campus.

2) David Mayer (Comments 4.4.19 and 6.17.19)

Construction and Design Deck/paths – Asphalt pavement will not last 50 years. At best we are lucky to get 15 years before the trail would need to be replaced or an overlay would need to occur. With a structure I don't know that overlaying is possible. Adjusting the lifespan of the asphalt for the ramps down to 15 would be more realistic. Also, not accounted for in the estimate is the connection to the trail system and required pedestrian crossing at River Road. The plan should address crossing River Road, there could be extensive cost implications.

Section 3.1 Opinion of Probable Costs...

As mentioned above in 1.3, long-term costs are not accounted for. This estimate looks at conversion to a pedestrian bridge and possible maintenance. Shouldn't it also discuss a savings or trust account to handle future major renovations/repairs?

3.2 Connections

On the Bismarck side the ramp ends at River Road and does not connect to the existing trail system. The design should include a connection to the existing trail system along the river. Along the west bank the ramp ends in a ditch, this document should discuss the connections to the community and how that will occur. The estimate should include those costs as well.

4.4 Public Input - Please change the word "Officials" at the end of Bismarck Parks and Recreation District to representatives. This is more accurate wording.

Overall document comment:

Throughout this draft, multiple agencies are listed as possible responsible parties, sponsors/governance and potential funding sources. Prior to completing this document, it would be prudent to discuss these topics with these entities representatives prior to naming them in these categories. Knowing these organizations stance on these topics ahead of time may change the statement in section

4.5, Summary of Findings and Opinion of Feasibility.

Reference sections: 2.2, 4.2 and 4.3 4.5 Summary of Findings and Opinion of Feasibility Not knowing BNSF's requirements in 2.4 and 2.5 it seems premature to make a case for feasibility. Another question that should be asked of BNSF is, what does BNSF want from that entity in terms of cost and indemnification of future claims?

3) Bob Shannon (5.21.19)

The maps showing roads and trails should reflect the existing and planned trail system as a starting point, as shown by the Bismarck Mandan Metropolitan Planning Organizations bike/ped master plan (which is available on the City of Bismarck's website under Growth Mgmt).

As FORB is a non profit group, the proposed improvements should be identified as those improvements necessary to have a barebones functional trail on the repurposed bridge (with some connection to the nearest existing trails). Then any improvements that could be added later could be identified so that they would be implemented as additional funding/partnerships are identified.

The preliminary cost estimates included painting the bridge...is this necessary? The preliminary cost of bridge painting appeared low.

The preliminary cost estimates included 'cleaning' of the stone piers...has there been any thought that we should preserve the patina rather than spend a lot of money on something that isn't necessary?

The preliminary cost estimates included 500,000 cubic yards of embankment at \$1/c.y.Embankment borrow that is \$1/c.y. is typically moved a short distance within a road R/W by a scraper, not trucked to the site. The proposed new RR bridge is only using 200,000 c.y. of embankment, and all of it is to be trucked in borrow that creates huge logistics issues and high cost (\$15/c.y. or more). Captains Landing Township will not allow the borrow to be trucked over their roads, and there are no other access points to the west side of the bridge. The railroad has proposed a temporary access off of the I-194 northbound lanes, which the NDDOT will only accommodate during a construction project on I-194 this summer. That temporary access involves significant expense to just construct the access point...and it will be removed after 90 days, so the access will not be available for later construction. Without the access, the railroad was considering the use of barges to bring embankment and materials to the work site. The amount of estimated embankment needed should be split out as to which side of the river it is needed, and for what specific improvements.

The proposed typical section for the bridge include 8' wide exclusive bike lanes, a landscaped median and a separate pedestrian trail with fences/rails alongside. However, it appears this does not meet the AASHTO bicycle facility design guidelines and may not qualify for some federal aid programs. Trails typically have a 2'-3' shyway along either sides of trails...putting bicycles on a high structure with no shyway along an 8' wide trails seems like there may be inadequate space for the trail users. The landscaped median is nice but brings higher maintenance and construction costs, as well as questionable ability to water anything. Could this be reconsidered to provide a trail section that is cost efficient while also meeting the AASHTO design guide?



The City of Bismarck will limit its comments on the BNSF Rail Bridge Feasibility Study to subject matters that relate directly to the City of Bismarck's infrastructure, in particular, the Water Treatment Plant and related facilities in the vicinity of the BNSF rail bridge. The City of Bismarck does not manage/maintain/operate the existing multi-use trail facilities adjacent to the rail bridge. Therefore, the City of Bismarck does not have a position to take in regard to the feasibility of repurposing the bridge to a bicycle/pedestrian facility in concert with existing trail networks.

At this time, and based on the information contained in the draft report, the City of Bismarck will not be expending any funds toward the repurposing of the rail bridge for reasons stated previously. The Commission indicated that any official comments or discussion with the City will go through City Administration, who will bring the appropriate information to the City Commission to make any formal decisions.



APPENDIX E Preliminary Cost Estimates [Structures]

Date: 06/24/2019

OPINION OF PROBABLE COST FOR THE CONVERSION OF THE BNSF MISSOURI RIVER RAILROAD BRIDGE TO A PEDESTRIAN BRIDGE

MAINTENANCE		EXPECTED LIFE CYCLE	Unit	Qty	UNIT COST	Total	Annual Cost	
1.00	SUPERSTRUCTURE						\$12,750.00	
2.00	SUBSTRUCTURE						\$24,550.00	
3.00	RAILINGS/FENCING						\$5,400.00	
4.00	DECK/PATHS						\$7,800.00	
5.00	INSPECTION/OTHER						\$13,000.00	
							\$63,500.00	
CONSTRUCTION and DESIGN								
1.00	SUPERSTRUCTURE							<u>\$150,000.00</u>
	Patina Coating Truss Span	10	SF	20000	6	\$120,000.00	\$12,000.00	
	Spot Coat Truss Span	40	SF	5000	6	\$30,000.00	\$750.00	
2.00	SUBSTRUCTURE							<u>\$285,500.00</u>
	Clean masonry	15	SF	40000	3	\$120,000.00	\$8,000.00	
	Tuckpoint masonry joings	10	LF	10000	8	\$80,000.00	\$8,000.00	
	Crack injection	10	LF	1500	45	\$67,500.00	\$6,750.00	
	Crack sealing	10	LF	1500	12	\$18,000.00	\$1,800.00	
3.00	RAILINGS/FENCING							<u>\$457,600.00</u>
	Pedestrian Railings/Fencing		LF	3000	120	\$360,000.00		
	Saftey/security fencing along trail		LF	2800	30	\$84,000.00		
	Security bollards		EA	1200	8	\$9,600.00		
	Emergency call pole		EA	2000	2	\$4,000.00		
4.00	DECK/PATHS							<u>\$926,000.00</u>
	Overlook decking	50	SF	5000	25	\$125,000.00		
	Bituminous pavement	15	SF	25000	20	\$500,000.00		
	Repair/replace expansion joints	25	SY	6000	3.5	\$21,000.00		
	Accessible Trail Ramps	50	SF	14000	20	\$280,000.00		
5.00	EARTHWORK							<u>\$3,150,000.00</u>
	Grading/Fill		CY	2.25	500000	\$1,125,000.00		
	Wall, Foundation		LF	10000	100	\$1,000,000.00		
	Wall, Finish Material, Premium		SF	25000	35	\$875,000.00		
	Landscape Plantings		SF	30	5000	\$150,000.00		
6.00	ELECTRICAL/LIGHTING							<u>\$80,000.00</u>
	Pedestrian lighting		EA	1500	40	\$60,000.00		
	Electrical		LS	1	20000	\$20,000.00		
7.00	INSPECTION/MAINTENANCE						\$0.00	
	Underwater Inspection & Report	5	LS	1	20000	\$20,000.00	\$4,000.00	
	Fracture critical inspection and repo	4	LS	1	50000	\$50,000.00	\$12,500.00	
	Arm's length Masonry Inspection	10	LS	1	15000	\$15,000.00	\$1,500.00	
	Annual Inspection	1	LS	1	4000	\$4,000.00	\$4,000.00	
	Survey	10	LS	1	5000	\$5,000.00	\$500.00	<u>\$94,000.00</u>
Indirects	Design and Plan Peparation				8%			\$400,000.00
	Permitting, Agency, and Construction Services							\$200,000.00
							SUBTOTAL	\$5,743,100.00
							TOTAL *	\$6,891,720.00

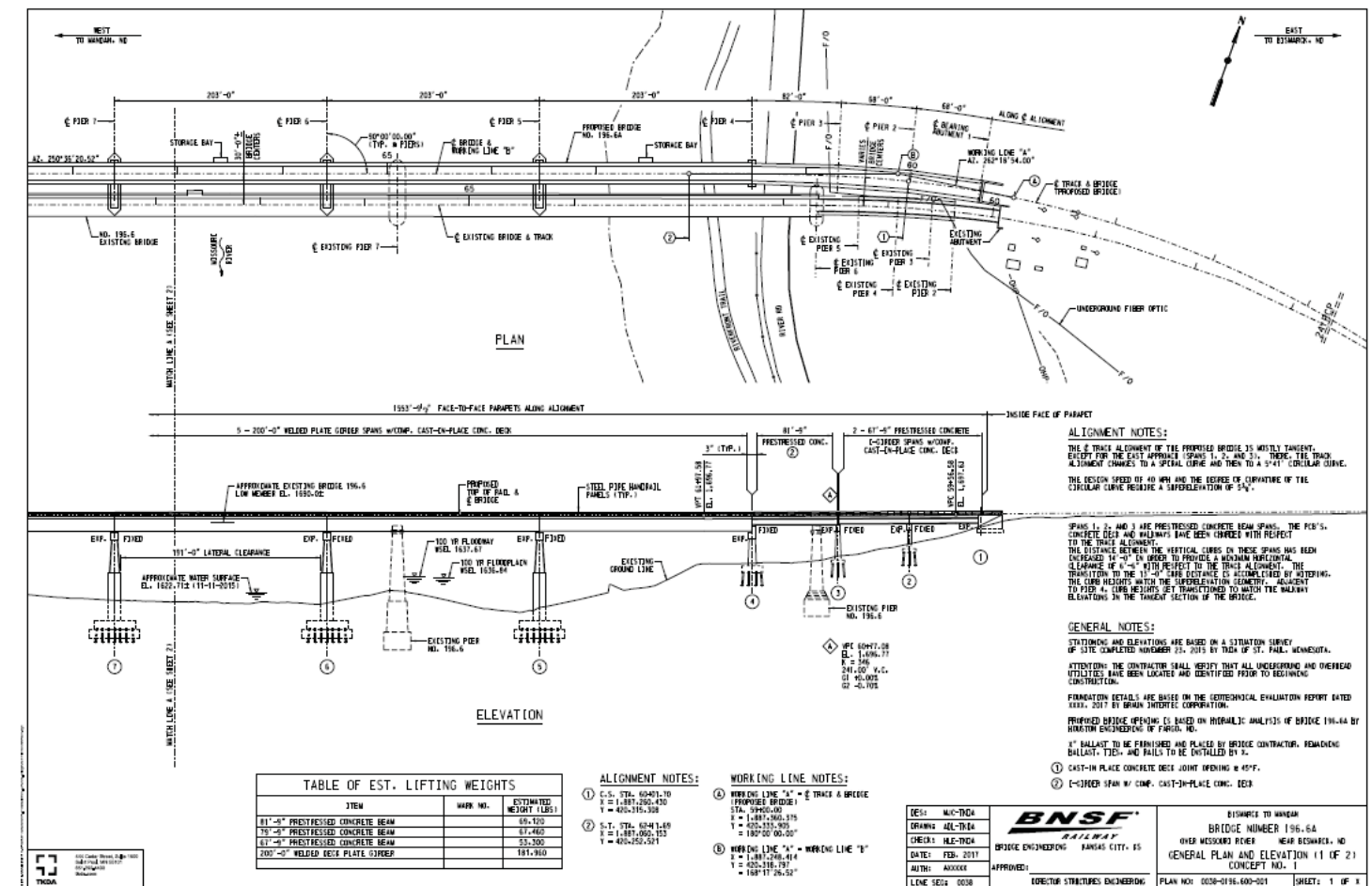
* with 20% contingencies

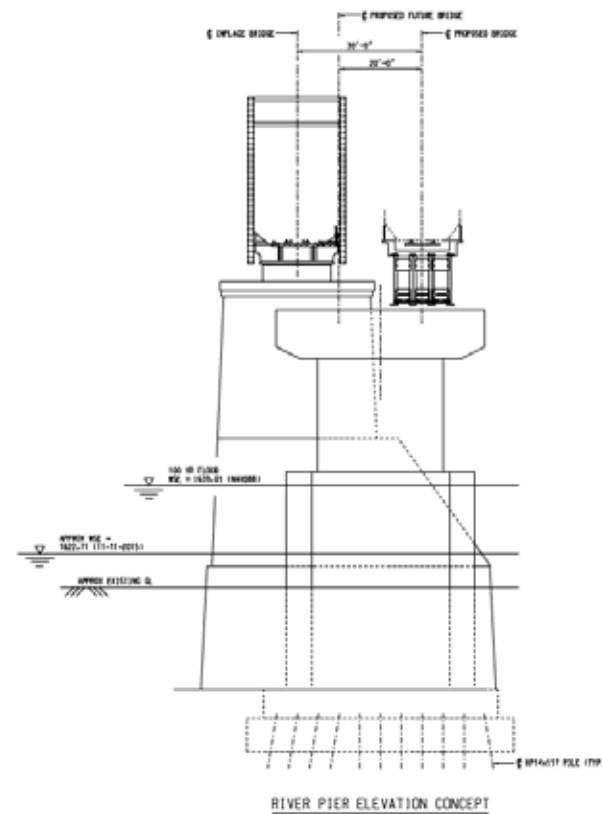
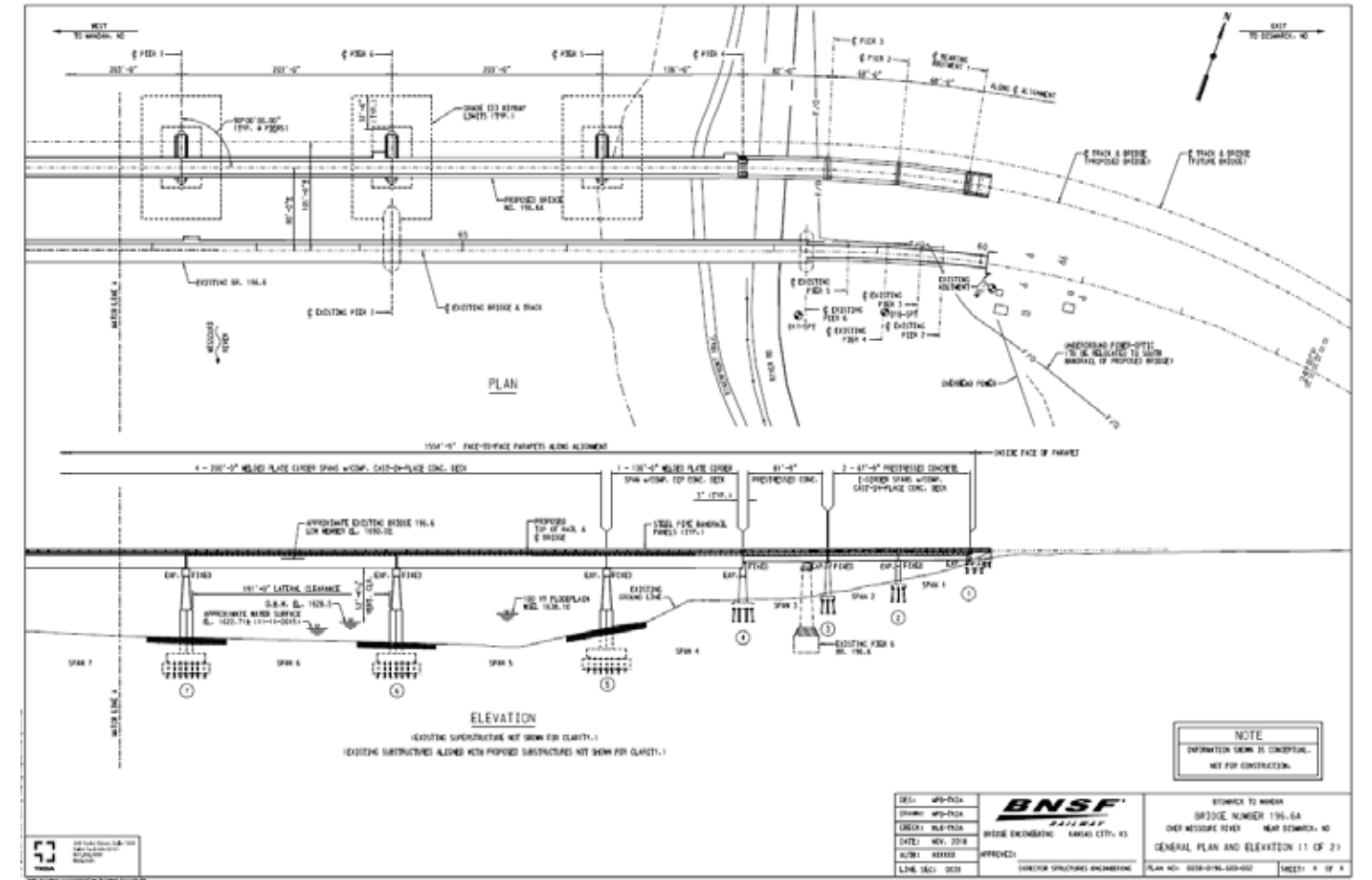
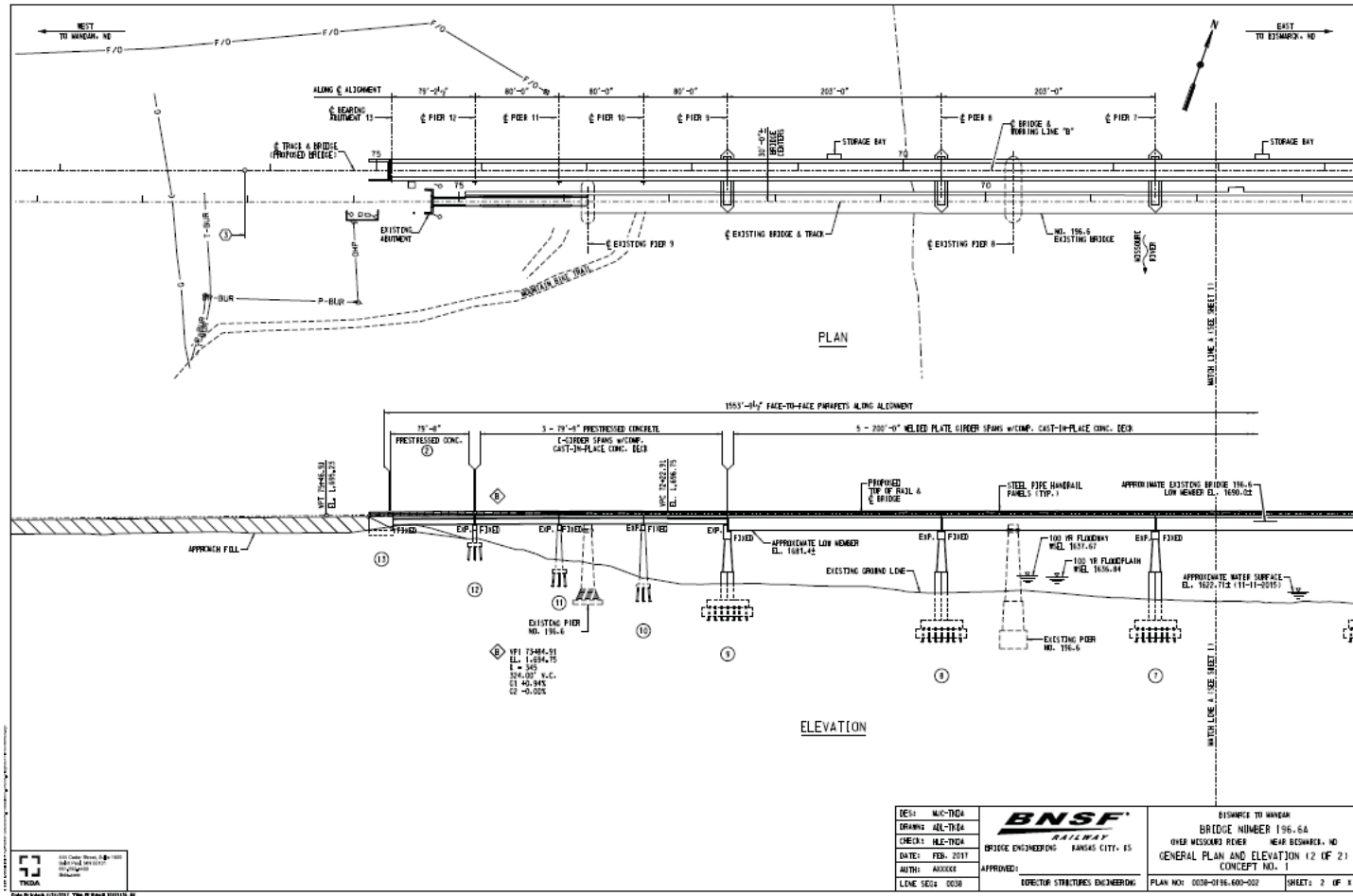
Bridge Replacement Concepts for BNSF's Missouri River Bridge

BNSF Preferred vs. Alternate Concept

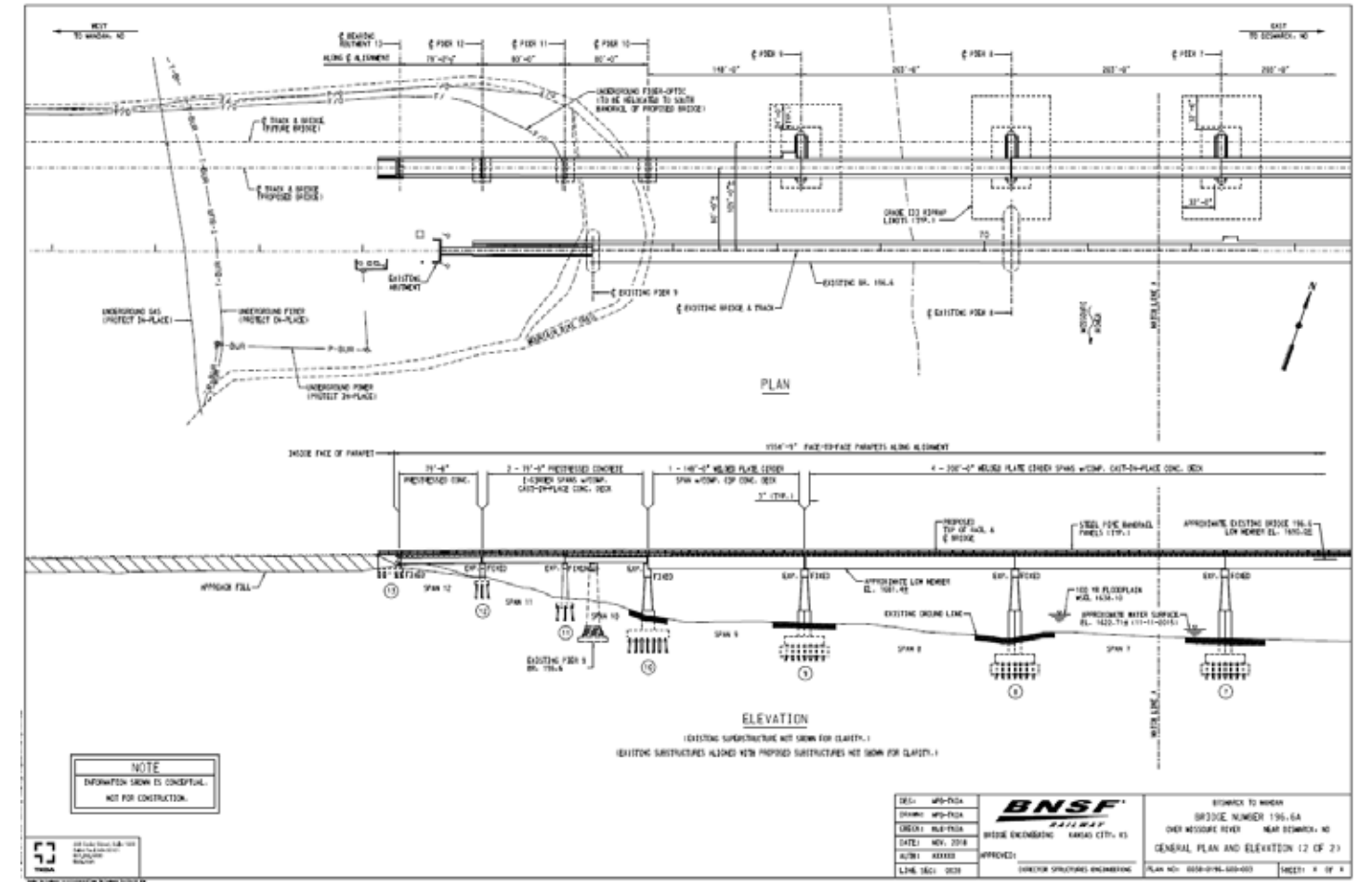
BNSF Preferred Design Concept

Replacement bridge with track offset 30ft upstream and future track on existing alignment



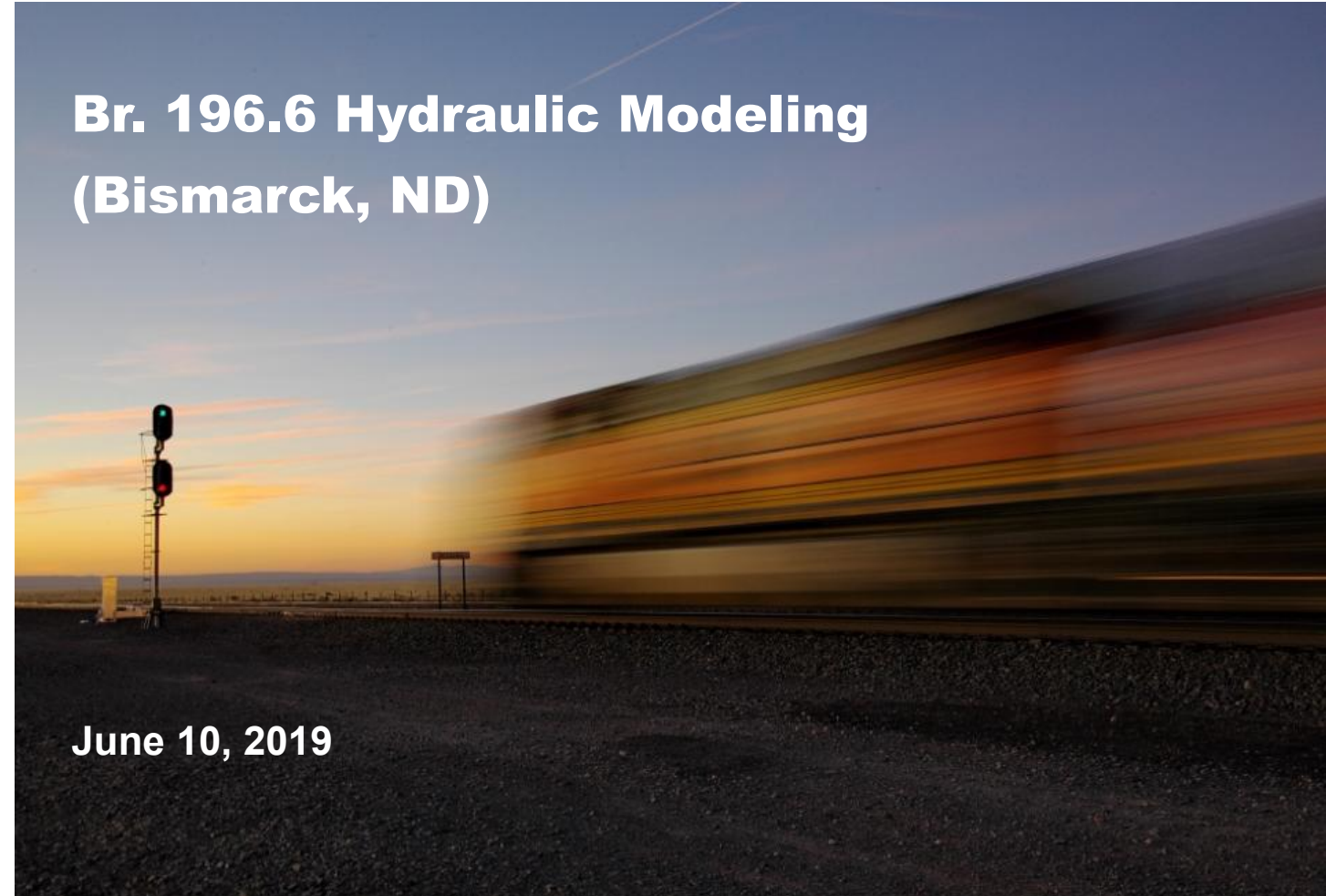
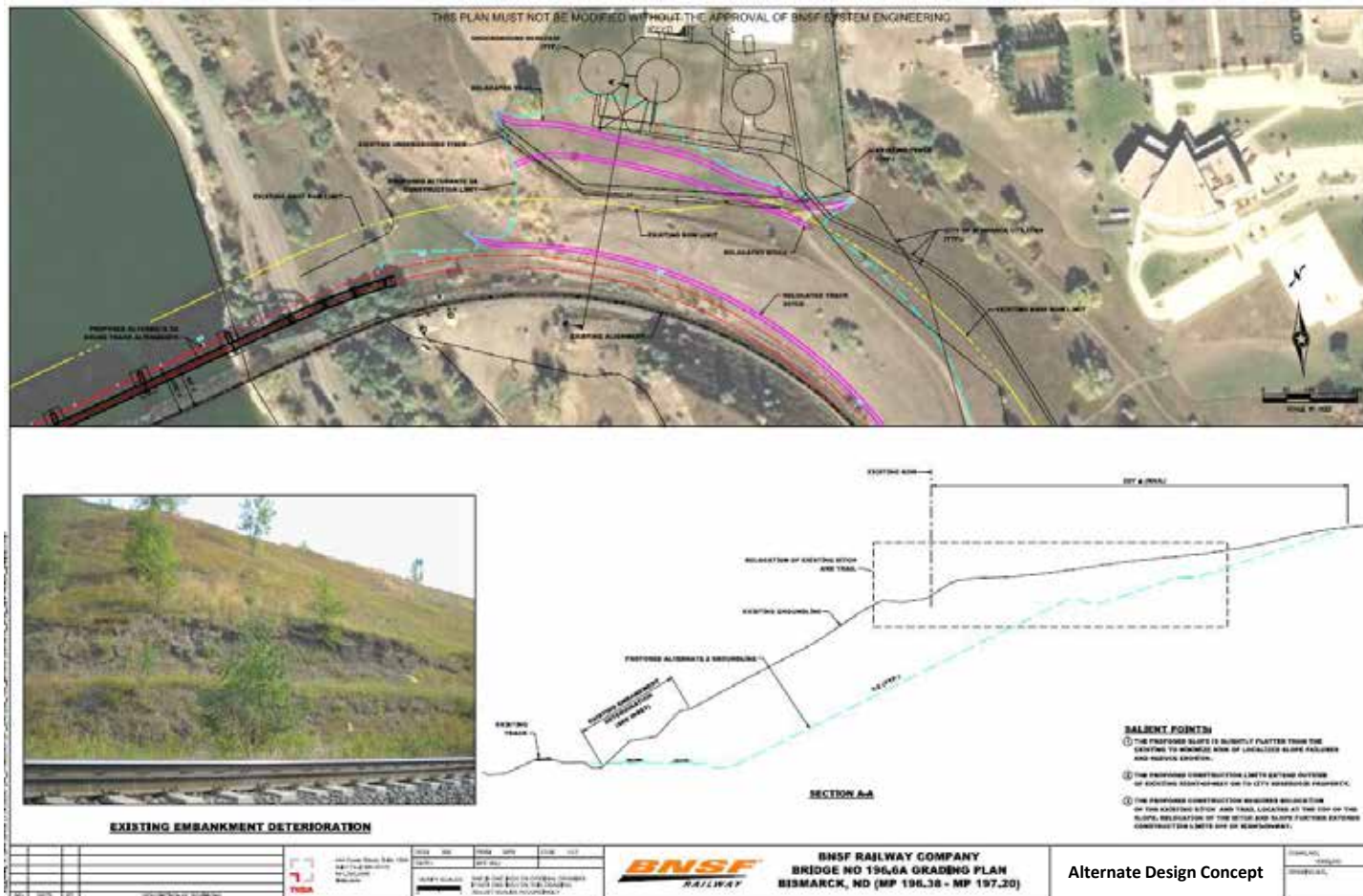
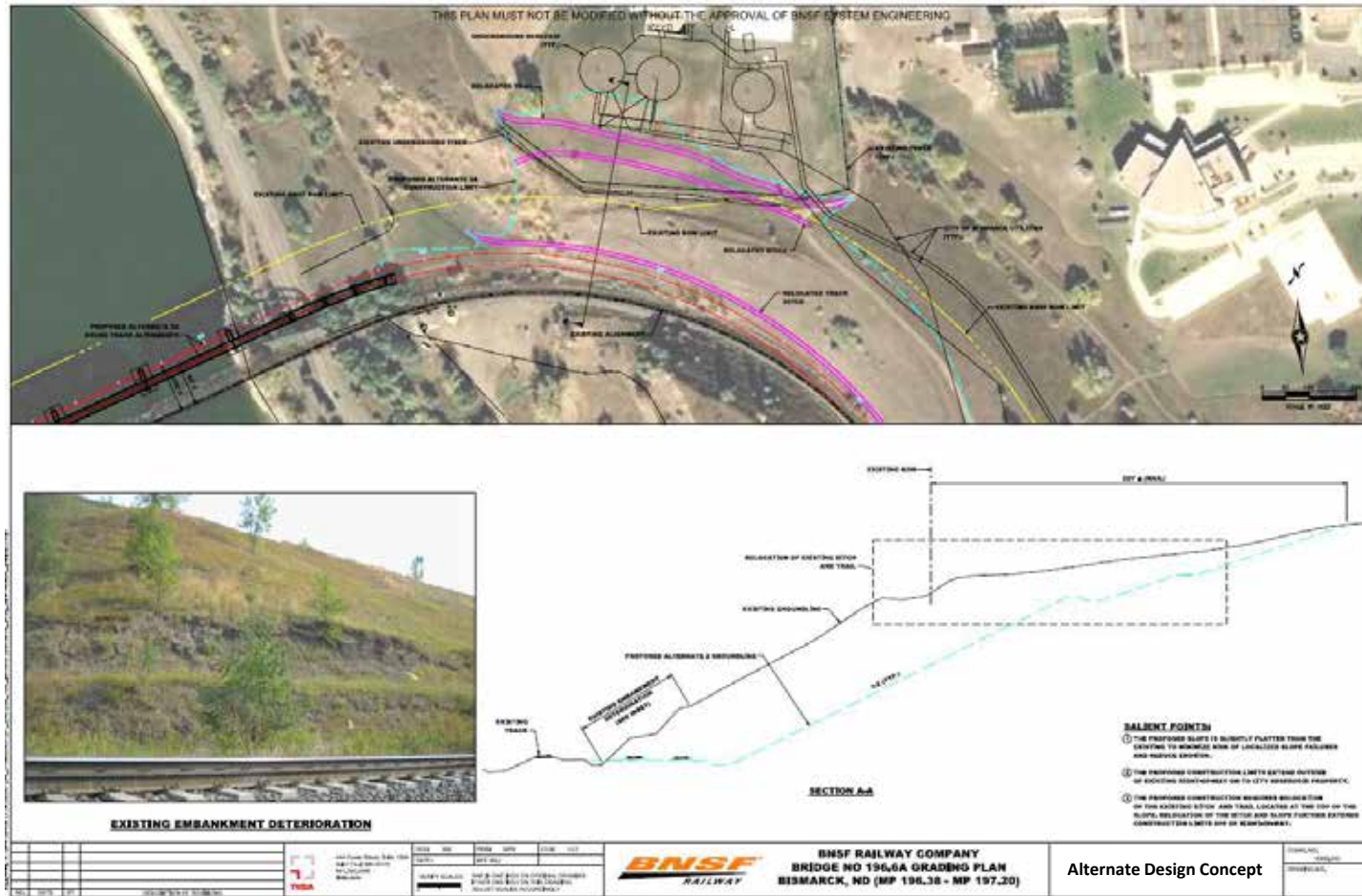


DESIGN: MFC/TCM		STATION TO WAGON
DRAWING: MFC/TCM		BRIDGE NUMBER 196-6A
CHECKED: MFC/TCM		OVER MISSOURI RIVER NEAR BETHANY, MO
DATE: NOV. 2017		RIVER SPAN PIER CONCEPT
APPROVED: [Signature]		
LINE SECT: 0038	DIRECTOR STRUCTURES ENGINEERING	PLAN NO: 0038-016-600-004 SHEET: 04 OF 04



Design Concept Comparison

1. Cost – Premium cost of \$25M-\$30M to construct alternate design concept
 - \$19.4M – Retaining wall along Missouri River Nature Preserve
 - \$5M – Grading
 - \$4.3M – Relocation of rail bridge over expressway
2. Risk – BNSF’s preferred design concept minimizes risk of soil movement
 - Excavation for existing bridge initiated chronic soil/bridge pier movement
 - Alternate concept requires significant excavation of embankment in NE quadrant
3. Schedule – Alternate design concept adds 2-3 years to project schedule
 - Design of added scope
 - Significant increase in scope of construction



Hydraulic Modeling Summary

- **Case A** - BNSF Preferred Design WITHOUT Existing Bridge - Tracks positioned on existing alignment and 30' north:
 - Yields a no-rise in base flood elevation.
 - No structures impacted by base flood.
- **Case B** – New bridge with tracks positioned 80' and 105' north of existing bridge WITH existing bridge, and every other new “wet” pier aligned with an existing pier:
 - Yields a base flood elevation rise of 0.02'.
 - Rise extends eight miles upstream and impacts approximately 500 structures.
- **Case C** - BNSF Preferred Design WITH Existing Bridge - Tracks positioned on existing alignment and 30' north of existing bridge, and all new piers offset from existing piers:
 - Yields a base flood elevation rise of 0.03'.
 - Rise extends ten miles upstream and impacts approximately 550 structures.

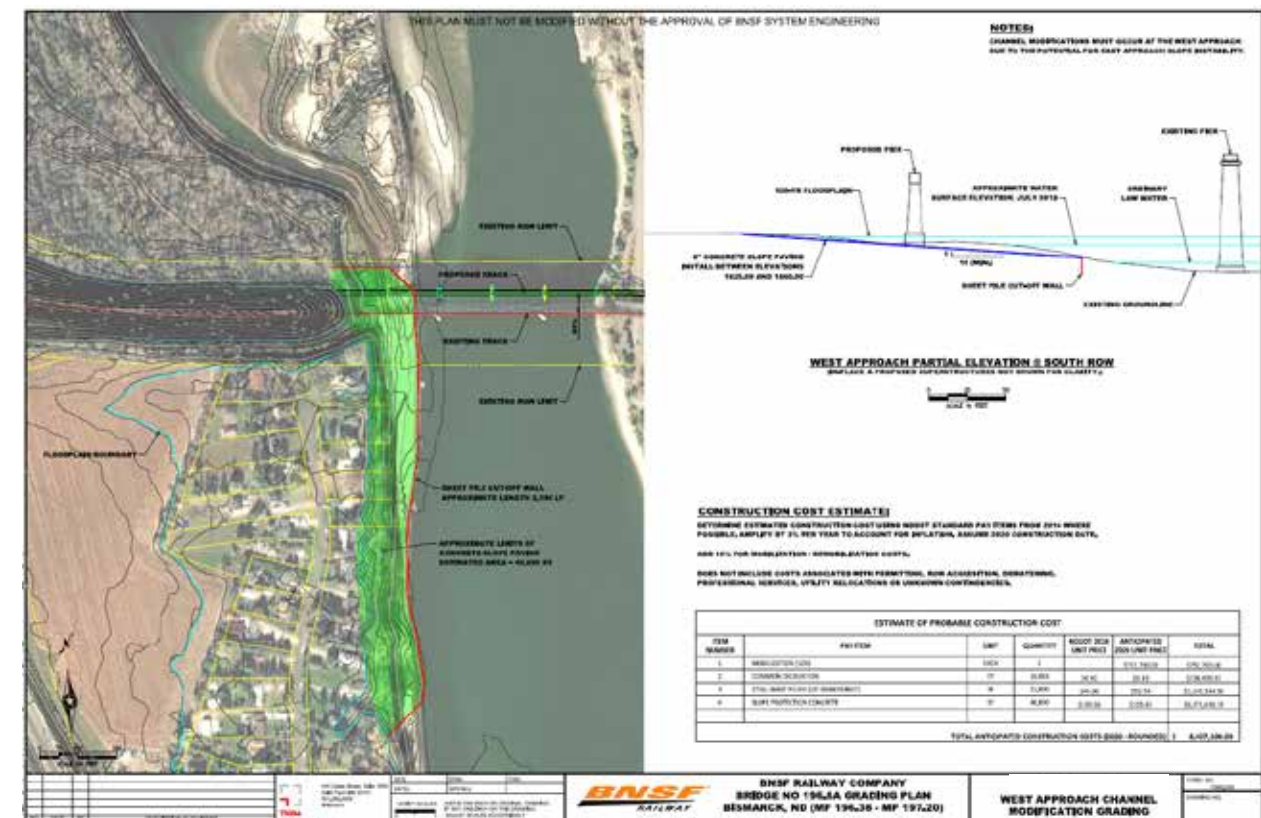
Cost and R/W Implications

- **Case A** - BNSF Preferred Design with no rise in base flood elevation:
 - Provides baseline cost for comparison to Cases B and C.
 - All work is within BNSF R/W.
- **Case B** - Base flood elevation rise of 0.02':
 - Requires a cost premium of \$32M compared to Case A:
 - \$23.7M to construct modified bridge design.
 - \$8.4M to achieve a no-rise base flood elevation rise. (See slide #4)
 - Requires significant work outside of BNSF R/W.
- **Case C** - Base flood elevation rise of 0.03':
 - Requires an added premium cost, in excess of the \$8.4M, to achieve a no-rise base flood elevation rise.
 - Work to achieve no-rise base flood extends further off BNSF R/W than required for Case B.



2

Case B Mitigation – Base Flood Elevation Rise 0.02'





May 30, 2019

Discover America's 11 Most Endangered Historic Places for 2019

More: 11 Most Endangered Historic Places | By: National Trust for Historic Preservation

SHARE (Facebook, Twitter, Email)

Each year, [America's 11 Most Endangered Historic Places](#) sheds light on important examples of our nation's heritage that are at risk of destruction or irreparable damage. Over 300 places have been listed in its 32-year history, and in that time, fewer than 5 percent of listed sites have been lost.

The 2019 list includes a diverse mix of historic places across America that face a range of challenges and threats, from climate change to inappropriate development to neglect and disuse.

Find out what you can do to support these irreplaceable sites through the list below.



Mike Renner

Bismarck-Mandan Rail Bridge

Bismarck, North Dakota

ADD YOUR NAME

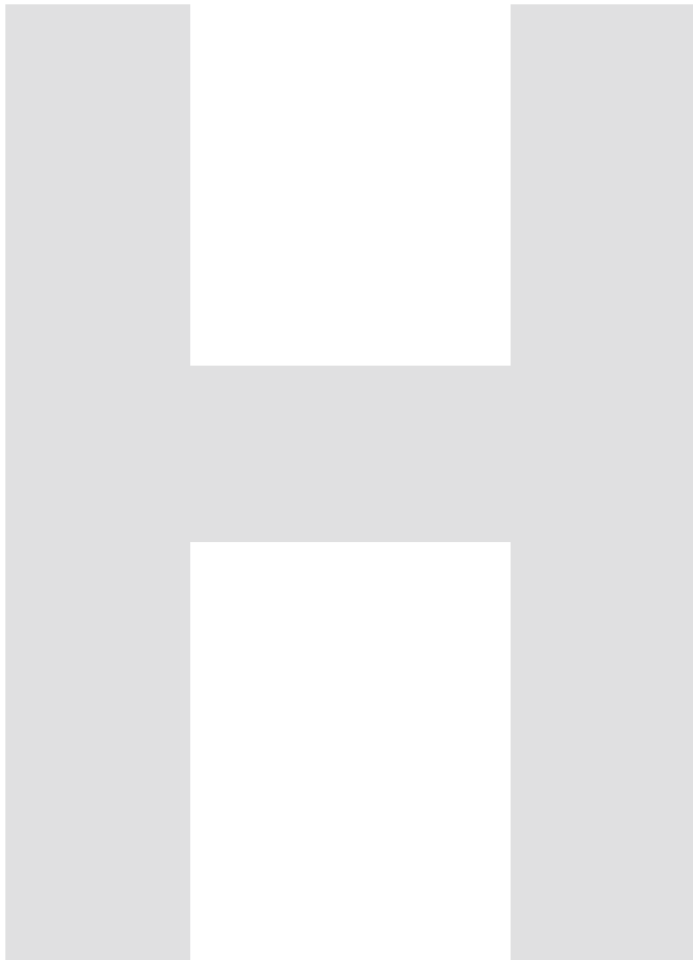
The Bismarck-Mandan Rail Bridge connects Bismarck and Mandan, North Dakota. Constructed in 1883, it was the first rail bridge built across the upper Missouri River. The iconic bridge has been recognized as an International Site of Conscience for the role it played in opening the western United States to white settlement—and the resulting profound impacts to Native American communities—but it has been proposed for demolition by railway company BNSF.

The Coast Guard is in consultation with BNSF and other parties under Section 106 of the National Historic Preservation Act. The Coast Guard has proposed a conditional permit that would require BNSF to retain the historic bridge until after an adjacent new bridge is constructed, in order to allow time to identify a preservation solution for the Bismarck-Mandan Rail Bridge. [Tell the Coast Guard not to allow demolition of this iconic bridge.](#)



National Trust for Historic Preservation
Save the past. Enrich the future.™

APPENDIX H Public Input



When we see the Brooklyn Bridge or the Golden Gate Bridge we recognize them for their place in history, as wonders of technology, as icons of a place - a time past and present. When we look at this Rail Bridge, **in our own backyard**- it is as nationally and regionally significant for what it represents. The 60 miles of the Missouri River around Bismarck-Mandan, between the Garrison and Oahe dams, is host to a National Heritage Area, national historic sites, numerous state historic sites and parks, and recreational trails. The Rail Bridge is an integral piece to the history and experience of this region.

Spanning the Missouri River in 1883 this bridge was completed the same year as the Brooklyn Bridge. No one would think of tearing down that bridge.

When traveling- visitors want to experience the icons of a special place - in Paris, for many visitors, it is the iconic Eiffel Tower. I feel that the Rail Bridge is our Eiffel Tower- immediately recognizable and representative of a special place. BTW- this bridge is 6 years older than the Eiffel Tower. (built in 1889)

In an age of all most everything being disposable, our grandparents and great grandparents who lived through the Depression and our children today recognize the value of recycling or repurposing what we have. This bridge should not be thought of as disposable.

We must respect the past, repurpose in the present and build for the future-

A new bridge is welcome, but we should also recognize the value of and potential for the Rail Bridge in the decades to come.

The Rail Bridge, for Bismarck-Mandan, North Dakota and the Missouri River, is part of our heritage. This Place Matters!



Commander
Eighth Coast Guard District

1222 Spruce Street
St. Louis, MO 63103-2832
Staff Symbol: dwb
Phone: (314) 269-2378
Email: Eric.Washburn@uscg.mil

April 17, 2019

PUBLIC NOTICE D8 DWB-887

All interested parties are notified that an application dated April 19, 2019, has been received from the Burlington Northern Santa Fe Railway Company by the Commander, Eighth Coast Guard District, for approval of location and plans for the construction of a fixed railroad bridge over a navigable waterway of the United States.

WATERWAY AND LOCATION: Missouri River, Mile 336.2, at Sibley, between Jackson and Ray Counties, Missouri.

CHARACTER OF WORK: Construct a new fixed railroad bridge adjacent to and immediately downstream from the existing railroad bridge.

MINIMUM NAVIGATIONAL CLEARANCES:

<u>Existing</u>	<u>Proposed</u>
Horizontal: 383.0 feet at channel margins measured normal to flow of river	Horizontal: 375.0 feet at channel margins measured normal to flow of river
Vertical: 88.5 feet above zero on Napoleon W.B. gage at mile 328.6	Vertical: 89.1 feet above zero on Napoleon W.B. gage at mile 328.6

ENVIRONMENTAL CONSIDERATIONS:

The Coast Guard, the lead federal agency, has made a tentative determination that the companion bridge is categorical exclusion for the purposes of the National Environmental Policy Act (NEPA) because it satisfies criteria for such actions listed in the Coast Guard's NEPA Implementing Instructions. The applicant performed a Cultural Resources Survey for the proposed bridge project during the environmental review process.

The applicant determined that the proposed project will have no adverse impacts to cultural resources listed or eligible for listing in the National Register of Historic Places, or otherwise of archaeological, historical, or architectural significance. The Missouri State Historic Preservation Office (MoSHPO) concurred with this determination on August 22, 2017 and subsequently on December 14, 2018. The bridge is located in the base floodplain. The 100-year flood elevation is 714.4 feet m.s.l., while elevation of the low steel of the navigation span is 771.78, elevations are referenced to NAVD88 datum. No excavated material nor permanent fill material will be placed below the 100-year flood elevation. Approximately 0.26 acres of permanent wetlands will be impacted by the project and 0.86 acres of temporary wetlands will be impacted. These wetlands will be mitigated at Clear Fork Mitigation Bank. Water Quality Certifications (WQC) pursuant to Section 401 of the Clean Water Act have been applied for from the State of Missouri, Department of Natural Resources. The project will have no impacts on historic properties, threatened or endangered species,

residential and business properties, minority and low-income populations, or adversely impact Environment Justice.

The Coast Guard has made the determination that the proposed project will not pose a risk to Federally-listed threatened and endangered species. The applicant, as the Coast Guard's designated Federal representative, coordinated with the U.S. Fish and Wildlife Service (USFWS), which concurred on October 11, 2017, that "[t]his project is not likely to adversely affect any species under the Endangered Species Act, as amended."

The environmental document is available for review at the office of the Commander (dwb), Eighth Coast Guard District, Bridge Branch, Room 2.102D, 1222 Spruce Street, St. Louis, Missouri 63103-2832, Monday through Friday, 8:00 a.m. to 4:00 p.m., except Federal holidays.

SOLICITATION OF COMMENTS:

Interested parties are requested to express their views, in writing, on the proposed bridge. Give sufficient details to establish a clear understanding of the reasons for support or opposition to the proposal. Comments will be received for the record at the office of the Commander (dwb), Eighth Coast Guard District Bridge Branch, Room 2.102D, 1222 Spruce Street, St. Louis, Missouri 63103-2832 through May 20, 2019. Any comments received will be made part of the case record.

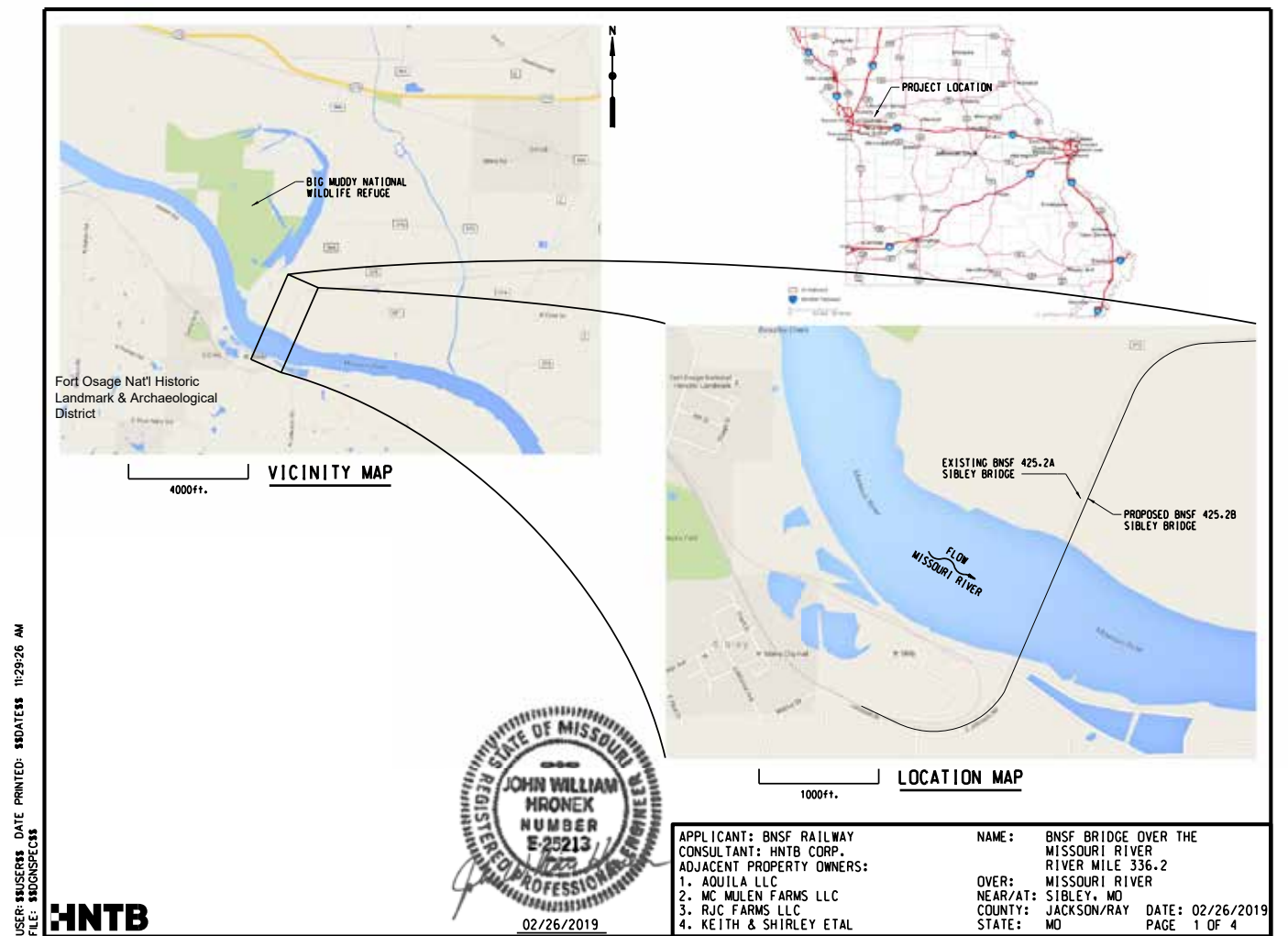
Location map and plans are attached.

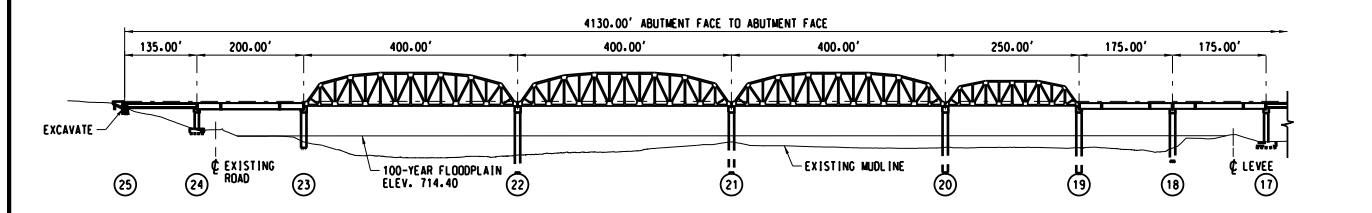
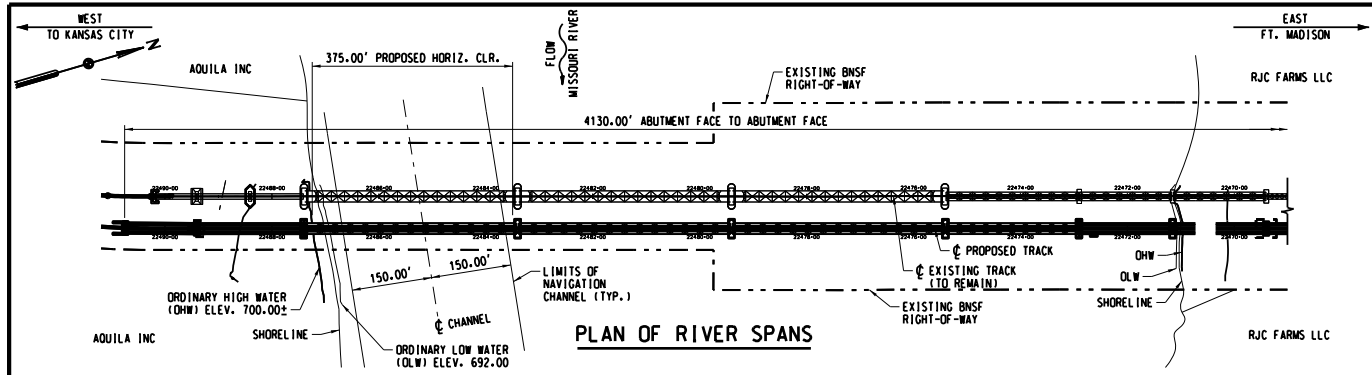
//s//
ERIC A. WASHBURN
Bridge Administrator, Western Rivers
By direction of the District Commander

NOTE: The mailing list for this Public Notice is arranged by watershed. Due to the size of this list, selective mailing is not practical. Please discard notices that are not of interest to you. If you have no need for any of these notices, please advise us so that your name can be removed from the mailing list.

POSTMASTER: Official business. Please post.

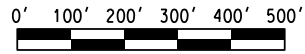
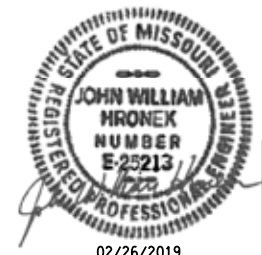
"This is a web-searchable copy and is not the official, signed version; however, other than the signature being omitted, it is a duplicate of the official version."





NOTE:
NO EXCAVATED MATERIAL NOR PERMANENT FILL MATERIAL WILL BE PLACED BELOW THE 100-YEAR FLOOD CONTOURS.

NOTES:
1. EXISTING BRIDGE TO REMAIN IN PLACE.
2. SINGLE TRACK RAILROAD BRIDGE.
3. DIMENSIONS SHOWN ARE IN FEET.
4. SURVEY DATUM:
HORIZONTAL: NAD83 STATE PLANE MO WEST
VERTICAL: NAVD83



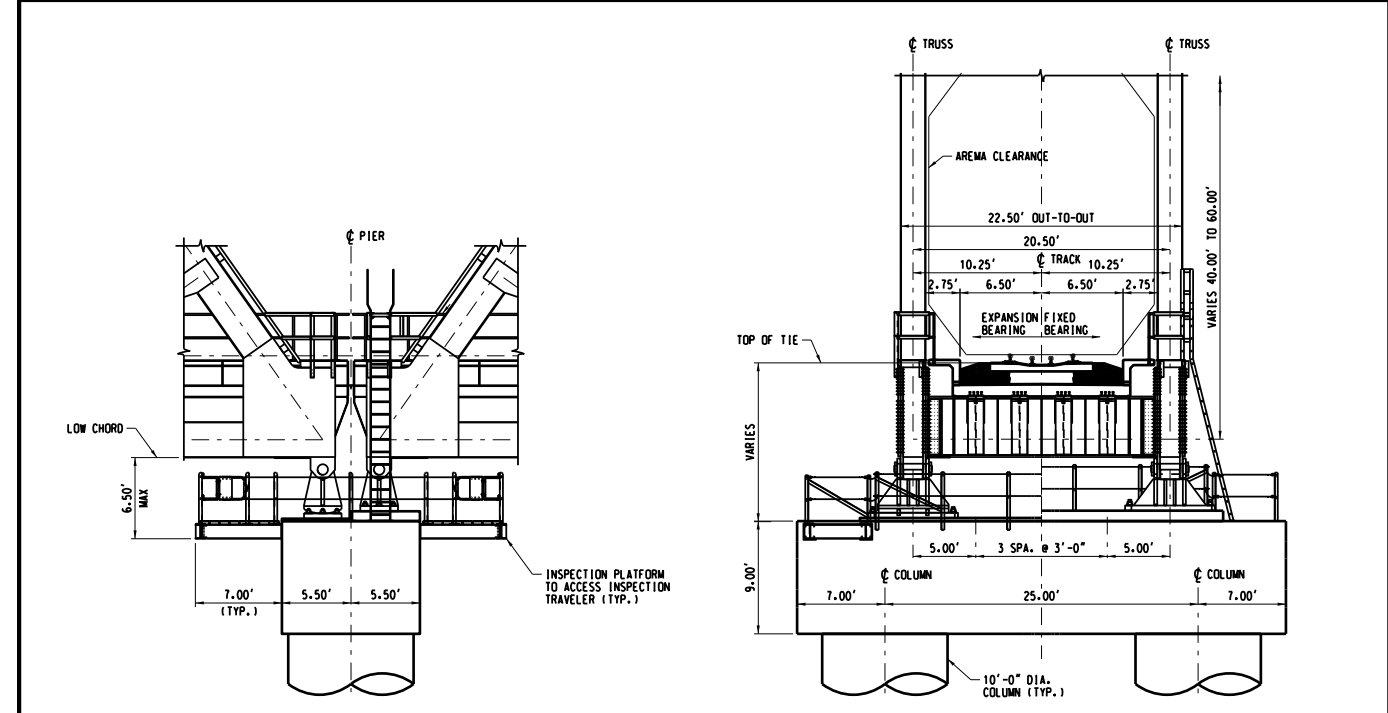
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CONSULTANT: HNTB CORP.
ADJACENT PROPERTY OWNERS:
1. AQUILA LLC
2. MC MULLEN FARMS LLC
3. RJC FARMS LLC
4. KEITH & SHIRLEY ETAL

NAME: BNSF BRIDGE OVER THE MISSOURI RIVER
RIVER MILE 336.2
OVER: MISSOURI RIVER
NEAR/AT: SIBLEY, MO
COUNTY: JACKSON/RAY
STATE: MO

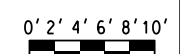
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PAGE 2 OF 4

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HNTB



NOTES:
1. DIMENSIONS SHOWN ARE IN FEET.



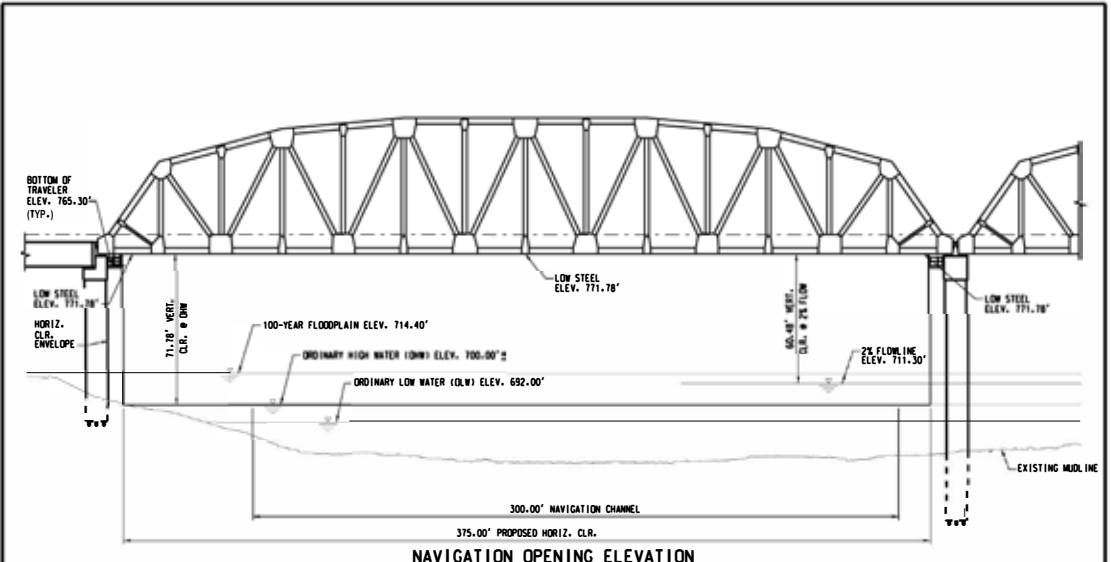
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CONSULTANT: HNTB CORP.
ADJACENT PROPERTY OWNERS:
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RIVER MILE 336.2
OVER: MISSOURI RIVER
NEAR/AT: SIBLEY, MO
COUNTY: JACKSON/RAY
STATE: MO

DATE: 02/26/2019
PAGE 4 OF 4

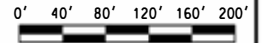
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NOTE:
NO EXCAVATED MATERIAL NOR PERMANENT FILL MATERIAL WILL BE PLACED BELOW THE 100-YEAR FLOOD CONTOURS.

NOTES:
1. EXISTING BRIDGE TO REMAIN IN PLACE.
2. SINGLE TRACK RAILROAD BRIDGE.
3. DIMENSIONS SHOWN ARE IN FEET.
4. SURVEY DATUM:
HORIZONTAL: NAD83 STATE PLANE MO WEST
VERTICAL: NAVD83
5. TRAVELER SYSTEM TO BE STORED ADJACENT TO PIER WHEN NOT IN USE.



APPLICANT: BNSF RAILWAY
CONSULTANT: HNTB CORP.
ADJACENT PROPERTY OWNERS:
1. AQUILA LLC
2. MC MULLEN FARMS LLC
3. RJC FARMS LLC
4. KEITH & SHIRLEY ETAL

NAME: BNSF BRIDGE OVER THE MISSOURI RIVER
RIVER MILE 336.2
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NEAR/AT: SIBLEY, MO
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DATE: 02/26/2019
PAGE 3 OF 4

USER: BUSER88 DATE PRINTED: 02/26/2019 11:30:10 AM FILE: 800NSPEC38

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