

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION 8

2016 SEP 13 AM 9:14

FILED
EPA REGION VIII
HEARING CI FRK

IN THE MATTER OF)

Roger Lothspeich)
2323 South Haynes Avenue)
Miles City, Montana 59301)

Respondent.)
_____)

ADMINISTRATIVE ORDER
ON CONSENT

Docket No. **CWA-08-2016-0016**

I. INTRODUCTION

1. This Administrative Order on Consent (Consent Order) is entered into voluntarily by the United States Environmental Protection Agency (EPA) and Roger Lothspeich (Respondent). This Consent Order concerns riverbank restoration and mitigation for environmental damage caused by alleged illegal discharges of dredged or fill material to waters of the United States in the southwest quarter of Section 6, Township 6 North, Range 45 East, Custer County, Montana (the Site).

II. STATUTORY AUTHORITY

2. This Consent Order is issued under section 309(a) of the Clean Water Act (CWA), 33 U.S.C. § 1319(a). The authority to issue this Consent Order has been properly delegated to the Assistant Regional Administrator of the Office of Enforcement, Compliance and Environmental Justice, EPA Region 8. This Consent Order is based on the following findings of violation of section 301(a) of the CWA, 33 U.S.C. § 1311(a), which, among other things, prohibits the discharge of pollutants into waters of the United States except as in compliance with section 404 of the CWA, 33 U.S.C. § 1344.

III. PARTIES BOUND

3. This Consent Order shall apply to and be binding upon the EPA and upon Respondent and Respondent's agents, successors and assigns. Each signatory to this Consent Order certifies that he or she is authorized to execute and legally bind the party he or she represents to this Consent Order.

No change in ownership of the Site shall alter Respondent's responsibilities under this Consent Order unless the EPA, Respondent and the transferee agree in writing to allow the transferee to assume such responsibilities. Additionally, no later than thirty (30) calendar days prior to such transfer, Respondent shall notify the EPA at the address specified in paragraph 42, below.

IV. STATEMENT OF THE PARTIES

4. The following FINDINGS OF FACT AND OF VIOLATION are made solely by the EPA. In signing this Consent Order, Respondent neither admits nor denies the FINDINGS OF FACT AND OF VIOLATION. As such, and without any admission of liability, Respondent consents to the issuance of this Consent Order and agrees to abide by all of its conditions. Respondent waives any and all remedies, claims for relief and otherwise available rights to judicial or administrative review that Respondent may have with respect to any issue of fact or law set forth in this Consent Order, including any right of judicial review under the Administrative Procedure Act, 5 U.S.C. §§ 701-706. Respondent further agrees not to challenge the jurisdiction of the EPA or the FINDINGS OF FACT AND OF VIOLATION below in any proceeding to enforce this Consent Order or in any action under this Consent Order.

V. FINDINGS OF FACT AND OF VIOLATION

5. Respondent is an individual with a mailing address of 2323 South Haynes Avenue, Miles City, Montana 59301.

6. At all relevant times, Respondent owned, managed, operated on and/or otherwise controlled property adjacent to the Yellowstone River at the Site.

7. The Yellowstone River is a navigable, interstate waterway.

8. On or around November 7, 2014, Respondent or persons acting on Respondent's behalf submitted a permit application to the U.S. Army Corps of Engineers (Corps) for placement of up to 500 linear feet of riprap revetment along the south bank of the Yellowstone River that would tie into an existing revetment previously authorized for the Burlington Northern Santa Fe Railway Company.

9. The Corps determined that an individual permit was necessary, rather than a nationwide permit (NWP), due to cumulative impacts from Respondent's prior work done in 2012 and 2014 a short distance upstream of the proposed revetment. On February 2, 2015, the Corps issued a public notice for the work as proposed in the permit application. The public notice was due to expire February 26, 2015.

10. On or prior to February 19, 2015, Respondent's consultant noticed an excavator working on Respondent's property and called Respondent to instruct him to stop the work.

11. On February 23, 2015, Respondent and Respondent's consultant notified the Corps that unauthorized work had occurred at the Site. The work was performed prior to the expiration of the public notice and any permit issuance.

12. On February 23, 2015, after learning that unauthorized work had occurred at the Site, the Corps issued a notice of violation and cease and desist letter to Respondent.

13. On February 24, 2015, the Corps conducted a site visit with Respondent and Respondent's consultant. The Corps noted that an excavator was on site and a large portion of work had been completed. The Corps also noted that the work had been conducted in an area other than that identified in Respondent's permit application described in paragraph 8, above. The Corps observed that the 15-foot high, dirt bank had been pushed into the river channel to create a 2.5:1 bank slope and a 10-foot wide bench at the base of the bank. The Corps further observed that rock had then been placed along approximately 635 linear feet of bank below the ordinary high water mark.

14. During the February 24, 2015, site visit, the Corps hand-delivered to Respondent the notice of violation and cease and desist letter referenced in paragraph 12, above, which ordered Respondent to cease and desist any activity related to the placement of unauthorized dredged or fill material into the Yellowstone River and any other waters of the United States. The letter also encouraged Respondent to provide a written response to the Corps explaining the details of the unauthorized work. In addition, the letter explained that, due to the unauthorized work, processing of

Respondent's permit application, described in paragraph 8, above, for similar bank stabilization work nearby on the Yellowstone River had been suspended.

15. On March 6, 2015, Respondent's consultant responded in writing to the Corps' February 23, 2015, notification of violation and cease and desist letter on behalf of Respondent. The response letter indicated 952 cubic yards of rock had been placed along 635 linear feet of stream and a 10-foot wide soil bench had been constructed at the base of the rock. The letter noted that the work began on January 2, 2015, and ended on February 19, 2015. The letter also noted that the work was performed approximately 500 feet upstream from the location identified in the permit application described in paragraph 8, above.

16. In the March 6, 2015, letter, Respondent's consultant suggested that a portion of the construction activities described in paragraphs 13 and 15, above, may have been authorized by a July 18, 2014, permit issued by the Corps to Respondent for 230 feet of riprap at the Site. However, because the construction activities were not done in accordance with the methods and specifications noted in the application for the July 18, 2014, permit, no portion of the construction activities that are the subject of this Consent Order was authorized by the prior permit.

17. The construction activities described in paragraphs 13 and 15, above, resulted in discharges of dredged and fill material within and along 635 linear feet of the Yellowstone River, increasing the potential for erosion and sedimentation within the river. The Yellowstone River provides numerous functions and values including aquatic and wildlife habitat, runoff conveyance, groundwater recharge, recreation, and aesthetics.

18. The construction activities described in paragraphs 13 and 15, above, were performed using common earthmoving vehicles and equipment.

19. Respondent is a "person" as defined in section 502(5) of the CWA; 33 U.S.C. § 1362(5).

20. The material discharged at the Site and described in paragraphs 13 and 15, above, is and was at all relevant times "dredged material" or "fill material" as defined in 33 C.F.R. § 323.2(c) or

33 C.F.R. § 323.2(e), respectively, and “pollutants” as defined in section 502(6) of the CWA, 33 U.S.C. § 1362(6).

21. The vehicles and equipment described in paragraphs 10, 13 and 18, above, are and were at all relevant times each a “point source” as defined in section 502(14) of the CWA, 33 U.S.C. § 1362(14).

22. The Yellowstone River referenced in paragraphs 6 – 8, 14 and 17, above, is and was at all relevant times “waters of the United States” as defined in 33 C.F.R. § 328.3(a) and therefore “navigable waters” as defined in section 502(7) of the CWA, 33 U.S.C. § 1362(7).

23. The placement of dredged or fill material into the Yellowstone River constitutes the “discharge of pollutants” as defined in section 502(12) of the CWA, 33 U.S.C. § 1362(12).

24. Section 301(a) of the CWA, 33 U.S.C. § 1311(a), prohibits, among other things, the discharge of pollutants by any person into waters of the United States except as in compliance with section 404 of the CWA, 33 U.S.C. § 1344(a).

25. Section 404 of the CWA, 33 U.S.C. § 1344, sets forth a permitting system authorizing the Secretary of the Army, acting through the Chief of Engineers of the Corps, to issue permits for the discharge of dredged or fill material into navigable waters, which are defined as waters of the United States.

26. According to 33 C.F.R. § 323.3(a), a permit issued by the Corps is required for the discharge of dredged or fill material into waters of the United States unless an exemption pursuant to 33 C.F.R. § 323.4 applies.

27. Respondent had prior knowledge of the CWA Section 404 permitting program as demonstrated by the submittal of permit applications and receipt of permit authorizations described in paragraphs 28 – 31, below.

28. On May 9, 2011, the Corps issued a NWP authorization to Respondent for 100 linear feet of shoreline stabilization on Fort Peck Lake in Montana.

29. On January 7, 2013, the Corps issued an after-the-fact (ATF) NWP authorization to Respondent after Respondent completed an ATF permit application for unauthorized placement of rock on an existing jetty at the Site. The authorization included the following statement: **“This letter also notifies Vision Enterprises, LLC, and Roger Lothspeich, that any future work in jurisdictional waters without the proper DA permits may be referred to the Department of Justice or the Environmental Protection Agency for applicable enforcement action.”**

30. On July 18, 2014, the Corps issued a NWP authorization to Respondent after Respondent’s contractor completed a permit application on Respondent’s behalf to install rock riprap in order to protect the existing jetty and additional property at the Site.

31. As described in paragraph 8, above, on or around November 7, 2014, Respondent or persons acting on Respondent’s behalf submitted a permit application to the Corps for placement of up to 500 linear feet of riprap revetment at the Site.

32. Respondent is not and never has been authorized by a permit issued pursuant to section 404 of the CWA, 33 U.S.C. § 1344, to conduct any of the activities described in paragraphs 13 and 15, above.

33. The activities conducted by Respondent and/or by persons acting on Respondent’s behalf as described in paragraphs 13 and 15, above, violate section 301(a) of the CWA, 33 U.S.C. § 1311(a). Each discharge of pollutants from a point source by Respondent into waters of the United States without the required permits issued pursuant to section 404 of the CWA, 33 U.S.C. § 1344, constitutes a violation of section 301(a) of the CWA, 33 U.S.C. § 1311(a). Each day the discharges remain in place without the required permits constitutes an additional day of violation of section 301(a) of the CWA, 33 U.S.C. § 1311(a).

34. Activities to be carried out under this Consent Order are remedial, not punitive, and are necessary to achieve the CWA’s objective “to restore and maintain the chemical, physical, and

biological integrity of the Nation's waters," as specified in section 101(a) of the CWA, 33 U.S.C. § 1251(a). Restoration and mitigation are appropriate to address the actual and potential harm to water quality, aquatic habitat and wildlife habitat, as well as other functions and values, caused by Respondent's unpermitted activities.

35. This Consent Order was issued after consultation and coordination with the Corps' Omaha District, Helena Regulatory Office.

VI. ORDER FOR COMPLIANCE

Based upon the foregoing FINDINGS OF FACT AND OF VIOLATION and pursuant to the authority vested in the Administrator of the EPA pursuant to section 309(a) of the CWA, 33 U.S.C. § 1319(a), as properly delegated to the Assistant Regional Administrator of the Office of Enforcement, Compliance and Environmental Justice, EPA Region 8, it is hereby ORDERED:

36. Respondent shall immediately terminate all unauthorized discharges of dredged or fill material, now and in the future, into waters of the United States, unless specifically authorized by the Corps under a valid permit issued pursuant to section 404 of the CWA, 33 U.S.C. § 1344. This prohibition includes all mechanical land clearing, dredging, filling, grading, leveling, installation of utilities, construction and any other activities that result in a discharge of dredged or fill material into waters of the United States.

37. Respondent shall conduct restoration and mitigation activities for impacts to waters of the United States resulting from the unauthorized discharges of dredged or fill material at the Site in accordance with the schedule and other requirements set forth in the restoration and mitigation plan attached to this Consent Order as Exhibit A (Plan), which is hereby approved by the EPA.

38. Within fourteen (14) calendar days of receipt of this Consent Order, Respondent shall submit to the EPA the name and qualifications, including professional resume, of a consultant experienced in stream restoration who will directly supervise all work performed pursuant to the Plan.

39. Respondent shall obtain all necessary permits to implement the Plan and then commence all restoration and mitigation activities in accordance with the approved Plan, including the time frames specified therein, and all granted permits. Respondent shall demonstrate that all necessary permits have been granted by providing copies of all such permits, and any amendments thereto, to the EPA within seven (7) calendar days of the issuance of each permit.

40. All restoration and mitigation activities conducted pursuant to this Consent Order and involving the use of heavy construction equipment shall be undertaken under the direct, on-site supervision of the consultant retained pursuant to paragraph 38.

41. This Consent Order is not a permit or an authorization to place or discharge dredged or fill material in waters of the United States. Respondent shall consult with the Corps at the address and telephone number below to determine if any work to be performed pursuant to this Consent Order requires a permit from the Corps under section 404 of the CWA. If any such permit is required, Respondent shall obtain such permit(s) and provide a copy or copies to the EPA pursuant to paragraph 39, above, prior to initiating any work that is to be performed pursuant to this Consent Order.

U.S. Army Corps of Engineers
Helena Regulatory Office
10 West 15th Street, Suite 2200
Helena, Montana 59626
Telephone: (406) 441-1378
Facsimile: (406) 441-1380

42. Respondent shall submit all notifications under this Consent Order and related correspondence to:

Monica Heimdal, 8ENF-W
U.S. Environmental Protection Agency, Region 8
1595 Wynkoop Street
Denver, Colorado 80202-1129
Telephone: (303) 312-6359
Facsimile: (303) 312-7518
Email: heimdal.monica@epa.gov

A copy of all notifications and related correspondence also shall be provided to:

Abigail Dean, 8ENF-L
U.S. Environmental Protection Agency, Region 8
1595 Wynkoop Street
Denver, Colorado 80202-1129
Telephone: 303-312-6106
Facsimile: 303-312-6953
Email: dean.abigail@epa.gov

43. In addition to the notification requirements set forth in paragraph 42, after issuance of any Corps authorization for the restoration and mitigation work, Respondent shall submit all notifications and correspondence to the Corps in accordance with the terms and conditions in the Corps permit(s).

44. The Plan and any other deliverables, reports, specifications, schedules and attachments required by this Consent Order are, upon approval by the EPA, incorporated into this Consent Order. Any non-compliance with the Plan, deliverables, reports, specifications, schedules, permits or attachments shall be deemed a failure to comply with this Consent Order and shall be subject to EPA enforcement.

45. Until termination of this Consent Order, the EPA and its authorized representatives and contractors shall have the authority at all reasonable times to enter the Site to:

- a. Inspect and monitor progress of the activities required by this Consent Order;
- b. Inspect and monitor compliance with this Consent Order;
- c. Inspect and review any records relevant to this Consent Order; and
- d. Verify and evaluate data and other information submitted to the EPA.

This Consent Order shall in no way limit or otherwise affect the EPA's authority or the authority of any other governmental agency to enter the Site, conduct inspections, have access to records, issue notices and orders for enforcement, compliance or abatement purposes or monitor compliance pursuant to any statute, regulation, permit or court order.

46. This Consent Order shall be effective upon receipt by Respondent of a fully executed copy.

47. Issuance of this Consent Order shall not be deemed an election by the United States to forego any civil or criminal action to seek penalties, fines or other appropriate relief under the CWA for violations giving rise to the Consent Order.

48. The EPA agrees to submit all notifications and correspondence to:

Roger Lothspeich
2323 South Haynes Avenue
Miles City, Montana 59301

49. Any party hereto may, by notice, change the address to which future notices shall be sent or the identities of the persons designated to receive notices hereunder.

50. If an event causes or may cause delay in the achievement of the requirements of this Consent Order, Respondent shall notify the EPA orally as soon as possible and in writing within ten (10) working days from the date Respondent first knew of such event or should have known of such event by exercise of due diligence, whichever is earlier. Respondent's written notice shall specify the length of the anticipated delay, the cause(s) of the delay, the measures taken or to be taken by Respondent to minimize the delay and a timetable by which those measures will be or have been implemented. Notification to the EPA pursuant to this paragraph of any anticipated delay, by itself, shall not excuse the delay or the obligation of Respondent to comply with the requirements and deadlines of this Consent Order, unless the EPA grants in writing an extension of the applicable requirement or deadline.

51. If Respondent demonstrates to the EPA's satisfaction that the delay or anticipated delay has been or will be entirely caused by circumstances beyond Respondent's control (or the control of any of Respondent's agents) that Respondent could not have foreseen and prevented despite due diligence, and that Respondent has taken all reasonable measures to prevent or minimize such delay, the EPA may excuse performance or extend the time for performance of such requirement for a period not to exceed the actual delay resulting from such circumstances. The EPA's determination on these matters shall be

made as soon as possible, and in writing within ten (10) working days, after the receipt of Respondent's written notification of the event. The parties agree that changed economic circumstances shall not be considered circumstances beyond the control of Respondent.

52. Each party shall bear its own costs and attorneys fees in connection with this matter.

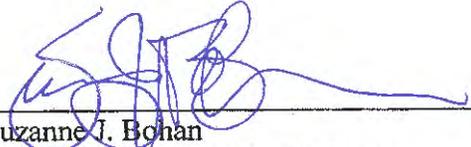
53. Respondent understands and acknowledges the following:

- a. Section 309(d) of the CWA, 33 U.S.C. § 1319(d), authorizes civil penalties of up to \$37,500 per day for each violation of an order issued by the Administrator of the EPA under section 309(a) of the CWA, 33 U.S.C. § 1319(a).
- b. Compliance with the terms and conditions of this Consent Order shall not be construed to relieve Respondent of his obligations to comply with any applicable federal, state or local law or regulation.
- c. Failure by Respondent to complete the tasks described herein in the manner and time frame specified pursuant to this Consent Order may subject Respondent to a civil action under section 309 of the CWA, 33 U.S.C. § 1319, for violation of this Consent Order.

BY: 

Roger Lothspeich
Respondent

DATE: 08-30-16

BY: 

Suzanne J. Bohan
Assistant Regional Administrator
Office of Enforcement, Compliance and
Environmental Justice

DATE: 9/13/2016

Exhibit A

RESTORATION PLAN

**Bank Stabilization Project on Yellowstone River
Vision Enterprises LLC Property – Roger Lothspeich
Northeast of Hathaway, Custer County, Montana
USACE No.: NWO-2012-02901-MTB
Terracon Project No. 26137052**

Project Background:

This Restoration Plan will be implemented as part of an Administrative Order on Consent (AOC) that is voluntarily being entered into by the U. S. Environmental Protection Agency (EPA) and Mr. Roger Lothspeich, for violation of Section 301(a) of the Clean Water Act (CWA), 33 U.S.C. § 1311(a) for discharge of fill materials in Yellowstone River, NW/4 NW/4 SW/4 Section 6, T6N, R45E, Custer County, Montana. By way of background, in early 2014, a *Joint Application for Proposed Work in Montana's Streams, Wetlands, Floodplains, and Other Water Bodies (Joint Application)* was submitted and project subsequently approved (USACE No.: NWO-2012-02901-MTB; Custer County Conservation District Application No. 1401; 318 waived by FWP) for installation of approximately 230' riprap revetment at this site. Approximately 130' of riprap was installed in fall 2014. From January 2, 2015 to February 19, 2015, work completed at the site involved blanket riprap along approximately 635' of bank with 100' overlapping between the previously permitted area and the bank area that was riprapped. The entire 635' of bank riprapped in early 2015 was inadequately installed with keying and sloping deficient, and no vegetation integrated into the project. The USACE issued a **Notice of Violation** and **Cease and Desist** letter on February 23, 2015 for the unauthorized discharge of fill material into Yellowstone River at this site.

Existing Conditions:

The site is located on the south bank of Yellowstone River in NW/4 NW/4 SW/4 Section 6, T6N, R45E, Custer County, Montana. This is immediately east of the Rosebud County/Custer County line. The GPS coordinates are N46° 18' 13.21"; W106° 09' 9.86" (NAD 83). Figure 1 shows the general location of the project on the USGS topographic map. Aerial photographs of the site dated May 22, 2014 are presented in Figure 1A.

Yellowstone River Cumulative Effects Analysis (CEA), December 2015 is the result of a detailed Yellowstone River Corridor Study led jointly by the Yellowstone River Conservation District Council (YRCDC) and USACE. This document provides the following assessment of "Reach C14" in which the proposed project is located.

- Reach C14 is 12.2 miles long and is located near Sheffield, which is about 15 miles upstream of Miles City. The reach straddles the Rosebud/Custer County Line. The reach is characterized by a dominant main thread that shows a distinct meandering pattern, with several islands persisting where meander bends have historically cut off. The river intermittently flows along the south valley wall. As a result it is classified as Partially

Confined Meandering with Islands (PCM/I). In this section of river the valley bottom is consistently about 1.8 miles wide, and bound by Tertiary-age Fort Union Formation. The active meanderbelt of the Yellowstone River is about 3,000 feet wide.

A review of the U. S. Department of Agriculture – Natural Resource Conservation Service, Web Soil Survey for the project location classified soils at the site “Havre loam, 0 to 2 percent slopes, occasionally flooded”. The farmland classification for this soil is “Prime farmland if irrigated”. The soil is in the Hydrologic Soil Group B indicating that the soil is moderately deep or deep; moderately well drained or well drained; and have a moderately fine to moderately coarse texture. There is a moderate infiltration rate when thoroughly wet and a moderate rate of water transmission.

The Federal Emergency Management Agency (FEMA) Flood Map Service shows the site is located within Panel 30017C0925D, Effective 7/22/2010, which is a Non-printed Flood Map Boundary. The project site is in Zone D indicating that no analysis of flood hazard has been conducted.

Currently, blanket riprap installed in January-February 2015 covers approximately 635' of the south bank of Yellowstone River. Figure 2 shows photographs from a March 5, 2016 site visit. A survey of the existing site conditions was also performed on March 5, 2016. Figure 2 shows the location of the riprap on the aerial photograph and a cross-section view of the installation. The low water surface elevation at this time of the survey was 2407.1' with the 2-Year water surface elevation computed using HEC-RAS being 2415.82' and a 100-Year water surface elevation of 2419.32'. From the site survey, the elevation of the gravel layer was measured to be approximately 2411.3' with topsoil and fines above; and the installed rock layer surface approximately 1-2' in thickness.

Previously, the USACE had requested additional information on the blanket riprap installation. Mr. Tim McNew, USACE – Omaha District, Helena Regulatory Office completed a site visit on February 24, 2015 following the USACE Notice of Violation letter. Mr. McNew made the following measurements and observations:

- Length of work: 635 linear ft.
- Width of work: 22 ft. (top of bench to bottom)
- Estimated dimensions of materials: Approximately 16 to 48-inch in diameter.
- Estimated depth of rock: 4 to 5 ft.
- Estimated bank height: 15 ft.
- Estimated soil bench width at base of riprap: 10 ft.

Diamond J Construction, LLC, who performed the riprap installation, also provided Mr. Lothspeich with the following information:

- Estimated volume of material: 952 cubic yards (17 dump truck loads and 40 side dump loads)

Access to the site is from the Hathway exit on I-94 to the southwest. From there, proceed approximately 2 miles east/northeast on the frontage road and cross the railroad tracks. Follow the gravel road to the northeast for approximately 1 mile to the Lothspeich residence. From the residence, proceed on the 2-track between the irrigated fields approximately 750' north to the west end of the riprap site. The field immediately south of the project site has a pivot irrigation system and is typically planted with alfalfa. There is an approximately 10-20 -foot strip of land between the field and the top of riprapped bank that has native medium grasses and forage.

Proposed Restoration Plan:

This proposed restoration plan involves work on approximately 635' of the south bank on Yellowstone River that was covered with unpermitted blanket riprap in January-February 2015. A *Joint Application* will be submitted to the respective agencies for the restoration plan project. The objective of this plan is to install a riprap revetment that provides adequate stability and protection from eroding banks while also supporting vegetative growth. This new revetment is being installed under the context that removing the unpermitted riprap and then leaving the existing banks unprotected would likely exacerbate the erosion situation due to the already disturbed bank area. The proposed project would involve removing the 635' of blanket riprap; properly keying in riprap at the toe of the slope and at the upstream and downstream ends; installation of riprap to appropriate depths and widths for reliable protection and minimal maintenance; placement of willows along the length of project; and installation of vegetated soil lifts. The revegetation plan should induce the creation of some overhanging vegetation as opposed to the blanket riprap that is currently in-place and oversteepened with unvegetated banks. The following steps provide additional details on implementing this plan. In addition, Figure 3 provides a schematic of the plan, and Figure 3A provides a progressive series of pictures from similar installations.

1. A track hoe operating from on top of the bank will be used to remove the existing placed rock and stockpile it overland. The gravel and topsoil will be removed as indicated on Detail 3 at approximately 2H:1V slope to allow for rock installation. As noted above in the existing conditions, the estimated volume of material for the previous blanket riprap is 952 cubic yards. For the proposed project, it is estimated that 1,350 cubic yards or 1,890 tons (at 1.4 tons/cyd) of rock will be required. The 398 cubic yard difference will be brought to the site using dump trucks and stockpiled on the over bank areas.
2. The existing hard angular durable rock (D50 = 18" and DMAX = 36") will be placed using a track hoe along the toe of the reshaped bank at depth of approximately 3.0' below the channel bed elevation and a minimum width of 3'. A rock key (approximately 10' X 3') will be placed on the upstream and downstream ends of the stabilization to prevent end cutting. This work will be done by a track hoe operating from a bench area near the gravel elevation.
3. Rock will be sloped at 2H:1V and have a 3' thickness from the approximate bank toe up to the top of gravel installation. During the course of this phase of construction, infill material will be placed in the riprap voids in quantities and at intervals to create a uniform substrate of rock and reduce the amount of air voids. The infill is not intended to increase the volume of the riprap

installation or prevent contact of the individual riprap pieces. The infill will be a 50/50 mixture of native streambed materials and topsoil. Topsoil/fines are available from the initial preparation work. Native streambed material is available from the excavation of the below-channel riprap key and from the gravel stratum.

4. Willows will be placed at the top of the initial rock installation (after top of gravel) behind the rock installation. Willow cuttings will be gathered in bundles of 3 to 5 cuttings and randomly placed on 1' or less centers throughout the length of the project. The bundles will be placed into the low water elevation line at approximately 30°-45° angles. Each bundle will be surrounded with suitable rooting material. The cuttings/soil will then be saturated before additional infill is placed. The approximate lower 50% of the cutting should be buried in the infill, with the remaining 50% extending out from the riprap. After willows are placed, some will be cut off to leave ~1 foot of the stem sticking out.

Willow Cuttings Specifications:

- Source: Riparian land owned by Vision Enterprises LLC approximately 1,600' upstream of project. N46.302536°, W106.159733°
- Size: 6-8 feet in length
- Cut surface diameter: 0.75-1.25 inch at the base
- Condition: Live, dormant, freshly cut. Willow cuttings will be collected and stored in a manner that preserves their vigor and health. Cuttings are to be stored so that the lower 2 feet are submersed in water from the time of collection until final placement. Collections are to be made within 48 hours of the anticipated placement and coverage in the riprap infill.
- The Project Manager, or their representative, will inspect the cuttings for acceptance prior to installation. Cuttings not conforming will be rejected.

5. Another course of rock will be installed above the willows up to approximately the 2-Year water surface elevation. This will also be on a 2H:1V slope and approximately 3' in thickness with infill material. This work will be done by a track hoe operating from the top of the bank or from a bench cut into the bank.

6. Two (2) native soil lifts approximately 1.5' in height and covered with a KoirMat™ 400 (minimum embedment of 3') will be installed at the top of the rock installation. The second lift will be set back approximately 4.0' to 4.5' from the edge of the first lift. Then, starting approximately 1.5' from the edge of the second lift, topsoil will be sloped at 3H:1V to match existing grade. This slope will be matted with the biodegradable matting.

7. The stabilized bank areas will be revegetated with an approved seed mix (see below) and monitored for noxious weeds. Any excess stockpiled materials will be removed from the overbank and disposed of on Vision Enterprises LLC's property outside of the floodplain as indicated on Figure 1B

The U.S. Department of Agriculture – National Resource Conservation Service, Miles City Montana Field Office was contacted by telephone concerning a seed mix for the soil lifts and

overland strip between the top of bank and cultivated field. Mr. David George, Range Management Specialist, provided the following mix to be hand broadcast at the site at completion. Mr. George believed that 10-15 lbs of seed would be adequate for reseeding the relatively small area by hand with ground worked using a 4-wheeler and harrow.

Recommended Seed Mix:

Western Wheat Grass – 5lbs
 Slender Wheat Grass – 1-1.5 lbs
 Alfalfa – 2 lbs
 Sweet Clover – 2 lbs
 Quackgrass/Wild Rye – 3 lbs
 Blue Stem – 1 lbs

A water surface profiles analysis of the proposed restoration plan was performed using the USACE's HEC-RAS computer program to demonstrate that the project would not increase the calculated Base Flood Elevation (BFE) in this reach of the river. The HEC-RAS analysis was based on cross sections surveyed by a registered land surveyor and statistical design flows from Yellowstone River at Forsyth. The peak discharge for the 100-year (base flood) event is 102,815 cfs. Using the hydraulic parameters from that study for the 100-year event and a gradation from a streambed material sample, we computed scour using procedures after Lacey, Blench and Neill. An average value for scour from these calculations is about 4 feet. Modeling the restoration plan involved adjusting the slopes and roughness of the bank. The channel width increased slightly due to the 2H:1V slopes as opposed to the original over-steepened banks, but the roughness also increased from the raw, non-vegetated bank to the ripped bank with vegetation. In comparing the HEC-RAS model results of the computed 100-Year water surface elevations through the project reach, water surface elevations were the same or decreased by 0.01ft. Model results showed a pre-project velocity at 8.30 ft/s at the upper end of the project and 10.95 ft/s at the lower end. Post project velocities at these locations were 8.40 ft/s and 10.93 ft/s, respectively, which equate to an approximate 1% increase and 0.2% decrease.

Mitigation: Compensatory mitigation is being proposed for this restoration plan to successfully fulfill the USACE requirements for compensatory stream mitigation to offset unavoidable impacts to Yellowstone River resulting from work on greater than 300 linear feet of river bank. The *USACE Montana Stream Mitigation Procedures (MTSMP), February 2013* was used as guidance in preparation of the proposed mitigation plan.

A mitigation worksheet calculation of debits (Table 1) for this project resulted in a debit of 3,537.75. Note that the mitigation is being proposed to cover 635' of revetment for this project, 130' of permitted riprap that was previously installed immediately upstream and 125' of maintenance work including placement of rock on a pre-existing jetty adjacent to the site upstream. The USACE considers the upstream work as cumulative at this location and therefore this needs to be included in the area of impact. The mitigation plan will provide sufficient mitigation credits to offset the net debits. This will be accomplished by implementing a "permittee-responsible mitigation" as described in the *MTSMP* in the form of riparian buffer

protection through deed restriction. The location of the mitigation effort will be on property owned by Vision Enterprises LLC adjoining Yellowstone River within 2.5 miles of the restoration project. The area being proposed for mitigation is shown on Figure 1B. The area shown for mitigation plus alternative areas will be verified for ownership by a registered Professional Land Surveyor and then approved by the USACE for use as mitigation for the protection. As shown on the riparian mitigation credit worksheet (Table 2), it is estimated that a riparian buffer preservation area approximately 250 feet by 1,500 feet will provide a mitigation credit of 3,750 thus exceeding the stabilization debits (Table 3). If the area is not accepted by the USACE, 4 additional riparian buffers within 2.5 miles of the project may also be considered. These areas are also marked in Figure 1B. The EPA will be notified of the accepted riparian buffer zone following USACE acceptance. All of these riparian buffers are of moderate to high quality and the preservation would improve and protect both water quality and the riparian habitat. In addition, Roger Lothspeich has agreed to grant a legally binding mechanism to protect the designated areas of buffer on the property. The agreement covenants will ensure that no construction of roads or buildings, manipulation of the river bank, or agricultural operations will occur within the buffer and that natural erosion processes will be allowed to occur.

Actual Restored Conditions:

At project completion, an "as-built" plan will be compiled that shows the actual finished grades and project features including a cross-section of the riprap installation. Photographs detailing project installation with the willow plantings and the reseeded soil lifts will be included. As the willow planting and reseeded are part of the actual project installation plan, this as-built plan will be submitted following these activities as opposed to the requested submitting prior to planting/seeding activities.

Monitoring:

A minimum 3-year monitoring program of the restoration project will begin before the end of the 2016 growing season. The objective of the monitoring program will be to verify establishment of the willows and growth of soil lift and overbank vegetation in addition to reviewing the integrity of the project. The monitoring will be performed by a qualified engineer or scientist.

The first inspection will be done after project completion and before the end of 2016. Three (3) site inspections will be conducted in both 2017 and 2018. During 2017 and 2018, inspections will be conducted within a week plus/minus of April 1, July 1 and October 1. This schedule coincides with end of winter/ice season and prior to growing season; end of high water and middle of growing season; and end of growing season. The 3-year time frame should allow time for the willows and vegetation to adequately establish and for the structure to have weathered 2 spring run-off events.

The inspections will involve a visual review of the willows and vegetation including an estimated percent of growth and coverage. If vegetation is not recovering, assessment of possible causes such as deer or insects will be noted. In addition, the integrity of the structure will be assessed during the inspections. Various items such as possible scour, rock subsidence or damage due to potential flooding will be reviewed and noted.

Three (3) photo points will be used to document the site conditions and progression of revegetation. One (1) photo point will be set at both the east and west ends of the project and an additional photo point will be set (post established) near the middle of the revetment. Photos will be taken upstream and downstream in the direction of the next nearest photo point.

A monitoring report will be submitted to the EPA following each inspection event. The report will include:

- Narrative detailing revegetation progress including estimates on regrowth and coverage and review of structure integrity.
- Photo log of site conditions from the 3 established photo point locations.
- Description of any maintenance or corrective actions performed by landowner/contractor during the monitoring period.

Final Success Criteria:

The intention of this restoration plan is to institute a riprap revetment that provides adequate stability and protection from eroding banks while also supporting vegetative growth as a replacement for the unpermitted blanket riprap that was inadequately installed at this same location. The restoration plan will be deemed successful when the following conditions are demonstrated to have been met:

- Revegetation has met at least a 75 percent threshold at the end of the 3-year monitoring period for willow survivability and soil lift and overbank vegetation coverage. This criteria is set with the understanding that revegetation is influenced by climate events in Yellowstone River drainage impacting water levels and potential flood events. Revegetation is also a consequence of other natural and environmental factors such as deer and insects that are beyond the control of Roger Lothspeich.
- The site will have less than 10 percent noxious weeds in support of the Custer County, Montana weed management program.
- The structural integrity of the revetment is sound and is functioning satisfactorily to meet the objectives of stability and protection.

During the monitoring period, appropriate maintenance measures or corrective actions may be taken by Roger Lothspeich to ensure that the restoration plan success criteria are achieved. Additionally, Roger Lothspeich will not be responsible or obligated to replace vegetative damages due to natural drought, natural flooding or other Force Majeure events following the monitoring period beyond that which is necessary to maintain the integrity of the bank stabilization.

Schedule:

The proposed restoration plan will be implemented in October 2016 assuming that all Agency permitting approvals are obtained by September 30, 2016. The work is planned during a low water period on Yellowstone River to minimize potential turbidity and water quality impacts. Due to contractor availability, changing weather conditions, unforeseen equipment problems or other site obstacles, exact dates for the project are not presented. The project is anticipated to be

completed in 2 to 3 weeks. The following task list provides the general order of activities. The approximate number of days to complete each task is also provided below.

October 2016 – Notify EPA that work will be starting in 5 days.

Task 1: 1-2 Days – Remove existing blanket riprap and stockpile on overbank. Remove gravel and topsoil to create bank slope at approximately 2H:1V. Bench into the bank as needed to facilitate placement of the rock toe.

Task 2: 1-2 Days – Install rock toe approximately 3 feet below channel bed elevation. Install rock keys at upstream and downstream ends of revetment

Task 3: 1-2 Days – Install rock on 2H:1V slope with 3-foot width to approximate gravel elevation. Infill this rock slope with 50/50 native streambed materials and topsoil to create a uniform substrate and reduce voids.

Task 4: 2-3 Days– Harvest willows at specified location and install per detail to promote viability.

Task 5: 1-2 Days – Install layer of rock above willows to 2-year water elevation with infill material.

Task 6: 1-2 Days – Install 2 soil lifts per detail.

Task 7: 1-2 Days – Perform final contouring on overbank and reseed with recommend seed mix.

November 2016 – Complete site inspection at project completion and submit report to EPA by November 30, 2016. This report will include the “as-built” plans and construction/installation photographs.

Additional site inspections will be conducted in both 2017 and 2018 as follows:

- April 1, 2017; July 1, 2017; and October 1, 2017 – Complete monitoring site inspections (plus/minus 1 week) and submit report to EPA by May 1, 2017; August 1, 2017; and November 1, 2017.
- April 1, 2018; July 1, 2018; and October 1, 2018 – Complete monitoring site inspections (plus/minus 1 week) and submit report to EPA by May 1, 2018; August 1, 2018; and November 1, 2018.

Notification and Reporting:

Roger Lothspeich will be responsible for obtaining all federal, state and local permitting notifications/approvals that may be required for implementing this restoration plan.

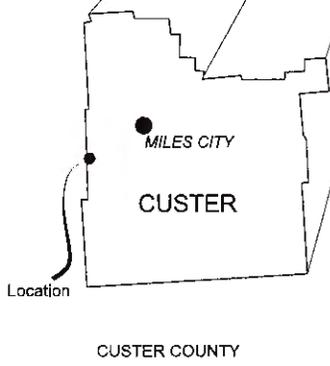
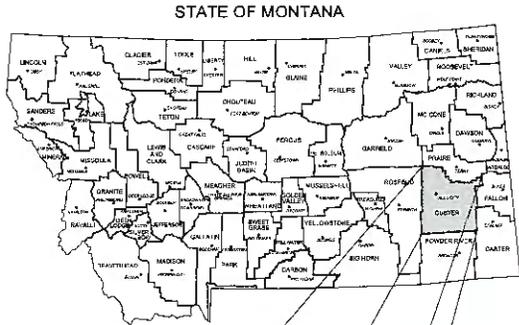
Roger Lothspeich will complete the restoration work as soon as the restoration plan has been approved by the EPA in conjunction with the AOC; has received other Agency permitting notifications/approvals; and subject to weather and water level conditions at the site.

Roger Lothspeich will notify the EPA project coordinator 5 days prior of the initiation of the proposed restoration plan and within 5 days of completing the work.

Roger Lothspeich will submit annual monitoring reports to EPA for a minimum of 3 post-restoration monitoring years as per the proposed schedule.

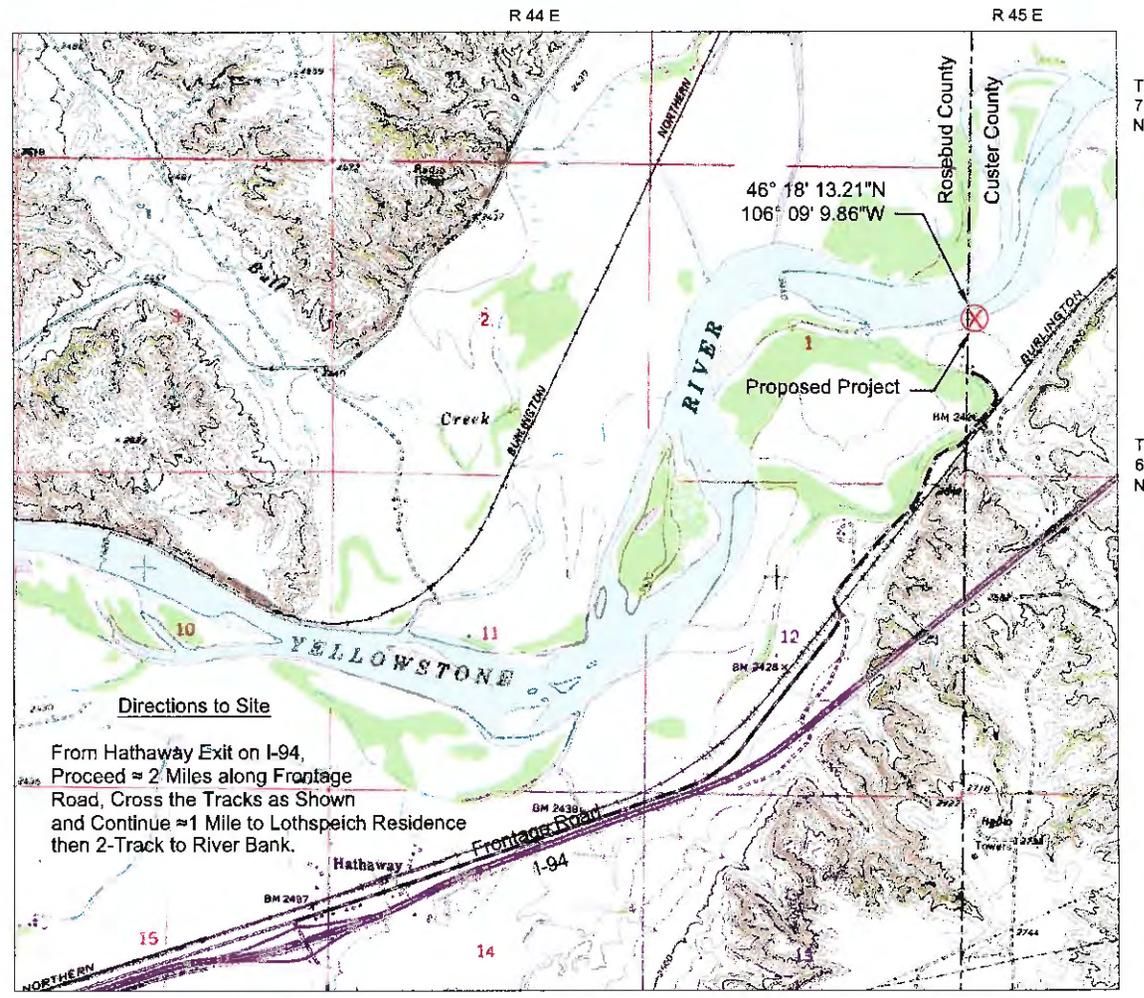
EPA will notify Roger Lothspeich when it has determined that the restoration project achieved the stated success criteria. EPA reserves the right to inspect the restoration area in accordance with the terms of the AOC and will submit written concurrence or dissent within 200 days of receipt of the final post-restoration monitoring report.

General Location
Yellowstone River near Hathaway
Vision Enterprises, Roger Lothspeich Property
West of Miles City, Custer County, Montana



MAP INDEX SHEET

Sheet	Description
1.	General Location
2.	Existing Conditions
3.	Proposed Work



Directions to Site
 From Hathaway Exit on I-94,
 Proceed ≈ 2 Miles along Frontage
 Road, Cross the Tracks as Shown
 and Continue ≈ 1 Mile to Lothspeich Residence
 then 2-Track to River Bank.

Section 6, Township 6 N, Range 45 E
 Mapping Excerpted From USGS
 7½-minute Quad Hathaway, Montana

REV	DATE	BY	DESCRIPTION

Terracon
 Consulting Engineers and Scientists

2110 Overland Avenue, Suite 124
 Billings, MT 59102
 PH. (406) 658-3072 FAX. (406) 658-3578

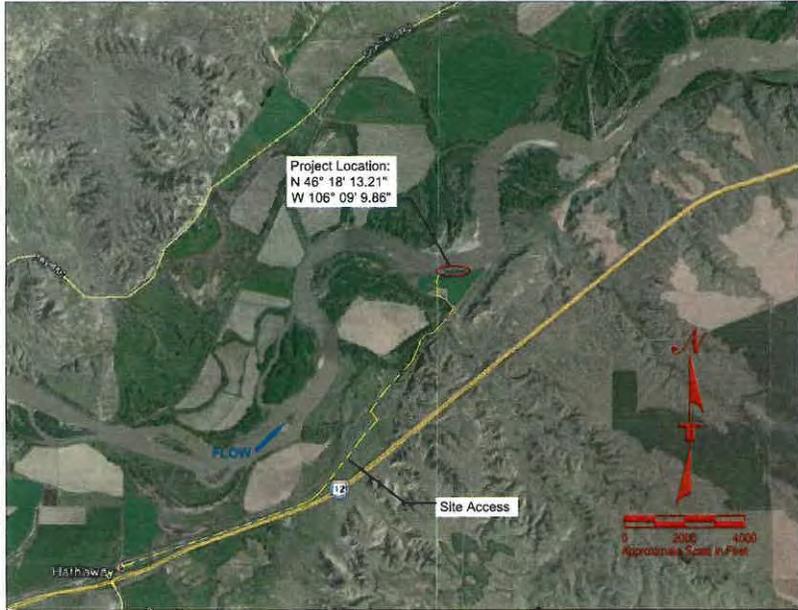


GENERAL LOCATION
 River Bank Stabilization AOC
 Vision Enterprises
 Yellowstone River Bank

Custer County

DESIGNED BY:	GR
DRAWN BY:	GR
APPROV BY:	DCN
SCALE:	As Shown
DATE:	April 2016
JOB NO.:	26137862 - AOC
FILE NAME:	Gen Location.mxd
SHEET NO.:	1 OF 3

Montana



May 22, 2014 Aerial Photograph - Google Earth



May 22, 2014 Aerial Photograph - Google Earth

REV.	DATE	BY	DESCRIPTION

Terracon
Consulting Engineers and Scientists

2110 Overland Avenue, Suite 121 Billings, MT 59102
PH: (406) 656-3072 FAX: (406) 656-3578

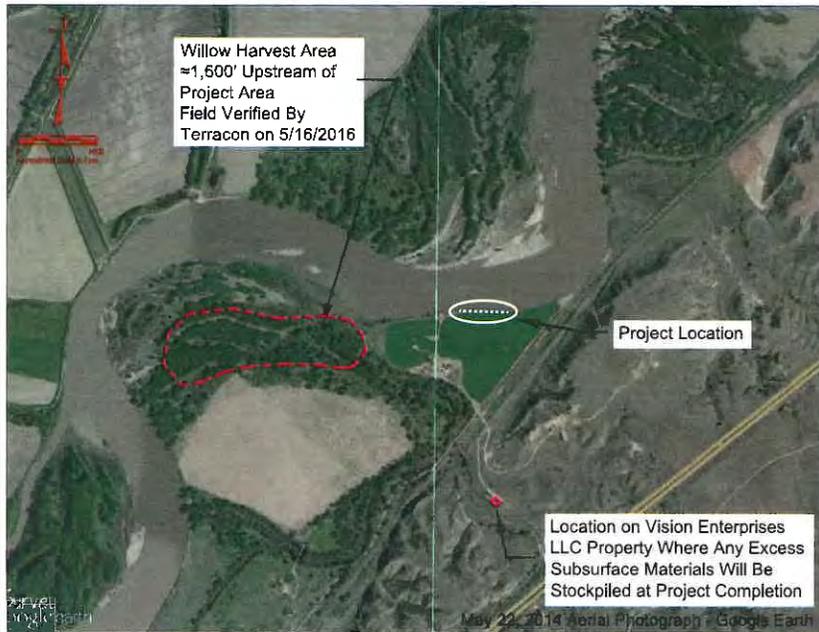


SITE LOCATION - AERIAL PHOTOGRAPHS

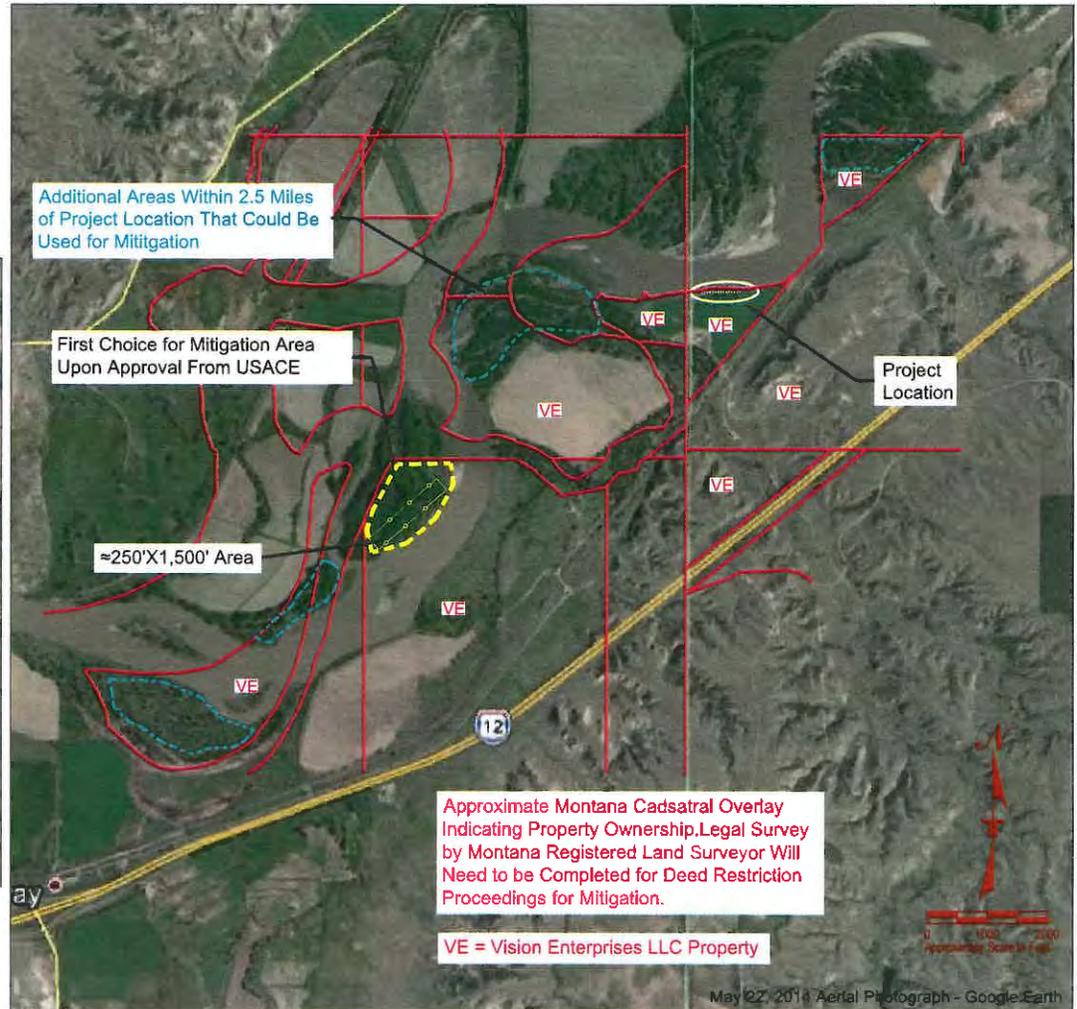
River Bank Stabilization AOC
Vision Enterprises
Yellowstone River Bank

Custer County Montana

DESIGNED BY:	GRoma
DRAWN BY:	SSS
APP'D BY:	GRoma
SCALE:	As Shown
DATE:	May 2016
JOB NO.:	26137022 - ACC
FILE NAME:	Gen Location.dwg
SHEET NO.:	1A OF 3



LOCATION OF WILLOW HARVEST AND FINAL MATERIAL STOCKPILE FOR RESTORATION PROJECT



LOCATION OF MITIGATION FOR RESTORATION PLAN PROJECT

REV.	DATE	BY	DESCRIPTION

Terracon
 Consulting Engineers and Scientists

2110 Overland Avenue, Suite 124 Billings, MT 59102
 PH. (406) 656-3872 FAX. (406) 656-3678

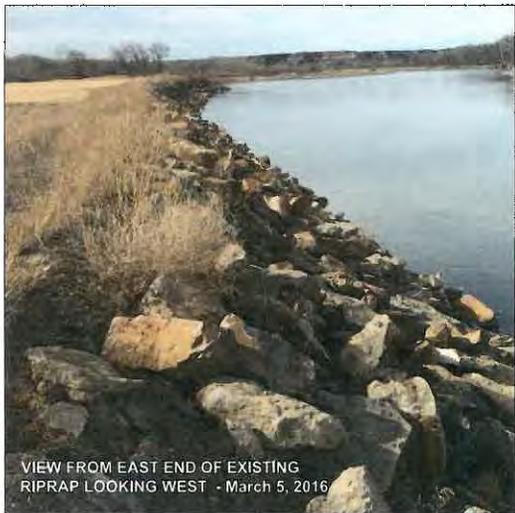
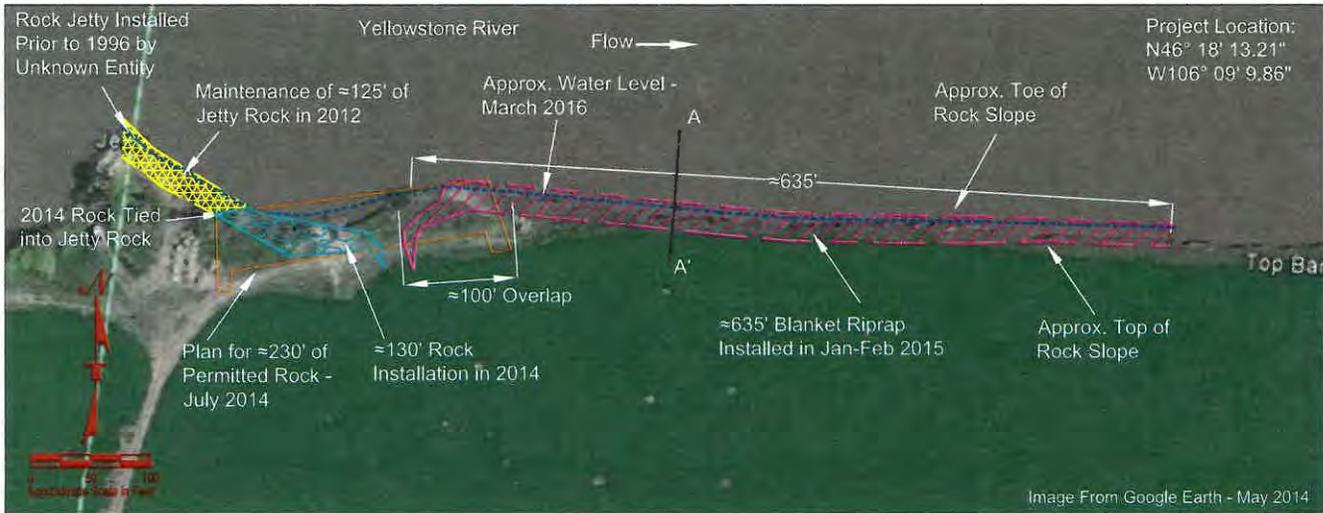
RESTORATION PLAN - WILLOWS; MITIGATION; STOCKPILES

River Bank Stabilization AOC
 Vision Enterprises
 Yellowstone River Bank

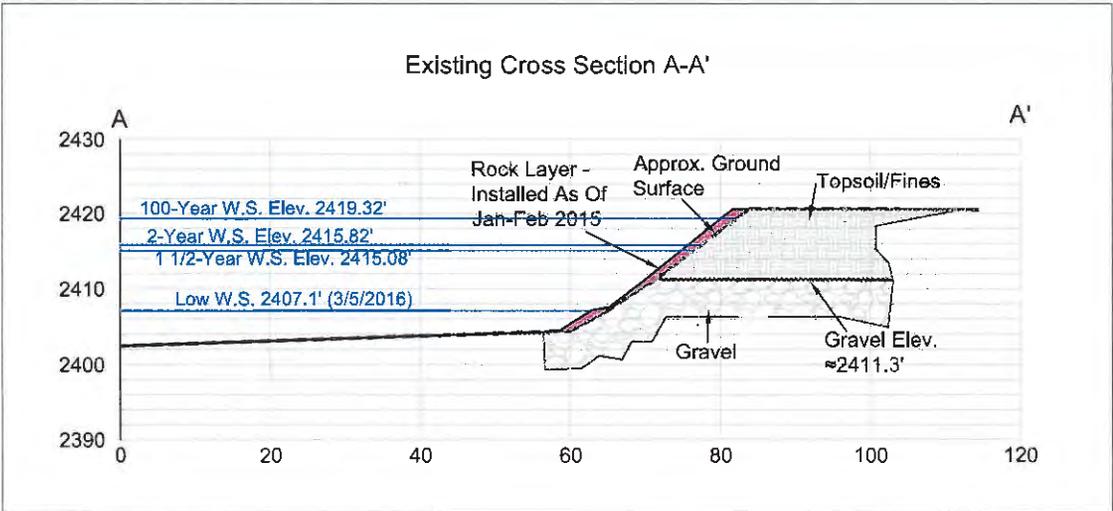
Custer County Montana

DESIGNED BY: GRome
 DRAWN BY: BSS
 APPVD. BY: GRome
 SCALE: As Shown
 DATE: May 2016
 JOB NO.: 26137052 - AOC
 FILE NAME: Gen Location.dwg
 SHEET NO.: 1B OF 3

1B



VIEW FROM EAST END OF EXISTING RIPRAP LOOKING WEST - March 5, 2016



VIEW FROM WEST END OF EXISTING RIPRAP LOOKING EAST - March 5, 2016

REV.	DATE	BY	DESCRIPTION

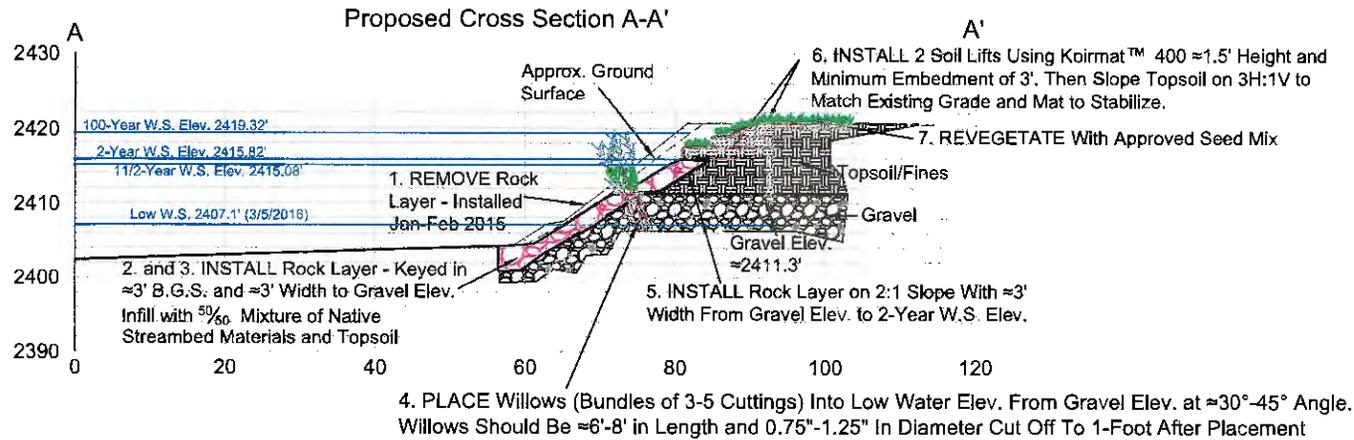
Terracon
 Consulting Engineers and Scientists

2110 Overland Avenue, Suite 124 Billings, MT 59102
 PH. (406) 658-3072 FAX. (406) 656-3578

EXISTING CONDITIONS
 River Bank Stabilization AOC
 Vision Enterprises
 Yellowstone River Bank

Custer County Montana

	2
DESIGNED BY:	G Roma
DRAWN BY:	G Roma
APPROV. BY:	DC Nebel
SCALE:	As Shown
DATE:	April 2018
LOG NO.:	26137062.AOC
File Name:	AOC_Specs.docx
SHEET NO.:	2 of 3



NOTES:

The proposed project involves work on approximately 635' of the south bank on Yellowstone River at this location. The project site would be accessed from agricultural land to the south.

- The existing placed rock will be removed and stockpiled overland. The gravel and topsoil will be removed as indicated on the detail at approximately 2H:1V slope to allow for rock installation. Some topsoil will be drifted back over the top portion of the installed revetment to create a "dirty riprap".
- The existing hard angular durable rock (D50 = 18" and DMAX = 36") will be placed along the toe of the reshaped bank at depth of 3.0' below the channel bed elevation and a minimum width of 3'. A rock key (approximately 10' X 3') will be placed on the upstream and downstream ends of the stabilization to prevent end cutting.
- Rock will be sloped at 2H:1V and have a 3' thickness from the approximate bank toe up to the top of gravel installation. During the course of this phase of construction, infill material will be placed in the riprap voids in quantities and at intervals to create a uniform substrate of rock and reduce the amount of air voids. The infill is not intended to increase the volume of the riprap installation or prevent contact of the individual riprap pieces.
 - Riprap Infill: A 50% mixture of native streambed materials and topsoil. Topsoil/fines are available from the initial preparation work. Native streambed material is available from the excavation of the below-channel riprap key and from the gravel stratum.
- Willows will be placed at the top of the initial rock installation (after top of gravel) behind the rock installation. Willow cuttings will be gathered in bundles of 3 to 5 cuttings and randomly placed on 1' or less centers throughout the length of the project. The bundles will be placed into the low water elevation line at approximately 30°-45° angles. Each bundle will be surrounded with suitable rooting material. The cuttings/soil will then be saturated before additional infill is placed. The approximate lower 50% of the cutting should be buried in the infill, with the remaining 50% extending out from the

riprap. After willows are placed, some will be cut off to leave ~1 foot of the stem sticking out.

a. Willow Cuttings:

- Source: Within 10 miles of project site along Yellowstone River
- Size: 6-8 feet in length
- Cut surface diameter: 0.75-1.25 inch at the base
- Condition: Live, dormant, freshly cut. Willow cuttings will be collected and stored in a manner that preserves their vigor and health. Cuttings are to be stored so that the lower 2 feet are submerged in water from the time of collection until final placement. Collections are to be made within 48 hours of the anticipated placement and coverage in the riprap infill.
- The Project Manager, or their representative, will inspect the cuttings for acceptance prior to installation. Cuttings not conforming will be rejected.

5. Another course of rock will be installed above the willows up to approximately the 2-Year water surface elevation. This will also be on a 2H:1V slope and approximately 3' in thickness with infill material.

6. Two (2) native soil lifts approximately 1.5' in height and covered with a KoirMat™ 400 (minimum embedment of 3') will be installed at the top of the rock installation. The second lift will be set back approximately 4.0 to 4.5' from the edge of the first lift. Then, starting approximately 1.5' from the edge of the second lift, topsoil will be sloped at 3H:1V to match existing grade. This slope will be matted with the biodegradable matting.

7. The stabilized bank areas will be revegetated with an approved seed mix and monitored for noxious weeds.

Estimated Quantities

1. Hard Angular Durable Rock D50 = 18", DMAX = 3' and DMIN = 4" 1,350 cubic yards or 1,890 tons (at 1.4 tons/cyrd)

REV.	DATE	BY	DESCRIPTION

Terracon
Consulting Engineers and Scientists

2110 Overland Avenue, Suite 124 Billings, MT 59102
PH. (406) 656-3072 FAX. (406) 656-3578

PROPOSED WORK
River Bank Stabilization AOC
Vision Enterprises
Yellowstone River Bank

Custer County Montana

	3
DESIGNED BY:	G. Rime
DRAWN BY:	G. Rime/SSS
APPROV. BY:	DC Nebel
SCALE:	As Shown
DATE:	Apr 2016
JOB NO.:	26137052 AOC
File Name:	AOC Station
SHEET NO.:	3 OF 3

NOTE: These photos are provided to demonstrate construction work and installation details similar to the proposed restoration plan project. These sites have the same basic overall bank stabilization and revegetation objectives as the restoration plan with differences in bank sloping, height of rock above willows and similar site specific items.



Step 1: Bank Sloping Techniques



Steps 2-3: Rock Toe and Infill With Track Hoe on Bench



Step 4: Willow Installation



Step 5: Rock Above Willow Installation



Step 6: Soil Lifts Above Willow Installation

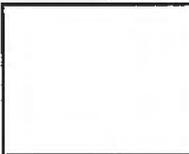


Step 7: Final Cover Over Soil Lifts in Preparation of Seeding

REV.	DATE	BY	DESCRIPTION

Terracon
Consulting Engineers and Scientists

2110 Overland Avenue, Suite 124 Billings, MT 59102
PH: (406) 658-3072 FAX: (406) 658-3576



CONSTRUCTION EXAMPLES

River Bank Stabilization AOC
Vision Enterprises
Yellowstone River Bank

Custer County Montana

DESIGNED BY:	G Rome
DRAWN BY:	G Rome/SSS
APP'D. BY:	DC Nebel
SCALE:	As Shown
DATE:	May 2016
JOB NO.:	2613762 AOC
File Name:	AOC Sections
SHEET NO.:	3A OF 3

Debits Tables

Table 1-a. Adverse Impacts (debit) Factors and Worksheet.

FACTORS	MULTIPLIERS					
Stream Type (Pg 8)	Ephemeral 0.2		Intermittent 0.3			Perennial 0.6
Stream Status (Pg 8)	All Others 0.25		High Resource Value 0.75			
Existing Condition (Pg 8)	Impaired 0.25		Somewhat Impaired 0.75			Fully Functional 1.5
Dominant Impact (Pg 9)	Bank Stabilization* See Table 1-b. below	Morphologic 1.5	Channelization 2.0	Impound 2.0	Pipe 2.2	Fill 2.5
Cumulative Impact (Pg 9)	* For projects impacting up to 1,000 linear feet, multiply 0.00050 x linear feet of stream impacted by the total length of all impact areas. * For projects impacting 1,001-3,000 linear feet, multiply 0.00075 x linear feet of stream impacted by the total length of all impact areas. * For projects impacting over 3,000 linear feet, multiply 0.00100 x linear feet of stream impacted by the total length of all impact areas.					
Comparative Stream Order of Mitigation Site (Pg 9)	Same Order 0.0		1 Order Difference 0.10		2 or more Order Difference 0.2	
Location of Mitigation Site (Pg 10)	On-site 0.0		Off-site 0.10		Outside 0.2	
Legal Protection on Mitigation Site (Pg 10)	Covenant 0.15	Deed Restriction 0.10	Conservation Easement 0.05		Fee Title 0.00	
Mitigation Timing (Pg 10)	Prior to Impacts 1.0		Concurrent with Impacts 1.25			After Impacts 1.5

Table 1-b. Bank Stabilization Multipliers

Multiplier	Description For Bank Stabilization (Dominant Impact)
0.2	Vegetation and/or soil lifts established at the base flow elevation combined with either a rock toe and/or wood at or below base flow elevation
0.4	Rock riprap with incorporation of willow cuttings or other native vegetation
0.6	Rock riprap with no incorporation of vegetation on bank or any type of vanes/barbs/weirs/hard points that project into the channel
0.8	Combinations of bank riprap with vanes/barbs/weirs/hard points
1.0	Vertical or nearly vertical retaining walls constructed of gabion baskets, hand-placed stone, masonry, concrete, steel, wood, or other materials

Table 1-c. Debits Worksheet

Factor	Impact Area 1	Impact Area 2	Impact Area 3	Impact Area 4	Impact Area 5	Impact Area 6
Stream Type	0.60					
Stream Status	0.25					
Existing Condition	0.75					
Dominant Impact	0.40					
Cumulative Impact	0.45					
Location of Mitigation	0.10					
Comparative Stream Order of Mitigation Site	0.00					
Type of Legal Protection for Mitigation Site	0.10					
Sum of Factors (SF.)	2.65	0.00	0.00	0.00	0.00	0.00
Linear Feet Impact* (LF.)	890.00	0.00	0.00	0.00	0.00	0.00
Mitigation Timing	1.50	0.00	0.00	0.00	0.00	0.00
SF, X LF, X Mitigation Timing	3537.75	0.00	0.00	0.00	0.00	0.00

Table I-c. Debits Worksheet Cont.

Factor	Impact Area 7	Impact Area 8	Impact Area 9	Impact Area 10	Impact Area 11	Impact Area 12
Stream Type	0.00	0.00	0.00	0.00	0.00	0.00
Stream Status	0.00	0.00	0.00	0.00	0.00	0.00
Existing Condition	0.00	0.00	0.00	0.00	0.00	0.00
Dominant Impact	0.00	0.00	0.00	0.00	0.00	0.00
Cumulative Impact	0.00					
Location of Mitigation	0.00	0.00	0.00	0.00	0.00	0.00
Comparative Stream Order of	0.00	0.00	0.00	0.00	0.00	0.00
Type of Legal Protection for	0.00	0.00	0.00	0.00	0.00	0.00
Sum of Factors (SF _i)	0.00	0.00	0.00	0.00	0.00	0.00
Linear Feet Impact* (LF _i)	0.00	0.00	0.00	0.00	0.00	0.00
Mitigation Timing	0.00	0.00	0.00	0.00	0.00	0.00
SF _i X LF _i X Mitigation Timing	0.00	0.00	0.00	0.00	0.00	0.00

Total Debits = Σ (SF_i X LF_i X Mitigation Timing) = 3,537.75

*For bank stabilization projects, impacts include the entire length of the bank being protected not just the footprint of the structure or revetment.

Riparian Mitigation Credits Tables

Table 2-a. Factors with Multiplier reference table

FACTORS (see page 10 for definitions)		MULTIPLIERS
a	Buffer Width	Width of Riparian Buffer Preserved + 100
b	Remove Disturbance to Riparian Buffer	0.5
c	Fence around Buffer	0.5
d	Re-vegetate Riparian Buffer	1.0 x % of buffer re-vegetated
e	Micro Topography in Floodplain	0.5
f	Addition of Woody Debris in Floodplain	0.5
g	Management of Invasive Species	0.5
h	Removal of Riprap Below Ordinary High Water	1.0 X % of Riprap removed
i	Removal of Floodplain Fill (Berms or Impervious Materials)	1.0 X % of fill removed
j	Restoration of Channel Morphology	1 (both sides will earn a multiplier)

Table 2-b. Stream and Riparian Credit Factors Worksheet

FACTORS	Reach 1 /Side A	Reach 1 /Side B	Reach 2 /Side A	Reach 2 /Side B
a Buffer Width	2.50	0.00	0.00	
b Remove Disturbance to Riparian Buffer	0.00	0.00	0.00	0.00
c Fence around Buffer	0.00	0.00	0.00	0.00
d Re-vegetate Riparian Buffer	0.00	0.00	0.00	0.00
e Micro Topography in Floodplain	0.00	0.00	0.00	0.00
f Addition of Woody Debris in Floodplain	0.00	0.00	0.00	0.00
g Management of Invasive Species	0.00	0.00	0.00	
h Removal of Riprap below ordinary High Water	0.00	0.00	0.00	0.00
i Removal of Floodplain Fill (Berms or Impervious Materials)	0.00	0.00	0.00	0.00
j Restoration of Channel Morphology	0.00	0.00	0.00	0.00
Total Sum of Factors (SFm) a-j	2.50	0.00	0.00	0.00
Linear Feet Impact* (LF _m)	1,500.00	0.00	0.00	0.00
SF _m x LF _m	3750.00	0.00	0.00	0.00

Credits

Table 2-b. Stream and Riparian Credit Factors Worksheet Cont.

FACTORS	Reach 3 /Side A	Reach 3 /Side B	Reach 4 /Side A	Reach 4 /Side B
a Buffer Width	0.00	0.00	0.00	0.00
b Remove Disturbance to Riparian Buffer	0.00	0.00	0.00	0.00
c Fence around Buffer	0.00	0.00	0.00	0.00
d Re-vegetate Riparian Buffer	0.00	0.00	0.00	0.00
e Micro Topography in Floodplain	0.00	0.00	0.00	0.00
f Addition of Woody Debris in Floodplain	0.00	0.00	0.00	0.00
g Management of Invasive Species	0.00	0.10	0.00	0.00
h Removal of Riprap below ordinary High Water	0.00	0.00	0.00	0.00
i Removal of Floodplain Fill (Berms or Impervious Materials)	0.00	0.00	0.00	0.00
j Restoration of Channel Morphology	0.00	0.00	0.00	0.00
Total Sum of Factors (SF _m) a-j	0.00	0.10	0.00	0.00
Linear Feet Impact* (LF _m)	0.00	0.00	0.00	0.00
SF _m x LF _m	0.00	0.00	0.00	0.00

FACTORS	Reach 5 /Side A	Reach 5 /Side B	Reach 6 /Side A	Reach 6 /Side B
a Buffer Width	0.00	0.00	0.00	0.00
b Remove Disturbance to Riparian Buffer	0.00	0.00	0.00	0.00
c Fence around Buffer	0.00	0.00	0.00	0.00
d Re-vegetate Riparian Buffer	0.00	0.00	0.00	0.00
e Micro Topography in Floodplain	0.00	0.00	0.00	0.00
f Addition of Woody Debris in Floodplain	0.00	0.00	0.00	0.00
g Management of Invasive Species	0.00	0.00	0.00	0.00
h Removal of Riprap below ordinary High Water	0.00	0.00	0.00	0.00
i Removal of Floodplain Fill (Berms or Impervious Materials)	0.00	0.00	0.00	0.00
j Restoration of Channel Morphology	0.00	0.00	0.00	0.00
Total Sum of Factors (SF _m) a-j	0.00	0.00	0.00	0.00
Linear Feet Impact* (LF _m)	0.00	0.00	0.00	0.00
SF _m x LF _m	0.00	0.00	0.00	0.00

Credits

Table 2-b. Stream and Riparian Credit Factors Worksheet Cont. 2

FACTORS		Reach 7 /Side A	Reach 7 /Side B	Reach 8 /Side A	Reach 8 /Side B
a	Buffer Width	0.00	0.00	0.00	0.00
b	Remove Disturbance to Riparian Buffer	0.00	0.00	0.00	0.00
c	Fence around Buffer	0.00	0.00	0.00	0.00
d	Re-vegetate Riparian Buffer	0.00	0.00	0.00	0.00
e	Micro Topography in Floodplain	0.00	0.00	0.00	0.00
f	Addition of Woody Debris in Floodplain	0.00	0.00	0.00	0.00
g	Management of Invasive Species	0.00	0.00	0.00	0.00
h	Removal of Riprap below ordinary High Water	0.00	0.00	0.00	0.00
i	Removal of Floodplain Fill (Berms or Impervious Materials)	0.00	0.00	0.00	0.00
j	Restoration of Channel Morphology	0.00	0.00	0.00	0.00
Total Sum of Factors (SF _m) a-j		0.00	0.00	0.00	0.00
Linear Feet Impact* (LF _m)		0.00	0.00	0.00	0.00
SF _m x LF _m		0.00	0.00	0.00	0.00

FACTORS		Reach 9 /Side A	Reach 9 /Side B	Reach 10 /Side A	Reach 10 /Side B
a	Buffer Width	0.00	0.00	0.00	0.00
b	Remove Disturbance to Riparian Buffer	0.00	0.00	0.00	0.00
c	Fence around Buffer	0.00	0.00	0.00	0.00
d	Re-vegetate Riparian Buffer	0.00	0.00	0.00	0.00
e	Micro Topography in Floodplain	0.00	0.00	0.00	0.00
f	Addition of Woody Debris in Floodplain	0.00	0.00	0.00	0.00
g	Management of Invasive Species	0.00	0.00	0.00	0.00
h	Removal of Riprap below ordinary High Water	0.00	0.00	0.00	0.00
i	Removal of Floodplain Fill (Berms or Impervious Materials)	0.00	0.00	0.00	0.00
j	Restoration of Channel Morphology	0.00	0.00	0.00	0.00
Total Sum of Factors (SF _m) a-j		0.00	0.00	0.00	0.00
Linear Feet Impact* (LF _m)		0.00	0.00	0.00	0.00
SF _m x LF _m		0.00	0.00	0.00	0.00

Credits

Table 2-b. Stream and Riparian Credit Factors Worksheet Cont. 3

FACTORS	Reach 11 /Side A	Reach 11 /Side B	Reach 12 /Side A	Reach 12 /Side B
a Buffer Width	0.00	0.00	0.00	0.00
b Remove Disturbance to Riparian Buffer	0.00	0.00	0.00	0.00
c Fence around Buffer	0.00	0.00	0.00	0.00
d Re-vegetate Riparian Buffer	0.00	0.00	0.00	0.00
e Micro Topography in Floodplain	0.00	0.00	0.00	0.00
f Addition of Woody Debris in Floodplain	0.00	0.00	0.00	0.00
g Management of Invasive Species	0.00	0.00	0.00	0.00
h Removal of Riprap below ordinary High Water	0.00	0.00	0.00	0.00
i Removal of Floodplain Fill (Berms or Impervious Materials)	0.00	0.00	0.00	0.00
j Restoration of Channel Morphology	0.00	0.00	0.00	0.00
Total Sum of Factors (SF _m) a-j	0.00	0.00	0.00	0.00
Linear Feet Impact* (LF _m)	0.00	0.00	0.00	0.00
SF _m x LF _m	0.00	0.00	0.00	0.00

Total Riparian Credits = Σ (SF_m x LF_m x RM) = 3,750.00

Credits

Table 3. Mitigation Summary Worksheet

Project Name: Lothspeich Yellowstone River Bank Stabilization

Corps # NWO-2012-02901-MTB

	Debits	Linear Ft	Total Debits
A	3,537.75	890.00	= Stream and Riparian Debits
	Credit	Linear Ft	Total Credits
B	3,750.00	1,500.00	=Stream and Riparian Credits

TRUE	Proposed Stream and Riparian Credits \geq Debits (B \geq A)
-------------	--