IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF WYOMING

UNITED STATES OF AMERICA, Plaintiff, NORTHERN ARAPAHO TRIBE and EASTERN SHOSHONE TRIBE, Plaintiff-Intervenors, v. JOHN HUBENKA et al. Defendants.	)	Civil Action No. 10-cv-0093-ABJ

ORDER AMENDING MEMORANDUM OPINION FILED OCTOBER 22, 2014

This matter comes before the Court on the parties' Joint Motion for Order Amending Memorandum Opinion filed October 22, 2014, and the Court's Judgment entered October 22, 2014. The Court is fully advised on the basis for the motion, and grants the motion. The granting of the parties' Motion for Order Amending Memorandum Opinion and the issuance of this Order result in no change to this Court's Findings of Fact set forth in paragraphs 1 through 71 (pages 2-31) of its Memorandum Opinion Stating Findings of Fact and Conclusions of Law (Dkt. # 250). The granting of the parties' Motion for Order Amending Memorandum Opinion and the issuance of this Order result in no change to the Court's Conclusions of Law set forth in paragraphs 1 through 50 (pages 31-50) of its Memorandum Opinion Stating Findings of Fact and

Conclusions of Law. By this Order, the Court vacates the portion of its Conclusions of Law set forth in paragraphs 51 through 54 (pages 50-51) and vacates its order set forth in paragraphs 1 through 4 (pages 51-52) of its Memorandum Opinion Stating Findings of Fact and Conclusions of Law, and it is hereby

ORDERED AS FOLLOWS:

1. LeClair Irrigation District ("LeClair") and John Hubenka ("Hubenka") are responsible for performing restoration activities on the Wind River in accordance with the "Restoration Framework to Remediate the Damage to the Wind River in Riverview Valley, Wyoming Caused by the Clean Water Act Violations of John Hubenka and the LeClair Irrigation District" (the "Restoration Framework") associated with Dike #1.
2. Hubenka is solely responsible for performing restoration activities on the Wind River in accordance with the Restoration Framework associated with Dikes # 2, 3 and 4.
3. The Restoration Framework, dated March 30, 2016, refines design standards necessary to achieve the restoration objectives set forth in the Skates report (NAT Ex. 2095) for Dike #1, for removal of Dikes #2, 3, and 4, and certain other restoration activities. A copy of the Restoration Framework is attached to this Order as Appendix A and incorporated by this reference.
4. LeClair shall satisfy its responsibility for performing restoration activities on the Wind River in accordance with the Restoration Framework through a monetary payment by LeClair's insurer, Diamond State Insurance Company, for the performance of

restoration activities associated with Dike #1 and the satisfactory completion of those restoration activities in accordance with paragraph 5 below.

5. The Northern Arapaho Tribe has agreed to undertake the performance of the restoration work associated with Dike #1 as set forth in the Restoration Framework, including the construction of a rock revetment to restore the right bank alignment of the Wind River and restoration of channel profile, geometry, and historic flow in the north channel.
6. The Northern Arapaho Tribe must complete restoration activities associated with Dike #1 on or before December 15, 2016. If environmental conditions make it impractical to meet this deadline, the Northern Arapaho Tribe can request an extension from the Court.
7. The Northern Arapaho Tribe will contract with a contractor approved by the EPA and the Corps to construct all restoration activities associated with Dike #1 as set forth in the Restoration Framework.
8. In consultation with the Tribal Water Engineer ("TWE"), the EPA and the Corps shall provide supervision and oversight of the Northern Arapaho Tribe's performance of its restoration activities associated with Dike #1, as the EPA and the Corps believe appropriate, and shall determine successful completion of the restoration activities and compliance with the Restoration Framework. The Northern Arapaho Tribe shall provide written notice to the TWE, the EPA, the Corps, and LeClair at least five business days before starting on-the-ground restoration activities.

9. The Northern Arapaho Tribe shall require its contractor to obtain a performance bond to ensure the contractor's satisfactory completion of the restoration work in accordance with the Restoration Framework associated with Dike #1. The surety company issuing the bond shall be listed on the Department of Treasury's Circular 570. The United States, LeClair, and the Eastern Shoshone Tribe shall be named as additional insureds under the performance bond.

10. The construction, monitoring and maintenance activities undertaken in furtherance of the Restoration Framework and all related activities shall be performed by the Northern Arapaho Tribe, the Eastern Shoshone Tribe and the United States through the five year monitoring period in a manner that avoids any impairment or damage to the integrity of LeClair's facilities, including but not limited to its diversion dam, head gate, canal and appurtenant facilities, and shall not compromise LeClair's ability to use, maintain and protect those facilities. The Northern Arapaho Tribe and its contractor(s) will perform the work called for by the Restoration Framework, and all related activities in a workmanlike manner. Except as provided in Paragraph 4, LeClair will not have any responsibility or liability for any cost, expense, or third-party claims arising out of or relating to the construction, monitoring, maintenance or performance of the restoration work performed in furtherance of the Restoration Framework. The Restoration Framework is not intended to warranty against or alleviate the risks that the Wind River has historically posed to LeClair facilities, including but not limited to its diversion dam, head gate, canal, and appurtenant facilities, nor is it intended to exacerbate those

risks. The Restoration Framework also is not intended to warranty against or cure any existing defects in these facilities.

11. At the conclusion of the construction, monitoring and maintenance called for in the Restoration Framework, the Northern Arapaho Tribe shall provide a notice of completion to the EPA, the Corps, the Eastern Shoshone Tribe and LeClair.

12. Monitoring and maintenance of the restoration work associated with Dike #1 shall occur for a period of five years, through December 15, 2021, in accordance with the Restoration Framework. The Northern Arapaho Tribe shall be responsible for all costs and expenses incurred in connection with this monitoring and maintenance. The Northern Arapaho Tribe will deposit $150,000 in a segregated account that it shall establish and that shall be used solely for the purpose of funding all necessary monitoring and maintenance activities associated with Dike #1.

13. No civil penalty is imposed upon LeClair as a result of its responsibility for Hubenka's violations of the Clean Water Act adjudicated in this case.

14. After the Northern Arapaho Tribe has satisfactorily completed the restoration work associated with Dike #1 in accordance with the Restoration Framework, as determined by the EPA and the Corps, and in consultation with the TWE (not including post-construction monitoring and maintenance), LeClair and Hubenka shall have no obligation to perform any additional restoration work, monitoring, or maintenance associated with Dike #1 arising from the violations of the Clean Water Act adjudicated in this case. LeClair or its insurer, Diamond State Insurance Company, shall not be

required to make additional payments or otherwise additionally contribute to the costs for performing the restoration activities associated with Dike #1. The United States will file a notice notifying the Court of the United States' determination that the restoration activities associated with Dike #1, not including post-construction monitoring and maintenance, have been satisfactorily completed.

15. Hubenka shall remove Dikes #2, 3, and 4 in accordance with the Restoration Framework on or before December 15, 2016.

16. Hubenka's restoration activities must be undertaken and performed pursuant to the direction, supervision and oversight of the EPA, the Corps, and the Tribes, as they believe to be appropriate. Hubenka shall provide written notice to the EPA, the Corps, and the Tribes at least five business days before starting on-the-ground restoration activities.

17. Hubenka shall obtain a performance bond to ensure the contractor's satisfactory completion of the restoration work in accordance with the Restoration Framework. The surety company issuing the bond shall be listed on the Department of Treasury's Circular 570. The United States, LeClair, the Northern Arapaho Tribe, and the Eastern Shoshone Tribe shall be named as additional insureds under the performance bond.

18. After Hubenka has satisfactorily completed the restoration work associated with Dikes #2, 3, and 4 in accordance with the Restoration Framework, as determined by the EPA and the Corps, Hubenka shall have no obligation to perform any additional restoration work, monitoring, or maintenance associated with Dikes # 2, 3, and 4 arising from his

violations of the Clean Water Act adjudicated in this case. The United States will file a notice notifying the Court of the United States' determination that the restoration activities associated with Dikes #2, 3, and 4 have been satisfactorily completed.

19. Nationwide Permit 32, published at 77 Fed. Reg. 10,184, 10,277 (Feb. 21, 2012), authorizes discharges of dredged or fill material undertaken for mitigation, restoration, or environmental benefit in accordance with terms of a final Federal court decision. Any such discharges of dredged or fill material necessary for completion of restoration activities associated with Dikes #1, 2, 3, and 4 required by this Order shall be subject to terms and conditions of Nationwide Permit 32.

20. The Northern Arapaho Tribe intends to perform the restoration work associated with the Wind River floodplain as set forth on Sheet 5 of the Restoration Framework. Discharges of dredged or fill material undertaken for the purpose of environmental restoration as shown on Sheet 5 of the Restoration Framework have been authorized by the Corps under Nationwide Permit 27, published at 77 Fed. Reg. at 10,275. LeClair and Hubenka will not have any responsibility or liability for any cost, expense, loss, or consequential damage arising out of or relating to construction or maintenance of the restoration work shown on Sheet 5 of the Restoration Framework and performed by the Northern Arapaho Tribe.

21. The Northern Arapaho Tribe has obtained permits required by the TWE to complete the restoration activities required by this Order that the Tribe will perform. Such permits are attached herewith as Appendix B. Hubenka shall obtain permits required by the

TWE to complete the restoration activities required by this Order that Hubenka will perform.

22. A penalty is hereby imposed on Hubenka in the amount of $42,500, which, upon satisfactory completion of all restoration obligations imposed herein, verified by the government through the Corps, shall be reduced to $4,250. A penalty payment in the amount of $4,250 shall be paid within 30 days of the entry of this order. A penalty payment in the amount of $38,250 shall be paid by December 31, 2016, if Hubenka does not satisfactorily complete all restoration obligations imposed herein by December 15, 2016. Hubenka shall make his penalty payment(s) by FedWire Electronic Funds Transfer ("EFT" or wire transfer) to the U.S. Department of Justice account in accordance with current electronic funds transfer procedures, referencing U.S.A.O. file number 2010V000042, EPA Region 8 and the DOJ case number 90-5-1-1-18408. Payment shall be made in accordance with instructions provided to Hubenka by the Financial Litigation Unit of the United States Attorney's Office for the District of Wyoming.

23. Hubenka, LeClair, and their respective agents, assigns and successors are permanently enjoined from violating the Clean Water Act in this or any other segment of the Wind River.

24. During construction of the restoration work and until expiration of the five year monitoring period of the Restoration Framework, the United States, the Northern Arapaho Tribe, the Eastern Shoshone Tribe, and their authorized representatives and contractors shall have authority at all reasonable times upon prior notice to LeClair and Hubenka to reasonable access across LeClair and Hubenka properties (including Slack Farms LLC) to the areas associated with restoration work relating to Dikes #1, 2, 3, and 4 and the Restoration Framework in order to perform the activities required by this Order and monitor the activities required by this Order, verify any data or information submitted to the United States, and inspect and evaluate the restoration work required by this Order. When giving notice, the United States or the Northern Arapaho Tribe shall at the same time provide LeClair, Hubenka, and the Eastern Shoshone Tribe with the names and contact information of any authorized representatives and contractors.
25. During construction of the restoration work and until expiration of the five year monitoring period of the Restoration Framework, all parties shall cooperate in good faith and do nothing to impede or frustrate the performance of any requirements of this Order.
26. This Court shall retain jurisdiction over this action in order to enforce or modify this Order consistent with applicable law or to resolve all disputes arising hereunder as may be necessary or appropriate for construction or execution of this Order. During the

pendency of this Order, any party may apply to the Court for any relief necessary to construe and effectuate the Order.

IT IS SO ORDERED.

Dated and entered this _____ day of _____, 2016.

_____
ALAN B. JOHNSON
United States District Judge

ORDER AMENDING MEMORANDUM OPINION FILED OCTOBER 22, 2014

APPENDIX A – RESTORATION FRAMEWORK

RESTORATION FRAMEWORK

TO REMEDIATE THE DAMAGE TO THE

WIND RIVER IN RIVERVIEW VALLEY, WYOMING

CAUSED BY THE CLEAN WATER ACT VIOLATIONS OF

JOHN HUBENKA AND THE LECLAIR IRRIGATION DISTRICT

March 30, 2016

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RESTORATION FRAMEWORK

TO REMEDIATE THE DAMAGE TO THE

WIND RIVER IN RIVERVIEW VALLEY, WYOMING

PROJECT AREA

The project area is located approximately 3.5 miles south and east of Kinnear, in Fremont County, Wyoming (T2N R2E Sections 32 and 33; T1N R2E Sections 3 and 4; Sheet 1) in and adjacent to the Wind River.

RESTORATION APPROACH

Natural Channel Design (NCD), a standard approach to river restoration, is based upon the principle that channel form is dictated by hydrologic regime, sediment supply, and boundary conditions. Three components of NCD include development of restoration treatments using analogue, empirical, and analytical techniques. Analogue approaches rely on proximate or historical channel conditions as a reference from which a design is mirrored. Empirical approaches use mathematical relationships correlating channel form to independent variables derived from field observations at multiple locations. Analytical approaches use hydraulic models, sediment transport analyses, and mathematical calculations to derive stable channel design based upon independent input variables. There are advantages, disadvantages, and critical assumptions associated with each design approach. Due to the inherent limitations associated with applying a single approach, it is beneficial to use aspects of each approach during the river restoration process. The following materials present project objectives, available site data, and conceptual restoration treatments developed using analogue, empirical, and analytical techniques.

GOALS AND OBJECTIVES

The goal of the Wind River restoration effort is to attain compliance with the U.S. District Court Memorandum Opinion of October 22, 2014, as amended, which identifies the following specific objectives[1]:

1) Remove Dikes 1, 2, 3 and 4;
2) Return the river to the historic northern channel alignment;
3) Restore floodplain ecology along the North Channel under bankfull flow conditions;
4) Return the river to a natural stable channel condition; and
5) Restore land lost to the Tribes following construction of Dike 1.

[1] Presented objectives only address the requirements of the US District Court Opinion and do not address the entire scope of ecological and fluvial system degradation that occurred as a result of the unlawful dike building completed by John Hubenka and the LeClair Irrigation District.

HYDROLOGIC REGIME

Initial hydrologic investigations completed by Biota Research and Consulting, Inc. in 2011 were associated with identification of bankfull discharge, which is the design discharge that informs restoration plan development. Bankfull discharge is the flow rate (and bankfull stage is the corresponding water surface elevation) at which instream water escapes the active channel and inundates the floodplain, or the point at which incipient flooding occurs. Suitable restoration treatments should achieve channel capacity that conveys the bankfull discharge and achieves floodplain connectivity when flows exceed that rate.

The U.S. Geological Survey (USGS) maintains a stream flow gauging station (#06227600) in the Wind River near Kinnear, located 3.5 miles upstream of the project area. The gauge site has a 30 year period of record (1974 to the present except for 1980-1990) consisting of recorded instantaneous discharge and annual peak flows. There are no inputs or withdrawals to the Wind River large enough to significantly influence peak flow conditions between the USGS gauge and the project area, so peak flow conditions recorded at the USGS gauge location are assumed to accurately represent conditions within the project area. Flow data recorded at the USGS site were obtained and used during statistical analysis to generate peak flow recurrence intervals within the project area (Figure 1). A Log Pearson Type III Distribution analysis was completed to identify large magnitude peak flow return intervals (Table 1).

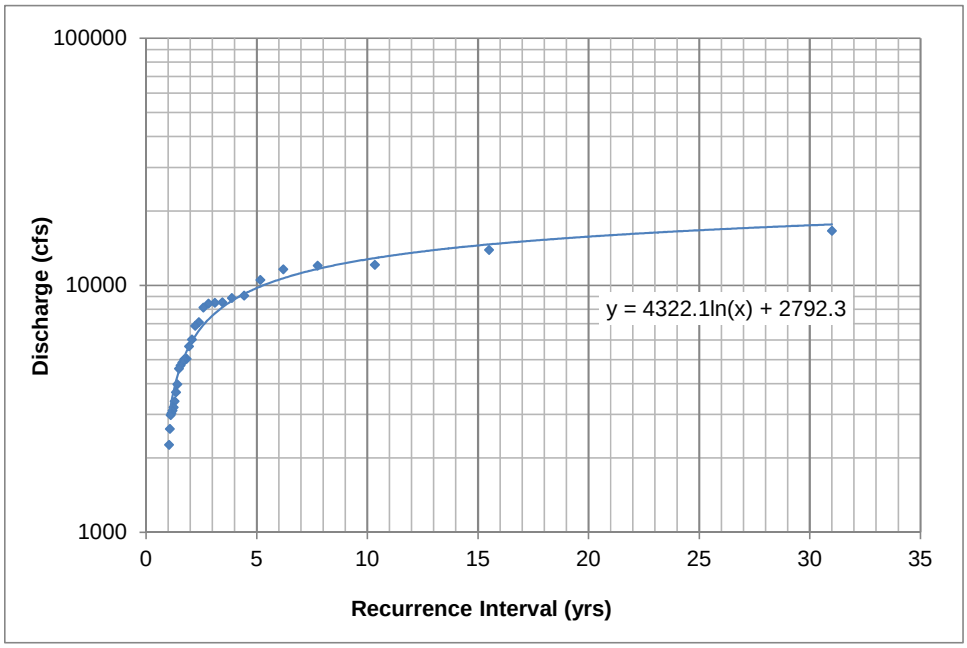


Figure 1. Recurrence interval of peak flows recorded at the USGS Wind River gauging station near Kinnear, Wyoming, 1974-2013.

Table 1. Log Pearson Type III Distribution analysis of peak flow recurrence interval at the USGS Wind River gauging station near Kinnear, Wyoming, 1974-2014.

Return Interval (yrs)	Peak Flow (cfs)
1.01	1,629
1.25	3,715
2	5,929
5	9,462
10	12,078
25	15,668
50	18,535
100	21,577

Natural variability in bankfull discharge recurrence interval between sites precludes exact calculation of bankfull discharge solely from the recurrence interval of an instantaneous peak discharge. However, professional experience in the region suggests that a reasonable estimation of bankfull discharge recurrence interval is 1.3-1.5 years, which corresponds to a bankfull discharge within the channel assessment area of 3,926 to 4,545 cubic feet per second (cfs) based upon the Kinnear gauging station peak flow data.

The initial estimation of bankfull discharge (based on recurrence interval) was refined using morphologic data collected within the Wind River channel at the Kinnear gauging station and in the abandoned historic northern channel alignment in the project area. The morphologic survey data documented riffle geometry and channel profile including thalweg elevation, water surface elevation, and elevation of field identified bankfull indicators such as depositional features, breaks in stream bank slope, perennial vegetation extents, and floodplain boundaries. At the USGS gauge site, surveyed bankfull indicators were translated to the USGS gauge vertical datum in order to quantify bankfull discharge based upon the current gauge site rating table. In the historic northern channel alignment, hydraulic modeling of open channel flow conditions was completed to calculate bankfull discharge using several methods of determining channel roughness. The various analysis techniques produce similar results (Table 2), and the USGS gauge site analysis result of 4,400 cfs is selected as the project bankfull (design) discharge.

Table 2. Bankfull discharge as determined through multiple hydraulic analyses, Wind River project area, Riverview Valley, Wyoming.

Analysis Technique	Bankfull Estimation (cfs)
Statistical Analyses, USGS Gauge Data	
USGS Gauge Record, 1.3 Year Recurrence Interval	3,926
USGS Gauge Record, 1.5 Year Recurrence Interval	4,545
Hydraulic Analyses, Abandoned Northern Channel	
Relative Roughness	3,414
Relative Roughness-Friction Factor Empirical Relation	4,517
Stream Type-Roughness Empirical Relation	4,663
Average	4,198
Hydraulic Analyses, USGS Gauge Site	
Channel Morphology and USGS Gauge Rating	4,400

Flow duration characteristics within the project area were investigated in order to provide hydrologic information pertinent to sediment transport capacity, instream flow variability, aquatic habitat, and hydraulic conditions. A flow duration curve was compiled using mean daily discharge data, or flow rate averaged across each 24-hour day from the USGS gauge, from all complete years of record. The LeClair Irrigation Ditch diversion located at the upstream end of the project area may influence the low flow spectrum of the compiled flow duration curve. However, analyses outlined herein apply the flow duration curve primarily to the assessment of sediment transport. The majority of sediment transport occurs during peak flow conditions, so the influence of the LeClair ditch on low flow conditions is not pertinent to these analyses. The mean daily discharge flow duration curve generated from data collected at the Kinnear gauging station is presented in Figure 2.

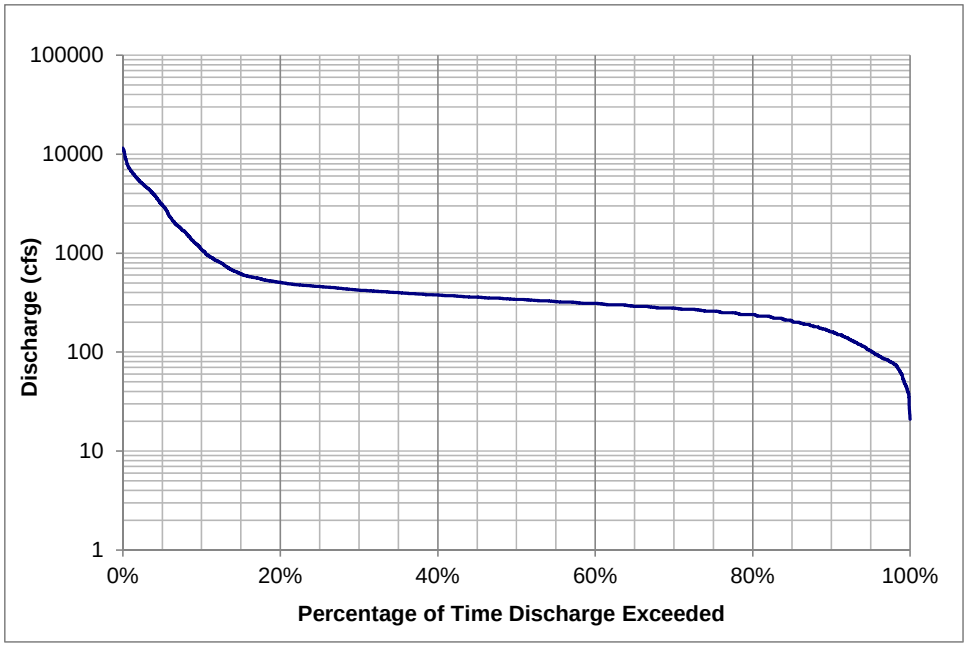


Figure 2. Mean daily discharge flow duration curve, USGS Wind River gauge near Kinnear, Wyoming.

CHANNEL MORPHOLOGY

Quantification of existing channel morphology within the project area was conducted in the fall of 2011. A detailed morphologic channel survey was performed using professional-grade GPS equipment and standard stream channel morphological survey techniques. The survey was conducted during a period of relatively low flows, and extended from above the site of Dike 1 downstream in the historic northern channel alignment for a distance of approximately 2.5 miles. The survey was conducted for the purpose of investigating the Dike 1 site and the northern channel geometry, and did not extend all the way to the sites of Dikes 2, 3, or 4. The survey did include measurement of channel morphology between Dikes 1 and 3, in areas not directly altered by the construction of dikes or establishment of the current southern channel alignment.

A longitudinal profile depicting thalweg, water surface, bankfull, and top of bank elevations reveals that the northern channel has a bankfull slope of 0.24% (Figure 3). The bankfull indicators correspond to the design (bankfull) flow rate and are located at the elevation of the adjacent historic floodplain, which is typical of a single thread channel morphology with hydraulically connected floodplain. Channel geometry was quantified through measurement of 10 cross sections within active riffle bed features located between

Dikes 1 and 3. Data were used to quantify bankfull channel cross sectional area, width-to-depth ratio, channel width, mean depth, and maximum depth.

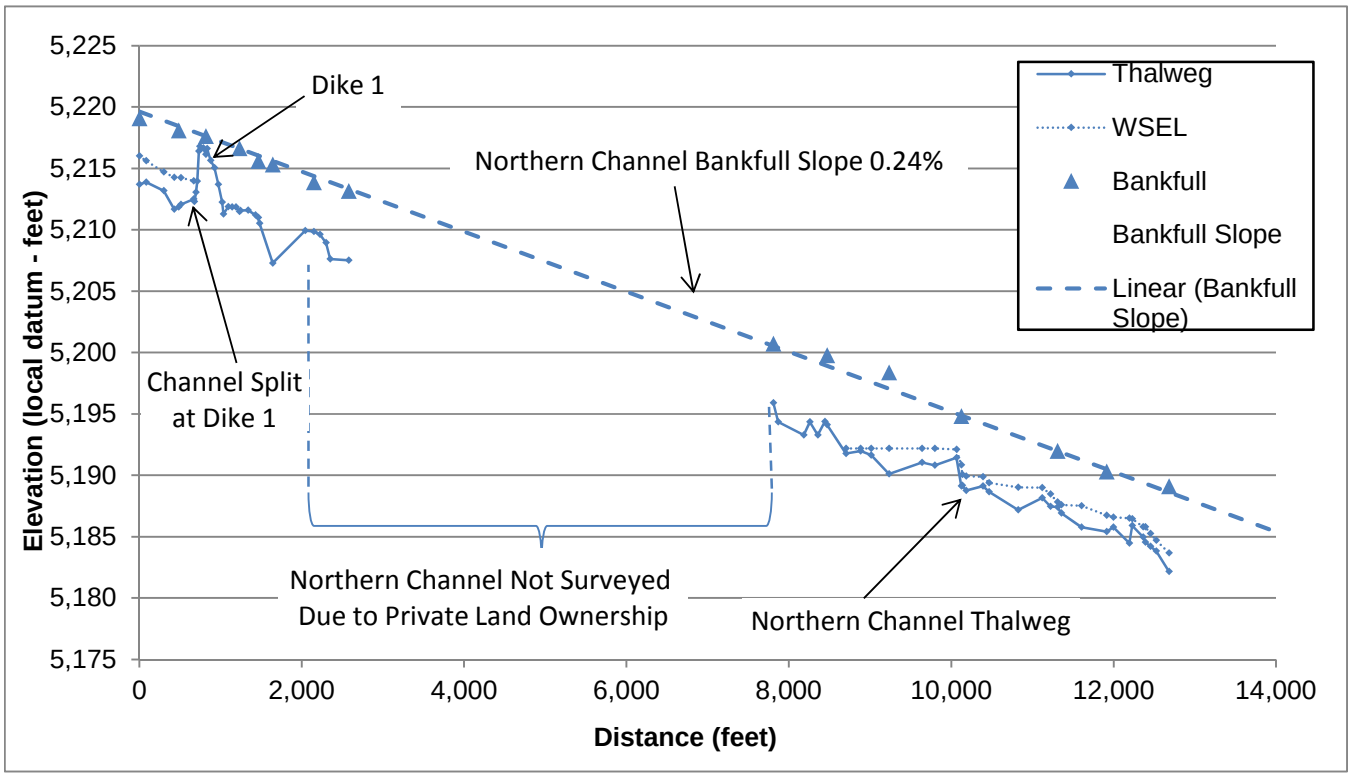


Figure 3. Longitudinal profile within the Wind River project area, Riverview Valley, Wyoming.

The sediment size class distribution of surface grains was measured in active riffle bed features using the Wolman Pebble Count method. Bed material particles were blindly selected at even intervals across transects oriented perpendicular to the bankfull channel upstream of the Dike 1 site. The results of the sediment sampling are presented in a bar graph histogram displaying the percentage of sample corresponding to standard size classes (sand, gravel, cobble) (Figure 4). The median (D_{50}) particle in the surface grains was measured at 68 mm, the D_{84} was 111 mm, and the D_{max} was 215 mm.

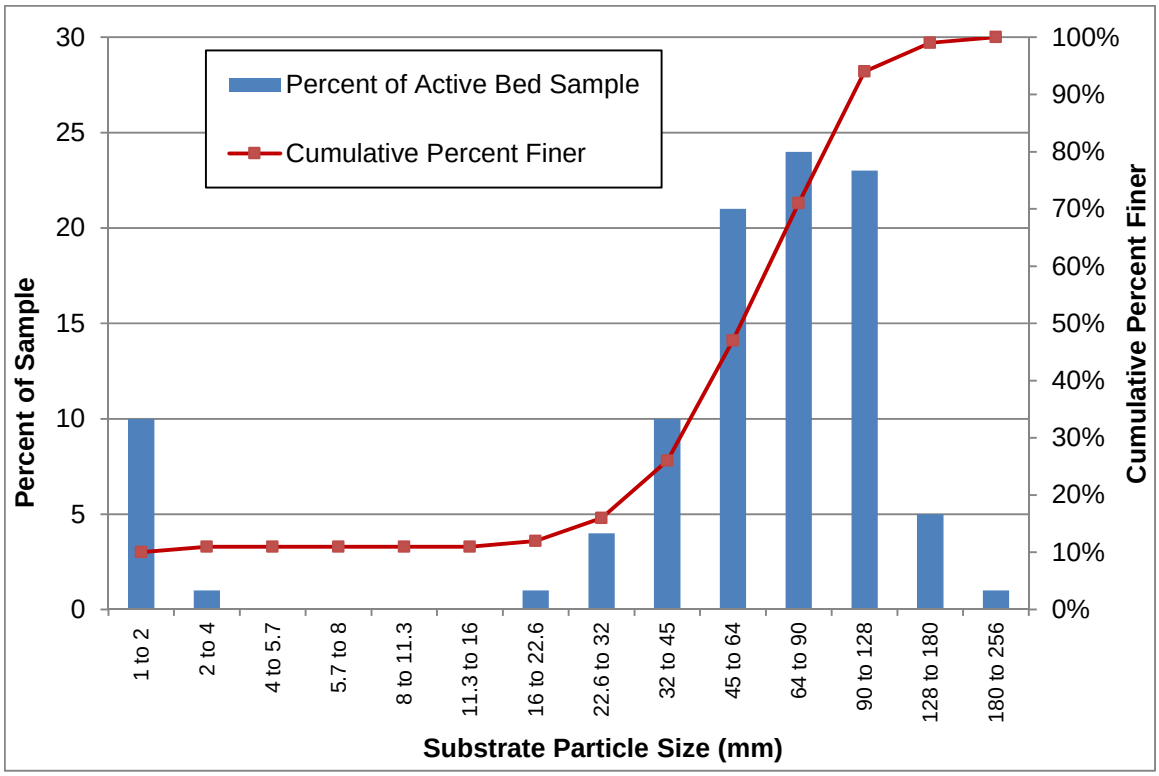


Figure 4. Sediment size class distribution Wind River project area, Riverview Valley, Wyoming.

RESTORATION TREATMENTS

A suite of restoration treatments has been generated to achieve project objectives by (1) removing illegally placed fill material, and (2) reconstructing appropriate channel form (width, depth, alignment) where dikes have caused sedimentation or impaired channel morphology (attached Sheets 1 to 3). Restoration treatments are generally designed to be implemented from downstream to upstream if the construction schedule and flow conditions allow sufficient time for sequencing. Primary treatments include removal of remnant dikes, excavation of sediment that was deposited as a result of dike persistence, and use of generated material to construct design channel morphology.

The longitudinal profile generated from the 2011 morphologic channel survey was extrapolated based upon river slope to identify design floodplain elevation at the locations of Dikes 3 and 4 (Figure 5). Design riffle geometry was developed based upon sub-reaches of the 2011 morphologic survey area that were identified as relatively stable and functional during field observation. These sub-reaches, utilized during restoration design as reference reaches, have average bankfull channel cross sectional area of 784 sq ft. The geometry of the sub-reach with lowest width/depth ratio was hydraulically scaled to achieve the design cross sectional area. This approach maintains the hydraulic geometry of the input reference reach while achieving cross sectional area typical of all reference conditions. The design channel geometry has bankfull area of 784 sq ft, bankfull width of 193 ft, mean depth of 4.1 ft, maximum depth of 5.8 ft, width/depth ratio of 48, and channel capacity of 4,400 cfs at the existing channel slope of 0.24% (Figure 6). The design riffle cross section can be shifted vertically to identify design channel invert elevations throughout the project area based upon local floodplain elevation.

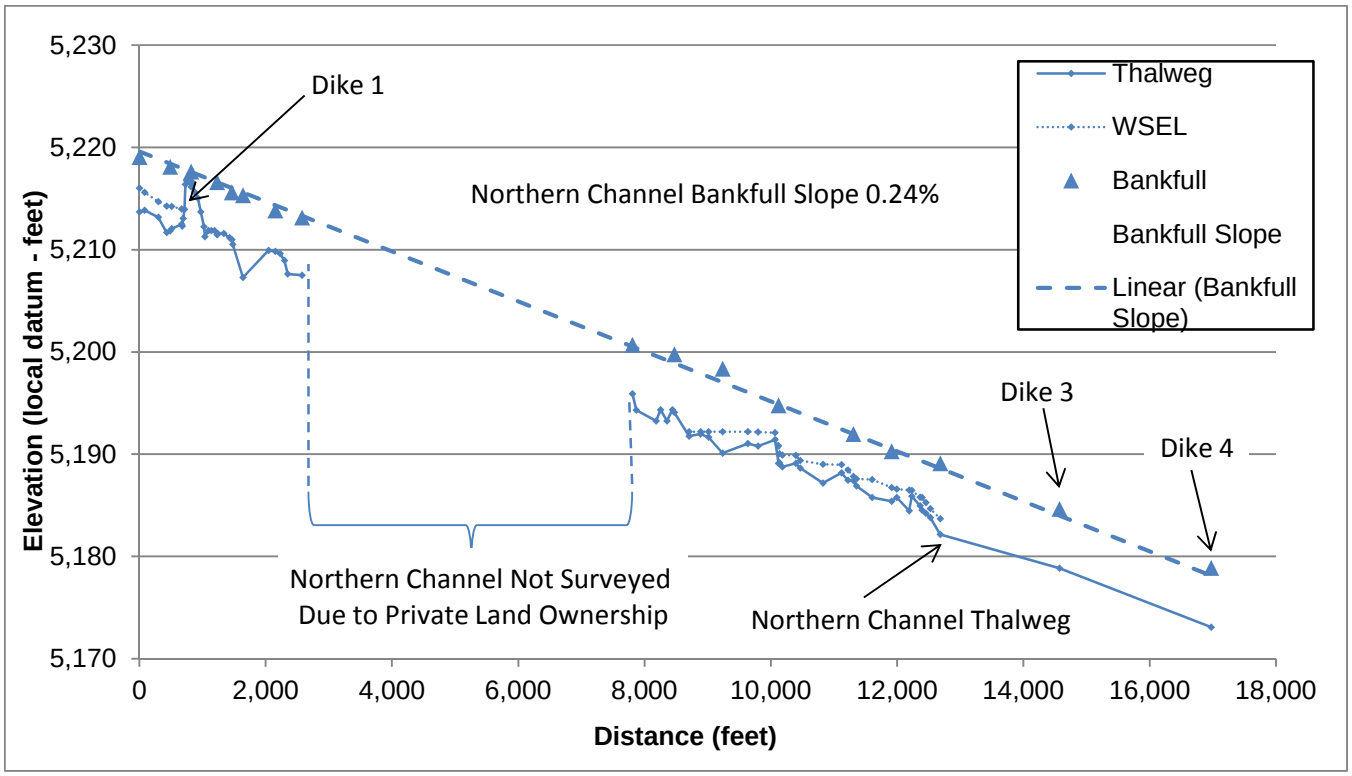


Figure 5. Longitudinal profile extrapolation to sites of Dikes 3 and 4 in the Wind River project area, Riverview Valley, Wyoming.

The design channel geometry and profile will result in bankfull shear stress of 0.61 lbs/feet^2. Resultant hydraulic conditions will be competent to mobilize stream bed particles with B-axis of 106 mm (the approximate D80 of the native alluvium) according to a modified Shields curve depicting the incipient motion of particles based upon empirical data. The design channel geometry has the same sediment transport capacity as the reference reach from which it was hydraulically scaled (which serves as the sediment supply reach for analysis purposes), so construction of the design channel form will achieve equilibrium in sediment transport competence and capacity.

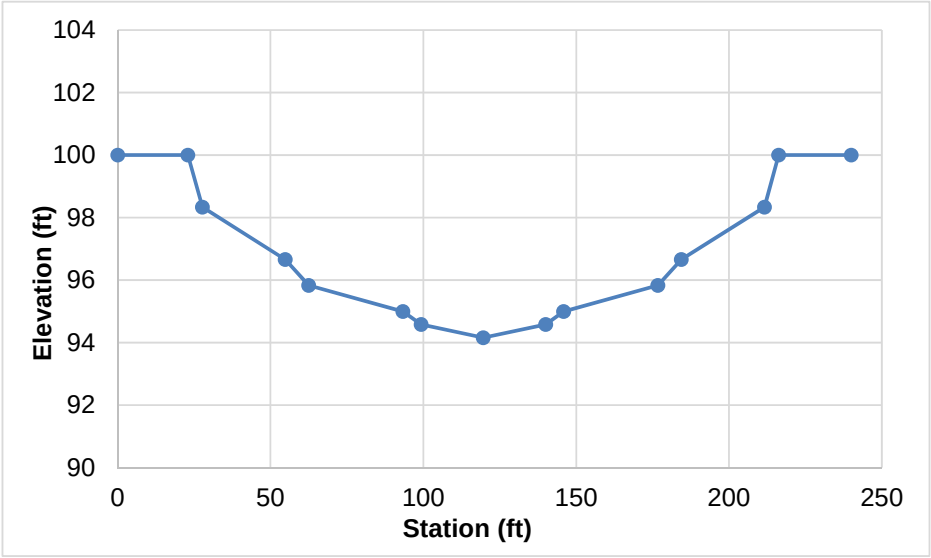


Figure 6. Design riffle geometry in the Wind River project area, Riverview Valley, Wyoming.

Dike 4 Treatment

Restoration activities should remove remaining material comprising Dike 4 and restore a flat floodplain at the design elevation. Data indicate that the design floodplain elevation at Dike 4 is 5,178.9 feet; this elevation should be confirmed in the field during project implementation. The dike is estimated to consist of 250 cy of alluvium; a survey completed by Apex Engineering in 2011 estimated the dike to be 5 feet tall, 37.2 feet wide at the base, and 9.3 feet wide at the top, and the remaining dike is estimated to be 58 feet long based upon 2013 aerial photography. Removed material could be disposed of in a proximate upland area located beyond the active (bankfull) floodplain, or the material could be hauled to the site of Dike 2 and stockpiled for subsequent use (dependent upon the desires of the landowner). Sedimentation and channel geometry (cross sectional attributes) in the reach of the Wind River influenced by Dike 4 should be assessed during project implementation, and the design channel geometry should be applied to identify areas where grading or excavation are needed to restore stable channel width and depth. Field staking and completion of channel grading activities should occur during project implementation.

Dike 3 Treatment

Restoration activities should remove remaining material comprising Dike 3 and restore a flat floodplain at the design elevation. Survey data indicate that the design floodplain elevation at Dike 3 is 5,184.7 feet; this elevation should be confirmed in the field during project implementation. A survey completed by Apex Engineering in 2011 estimated the dike volume to be about 820 cy. A portion of the Dike 3 material should be used to enlarge a point bar on the river left (north) bank upstream of the dike where channel width appears to be excessive. This treatment area should be verified and staked in the field during implementation. The point bar enlargement area need not be actively re-vegetated; frequent inundation and anticipated fine sediment deposition will result in natural recruitment of riparian vegetation that will reclaim the treatment area through a passive process. The remainder of the alluvium removed from Dike 3 should be placed within a designated alluvial fill treatment area.

A depositional bar has formed adjacent to the southern bank of the northern channel across from Dike 3 as a result of enlargement of the channel that currently connects the southern and northern river alignments. The depositional feature, with surface area of approximately 15,000 sq ft and estimated volume of 2,200 cy, should be removed by a tracked excavator (to enable scooping of material instead of pushing or pulling alluvial material below the ordinary high water mark), loaded into an off-road haul truck, and placed in a designated alluvial fill area in the connector channel or the southern channel proximate to Dike 2. This treatment should restore stable bed form across from Dike 3 where a pool bed feature would naturally be located in order to dissipate energy through hydraulic scour around the outside of the meander. The typical ratio of pool maximum depth to riffle mean depth in regional streams of similar form and setting to that of the Wind River is 3.0 (ranging from 2.5 to 3.5). These empirical data indicate that excavation should be completed to achieve a bankfull pool depth of approximately 12 feet at this treatment location; this elevation should be confirmed and staked in the field during project implementation.

Sedimentation and existing channel geometry (cross sectional attributes) in the reach of the Wind River influenced by Dike 3 should be assessed during project implementation, and the design channel geometry should be applied to identify areas where grading or excavation are needed to restore stable channel width and depth. Field staking and completion of channel grading activities should occur during project implementation.

Dike 2 Treatment

A broad alluvial bar is evident in the 1994 aerial photography adjacent to the current location of Dike 2. That historic channel form appears to have directed surface water in the southern channel to the northern (primary Wind River) channel. The persistence of Dikes 1 and 2 resulted in direct alteration of this configuration because the conveyance of peak flows past the southern side of Dike 2 caused enlargement and down-cutting of the southern channel. The 2011 morphologic survey data indicate that the surveyed reach of the southern channel is lower than the northern channel, and that the cross sectional area of the southern channel is approximately 20% larger than that of the northern channel. These conditions result in a likelihood that surface water conveyed in the northern channel to the vicinity of Dikes 2 and 3 would return to the southern channel via the existing connector channel if the enlarged and lowered southern channel morphology is not corrected in conjunction with removal of Dike 2. A reasonable approach to address this issue would be to use alluvium generated during the removal of Dike 2 and other sources to elevate and re-contour a short reach of the southern channel adjacent to Dike 2.

Restoration activities should remove remaining material comprising Dike 2 and restore a flat bench within the dike footprint at the elevation of the adjacent vegetated floodplain. A survey completed by Apex Engineering in 2011 estimated the dike volume to be about 1,290 cy. This material, in addition to alluvium generated from other restoration activities should be used to fill, elevate, and re-contour the enlarged southern channel adjacent to Dike 2. Such grading activities would effectively restore the floodplain and functionality of the northern channel on an outside bend where the high bank height typically exceeds the bankfull elevation by one foot in meandering single channel rivers of similar size to that of the Wind River. Grading activities in the southern channel treatment area should therefore restore an elevation one foot above the bankfull elevation of the northern channel near Dike 3. The 2011 morphologic survey data indicate that the southern channel average cross sectional area is about 930 feet^2, so grading activities could restore local topography in an approximately 90-ft reach of the enlarged southern channel through placement of approximately 3,000 cy of alluvium.

Dike 1 Treatment

Morphologic survey data collected in 2011 proximate to Dike 1 indicate that the southern channel is lower in elevation than the historic northern channel and is moderately incised compared to the historic floodplain. Field observation of the site in November 2014 revealed that the northern channel inlet has filled with alluvium approximately to the adjacent historic floodplain elevation. Restoration of the historic northern channel alignment should therefore include establishment of the right bank alignment and excavation in the northern channel to restore channel profile and geometry.

Under the historical northern channel alignment, the river left (facing downstream) bank was on the inside of the meander at the location of the current channel split. Under the existing southern channel alignment, that river left bank is on the outside of the meander. The shift of the bank from the inside of a meander to the outside of a meander that occurred during the establishment and enlargement of the southern channel resulted in the northeasterly migration of the river proximate to the current channel split. The restoration of the right bank alignment across the southern channel and restoration of the left bank as an inside meander will, therefore, require some channel realignment to achieve appropriate planform.

Restoration of the Dike 1 area (attached Sheets 3 and 4) should include construction of a bank alignment that approximates the pre-violation location of the river right bank at the location. The design planform should achieve morphologic conditions reflective of empirical data, or morphologic conditions typical of regional river systems in similar settings, including the following:

- Flood-prone width (or the channel width plus the floodplain width) of at least 2.2 times the bankfull channel width;
- Riffle length of 2-3 times the bankfull channel width;
- Pool to pool spacing of 5-7 times the bankfull channel width; and
- Pool maximum depth of 2.5-3.5 times the bankfull mean depth of riffles.

Restoration activities should reconstruct the bankfull channel proximate to Dike 1 to restore the northern channel alignment under stable hydraulic conditions. Activities should include grading within an approximately 3,000-foot reach of the Wind River downstream of the diversion in order to construct a series of riffle and pool bed features with appropriate location based upon the design alignment and appropriate length based upon empirical data. Design riffle lengths should range from 390-580 feet, pool to pool spacing should range from 970-1,350 feet, and pool maximum depth should be approximately 12 feet.

Alluvium generated during restoration of the channel alignment should be used to re-establish the river right bank of the Wind River. A revetment constructed of angular rock and woody vegetation plantings should comprise the face of the bank. The top of the bank should incorporate a floodplain bench with width of 133 feet and elevation of 5,218.9 feet, which is one foot above the local bankfull elevation because it is on the outside of the meander. At the southern extent of the floodplain bench, the bank should gently slope up to reach a peak elevation of 5,220.9 feet. This upslope would ensure that floodwater depth, and shear stress on the bank, decrease toward the outer extent of the bank. Beyond the peak elevation, an approximately 45-foot long apron should slope down to existing grade in the southern channel at (5H to 1V). The width of the floodplain bench and peak elevation of the bank presented herein were designed to withstand the 10-year recurrent interval peak flow of 12,078 cfs in order to prevent anticipated flood waters from over-topping the bank and establishing head-cuts that could compromise the structure. The ratio of floodplain width to bankfull channel width achieved by the design presented herein is 2.2, which is the minimum value typical of similar C-type channels in regional fluvial systems. A typical design cross section through the river channel and revetment is presented in Figure 7.

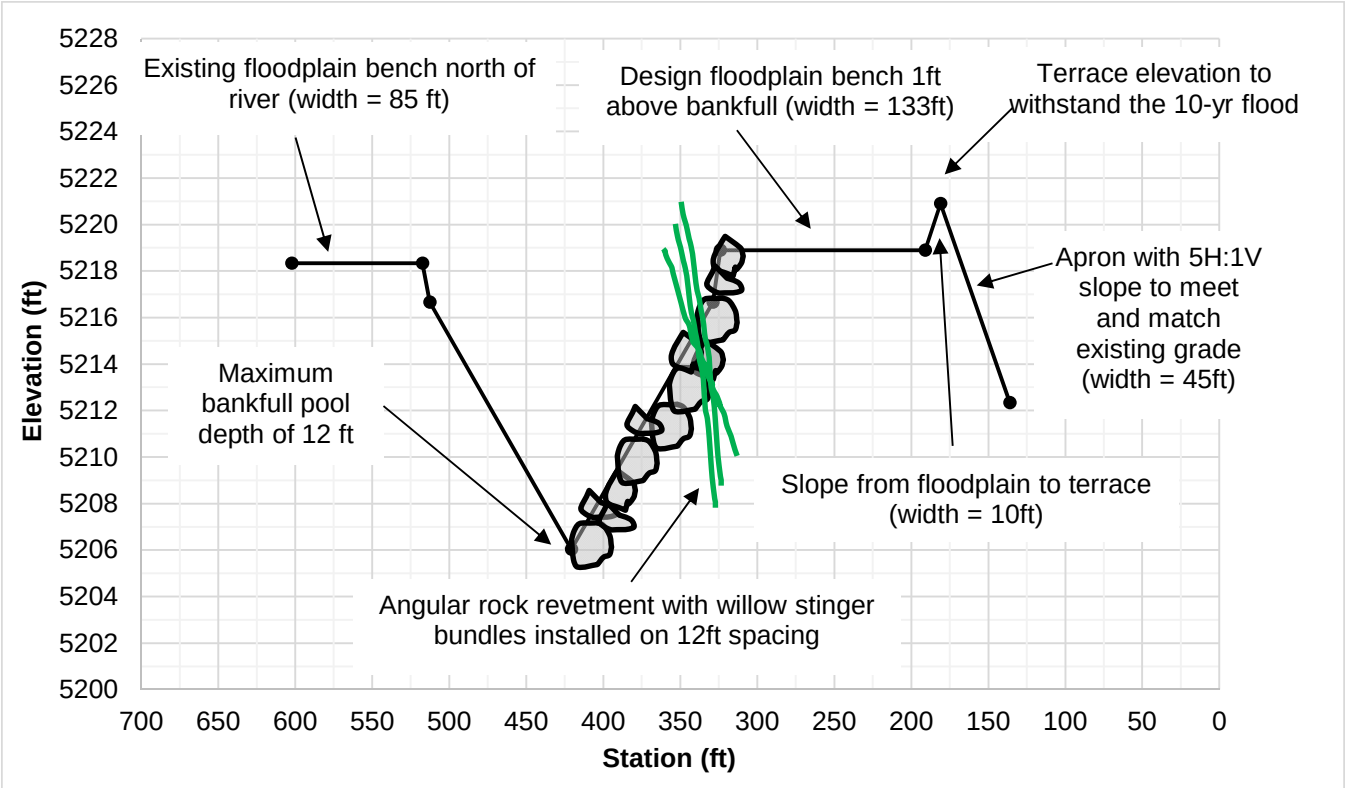


Figure 7. Typical design cross section through revetment, Wind River project area, Riverview Valley, Wyoming.

A preliminary rock revetment treatment was designed using multiple U.S. Army Corps of Engineers technical bulletins and methodologies that incorporated input parameters of design channel geometry, channel slope, meander pattern, mean and maximum channel depths, flow velocity, and radius of curvature. The rock revetment should be installed along the entire length of the right bank, which extends approximately from the point of curvature at the upstream end to the point of tangency at the downstream end. The length of the revetment is estimated to be 740 feet, but should be confirmed and staked in the field during implementation. A factor of safety of 1.5 was applied to the revetment rock sizing because the treatment would protect a newly constructed river bank composed of recently placed unconsolidated alluvium. The revetment rock should have a median (D_{50}) size of 1.5 feet and appropriate gradation based upon local hydraulic conditions. A gravel or geotextile filter may be required depending on the size class distribution of the material used to construct the channel bank (the material underneath the rock revetment); the use of coarse alluvial fill instead of a fine sediment mixture may negate the need to incorporate an intermediate layer under the revetment. The rock revetment should extend from the adjacent floodplain bench elevation (1 foot above bankfull) down to a depth of 16 feet below the bankfull elevation. The installed revetment should have a horizontal to vertical slope of 2:1. Live woody vegetation bundles should be installed vertically within the revetment on 12-foot spacing, and bundle installation elevations should alternate between the bankfull elevation and 1 ft below bankfull.

PROJECT IMPLEMENTATION AND SEQUENCE

Construction quantities associated with the restoration design presented herein cannot be precisely calculated because conditions in the project area have changed since the last site survey conducted in 2011. Treatment quantities estimated based upon best available site survey data and professional experience are presented in Table 3. Restoration activities at the Dike 2, 3 and 4 project area should generate about the same volume of material needed to fill, elevate, and re-contour the southern channel,

but additional material could be collected from downstream point bars within the southern channel as needed. Restoration activities at the Dike 1 project area should require more fill than the depicted excavation treatments would generate. Proximate sources of additional needed material include in-channel deposition located upstream of the diversion dam or point bars located in the southern channel downstream of the restoration location.

Restoration activities should generally be implemented from downstream to upstream unless sequencing would cause unacceptable delay in achieving restoration objectives at Dike 1 either prior to runoff or to comply with a Court-imposed deadline. The most important consideration is to accomplish all restoration activities expeditiously during periods of low flow to minimize turbidity increases and environmental damage. For example, routing flow through the LeClair Canal at full capacity would facilitate completion of treatments at Dike 1 under dry conditions. Treatments at Dikes 3 and 4 should be implemented prior to full reactivation of the northern channel alignment at Dike 1. Removal of Dike 2 and initial grading of the alluvial point bar in the southern channel should be completed concurrent with treatments at Dikes 3 and 4 resulting in an "elevated point bar" restricting the channel width but without placement of alluvium in flowing water conditions. After treatments proximate to Dike 1 are completed and the northern channel alignment is reactivated, any additional work that is necessary to re-contour the southern channel near Dike 2 should occur by spreading alluvium stored on the elevated point bar.

Table 3. Estimated treatment quantities[2], Wind River project area, Riverview Valley, Wyoming.

Treatment Description	Cut Volume (cy)	Fill Volume (cy)
Dikes 2, 3 and 4 Project Areas		
Removal of Dike 4	250	--
Removal of Dike 3	820	--
Removal of Dike 2	1,290	--
Construct Design Channel Geometry Proximate to Dikes 3 and 4	unknown	--
Excavation of Gravel Bar, River Right, South of Dike 3	2,200	--
Alluvial Fill to Shape Point Bar, River Left, Upstream of Dike 3	--	150
Alluvial Fill to Shape Connector Channel	--	1,350
Fill, Elevate, Re-contour Southern Channel at Dike 2	--	3,060
Total	**4,560**	**4,560**
Dike 1 Project Area		
Construction of Southern Channel– Flat Floodplain Bench	--	7,900
Construction of Southern Channel– Terrace Slope	--	800
Construction of Southern Channel– Apron	--	2,700
Rock Revetment along Right Bank (Graded Angular Rock, 1.5ft D50)	--	2,280
Construct Design Channel Geometry (Station -575ft to 2,330ft)	38,415	13,240
Construction of River Left Alluvial Bar Upstream of Dike 1	--	10,500
Total	**~38,415**	**~37,420**

[2] Treatment quantities are estimates based upon best available information, and actual construction quantities may vary due to modification of conceptual treatments based upon evaluation of site conditions.

Bioengineering techniques including offset brush trenches, pole clusters, and stinger bundles should be collected onsite and utilized to revegetate the constructed floodplain bench and apron associated with the bank restoration at Dike 1 and the grading activities in the southern channel proximate to Dike 2. Harvest, preparation, and installation of live dormant cuttings should be done in accordance with the Natural Resources Conservation Service technical note, "How to Plant Willows and Cottonwoods for Riparian Restoration," found at http://www.nrcs.usda.gov/Internet/fse_plantmaterials/publications/idpmctn7064. The existing riparian community would provide high quality site-adapted material. Flexible-stem willows, such as *Salix exigua*, should be installed in the bank zone, and larger willows (e.g., *Salix lasiandra*) and cottonwoods should be installed in over-bank and transitional zones. Installed cuttings would provide immediate vegetative cover and hydraulic roughness that would facilitate future deposition of fine sediment during peak flow events, which would then enable subsequent recruitment of additional riparian vegetation. All cuttings should be installed to sufficient depth to reach the lowest water table of the year.

Disturbed upland and transitional areas will consist of equipment access routes, and equipment and material storage areas. Revegetation methods used to reclaim these areas should consist of broadcast seeding with a blend of endemic grass and forb species common to the area and sterile annual cereal grain. Seed should be lightly raked or harrowed and mulched with weed-free straw.

Project implementation should occur in an environmentally sensitive manner, and any incidental site disturbances should be reclaimed. Construction activities should be performed by a qualified contractor with experience completing work in fluvial conditions.

SUCCESS CRITERIA

Success criteria are used to quantify objectives and to determine if the restoration goals are achieved. In addition to assessing the specific restoration components identified below in POST-CONSTRUCTION MONITORING, the following criteria will be used to evaluate restoration success:

- Plant species, composition, and cover of bio-engineered and revegetated areas should be comparable to that of nearby, similarly-situated undisturbed areas.
- As compared to similarly-situated undisturbed areas, bio-engineered and revegetated areas must have relative vegetative cover of 25% the second-year, 50% the third year, 75% the fourth year, and 80% the fifth year of the monitoring period.
- Invasive and noxious species shall be limited to 10% or less of the total cover in the third, fourth, and fifth years of the monitoring period, or shall not exceed noxious species percent cover in similarly-situated undisturbed areas.

AS-BUILT CONDITIONS

An as-built report will be submitted to the Corps and the EPA within 45 days of completion of restoration activities, or as soon as flow conditions enable completion of post-construction surveying. The as-built report will include surveys of the constructed treatments, as well as surveys of the longitudinal profile of the thalweg of the North Channel upstream and downstream of Dike 1, from station -230 feet to station 2,330 feet, as depicted on Sheet 3. Cross-sectional surveys of this segment of the North Channel will also be done at channel stations -230 feet, 170 feet, 720 feet, 1,230 feet, 1,730 feet, and 2,330 feet as shown on Sheet 4. The cross sections will extend a sufficient distance beyond the bankfull elevation to allow evaluation of floodplain connectivity. At the Dike 2, 3, and 4 restoration areas, channel cross sections will be recorded at a representative location through the footprint of each dike. The as-built report also will include sufficient photographs taken before and after the work at permanent photo points established

before restoration activities begin that will document the work. The date, location, and direction of each photograph will be recorded. These photo points also will be used during the monitoring period.

POST-CONSTRUCTION MONITORING

Monitoring is a critical aspect of restoration and habitat enhancement projects because it enables project proponents to assess project success with respect to specific objectives. Based on the results of monitoring, adaptive management strategies can be employed in order to adjust project components to achieve ecological, fluvial, regulatory, or judicial objectives. Annual monitoring implemented in conjunction with Wind River restoration treatments should occur for a period of five years and include measures to assess stability and functionality of constructed treatments, capacity and hydraulics in the re-activated northern channel, floodplain connectivity at the bankfull discharge, establishment of bioengineering treatments, reclamation of disturbed areas and vegetative treatments, and the achievement of project objectives.

RIVER RESTORATION

The location of treatments designed to restore floodplain ecology on the banks of the North Channel (Sheet 5) are a component of efforts to restore the Wind River to the historical northern channel alignment, and are coincident with the location of the Heil Channel and associated dike. Existing alluvium that was used to construct the dike will be removed to re-establish a floodplain bench at the local bankfull elevation. Materials salvaged from the effort will be returned to their place of origin within the adjacent cutoff channel in order to reclaim the floodplain. Disturbed areas resulting from dike removal and leveling of the cutoff channel will be re-vegetated using transplanted woody and herbaceous riparian vegetation and broadcast seeding. These activities will restore floodplain ecology along the North Channel by enabling river flows to escape the channel and inundate the floodplain during large magnitude runoff events. The effort will also restore proper fluvial conditions by reducing the potential for floodwaters to concentrate within the cutoff channel and promote an avulsion of the river.

Treatments have also been designed to accelerate passive restoration of riparian lands and wetlands lost or damaged within the South Channel (Sheet 5). Native coarse alluvium deposits (e.g., point bars) within the South Channel will be used to construct a series of low-head impoundment structures. These structures will reduce the velocity of turbid waters that are expected to intermittently enter the South Channel during flood events, and will promote fine sediment deposition and accumulation within the barren alluvial channel. Impoundment structures will also reduce the potential of the existing entrenched channel to capture and rapidly convey surface and groundwater from the area. Impoundments will be spaced approximately 333 feet apart in order to achieve no more than a 1-foot drop over each structure. Redistribution of alluvium will be conducted in a manner that avoids disturbance of existing vegetation to the maximum extent possible. Large woody debris within the channel and adjacent floodplain may also be salvaged and used to provide additional stability at select impoundment locations. Fine sediment accumulations and hydrologic support resulting from the impoundment structures will promote passive reclamation through the natural recruitment of riparian vegetation within the South Channel. Impoundment structures are not intended to persist in perpetuity, but instead are designed to stimulate sedimentation and vegetative recruitment that will reclaim the channel.

SUMMARY

The Restoration Framework was developed to achieve project objectives with a reasonable likelihood of success[3] (see Addendum 1). Design methods included consideration of peak flow recurrence interval and magnitude, flow duration, sediment transport competence and capacity, channel planform and meander pattern, bed feature location and length, and stable channel geometry. Establishment of the right bank alignment adjacent to Dike 1 achieves the minimum floodplain width typical of similar watercourses in the region, and proximate reasonable sources for required alluvium exist in the form of in-channel deposition located upstream of the diversion dam or point bars located in the southern channel downstream of the restoration location. Implementation of the suite of treatments presented in the Framework would restore fluvial morphologic form and processes in the Wind River that were degraded by the construction and persistence of the illegal dikes.

LIST OF ATTACHMENTS

Sheet 1 Title Sheet, Restoration Framework, Wind River, Riverview Valley, Wyoming.

Sheet 2 Design Plan – Dikes 2, 3, & 4, Restoration Framework, Wind River, Riverview Valley, Wyoming.

Sheet 3 Design Plan – Dike 1, Restoration Framework, Wind River, Riverview Valley, Wyoming.

Sheet 4 Design Detail – Dike 1, Restoration Framework, Wind River, Riverview Valley, Wyoming

Sheet 5 Design Plan – Restoration of Floodplain and Lands, Restoration Framework, Wind River, Riverview Valley, Wyoming.

Addendum 1 Engineer Statement, Restoration Framework, Wind River, Riverview Valley, Wyoming.

Addendum 2 Channel Bed Control Points, Wind River, Riverview Valley, Wyoming.

Addendum 3 Restoring Floodplain Connectivity on the South Bank, Wind River, Riverview Valley, Wyoming

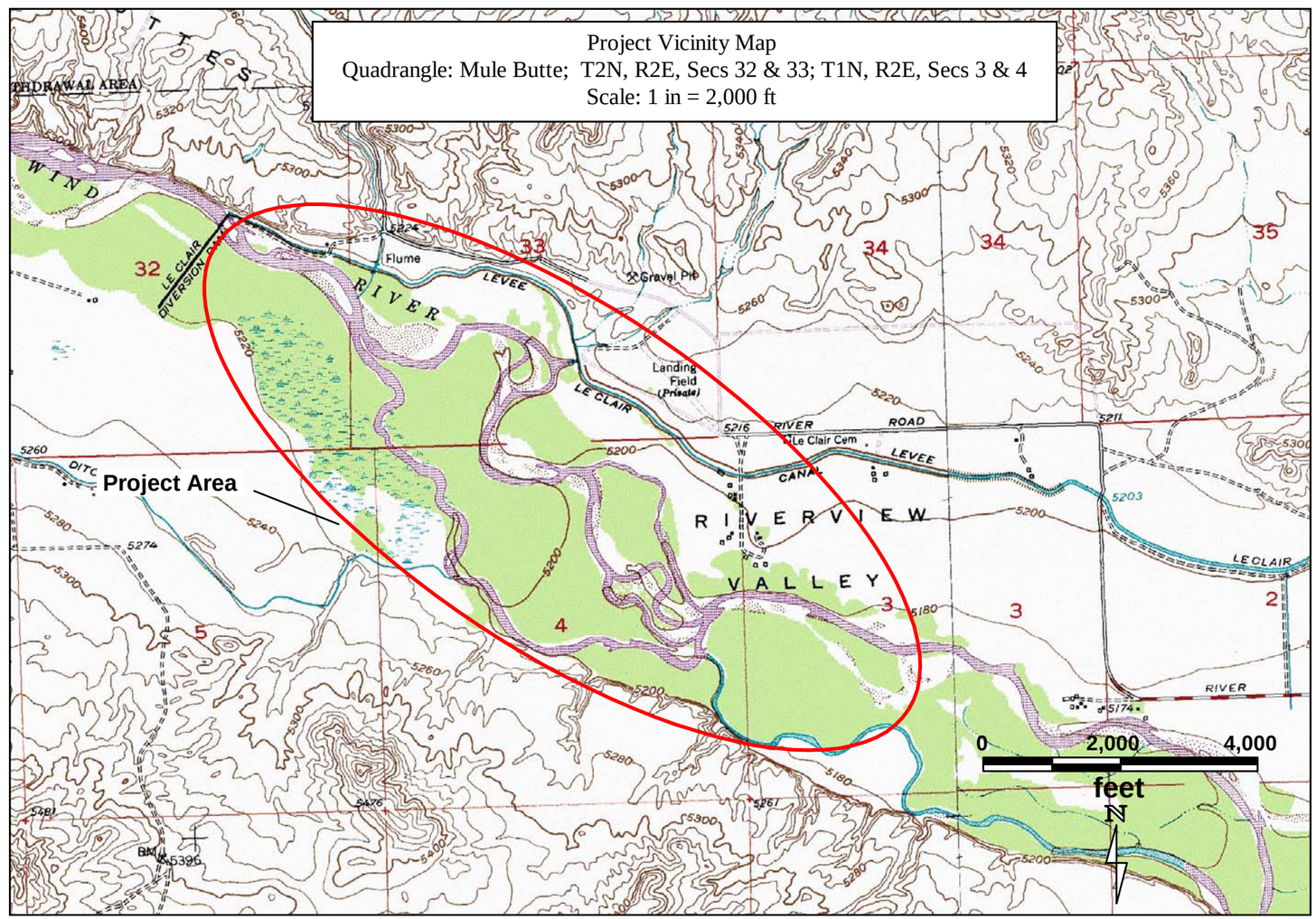
[3] The Restoration Framework should not be construed as warranty against any defects in the design, construction, or maintenance of the LeClair facilities, including but not limited to its diversion dam, head gate, canal and appurtenant facilities. As indicated in the Court's Memorandum Opinion Stating Findings of Fact and Conclusions of Law dated 22 October 2014 (page 8, paragraph 13), for several decades, LeClair has endeavored to protect against a perceived threat of erosion created by the proximity of the Wind River to the LeClair canal. Completion of the Restoration Framework will achieve the Court's order of re-establishing the historic northern river channel alignment, and restoring floodplain ecology along the northern channel under bankfull flow conditions. If LeClair believes its facilities are vulnerable to erosion as a result of this Court-ordered restoration, LeClair is advised to take all prudent and lawful measures to improve, protect and maintain its facilities.

DESIGN DRAWINGS

RESTORATION FRAMEWORK TO REMEDIATE THE DAMAGE TO THE WIND RIVER IN RIVERVIEW VALLEY, WYOMING CASED BY THE CLEAN WATER ACT VIOLATIONS OF JOHN HUBENKA AND THE LECLAIR IRRIGATION DISTRICT

SHEET INDEX

SHEET 1	TITLE SHEET
SHEET 2	DESIGN PLAN - DIKES 2, 3, AND 4
SHEET 3	DESIGN PLAN - DIKE 1
SHEET 4	DESIGN DETAIL - DIKE 1
SHEET 5	RESTORATION OF FLOODPLAIN AND LANDS

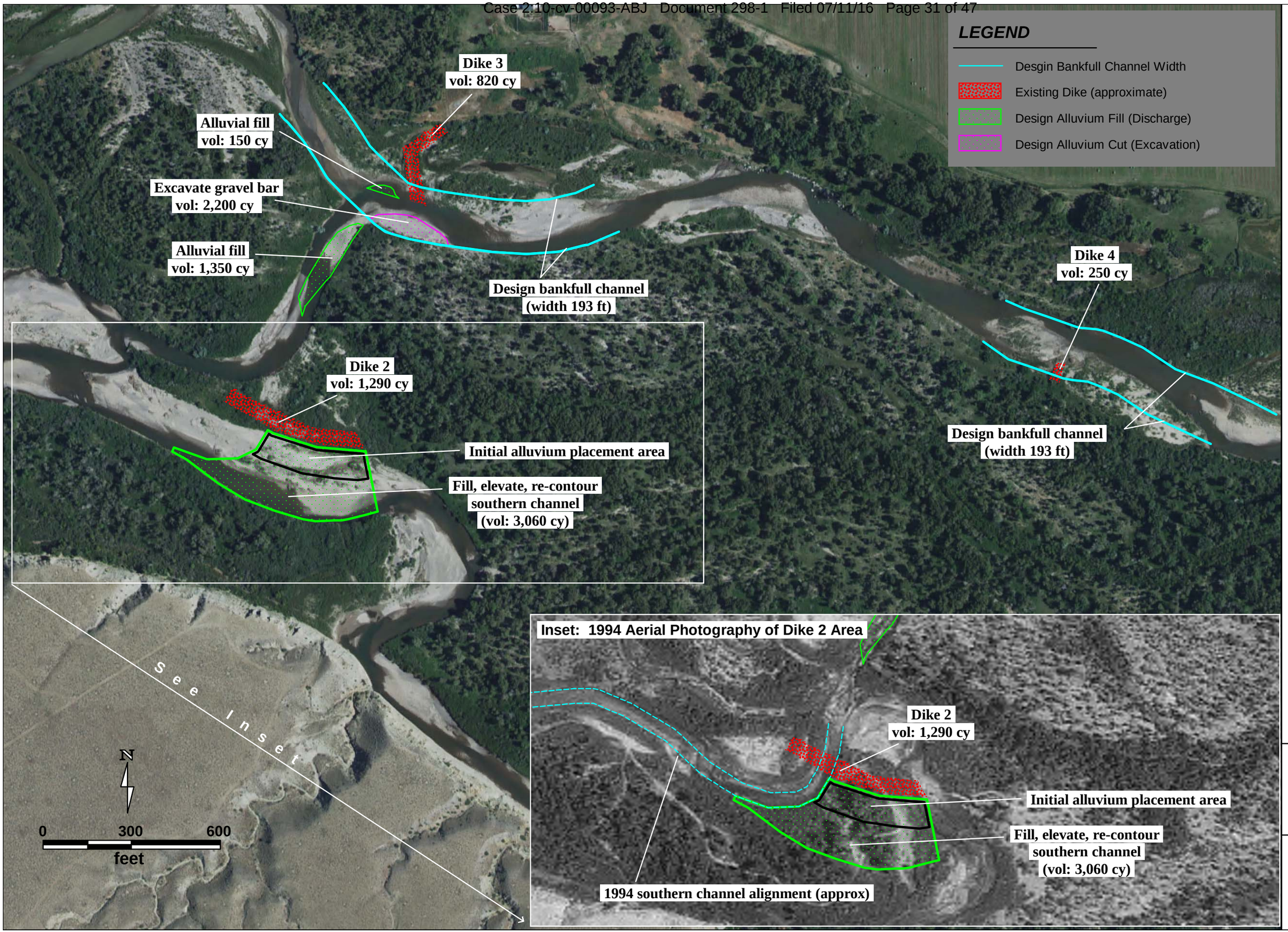


TITLE SHEET

Restoration Framework
Wind River, Riverview Valley, Wyoming

Date: 3/10/2016
Description:
Design Drawings

SHEET 1

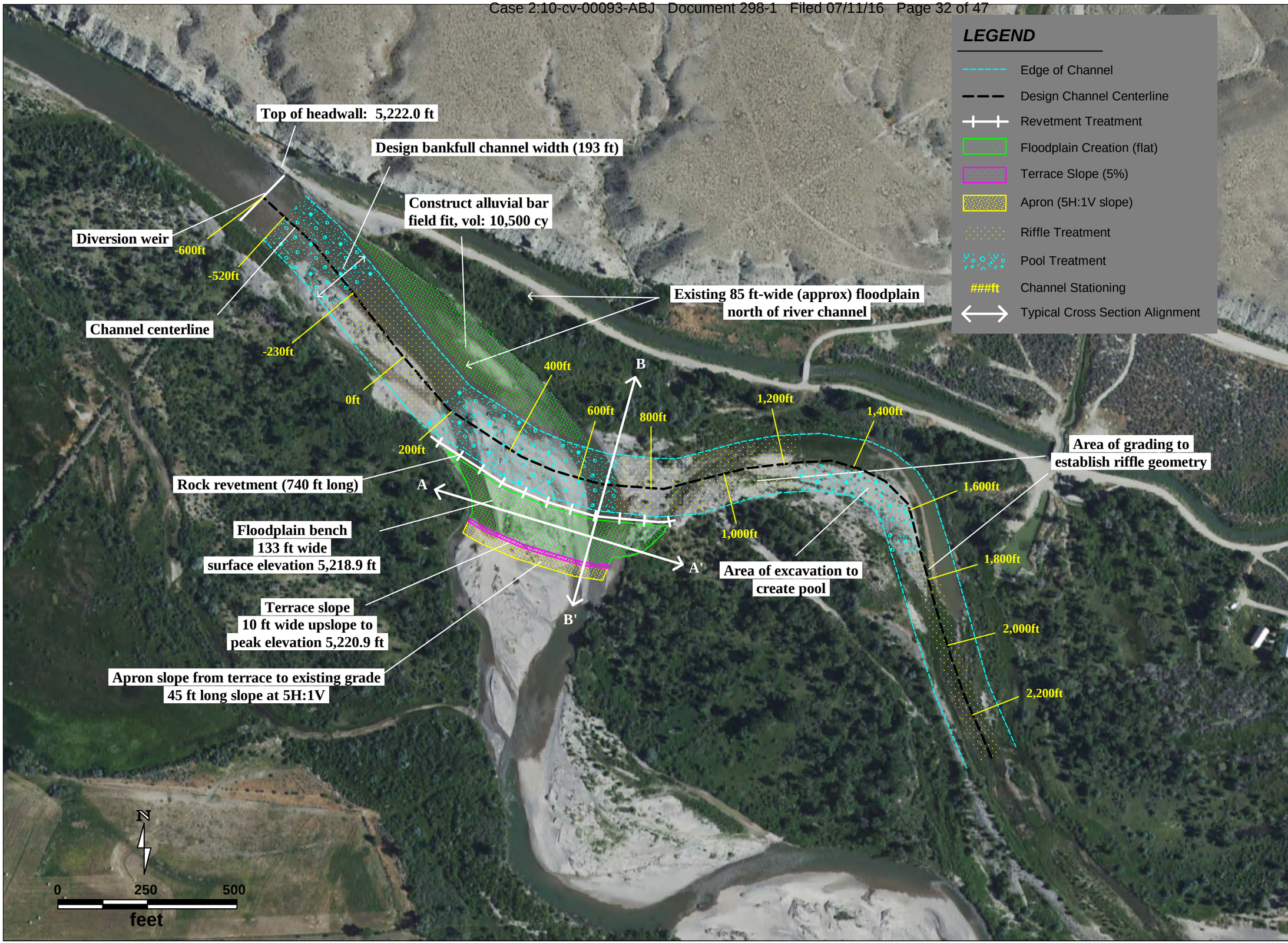


DESIGN PLAN - DIKES 2, 3, & 4

Restoration Framework
Wind River, Riverview Valley, Wyoming

Date: 3/10/2016
Description: Design Drawings
Scale: 1in = 300ft
2015 Color Aerial Photography

SHEET 2



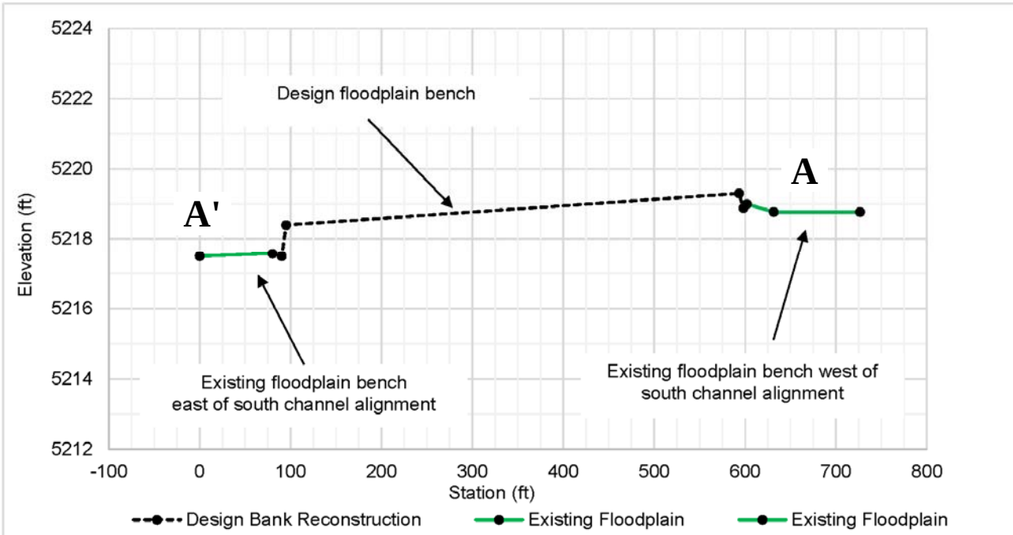
DESIGN PLAN - DIKE 1

Restoration Framework
Wind River, Riverview Valley, Wyoming

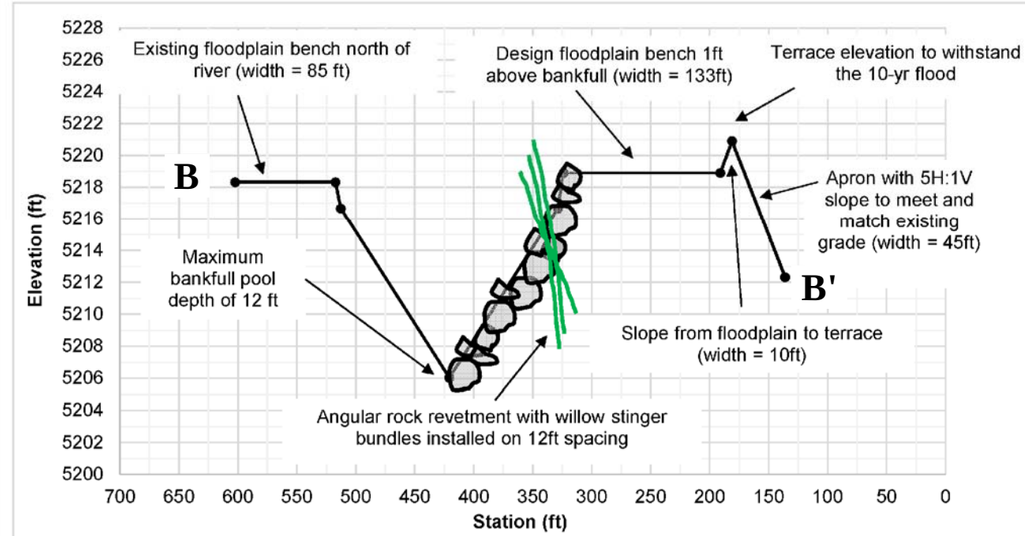
Date: 3/10/2016
Description: Design Drawings
Scale: 1in = 250ft
2015 Color Aerial Photography

SHEET 3

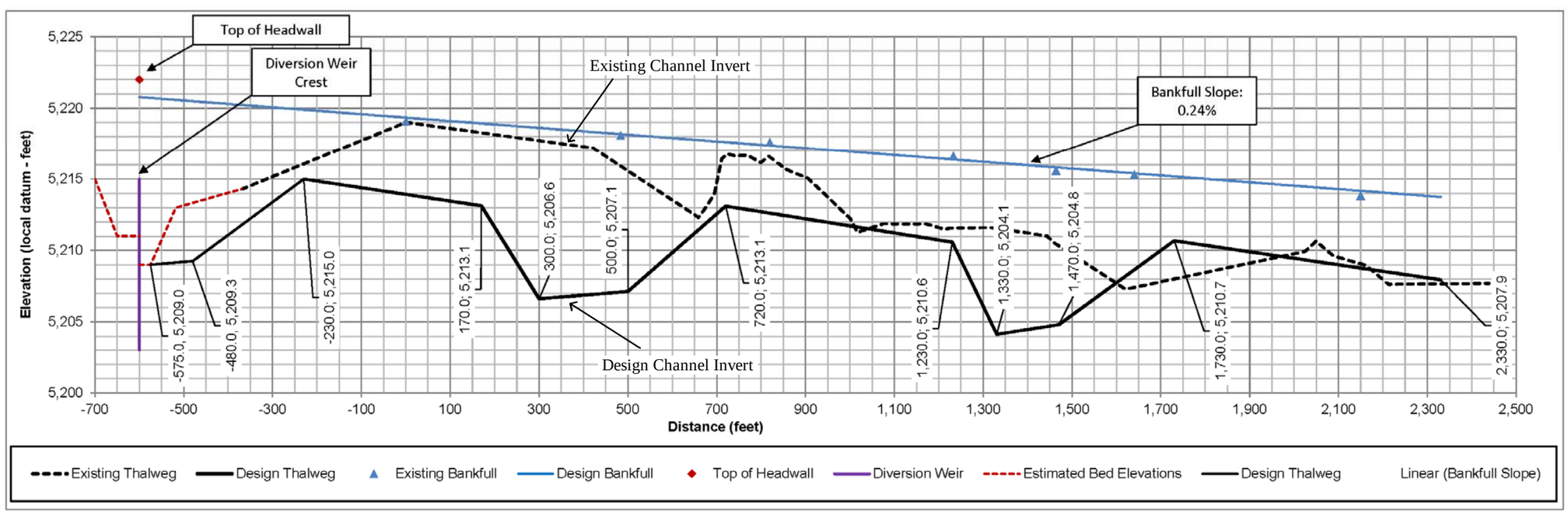
Typical Section A



Typical Section B



Existing and Design Longitudinal Profile

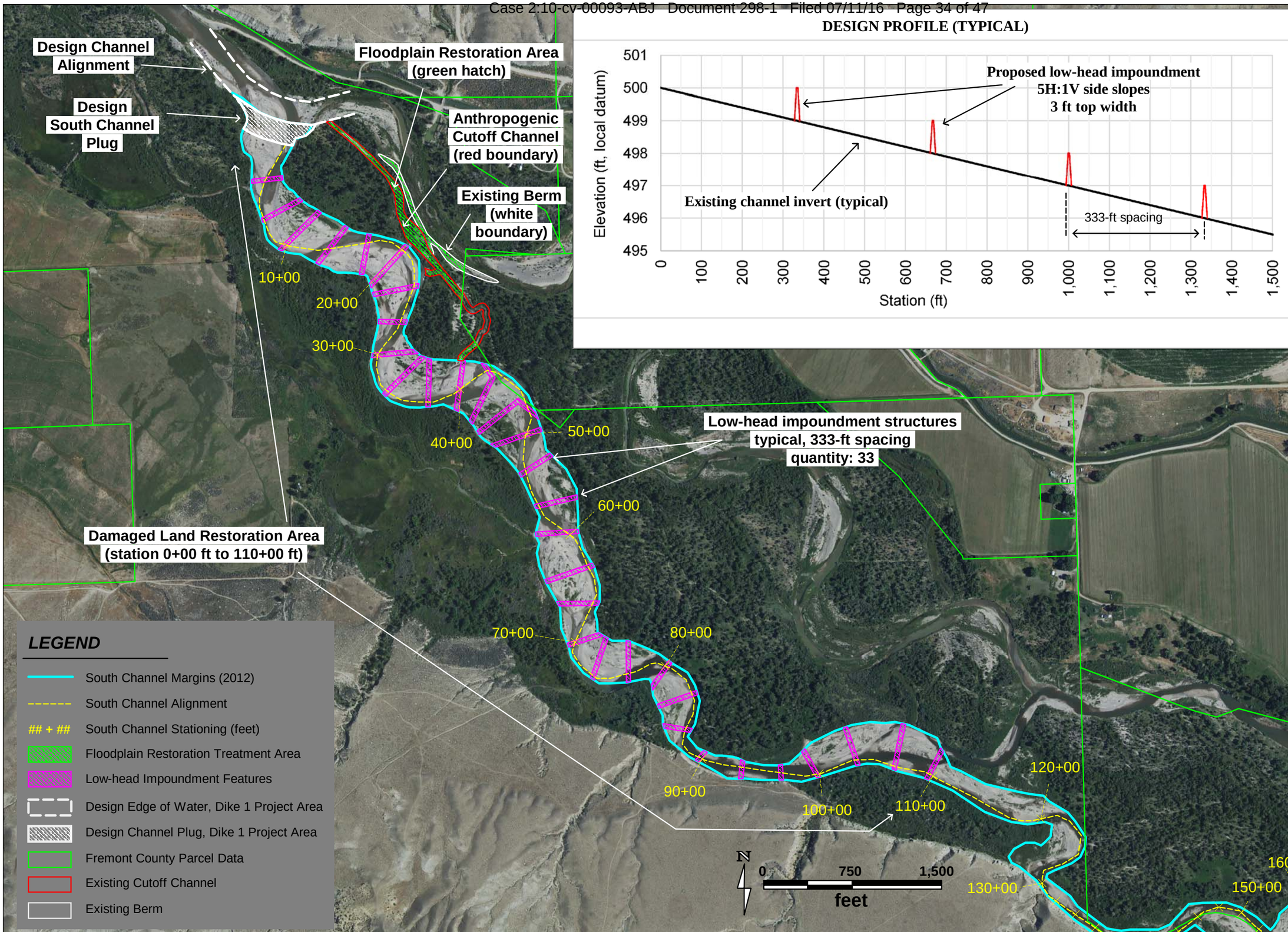


DESIGN DETAIL - DIKE 1

Restoration Framework
Wind River, Riverview Valley, Wyoming

Date: 3/10/2016
Description: Design Drawings
Scale: as depicted

SHEET 4



DESIGN PLAN
RESTORATION OF FLOODPLAIN AND LANDS

Restoration Framework
Wind River, Riverview Valley, Wyoming

Date: 3/10/2016
Description: Design Drawings
Scale: 1in = 750ft
2015 Color Aerial Photography

SHEET 5

ADDENDUM 1

ENGINEER STATEMENT

RESTORATION FRAMEWORK, WIND RIVER, RIVERVIEW VALLEY, WYOMING

The Wind River Restoration Framework (Framework) was developed in order to achieve the following project objectives:

1. Removal of Dikes 1, 2, 3 and 4;
2. Restoration of the historic northern river channel alignment;
3. Construction of an engineered dike, or river plug, in the southern channel alignment;
4. Restoration of floodplain ecology along the northern channel under bankfull flow conditions;
5. Restoration of natural stable channel condition; and
6. Restoration of land lost to the Tribes following the construction of Dike 1.

The Framework and designed treatments adhere to standard engineering practices associated with stream restoration and stabilization projects. Respective elevations presented within the Framework were determined based upon site topographic data collected in 2011 by Biota Research and Consulting, Inc. and in 2015 by Spurlock Land Surveying during independent survey efforts. Available information was used to rectify the survey datums and to identify the treatment elevations depicted in the Framework. Field adjustments will be necessary during project implementation to account for changes that have occurred in the river since the surveys were conducted, to account for deviations between previous survey datums, and to establish an accurate common datum. The compilation of the Framework utilized the best available data and accepted engineering approaches described in published literature, including:

1. United States Department of Agriculture, Natural Resources Conservation Service, *National Engineering Handbook, Part 654*;
2. *Watershed Assessment of River Stability and Sediment Supply (WARSSS),* recognized and supported by the Environmental Protection Agency (https://owpubauthor.epa.gov/scitech/datait/tools/warsss/);
3. Pitlick, John; Cui, Yantao; Wilcock, Peter. 2009. *Manual for computing bed load transport using BAGS (Bedload Assessment for Gravel-bed Streams) software*; and
4. U.S. Army Corps of Engineers, *EM-1110-2-1601, Engineer Manual, Hydraulic Design of Flood Control Channels.*

The content of the Framework is not intended to certify that presented restoration treatments will remain unaltered and intact in perpetuity. Instead, the Framework presents a plan to achieve fluvial conditions mandated by the U.S. District Court Memorandum Opinion of October 22, 2014. Addendums 2 and 3 were prepared by others during their subsequent analysis and their on-site investigation to supplement the Framework. Specific project treatments presented in the Framework were developed using standard engineering practices and restoration treatments that have been demonstrated to be successful in the region and that have a high probability of success in the Riverview Valley project area.

Professional Engineer
MAZAMEWSKI
14004
05/18/16
WYOMING

RESTORATION FRAMEWORK
ADDENDUM 2

Channel Bed Control Points derived from and supplemental to Sheets 3 and 4.

POINT	STATION (1)	ELEVATION (2)	TOP WIDTH	FEATURE	NOTES
1	-575	5209.0	250	pool	3, 4
2	-480	5209.3	193	glide	
3	-230	5215.0	193	riffle	
4	170	5213.1	193	pool	
5	300	5206.6	193	pool	
6	500	5207.1	193	glide	
7	720	5213.1	193	riffle	
8	1230	5210.6	193	pool	
9	1330	5204.1	193	pool	
10	1470	5204.8	193	glide	
11	1730	5210.7	193	riffle	
12	2330	5207.9	193	pool	5

NOTES:
(1) Location of control points at stations shown on Sheet 3 should allow for any reasonable site conditions adjustments.

(2) Elevation of control points (thalweg) on Sheet 4 should be survey quality and may not be higher than listed. Reasonable construction accuracy is required. Thalweg does not necessarily follow the channel centerline.

(3) The LeClair Diversion Dam weir is at station -600' and the elevation benchmark is the concrete deck spanning the headgate at 5222.3 feet.

(4) The concrete splash pad below the weir is at 5209.0 and the original 1919 river bed was at 5211.2. Copies of the 1919 Diversion Dam plans are on the LeClair web site or are available on request.

DECK	5222.3
TOP OF WEIR	5215.0
SPLASH PAD	5209.0
RIVER BED IN 1919	5211.2

(5) The channel at station 2330 begins to align with existing channel. By station 2425 the channel is aligned and graded to transition to existing river channel.

Section A:

WEST END ELEVATION	5219.3 ALIGNED WITH FLOODPLAIN AT (A)
EAST END ELEVATION	5218.4 ALIGNED WITH FLOODPLAIN AT (A')

RESTORATION FRAMEWORK
ADDENDUM 3

Restoring Floodplain Connectivity on the South Bank

Maintenance of the diversion dam at the LeClair Canal has involved dredging to remove sediment from the Wind River. In the past, alluvium generated during dredging operations has historically been deposited along the south bank forming a few large spoil piles. Those piles obstruct movement of water into the floodplain. This addendum defines specific locations and approximate boundaries of spoil piles that would be eliminated or minimized to restore floodplain connectivity thereby allowing overbank flooding along the south bank upstream of the revetment shown on Sheet 3.

Attached is Figure 1 depicting topographic anomalies in the area of interest around the diversion and downstream along the south bank to the revetment. The figure was developed based on a digital terrain model (DTM) displayed as a "heat map" with darker colors in the red spectrum representing higher elevations. Outlines of those anomalies were transferred to Google Earth as a visual aid for comparison to aerial images. That analysis indicated dredged material (spoil) was obviously deposited adjacent to the earthen dam that extends across the floodplain southwest of the weir. Other anomalies downstream appeared to be in areas where topography is naturally irregular or where the DTM is inaccurate due to dense vegetative cover such as a tree canopy.

An on-site investigation was conducted on April 13, 2016, to determine if there are additional spoil piles associated with anomalies between the most prominent spoil pile (Site 1) and the revetment. A linear topographic feature higher than the surrounding terrain (Site 2) was observed extending southeastward along an historic bank alignment visible in an aerial image from 1994. The feature at Site 2 is a few feet high and may include natural deposits or dredged material pushed to the river bank at some time in the past. The feature does include piles that obstruct flow of water into the floodplain regardless of the origin. Both sites are shown on the attached Figure 2 overlaid on an aerial image from 2013 with Site 1 in yellow, Site 2 in blue, and the revetment in black.

Attempts to estimate ground elevations surrounding both sites using the DTM were difficult and are not considered to be reliable. Finished grades at all sites would be established at the time of construction based on visual indicators of undisturbed natural ground in the floodplain on the south side of each pile. There would be no attempt to lower floodplain elevations at either site. Site 1 covers approximately 0.25 acre and Site 2 covers 0.10 acre. It has been estimated that spoil at Site 1 would generate 1,500 cubic yards of dry sand and gravel. Site 2 could generate up to 300 cubic yards of similar material.

Surface disturbance would be limited to activities necessary to gain access and remove piles while minimizing removal of large woody vegetation. Sites would be accessible along the river's edge connecting with routes further south established to reach other construction locations. Spoil at Site 1 would be loaded into trucks and hauled to areas where dry fill material is needed, such as the floodplain bench. Treatments at Site 2 include use of small machinery to minimize damage to beneficial vegetation while eliminating as many piles as feasible. Therefore, some piles could remain and others would be leveled in place or removed to achieve finished grade depending on site conditions. Natural recruitment of plants within disturbed areas is expected to occur during the following growing season providing adequate vegetative cover without additional treatments because native topsoil would be preserved in place as much as possible.

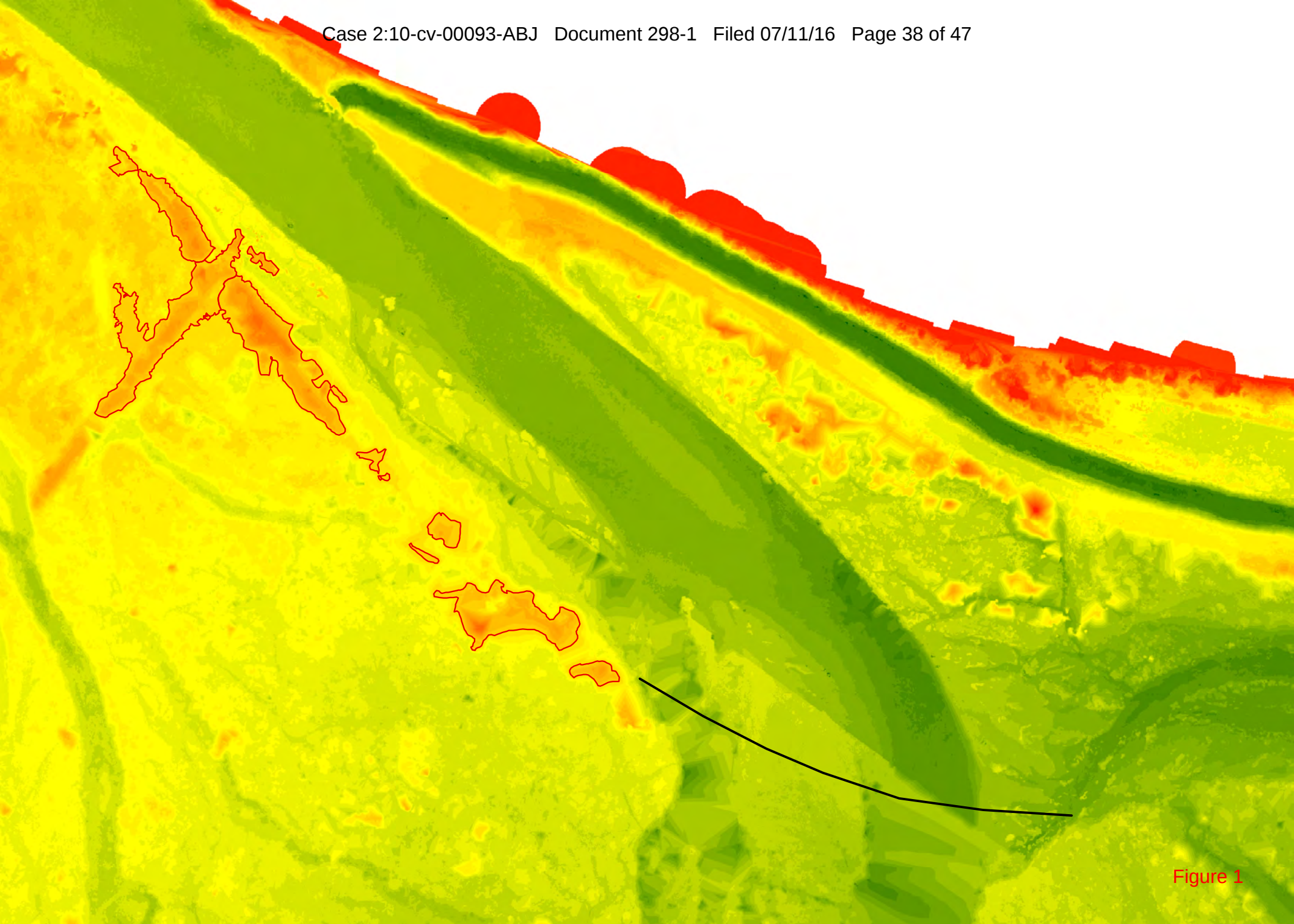


Figure 1

N
© 2016 Google
Google earth
1994
Imagery Date: 10/24/2013 43°06'24.81" N 108°39'44.81" W elev 0 ft eye alt 1647 ft

Figure 2

ORDER AMENDING MEMORANDUM OPINION FILED OCTOBER 22, 2014

APPENDIX B – STREAM ZONE ALTERATION PERMIT

(The Restoration Framework that is an attachment to this Permit can be found at Appendix A)

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BOX 217
FORT WASHAKIE, WYOMING 82514
307-332-6464
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June 3, 2016

To Whom It May Concern:

This letter addresses the Stream Zone Alteration Permit License that has been issued to the Northern Arapaho Tribe, authorizing work in accordance with the "Restoration Framework to Remediate the Damage to the Wind River in Riverview Valley, Wyoming Caused by the Clean Water Act Violations of John Hubenka and the LeClair Irrigation District." The application for this license was received on May 16, 2016 and was approved by signature of myself, Mitchel T. Cottenoir, Tribal Water Engineer, upon that application.

Sincerely,

M. T. Cottenoir

Mitchel T. Cottenoir
Tribal Water Engineer

Application Fee $ 25.00

SHOSHONE & NORTHERN ARAPAHO

OFFICE OF THE TRIBAL WATER ENGINEER

APPLICATION FOR STREAM ZONE ALTERATION LICENSE

THIS SECTION IS NOT TO BE FILLED IN BY APPLICANT

Filing Date

SHOSHONE & ARAPAHO TRIBES)
OFFICE OF THE TRIBAL WATER) SS
ENGINEER)

This instrument was received and field for record on the 23 day of May, A.D. 20 16, at 11:00 o'clock A. M.

M. S. Cottenoir
Tribal Water Engineer

Recorded in Book _____ of Licenses, on Page _____
Fee Paid $ 350.00 Map Filed _____

Wind River Indian Reservation, District No. _____

LICENSE NO. _____ S

NAME OF FACILITY Wind River Restoration Project

1. Name(s), mailing address, phone number, and tribal affiliation (if applicable) of applicants is/are Northern Arapaho Tribe

(If more than one applicant, designate one to act as Agent for the others)

2. Name and address of agent to receive correspondence and notices Northern Arapaho Tribe c/o Baldwin, Crocker & Rudd, PO Box 1229, Lander, WY 82520

3. The activity which may affect the streambed and banks includes Restoration of the northern channel alignment of the Wind River in the vicinity of the LeClair Irrigation District Headgate and scene of the Clean Water Act violations of LeClair and John Hubenka. Please see attached Restoration Framework.

4. The proposed activity is located on the Wind River River/Creek in ~~the~~ T2N R2E Secs 32 & 33 ~~of Section~~ ~~T~~ and T1N R2E Secs 3 & 4 ~~R.~~ Activity will affect:
- ☒ Streambed
- ☐ One bank _____ (e.g. north, SW, etc.)
- ☒ Both banks - Length of banks and/or streambed affected: 3,000 feet

5. a. The source of riprap material is High Country Construction, South Pass

5. b. Dredged material shall be placed/disposed of at design locations intended to restore the Wind River. Please see attached Restoration Framework, design sheets 2 , 3, and 5.

6. Affected neighboring landowners are The project will take place entirely on Tribal Lands.

7. The estimated time required for commencement of work is November, 2016 and for completion of construction is January 1, 2017, with monitoring and potential repairs for a period which may extend for up to five years.

8. The accompanying map and plans are prepared in accordance with the Tribal Water Engineer's regulations for filing applications and are hereby declared a part of this application. The Tribal Water Engineer may require the filing of detailed construction plans.

9. All pertinent legal documents, including but not limited to U.S. Army Corps of Engineers' 404 permit and rights-of-way, must accompany this permit.
Nationwide Permit #32
Nationwide Permit #27, attached.

REMARKS

Please see attached Restoration Framework, which depicts in text and graphic form the proposed river restoration treatments.

Under penalties of perjury, I declare that I have examined this application and to the best of my knowledge and belief it is true, correct, and complete.

Allen Zeh 5/12/16

Signature of Applicant or Agent — Date

and walkways, or for general navigation, such as mooring cells, including the excavation of bottom material from within the form prior to the discharge of concrete, sand, rock, etc. This NWP does not authorize filled structural members that would support buildings, building pads, homes, house pads, parking areas, storage areas and other such structures. The structure itself may require a separate section 10 permit if located in navigable waters of the United States. (Section 404)

26. [Reserved]

27. Aquatic Habitat Restoration, Establishment, and Enhancement Activities. Activities in waters of the United States associated with the restoration, enhancement, and establishment of tidal and non-tidal wetlands and riparian areas, the restoration and enhancement of non-tidal streams and other non-tidal open waters, and the rehabilitation or enhancement of tidal streams, tidal wetlands, and tidal open waters, provided those activities result in net increases in aquatic resource functions and services.

To the extent that a Corps permit is required, activities authorized by this NWP include, but are not limited to: The removal of accumulated sediments; the installation, removal, and maintenance of small water control structures, dikes, and berms, as well as discharges of dredged or fill material to restore appropriate stream channel configurations after small water control structures, dikes, and berms, are removed; the installation of current deflectors; the enhancement, restoration, or establishment of riffle and pool stream structure; the placement of in-stream habitat structures; modifications of the stream bed and/or banks to restore or establish stream meanders; the backfilling of artificial channels; the removal of existing drainage structures, such as drain tiles, and the filling, blocking, or reshaping of drainage ditches to restore wetland hydrology; the installation of structures or fills necessary to establish or re-establish wetland or stream hydrology; the construction of small nesting islands; the construction of open water areas; the construction of oyster habitat over unvegetated bottom in tidal waters; shellfish seeding; activities needed to reestablish vegetation, including plowing or discing for seed bed preparation and the planting of appropriate wetland species; re-establishment of submerged aquatic vegetation in areas where those plant communities previously existed; re-establishment of tidal wetlands in tidal waters where those wetlands previously existed; mechanized land clearing to remove non-native invasive, exotic, or nuisance vegetation; and other related activities. Only native plant species should be planted at the site.

This NWP authorizes the relocation of non-tidal waters, including non-tidal wetlands and streams, on the project site provided there are net increases in aquatic resource functions and services.

Except for the relocation of non-tidal waters on the project site, this NWP does not authorize the conversion of a stream or natural wetlands to another aquatic habitat type (e.g., stream to wetland or vice versa) or uplands. Changes in wetland plant communities that occur when wetland hydrology is more fully restored during wetland rehabilitation activities are not considered a conversion to another aquatic habitat type. This NWP does not authorize stream channelization. This NWP does not authorize the relocation of tidal waters or the conversion of tidal waters, including tidal wetlands, to other aquatic uses, such as the conversion of tidal wetlands into open water impoundments.

Compensatory mitigation is not required for activities authorized by this NWP since these activities must result in net increases in aquatic resource functions and services.

Reversion. For enhancement, restoration, and establishment activities conducted: (1) In accordance with the terms and conditions of a binding stream or wetland enhancement or restoration agreement, or a wetland establishment agreement, between the landowner and the U.S. Fish and Wildlife Service (FWS), the Natural Resources Conservation Service (NRCS), the Farm Service Agency (FSA), the National Marine Fisheries Service (NMFS), the National Ocean Service (NOS), U.S. Forest Service (USFS), or their designated state cooperating agencies; (2) as voluntary wetland restoration, enhancement, and establishment actions documented by the NRCS or USDA Technical Service Provider pursuant to NRCS Field Office Technical Guide standards; or (3) on reclaimed surface coal mine lands, in accordance with a Surface Mining Control and Reclamation Act permit issued by the Office of Surface Mining Reclamation and Enforcement (OSMRE) or the applicable state agency, this NWP also authorizes

any future discharge of dredged or fill material associated with the reversion of the area to its documented prior condition and use (i.e., prior to the restoration, enhancement, or establishment activities). The reversion must occur within five years after expiration of a limited term wetland restoration or establishment agreement or permit, and is authorized in these circumstances even if the discharge occurs after this NWP expires. The five-year reversion limit does not apply to agreements without time limits reached between the landowner and the FWS, NRCS, FSA, NMFS, NOS, USFS, or an appropriate state cooperating agency. This NWP also authorizes discharges of dredged or fill material in waters of the United States for the reversion of wetlands that were restored, enhanced, or established on prior-converted cropland or on uplands, in accordance with a binding agreement between the landowner and NRCS, FSA, FWS, or their designated state cooperating agencies (even though the restoration, enhancement, or establishment activity did not require a section 404 permit). The prior condition will be documented in the original agreement or permit, and the *10276 determination of return to prior conditions will be made by the Federal agency or appropriate state agency executing the agreement or permit. Before conducting any reversion activity the permittee or the appropriate Federal or state agency must notify the district engineer and include the documentation of the prior condition. Once an area has reverted to its prior physical condition, it will be subject to whatever the Corps Regulatory requirements are applicable to that type of land at the time. The requirement that the activity results in a net increase in aquatic resource functions and services does not apply to reversion activities meeting the above conditions. Except for the activities described above, this NWP does not authorize any future discharge of dredged or fill material associated with the reversion of the area to its prior condition. In such cases a separate permit would be required for any reversion.

Reporting. For those activities that do not require pre-construction notification, the permittee must submit to the district engineer a copy of: (1) The binding stream enhancement or restoration agreement or wetland enhancement, restoration, or establishment agreement, or a project description, including project plans and location map; (2) the NRCS or USDA Technical Service Provider documentation for the voluntary stream enhancement or restoration action or wetland restoration, enhancement, or establishment action; or (3) the SMCRA permit issued by OSMRE or the applicable state agency. The report must also include information on baseline ecological conditions on the project site, such as a delineation of wetlands, streams, and/or other aquatic habitats. These documents must be submitted to the district engineer at least 30 days prior to commencing activities in waters of the United States authorized by this NWP.

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing any activity (see general condition 31), except for the following activities:

(1) Activities conducted on non-Federal public lands and private lands, in accordance with the terms and conditions of a binding stream enhancement or restoration agreement or wetland enhancement, restoration, or establishment agreement between the landowner and the U.S. FWS, NRCS, FSA, NMFS, NOS, USFS or their designated state cooperating agencies;

(2) Voluntary stream or wetland restoration or enhancement action, or wetland establishment action, documented by the NRCS or USDA Technical Service Provider pursuant to NRCS Field Office Technical Guide standards; or

(3) The reclamation of surface coal mine lands, in accordance with an SMCRA permit issued by the OSMRE or the applicable state agency.

However, the permittee must submit a copy of the appropriate documentation to the district engineer to fulfill the reporting requirement. (Sections 10 and 404)

Note: This NWP can be used to authorize compensatory mitigation projects, including mitigation banks and in-lieu fee projects. However, this NWP does not authorize the reversion of an area used for a compensatory mitigation project to its prior condition, since compensatory mitigation is generally intended to be permanent.

authorized disposal site in waters of the United States, and proper siltation controls must be used.

Maintenance Baseline: The maintenance baseline is a description of the physical characteristics (e.g., depth, width, length, location, configuration, or design flood capacity, etc.) of a flood control project within which maintenance activities are normally authorized by NWP 31, subject to any case-specific conditions required by the district engineer. The district engineer will approve the maintenance baseline based on the approved or constructed capacity of the flood control facility, whichever is smaller, including any areas where there are no constructed channels but which are part of the facility. The prospective permittee will provide documentation of the physical characteristics of the flood control facility (which will normally consist of as-built or approved drawings) and documentation of the approved and constructed design capacities of the flood control facility. If no evidence of the constructed capacity exists, the approved capacity will be used. The documentation will also include best management practices to ensure that the impacts to the aquatic environment are minimal, especially in maintenance areas where there are no constructed channels. (The Corps may request maintenance records in areas where there has not been recent maintenance.) Revocation or modification of the final determination of the maintenance baseline can only be done in accordance with 33 CFR 330.5. Except in emergencies as described below, this NWP cannot be used until the district engineer approves the maintenance baseline and determines the need for mitigation and any regional or activity-specific conditions. Once determined, the maintenance baseline will remain valid for any subsequent reissuance of this NWP. This NWP does not authorize maintenance of a flood control facility that has been abandoned. A flood control facility will be considered abandoned if it has operated at a significantly reduced capacity without needed maintenance being accomplished in a timely manner.

Mitigation: The district engineer will determine any required mitigation one-time only for impacts associated with maintenance work at the same time that the maintenance baseline is approved. Such one-time mitigation will be required when necessary to ensure that adverse environmental impacts are no more than minimal, both individually and cumulatively. Such mitigation will only be required once for any specific reach of a flood control project. However, if one-time mitigation is required for impacts associated with maintenance activities, the district engineer will not delay needed maintenance, provided the district engineer and the permittee establish a schedule for identification, approval, development, construction and completion of any such required mitigation. Once the one-time mitigation described above has been completed, or a determination made that mitigation is not required, no further mitigation will be required for maintenance activities within the maintenance baseline. In determining appropriate mitigation, the district engineer will give special consideration to natural water courses that have been included in the maintenance baseline and require compensatory mitigation and/or best management practices as appropriate.

Emergency Situations: In emergency situations, this NWP may be used to authorize maintenance activities in flood control facilities for which no maintenance baseline has been approved. Emergency situations are those which would result in an unacceptable hazard to life, a significant loss of property, or an immediate, unforeseen, and significant economic hardship if action is not taken before a maintenance baseline can be approved. In such situations, the determination of mitigation requirements, if any, may be deferred until the emergency has been resolved. Once the emergency has ended, a maintenance baseline must be established expeditiously, and mitigation, including mitigation for maintenance conducted during the emergency, must be required as appropriate.

Notification: The permittee must submit a pre-construction notification to the district engineer before any maintenance work is conducted (see general condition 31). The pre-construction notification may be for activity-specific maintenance or for maintenance of the entire flood control facility by submitting a five-year (or less) maintenance plan. The pre-construction notification must include a description of the maintenance baseline and the dredged material disposal site. (Sections 10 and 404)

32. Completed Enforcement Actions. Any structure, work, or discharge of dredged or fill material remaining in place or undertaken for mitigation, restoration, or environmental benefit in compliance with either:

(i) The terms of a final written Corps non-judicial settlement agreement resolving a violation of Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899; or the terms of an EPA 309(a) order on consent resolving a violation

of Section 404 of the Clean Water Act, provided that:

(a) The unauthorized activity affected no more than 5 acres of non-tidal waters or 1 acre of tidal waters;

(b) The settlement agreement provides for environmental benefits, to an equal or greater degree, than the environmental detriments caused by the unauthorized activity that is authorized by this NWP; and

(c) The district engineer issues a verification letter authorizing the activity subject to the terms and conditions of this NWP and the settlement agreement, including a specified completion date; or

(ii) The terms of a final Federal court decision, consent decree, or settlement agreement resulting from an enforcement action brought by the United States under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899; or

(iii) The terms of a final court decision, consent decree, settlement agreement, or non-judicial settlement agreement resulting from a natural resource damage claim brought by a trustee or trustees for natural resources (as defined by the National Contingency Plan at 40 CFR subpart G) under Section 311 of the Clean Water Act, Section 107 of the Comprehensive Environmental Response, Compensation and Liability Act, Section 312 of the National Marine Sanctuaries Act, Section 1002 of the Oil Pollution Act of 1990, or the Park System Resource Protection Act at 16 U.S.C. 19jj, to the extent that a Corps permit is required.

Compliance is a condition of the NWP itself. Any authorization under this NWP is automatically revoked if the permittee does not comply with the terms of this NWP or the terms of the court decision, consent decree, or judicial/non-judicial settlement agreement. This NWP does not apply to any activities occurring after the date of the decision, decree, or agreement that are not for the purpose of mitigation, restoration, or environmental benefit. Before reaching any settlement agreement, the Corps will ensure compliance with the provisions of 33 *10278 CFR part 326 and 33 CFR 330.6(d)(2) and (e). (Sections 10 and 404)

33. Temporary Construction, Access, and Dewatering. Temporary structures, work, and discharges, including cofferdams, necessary for construction activities or access fills or dewatering of construction sites, provided that the associated primary activity is authorized by the Corps of Engineers or the U.S. Coast Guard. This NWP also authorizes temporary structures, work, and discharges, including cofferdams, necessary for construction activities not otherwise subject to the Corps or U.S. Coast Guard permit requirements. Appropriate measures must be taken to maintain near normal downstream flows and to minimize flooding. Fill must consist of materials, and be placed in a manner, that will not be eroded by expected high flows. The use of dredged material may be allowed if the district engineer determines that it will not cause more than minimal adverse effects on aquatic resources. Following completion of construction, temporary fill must be entirely removed to an area that has no waters of the United States, dredged material must be returned to its original location, and the affected areas must be restored to pre-construction elevations. The affected areas must also be revegetated, as appropriate. This permit does not authorize the use of cofferdams to dewater wetlands or other aquatic areas to change their use. Structures left in place after construction is completed require a separate section 10 permit if located in navigable waters of the United States. (See 33 CFR part 322.)

Notification: The permittee must submit a pre-construction notification to the district engineer prior to commencing the activity (see general condition 31). The pre-construction notification must include a restoration plan showing how all temporary fills and structures will be removed and the area restored to pre-project conditions. (Sections 10 and 404)

34. Cranberry Production Activities. Discharges of dredged or fill material for dikes, berms, pumps, water control structures or leveling of cranberry beds associated with expansion, enhancement, or modification activities at existing cranberry production