JOINT PUBLIC NOTICE

US Army Corps of Engineers®
Albuquerque District

Application Number: SPA-2009-00520-ABQ
Date: May 11, 2018
Comments Due: June 10, 2018

SUBJECT: The U.S. Army Corps of Engineers, Albuquerque District, (USACE) and the New Mexico Environment Department's Surface Water Quality Bureau (SWQB) are evaluating an application for the U.S. Bureau of Reclamation (USBR), Bosque del Apache Rio Grande Realignment Pilot Project, located at Bosque del Apache National Wildlife Refuge (BDANWR), in the City of San Antonio, Socorro County, New Mexico.

AUTHORITY: This application is being evaluated under Sections 404 and 401 of the Clean Water Act (CWA) for the discharge of dredged or fill material in waters of the United States (U.S.). State water quality certification is provided under the authority of 20.6.2 New Mexico Administrative Code.

APPLICANT: Jennifer Faler
Albuquerque Area Office, USBR
555 Broadway Blvd. NE
Albuquerque, New Mexico 87102

LOCATION: The project site is located on and adjacent to the Rio Grande at approximately Section 4, Township 5 S, Range 1 E, Latitude 33.799069° North, Longitude -106.917845° West, in BDANWR, in the City of San Antonio, Socorro County, New Mexico (Figures 1-23 of 23).

PROJECT DESCRIPTION: The applicant proposes to relocate approximately 3 miles (mi) of the Rio Grande, a perennial stream, from its current location to the east, entirely within BDANWR (Figure 1 of 23). The total proposed project area is approximately 1,110 acres (ac) with a total area of disturbance of approximately 360 ac. The proposed east location is at a lower elevation than the adjacent floodplain and current bank elevation. The proposed project is a pilot to a longer potential realignment of the Rio Grande that would total approximately 8 mi. The applicant proposes to discharge approximately 215,000 cubic yards (cy) of material into waters of the U.S. and excavate approximately 218,000 cy of material from waters of the U.S. Based on available information, the overall project purpose is to reduce river maintenance and water depletions within a

portion of the Rio Grande perched channel reach. The applicant believes there is a need to relocate approximately 3 mi of the Rio Grande in order to maintain continuous low flows during drought, reduce sediment plug formation by addressing sediment transport imbalance, reconnect the main channel to overbanking flows during flood events, and reduce threats to existing infrastructure from an uncontrolled channel avulsion.

The realignment corridor is approximately 3 mi long and approximately 300 feet (ft) wide as measured from the realignment channel centerline (Figure 2 of 23). The approximate area of the realignment corridor is 100 ac.

The proposed project would include the following activities: vegetation destabilization and removal for the length of the realignment corridor; excavation at the inlet and outlet of the realignment corridor; select vegetation removal of primarily monotypic and exotic species and destabilization outside of the realignment corridor; and conversion of the existing river channel into a floodplain.

Existing vegetation within the realignment corridor would be removed by mulching or tree extraction. The applicant may not remove some existing stands of native vegetation at the exterior fringes of the realignment corridor depending on field conditions. Large native trees greater than 40 ft in height that would be removed due to their location in the realignment corridor would be temporarily stockpiled and potentially used for bank stabilization along the existing river channel in order to help transition flows into the realigned channel. Once vegetation is removed, the soil within the realignment corridor would be loosened using a single or multi shank ripper to dislodge roots and tree trunks within the first few feet of existing ground elevation. Woody vegetation that is not stockpiled would be burned on-site by BDANWR fire crews and the applicant would mix the ash and inorganic material with sediment to fill a portion of the existing river channel in order to provide nutrients for proposed plantings (Figures 8-16 of 23).

Vegetation removal would also be conducted within an approximate area of 170 ac located outside of the realignment corridor (Figures 8-16 of 23). This vegetation removal would focus on monotypic stands of non-native and noxious plant species. This vegetation removal would provide more area for the realigned channel to adjust its morphology and encourage development of varied active channel widths. In addition, removal of non-native and noxious plant species provides an opportunity for recruitment of native vegetation and improved habitat. Additionally, some removal of large native vegetation may also be conducted in order to facilitate access to the existing channel at both proposed stockpile locations (Figures 9-16 of 23).

In order to facilitate the realigned pilot channel's connection with the existing channel, an inlet and outlet would be excavated (Figures 12, 14, & 18 of 23). Approximately 2,400 linear feet (lf) at the inlet and approximately 9,000 lf at the outlet would be excavated to a width of up to approximately 300 ft (the total width of the realignment corridor) with a depth range between approximately 0-7 ft. The inlet and outlet would be trapezoidal in shape and tiered with a minimum bottom width of approximately 50 ft. Excavation within the existing channel may be necessary in order to convey flows through the inlet and outlet, including removal of bars or other depositional features. All excavated material would be placed in the existing channel to be converted to floodplain.

The applicant would convert a portion of the existing channel into a floodplain (Figures 9-17 of 23). The existing channel fill and floodplain conversion would extend for approximately 1.6 mi, resulting in approximately 45 ac of fill in the current channel of the Rio Grande, a perennial stream. In order to facilitate this conversion, the applicant would divert flows from the existing channel into the realignment channel; fill and stabilize approximately 7,273 lf of the existing channel; and potentially stabilize the new river bankline. The applicant would construct a permanent earthen diversion berm located approximately 930 ft downstream of the inlet in the existing channel in order to divert flows into the realignment channel. The permanent berm would be part of the earthen existing channel fill and may have additional bank stabilization across the upstream end of the floodplain conversion area. This fill would ensure that river flows transition to the realignment channel as well as provide a location to place material from the vegetation clearing activities and substrate for plantings. The fill depth would be variable in order to create more natural topography and would generally match current bankline elevations of the existing channel (Figure 17 of 23).

The applicant proposes to plant the floodplain conversion area with native species such as coyote willow (*Salix exigua*), Gooding's willow (*Salix gooddingii*), and Rio Grande cottonwood (*Populus deltoides* var. *wislizenii*).

Bank stabilization, if needed, would consist of an engineered log jam (Figure 23 of 23). If bank stabilization is necessary, it would consist of 5 woody structures using mature native trees removed as part of the overall project. The woody structures would be placed along the upstream edge of the existing channel floodplain conversion area, providing additional erosion protection while encouraging sediment deposition upstream. The woody structures would be comprised of 5 groupings, spaced approximately 40 ft apart.

The applicant proposes to utilize existing roads on the east and west sides of the Rio Grande in BDANWR for construction and emergency access to the proposed project site (Figures 10-16 of 23). The applicant has identified primary and secondary access routes with primary routes being the most frequently used and the secondary routes being used by smaller construction vehicles such as pickup trucks. Road improvements such as clearing, mowing and trimming, blading,

widening, and gravel capping, would be necessary to ensure safe and convenient access to the proposed project site. If water is present in the San Pedro Drain area, located along the eastern portion of the realignment corridor, culverts would be installed to allow for dry working conditions during construction. Other culverts would be installed along secondary access routes in order to allow equipment access. Culverts would be removed upon completion of construction. Approximately 35 mi of access roads would be utilized for the proposed project.

Temporary staging and stockpile areas would be used to store equipment and materials (Figures 9-16 of 23). The two temporary stockpile areas totaling approximately 50 ac, would be used to store material for the floodplain conversion area and diversion berm as described above. The stockpile areas would be located in areas where vegetation removal is proposed. The staging area would be approximately 1 ac and some vegetation removal would also be performed at this site.

The overall proposed project would result in permanently filling approximately 8,000 lf or approximately 45 ac of perennial stream (Figures 10-16 of 23). The overall proposed project would result in permanently excavating approximately 4 acres (ac) of forested wetlands, approximately 8 ac of scrub/shrub wetlands, and approximately 1 ac of emergent wetlands that are waters of the United States (U.S.) and adjacent to the Rio Grande. The proposed project would also result in temporarily impacting approximately 96 ac of forested wetlands, approximately 294 ac of scrub/shrub wetlands, and approximately 4,000 lf or approximately 18 ac of perennial stream.

PROPOSED MITIGATION: The applicant proposes to compensate for unavoidable adverse impacts to waters of the U.S. on-site by creating or enhancing aquatic resources. The applicant proposes to create approximately 40 ac of combined forested and scrub/shrub wetlands and approximately 18 ac of emergent wetlands. The applicant proposes to create the forested and scrub/shrub wetlands by planting willow and cottonwood trees within the channel floodplain conversion area (Figure 15-16 of 23). The applicant proposes to create emergent wetlands within the downstream portion of the existing channel where riverine hydrology would no longer exist (Figure 10 of 23). The applicant proposes to enhance approximately 142 ac of saltcedar dominated scrub-shrub wetlands by removing non-native, invasive species. The applicant proposes to conduct groundwater monitoring and monitoring of plantings for a 5 year period post-construction.

ADDITIONAL INFORMATION:

Environmental Setting. The proposed project area is located in the Chihuahuan Desert portion of the Rio Grande Floodplain ecoregion. This ecoregion extends from San Acacia, New Mexico to the border with Texas and Mexico. Hydrology has been altered by upstream and downstream impoundments and by channelization. Annual flooding of terraces and benches has been significantly reduced from historic flooding. Land uses

include agriculture, urban, wildlife conservation and habitat. The Rio Grande Floodplain is an important wintering area for sandhill cranes (*Grus canadensis*), snow geese (*Anser caerulescens*), Ross's geese (*Anser rossii*) and other water fowl. This ecoregion is also a primary component to the Central Flyway; a bird migration route extending from central Canada to the Gulf of Mexico. The BDANWR was established in part to protect and conserve migratory bird habitat because of its location on the Central Flyway, in addition to the important role the refuge plays in protecting federally-listed species and their habitat.

The proposed project area is characterized by forested and scrub/shrub wetlands with a smaller emergent wetland within the Rio Grande floodplain. The current Rio Grande channel, a perennial stream, is perched above the floodplain through this reach. Historic river channels and ditches have become overgrown with saltcedar (*Tamarisk* sp.), coyote willow, and cottonwood of various age classes, which are the dominant species within the proposed project site. Vegetation is often so dense that it is not possible to see or walk through it. Large areas of saltcedar scrub have been flooded and, in some cases, burned by wildfires and then regenerated, which has created new, dense growth. The saltcedar in this area has also been infested with salt cedar beetles. Hydrology is driven by river flooding and, in some areas, a relatively high groundwater table. Soil texture ranges from coarse sand and rock to clay loam or silt, depending on topographic location.

The proposed project area contains the following aquatic resources that are waters of the U.S.: approximately 453.8 ac of forested wetlands, approximately 472.9 ac of scrub/shrub wetlands, approximately 15.2 ac of emergent wetlands, and approximately 15,160 lf or 55.4 ac of perennial streams (Figure 3-6 of 23). Total waters of the U.S. located in the proposed project area is 997.3 ac. The forested wetlands are dominated by cottonwood and Gooding's willow. The scrub-shrub wetlands are dominated by saltcedar, coyote willow, and mule's fat (*Baccharis salicifolia*). The emergent wetlands are dominated by cattail (*Typha latifolia*), curly dock (*Rumex crispus*), barnyard grass (*Echinochloa crus-galli*), cocklebur (*Xanthium strumarium*), common sunflower (*Helianthus annuus*) and common reed (*Phragmites australis*).

The proposed project area contains approximately 66.9 ac of dryland dominated by sand sagebrush (*Artemisia filifolia*), screwbean mesquite (*Prosopis pubescens*), and Russian olive (*Elaeagnus angustifolia*).

Alternatives. The applicant has provided information concerning project alternatives. The applicant formed and led an interagency and interdisciplinary team to evaluate potential options for addressing river maintenance and water depletion concerns. Six alternative types totaling seventeen different alternatives were considered, including:

The no action alternative that would involve ongoing maintenance without a pilot channel or removal of sediment plugs.

Three pilot channel alternatives that would involve excavation of a narrow channel through sediment plugs with different channel excavation and spoiling options.

A pilot channel with grade control alternative that would involve placement of deformable riffles in the channel bed and excavation of a narrow channel through sediment plugs.

Four levee improvement alternatives that would reduce hydraulic pressure against the spoil levee with different levee dimensions, or placement of bendway weirs separately or in conjunction with floodplain modifications such as vegetation clearing or excavation of small channels to route water away from the spoil levee toe.

Three preemptive channel work alternatives that would involve channel/floodplain work to minimize formation of sediment plugs. These alternatives included widening the river channel and removing/destabilizing vegetation of islands and banks, breaking up mud layers and channelization (smoothing out abrupt bends), and excavating the channel thalweg (deepest part of the river).

Five river realignment alternatives that would involve relocation of the river channel. Four of these alternatives were specific to realignment locations to the east around River Mile (RM) 83 and RM 81. Each eastern location considered excavation at the inlet and outlet and also continuous channel excavation. The fifth alternative considered options of relocating the channel to the west.

Other alternatives may develop during the review process for this permit application. All reasonable project alternatives, in particular those which may be less damaging to the aquatic environment, will be considered.

EVALUATION FACTORS: This application will be reviewed in accordance with 33 CFR 320-332, the Regulatory Program of the USACE, and other pertinent laws, regulations, and executive orders. The USACE evaluation will also follow the guidelines published by the U.S. Environmental Protection Agency pursuant to Section 404(b)(1) of the CWA. The decision whether to issue a permit will be based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits which reasonably may be expected to accrue from the proposed activity must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposed activity will be considered, including the cumulative effects thereof; among those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, consideration of property ownership and, in general, the needs and welfare of the people.

HISTORIC PROPERTIES: The proposed project would occur on federally-owned land, the BDANWR owned and managed by the U.S. Fish and Wildlife Service (USFWS). The applicant is a federal agency and is the lead federal agency for compliance with the National

Historic Preservation Act. The project area has not been recently surveyed for historic properties. In a letter to the New Mexico State Historic Preservation Officer (NMSHPO), dated May 10, 2017, the USBR requested concurrence with their recommendation to survey the proposed Rio Grande realignment path after hand cutting vegetation and before ground work occurs. The NMSHPO concurred with USBR's recommended course of action on June 12, 2017.

ENDANGERED SPECIES: The proposed project would occur on federally-owned land, the BDANWR, which is managed by USFWS. The applicant is a federal agency and is the lead federal agency for compliance with the Endangered Species Act. In a letter dated January 8, 2018, USBR notified USFWS that they would be including the Rio Grande Realignment Pilot Project under the Water Management and Maintenance Activities on the Middle Rio Grande Biological and Conference Opinion, Consultation Number 02ENNM00-2013-F-0033, issued December 2, 2016. The USBR expects that the proposed project would eventually create and improve habitat resulting in long-term beneficial impacts to Rio Grande Silvery Minnow (*Hybognathus amarus*), Southwestern Willow Flycatcher (*Empidonax traillii extimus*), and Yellow-billed Cuckoo (*Coccyzus americanus*). The USBR has determined that short-term impacts to these species would be adverse and temporary resulting from construction and initial disturbance. The USBR proposes to minimize adverse effects to federally-listed species during construction by implementing mowing for some vegetation removal, locating temporary staging and stockpile areas in unsuitable habitat, focusing vegetation removal in moderately and unsuitable habitat to the maximum extent possible, and utilizing existing access roads with minor improvements. The USBR anticipates that the completed project would create or improve habitat for federally-listed species by enhancing wetlands with more native species and removal of non-native invasive species, and by improving river hydrology through the realignment.

FLOODPLAIN MANAGEMENT: The USACE is sending a copy of this public notice to the local floodplain administrator. In accordance with 44 CFR part 60 (Flood Plain Management Regulations Criteria for Land Management and Use), the floodplain administrators of participating communities are required to review all proposed development to determine if a floodplain development permit is required and maintain records of such review.

COMMENT SUBMITTAL AND DEADLINES: The USACE and SWQB are soliciting comments from all interested parties to consider and evaluate the impacts of this proposed activity. Any comments received by the USACE will be considered to determine whether to issue, issue with special conditions, or deny a Sec. 404 permit for this proposal. Comments are used in the preparation of documentation required under the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

> **Submittal of USACE Permit Application Comments**: All comments regarding the USACE permit application for the above-described project must be received on or before June 10, 2018, which is the close of the comment period. Comments on

state Section 401 certification must be submitted as described below under "Water Quality Certification Comments". Extensions of the comment period may be granted for valid reasons provided a written request is received by the close of the comment period. If no comments are received by that date, it will be considered that there are no objections. Anyone may request, in writing, that a public hearing be held to consider this application. Requests shall specifically state the particular reason(s) for holding a public hearing. If the USACE determines that the information received in response to this notice is inadequate for thorough evaluation, a public hearing may be warranted. If a public hearing is warranted, interested parties will be notified of the time, date, and location. Comments and requests for additional information on the USACE permitting action should be submitted to:

Kelly Allen, Project Manager
US Army USACE of Engineers, Albuquerque District
4101 Jefferson Plaza NE
Albuquerque, New Mexico 87109
(505) 342-3216
E-mail: Kelly.E.Allen@usace.army.mil

Submittal of Water Quality Certification Comments: Section 401 requires that any applicant for a federal permit provide proof of water quality certification to the appropriate federal agency prior to permit issuance. For the above proposed project, the applicant is required to obtain water quality certification, under Section 401 of the CWA, from the SWQB.

This notice serves to inform the public that the SWQB will consider issuing a certification under Section 401 of the CWA. The purpose of such certification is to reasonably ensure that the permitted activities will be conducted in a manner compliant with applicable New Mexico water quality standards, including antidegradation policy, and statewide water quality management plan. This notice is also posted on the SWQB website at: https://www.env.nm.gov/surface-water-quality/public-notices/

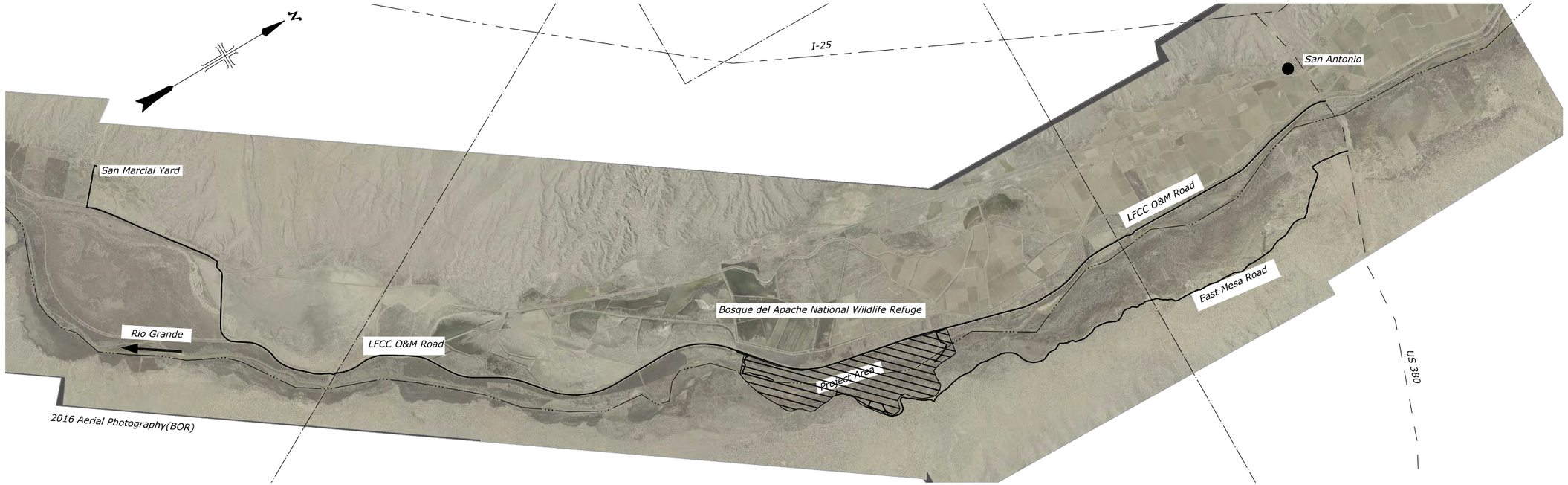
The SWQB will accept and consider written comments regarding the state certification received during the public comment period. Comments may be submitted electronically or by hard copy to:

Abraham Franklin
New Mexico Environment Department SWQB
P.O. Box 5469
Santa Fe, NM 87502-5469
505-827-2793
FAX 505-827-0160
E-mail: abraham.franklin@state.nm.us

Please note that names and addresses of those who submit comments in response to this public notice may be made publicly available through the Freedom of Information Act, the New Mexico Inspection of Public Records Act, or both.

DISTRICT ENGINEER
ALBUQUERQUE DISTRICT
USACE

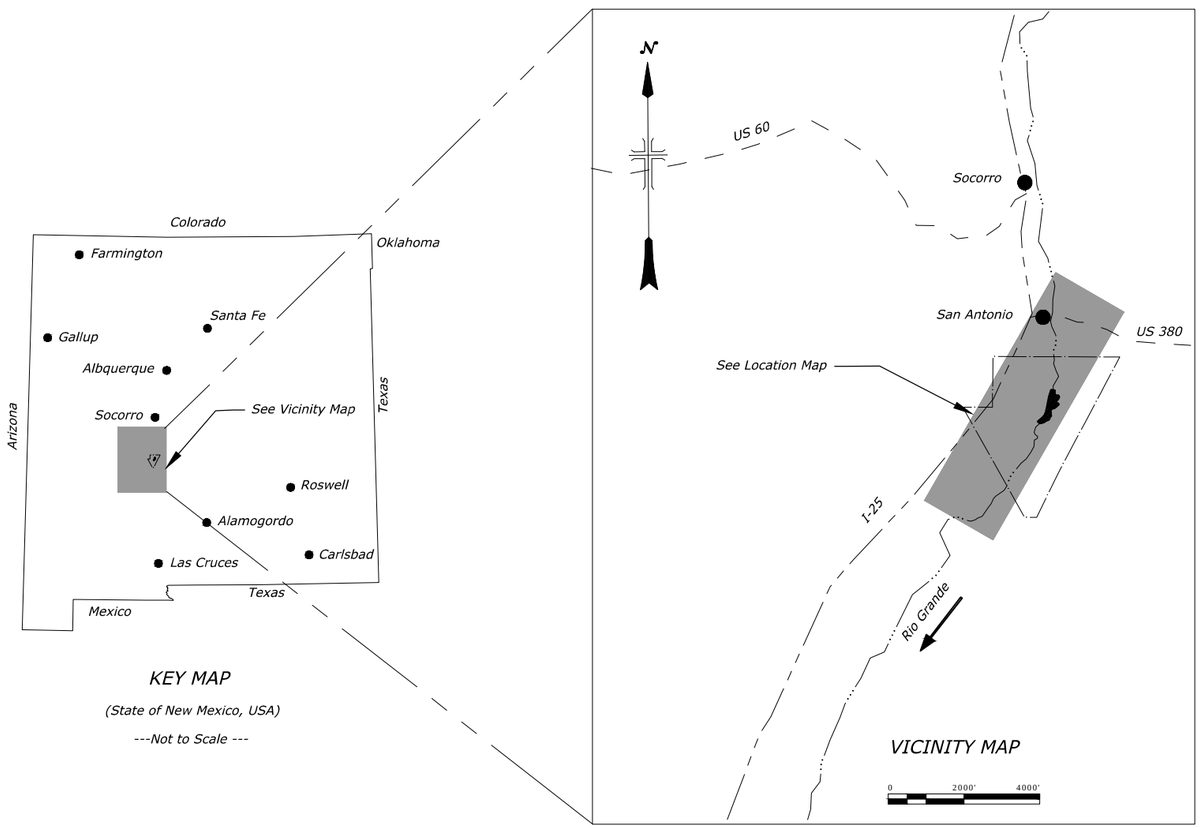
BUREAU CHIEF
SURFACE WATER QUALITY BUREAU
NEW MEXICO ENVIRONMENT DEPT



LOCATION MAP

6 0 6 12 18

SCALE OF MILES



KEY MAP

(State of New Mexico, USA)

---Not to Scale ---

VICINITY MAP

0 2000' 4000'

LEGEND

- City
- Interstate Highway
- US Highway
- BDA Realignment Pilot Project Access Road
- BDA Pilot Realignment Project Area
- Rio Grande
- Bosque del Apache National Wildlife Refuge Boundary

REFERENCE DRAWINGS

General Plan and Location Map	163-518-60019
Materials and Notes	163-518-60020
Site Plan Index	163-518-60021
Realignment Plan and Profile Sheet I	163-518-60022
Realignment Plan and Profile Sheet II	163-518-60023
Realignment Plan and Profile Sheet III	163-518-60024
Existing River Channel Conversion Plan and Profile Sheet I	163-518-60025
Existing River Channel Conversion Plan and Profile Sheet II	163-518-60026
Typical Cross Sections	163-518-60027
Typical Cross Sections - Realignment Sheet I	163-518-60028
Typical Cross Sections - Realignment Sheet II	163-518-60029
Typical Cross Sections - Realignment Sheet III	163-518-60030
Grading Plan	163-518-60031
Planting Detail	163-518-60032
ELJ (Engineered Log Jam) Detail	163-518-60033

NOTES

1. All coordinate data is in the NM State Plan, Central Zone 3002, NAD 83, NAVD 88 datum
2. Maximum project area is 1,100 acres.
3. Site access is from US Highway 380.
4. Access may be from either side of the Rio Grande. Tracked equipment should primarily use west side as access for transport trucks is limited on the East Mesa Road. Equipment would cross river to obtain access to the east.
5. Hauling may also occur from Reclamation's San Marcial Yard along the eastern side of the Low Flow Conveyance Channel (LFCC), following the Operation and Maintenance (O&M) road.

RECLAMATION
Managing Water in the West

ALWAYS THINK SAFETY

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
MIDDLE RIO GRANDE PROJECT
SOCORRO DIVISION

SOCORRO CHANNEL

SAN ANTONIO TO RM 78 REACH

Figure 1

SPA-2009-00520

DESIGNED	A. Harris/J. AuBuchon/N. Holste
DRAWN	J. AuBuchon
CHECKED	C. Bui/ B. Greimann
TECH. APPR.	
APPROVED (CMDN APPROVAL)	
ALBUQUERQUE, NM	2017-12-29

BDA REALIGNMENT PILOT PROJECT

GENERAL PLAN AND LOCATION MAP

163-518-60019

SHEET 1

DATE AND TIME PLOTTED
2017-11-27
PLOTTED BY
J. AuBuchon

CAD SYSTEM
AUTOCAD
CAD FILENAME
BDAPP_cover

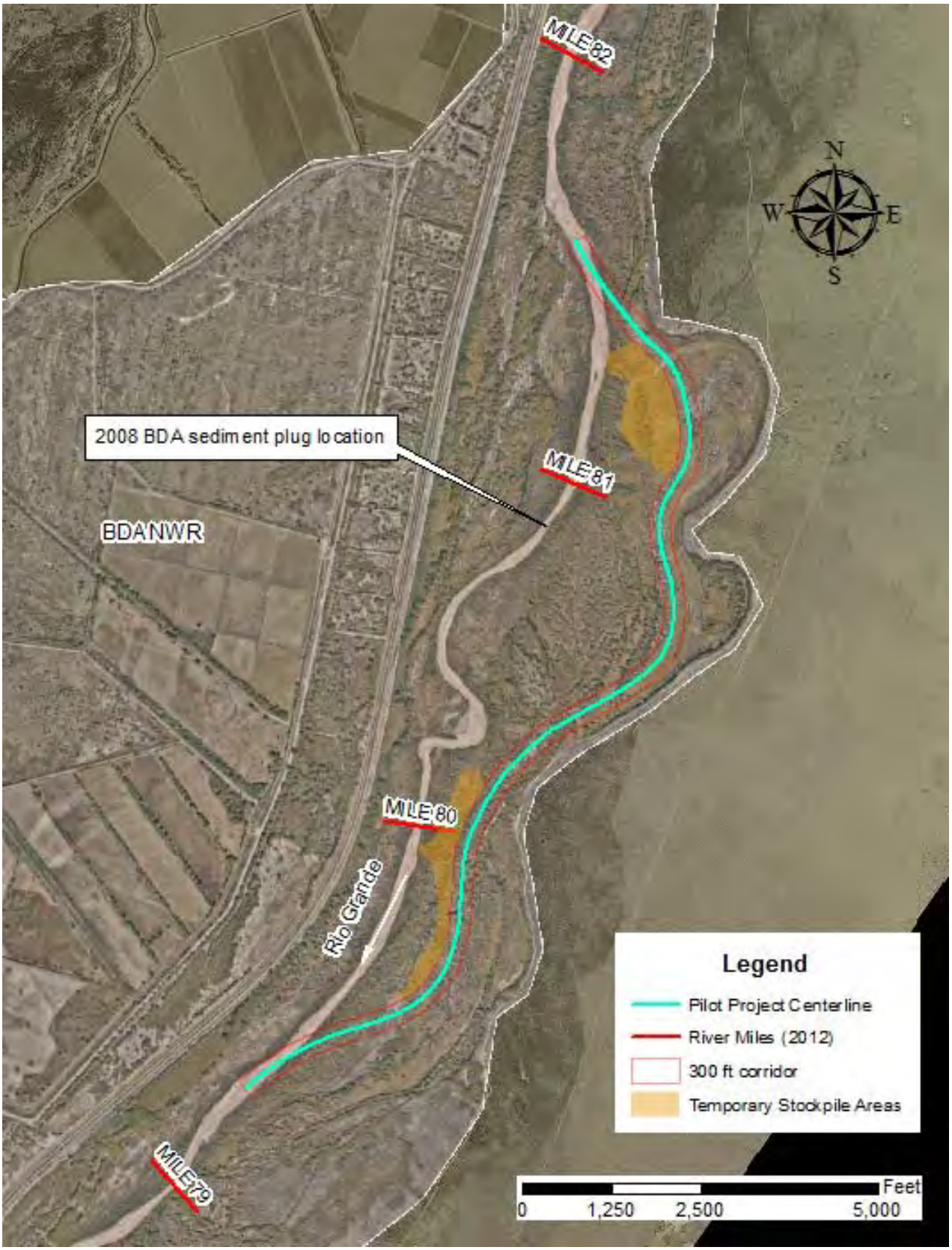


Figure 2. BDA pilot project centerline, 300 foot offset, and proposed temporary stockpile area. The background imagery is a combination of the 2012 and 2016 aerial photography (Reclamation).

Figure 2
SPA-2009-00520

BOSQUE DEL APACHE

San Antonio, New Mexico

Rio Grande Realignment
Pilot Project
National Wildlife Refuge

Wetland Delineation Map

Project Area Summary Total

- Sample Point
- BOR Delineation Point w/ 200ft Buffer
- Riverine Unconsolidated Bottom = 55.4 ac / 15,160 lf
- Palustrine Forested Wetland = 453.8 ac
- Palustrine Scrub/Shrub Wetland = 472.9 ac
- Palustrine Emergent Wetland = 15.2 ac
- Project Boundary = 1,064.2 ac

River and Realignment Area Summary

Existing River w/ 200ft Buffer
Palustrine Forested Wetland = 48.4 ac
Palustrine Scrub/Shrub Wetland = 78.7 ac
Existing Riverine Channel = 49.1 ac
TOTAL = 176.2 ac

Proposed Realignment w/ 250ft Buffer
Palustrine Forested Wetland = 59.9 ac
Palustrine Scrub/Shrub Wetland = 105.9 ac
Palustrine Emergent Wetland = 5.0 ac
Existing Riverine Channel = 12.9 ac
TOTAL = 183.7 ac

* Area Acreages are Included in Project Area Summary Above

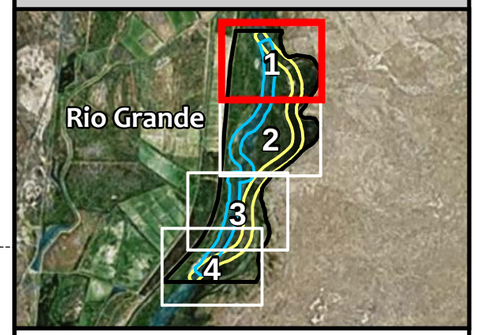


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Figure 3
SPA-2009-00520

North

BIO-WEST
www.bio-west.com
435.752.4202

Map Date: 11/7/2017

Transect 1
Transect 2
Transect 3
Rio Grande River
up12
w12
t1b1
t1b2
t1b3
t1b4
w11
up11
up10
gd2
gd1
w10
t2b1
t2b2
t2b3
t2b4
t3b4
t3b3
gd4
gd3
t3b2
t3b1
t3b5
up9
w8
up8
up13
w13

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BOSQUE DEL APACHE

San Antonio, New Mexico

Rio Grande Realignment
Pilot Project
National Wildlife Refuge

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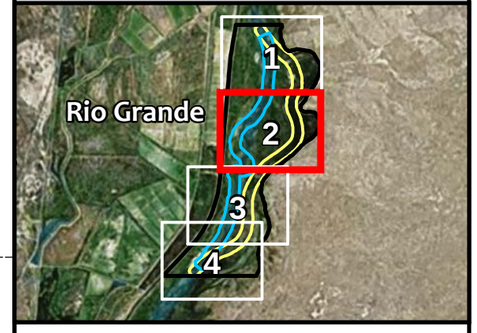

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Figure 4
SPA-2009-00520

North

BIO-WEST
www.bio-west.com
435.752.4202

Map Date: 11/7/2017

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BOSQUE DEL APACHE

San Antonio, New Mexico

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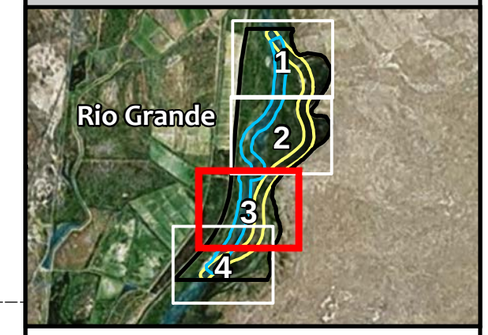

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Figure 5
SPA-2009-00520

North

BIO-WEST
www.bio-west.com
435.752.4202

Map Date: 11/7/2017

Transect 7
Transect 8
Transect 9
Rio Grande River
River

t7b4 t7b5 t7b3 w4 up4 t7b2 t7b1
2 3 1 t8b1 t8b2 t8b3 gd15 gd16 up3 w3
gd17 gd18 t9b3 t9b2 t9b1 t9b4 w2 up2

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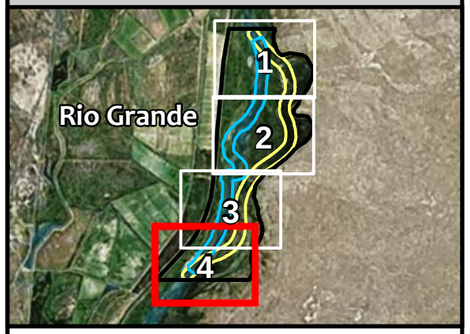
TOTAL = 176.2 ac

Proposed Realignment w/ 250ft Buffer
Palustrine Forested Wetland = 59.9 ac
Palustrine Scrub/Shrub Wetland = 105.9 ac
Palustrine Emergent Wetland = 5.0 ac
Existing Riverine Channel = 12.9 ac
TOTAL = 183.7 ac

* Area Acreages are Included in Project Area Summary Above



0 200 400 800 Feet

Figure 6
SPA-2009-00520

North

BIO-WEST
www.bio-west.com
435.752.4202

Map Date: 11/7/2017

Transect 9
Transect 10
Rio Grande River
t9b2
t9b1
gd17
gd18
t9b3
t9b4
BOR2
t10b1
t10b2
BOR1
gd20
gd19
up1
w1
4
6
5

Document Path: G:\Wetland Projects\Bosque Del Apache Wetlands\GIS\BDANWR_Wetland_Working.mxd

MATERIAL QUANTITIES		
Description	Unit	Expected Quantity
Clear and Grub (12 in. Depth)	cubic yard	130,000
Excavation for Realignment Inlet	cubic yard	13,000
Excavation for Realignment Outlet	cubic yard	32,000
Fill for Existing River Channel Conversion	cubic yard	173,000
Permanent Earthen Diversion Berm	cubic yard	2,000
Expected Project Disturbance Area	acre	330
Vegetation Clearing Areas - Realignment Corridor	acre	100
Vegetation Clearing Areas - Outside Realignment Corridor	acre	170
Existing River Channel Floodplain Conversion Area	acre	45
Large trees for ELJ	each	25
Coyote Willow Tree Whips	each	2,500
Other Native Tree Whips	each	1,000
Primary Access (LFCC O&M Road)	mile	20.0
Primary Access (existing/new) from west side	mile	0.5
Secondary Access (East Mesa Road)	mile	8.5
Secondary Access (new) from east side	mile	0.2
Staging Area	acre	1
Temporary Stockpile Area	acre	49

ABBREVIATIONS:

cfs	cubic feet per second
LiDAR	Light Detection and Ranging
LFCC	Low Flow Conveyance Channel
ELJ	Engineered Log Jam
BDANWR	Bosque del Apache National Wildlife Refuge
O&M	Operation and Maintenance
in.	inch

GENERAL NOTES:

1. Horizontal coordinates are in the New Mexico State Plane, Central Zone (3002), NAD83 datum.
2. Elevations are in the North American Vertical Datum, NAVD88 Datum.
3. Dimensions are rounded to the nearest foot.
4. Elevations are rounded to the nearest tenth of a foot (0.1).
5. Construction equipment shall be thoroughly pressure washed prior to arrival at the construction site to avoid the introduction of noxious weeds to the construction site.
6. Construction equipment shall be inspected daily for potential hydrocarbon leaks. All fueling shall occur outside the active floodplain. Spill kits shall be readily available onsite.
7. Construction supervisor will ensure that all applicable Reclamation Safety and Health Standards are followed.
8. All appropriate safety measures shall be taken by the construction supervisor when construction traffic is present including the transport of excavated or grubbed materials. Safety measures include, but are not limited to, locating flag persons at the appropriate intersection to avoid traffic incidents.
9. Work in the active channel of the Rio Grande should be conducted when flows are less than approximately 1,000 cfs.
10. Work within the migratory bird season (April 1st through September 1st) shall require coordination with the project biologist. Project manager will coordinate as appropriate with the project biologist.
11. Water quality will be assessed visually when working in the wet. Observations that construction work is affecting water quality shall be reported to the project manager.
12. River crossings shall occur in the designated area. The number of necessary trips shall be minimized. The wetted length of the river crossing is expected to be between 100 and 250 feet. Width of river disturbance area by construction vehicles shall be no more than 20 feet along the length of the river crossing. River crossings would primarily involve tracked equipment. Equipment with wheels shall access the project area via the East Mesa Road.

SITE NOTES:

1. Access to the site is from US 380.
2. Quantities listed for construction are neatline volumes. The neatline volumes are calculated from the differences in the 2016 LiDAR surface (existing ground) and the design surface.
3. Clearing and grubbing volume is in addition to the volumes shown for excavation and assumes a 12–inch depth. Topsoil within this section shall be stockpiled separately and spread on the surface of the designated fill areas to promote vegetation growth.
4. Grubbing shall consist of ripping the surface after vegetation has been removed. This will serve to dislodge roots and tree trunks and loosen earthen materials within the top 12–inches.
5. Water for dust abatement, if required, shall be pumped from the Rio Grande or the LFCC. The pump shall utilize a 0.25–inch mesh screen.
6. Construction staking for the project shall be performed prior to the start of construction. Some modifications are anticipated to accommodate field conditions that differ from assumed field conditions, including final floodplain elevations. Any adjustments determined in the field will require prior approval from the project engineer.
7. Local bench marks are documented river survey end points, provided as shown on the drawings for construction of the project improvements. Benchmarks shall be protected from disturbance, when possible.
8. Areas of disturbance shall be cleared of vegetation prior to placement of stockpile sites and new features. Areas for vegetation removal will be clearly marked prior to construction activities in that area.
9. Vegetation within the Realignment Corridor (150 feet on either side of the realignment centerline), including native vegetation, shall be removed (mulched or extracted) and the roots ripped. Larger cottonwood and Gooddings willow trees at the fringes of the Realignment Corridor may be left intact if pre–approved by the project engineer. Mulched and grubbed material shall be piled along the realignment centerline or in one of the designated temporary stockpile areas. The piles of woody material will be burned by the BDANWR fire crews. Extracted material, such as the larger native trees, shall be stockpiled in one of the designated temporary stockpile areas for use in constructing the ELJ, placement as dead tree "snags", or brush piles in the Existing River Channel Floodplain Conversion Area.
10. Existing large native trees shall not be removed outside the Realignment Corridor, unless pre–approved by the project engineer. All exotic species, primarily Russian olive and saltcedar trees, shall be removed within the vegetation removal areas outside the Realignment Corridor. If large native trees are extracted they shall be temporarily stockpiled for use in constructing the ELJ, placement as dead tree "snags", or brush piles in the Existing River Channel Floodplain Conversion Area.
11. Extracted, mulched, and grubbed woody material shall be accumulated within the Realignment Corridor or the Temporary Stockpile Areas. The construction supervisor shall coordinate with the BDANWR fire crew for scheduled controlled burning of this woody material. Upon completion of the burn the remaining ash and unburned material will be mixed with excavated material to fill the existing channel.
12. Construction activities shall be limited to a maximum disturbance footprint of 400 acres. The expected area of disturbance is 330 acres.
13. Fill material shall be compacted using the weight of construction equipment in lifts not to exceed 6–inches.
14. Vegetation planting within the Existing River Channel Floodplain Conversion Area shall be conducted during the dormant season (November through March), except if pre–approved by the project engineer.
15. ELJs shall only be placed during the initial construction period if river conditions facilitate the ability to work in the river bed (e.g. dry river bed conditions).
16. Road improvement of access roads may be conducted within a ten to fifteen foot width of the access road centerline. Vegetation clearing may occur in this area up to a height of 20 feet from the road surface. Road improvements are necessary to ensure safe access for the construction equipment. Road improvements include clearing, mowing and trimming, blading, wetting, widening, and gravel cap placement. Clearing on new roads may also involve some subsurface disturbance to vegetation roots.
17. Excavation in the Realignment Corridor shall proceed from downstream to upstream to minimize the construction time in the wet.
18. Fill in the Existing Channel Floodplain Conversion Area shall proceed from upstream to downstream until work is in the dry. If the existing channel has water a permanent earthen diversion berm shall be placed prior to additional fill activities. If the existing channel is dry filling may occur in either the upstream or downstream direction.

DATE AND TIME PLOTTED
11/17/2017
PLOTTED BY
JA

CAD SYSTEM
AUTOCAD
CAD FILENAME
BDAPS_notes

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BUREAU OF RECLAMATION
MIDDLE RIO GRANDE PROJECT
SOCORRO DIVISION

SOCORRO CHANNEL
SAN ANTONIO TO RM 78 REACH

Figure 7

SPA-2009-00520

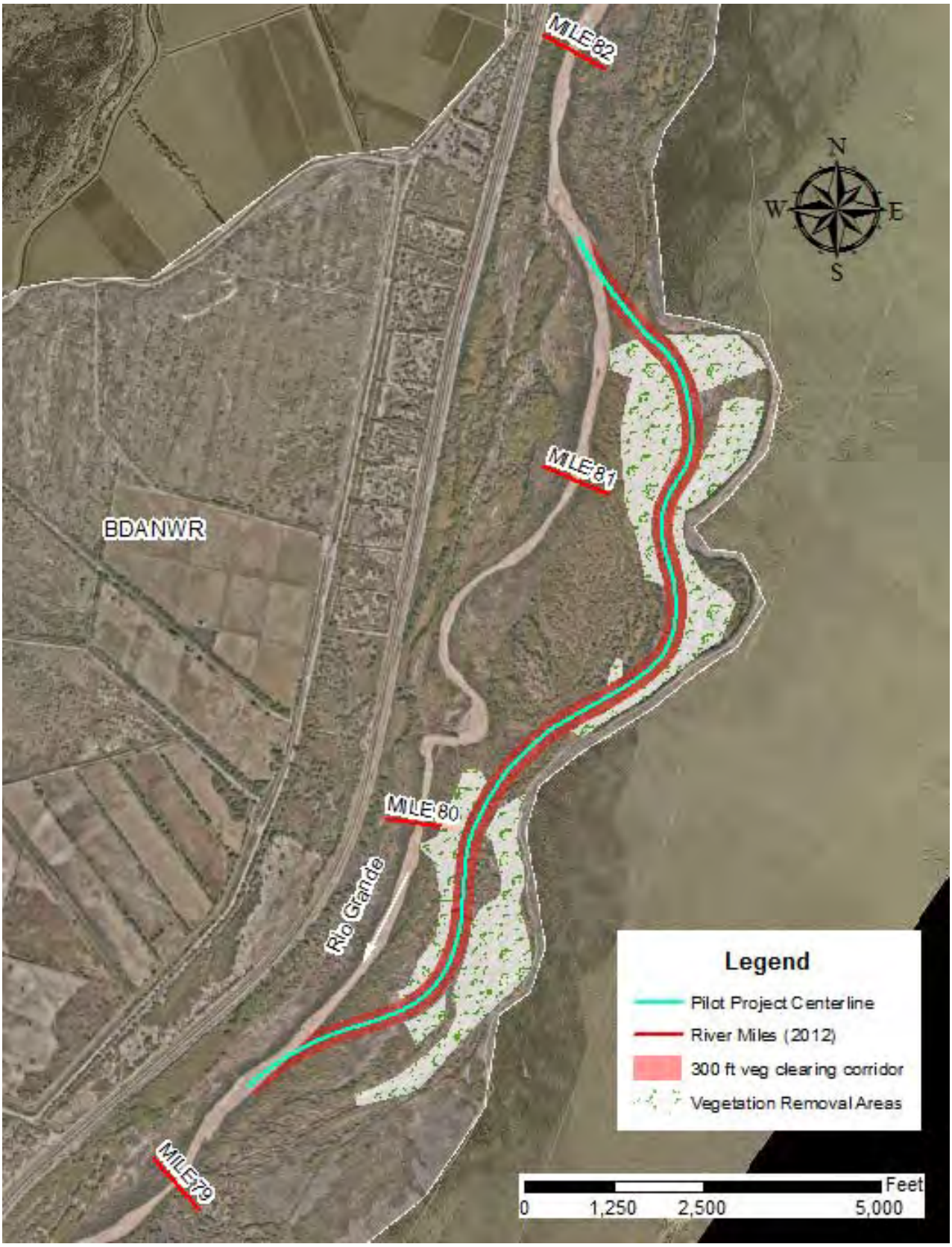
A. Harris/J. AuBuchon/N. Holste
DESIGNED
J. AuBuchon
DRAWN
C. Bui/ B. Greimann
CHECKED
TECH. APPR.
APPROVED
ADMIN APPROVAL -
ALBUQUERQUE, NM 2017-12-29

BDA REALIGNMENT PILOT PROJECT

MATERIALS AND NOTES

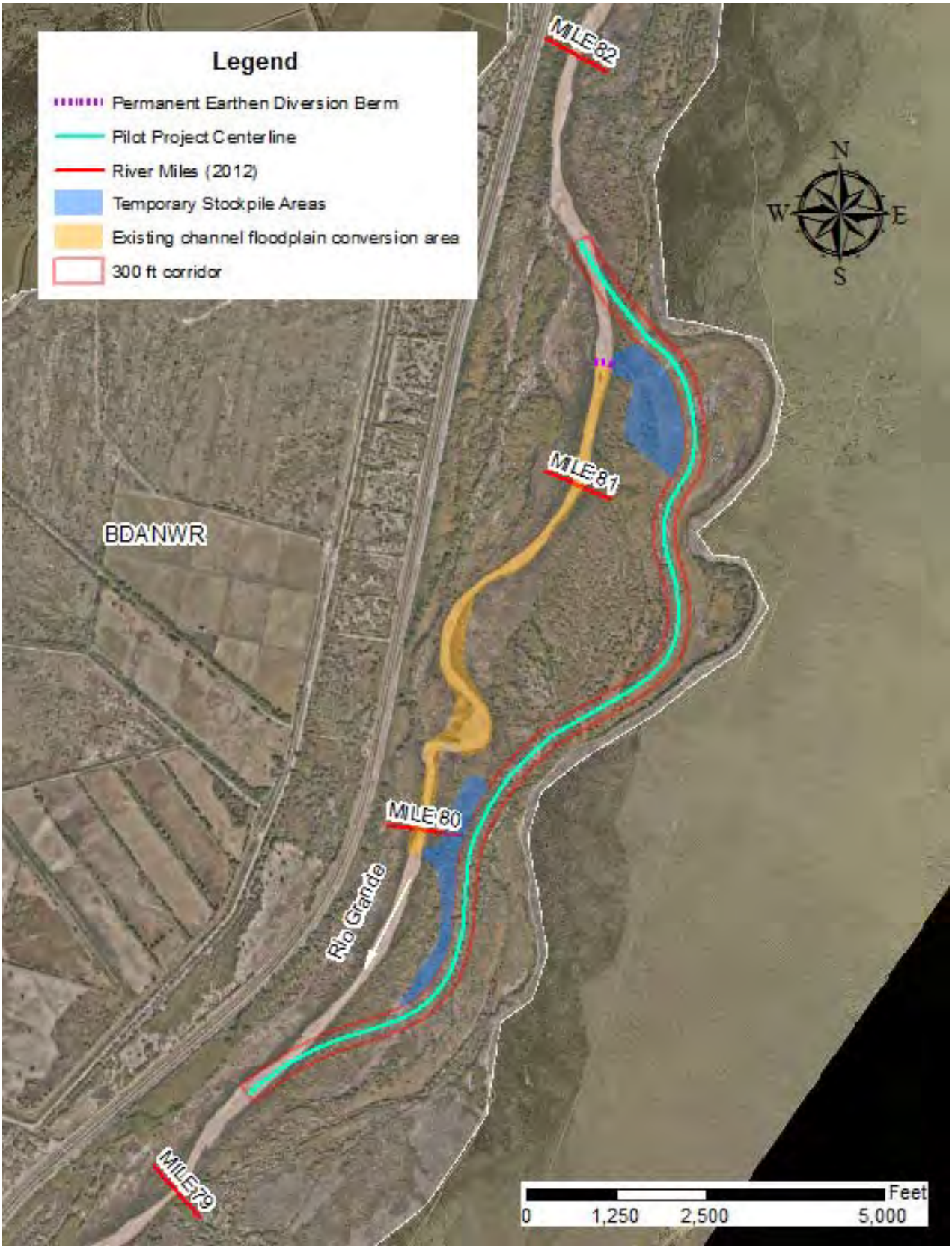
163-518-60020

SHEET 2



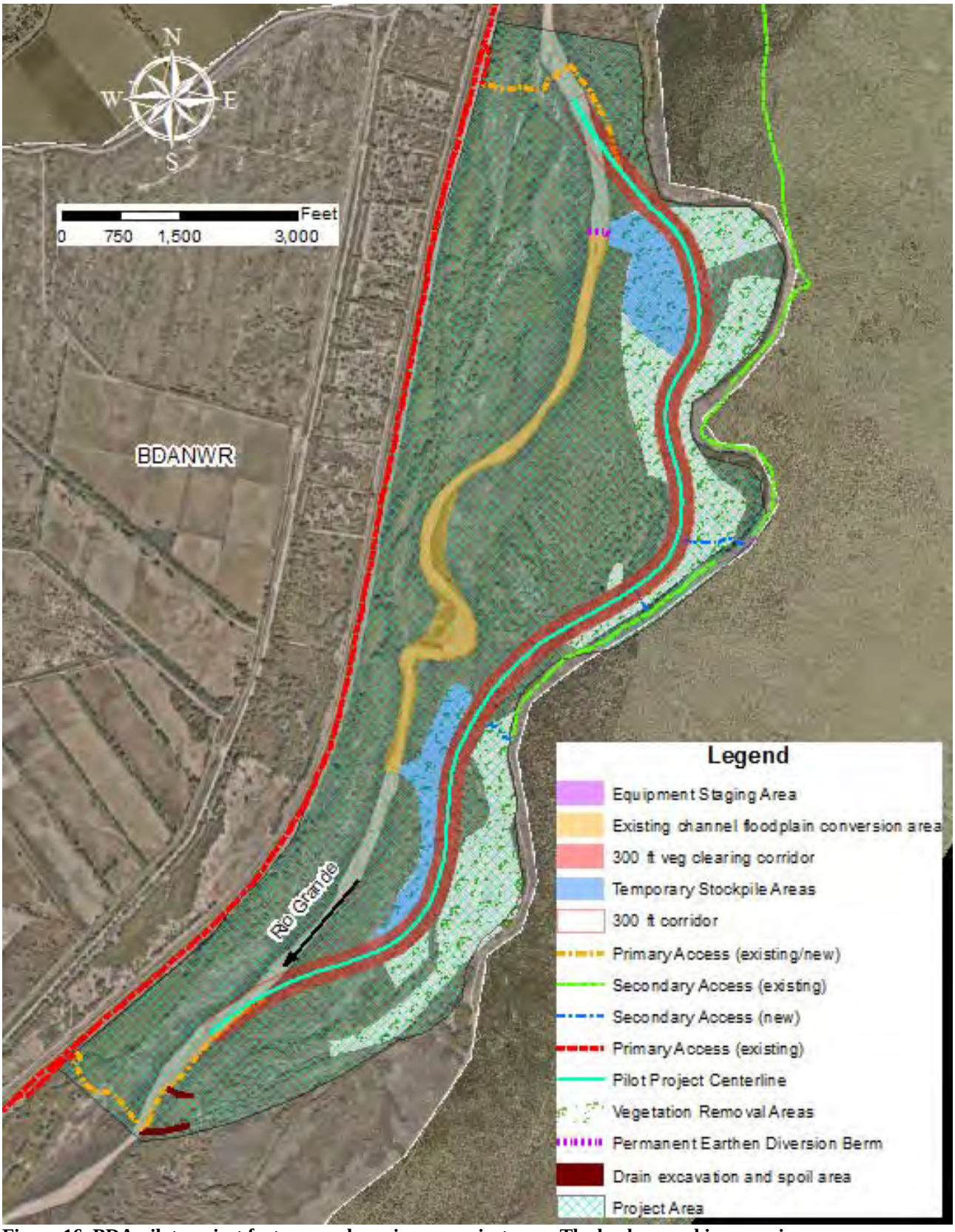
~~Figure 5.~~ **BDA pilot project centerline and 300 foot offset alignment with vegetation removal areas. The background imagery is a combination of the 2012 and 2016 aerial photography (Reclamation).**

Figure 8
SPA-2009-00520



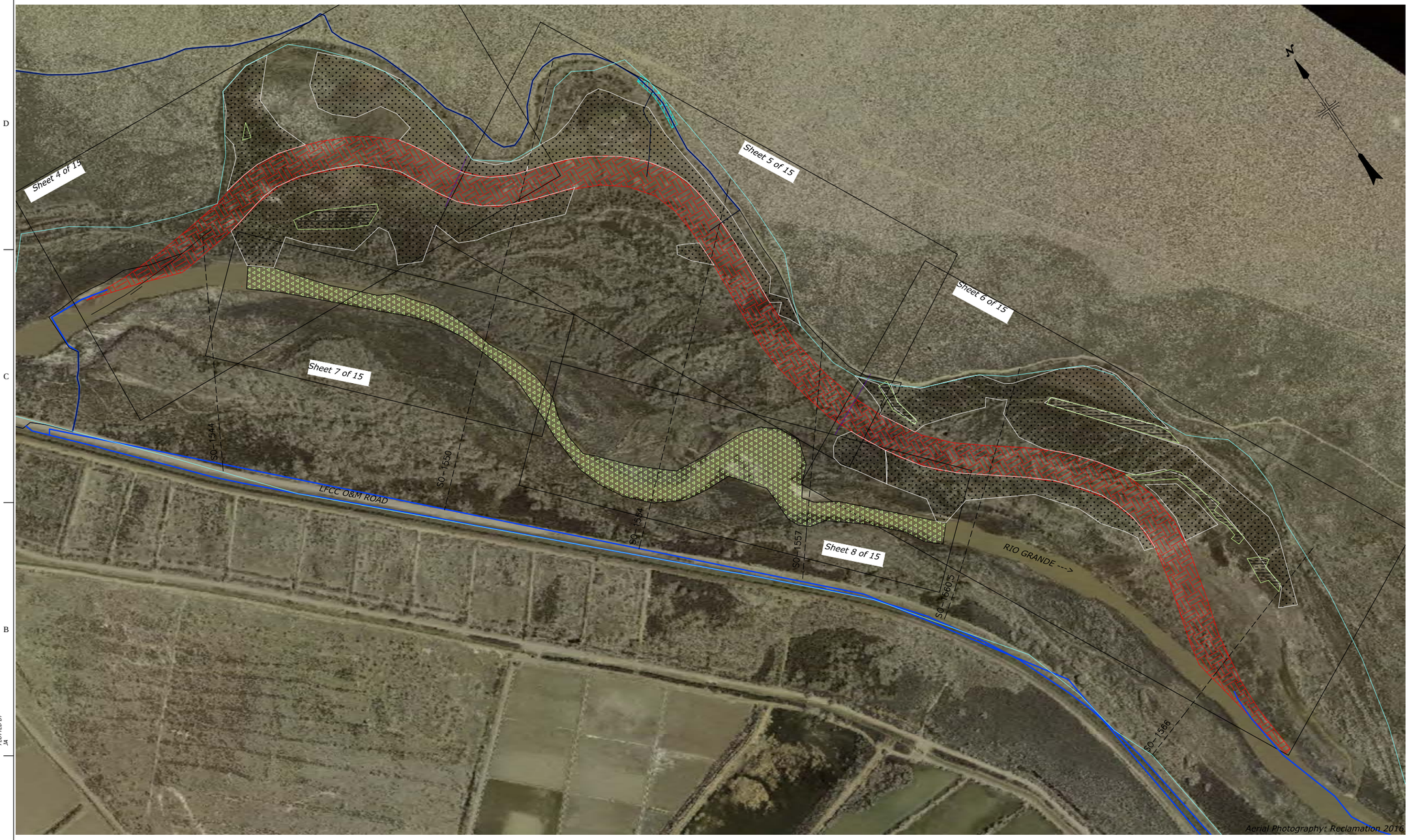
~~Figure 6.~~ BDA pilot project centerline and 300 foot offset alignment with existing channel fill area. The background imagery is a combination of the 2012 and 2016 aerial photography (Reclamation)

Figure 9
SPA-2009-00520



~~Figure 16.~~ BDA pilot project features and maximum project area. The background imagery is a combination of the 2012 and 2016 aerial photography (Reclamation).

Figure 10
SPA-2009-00520



BDA PILOT PROJECT PLAN AND PROFILE INDEX

0 500' 1000'

LEGEND
Vegetation Clearing
Clearing and Grubbing
Fill Placement in Current Channel
Equipment Storage and Access
Estimated Locations of Native Stands (keep)
Access Roads
Construction Footprint
Rangeline
Realignment Centerline

NOTES:
1. Coordinate data is in NM State Plane, Central Zone, NAD 83, NAVD 88 datum.
2. Areas labeled as stockpile areas are only temporary sites needed for construction activities.

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SOCORRO DIVISION

SOCORRO CHANNEL

SAN ANTONIO TO RM 78 REACH

Figure 11

SPA-2009-00520

A.Harris/J.AuBuchon/N. Holste
DESIGNED
A. Harris
DRAWN
C. Bui/B. Greimann
CHECKED
TECH. APPR.
APPROVED
ADMIN APPROVAL - TITLE
ALBUQUERQUE, NM 2017-11-13

BDA REALIGNMENT PILOT PROJECT

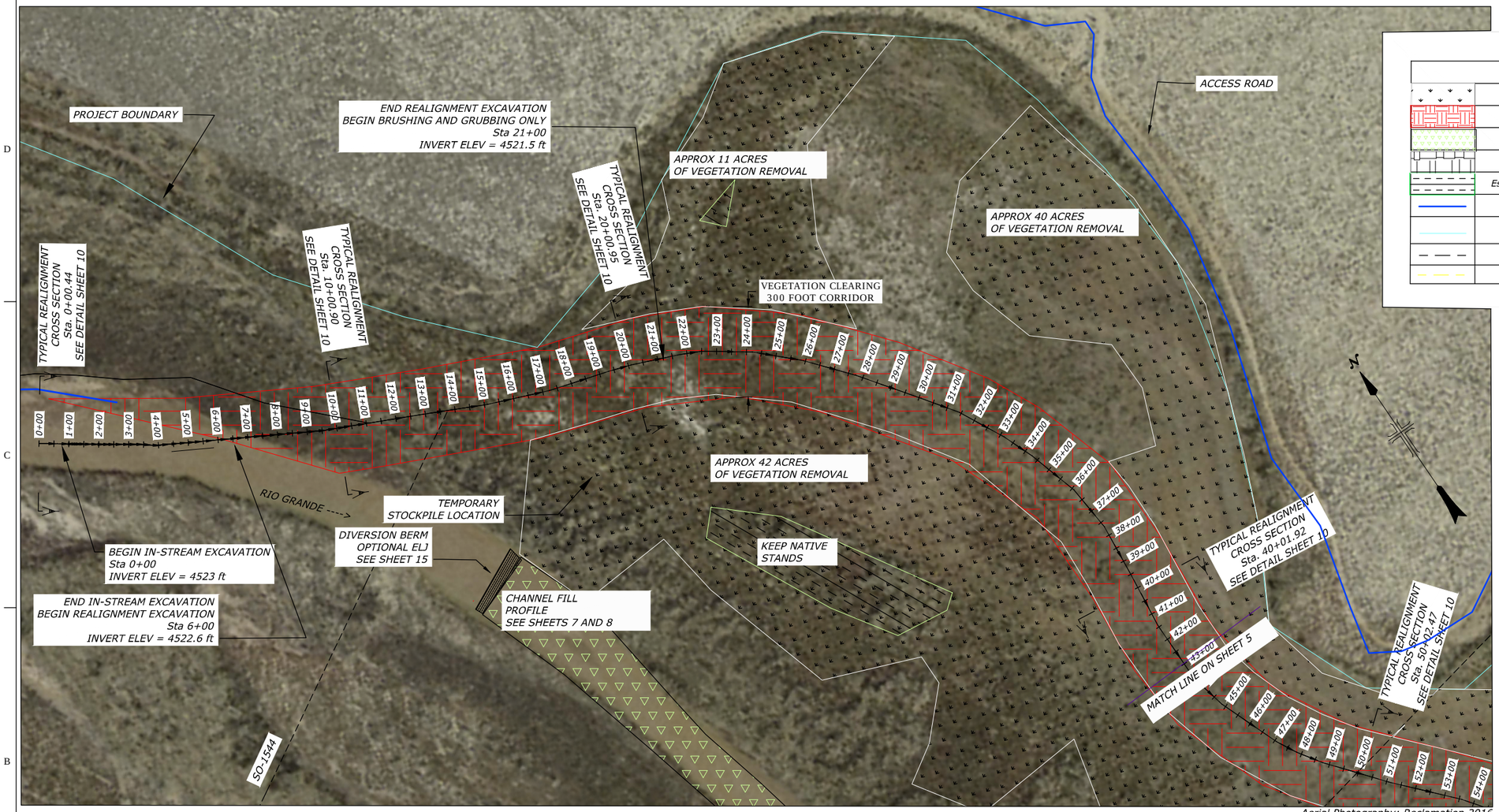
SITE PLAN INDEX

163-518-60021

SHEET 1

DATE AND TIME PLOTTED
2017-12-20
PLOTTED BY
JA

CAD SYSTEM
AUTOCAD
CAD FILENAME
BDA_DWG-3.dwg



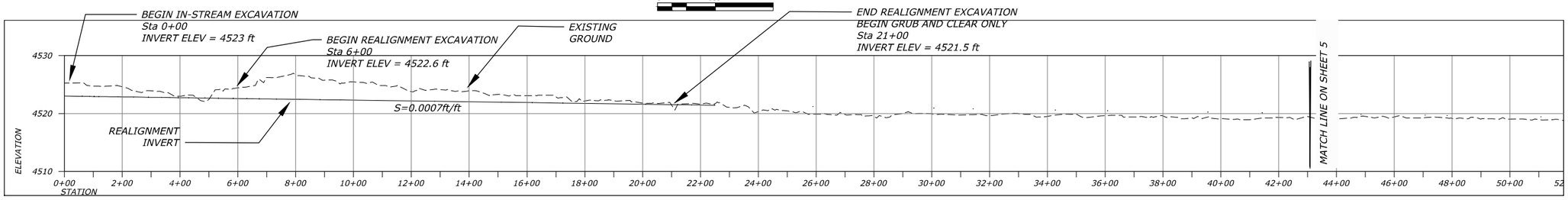
LEGEND

	Vegetation Clearing
	Clearing and Grubbing
	Fill Placement in Current Channel
	Equipment Storage and Access
	Estimated Locations of Native Stands (keep)
	Access Roads
	Construction Footprint
	Rangeline
	Realignment Centerline

Aerial Photography: Reclamation 2016

BDA PILOT PROJECT REALIGNMENT CHANNEL SHEET 4 PLAN

0 100' 200'



BDA PILOT PROJECT REALIGNMENT CHANNEL SHEET 4 PROFILE

0 100' 200'

NOTES:
1. Coordinate data is in NM State Plane, Central Zone, NAD 83, NAVD 88 datum.
2. Existing ground in river channel may be different than shown due to local scour and deposition. Excavate as necessary to achieve design invert elevations and slope.
3. Beginning at Sta 21+00, the existing ground is below the design grade. Only clearing, grubbing, and grading is expected.
4. Required construction staking and survey control points will be established prior to construction.
5. Excavated material may require temporary stockpiling at designated locations.
6. Stationing increases downstream.
7. Areas labeled as stockpile areas are only temporary sites needed for construction activities.

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SOCORRO DIVISION

SOCORRO CHANNEL

SAN ANTONIO TO RM 78 REACH

Figure 12

SPA-2009-00520

A. Harris/J. AuBuchon/N. Holste	DESIGNED
A. Harris	DRAWN
C. Bui/B. Greimann	CHECKED
	TECH. APPR.
	APPROVED ADMIN APPROVAL - TITLE
ALBUQUERQUE, NM	2017-12-29

BDA REALIGNMENT PILOT PROJECT

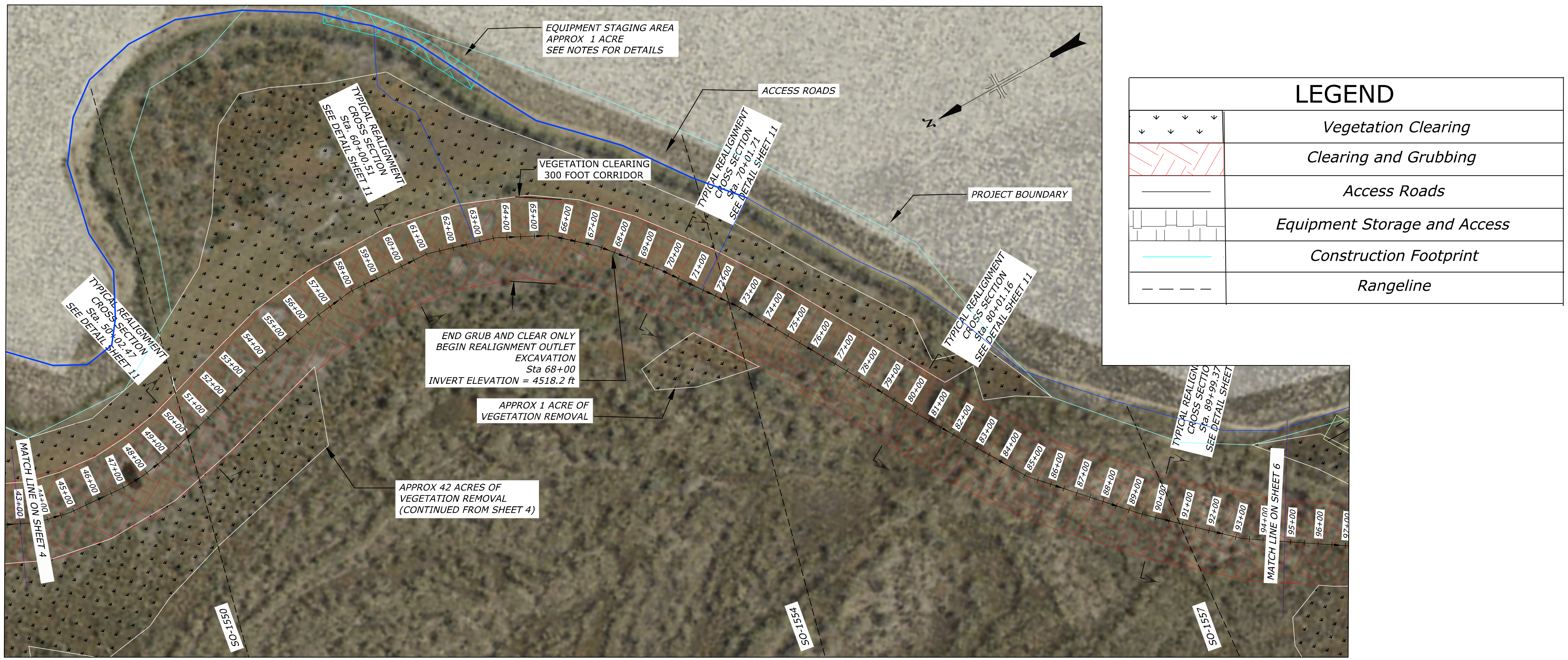
REALIGNMENT PLAN AND PROFILE SHEET I

163-518-60022

SHEET 4

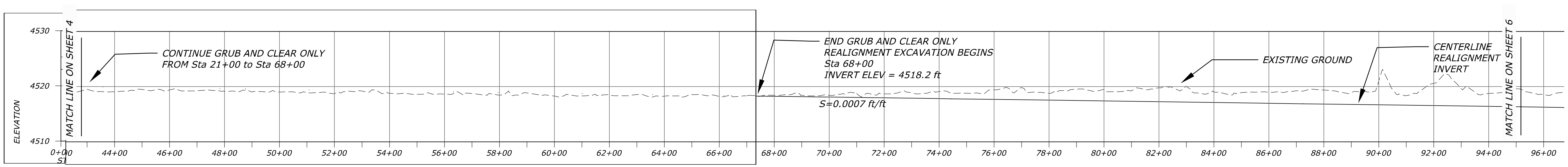
DATE AND TIME PLOTTED
2017-11-22
PLOTTED BY
JA

CAD SYSTEM
AUTOCAD
CAD FILENAME
BDA_DWG-3.dwg



Aerial Photography: Reclamation 2016

BDA PILOT PROJECT REALIGNMENT CHANNEL SHEET 5 PLAN



BDA PILOT PROJECT REALIGNMENT CHANNEL SHEET 5 PROFILE

NOTES:
1. Coordinate data is in NM State Plane, Central Zone, NAD 83, NAVD 88 datum.
2. Existing ground in river channel may be different than shown. Excavate as necessary to achieve design invert elevations and slope.
3. Between Sta 21+00 and 68+00, the existing ground is below the design grade. Only clearing, grubbing, and grading is expected.
4. Required construction staking and survey control points will be established prior to construction.
5. Excavated material may require temporary stockpiling at designated locations.
6. Stationing increases downstream.
7. Equipment should remain on relatively flat areas in the staging area, do not level or remove existing terraces.

DATE AND TIME PLOTTED 11/27/2017 PLOTTED BY JA
CAD SYSTEM AUTOCAD CAD FILENAME 5_RealignPPIIb.dwg

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SOCORRO DIVISION

SOCORRO CHANNEL
SAN ANTONIO TO RM78 REACH

Figure 13

SPA-2009-00520

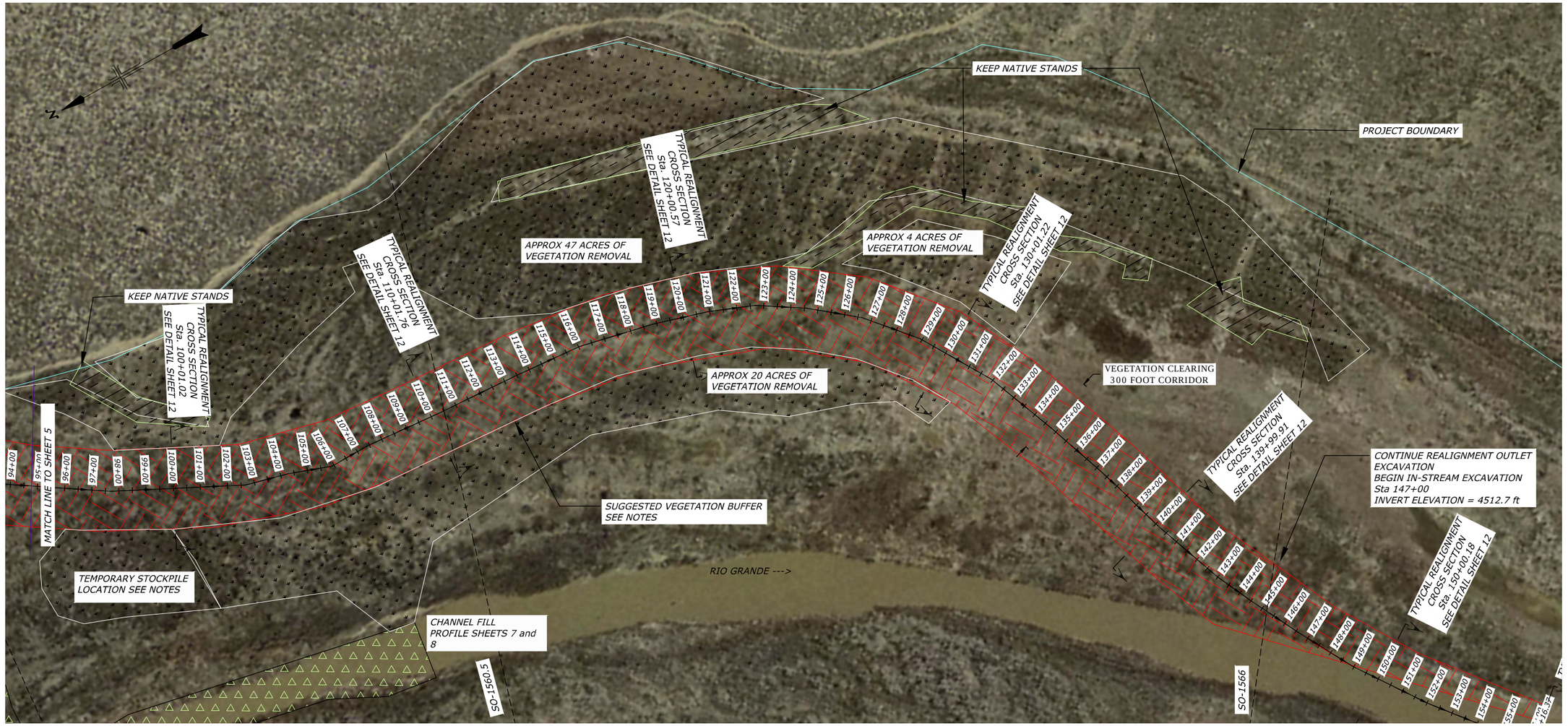
A. Harris/J. AuBuchon/N. Holste DESIGNED
A. Harris DRAWN
C. Bui/B. Greimann CHECKED
TECH. APPR.
APPROVED
ALBUQUERQUE, NM 2018-01-02

BDA REALIGNMENT PILOT PROJECT

REALIGNMENT PLAN AND PROFILE SHEET II

163-518-60023

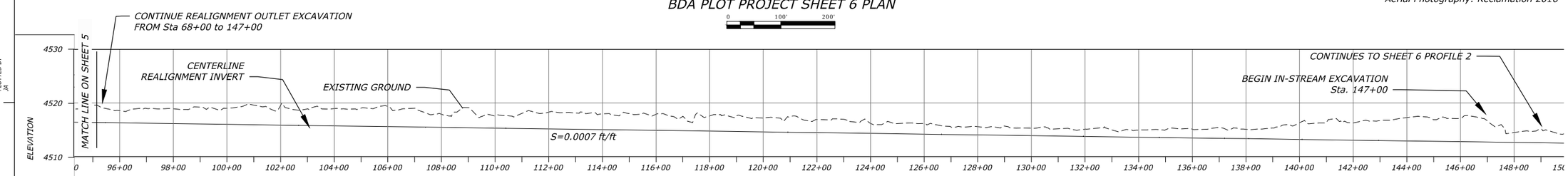
SHEET 1



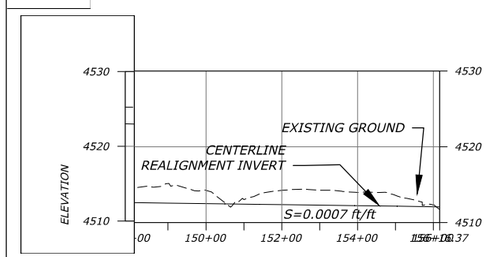
Aerial Photography: Reclamation 2016

BDA PLOT PROJECT SHEET 6 PLAN

0 100' 200'



BDA PLOT PROJECT SHEET 6 PROFILE 1



BDA PLOT PROJECT SHEET 6 PROFILE 2

0 100' 200'

NOTES:
1. Coordinate data is in NM State Plane, Central Zone, NAD 83, NAVD 88 datum.
2. Existing ground in river channel may be different than shown. Excavate as necessary to achieve design invert elevations and slope.
3. Required construction staking and survey control points will be established prior to construction.
4. Excavated material may require temporary stockpiling at designated locations.
5. Stationing increases downstream.
6. Areas labeled as stockpile areas are only temporary sites needed for construction activities.
7. Temporary Stockpile Location may be placed elsewhere in this vegetation clearing area; no additional vegetation removal may be added.
8. A 10-15 foot vegetation buffer between the clearing and grubbing corridor and the vegetation removal area is recommended to maintain a corridor for the active channel.

LEGEND
Vegetation Clearing
Clearing and Grubbing
Fill Placement in Current Channel
Equipment Storage and Access
Estimated Locations of Native Stands (keep)
Access Roads
Construction Footprint
Rangeline
Realignment Centerline

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SOCORRO DIVISION

SOCORRO CHANNEL

SAN ANTONIO TO RM 78 REACH

Figure 14

SPA-2009-00520

A. Harris/J. AuBuchon/ N. Holste
DESIGNED
A. Harris
DRAWN
C. Bui/ B. Greimann
CHECKED
TECH. APPR.
APPROVED
ADMIN APPROVAL - TITLE
ALBUQUERQUE, NM 2017-11-13

BDA REALIGNMENT PILOT PROJECT

REALIGNMENT PLAN AND PROFILE SHEET III

163-518-60024

SHEET 1

DATE AND TIME PLOTTED
11/22/2017
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JA

CAD SYSTEM
AUTOCAD
CAD FILENAME
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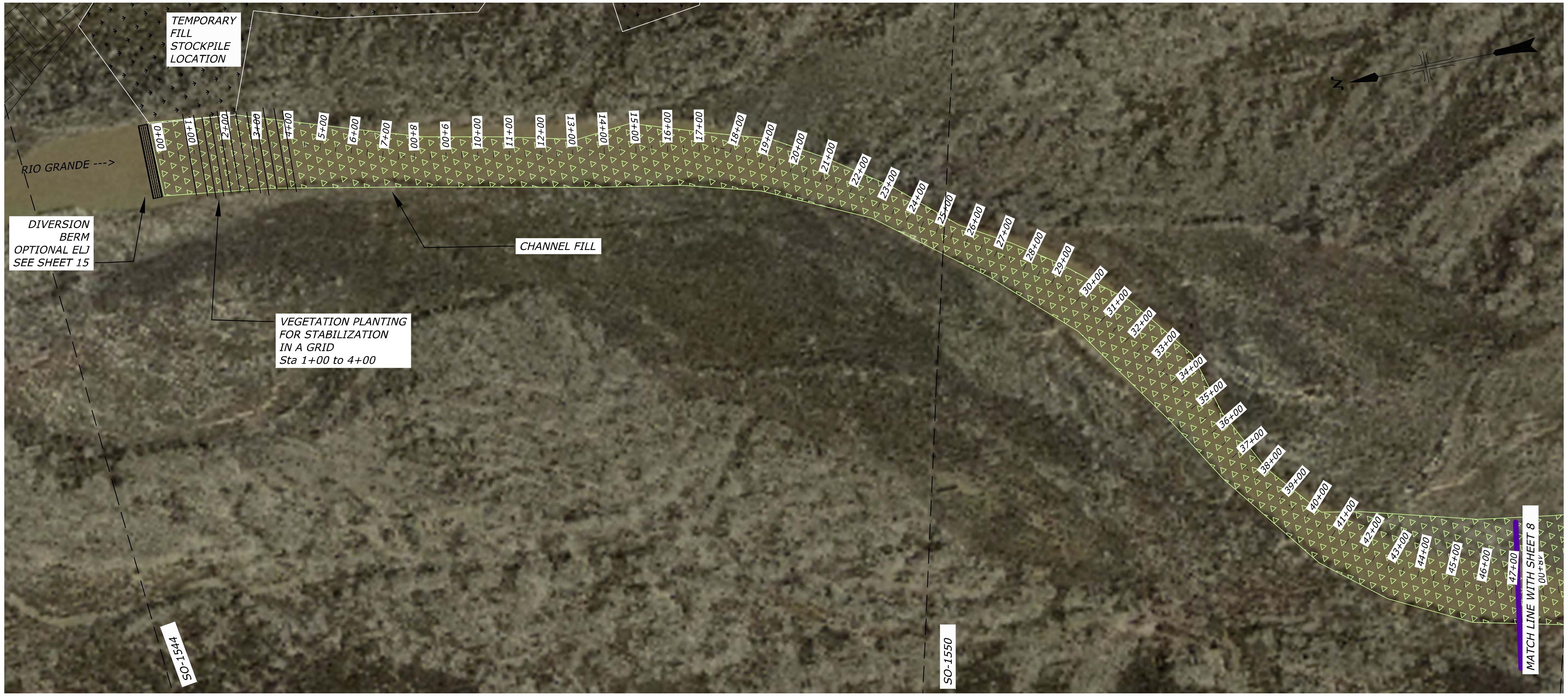
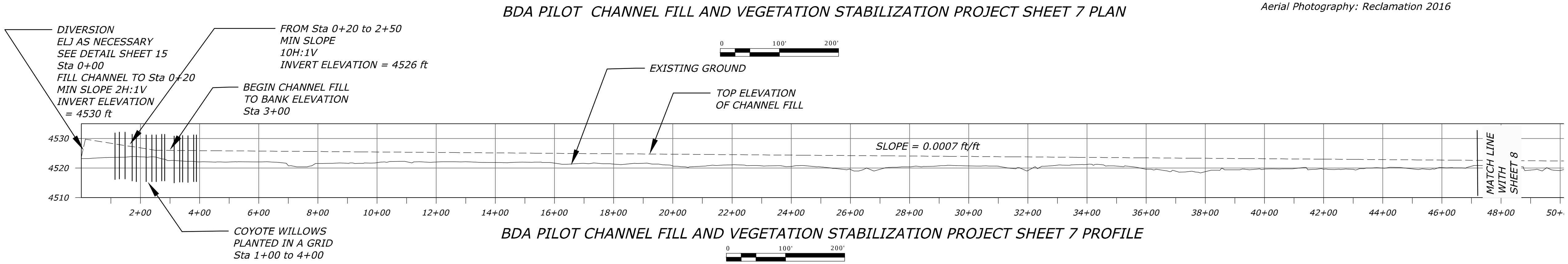


LEGEND	
	Vegetation Clearing
	Brushing and Scraping
	Fill Placement in Current Channel
	Rangelines
	Willow Plantings

BDA PILOT CHANNEL FILL AND VEGETATION STABILIZATION PROJECT SHEET 7 PLAN

Aerial Photography: Reclamation 2016



BDA PILOT CHANNEL FILL AND VEGETATION STABILIZATION PROJECT SHEET 7 PROFILE

NOTES:
1. Coordinate data is in NM State Plane, Central Zone, NAD 83, NAVD 88 datum.
2. Existing ground in river channel may be different than shown. Fill as necessary to achieve design top elevations.
3. Required construction staking and survey control points will be established prior to construction.
4. Stationing increases downstream
5. Earthern diversion berm must be placed before channel fill. Fill depth is generally to the current bankline elevation. Fill elevations may be varied in the field to create swales or other features to allow for a diversity of habitat surfaces to develop.
6. If the river is dry at the time of channel fill, and ELJ (see detail sheet 15) shall be placed upstream of the diversion berm.
7. Vegetation stabilization will consist of two coyote willow grids on the upstream and downstream extents of the channel fill. Willow grid is 50x 50 ft with a longitudinal extent of approximately 300 ft. Additional native riparian species may be planted as agreed upon by the project manager and BDANWR.

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SOCORRO CHANNEL
SAN ANTONIO TO RM 78 REACH

Figure 15

SPA-2009-00520

A. Harris/ J. AuBuchon/ N. Holste
DESIGNED
A. Harris
DRAWN
C. Bui/ B. Greimann
CHECKED
TECH. APPR.
APPROVED
ALBUQUERQUE, NM YYYY-MM-DD

BDA REALIGNMENT PILOT PROJECT

EXISTING RIVER CHANNEL CONVERSION PLAN AND PROFILE SHEET I

163-518-60025

SHEET 1

DATE AND TIME PLOTTED Not Plotted
PLOTTED BY Not Plotted
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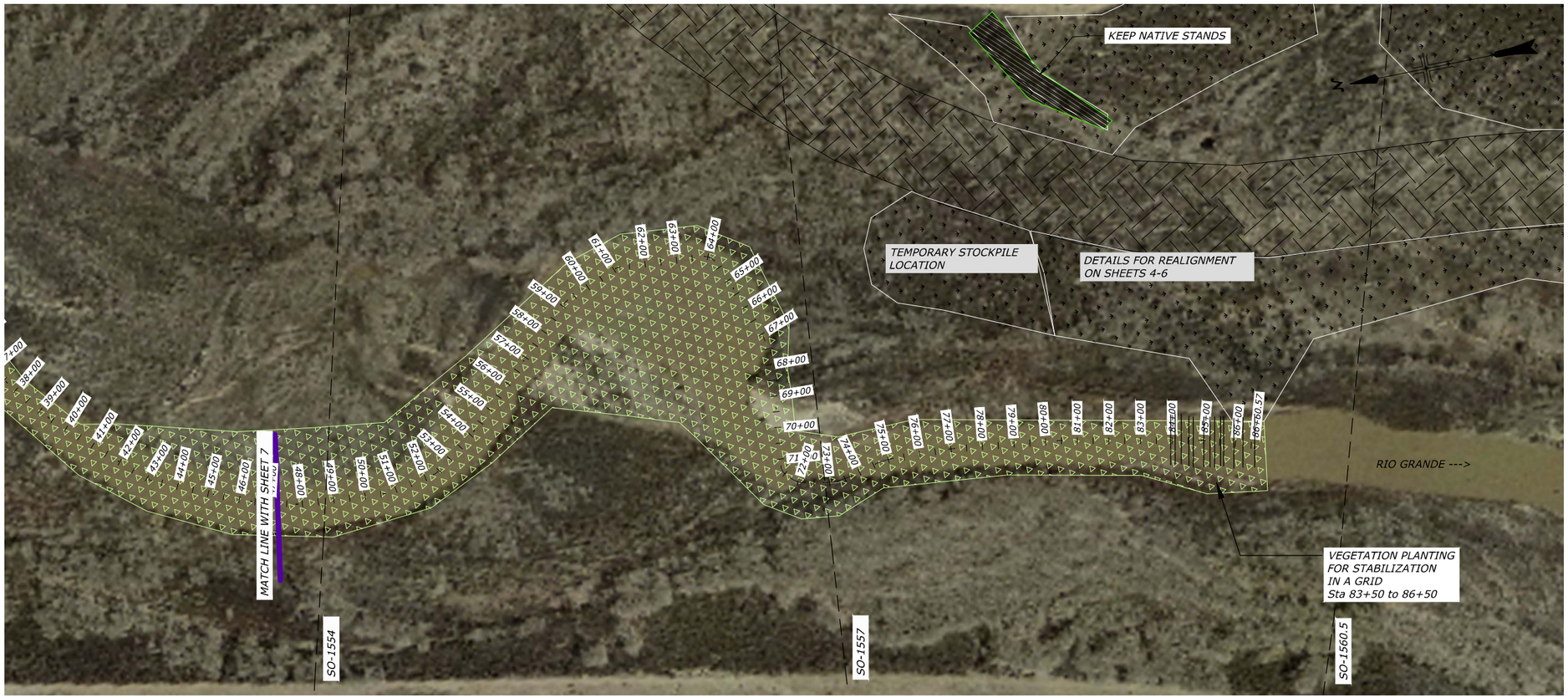
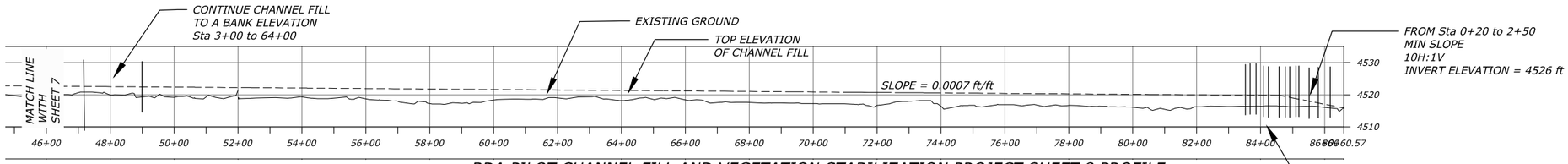


LEGEND

	Vegetation Clearing
	Brushing and Scraping
	Fill Placement in Current Channel
	Rangelines
	Willow Plantings

BDA PILOT CHANNEL FILL AND VEGETATION STABILIZATION PROJECT SHEET 8 PLAN

0 100' 200'



BDA PILOT CHANNEL FILL AND VEGETATION STABILIZATION PROJECT SHEET 8 PROFILE

0 100' 200'

NOTES:
1. All coordinate data is in NM State Plane, Central Zone, NAD 83, NAVD 88 datum.
2. Existing ground in river channel may be different than shown. Fill as necessary to achieve design top elevations.
3. Required construction staking and surveying will be established prior to construction.
4. Stationing increases downstream
5. Earthern diversion berm must be placed before channel fill. Fill depth is generally to the current bankline elevation. Fill elevations may be varied in the field to create swales or other features to allow for a diversity of habitat to develop.
6. If the river is dry at the time of channel fill, and ELJ (see detail sheet 15) shall be placed upstream of the diversion berm.
7. Vegetation stabilization will consist of two coyote willow grids on the upstream and downstream extents of the channel fill. Willow grid is 50x 50 ft with a longitudinal extent of approximately 300 ft. Additional native riparian species may be planted as agreed upon by the project manager and BDANWR.

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MIDDLE RIO GRANDE PROJECT
SOCORRO DIVISION

SOCORRO CHANNEL

SAN ANTONIO TO RM 78 REACH

Figure 16

SPA-2009-00520

A. Harris/ J. AuBuchon/ N. Holste — DESIGNED
A. Harris — DRAWN
C. Bui/ B. Greimann — CHECKED
TECH. APPR.
APPROVED — ADMIN APPROVAL - TITLE
ALBUQUERQUE, NM — YYYY-MM-DD

BDA REALIGNMENT PILOT PROJECT

EXISTING RIVER CHANNEL CONVERSION PLAN AND PROFILE SHEET II

163-518-60026

SHEET 1

DATE AND TIME PLOTTED
NOT PLOTTED AT
PLOTTED AT
Not Plotted

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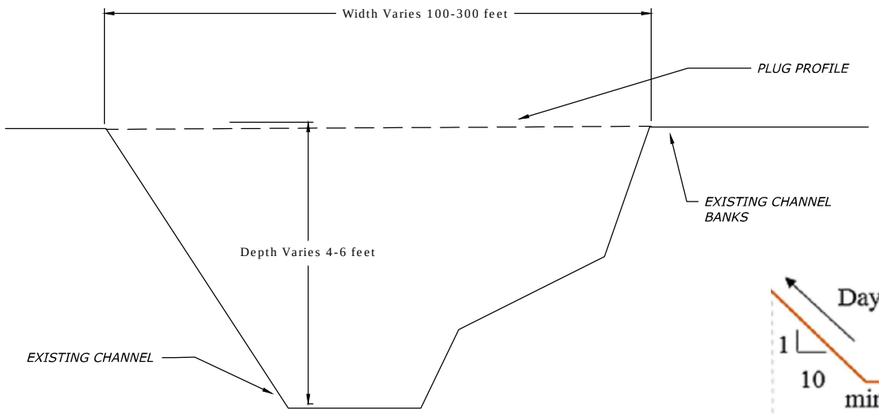
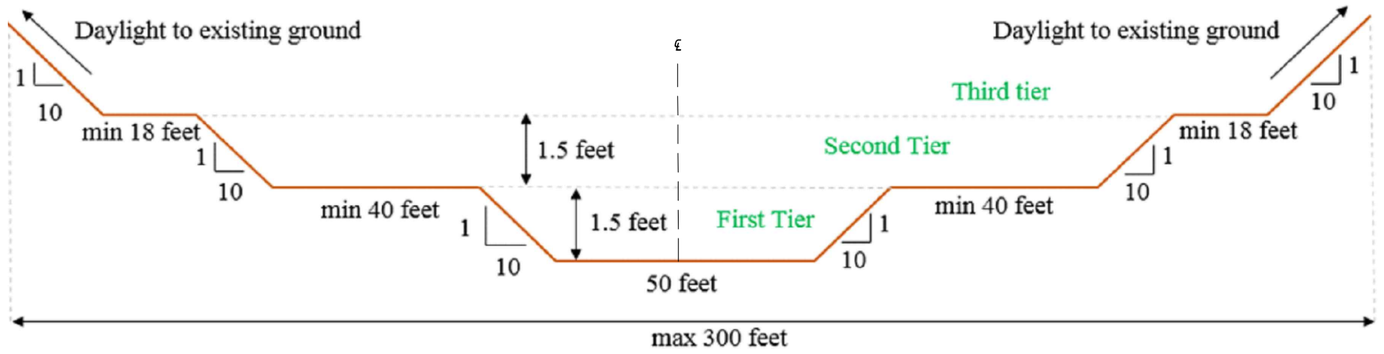


TYPICAL XS FOR CHANNEL FILL
(NOT TO SCALE)



TYPICAL XS FOR REALIGNMENT EXCAVATION
DETAILED XS ON SHEETS 10-12
(NOT TO SCALE)

SHEET 9 TYPICAL CROSS SECTIONS FOR CHANNEL FILL AND REALIGNMENT CHANNEL
NOTES:
1. Coordinate data is in NM State Plane, Central Zone, NAD 83, NAVD 88 datum.
2. Required construction staking and surveying will be established prior to construction.
3. Stationing increases downstream.
4. Earthern diversion berm shall be placed before channel fill. Fill depth is generally to the current bankline elevations. Fill elevations may be varied in the field to create swales or other features to allow for a diversity of habitat to develop.
5. Existing ground in the river channel may be different than shown. Fill as necessary to achieve design fill elevations.
6. Fill must be within the active channel. Existing vegetation at channel edge shall be left intact.

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Managing Water in the West

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U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
MIDDLE RIO GRANDE PROJECT
SOCORRO DIVISION

SOCORRO CHANNEL

SAN ANTONIO TO RM 78 REACH

Figure 17

SPA-2009-00520

A. Harris/J. AuBuchon/ N. Holste
DESIGNED
A. Harris
DRAWN
C. Bui/B. Greimann
CHECKED
TECH. APPR.
APPROVED
ADMIN APPROVAL - TITLE
ALBUQUERQUE, NM *2017-12-29*

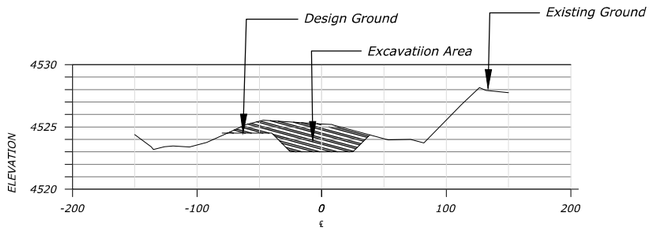
BDA REALIGNMENT PILOT PROJECT

TYPICAL CROSS SECTIONS

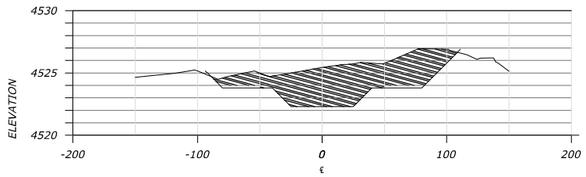
163-518-60027
SHEET 9

DATE AND TIME PLOTTED
AUTOCAD
PLOTTED BY
Not Plotted

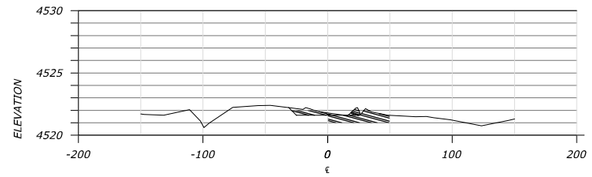
CAD SYSTEM
AUTOCAD
CAD FILENAME
UNKNOWN



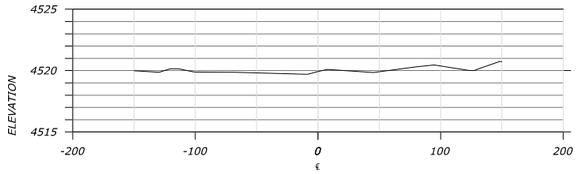
XS at Sta. 0+00
REALIGNMENT CHANNEL INLET EXCAVATION



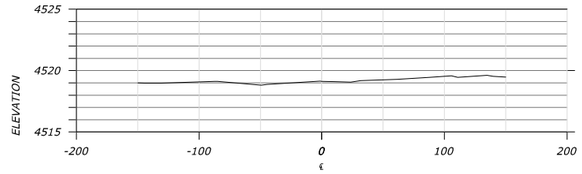
XS at Sta. 10+01
REALIGNMENT CHANNEL INLET EXCAVATION



XS at Sta. 20+01
REALIGNMENT CHANNEL INLET EXCAVATION



XS at Sta. 30+02
REALIGNMENT CHANNEL
GRUBBING AND CLEARING ONLY, AS EXISTING SURFACE IS BELOW DESIGN SLOPE GRADE



XS at Sta. 40+02
REALIGNMENT CHANNEL
GRUBBING AND CLEARING ONLY, AS EXISTING SURFACE IS BELOW DESIGN SLOPE GRADE

LEGEND	
	Existing Ground
	Excavation Area

NOTES:
1. *Coordinate data is in NM State Plane, Central Zone, NAD 83, NAVD 88 datum.*
2. *Existing ground in river channel may be different than shown between stations 0+00 and 6+00. Excavate as necessary to achieve design invert elevations and slope.*
3. *From Sta 21+00 to 68+00, the existing ground is below the design grade. Only clearing, grubbing and grading is expected.*
4. *Required construction staking and surveying will be established prior to construction.*
5. *Excavated material may require temporary stockpiling at designated locations.*
6. *Stationing increases downstream. Cross sections are viewed looking downstream with negative station values left of centerline.*
7. *See sheet 4 for plan and profile details.*

DATE AND TIME PLOTTED
2017-12-27
PLOTTED BY
JA

CAD SYSTEM
AUTOCAD
CAD FILENAME
BDA_DWG-XS.dwg

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Managing Water in the West

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BUREAU OF RECLAMATION
MIDDLE RIO GRANDE PROJECT
SOCORRO DIVISION

SOCORRO CHANNEL

SAN ANTONIO TO RM 78 REACH

Figure 18

SPA-2009-00520

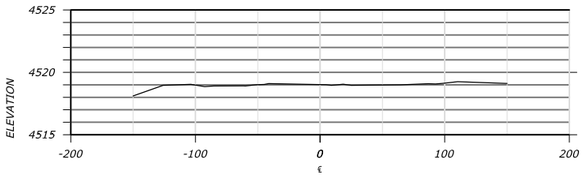
A. Harris/J. AuBuchon/N. Holste
DESIGNED
A. Harris
DRAWN
C. Bui/B. Greimann
CHECKED
TECH. APPR.
APPROVED
ADMIN APPROVAL - TITLE
ALBUQUERQUE, NM *2017-12-29*

BDA REALIGNMENT PILOT PROJECT

TYPICAL CROSS SECTIONS - REALIGNMENT SHEET I

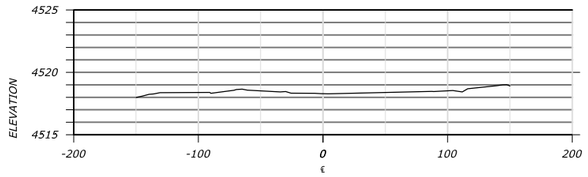
163-518-60028

SHEET 10



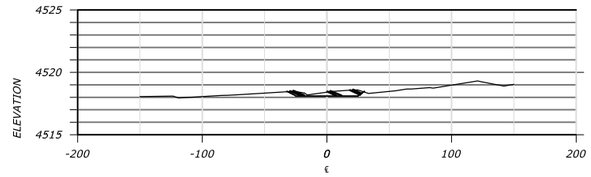
XS at Sta. 50+02

REALIGNMENT CHANNEL
GRUBBING AND CLEARING ONLY, AS EXISTING SURFACE IS BELOW DESIGN SLOPE GRADE



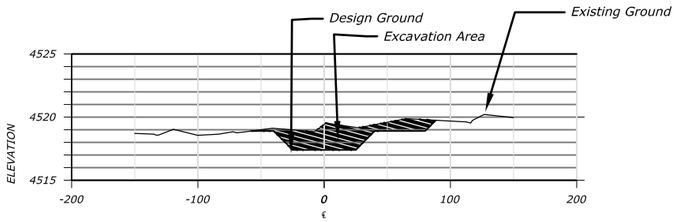
XS at Sta. 60+01

REALIGNMENT CHANNEL
GRUBBING AND CLEARING ONLY, AS EXISTING SURFACE IS BELOW DESIGN SLOPE GRADE

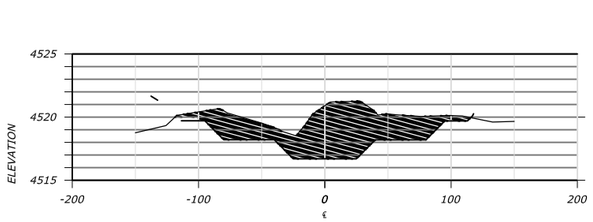


XS at Sta. 70+02

REALIGNMENT CHANNEL
GRUBBING AND CLEARING, MINIMAL EXCAVATION AS EXISTING SURFACE IS JUST ABOVE DESIGN SLOPE GRADE



XS at Sta. 80+01
REALIGNMENT CHANNEL
TIERED EXCAVATION FOR REALIGNMENT CHANNEL



XS at Sta. 89+99
REALIGNMENT CHANNEL
TIERED EXCAVATION FOR REALIGNMENT CHANNEL

NOTES:
1. All coordinate data is in NM State Plane, Central Zone, NAD 83, NAVD 88 datum.
2. Existing ground in river channel may be different than shown between stations 0+00 and 6+00. Excavate as necessary to achieve stated invert elevations and slope.
3. From Sta 21+00 to 68+00, the existing ground is below the design grade. Only clearing, grubbing and grading is expected.
4. Required construction staking and surveying will be established prior to construction.
5. Excavated material may require temporary stockpiling at designated locations.
6. Stationing increases downstream. Cross sections are viewed looking downstream with negative station values left of centerline.
7. See sheet 5 for plan and profile details.

LEGEND

———	Existing Ground
▨	Excavation Area

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Managing Water in the West

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MIDDLE RIO GRANDE PROJECT
SOCORRO DIVISION

SOCORRO CHANNEL

SAN ANTONIO TO RM 78 REACH

Figure 19

SPA-2009-00520

X DESIGNED
X DRAWN
X CHECKED
TECH. APPR.
APPROVED
ADMIN APPROVAL - TITLE
ALBUQUERQUE, NM 2017-12-29

BDA REALIGNMENT PILOT PROJECT

TYPICAL CROSS SECTIONS - REALIGNMENT SHEET II

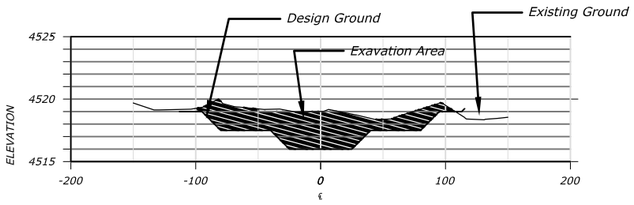
163-518-60029

SHEET 11

DATE AND TIME PLOTTED
2017-12-29
PLOTTED BY
JA

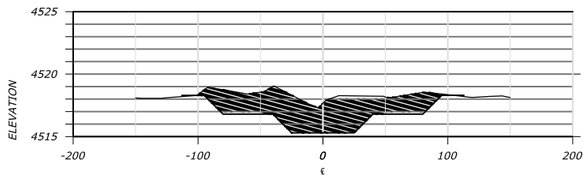
CAD SYSTEM
AUTOCAD
CAD FILENAME
BDA_DWG\XS.dwg

FOR OFFICIAL USE ONLY



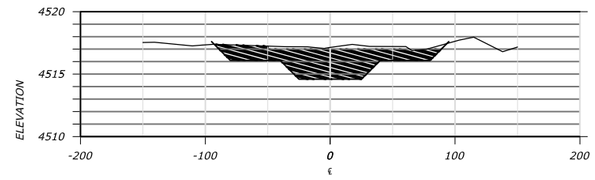
XS at Sta. 100+01

REALIGNMENT CHANNEL
TIERED EXCAVATION FOR REALIGNMENT CHANNEL



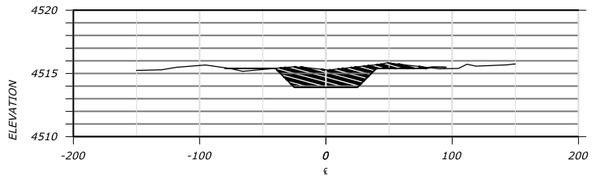
XS at Sta. 110+02

REALIGNMENT CHANNEL
TIERED EXCAVATION FOR REALIGNMENT CHANNEL



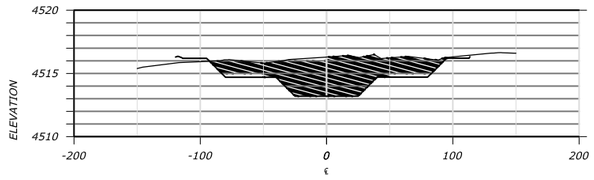
XS at Sta. 120+01

REALIGNMENT CHANNEL
TIERED EXCAVATION FOR REALIGNMENT CHANNEL



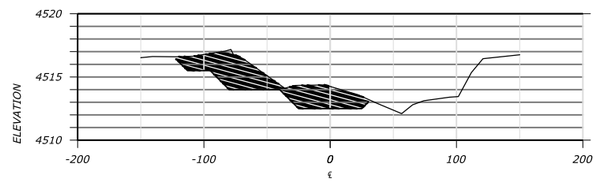
XS at Sta. 130+01

REALIGNMENT CHANNEL
TIERED EXCAVATION FOR REALIGNMENT CHANNEL



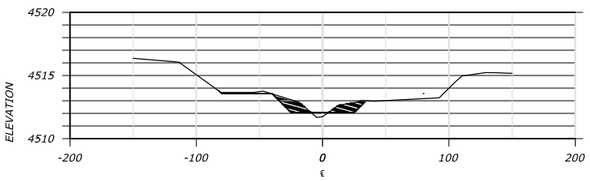
XS at Sta. 140+00

REALIGNMENT CHANNEL
TIERED EXCAVATION FOR REALIGNMENT CHANNEL



XS at Sta. 150+00

REALIGNMENT CHANNEL
IN-STREAM EXCAVATION BEGINS AT Sta. 147+00
EXISTING CHANNEL MAY BE DIFFERENT THAN INDICATED



XS at Sta. 156+15
REALIGNMENT CHANNEL
IN-STREAM EXCAVATION BEGINS AT Sta. 147+00
EXISTING CHANNEL MAY BE DIFFERENT THAN INDICATED

LEGEND	
———	Existing Ground
▨	Excavation Area

NOTES:
1. Coordinate data is in NM State Plane, Central Zone, NAD 83, NAVD 88 datum.
2. Existing ground in river channel may be different than shown between stations 147+00 and 156+00. Excavate as necessary to achieve stated invert elevations and slope.
3. Required construction staking and surveying will be established prior to construction.
4. Excavated material may require temporary stockpiling at designated locations.
5. Stationing increases downstream. Cross sections are viewed looking downstream with negative station values left of centerline.
6. See sheet 6 for plan and profile details.

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Managing Water in the West

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BUREAU OF RECLAMATION
MIDDLE RIO GRANDE PROJECT
SOCORRO DIVISION

SOCORRO CHANNEL
SAN ANTONIO TO RM 78 REACH

Figure 20

SPA-2009-00520

DESIGNED	A. Harris/J. AuBuchon/N.Holste
DRAWN	A. Harris
CHECKED	C. Bui/B.Greimann
TECH. APPR.	
APPROVED (ADMIN APPROVAL - TITLE)	
ALBUQUERQUE, NM	2017-12-29

BDA REALIGNMENT PILOT PROJECT

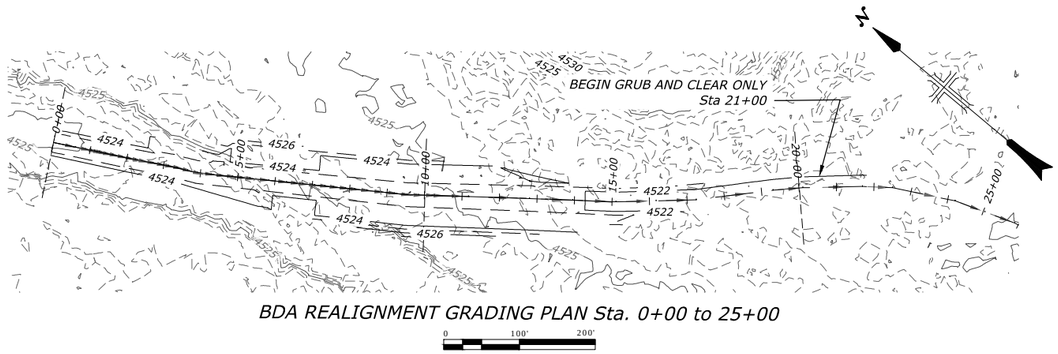
TYPICAL CROSS SECTIONS - REALIGNMENT SHEET III

163-518-60030

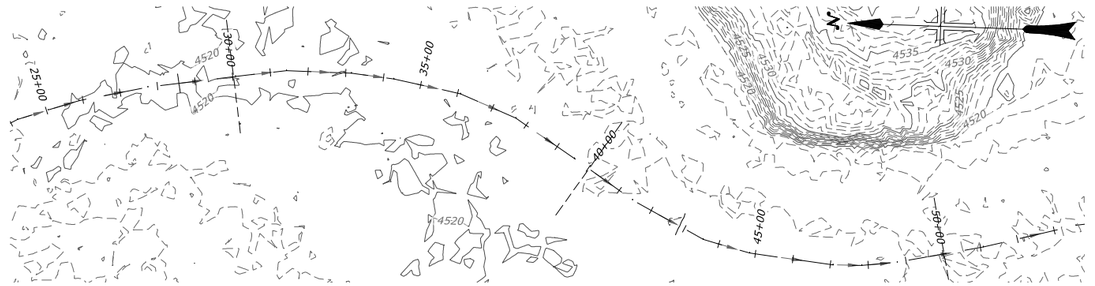
SHEET 12

DATE AND TIME PLOTTED
MAY 30, 2018
PLOTTED BY
Not Plotted

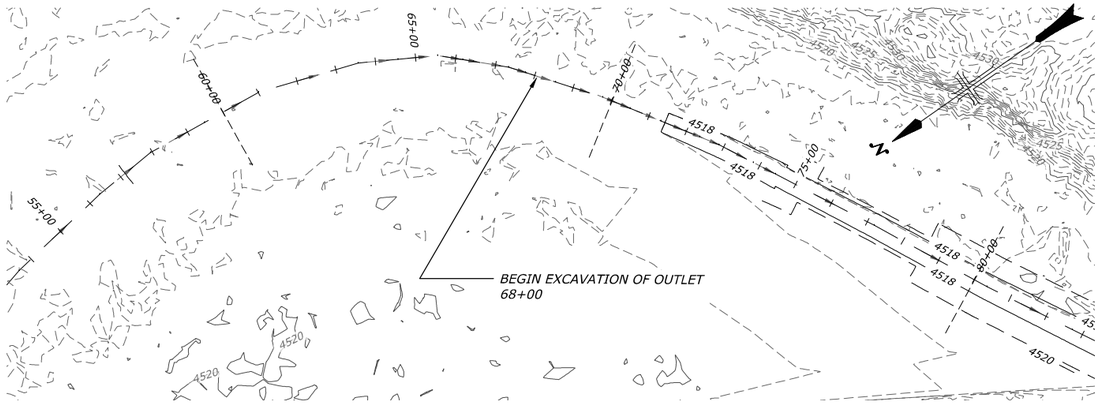
CAD SYSTEM
AUTOCAD
CAD FILENAME
UNKNOWN



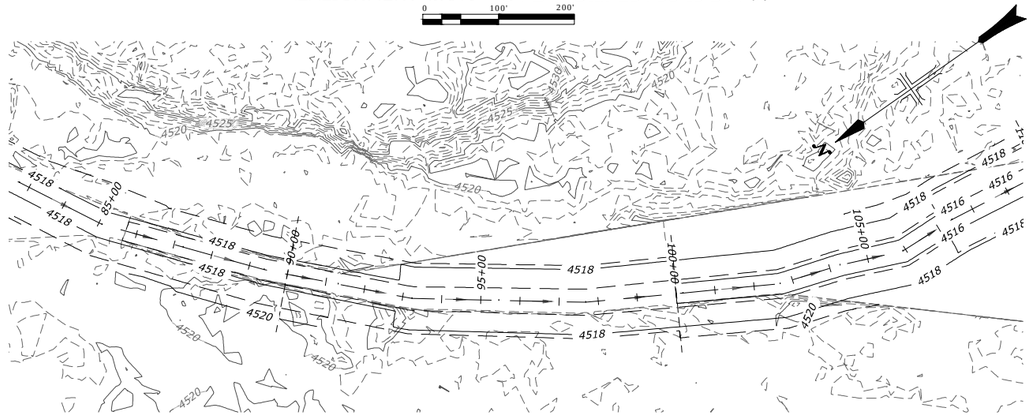
BDA REALIGNMENT GRADING PLAN Sta. 0+00 to 25+00



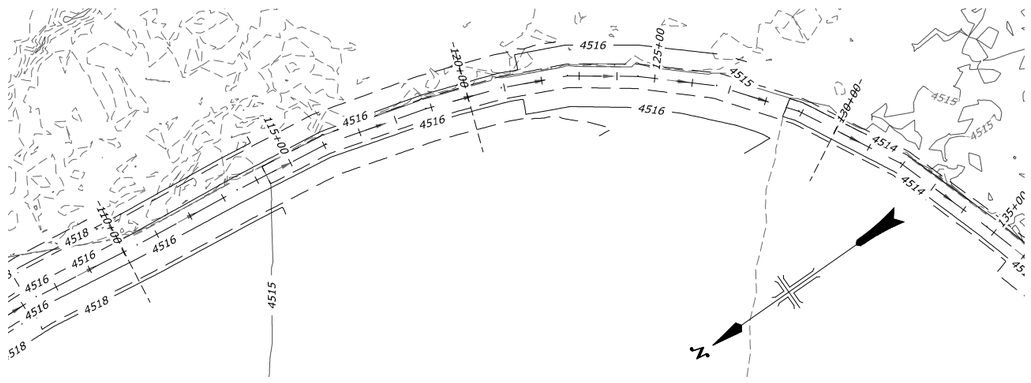
BDA REALIGNMENT GRADING PLAN Sta. 25+00 to 54+00



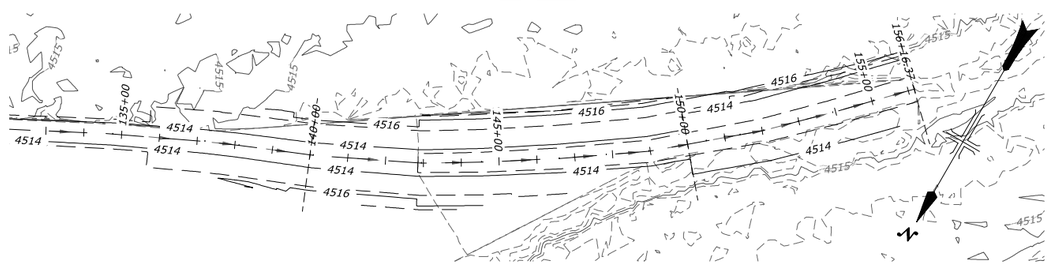
BDA REALIGNMENT GRADING PLAN Sta. 54+00 to 82+00



BDA REALIGNMENT GRADING PLAN Sta. 82+00 to 109+00



BDA REALIGNMENT GRADING PLAN Sta. 108+00 to 135+00



BDA REALIGNMENT GRADING PLAN Sta. 133+00 to 156+67

NOTES:
1. *Required lines, levels, contours and datum will be established prior to construction.*
2. *Before the start of grading, the location and extents of utilities in the work area will be established.*
3. *Excavated material may require temporary stockpiling at designated locations.*
4. *Stationing increases downstream.*
5. *All areas labeled as stockpile areas are only temporary sites needed for construction activities.*
6. *A 50 foot section within the Clear and Grub Only area shall be left smooth to facilitate initial movement of water along the corridor.*

LEGEND	
— — —	Contours of design ground (1 ft)
———	Contours of design ground (2 ft)
- - - - - -	Contours of existing ground (1 ft)
———	Contours of existing ground (5 ft)
—— ——	Realignment Centerline
- - - - - -	Realignment Station Line

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Managing Water in the West

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BUREAU OF RECLAMATION
MIDDLE RIO GRANDE PROJECT
SOCORRO DIVISION

SOCORRO CHANNEL

SAN ANTONIO TO RM 78 REACH

Figure 21

SPA-2009-00520

A. Harris/ J. AuBuchon/ N. Holste	*DESIGNED*
A. Harris	*DRAWN*
C. Bui/ B. Greimann	*CHECKED*
	TECH. APPR.
	APPROVED
	ADMIN. APPROVAL - TITLE
ALBUQUERQUE, NM	*2017-12-29*

BDA REALIGNMENT PILOT PROJECT

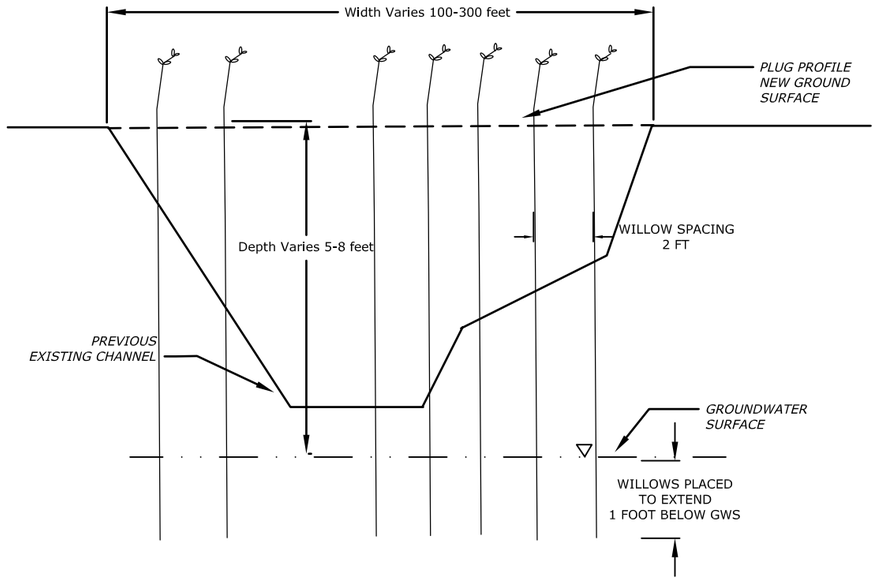
GRADING PLAN

163-518-60031

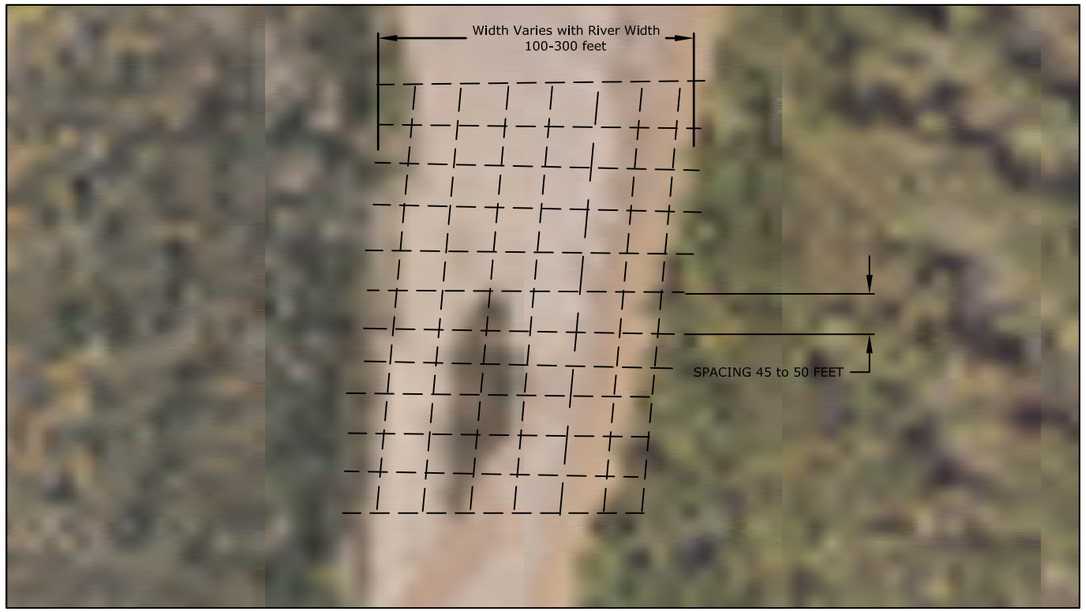
SHEET 13

DATE AND TIME PLOTTED
2017-12-29
PLOTTED BY
AA

CAD SYSTEM
AUTOCAD
CAD FILENAME
BRA_LWC Grading Plan-3.dwg



TYPICAL XS FOR WILLOW GRID
(NOT TO SCALE)



PLANVIEW OF WILLOW GRID
Sta 1+00 to 4+00
and Sta 83+50 to 86+50
(NOT TO SCALE)

SHEET 14
TYPICAL CROSS SECTIONS AND PLAN VIEW OF WILLOW GRID
NOTES:
1. Coordinate data is in NM State Plane, Central Zone, NAD 83, NAVD 88 datum.
2. Required construction staking and surveying will be established prior to construction.
3. Stationing increases downstream.
4. Earthern diversion berm must be placed before channel fill. Fill depth is generally to the current bankline elevations. Fill elevations may be varied in the field to create swales or other features to allow for a diversity of habitats to develop.
5. Existing ground in the river channel may be different than shown. Fill as necessary to achieve design profile elevations locations.
6. Fill must be within the active channel. Existing vegetation at channel edge shall be left intact.

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BUREAU OF RECLAMATION
MIDDLE RIO GRANDE PROJECT
SOCORRO DIVISION

SOCORRO CHANNEL

SAN ANTONIO TO RM 78 REACH

Figure 22

SPA-2009-00520

A. Harris/J. AuBuchon/N. Holste
DESIGNED
A. Harris
DRAWN
C. Bui/B. Greimann
CHECKED
TECH. APPR.
APPROVED
ADMIN APPROVAL - TITLE
ALBUQUERQUE, NM *2017-12-29*

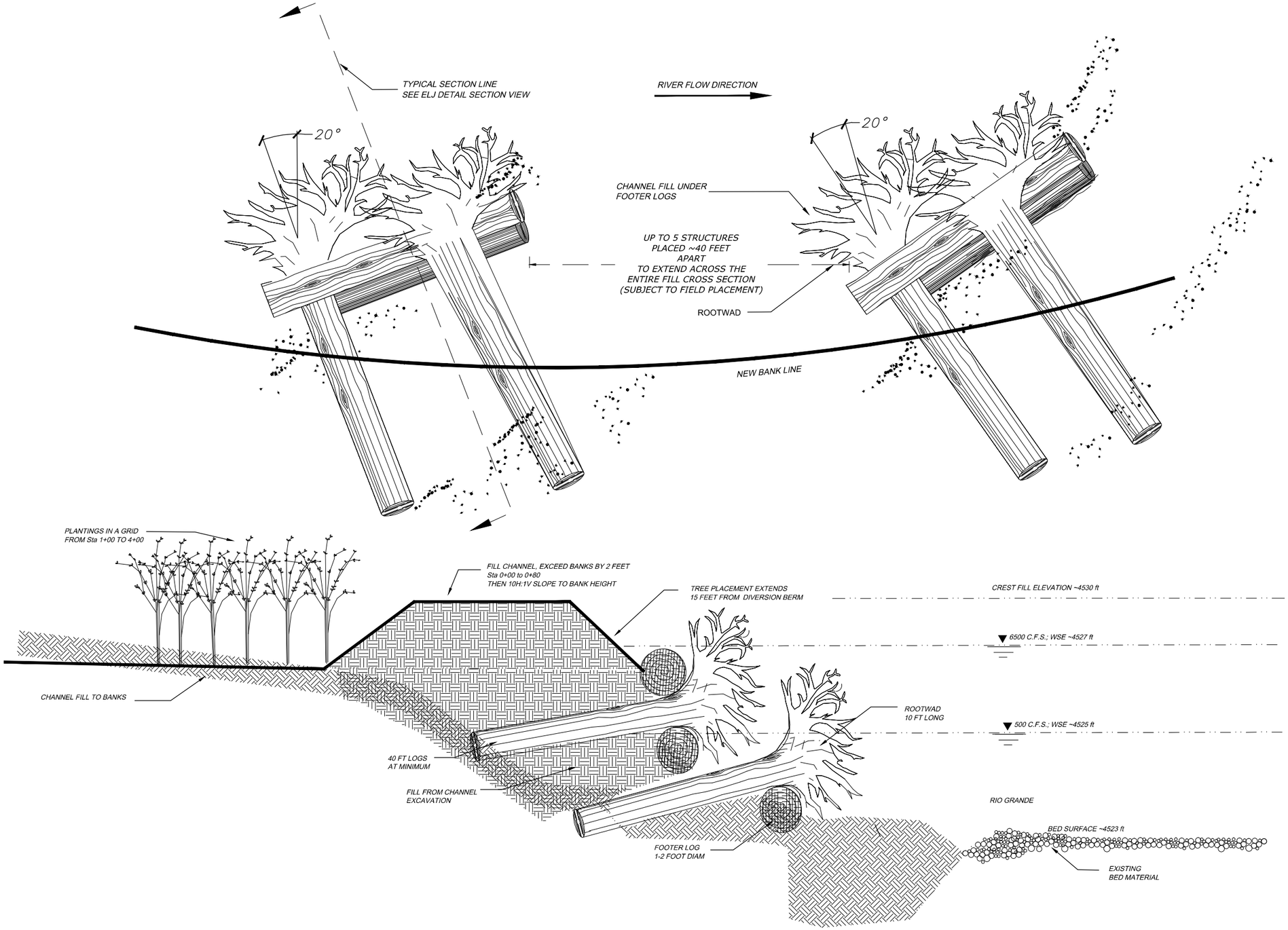
BDA REALIGNMENT PILOT PROJECT

PLANTING DETAIL

163-518-60032
SHEET 14

DATE AND TIME PLOTTED
Not Plotted
PLOTTED BY
Not Plotted

CAD SYSTEM
AutoCAD
CAD FILENAME
UNKNOWN



NOTES:
1. Coordinate data is in NM State Plane, Central Zone, NAD 83, NAVD 88 datum.
2. Required construction staking and surveying will be established prior to construction.
3. Earthern diversion berm must be placed before channel fill. Fill depth is generally to the current bankline elevations. Fill elevations may be varied in the field to create swales or other features to allow for a diversity of habitats to develop.
4. Fill must be within the active channel. Existing vegetation at channel edge shall be left intact.

ENGINEERED LOG JAM (ELJ) DETAIL SECTION VIEW

NOT TO SCALE

These drawings were modified from detail sheets created by BIO-WEST for the US Bureau of Reclamation in 2006 for the Bernallillo Priority Site.

DATE AND TIME PLOTTED
2017-12-29
PLOTTED BY
JA

CAD SYSTEM
AUTOCAD
CAD FILENAME
BDA_DWG-2.dwg

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BUREAU OF RECLAMATION
MIDDLE RIO GRANDE PROJECT
SOCORRO DIVISION

SOCORRO CHANNEL

SAN ANTONIO TO RM 78 REACH

Figure 23

SPA-2009-00520

DESIGNED	A. Harris/J. AuBuchon/N. Holste
DRAWN	A. Harris
CHECKED	C. Bui/B. Greimann
TECH. APPR.	
APPROVED ADMIN APPROVAL - TITLE	
ALBUQUERQUE, NM	2017-12-29

BDA REALIGNMENT PILOT PROJECT

ELJ (ENGINEERED LOG JAM) DETAIL

163-518-60033

SHEET 15