



January 19, 2024

Mark Oberschmidt, PE
City Engineer
City of Evans, Colorado
1100 37th Street
Evans, CO 80620

APPROVED
CITY OF EVANS
MARK OBERSCHMIDT, P.E.
CITY ENGINEER
05/29/2024

**RE: Floodplain Development Permit Application
Raptor Materials: Two Rivers Sand and Gravel Project (P124)**

Dear Mr. Oberschmidt:

On behalf of Raptor Materials LLC (Raptor), this is a letter documenting that Two Rivers Sand and Gravel project does not cause an adverse impact to the Big Thompson and South Platte Zone AE floodplains or floodways and is intended to accompany the attached floodplain development permit application (Attachment A).

Applicant and Design Engineer Information

Applicant:	Raptor Materials LLC	Engineer:	RESPEC Consulting & Services
	8120 Gage Street		720 S. Colorado Blvd., Suite 410S
	Frederick, CO 80516		Denver, CO 80246
	303-666-6657		720-775-6408
	Garrett C. Varra		Wyatt P. Foley, P.E., CFM

PROJECT DESCRIPTION

PURPOSE

The Two Rivers site is about 409 acres, consisting of mostly agricultural land south of the Big Thompson River and north of the South Platte River. The portion of the site north of the Big Thompson River is mostly undeveloped with trees, and other natural vegetation. CR 396 divides the site into two sections, and 54th Street Road borders the northernmost edge of the site.

The proposed use for this site will be the extraction, processing and stockpiling of sand and gravel materials reclaimed from within the site, as well as the truck scaling and sales of these products. Of the 409 acres that comprise the site, approximately 204 acres are currently permitted to be mined. Within this 204-acre area, the material processing and handling area will occupy approximately 18.4 acres. The remaining approximately 205 acres are currently providing setbacks from the rivers or other infrastructure, contain wash and dewatering ponds or have not been otherwise planned at this time for extraction and will be utilized as necessary for operations, but in many cases untouched. The materials processing area and the wash pond shown in Figure 2 will each be excavated to approximately 8 feet below existing grade, and the extracted soil will be added to an existing stockpile in the northeast corner of the site. Extraction is expected to extend for approximately 25 years (demand-driven) in small footprints with progressive reclamation, as detailed in Exhibit E of the Two Rivers Sand and

720 SOUTH COLORADO BLVD.
SUITE 410 S
DENVER, CO 80246
303.757.3655



Gravel Project DRMS Permit Application. The proposed post-mining land use is lined reservoirs for water storage.

LOCATION

The Two Rivers (P124) Sand and Gravel project is located within the City of Evans and Unincorporated Weld County. It is located within the southwest quarter of section 34 and the southern half of the southeast quarter of section 33, township 5N, range 66W; and the northeast quarter of section 4, township 4N, range 66W, and the west half and the northeast quarter of the northwest quarter of section 3, township 4N, range 66W. Figure 1 provides a vicinity map and Figure 2 provides a project location map with excavation, processing, and stockpiling locations.

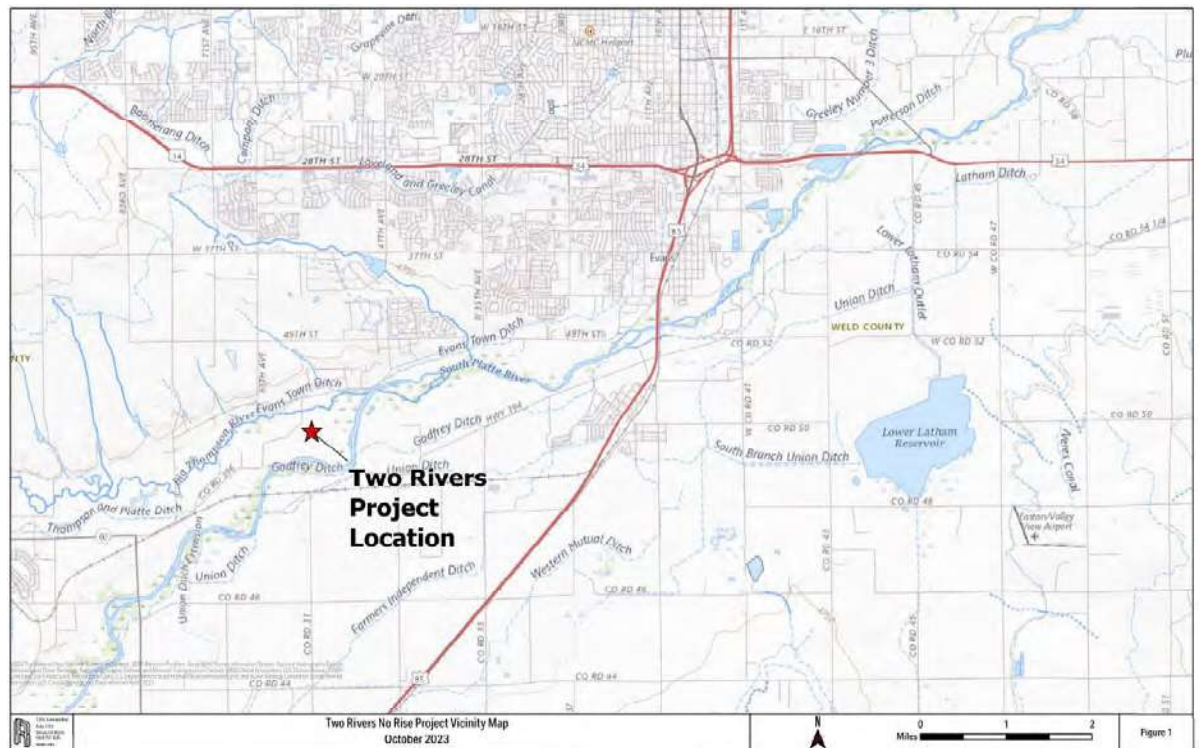


Figure 1. Two Rivers Project Vicinity Map



Figure 2. Two Rivers Project Location Map

EFFECTIVE FLOODPLAIN INFORMATION

IMPACTED FIRM PANELS AND COMMUNITIES

The Flood Insurance Rate Map (FIRM) panel numbers impacted by this project are 08123C1706F, 08123C1707F, 08123C1708F, and 08123C1709F, effective as of November 30, 2023. The excavation, equipment, and stockpiling locations are located within the City of Evans, Colorado (FEMA Community numbers 080182 and 080266, respectively). The effective FIRM panels are in Attachment B.

FLOODPLAIN DESIGNATION

The project is downstream of Effective Cross Section A of the Big Thompson River on the FIRM. The floodplain type is Zone AE with floodway. The effective FIRM shows a split flow that begins southwest of the intersections of Weld County Road 54 and South County Line Road called the "CR 13 Split". The CR 13 Split begins approximately 1,500 feet southeast of Effective Cross Section A and reconnects with The Big Thompson approximately 1,250 feet southwest of the intersection of County Road 54 and County Road 15. All work will take place in the Big Thompson River floodplain.

EFFECTIVE HYDROLOGY

The effective hydrology was completed in March 2016 for the Colorado Water Conservation Board (CWCB) as part of the "Colorado Hazard Mapping Program: Hydrologic Analysis Technical Support Data Notebook for the Big Thompson Watershed (HUC-8 10190006)" report prepared by AECOM. Table 1 shows the effective peak discharge within the project limits used in the HEC-RAS model.



Table 1. Summary of Available Peak Discharges

Peak Flow Source	Return Period	Peak Flow (cfs)
2016 CHAMP Report	100-year	22,247

HYDRAULIC MODELING

CWCB EFFECTIVE MODEL

This model was developed using HEC-RAS 5.0.1 in 2016 for the CWCB as part of the Colorado Hazard Mapping Program and serves as the basis for this analysis. The model spans from the Big Thompson River at South County Road 93 in Loveland to the South Platte River confluence. The Two Rivers Sand and Gravel project lies between Cross Sections 10253 and 3041 of the Big Thompson River reach. Table 2 summarizes the general hydraulic parameters of the effective model in the project reach.

Table 2: Hydraulic Model Parameters

Parameter	Value(s)
Boundary Condition	Known WS (D/S), I-25 Junction with Middle Big Thompson (U/S)
Manning's "n" in Channel	0.03
Overbank Manning's "n"	0.05 – 0.08
Contraction Coefficient	0.1 (0.3 adjacent to crossings)
Expansion Coefficient	0.3 (0.5 adjacent to crossings)

DUPLICATE EFFECTIVE MODEL

The duplicate effective model was migrated to HEC-RAS 6.4.1 for this floodplain analysis. A discrepancy in the GIS length vs. weir length for lateral weir structure 5310 in reach "SP-1" on river "SP-1" was corrected to allow the model to run. Duplicate effective model output from HEC-RAS 6.4.1 was compared to output from the effective HEC-RAS 5.0.1 model to ensure consistency. No changes were noted. Model output and results are in Attachment E.

PRE-PROJECT MODEL

The CWCB Effective Model was updated with drone surveyed topography conducted for the Two Rivers project area on February 27, 2023. Topographic information for the remainder of the model reach was updated with freely available LiDAR produced by FEMA (2018 3DEP East CO Block 2 QL North, 2014 USACE Post Flooding, and 2013 South Platte River and Denver Post Flood) through the CWCB. The LiDAR and drone survey have sufficient resolution to produce contours accurate to +/- 0.5 feet All information is in the North American Vertical Datum of 1988 (NAVD 88) and the Colorado State Plane North coordinate system, which are also the datum and coordinate system for the hydraulic model.

The updated topography was observed to capture channel shifts along the project area, such as at CR 396 (Bridge 5817) on the Big Thompson and was used for both the pre- and post-project model runs to perform a one-to-one comparison between the effective and the post-project models.

POST-PROJECT MODEL

The post-project model was created using the pre-project model as the basis and updating the project area with the proposed southwest materials processing area and associated equipment and stockpiles;



the southwest wash pond; and the northeast stockpiling area. The following updates were made to create the post-project model:

MANNING'S "N" VALUES

The fields that make up most of the site area consist of mature cultivated crops as well as small stands of brush, trees, and woody debris. For this reason, a Manning's n value of 0.06 for the open fields within the project area is more representative of the site conditions than the n of 0.05 used in CWCB's effective model. Manning's values for the field portions of cross sections 3041 through 10304 were therefore updated to 0.06.

The equipment proposed to be placed in the materials processing area consists of a hopper, screens, a wash plant, and a sand screw; this equipment consists largely of voids. Additionally, multiple dynamic stockpiles will be constructed and moved within the processing area. A Manning's value of 0.1 was applied to the entire processing area to conservatively represent the reduction in conveyance posed by the changing material and equipment in the area. The side slopes of the proposed excavation were assigned a Manning's of 0.03 to represent the excavated slopes. The cross sections that intersect the future materials processing area (8552, 8597, 8628, 9149, 9458, 10000) received the updates.

Cross sections portions that intersect the southwest wash pond (9149, 9458, 10000, 10304) were updated with Manning's values of 0.03.

PROJECT AREA GEOMETRY

The following geometry edits and associated affected cross sections were updated in the post-project model:

Excavation:

- SW Materials Processing Area: 8552, 8597, 8628, 9149, 9458, 10000
- SW Wash Pond: 9149, 9458, 10000, 10304

Stockpiling:

- NE Stockpile (includes entire volume excavated from the SW Materials Processing Area and Wash Pond, plus a 20 percent bulking factor): 4569, 4874, 5226, 5542. Because the existing top elevation of the NE Stockpile is above the Effective Base Flood Elevation, the added volume did not influence the post-project model results.

Ineffective flow areas were set for the materials processing area and the wash pond at the lowest elevation along the excavation perimeter.

NO FLOODPLAIN IMPACTS

The Big Thompson and South Platte Rivers have FEMA-regulated Zone AE floodplains with effective regulatory floodways. The entirety of the Two Rivers site is contained within the floodplain shown in the pending FEMA Flood Insurance Rate Map (FIRM) (effective November 2023), with most of the site located within the floodway. All proposed 100-year water surface elevations (WSELs) are either equal to or less than the pre-project conditions. No decrease in 100-year WSEL greater than 0.3 feet was observed. Rises in WSEL observed at certain locations between the post-project and effective models occurred due to updates in topographic and Manning's "n" values.



The table provided as Attachment E illustrates the 1-percent annual chance WSELs for the pre-project and post-project conditions. The resulting proposed floodplain boundaries and profiles are shown on Attachments F and G, respectively.

ENGINEERING "NO-RISE" CERTIFICATION

This is to certify that I am a duly qualified engineer licensed to practice in the state of Colorado. It is to further certify that the attached data supports the fact that the Two Rivers Sand and Gravel Project will not impact the effective Zone AE base flood elevations, floodplain elevations, and floodplain widths on the Big Thompson River. Therefore, this project does not adversely impact the Big Thompson River floodplain.

SIGNED 
DATE 1/19/2024

Contact RESPEC Consulting & Services
Information: (720) 775-6408
720 S. Colorado Boulevard
Denver, CO 80246



On behalf of Raptor Materials LLC we are requesting that a floodplain development permit be issued as we have demonstrated that construction of the proposed gravel mining pit will not raise the 100-year water surface elevations along the Big Thompson River.

Thank you for reviewing this no-rise certification letter. If you have any questions or need additional information, please contact me at 720-775-6408, or wyatt.foley@respec.com.

Sincerely,
RESPEC Consulting & Services



Wyatt P. Foley, P.E., CFM
Project Engineer

Attachments:
A - Application for Flood Hazard Area Development Permit
B - Effective FIRM
C - Site Plan
D - HEC-RAS Output
E - Summary Table of Water Surface Elevation Changes
F - Proposed Floodplain Maps
G - Floodplain Profiles



ATTACHMENT A

FLOOD PLAIN DEVELOPMENT PERMIT



APPLICATION

PERMIT No Rise DATE _____

OWNER Garrett C. Varra - Raptor Materials LLC PHONE 303-666-6657

ADDRESS 8120 Gage Street, Frederick, CO 80516

CONTRACTOR N/A PHONE _____

ADDRESS _____

PROJECT LOCATION/DIRECTIONS (40.348174, -104.776631)

PROJECT DESCRIPTION

_____ SINGLE FAMILY _____ NEW CONSTRUCTION _____ CHANNELIZATION

_____ MULTI-FAMILY _____ SUBSTANTIAL _____ FILL

RESIDENTIAL IMPROVEMENT (>50%)

_____ MANUFACTURED _____ IMPROVEMENT (<50%) _____ BRIDGE/CULVERT

(MOBILE) HOME

_____ NON-RESIDENTIAL _____ REHABILITATION _____ LEVEE

X OTHER – EXPLAIN Sand and gravel mining pit

FLOOD HAZARD DATA

WATERCOURSE NAME Big Thompson River

THE PROJECT IS PROPOSED IN THE X FLOODWAY _____ FLOOD FRINGE

BASE (100 YR) FLOOD ELEVATION(S) AT THE PROJECT SITE 4684 - 4691.5 ft

ELEVATION REQUIRED FOR THE LOWEST FLOOR _____ NGVD

FLOODPROOFING _____ NGVD

SOURCE DOCUMENTS: REPORTS/MAPS FEMA Firm Panels 1706F, 1707F, 1708F, 1709F

(Pending - Effective as of 11/30/2023)

PROPOSAL REVIEW CHECKLIST

_____ Site development plans are complete and depict flood hazard data.



_____ Engineering data is provided for proposed map and floodway revisions.



_____ Floodway Certification and data document no increase in flood heights.

_____ Subdivision proposals minimize flood damage and protect utilities.

_____ Lowest floor elevations are above the base (100 yr) flood elevation.

_____ Manufactured (mobile) homes address elevation and anchoring requirements.

_____ A flood-proofing certificate certifies flood proofing designs.

_____ Other: _____

PERMIT ACTION

_____ **PERMIT APPROVED:** The information submitted for the proposed project was reviewed and is in compliance with approved flood plain management standards (site development plans are on file).

_____ **PERMIT DENIED:** The proposed project does not meet approved flood plain management standards (explanation is on file).

_____ **VARIANCE GRANTED:** A variance was granted from the base (100 yr) flood elevations established by FEMA consistent with variance requirements of NFIP regulations Part 60.6 (variance action documentation is on file).

Flood Plain Administrator's Signature

Date

Comments: _____

COMPLIANCE DOCUMENTATION

_____ **MAP REVISION DATA:** Certified documentation by a registered professional engineer of as-built conditions for flood plain alterations were received and submitted to FEMA for flood insurance map revisions.

_____ **FILL CERTIFICATE:** A community official certified the elevation, compaction, slope and slope protection for all fill placed in the flood plain consistent with FNIP regulations Part 65.5 for map revisions.

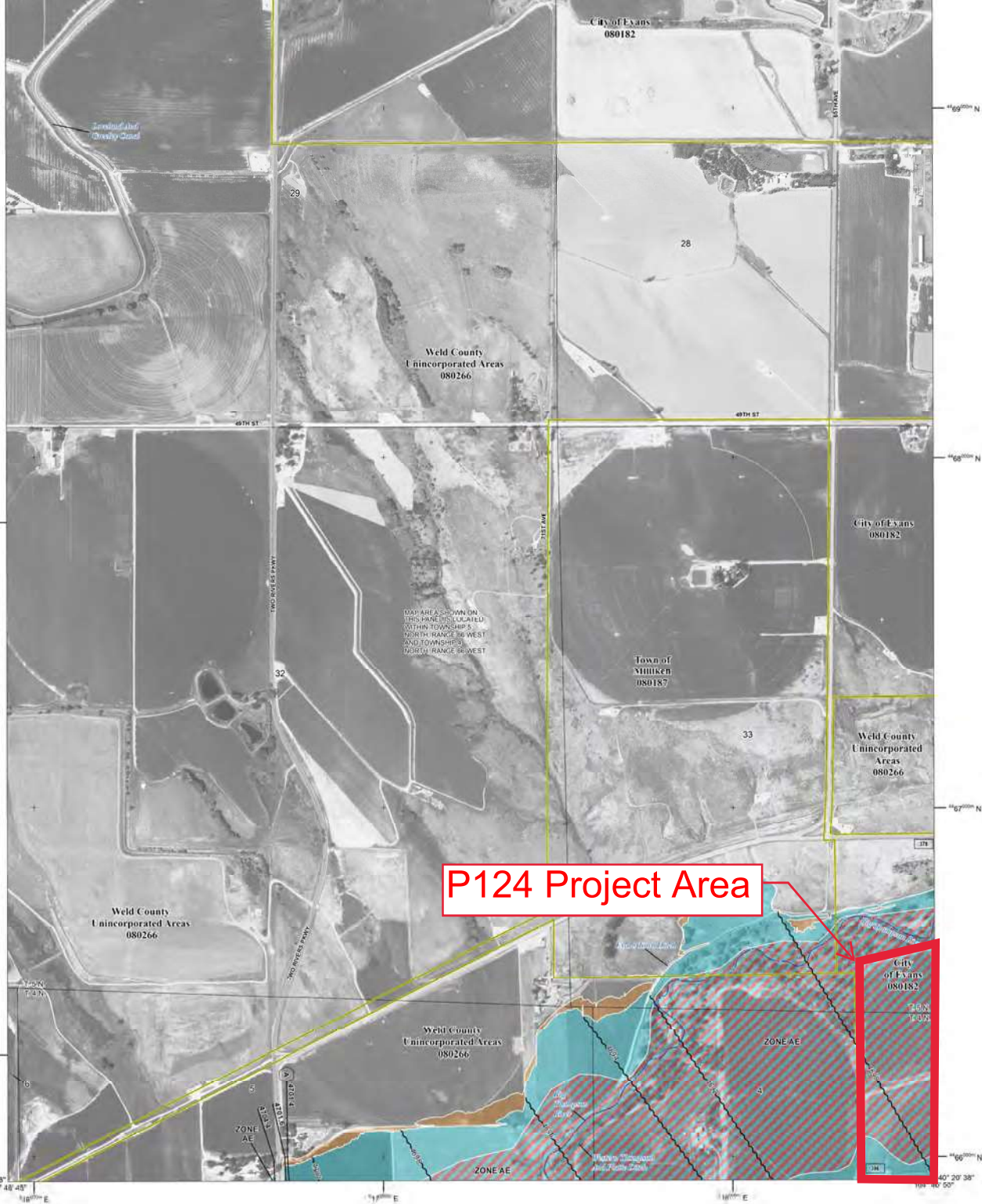
_____ **ELEVATION AND FLOODPROOFING CERTIFICATES:** The as-built elevation of the buildings lowest floor was certified as _____ NGVD; or the building's floodproofing level was certified as _____ NGVD; by a registered professional engineer or licensed surveyor and is on file.

CERTIFICATE OF OCCUPANCY OR COMPLIANCE ISSUED ON _____

Date

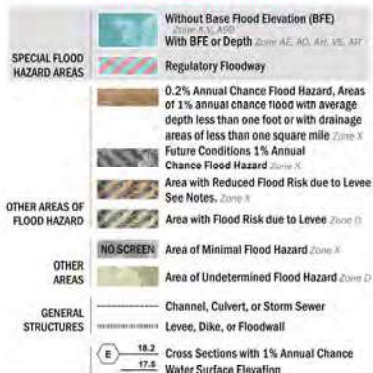


ATTACHMENT B



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING
DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT
[HTTPS://MSC.FEMA.GOV](https://msc.fema.gov)



NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with the FIRM, including historic versions, the current map data for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please visit the FEMA Mapping and Insurance Exchange at fema-mapping.com or visit the FEMA Flood Map Service Center website at <https://www.fema.gov>. Available products may include previously issued editions of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

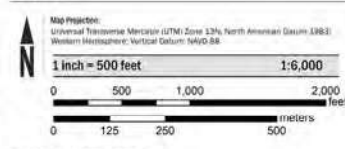
Communities acquiring land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and contractor map data refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-426-6820.

Base map information shown on this FIRM was derived from the National Flood Hazard Layer (NFHL), dated 2016 and digital data provided by Weld County GIS Department, dated 2018 and Orthorectified derived from the National Aerial Imagery Program (NAIP), dated 2017.

SCALE



PANEL LOCATOR



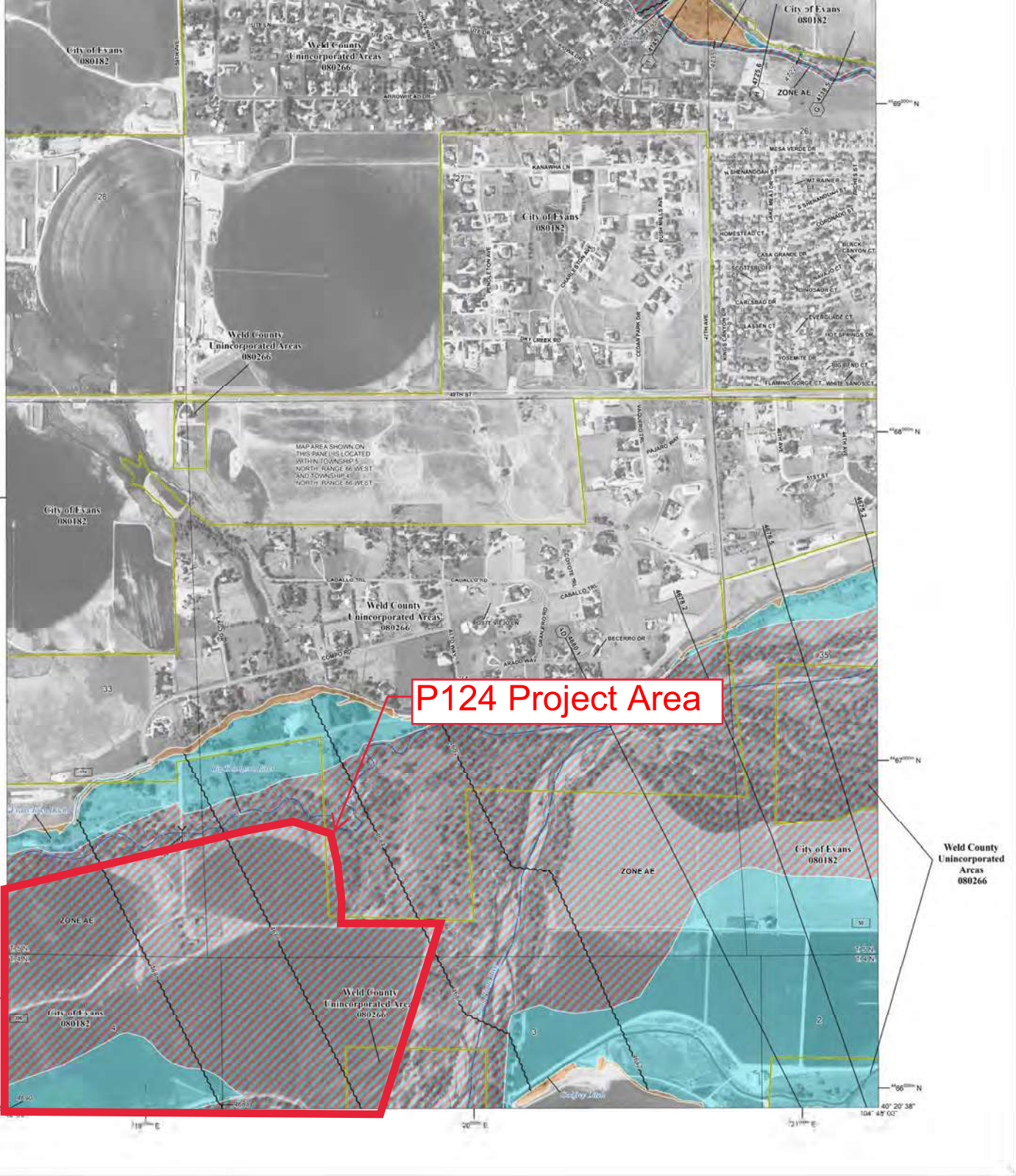
National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

WELD COUNTY, COLORADO
and Incorporated Areas

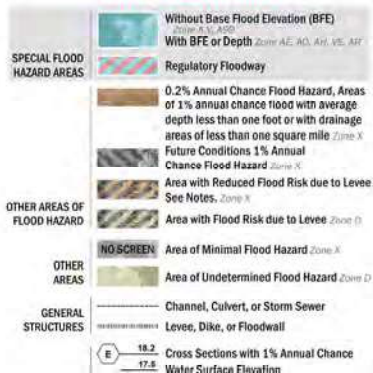
PANEL 1706 of 2250

COMMUNITY	NUMBER	PANEL	SUFFIX
EVANS, CITY OF	080182	1706	F
MULLEN, TOWN OF	080187	1706	F
WELD COUNTY	080266	1706	F



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT
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NOTES TO USERS

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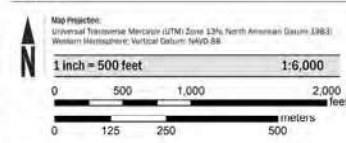
Communities acquiring land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and contractor map data refer to the Flood Insurance Study Report for this jurisdiction.

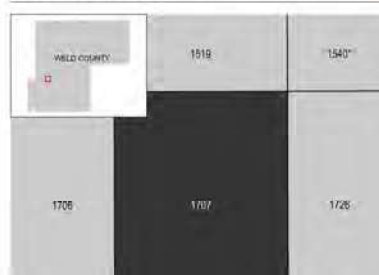
To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-426-8820.

Base map information shown on this FIRM was derived from the National Flood Hazard Layer (NFHL), dated 2016 and digital data provided by Weld County GIS Department, dated 2018 and Orthorectified derived from the National Aerial Imagery Program (NAIP), dated 2017.

SCALE



PANEL LOCATOR



FEMA
National Flood Insurance Program

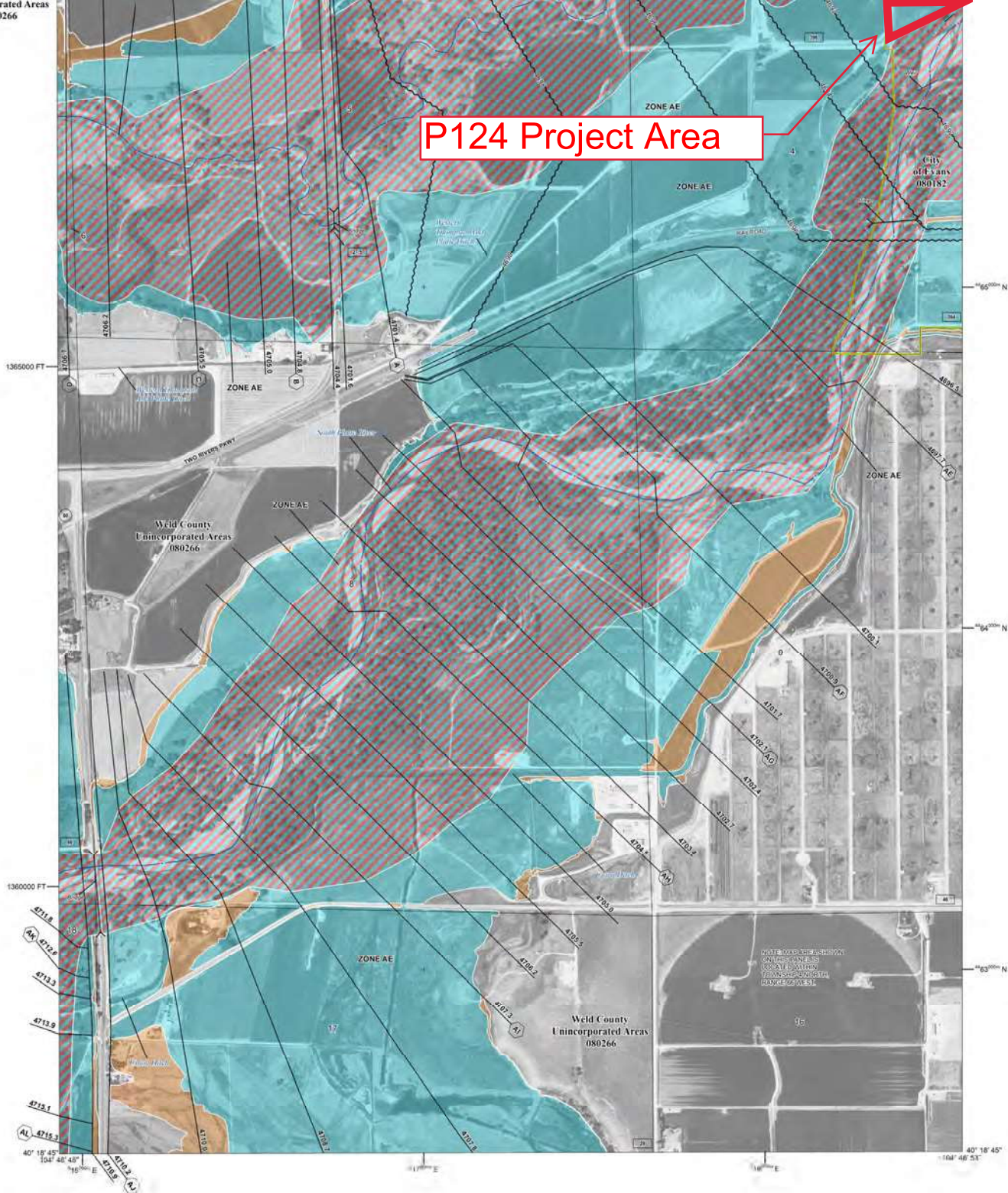
NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

WELD COUNTY, COLORADO
and Unincorporated Areas
PANEL 1707 of 2250



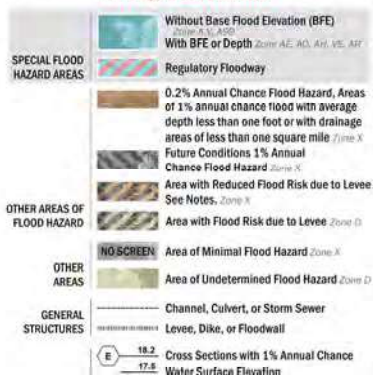
Former Designation:
COMMUNITY NUMBER PANEL SUFFIX
EVANS, CITY OF 080182 1707 F
WELD COUNTY 080266 1707 F

P124 Project Area



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING
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NOTES TO USERS

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Communities wanting land use adjacent to FIRM panels may obtain a lettermap of the adjacent panel as well as the current FIRM data. These may be ordered directly from the Flood Map Service Center at the number listed below.

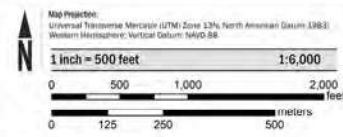
For community and countywide map data refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your local insurance agent or call the National Flood Insurance Program at 1-800-438-8622.

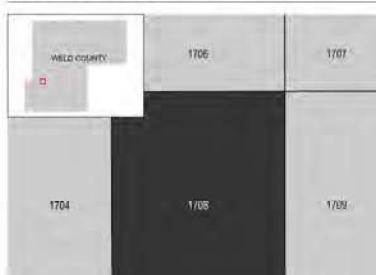
Base map information shown on this FIRM was derived from the National Flood Hazard Layer (NFHL), dated 2016 and digital data provided by Weld County GIS Department, dated 2016 and Orthoregistry derived from the Aerial Photograph Interpretation, December 2013, dated 2013.

TABLE 1. *Phylogenetic relationships of the studied species based on the analysis of the 16S rDNA sequence*

SCALE



PANEL LOCATOR



National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

WELD COUNTY, COLORADO

and Incorporated Areas:

PANEL 1708 OF 2250



COMMUNITY	NUMBER	PANEL	SUFFIX
EVANS, CITY OF	080182	1708	F
MILLIKEN, TOWN OF	080187	1708	F



ATTACHMENT C

LEGAL DESCRIPTION:

PARCEL 1:
THE W1/2 OF THE NW1/4 AND THE NE1/4 OF THE NW1/4 OF SECTION 3, TOWNSHIP 4 NORTH, RANGE 66 WEST OF THE 6TH P.M., COUNTY OF WELD, STATE OF COLORADO

PARCEL 2:
THE NE 1/4 OF SECTION 4, TOWNSHIP 4 NORTH, RANGE 66 WEST OF THE 6TH P.M., COUNTY OF WELD, STATE OF COLORADO

PARCEL 3:
THE S1/2 OF THE SE1/4 OF SECTION 33, TOWNSHIP 5 NORTH, RANGE 66 WEST OF THE 6TH P.M., COUNTY OF WELD, STATE OF COLORADO

PARCEL 4: ALL THAT PART OF THE W1/2 OF THE SW 1/4 LYING SOUTH OF THE SOUTH RIGHT OF WAY OF COUNTY ROAD 378 (AKA W. 54th St Rd), IN SECTION 34, TOWNSHIP 5 NORTH, RANGE 66 WEST OF THE 6TH P.M., COUNTY OF WELD, STATE OF COLORADO

EXCEPT THAT PORTION AS CONVEYED BY DEED RECORDED FEBRUARY 1, 1983 AT RECEPTION NO. 1916171, as shown on Improvement Survey recorded October 26, 2005 at Reception No. 3334443 and more particularly described as follows:

A tract of land located in the West One-Half Southwest One-Quarter (W1/2SW1/4) of Section Thirty-Four (34), Township Five (5) North, Range Sixty-Six (66) West of the 6th Principal Meridian, Weld County, Colorado being more particularly described as: Considering the North line of the Southwest One-Quarter (SW 1/4) of said Section Thirty-Four (34) to bear South 88°54'53" East, and all bearings contained herein being relative thereto:

Beginning at a point whence the South One-Sixteenth (S 1/16) Corner of said Section Thirty-Four (34) and Section Thirty-Three (33), Township Five (5) North, Range Sixty-Six (66) West of the 6th Principal Meridian bears South 06°37'18" West, 231.18 feet; thence along the easterly right-of-way line of Weld County Road 31, South 01°28'06" East, 211.06 feet; West, 231.18 feet; thence along the easterly right-of-way line of Weld County Road 31, South 01°28'06" East, 211.06 feet; 06" East, 211.06 feet; thence South 01°27'53" East, 726.25 feet; thence leaving said easterly right-of-way line of Weld County 53" East, 726.25 feet; thence leaving said easterly right-of-way line of Weld County East, 726.25 feet; thence leaving said easterly right-of-way line of Weld County Road 31, North 52°25'34" East, 228.87 feet; 34" East, 228.87 feet; East, 228.87 feet; thence, North 83°53'53" East 379.90 feet; thence, North 67°49'01" East, 174.21 feet; thence, North 84°46'00" East, 458.30 feet; East 379.90 feet; thence, North 67°49'01" East, 174.21 feet; thence, North 84°46'00" East, 458.30 feet; 01" East, 174.21 feet; thence, North 84°46'00" East, 458.30 feet; 00" East, 458.30 feet; thence, (L1) South 87°53'13" East, 66.99 feet; thence, (L2) South 75°20'24" East, 80.92 feet; thence, (L3) South 66°35'08" East 92.30 feet 13" East, 66.99 feet; thence, (L2) South 75°20'24" East, 80.92 feet; thence, (L3) South 66°35'08" East 92.30 feet 24" East, 80.92 feet; thence, (L3) South 66°35'08" East 92.30 feet 08" East 92.30 feet to a point on the east line of the West One-Half Southwest One-Quarter (W1/2SW1/4) of said Section Thirty-Four (34); thence along said east line of the West One-Half Southwest One-Quarter (W1/2SW1/4) of said Section Thirty-Four (34), North 02°26'26" West, 943.31 feet to West, 943.31 feet to the southeasterly right-ofway of Weld County Road 378; thence, leaving said east line of the West One-Half Southwest One-Quarter (W1/2SW1/4) of said Section Thirty-Four (34) and along said southeasterly right-of-way of Weld County Road 378, South 78°32'37" West, 54.05 feet; West, 54.05 feet; thence, South 80°31'42" West, 1347.02 feet to the Point of Beginning.42" West, 1347.02 feet to the Point of Beginning.

RAPTOR MATERIALS, LLC
AGGREGATE MINE SITE PLAN
PART OF SECTIONS 3 & 4, TOWNSHIP 4 NORTH
RANGE 66 WEST, AND SECTIONS 33 & 34,
TOWNSHIP 5 NORTH, RANGE 66 WEST OF THE
6TH PRIME MERIDIAN
CITY OF EVANS, COUNTY OF WELD, STATE OF COLORADO
CURRENT ZONE: PUD

REVISIONS	SHEET	INDEX
1	1	COVER SHEET
0	2	EXISTING CONDITIONS
0	3	SITE PLAN
0	4	GRADING PLAN
0	5	RECLAIMED SITE PLAN

0 INITIAL RELEASE OCTOBER 6, 2023

SITE PLAN FOR:
RAPTOR MATERIALS, LLC
AGGREGATE MINE
14822 HWY 396
EVANS, CO 80634

PREPARED FOR:
RAPTOR MATERIALS, LLC
GARRETT VARRA
8120 GAGE ST
FREDERICK, CO 80516
(303) 666-6657



APPROVED BY:

RAPTOR MATERIALS, LLC
GARRETT VARRA
DATE

RESPEC COMPANY, LLC
PETER CHRISTENSEN
DATE

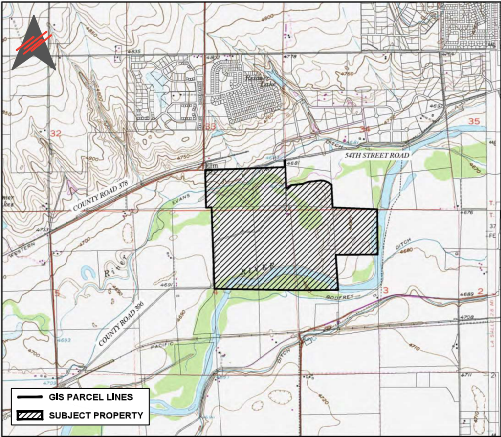


Image Source: ALTA-P124-VARRA COMPANIES_EVANS-MILLIKEN (2022-03-31).pdf, Lata40, Inc.

PREPARED BY:  RESPEC
720 S. Colorado Blvd., Suite 410
DENVER, CO 80246
www.respec.com

PROJECT NO: M0020
INITIAL PLAN RELEASE: October 6, 2023
TOTAL SHEETS: 5

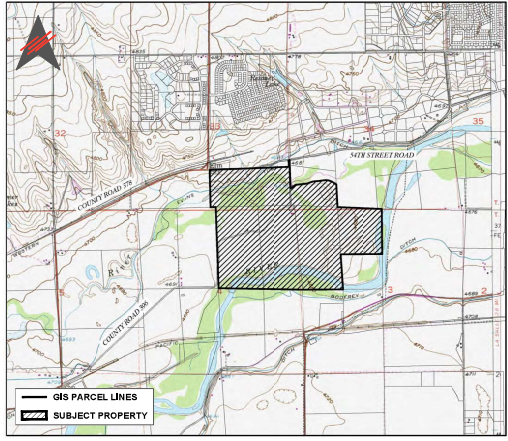
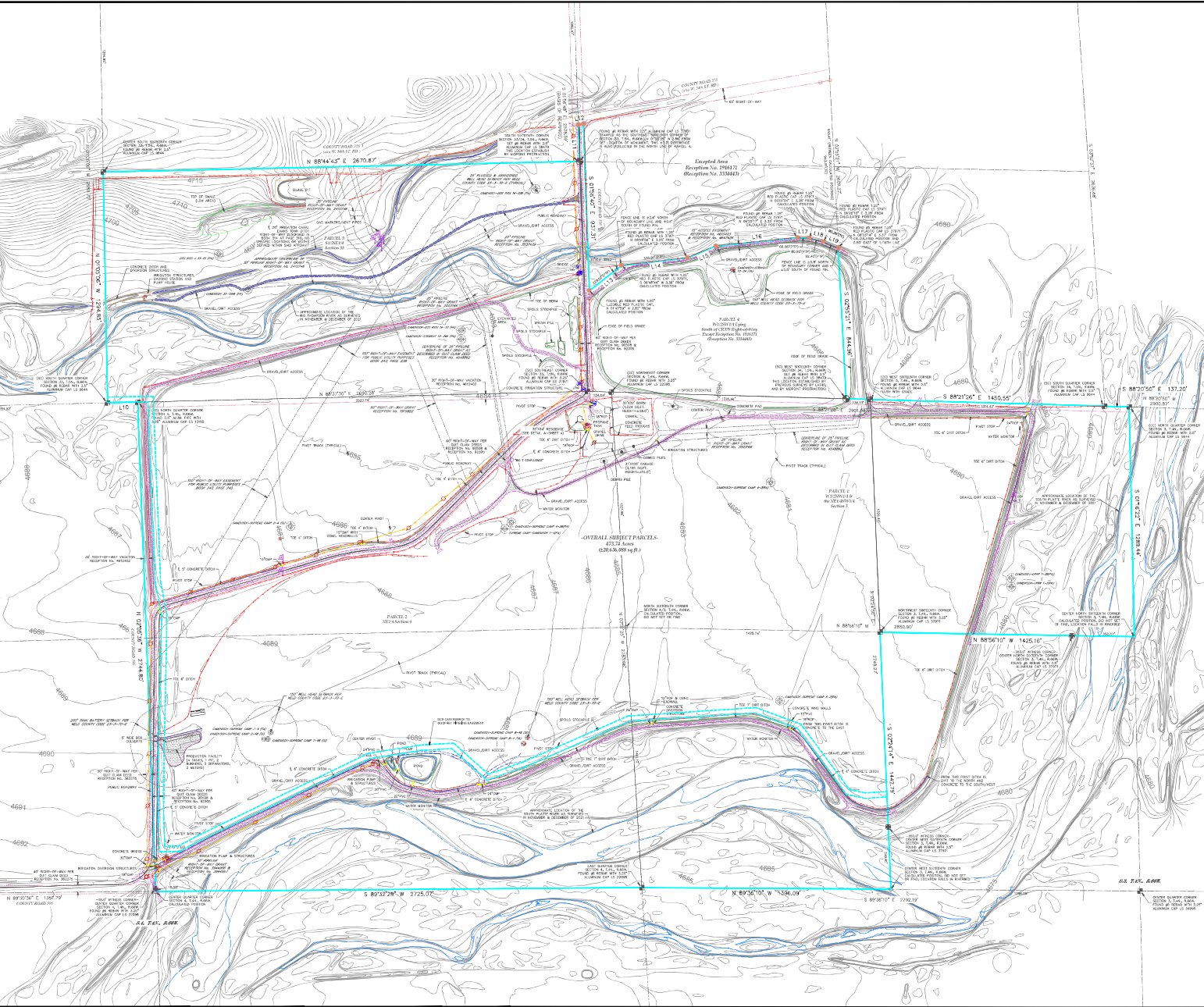


Image Source: ALTA-P124-VARRA COMPANIES- EVANS-MILLIKEN (2022-03-31).pdf, Lat40°, Inc.

NOTES

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DENVER, CO 80246
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MOD. DATE:
REPORT NO:
DB: S. VON FLUE
CBI: P. CHRISTENSEN



- | | | |
|---|-----------------------|----------------------------------|
| BOUNDARY - APPROXIMATE | OVERHEAD UTILITY LINE | SOUTH PLATTE RIVER (APPROXIMATE) |
| FENCE | STREET - EXISTING | DISTANCE BETWEEN FOUND PMS |
| RIGHT-OF-WAY GRANT (30) | | WITNESS CORNER |
| DOP CANVASBACK TO GODFREY PIPELINE EASEMENT | | FOUND ALGOUT CORNER AS DESCRIBED |
| CONTOUR LINE (1 FT) | | CALCULATED POSITION |
| RIGHT-OF-WAY LINE | | FOUND AS REAR VETH 1.25\"/> |

- | | |
|--|--------------|
| PRODUCING WELL HEAD | WATER MARKER |
| APPROXIMATE PLUGGED AND ABANDONED WELL HEAD LOCATION | WATER METER |
| ELECTRIC METER | WATER VALVE |
| ELECTRIC SERVICE | GAS MARKER |
| POWER POLE | GATE |
| | POST |

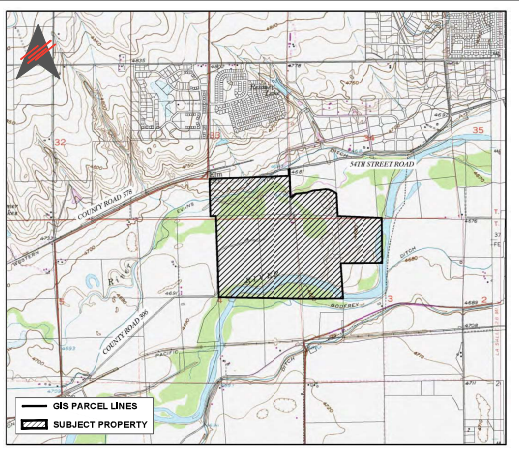
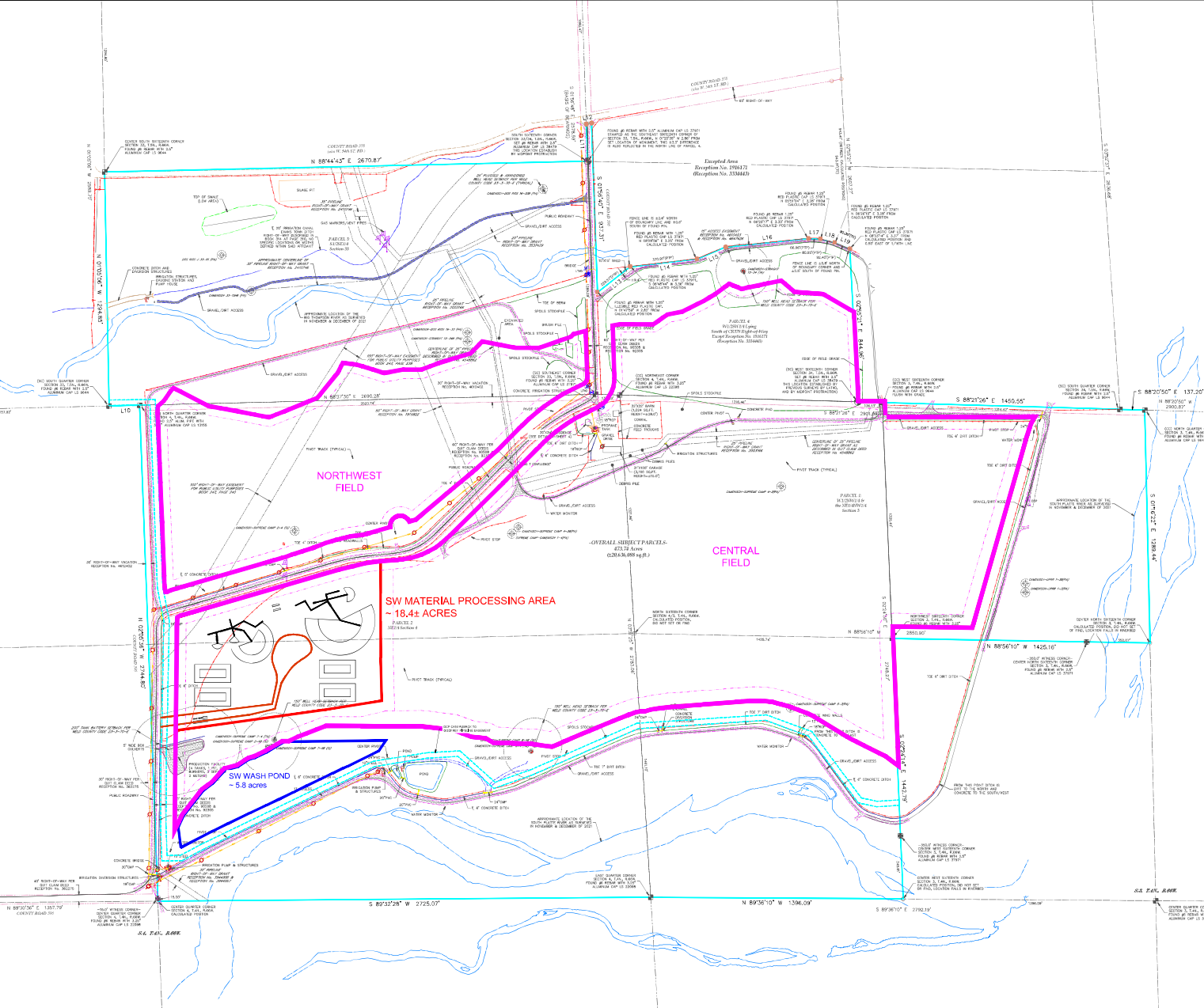


Image Source: ALTA-P124-VARRA COMPANIES_EVANS-MILLIKEN (2022-03-31).pdf, Lat40°, Inc.

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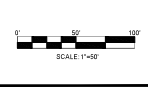
www.respec.com

MOD. DATE:


REPORT NO:

DB S. VON FLUE

CB P. CHRISTENSEN



SCALE: 1"=50'



BOUNDARY - APPROXIMATE	RIGHT-OF-WAY LINE	SOUTH PLATTE RIVER (APPROXIMATE)	PRODUCING WELL HEAD	WATER MARKER
EXTRACTION LIMITS	OVERHEAD UTILITY LINE	DISTANCE BETWEEN FOUND PINS	APPROXIMATE PLUGGED AND ABANDONED WELL HEAD LOCATION	WATER METER
FENCE	STREET - EXISTING	WITNESS CORNER		WATER VALVE
RIGHT-OF-WAY GRANT (30')		FOUND ALGOUT CORNER AS DESCRIBED	ELECTRIC METER	GAS MARKER
DGP CANVASBACK TO GODFREY PIPELINE EASEMENT		CALCULATED POSITION	ELECTRIC SERVICE	GATE
		FOUND AS BEAR WITH 1.25" RED PLASTIC CAP 15.00" HIGH 25.00" ± 3.00" FROM CALCULATED POSITION	POWER POLE	POST

RAPTOR MATERIALS, LLC

CITY OF EVANS, COUNTY OF WELD, STATE OF COLORADO / M0020

SITE PLAN

October 10, 2023

SHEET 3 OF 5

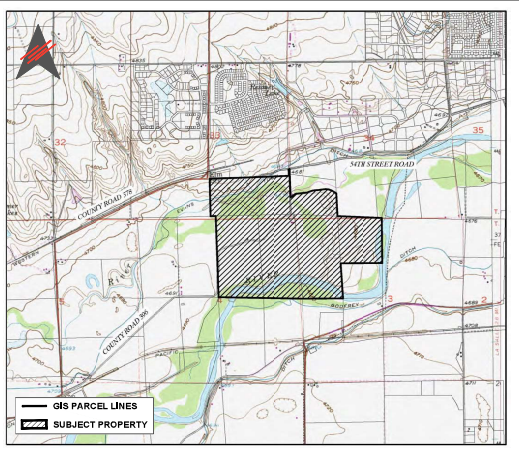
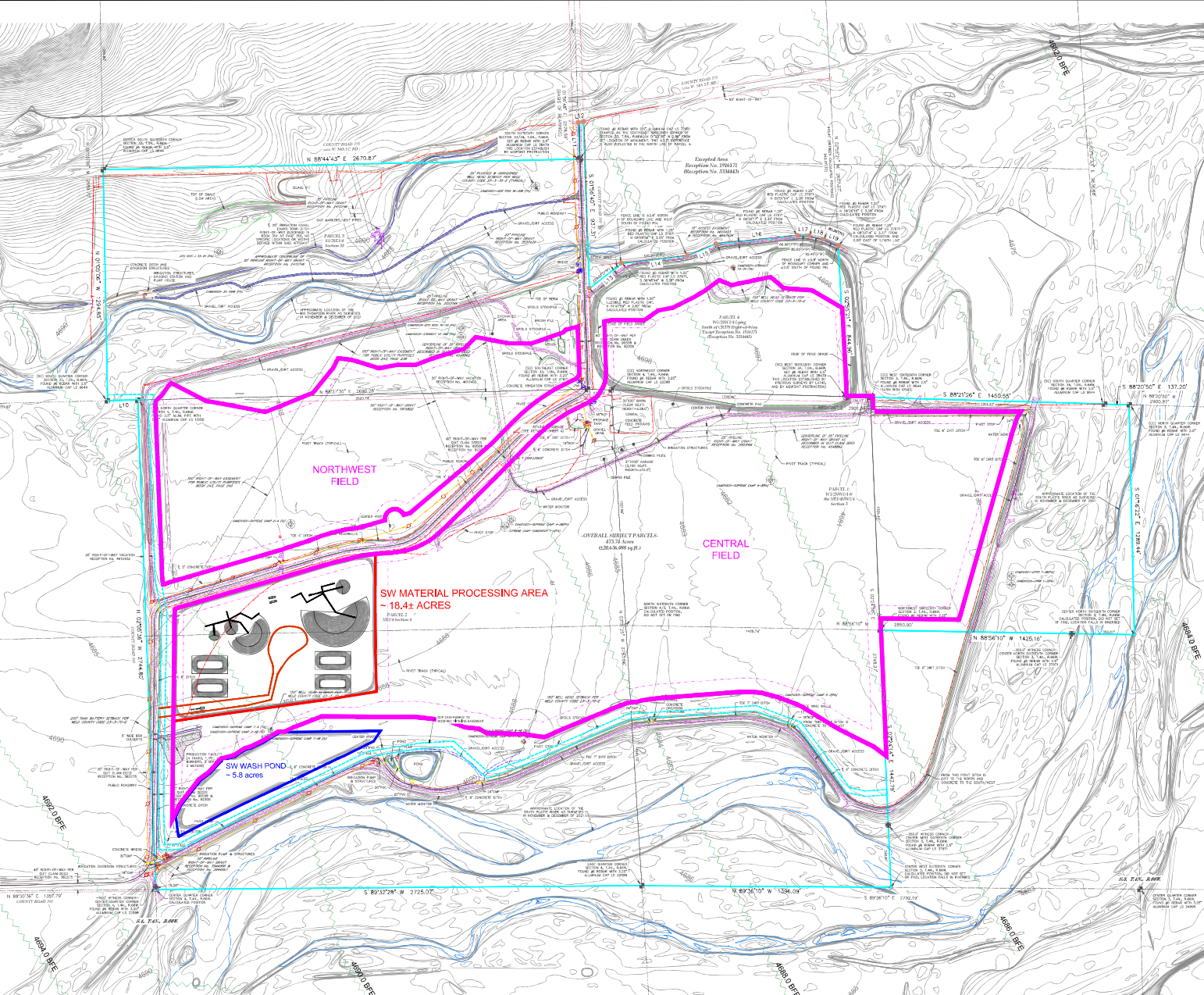


Image Source: ALTA-P124-VARRA COMPANIES_EVANS-MILLIKEN (2022-03-31).pdf, Lat40°, Inc.

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MOD. DATE:
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CB: P. CHRISTENSEN

BOUNDARY, APPROXIMATE
EXTRACTION LIMITS
FENCE
RIGHT-OF-WAY GRANT (30')
DGP CANVASBACK TO
GODFREY PIPELINE EASEMENT
AS-BUILT CONTOUR LINES (1 FT)

RIGHT-OF-WAY LINE
OVERHEAD UTILITY LINE
STREET - EXISTING

PPV
DISTANCE BETWEEN FOUND PINS
WITNESS CORNER
FOUND ALGOLIGHT CORNER AS DESCRIBED
CALCULATED POSITION
FOUND AS REAR VERT 1.25" RED PLASTIC
CAP 15.00" HIGH 25.00" ± 3.00" FROM
CALCULATED POSITION

PRODUCING WELL HEAD
APPROXIMATE PLUGGED AND
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ELECTRIC METER
ELECTRIC SERVICE
POWER POLE

WATER MARKER
WATER METER
WATER VALVE
GAS MARKER
GATE
POST

RAPTOR MATERIALS, LLC
CITY OF EVANS, COUNTY OF WELD, STATE OF COLORADO / M0020
GRADING PLAN

October 10, 2023

SHEET 4 OF 5

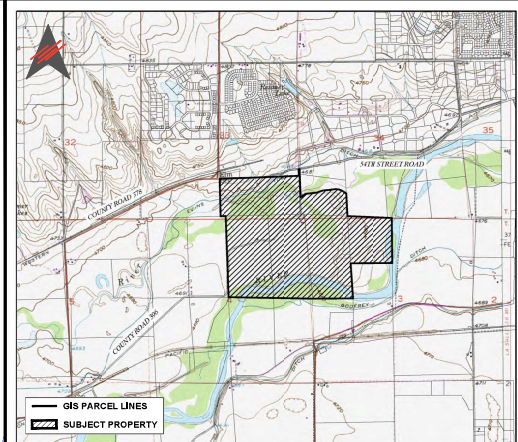
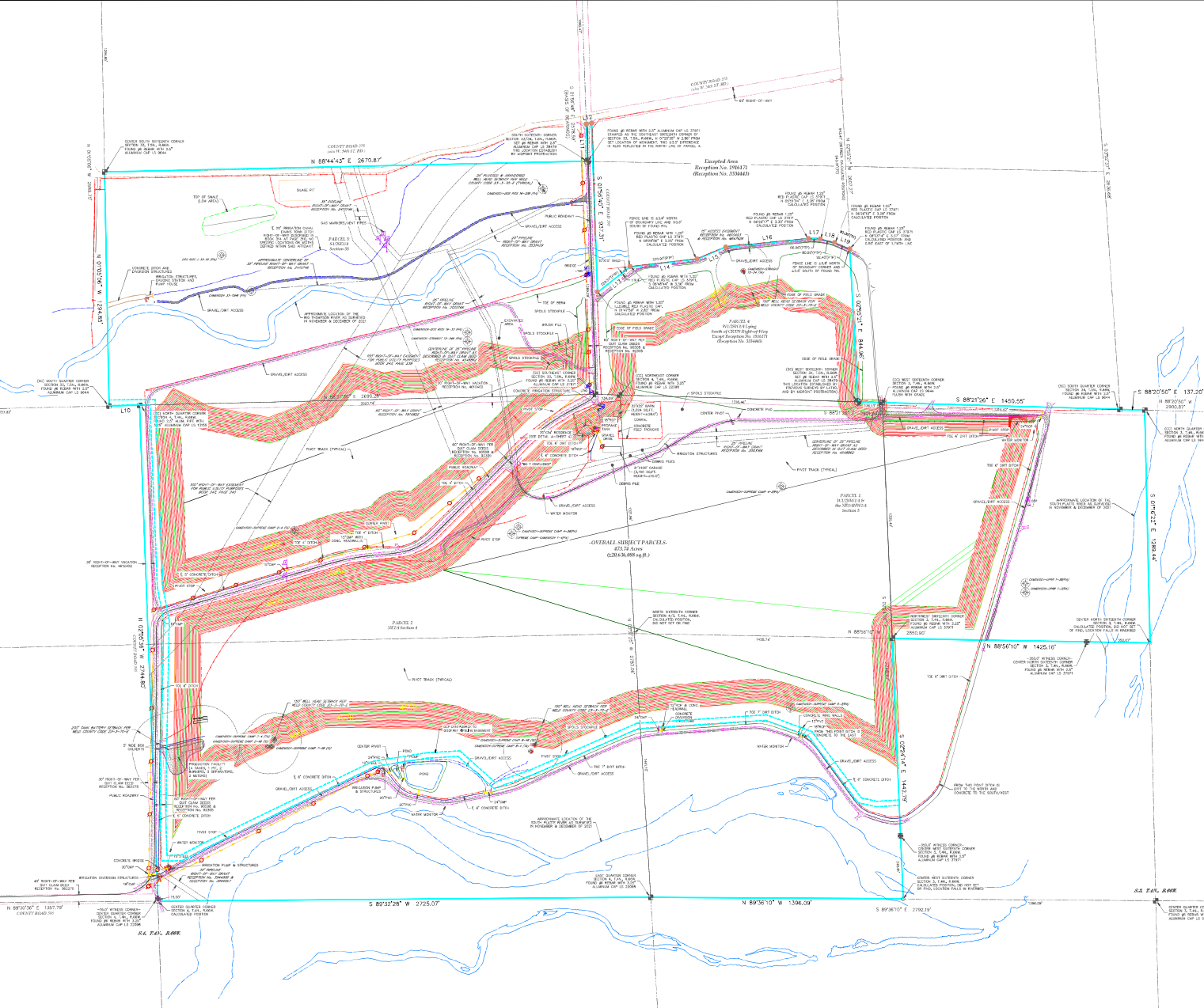


Image Source: ALTA-P124-VARRA COMPANIES_EVANS-MILLIKEN (2022-03-31).pdf, Lat40°, Inc.

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 RESPEC 720 S. Colorado Blvd., Suite 410 DENVER, CO 80246 www.respec.com	MOD. DATE: REPORT NO: DB: S. VON FLUE CB: P. CHRISTENSEN	 SCALE: 1"=30'		
	RAPTOR MATERIALS, LLC CITY OF EVANS, COUNTY OF WELD, STATE OF COLORADO / M0020 RECLAIMED SITE PLAN			

October 10, 2023

SHEET 5 OF 5



ATTACHMENT D

HEC-RAS Plan: NoRisePreProject River: BigThompson Reach: BT: Lower Profile: 1%

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
BT: Lower	15282	1%	22247.00	4688.09	4698.80	4697.46	4699.05	0.001339	7.04	8442.16	2482.56	0.41
BT: Lower	14843	1%	22247.00	4687.94	4698.23	4696.74	4698.45	0.001337	6.57	8024.61	2168.79	0.40
BT: Lower	14014	1%	22247.00	4687.27	4697.43		4697.66	0.001367	6.52	7173.97	1836.22	0.40
BT: Lower	13995		Lat Struct									
BT: Lower	12916	1%	22247.00	4686.56	4696.09		4696.39	0.001968	7.59	7090.78	2278.01	0.49
BT: Lower	12612	1%	22247.00	4686.83	4695.57		4695.77	0.001693	6.55	7975.10	2675.49	0.44
BT: Lower	12309	1%	22247.00	4686.88	4694.95	4693.97	4695.21	0.001909	7.08	7558.68	2826.30	0.50
BT: Lower	12230	1%	22247.00	4682.54	4694.63	4693.85	4695.06	0.001570	7.46	7204.49	2559.11	0.44
BT: Lower	12166	1%	22247.00	4678.15	4694.47	4693.87	4694.94	0.001855	7.90	6876.17	2583.08	0.50
BT: Lower	11919	1%	22247.00	4682.80	4693.81	4693.42	4694.30	0.003926	8.82	6303.63	2752.42	0.64
BT: Lower	10886	1%	22247.00	4680.31	4692.70		4692.96	0.000936	5.93	9460.36	3159.59	0.35
BT: Lower	10885		Lat Struct									
BT: Lower	10304	1%	22247.00	4680.24	4692.33	4690.14	4692.41	0.000918	3.08	11154.86	3524.49	0.19
BT: Lower	10000	1%	22247.00	4680.43	4692.11	4689.43	4692.19	0.000620	3.74	11649.47	3894.37	0.24
BT: Lower	9458	1%	22247.00	4679.62	4691.66	4690.41	4691.87	0.000978	6.25	10959.33	3662.44	0.37
BT: Lower	9149	1%	22247.00	4680.03	4691.20	4690.21	4691.45	0.001792	7.43	8852.01	3056.99	0.46
BT: Lower	8628	1%	22247.00	4679.12	4690.44		4690.64	0.001367	5.59	9107.17	3201.92	0.39
BT: Lower	8597	1%	22247.00	4679.67	4690.41		4690.59	0.001316	5.62	9482.01	3186.37	0.38
BT: Lower	8552	1%	22247.00	4678.55	4690.34		4690.52	0.001411	6.71	9513.38	3131.25	0.41
BT: Lower	7956		Lat Struct									
BT: Lower	7651	1%	22247.00	4677.23	4688.99		4689.20	0.001493	7.60	9230.09	3156.60	0.43
BT: Lower	7050	1%	22247.00	4676.09	4688.03		4688.31	0.001449	7.38	9083.97	3013.78	0.46
BT: Lower	6703	1%	22247.00	4676.35	4687.64		4687.81	0.001252	6.14	10461.45	3362.51	0.39
BT: Lower	5853	1%	22247.00	4674.81	4686.20	4685.31	4686.45	0.002074	6.94	8807.67	3635.12	0.51
BT: Lower	5817		Bridge									
BT: Lower	5792	1%	22247.00	4674.77	4685.91	4685.19	4686.18	0.001898	7.27	8969.65	3932.33	0.49
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BT: Lower	4874	1%	22247.00	4674.12	4684.59		4684.77	0.001510	6.31	9313.14	2822.35	0.41
BT: Lower	4569	1%	22247.00	4673.95	4684.09		4684.27	0.001769	4.98	8514.07	2778.09	0.42
BT: Lower	3839	1%	22247.00	4672.72	4682.15	4679.79	4682.74	0.003153	7.89	5399.01	2541.46	0.58
BT: Lower	3242	1%	22247.00	4672.05	4681.59	4678.04	4681.78	0.001534	5.31	8165.41	2183.09	0.41
BT: Lower	3041	1%	22247.00	4672.69	4681.58		4681.62	0.000223	2.36	15727.84	3638.59	0.17
BT: Lower	2320	1%	22247.00	4671.25	4681.37		4681.46	0.000452	3.81	10579.83	3024.44	0.23
BT: Lower	1708	1%	22247.00	4670.34	4681.11		4681.19	0.000521	3.89	10730.10	3845.09	0.24
BT: Lower	993	1%	22247.00	4669.62	4680.96		4681.01	0.000180	2.33	13118.86	4143.10	0.14
BT: Lower	464	1%	22247.00	4669.44	4680.82		4680.89	0.000322	3.51	14198.40	4388.68	0.21
BT: Lower	0	1%	22247.00	4669.12	4680.60	4675.15	4680.74	0.000303	3.82	12661.83	4483.69	0.20

HEC-RAS Plan: NoRisePostProject River: BigThompson Reach: BT: Lower Profile: 1%

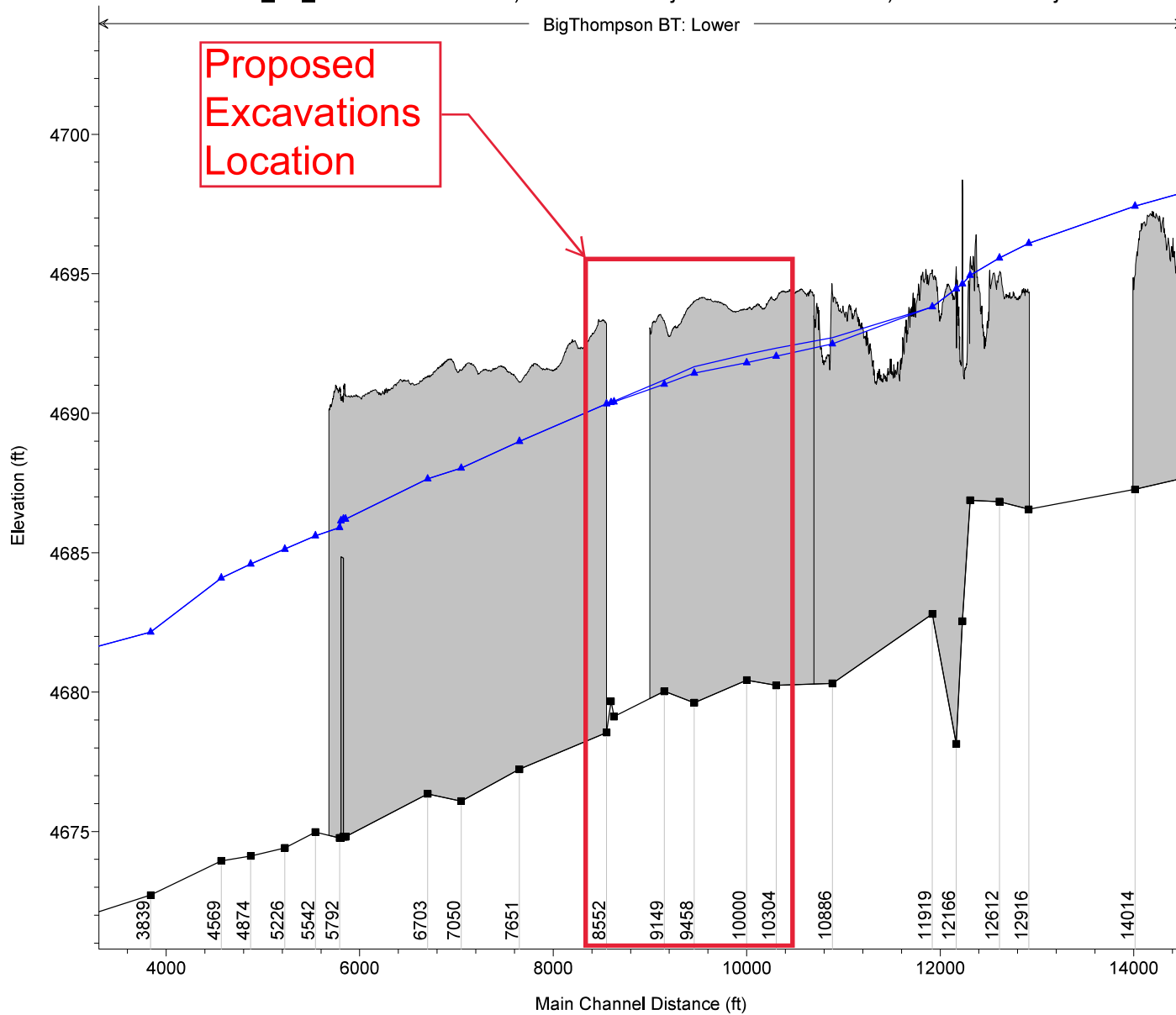
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			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
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BT: Lower	14014	1%	22247.00	4687.27	4697.43		4697.66	0.001367	6.52	7173.97	1836.22	0.40
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BT: Lower	12916	1%	22247.00	4686.56	4696.09		4696.39	0.001968	7.59	7090.78	2278.01	0.49
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BT: Lower	12309	1%	22247.00	4686.88	4694.95	4693.97	4695.21	0.001909	7.08	7558.68	2826.30	0.50
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BT: Lower	11919	1%	22247.00	4682.80	4693.81	4693.42	4694.30	0.003908	8.80	6314.38	2753.39	0.64
BT: Lower	10886	1%	22247.00	4680.31	4692.49		4692.79	0.001134	6.43	8771.51	3137.77	0.38
BT: Lower	10885		Lat Struct									
BT: Lower	10304	1%	22247.00	4680.24	4692.04	4690.08	4692.13	0.001093	3.28	10051.20	3470.73	0.21
BT: Lower	10000	1%	22247.00	4680.43	4691.81	4689.43	4691.89	0.000659	3.62	11325.31	3867.84	0.24
BT: Lower	9458	1%	22247.00	4679.62	4691.44	4689.89	4691.59	0.000819	5.62	12128.11	3659.40	0.34
BT: Lower	9149	1%	22247.00	4680.03	4691.04	4689.75	4691.24	0.001549	6.83	9831.32	3036.96	0.43
BT: Lower	8628	1%	22247.00	4679.12	4690.41		4690.56	0.001093	5.12	10482.76	3200.44	0.35
BT: Lower	8597	1%	22247.00	4679.67	4690.38		4690.52	0.001179	5.07	10390.69	3186.57	0.35
BT: Lower	8552	1%	22247.00	4678.55	4690.34		4690.46	0.001277	5.44	10265.16	3131.24	0.33
BT: Lower	7956		Lat Struct									
BT: Lower	7651	1%	22247.00	4677.23	4688.99		4689.20	0.001486	7.58	9228.55	3156.60	0.43
BT: Lower	7050	1%	22247.00	4676.09	4688.03		4688.31	0.001449	7.38	9083.97	3013.78	0.46
BT: Lower	6703	1%	22247.00	4676.35	4687.64		4687.81	0.001252	6.14	10461.45	3362.51	0.39
BT: Lower	5853	1%	22247.00	4674.81	4686.20	4685.31	4686.45	0.002074	6.94	8807.67	3635.12	0.51
BT: Lower	5817		Bridge									
BT: Lower	5792	1%	22247.00	4674.77	4685.91	4685.19	4686.18	0.001899	7.27	8967.76	3932.23	0.49
BT: Lower	5542	1%	22247.00	4674.98	4685.60		4685.69	0.001311	4.59	10986.40	3569.49	0.29
BT: Lower	5226	1%	22247.00	4674.41	4685.13		4685.27	0.001311	5.94	10291.06	3246.80	0.39
BT: Lower	4874	1%	22247.00	4674.12	4684.59		4684.77	0.001510	6.31	9313.14	2822.35	0.41
BT: Lower	4569	1%	22247.00	4673.95	4684.09		4684.27	0.001769	4.98	8513.99	2777.24	0.42
BT: Lower	3839	1%	22247.00	4672.72	4682.15	4679.79	4682.74	0.003153	7.89	5399.01	2541.46	0.58
BT: Lower	3242	1%	22247.00	4672.05	4681.59	4678.04	4681.78	0.001534	5.31	8165.41	2183.09	0.41
BT: Lower	3041	1%	22247.00	4672.69	4681.58		4681.62	0.000223	2.36	15727.84	3638.59	0.17
BT: Lower	2320	1%	22247.00	4671.25	4681.37		4681.46	0.000452	3.81	10579.83	3024.44	0.23
BT: Lower	1708	1%	22247.00	4670.34	4681.11		4681.19	0.000521	3.89	10730.10	3845.09	0.24
BT: Lower	993	1%	22247.00	4669.62	4680.96		4681.01	0.000180	2.33	13118.86	4143.10	0.14
BT: Lower	464	1%	22247.00	4669.44	4680.82		4680.89	0.000322	3.51	14198.40	4388.68	0.21
BT: Lower	0	1%	22247.00	4669.12	4680.60	4675.15	4680.74	0.000303	3.82	12661.83	4483.69	0.20

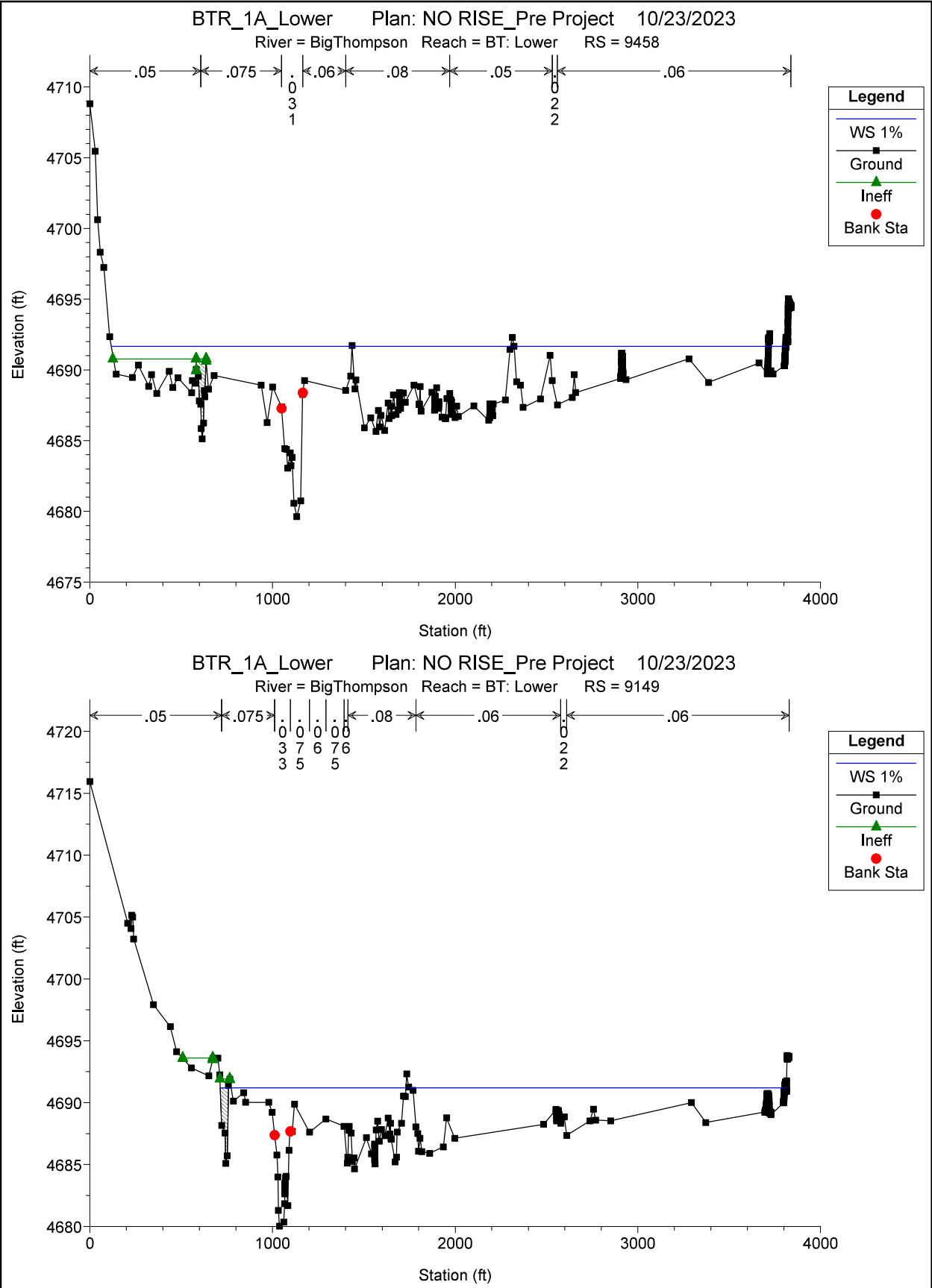
BTR_1A_Lower Plan: 1) NoRisePreProject 10/23/2023 2) NoRisePostProject 10/23/2023

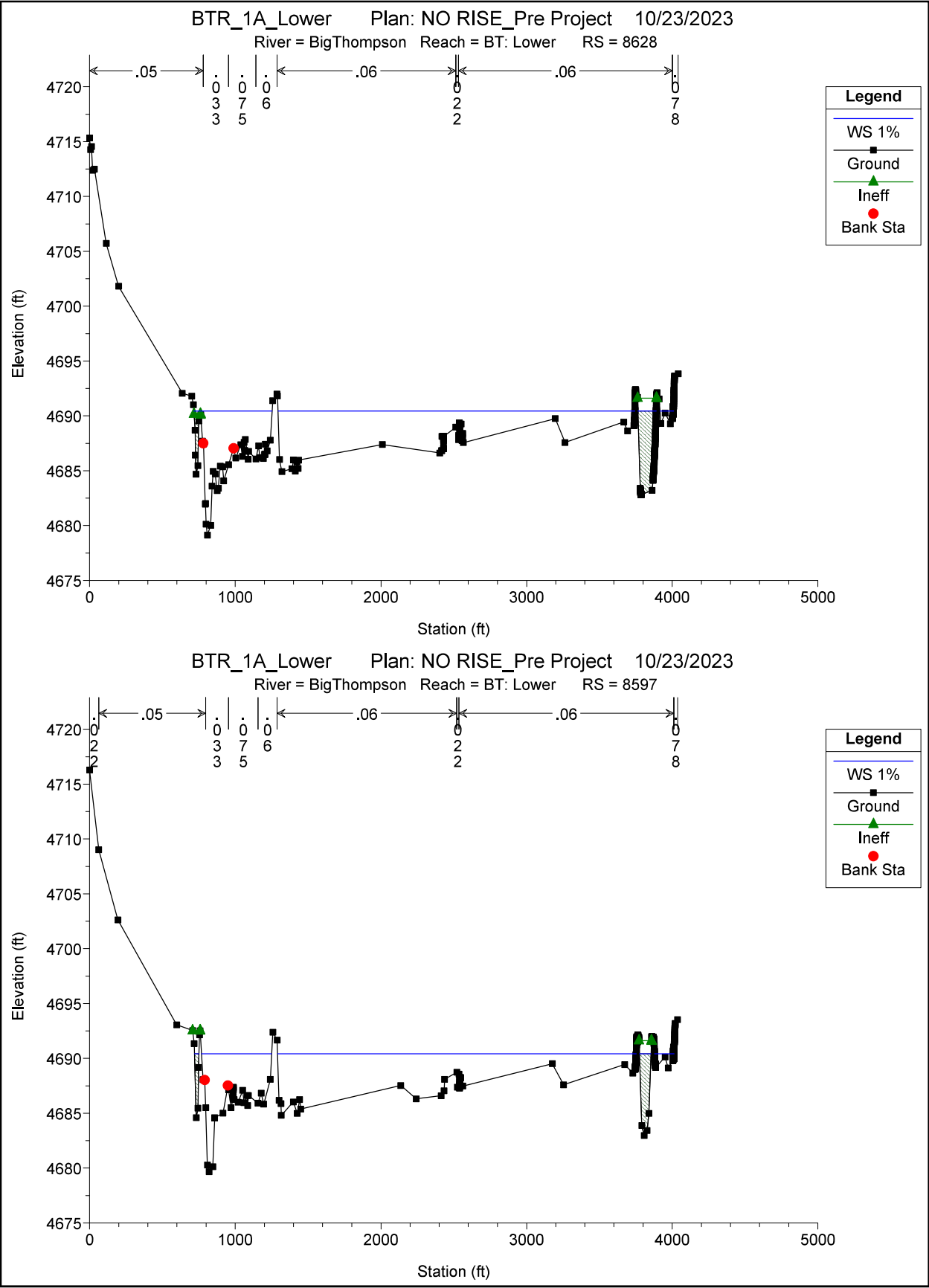
BigThompson BT: Lower

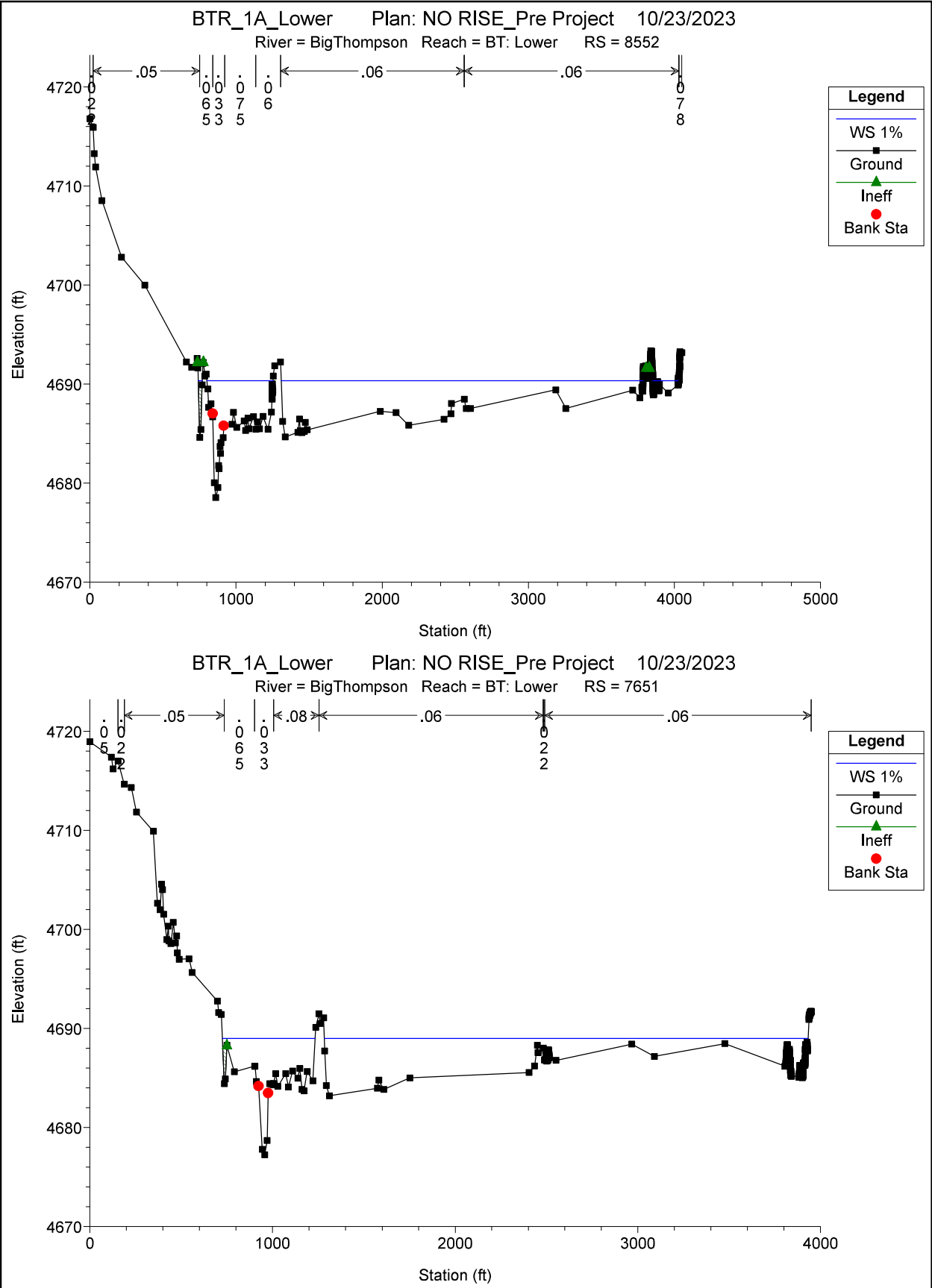
Proposed
Excavations
Location

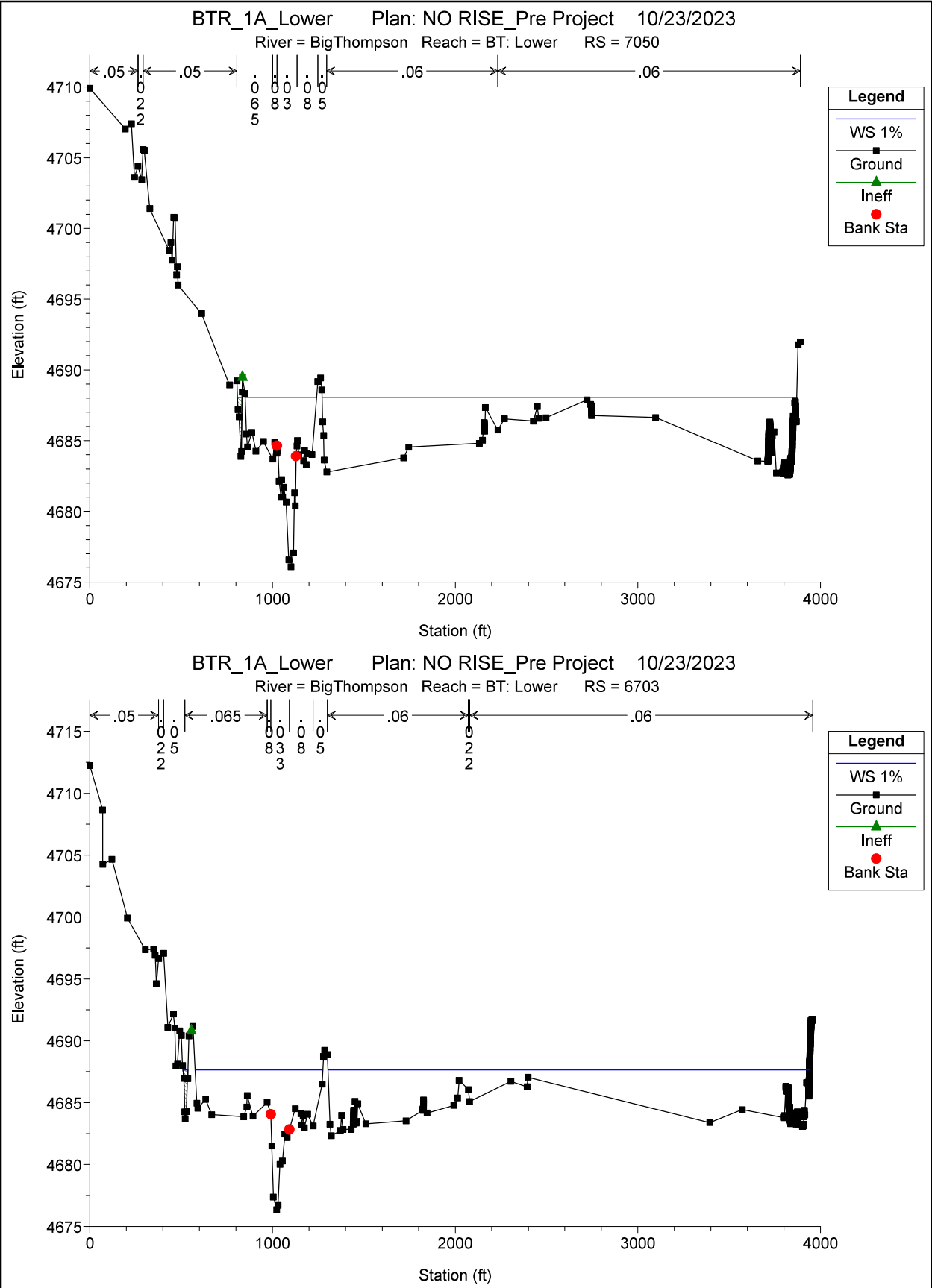
Legend	
WS 1% - NoRisePreProject	▲
WS 1% - NoRisePostProject	▲
Lat Struct	■
Ground	■

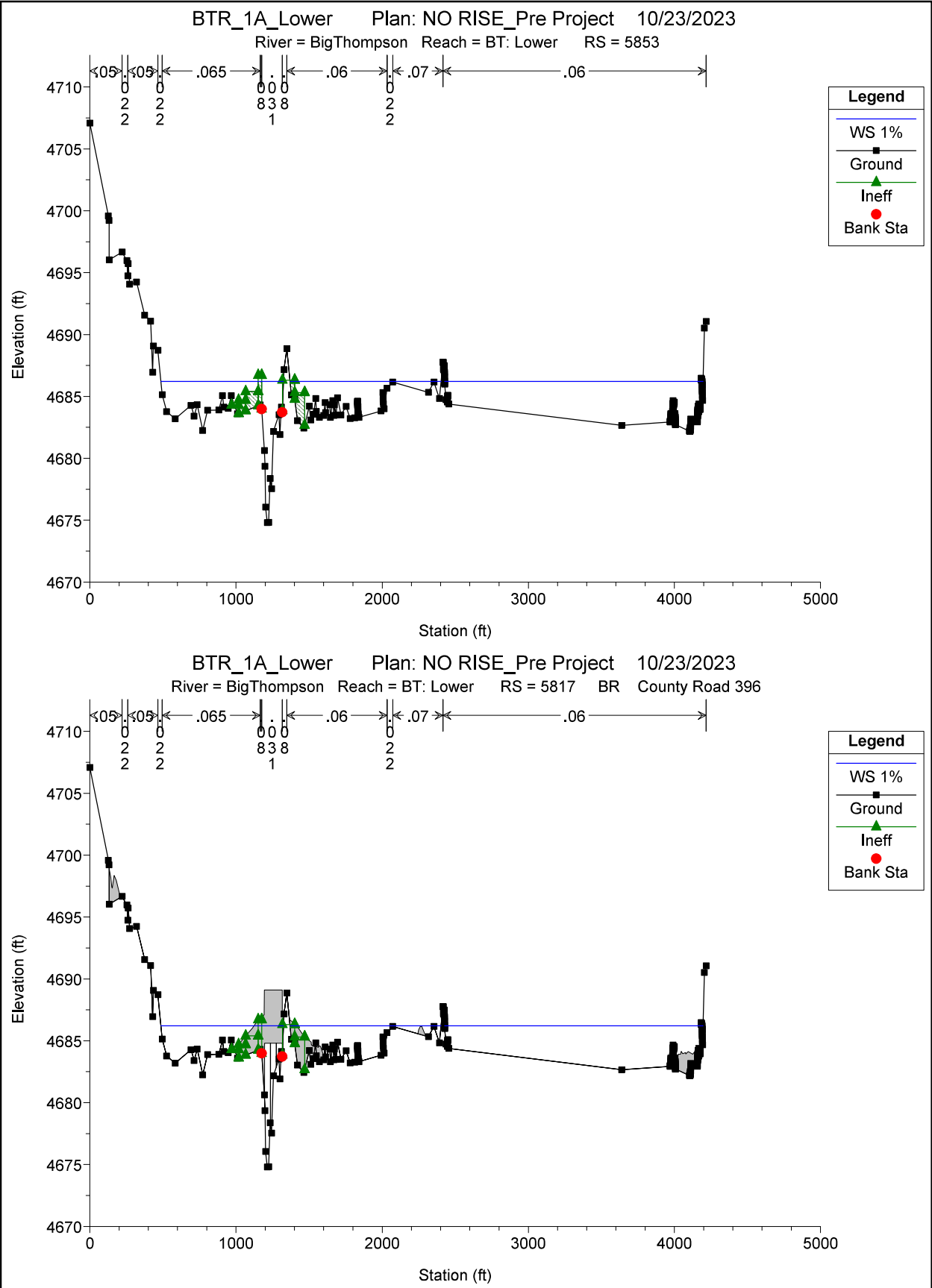


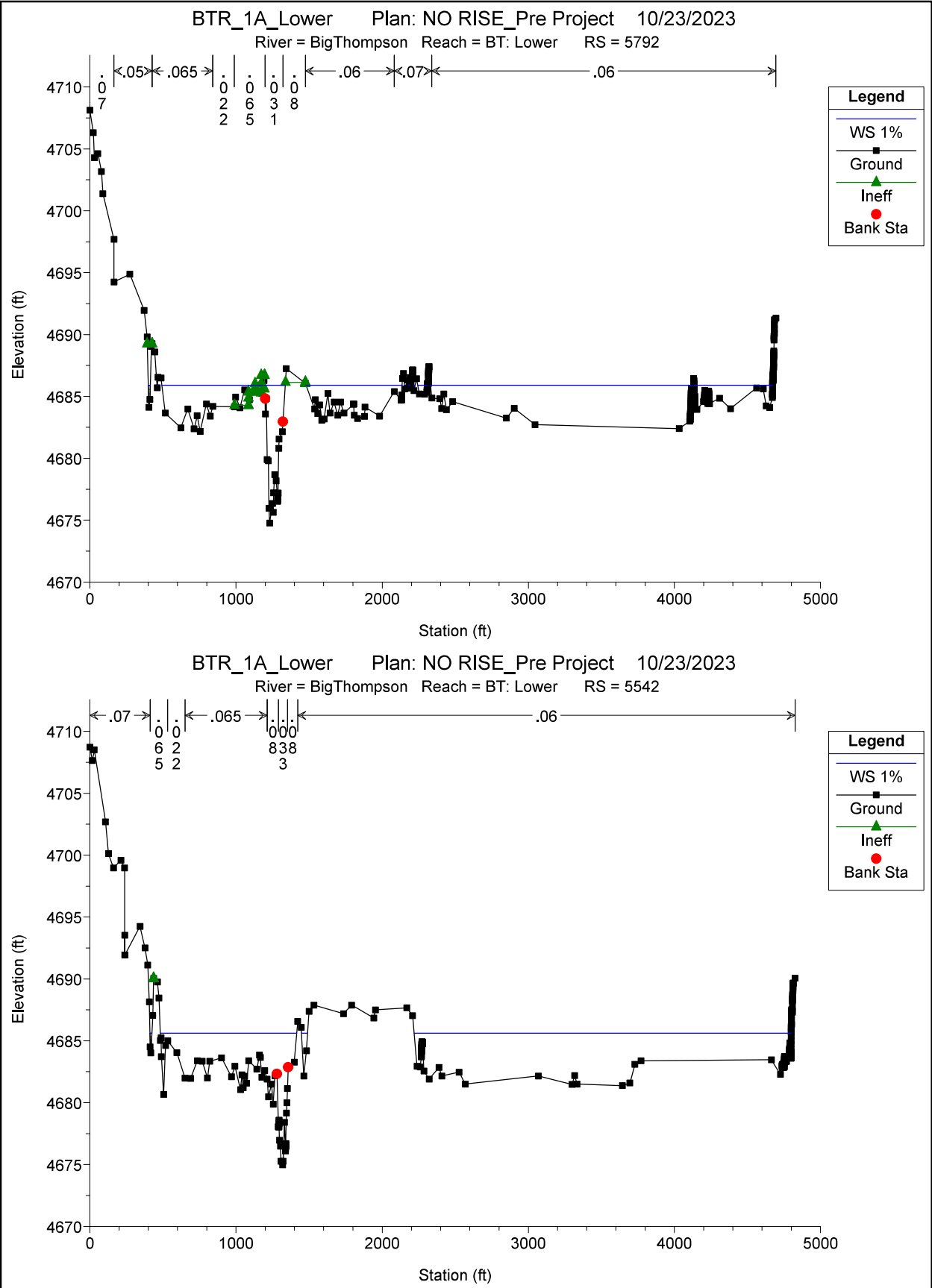












BTR_1A_Lower

Plan: NO RISE_Pre Project

10/23/2023

River = BigThompson

Reach = BT: Lower

RS = 5542

0.7

0.07

0.065

0.000

0.06

6

2

5

2

8

3

8

Elevation (ft)

4670

4675

4680

4685

4690

4695

4700

4705

4710

0

1000

2000

3000

4000

5000

Station (ft)

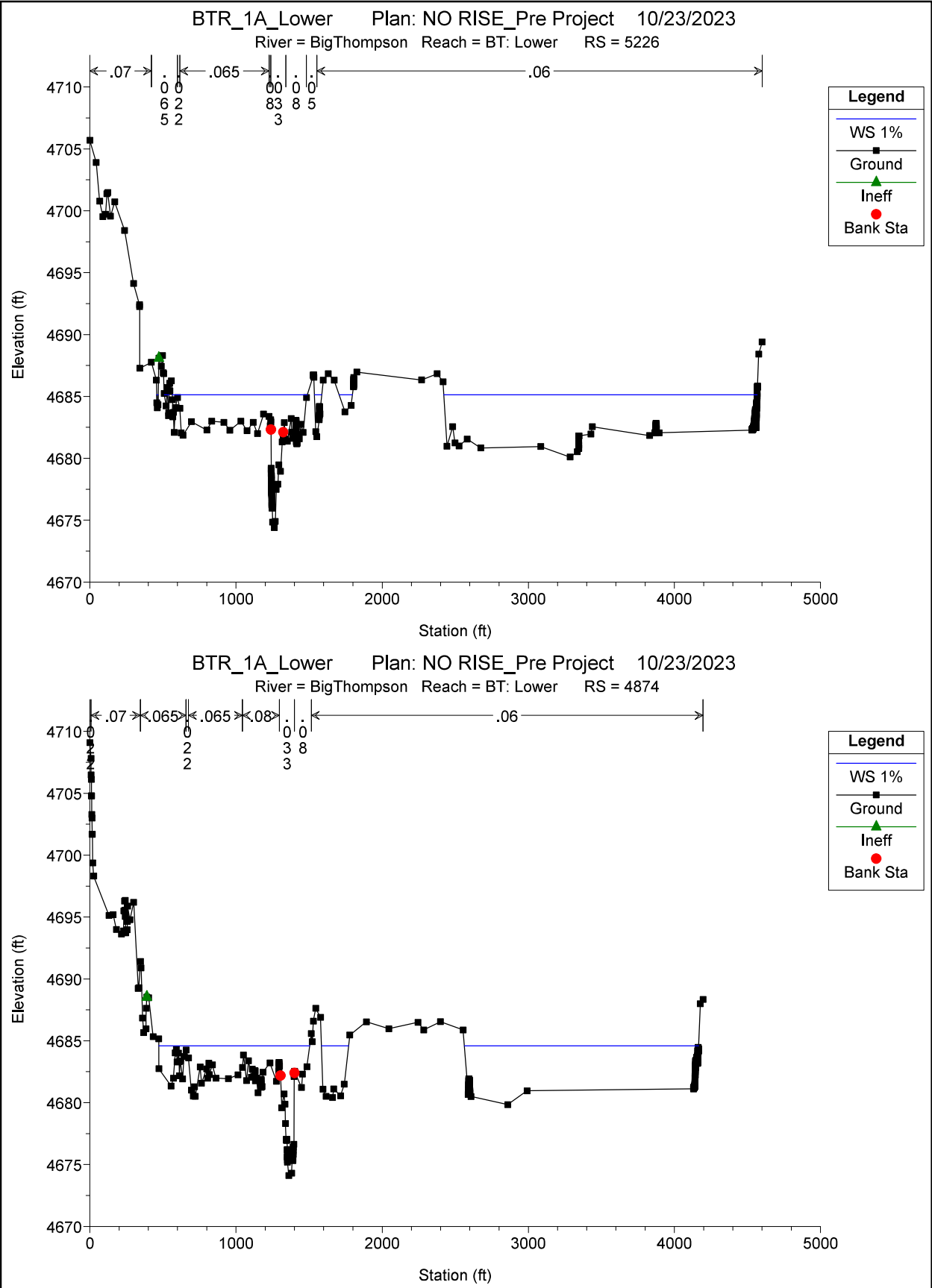
Legend

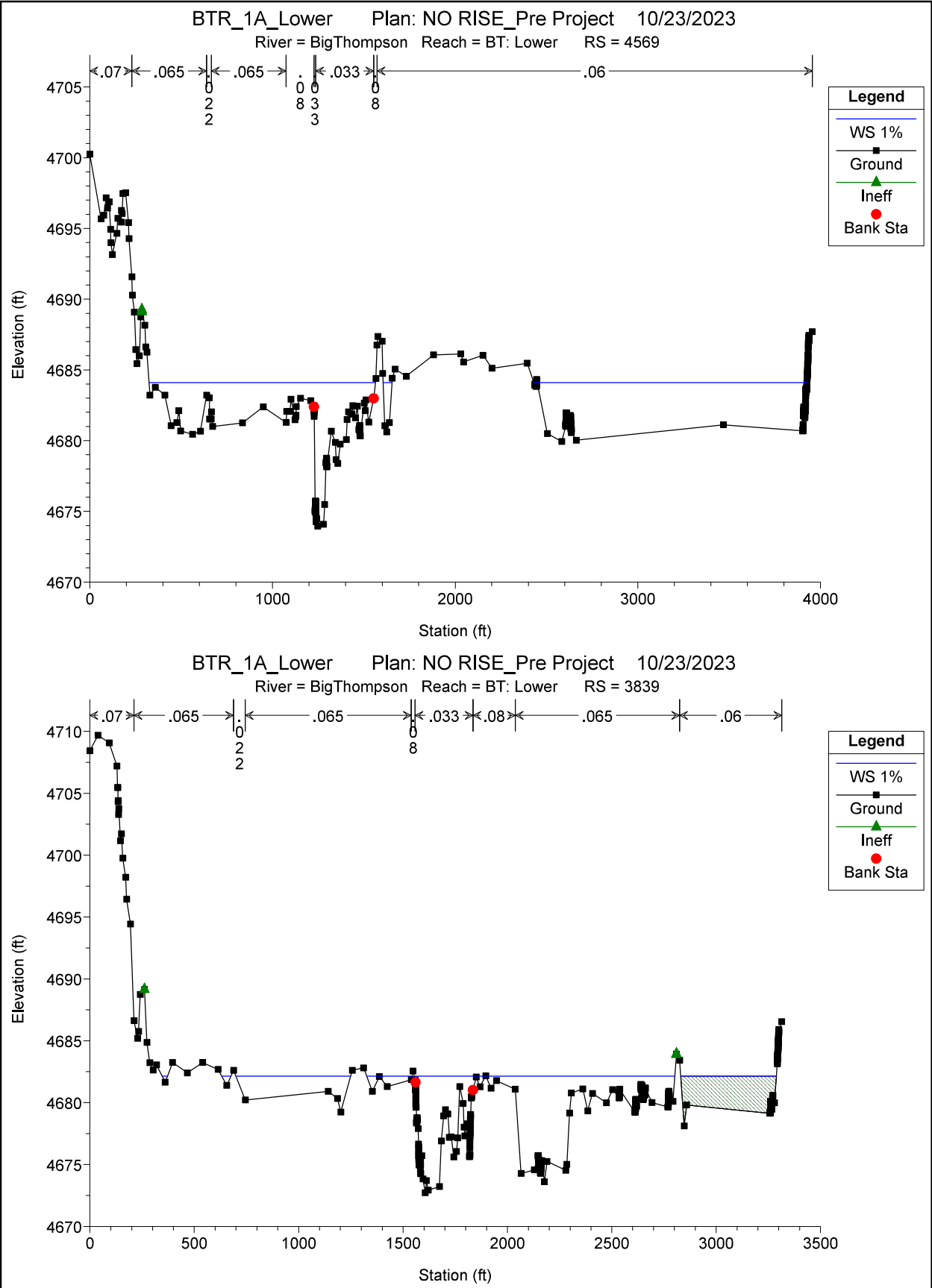
WS 1%

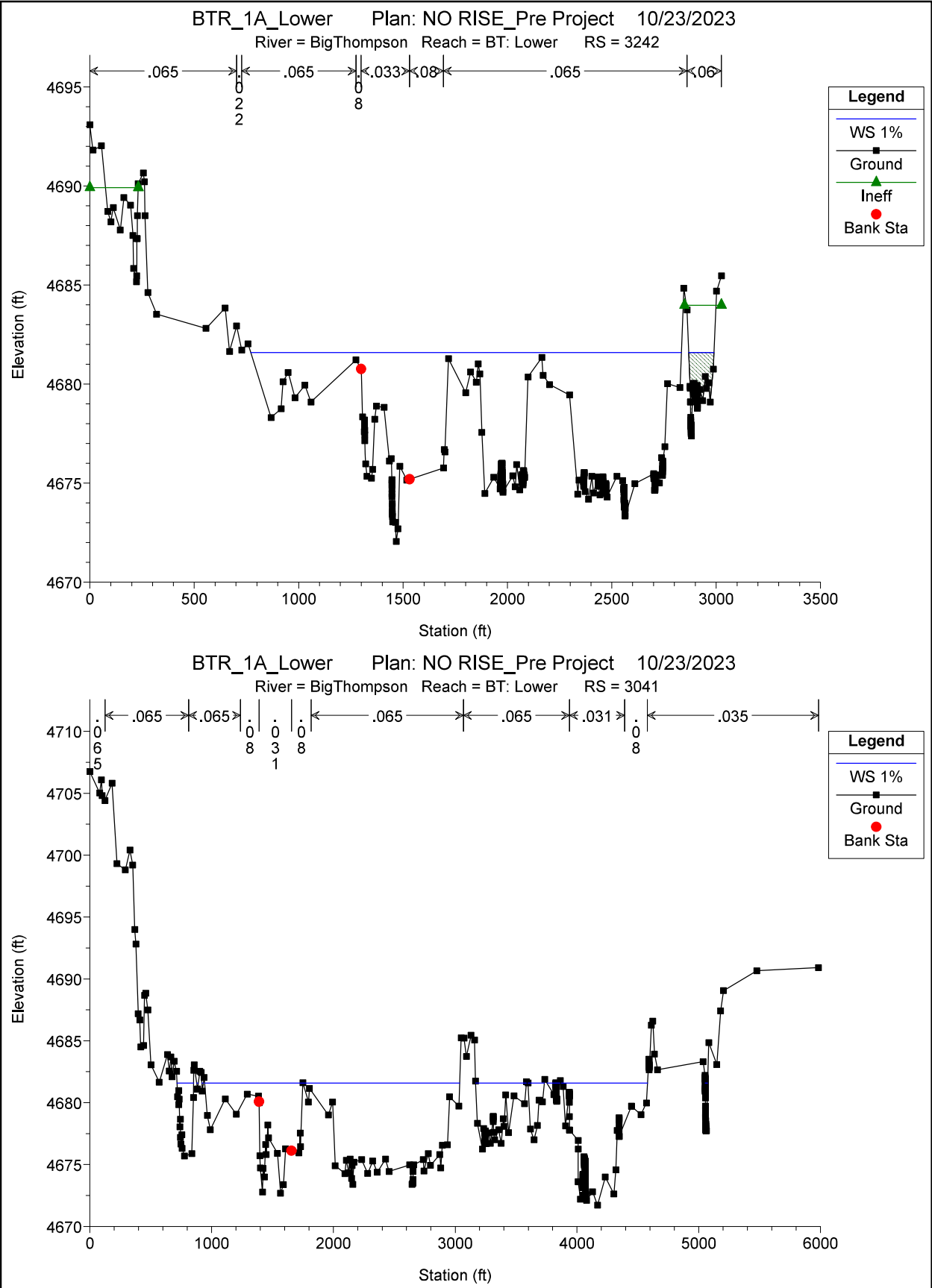
Ground

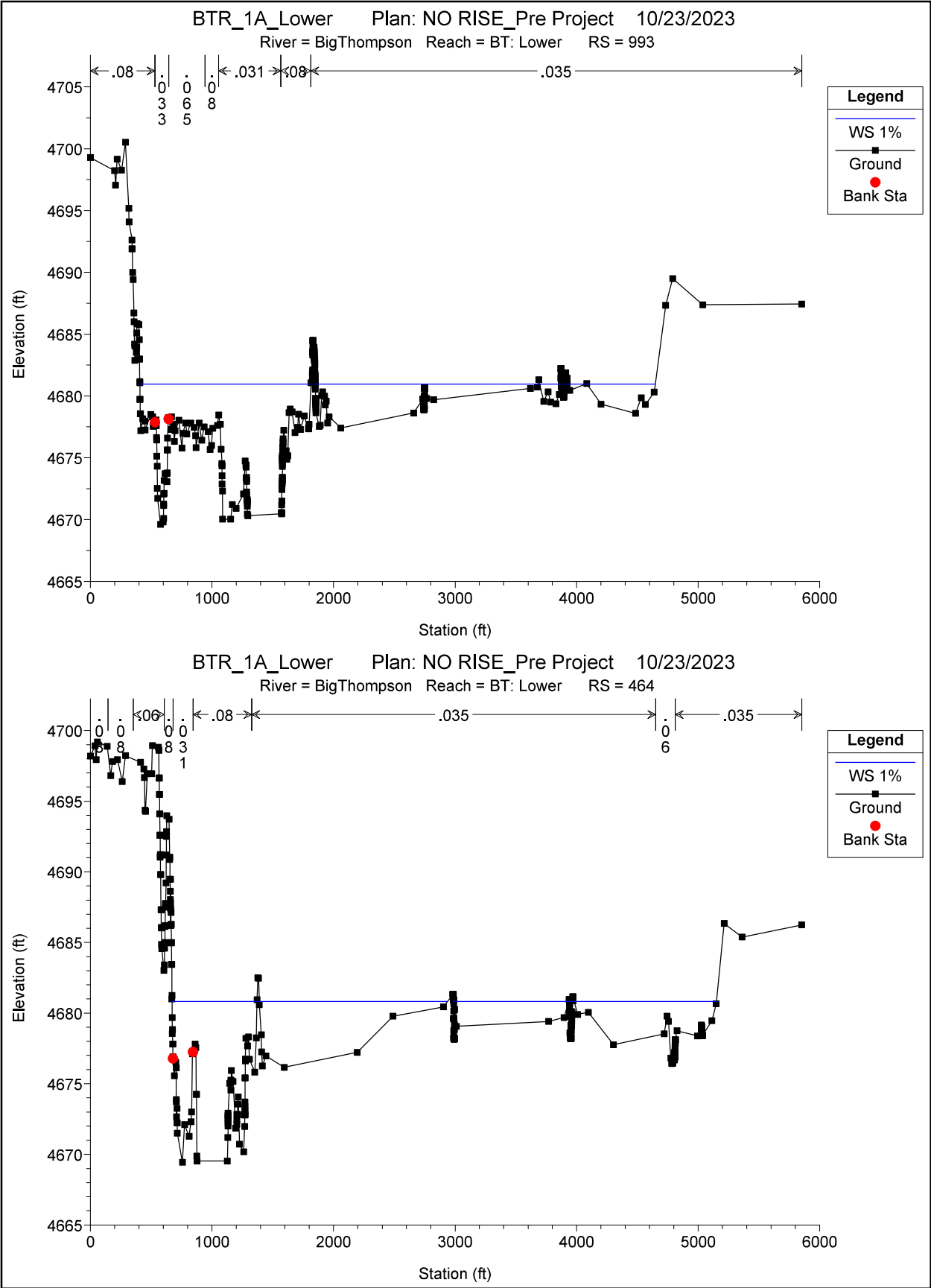
Ineff

Bank Sta



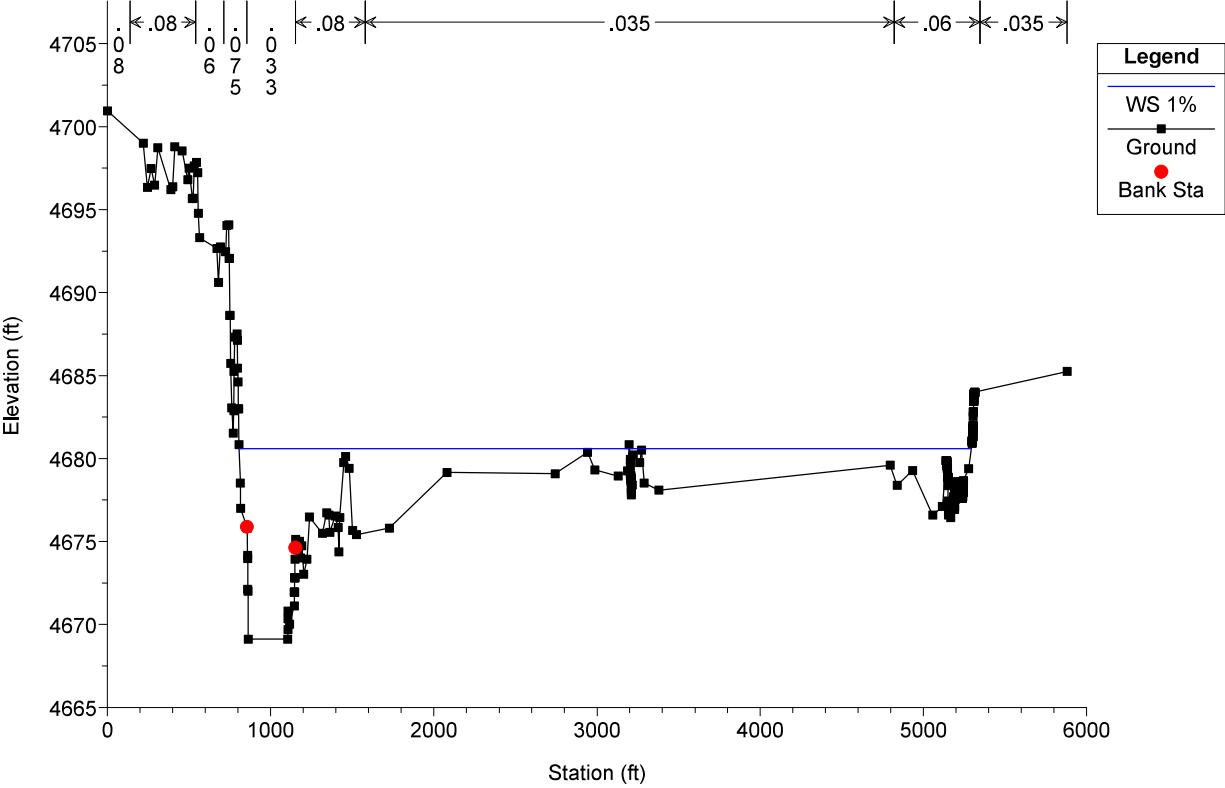


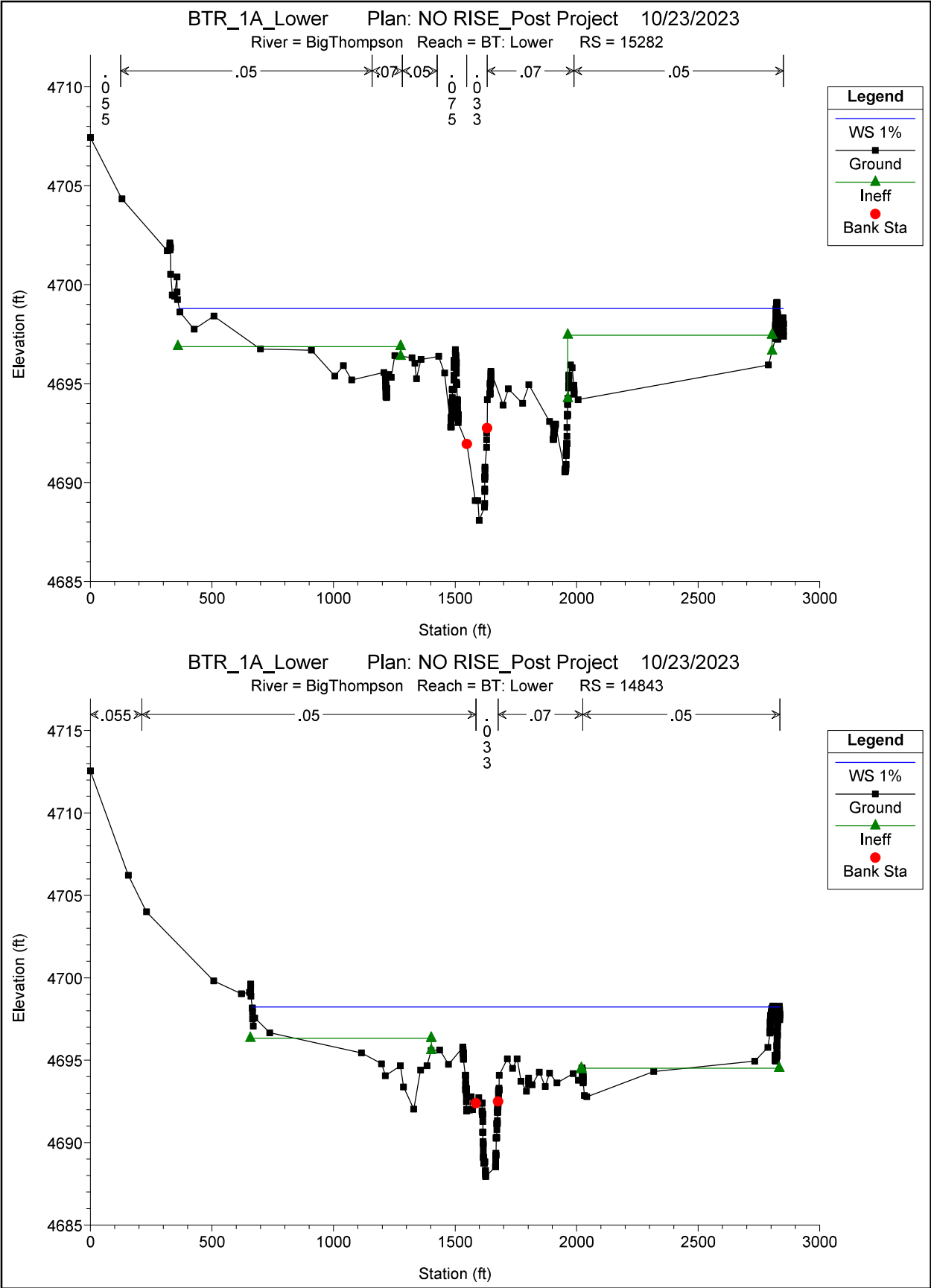


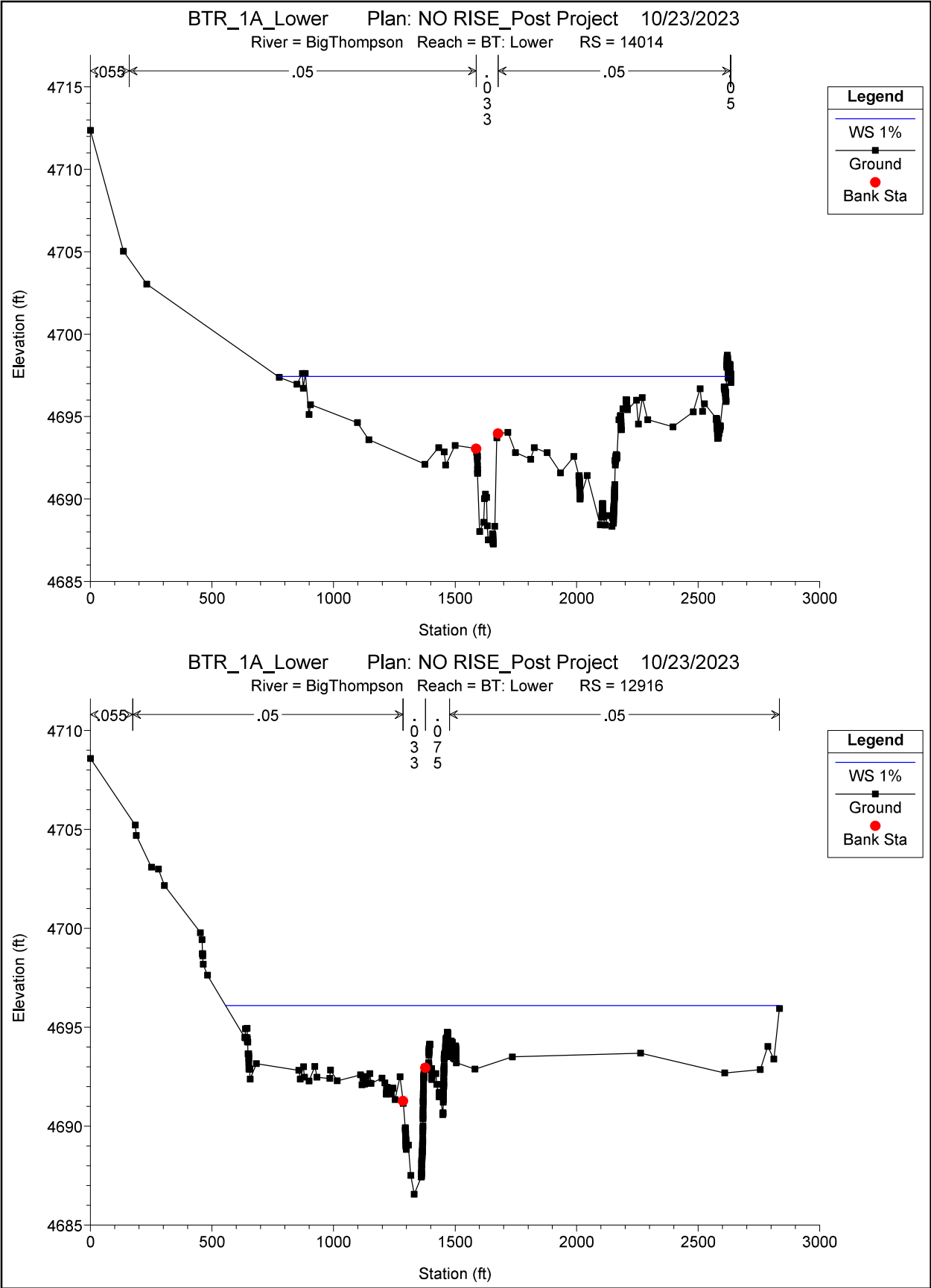


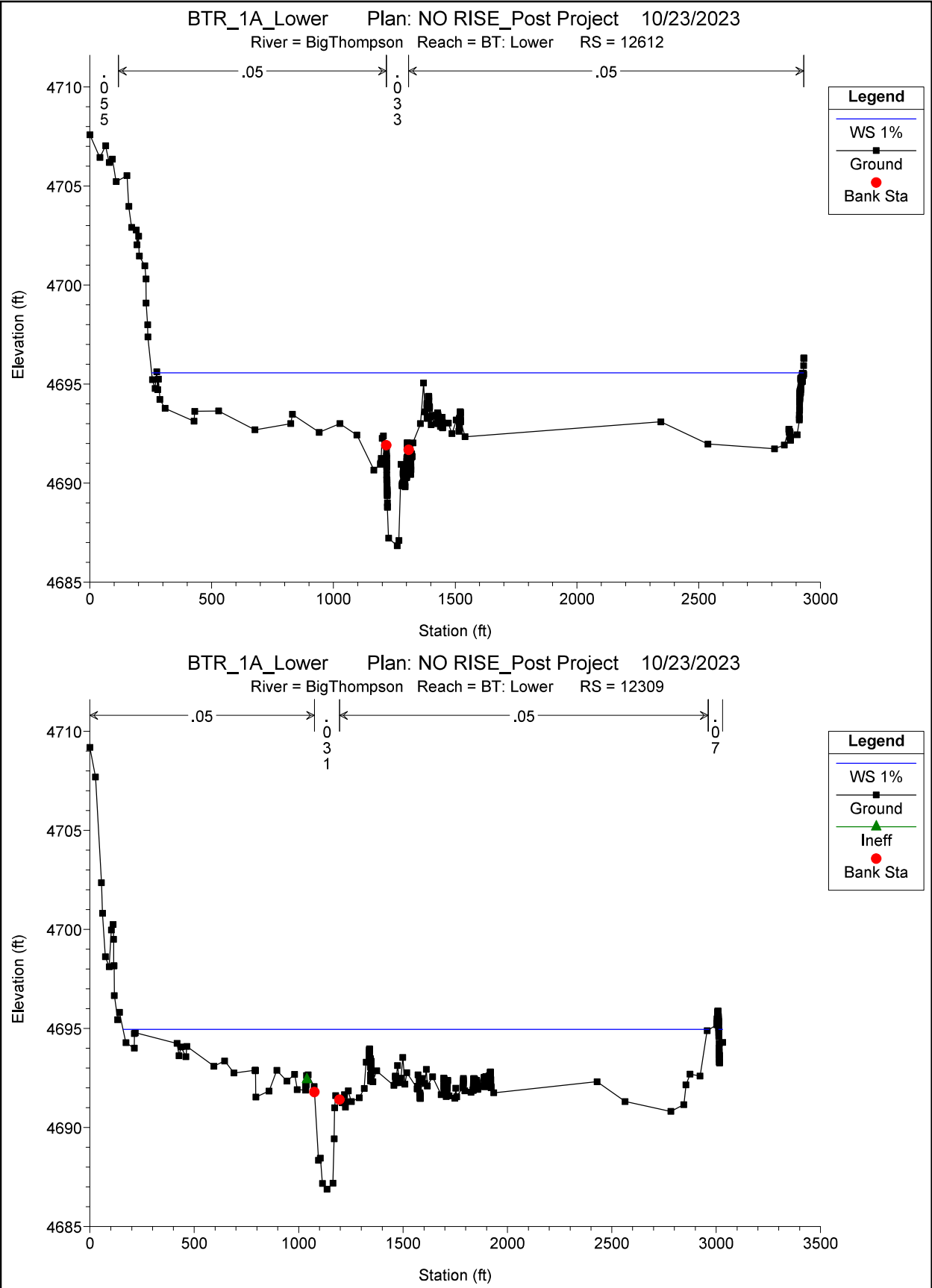
BTR_1A_Lower Plan: NO RISE_Pre Project 10/23/2023

River = BigThompson Reach = BT: Lower RS = 0









BTR_1A_Lower

Plan: NO RISE_Post Project

10/23/2023

River = BigThompson

Reach = BT: Lower

RS = 12309

0.31

0.07

0.05

0.05

Legend

WS 1%

Ground

Ineff

Bank Sta

Elevation (ft)

4710

4705

4700

4695

4690

4685

0

500

1000

1500

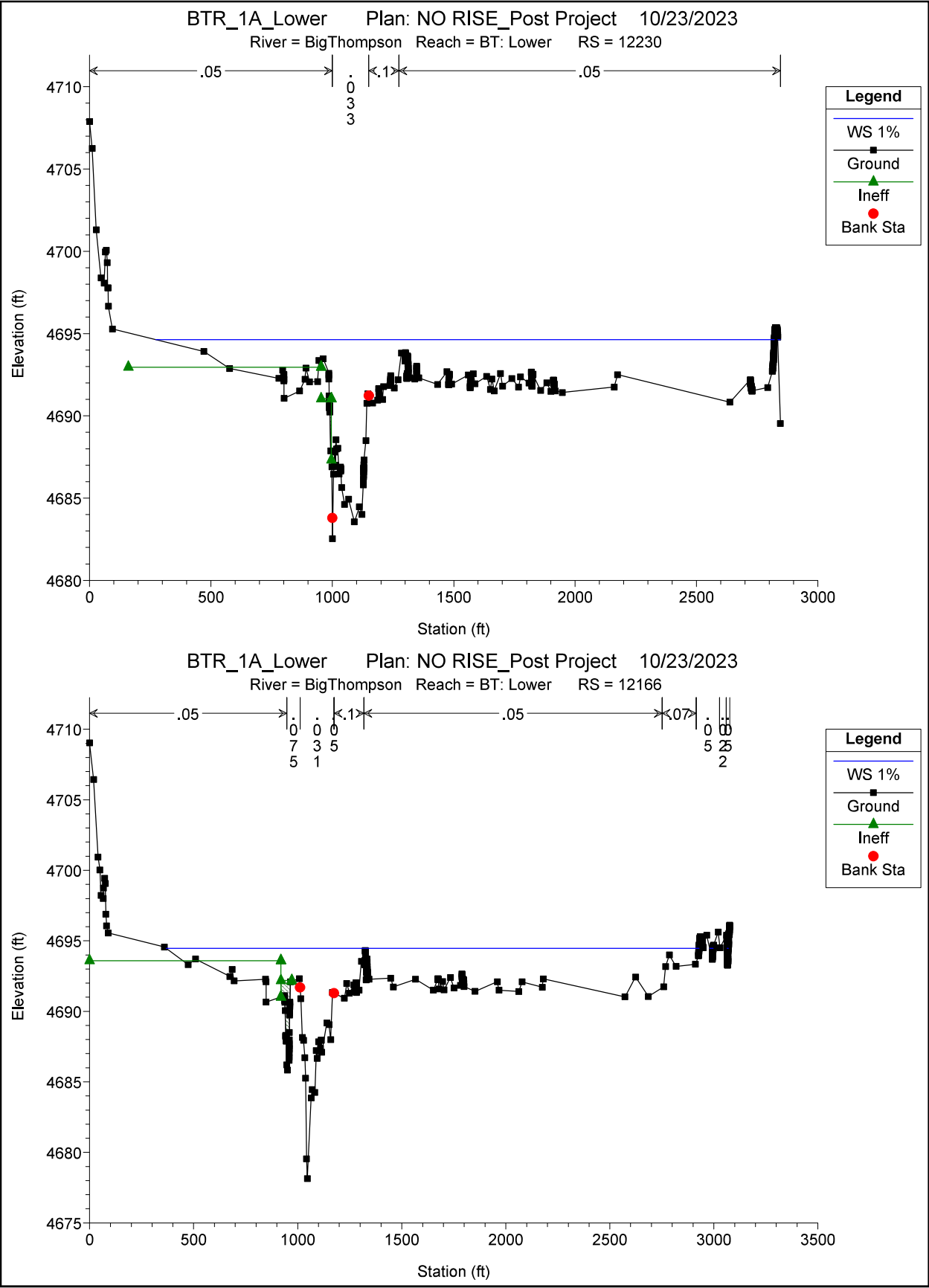
2000

2500

3000

3500

Station (ft)



BTR_1A_Lower

Plan: NO RISE_Post Project

10/23/2023

River = BigThompson

Reach = BT: Lower

RS = 12166

0.05

0.1

0.05

0.07

0.00

0.00

0.00

7

3

5

5

2

5

2

0

1

Elevation (ft)

4710

4705

4700

4695

4690

4685

4680

4675

0

500

1000

1500

2000

2500

3000

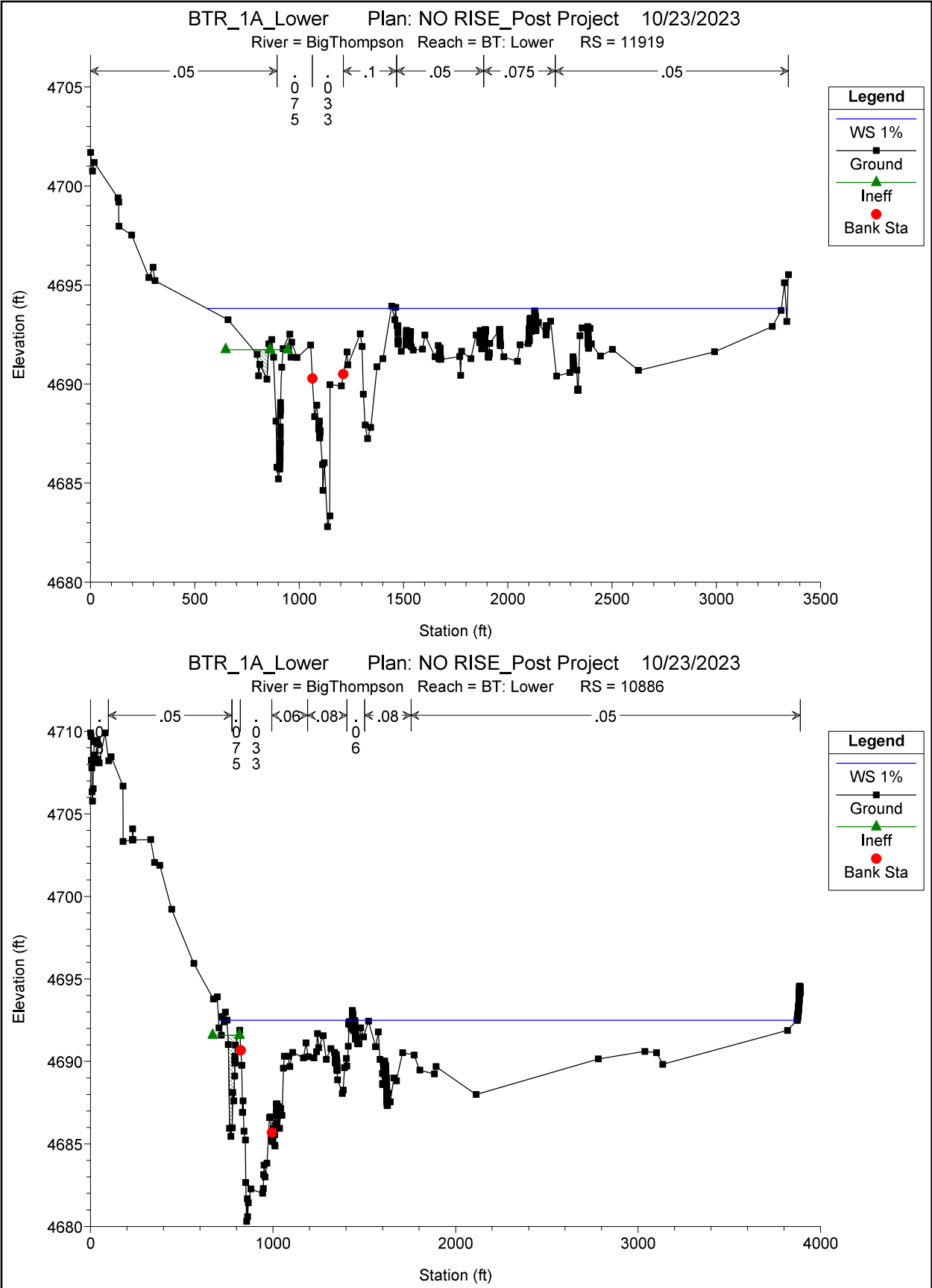
3500

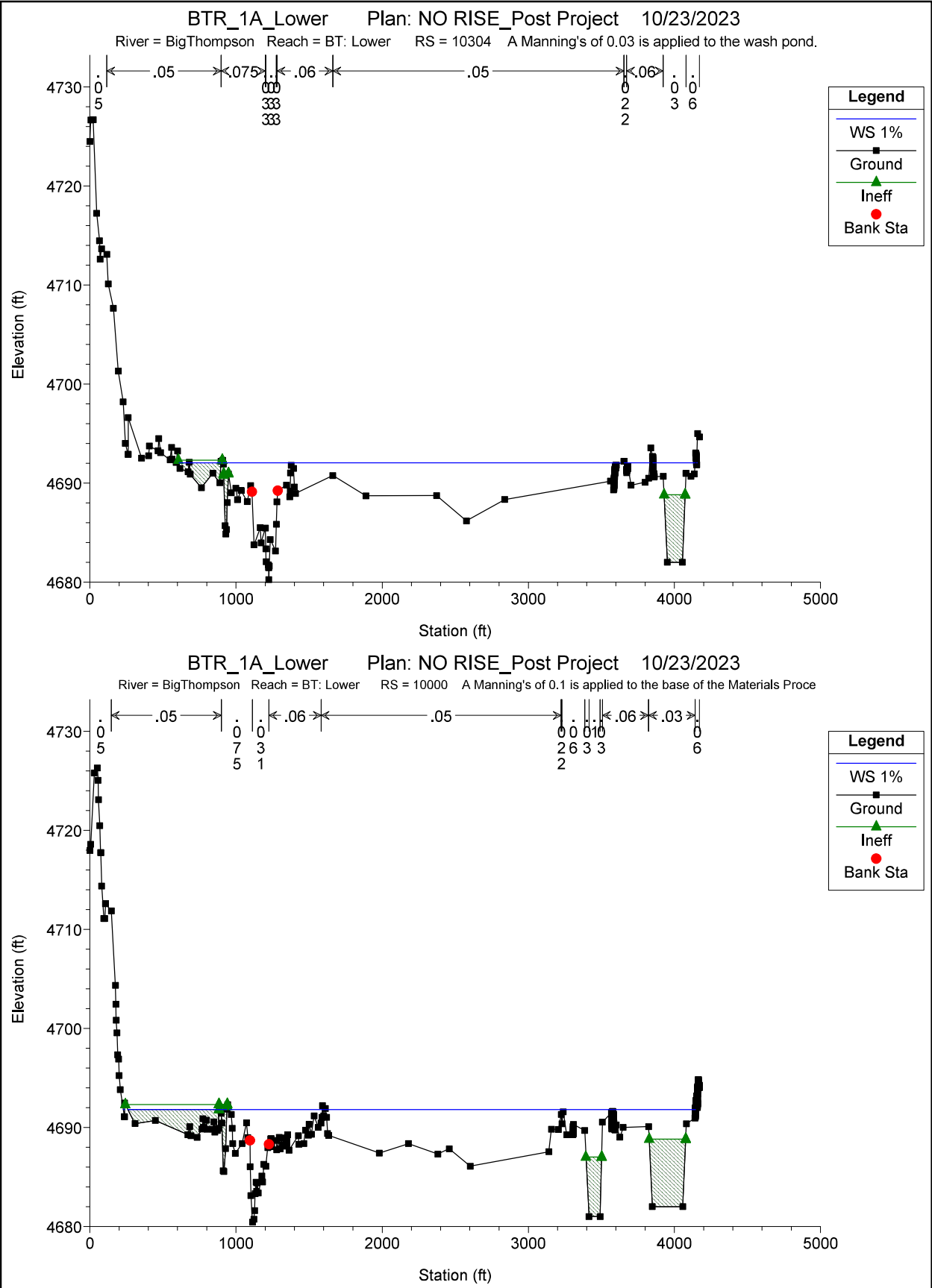
WS 1%

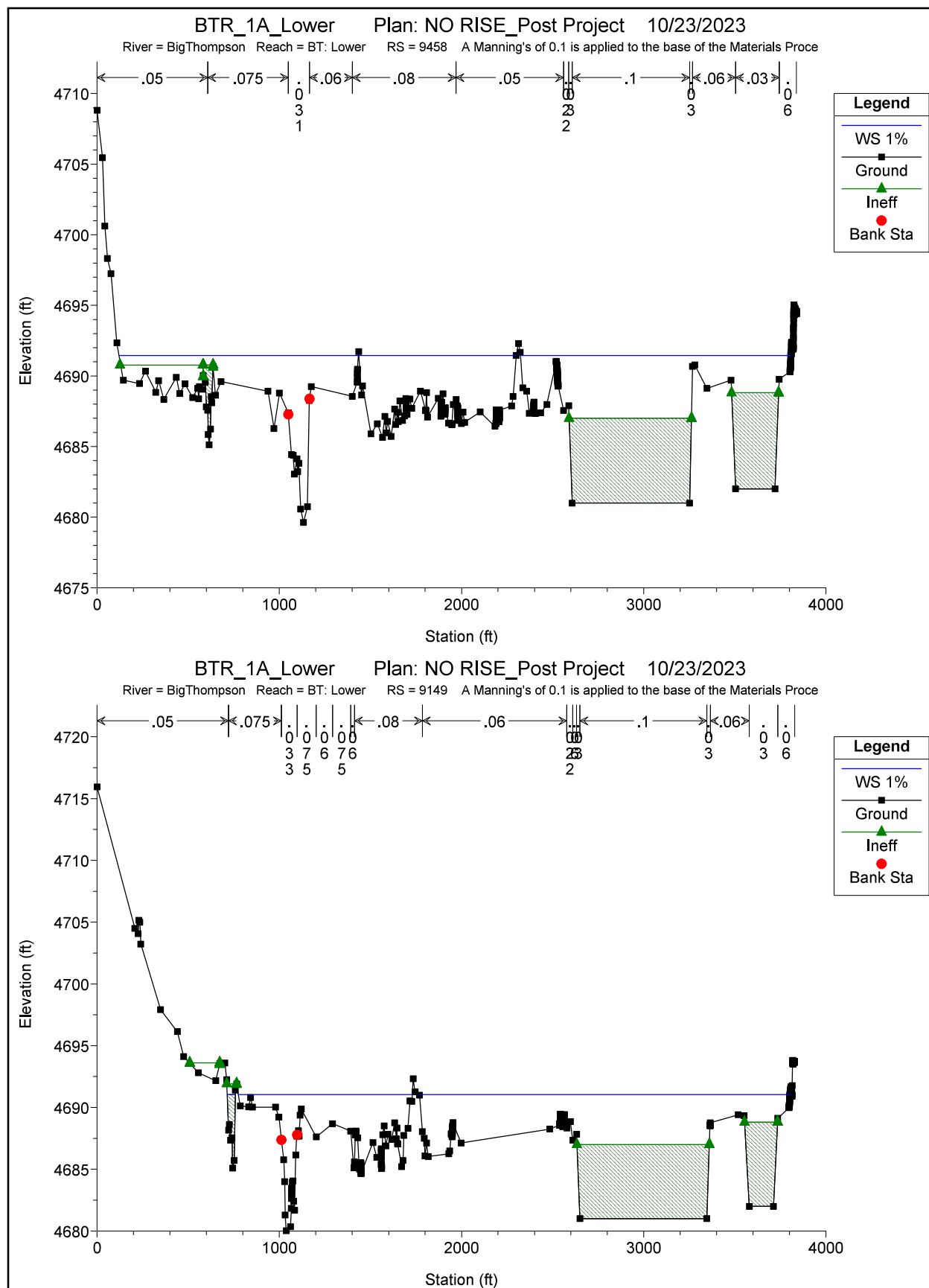
Ground

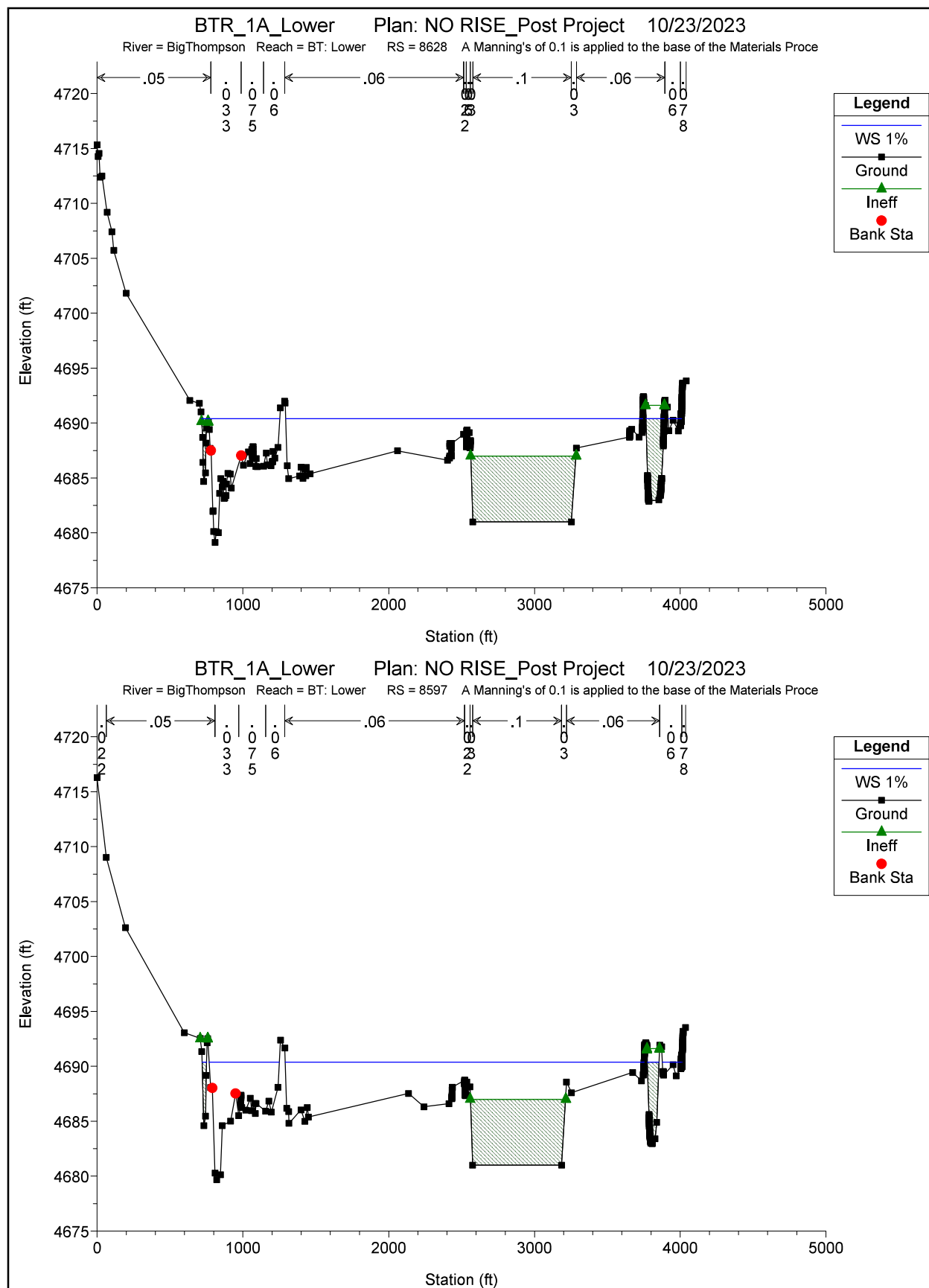
Ineff

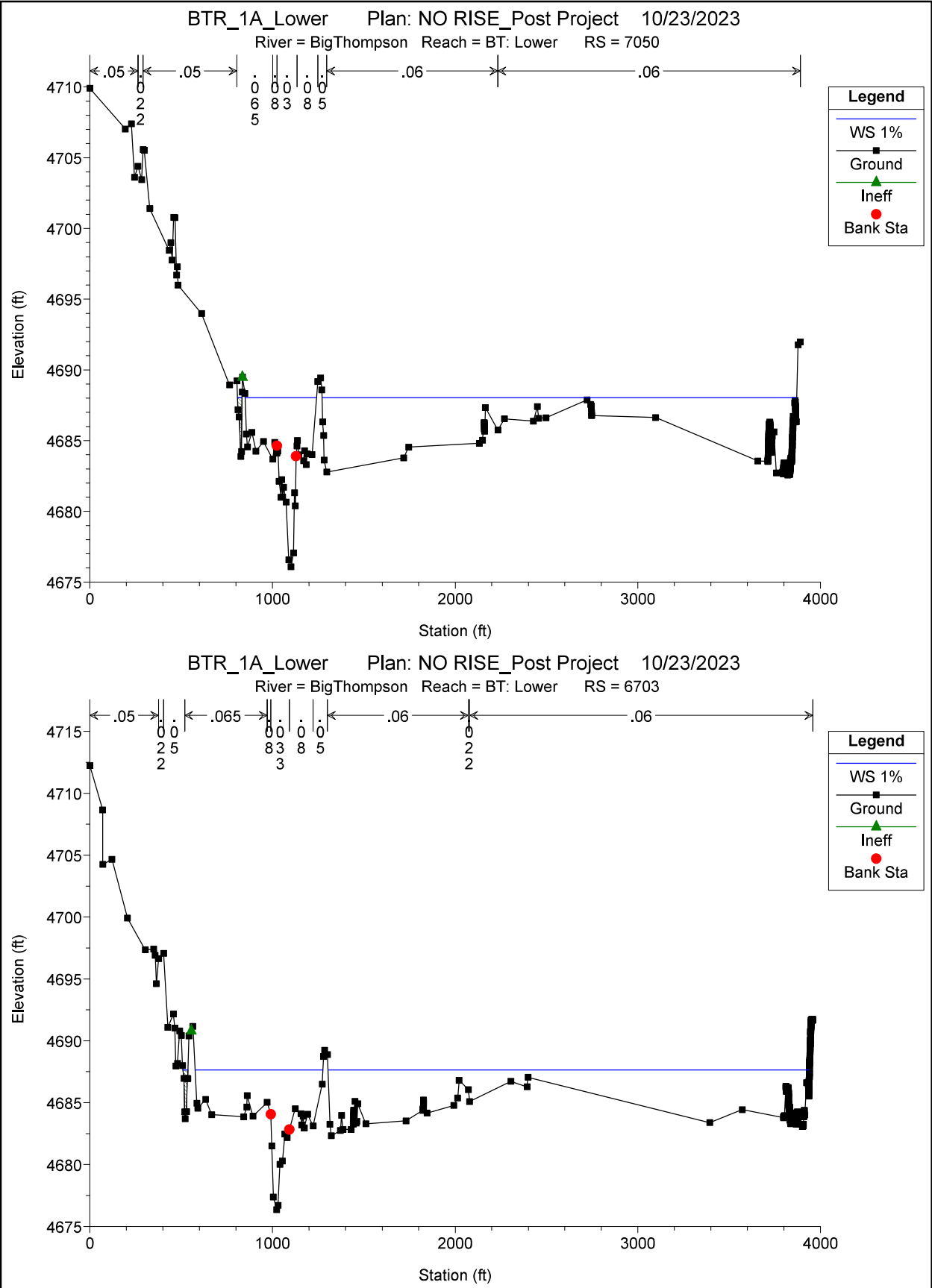
Bank Sta

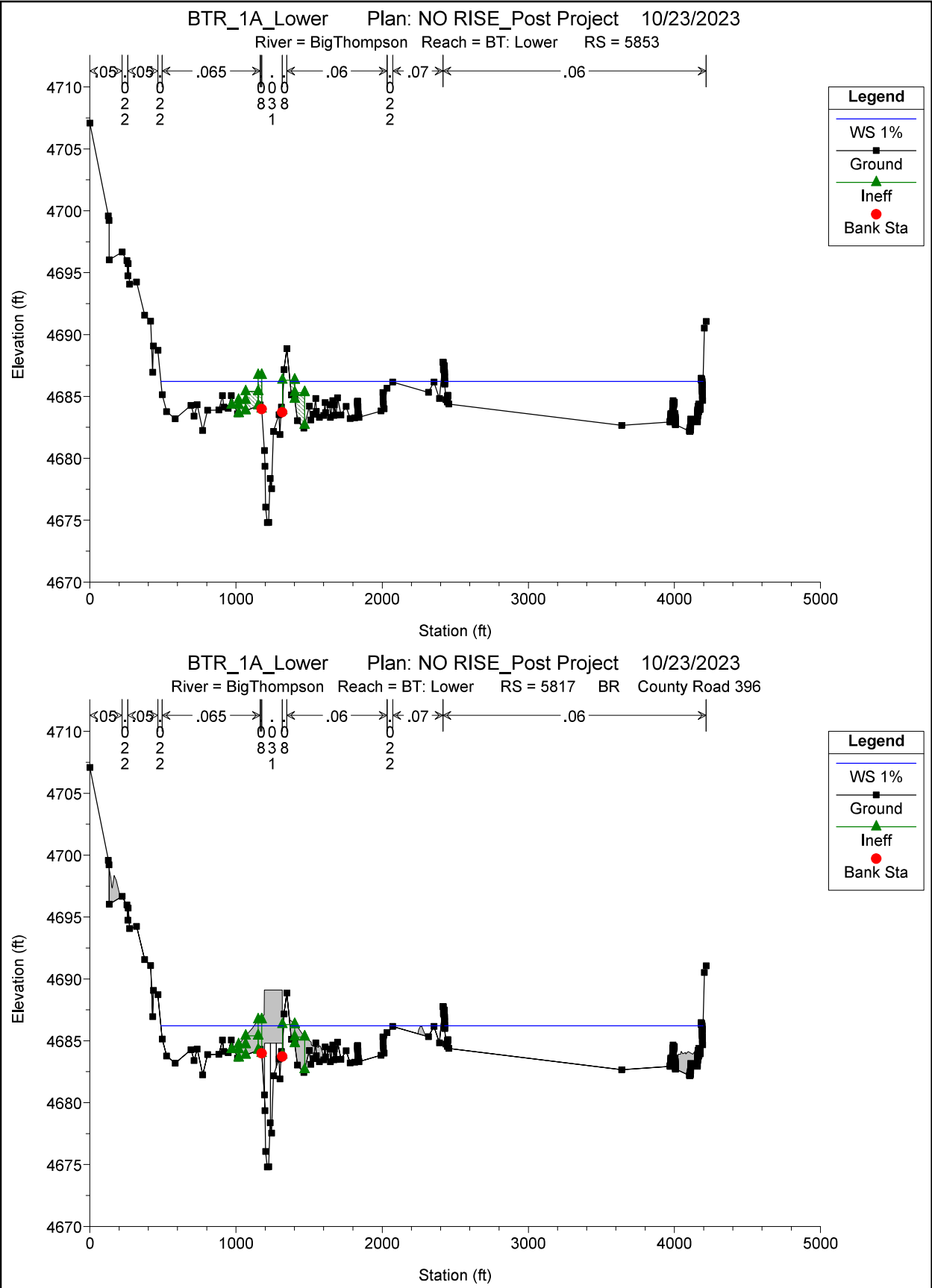


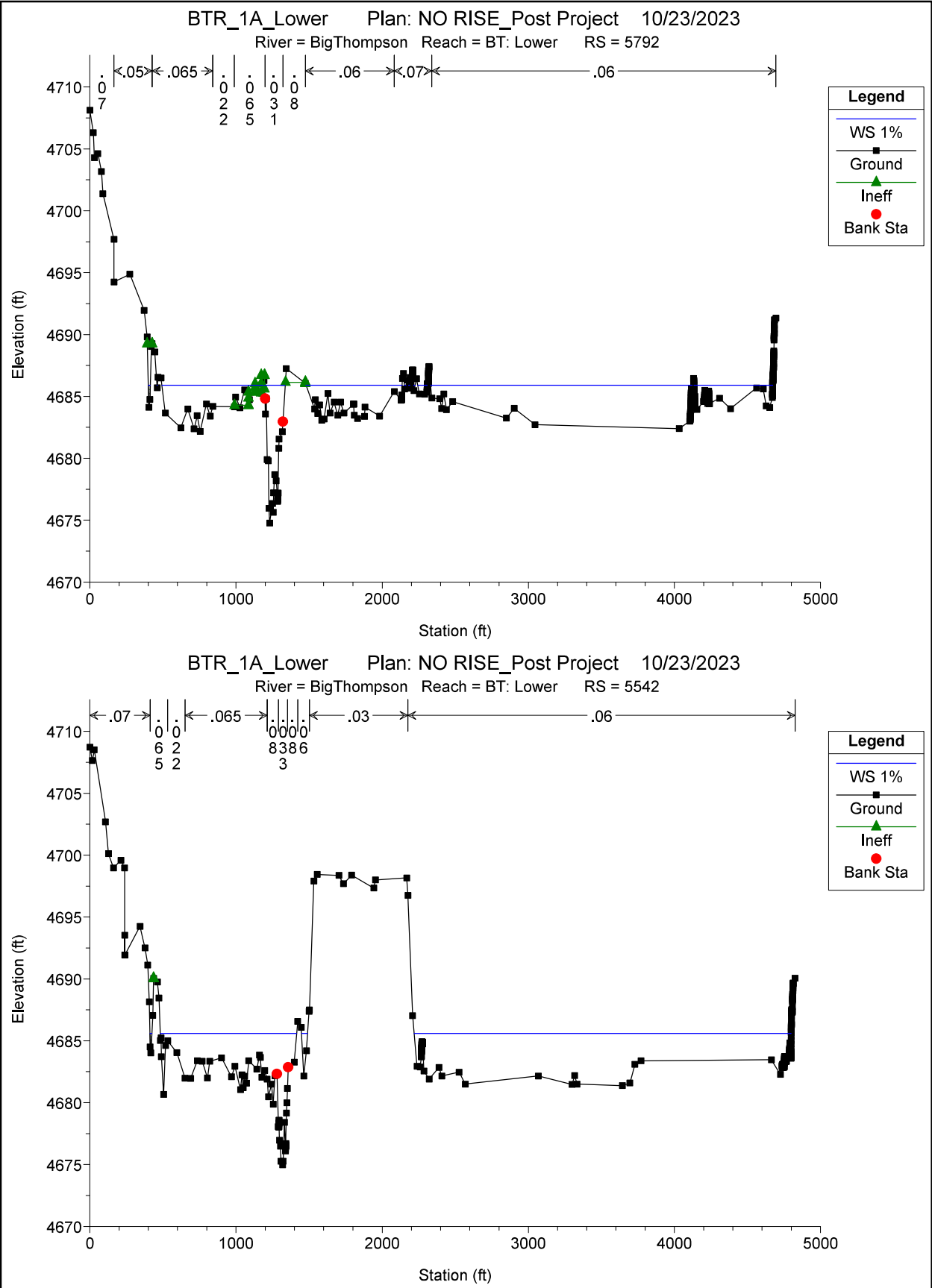












BTR_1A_Lower

Plan: NO RISE_Post Project

10/23/2023

River = BigThompson

Reach = BT: Lower

RS = 5542

0.070.00.00.0650.0000.030.06

625283863

Elevation (ft)

4710

4705

4700

4695

4690

4685

4680

4675

4670

Station (ft)

0

1000

2000

3000

4000

5000

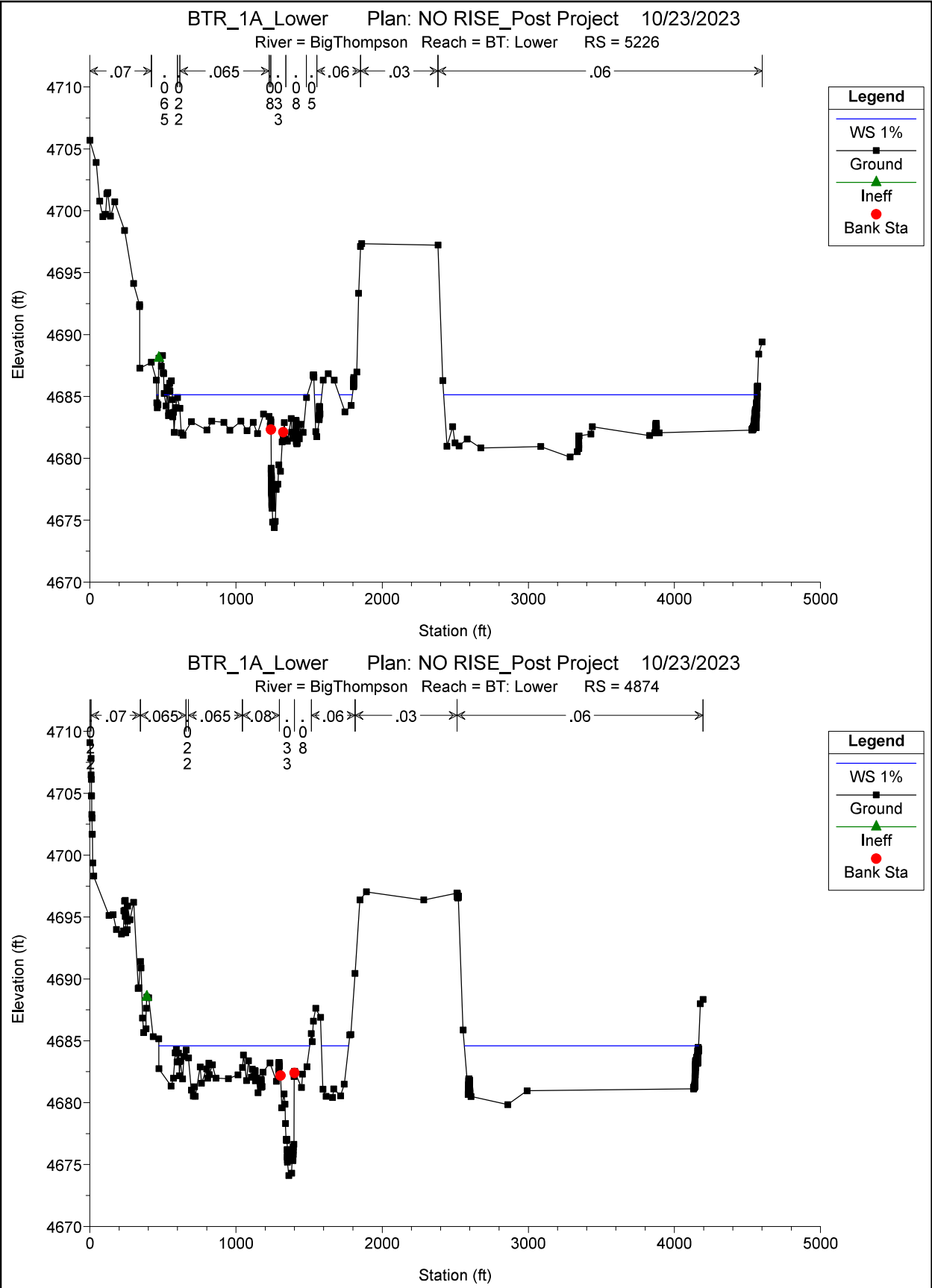
Legend

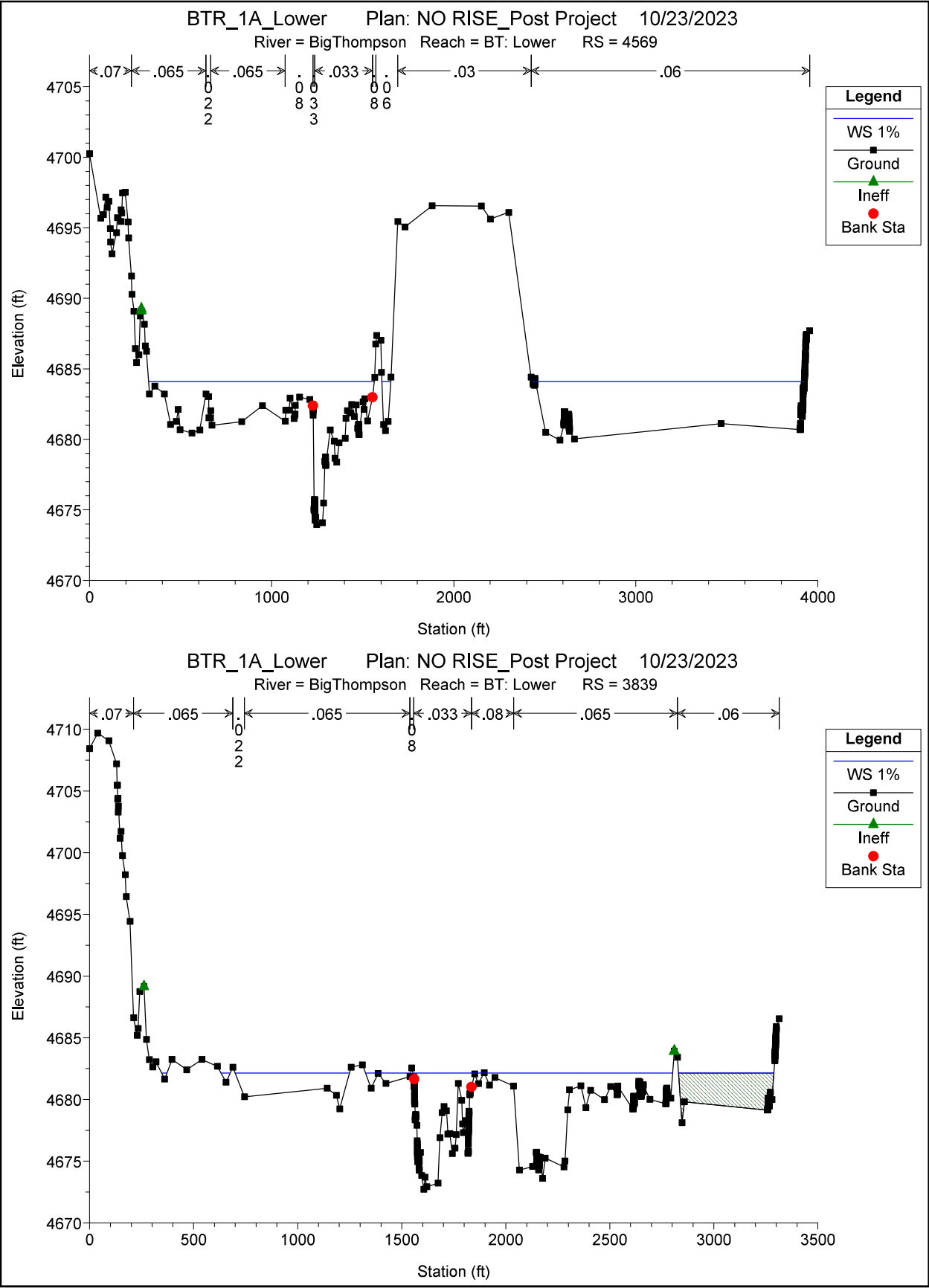
WS 1%

Ground

Ineff

Bank Sta





BTR_1A_Lower

Plan: NO RISE_Post Project

10/23/2023

River = BigThompson

Reach = BT: Lower

RS = 3839

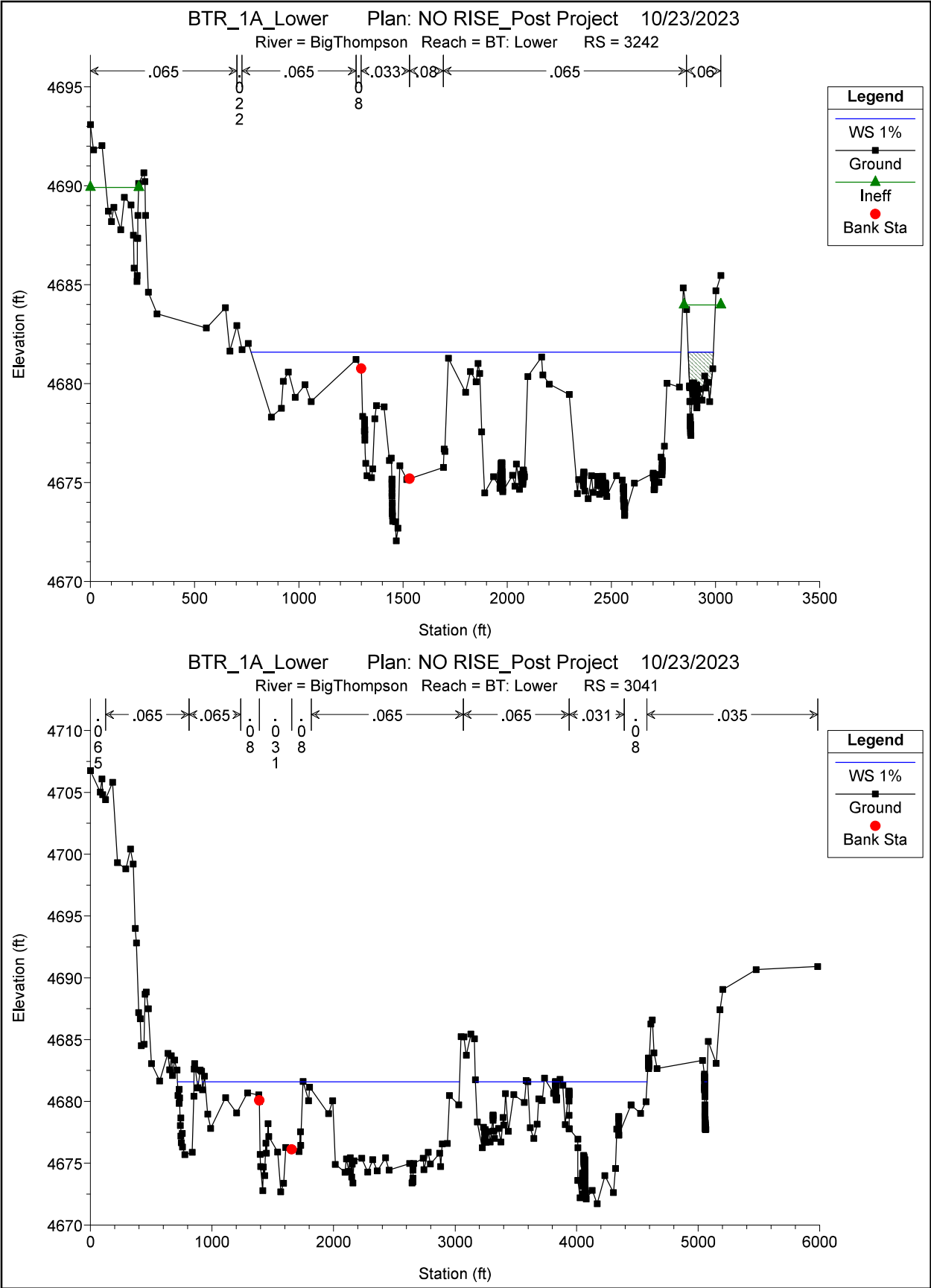
Legend

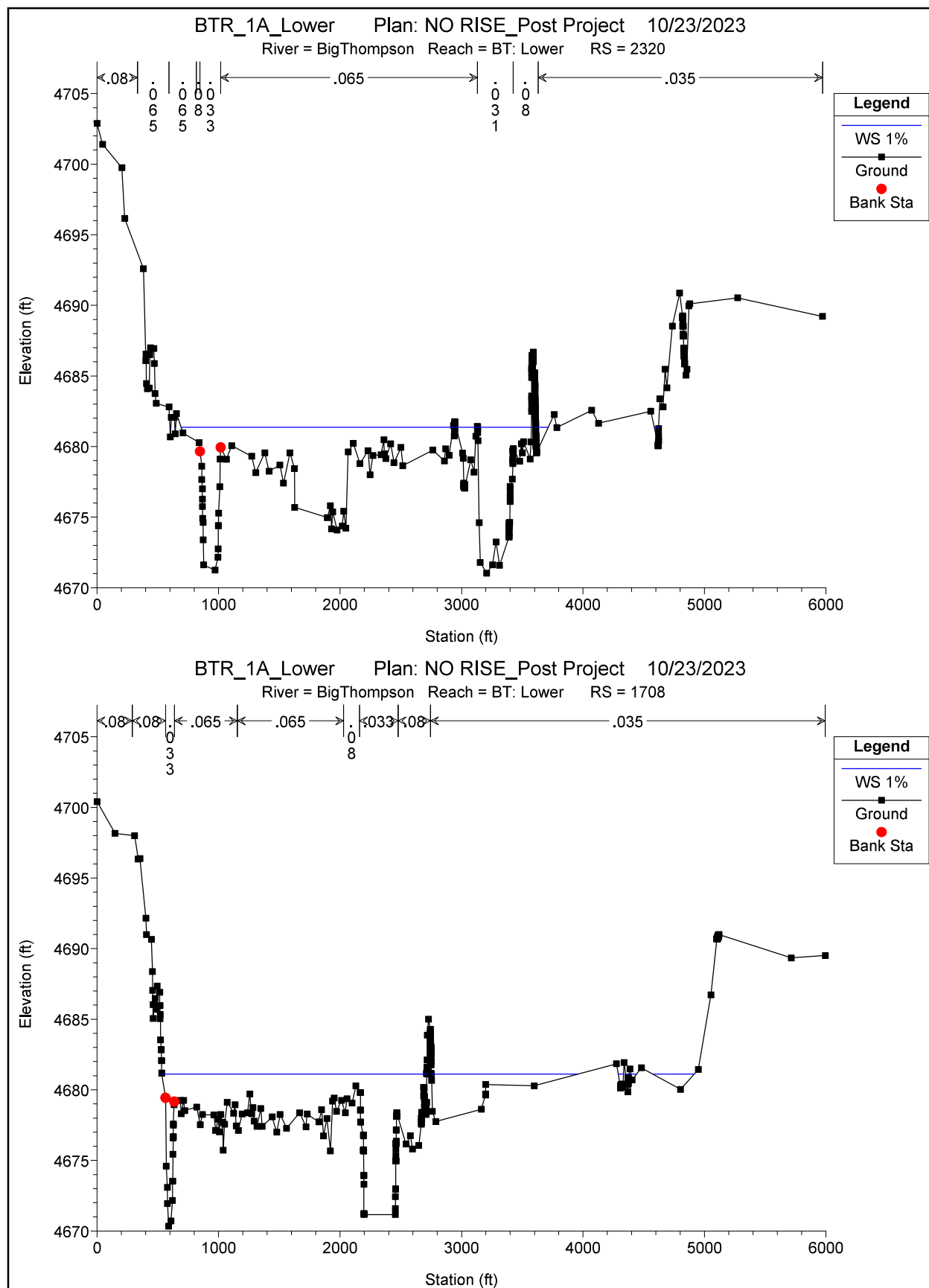
WS 1%

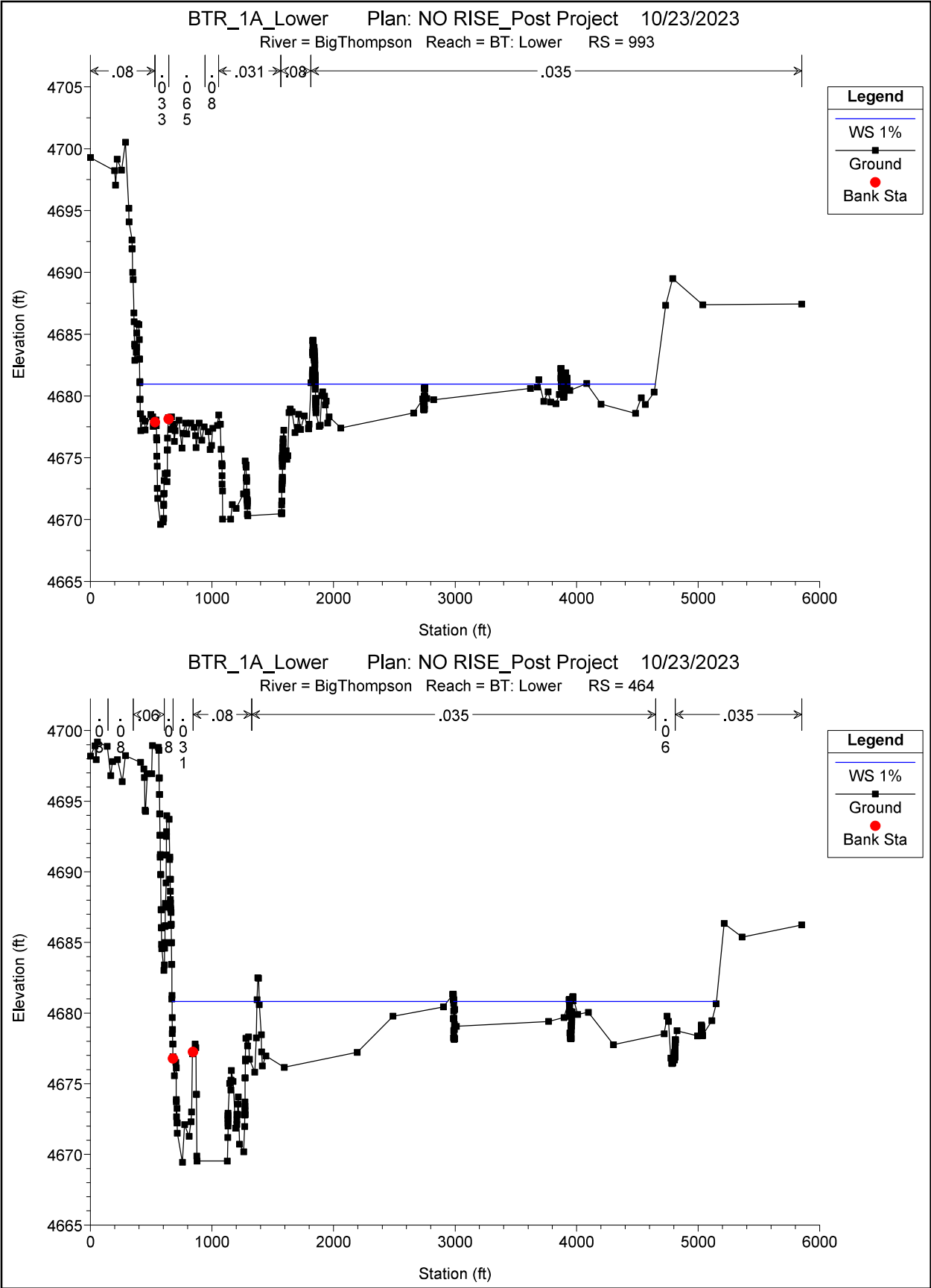
Ground

Ineff

Bank Sta

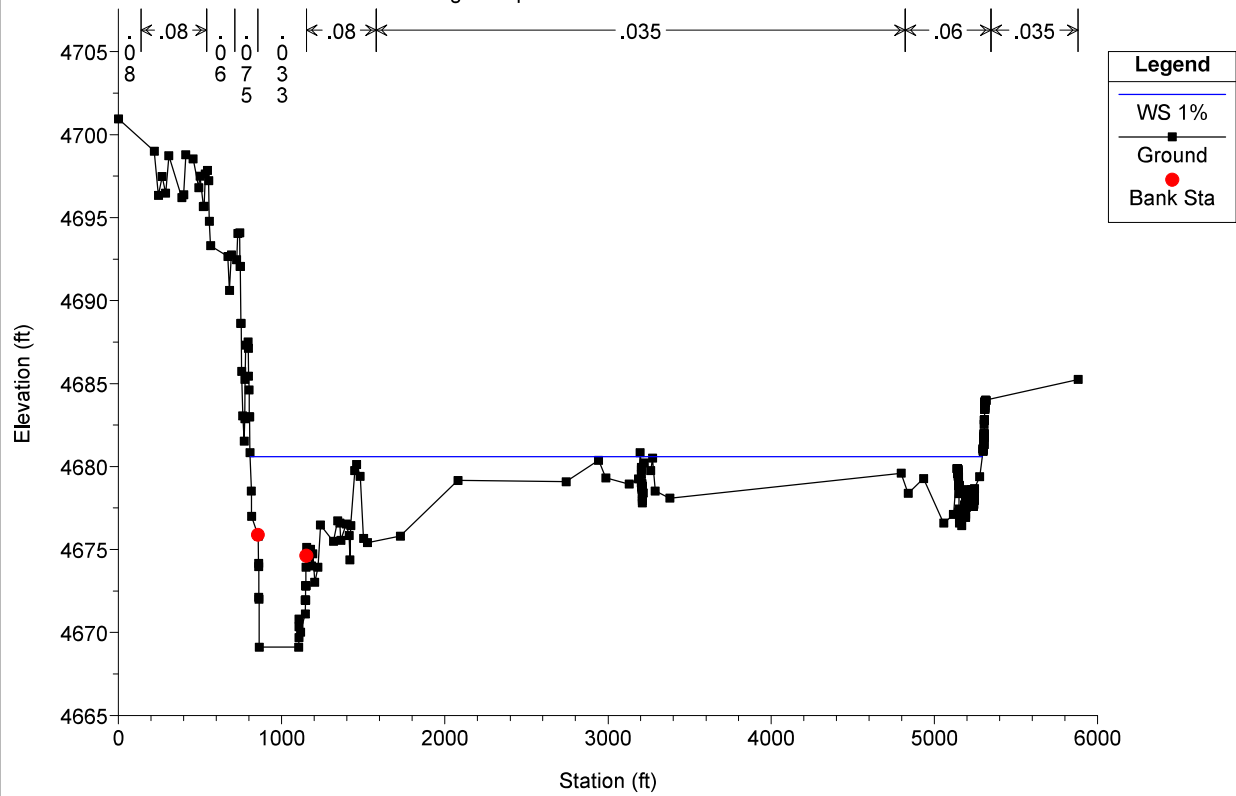


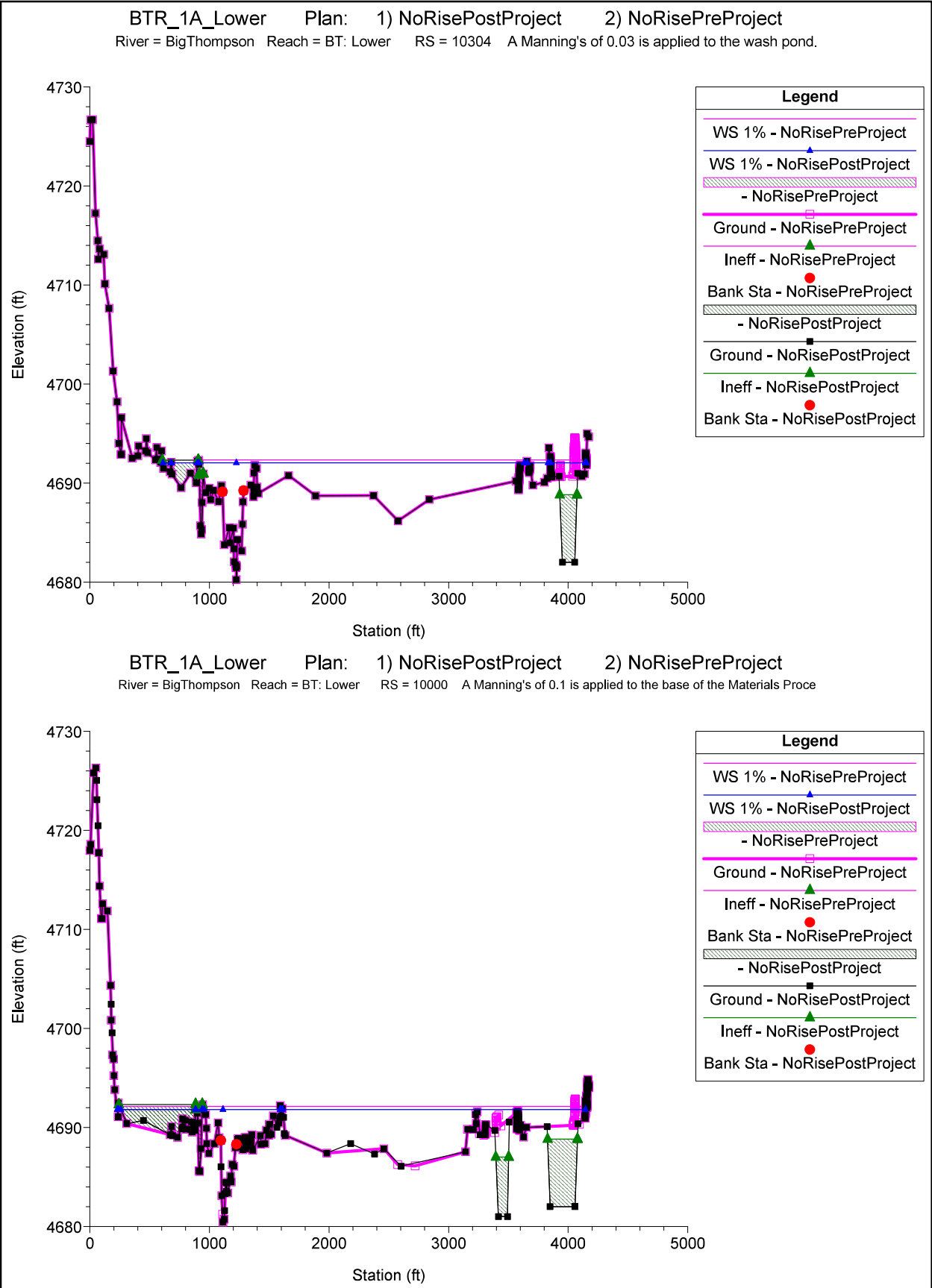


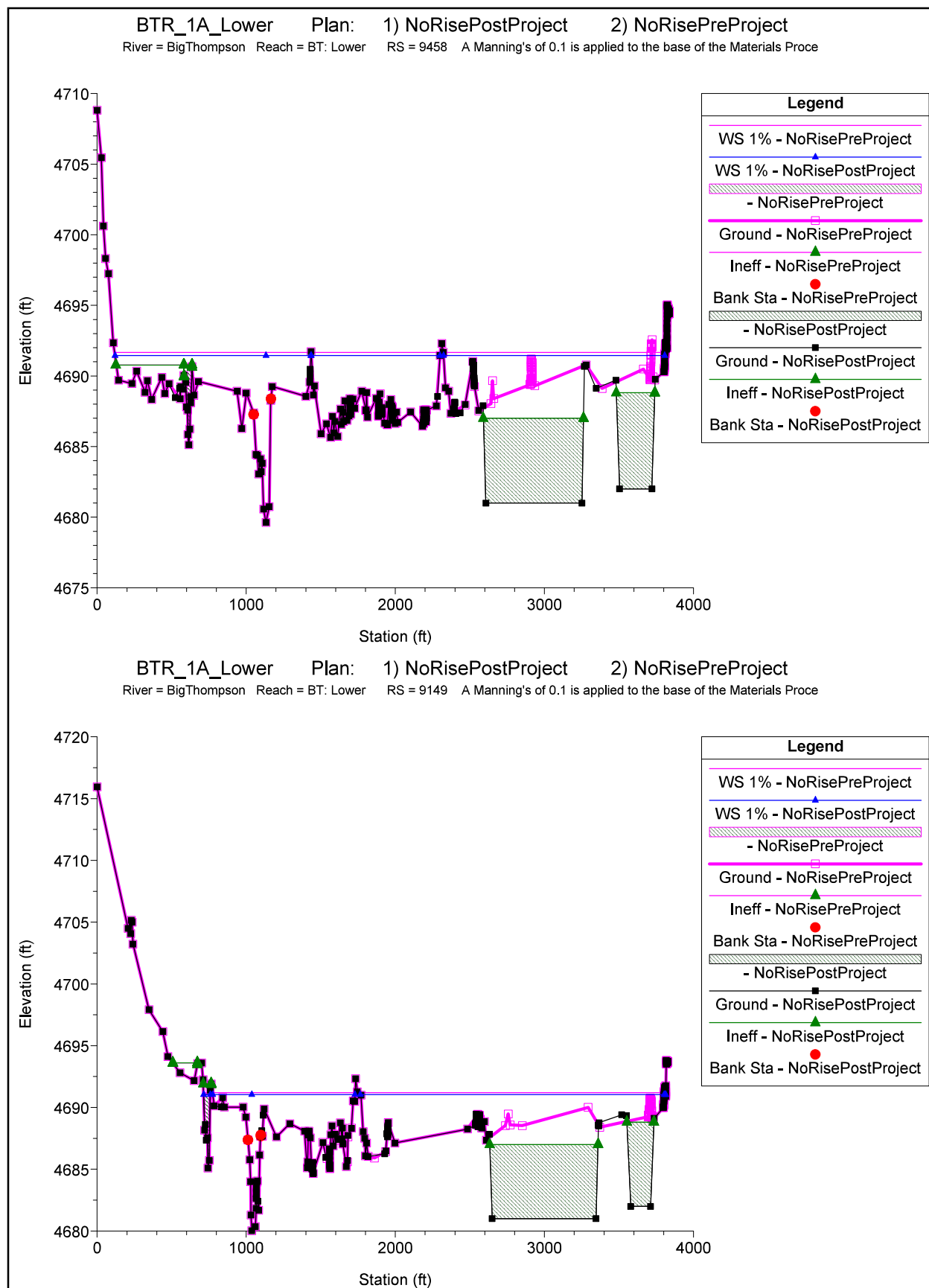


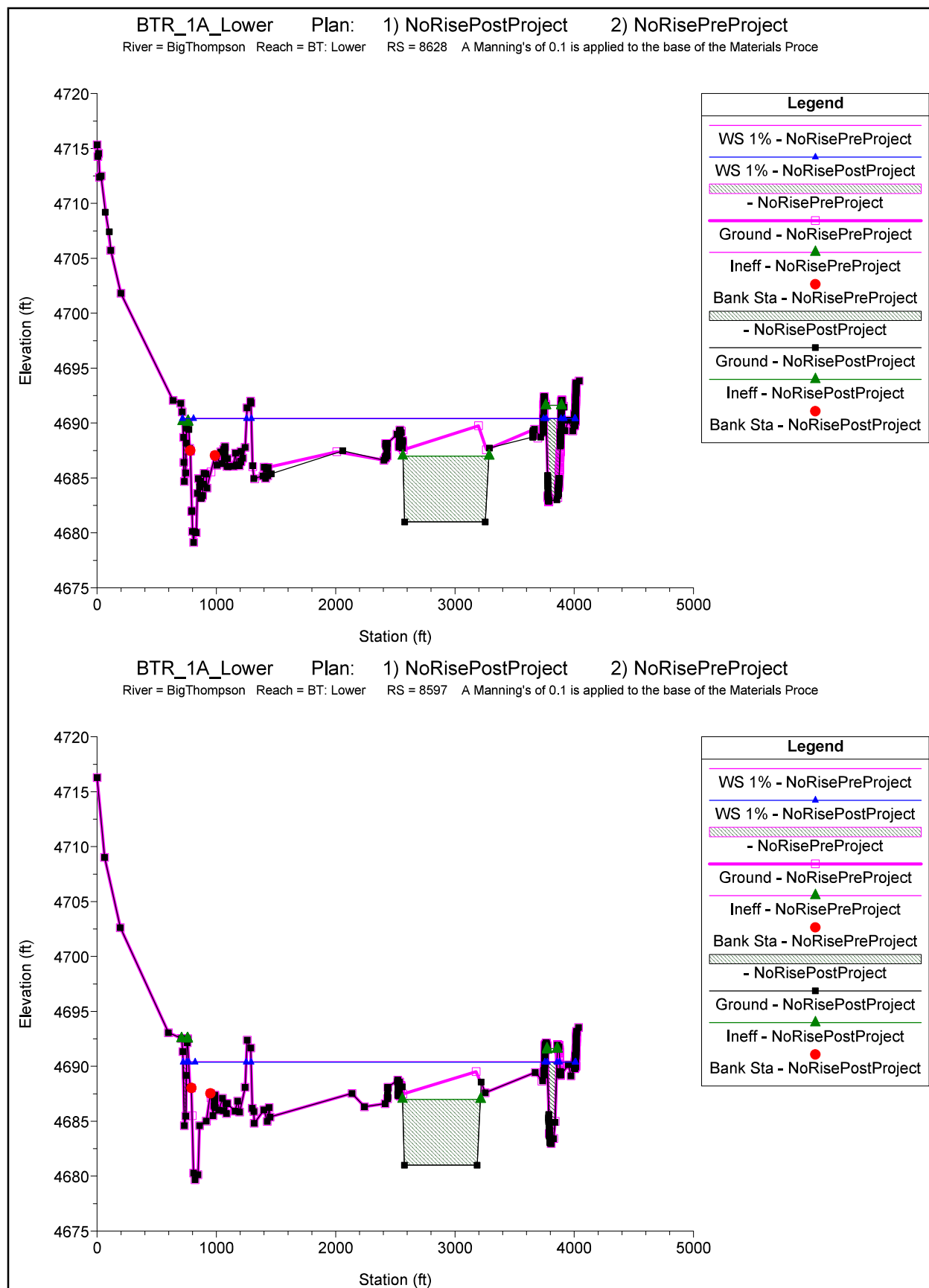
BTR_1A_Lower Plan: NO RISE_Post Project 10/23/2023

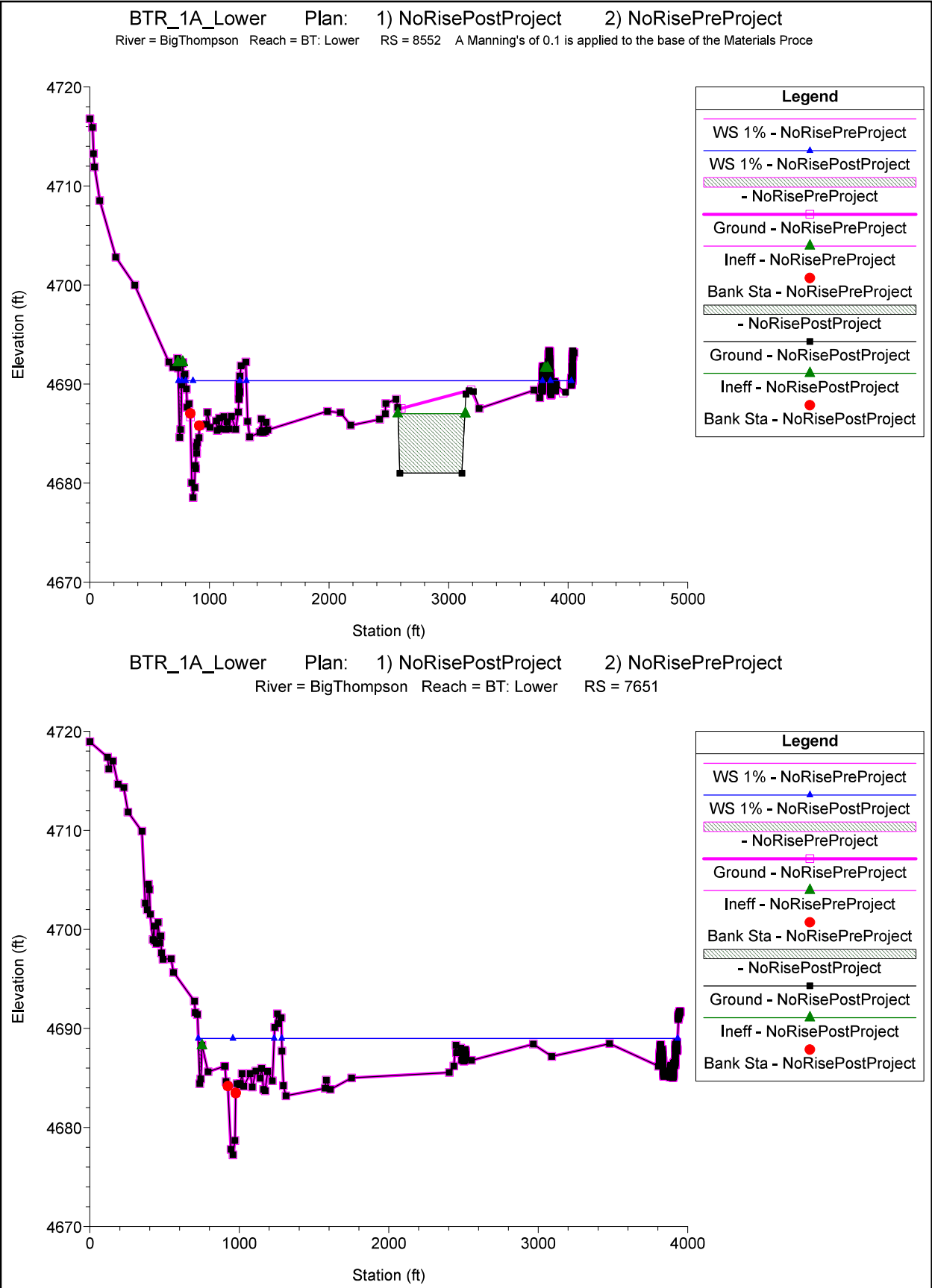
River = BigThompson Reach = BT: Lower RS = 0

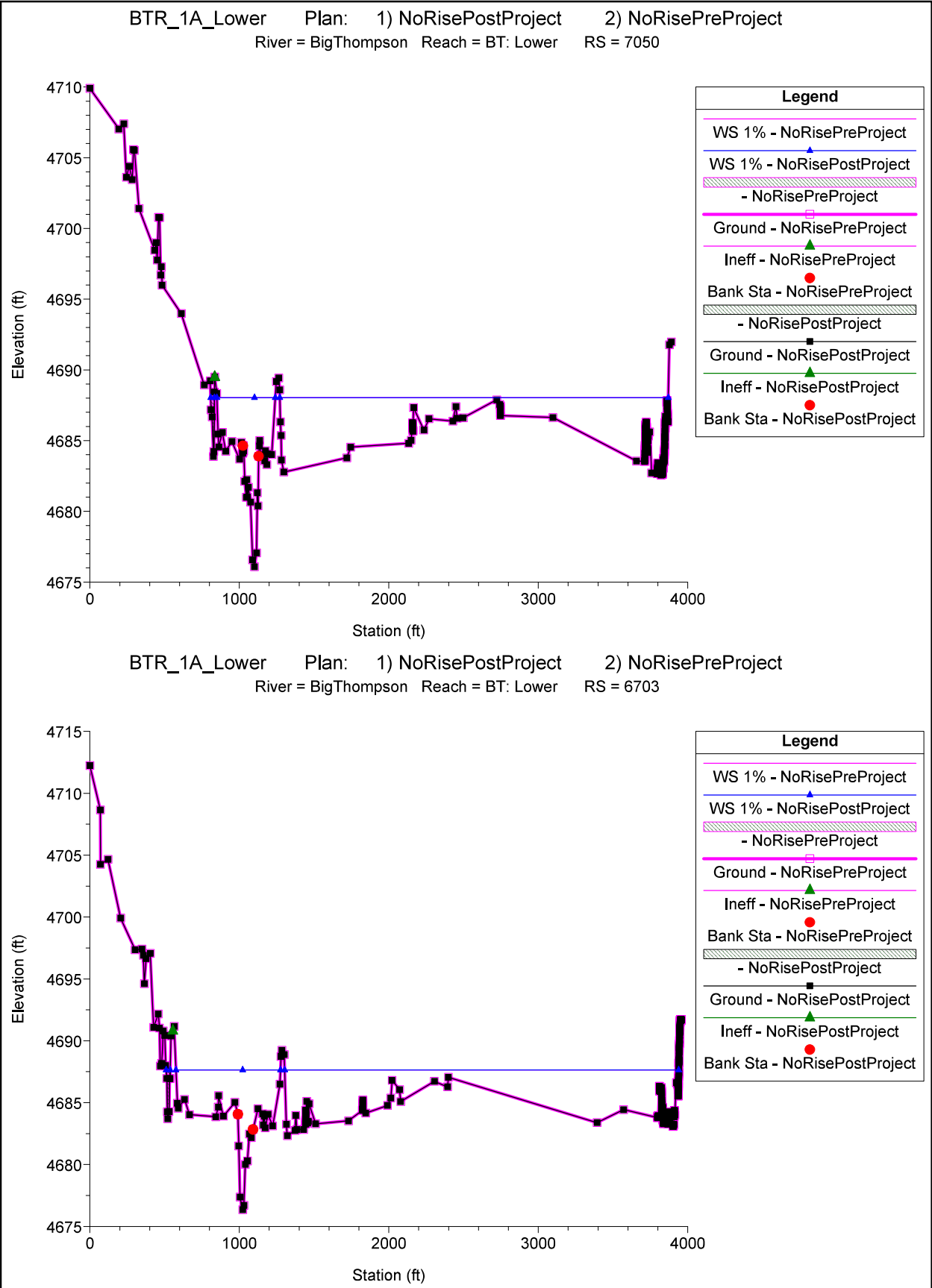




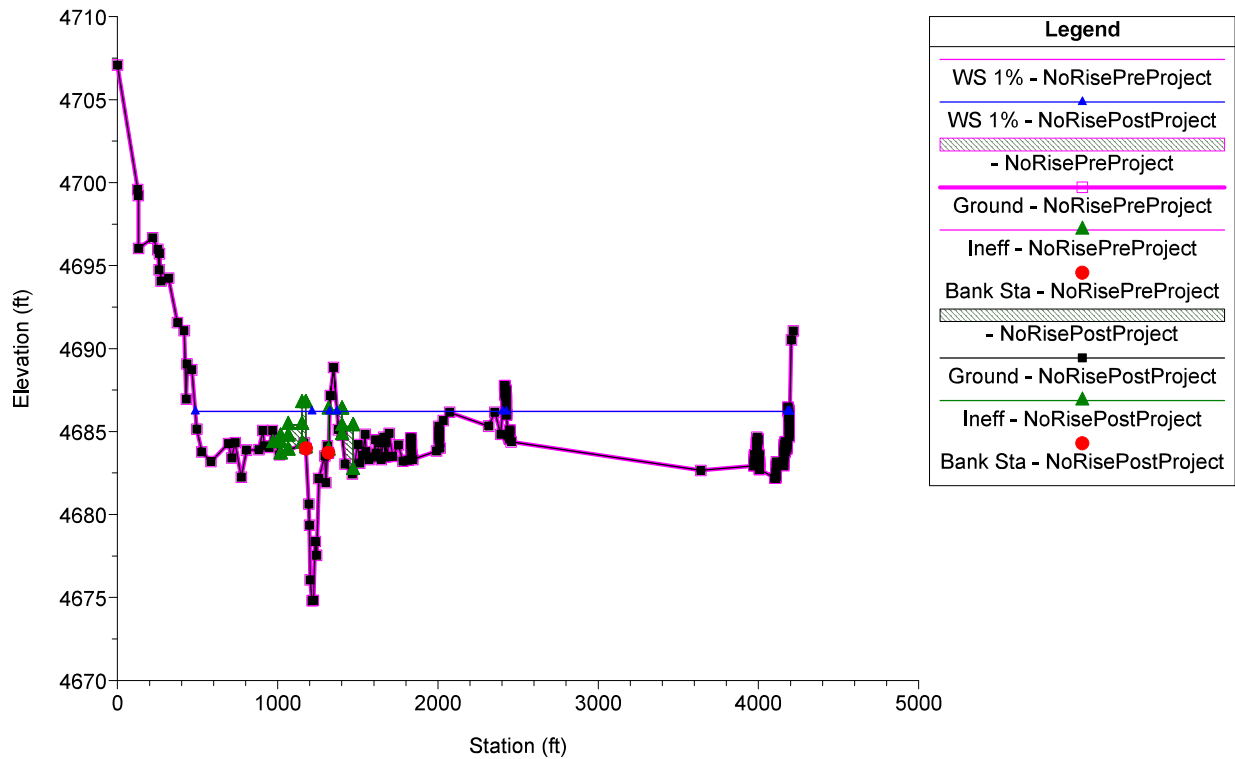




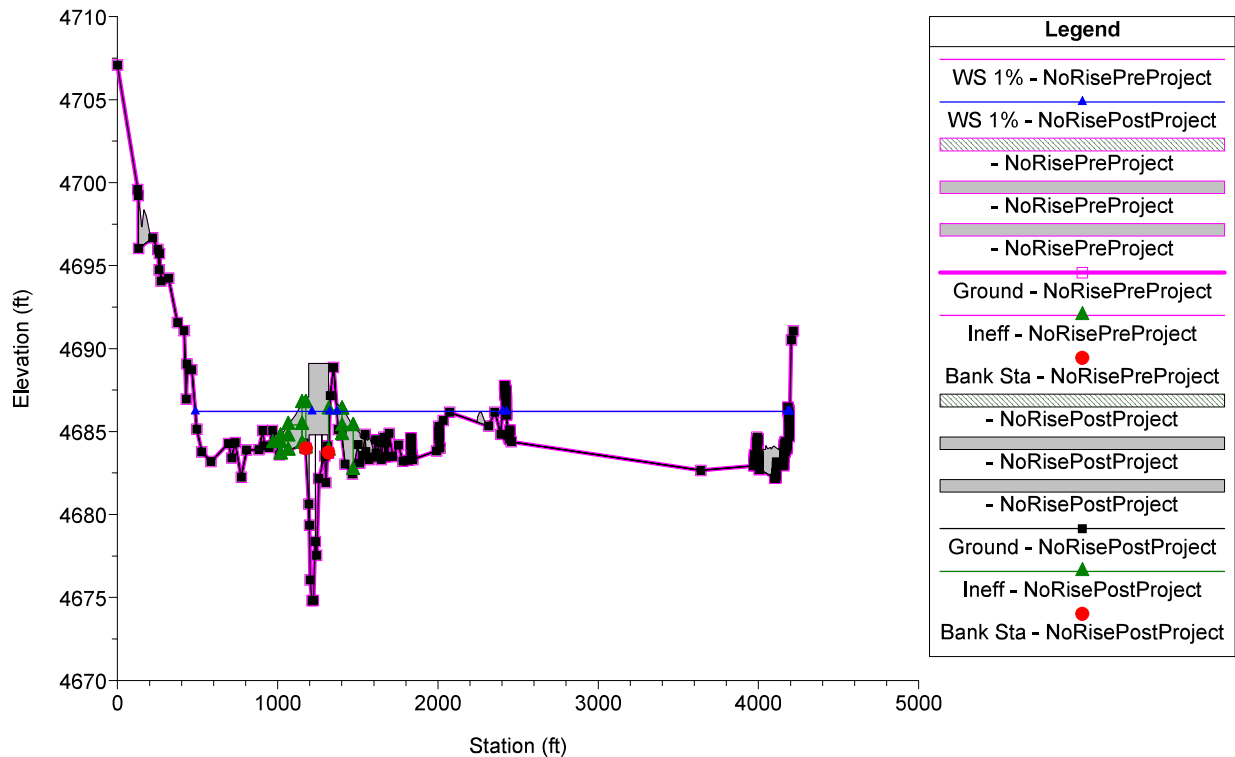




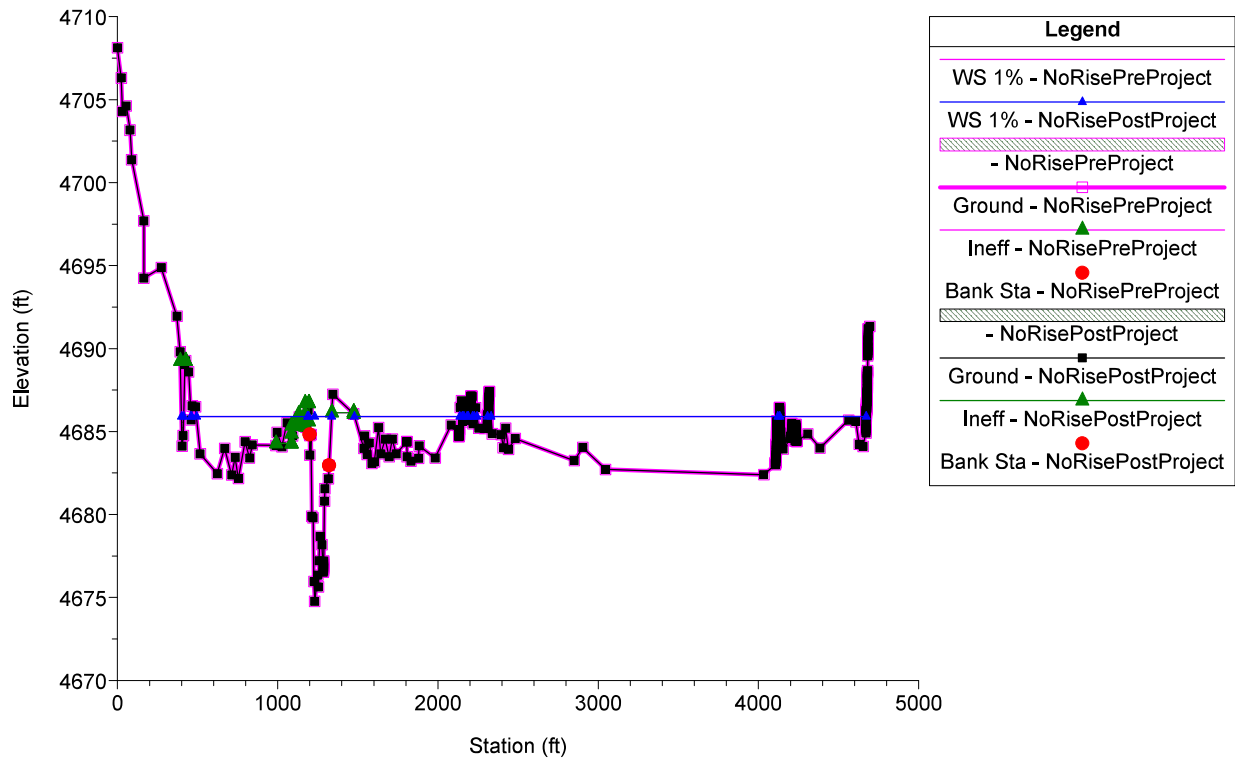
BTR_1A_Lower Plan: 1) NoRisePostProject 2) NoRisePreProject
 River = BigThompson Reach = BT: Lower RS = 5853



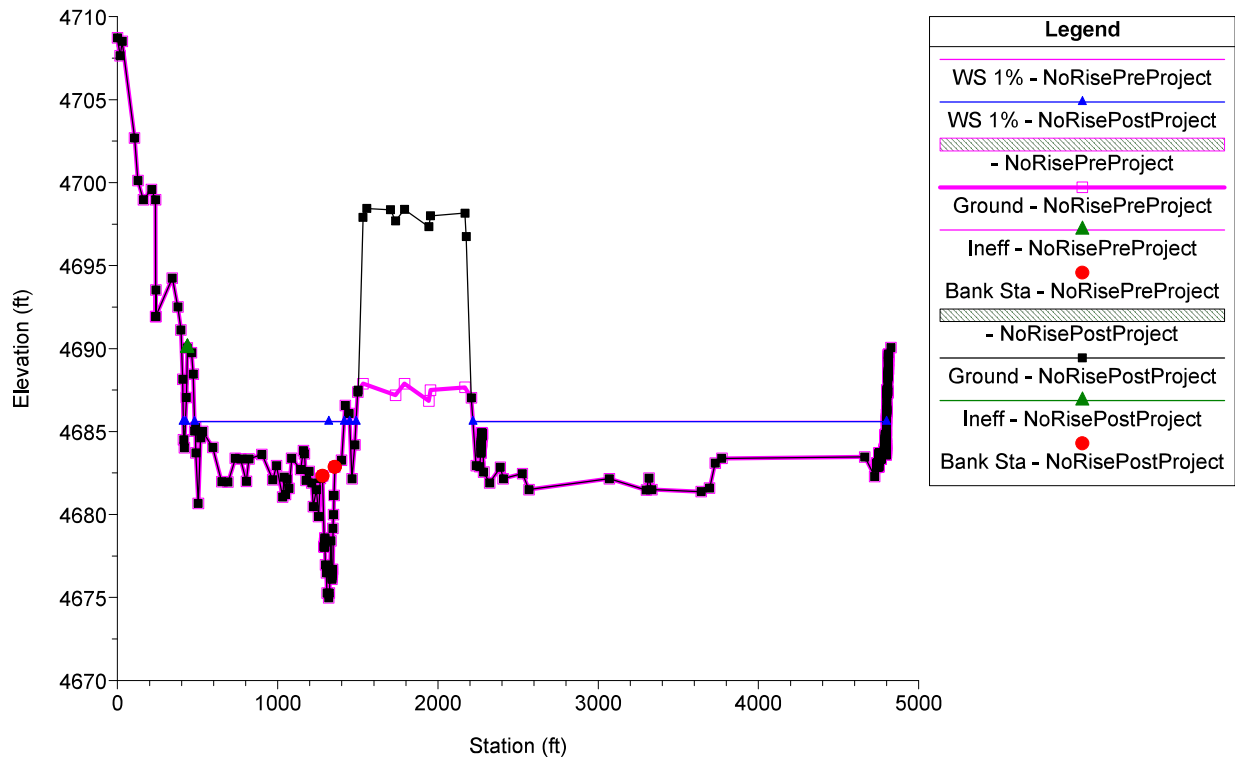
BTR_1A_Lower Plan: 1) NoRisePostProject 2) NoRisePreProject
 River = BigThompson Reach = BT: Lower RS = 5817 BR County Road 396



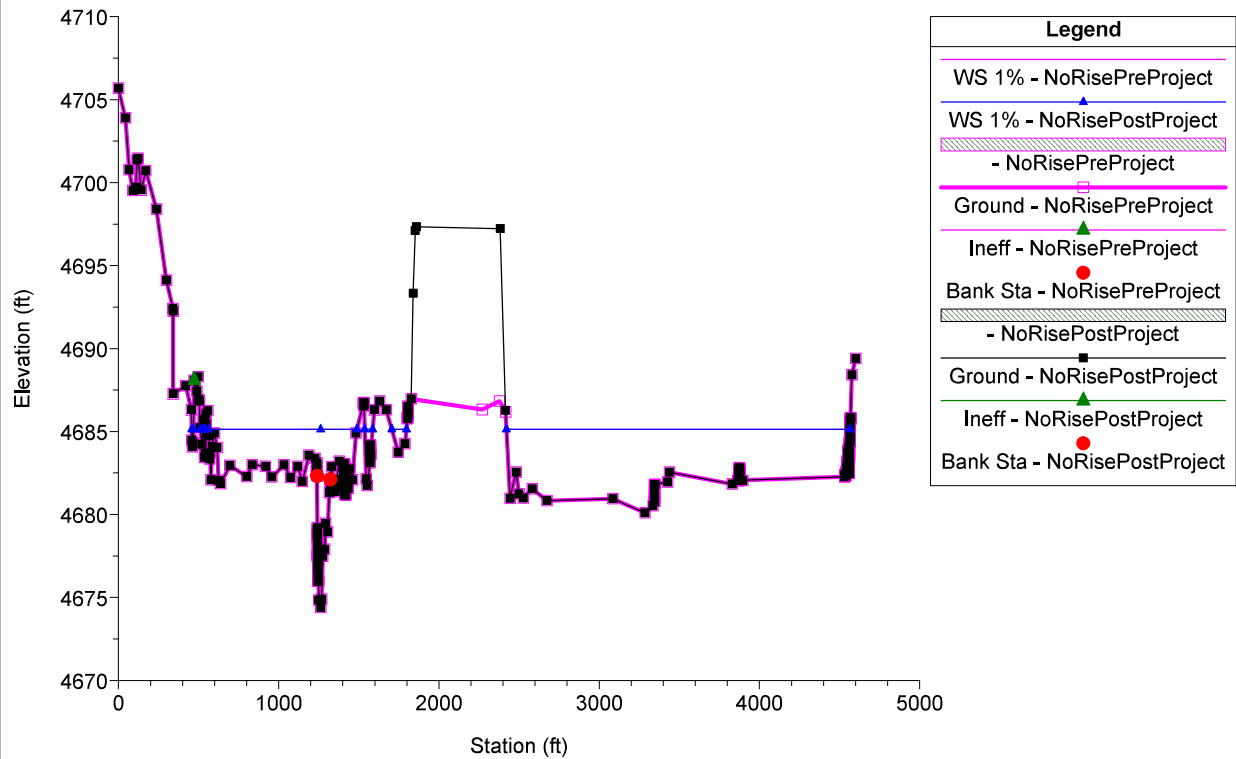
BTR_1A_Lower Plan: 1) NoRisePostProject 2) NoRisePreProject
 River = BigThompson Reach = BT: Lower RS = 5792



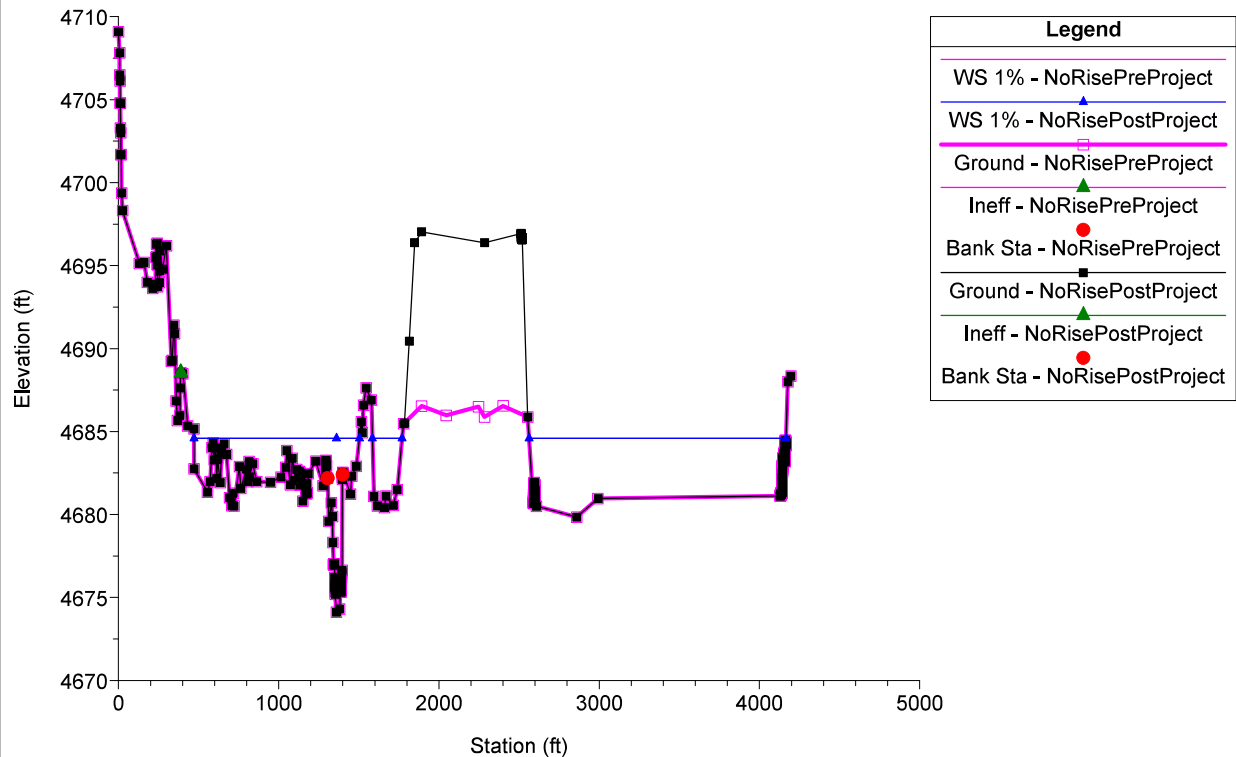
BTR_1A_Lower Plan: 1) NoRisePostProject 2) NoRisePreProject
 River = BigThompson Reach = BT: Lower RS = 5542



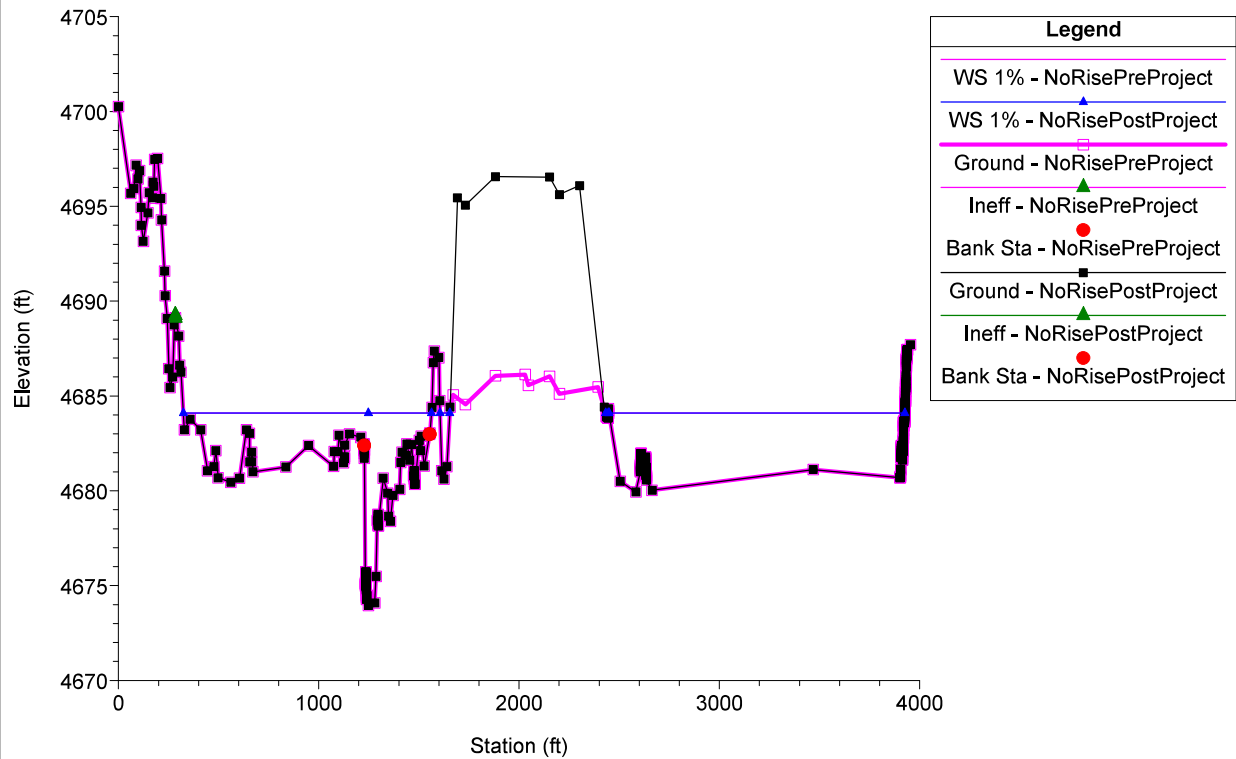
BTR_1A_Lower Plan: 1) NoRisePostProject 2) NoRisePreProject
River = BigThompson Reach = BT: Lower RS = 5226



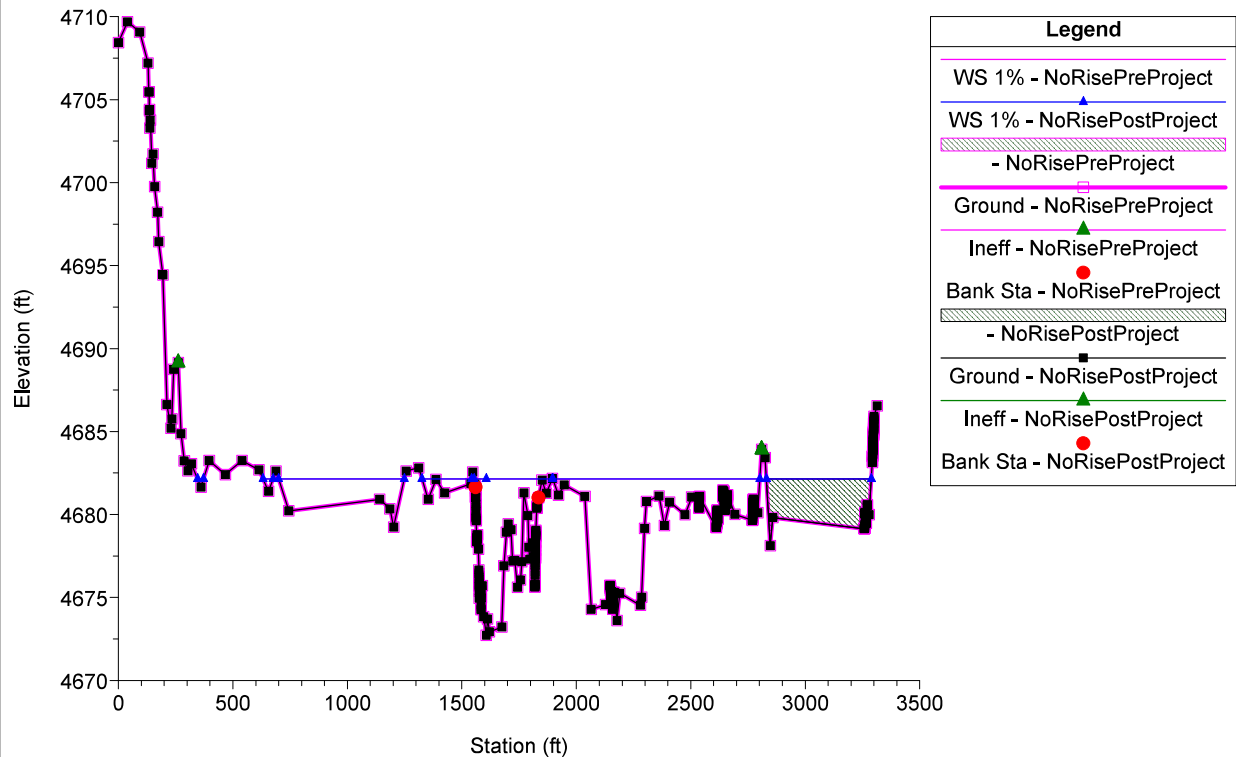
BTR_1A_Lower Plan: 1) NoRisePostProject 2) NoRisePreProject
River = BigThompson Reach = BT: Lower RS = 4874



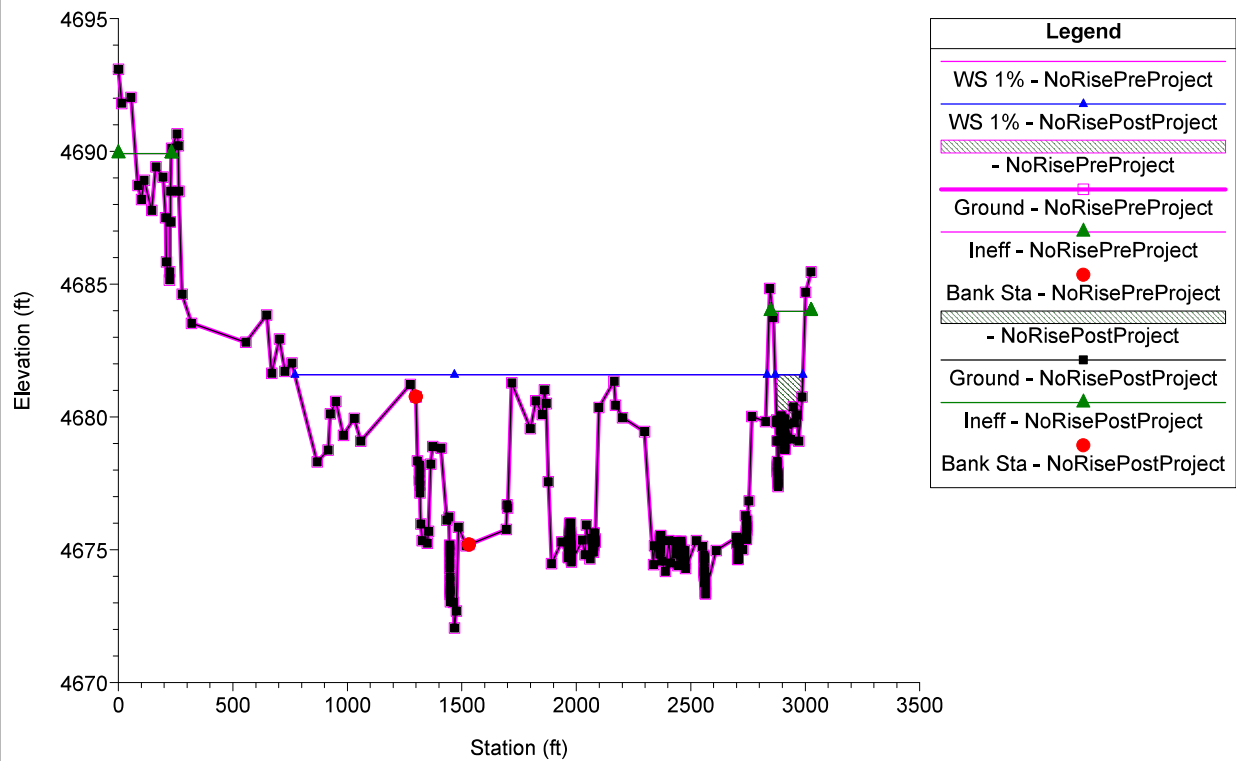
BTR_1A_Lower Plan: 1) NoRisePostProject 2) NoRisePreProject
 River = BigThompson Reach = BT: Lower RS = 4569



BTR_1A_Lower Plan: 1) NoRisePostProject 2) NoRisePreProject
 River = BigThompson Reach = BT: Lower RS = 3839



River = BigThompson Reach = BT: Lower RS = 3242





ATTACHMENT E





Summary of Water Surface Elevation Changes

Two Rivers Sand and Gravel Project

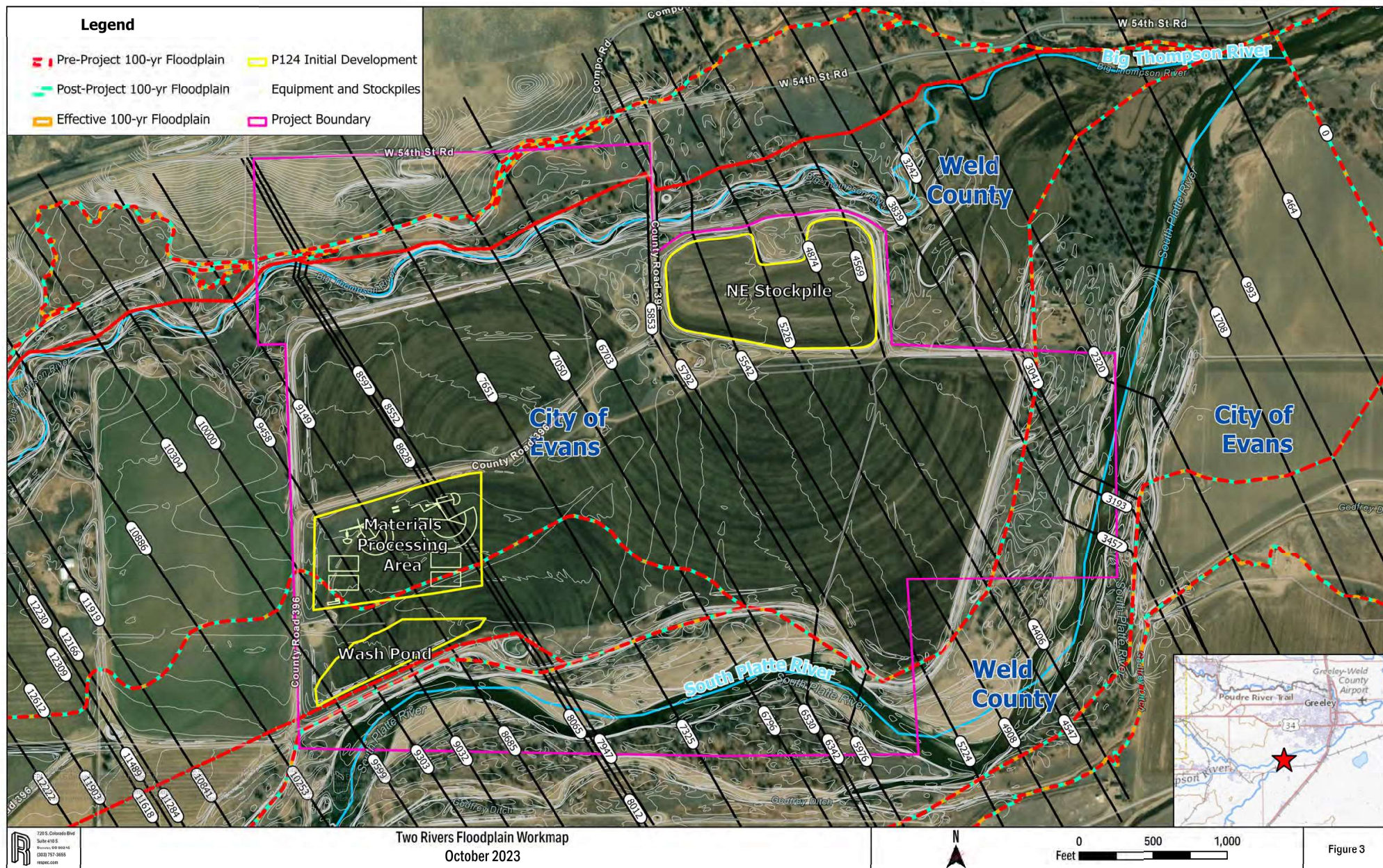
Cross- Section ID*			COMPARISONS
	Pre-Project	Post-Project	Post-Project to Pre-Project
15282	4698.80	4698.80	0.00
14843	4698.23	4698.23	0.00
14014	4697.43	4697.43	0.00
12916	4696.09	4696.09	0.00
12612	4695.57	4695.57	0.00
12309	4694.95	4694.95	0.00
12230	4694.63	4694.63	0.00
12166	4694.47	4694.47	0.00
11919	4693.81	4693.81	0.00
10886	4692.70	4692.49	-0.21
10304	4692.33	4692.04	-0.29
10000	4692.11	4691.81	-0.30
9458	4691.66	4691.44	-0.22
9149	4691.20	4691.04	-0.16
8628	4690.44	4690.41	-0.03
8597	4690.41	4690.38	-0.03
8552	4690.34	4690.34	0.00
7651	4688.99	4688.99	0.00
7050	4688.03	4688.03	0.00
6703	4687.64	4687.64	0.00
5853	4686.20	4686.20	0.00
5792	4685.91	4685.91	0.00
5542	4685.60	4685.60	0.00
5226	4685.13	4685.13	0.00
4874	4684.59	4684.59	0.00
4569	4684.09	4684.09	0.00
3839	4682.15	4682.15	0.00
3242	4681.59	4681.59	0.00
3041	4681.58	4681.58	0.00
2320	4681.37	4681.37	0.00
1708	4681.11	4681.11	0.00
993	4680.96	4680.96	0.00
464	4680.82	4680.82	0.00
0	4680.60	4680.60	0.00

*Cross Section ID represents stream distance in feet from the confluence of Big Thompson River and South Platte River

 Section of Proposed Fill
 Section of Proposed Cut



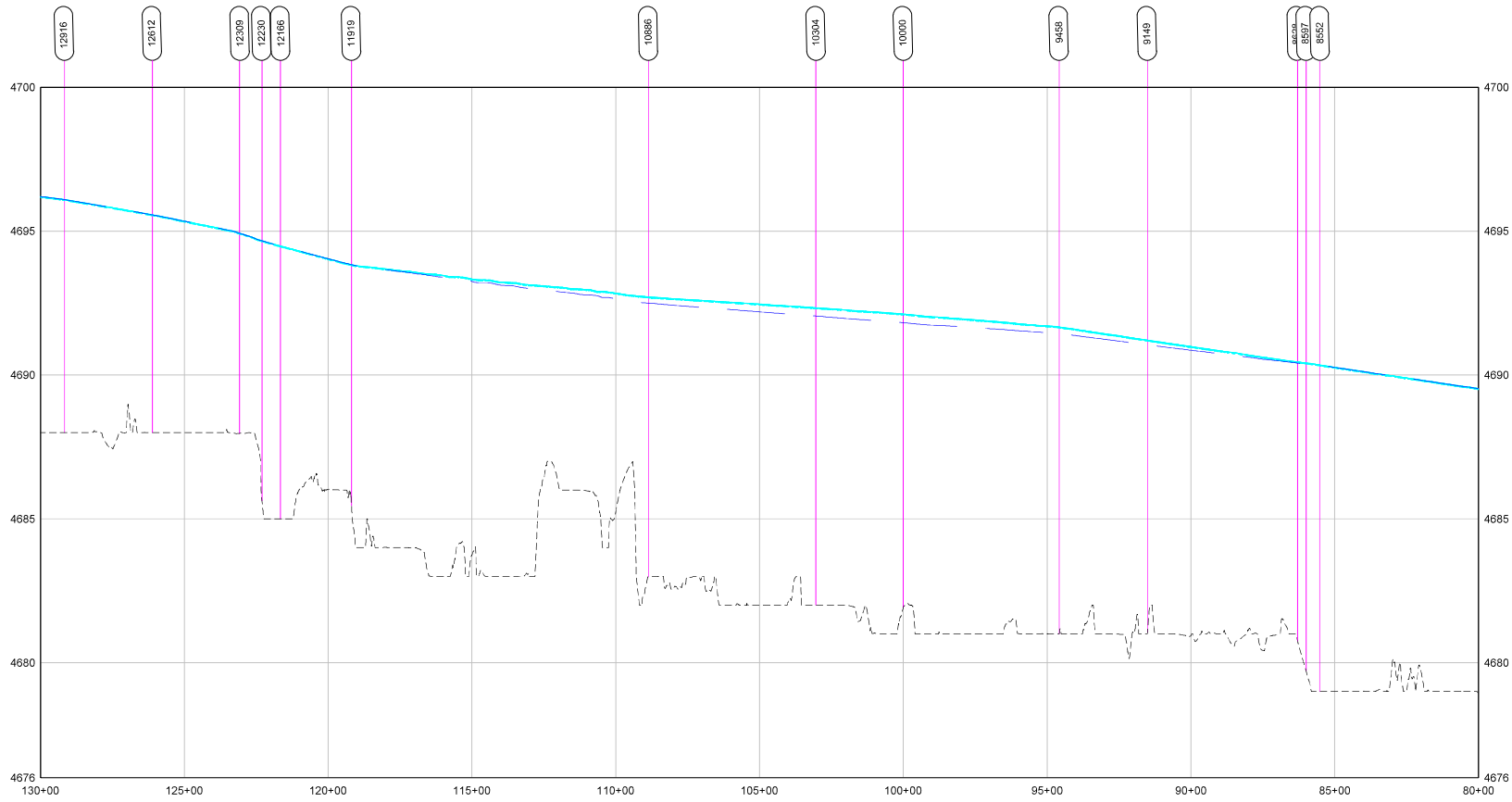
ATTACHMENT F



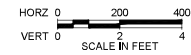




ATTACHMENT G

NAME: J:\PROJECTS\2025\2025-01-17\2025-01-17\TWO_RIVERS\CROSSSECTIONS\124-PROFILES.DWG
PLOT DATE: JANUARY 17, 2025 5:23 PM BY: JENNA LOHMEYER



LEGEND	
PRE-PROJECT 100-YR FLOOD	—
POST-PROJECT 100-YR FLOOD	—
EXISTING GROUND	---
EFFECTIVE HEC-RAS CROSS SECTIONS	



DESIGNED RESPEC 1750 COLORADO BLVD SUITE 4105 DENVER, CO 80246 PHONE (303) 757-3855	DESIGNED JEL	REVISION
	DRAWN JEL	
	CHECKED WFL	
	DATE 1/17/2024	
STAMP		
 Know what's below. Call before you dig.		
Raptor Materials LLC 8120 Gage Street Frederick, CO 80516 303-666-6657		
Two Rivers (P124) Sand and Gravel Project		
RESPEC		
DRAWING NUMBER: Fig 1 ATTACH G		