

# Memorandum

DATE **January 27, 2020**

TO Dillon Dittmer, Jamie Mikkleson, Cara Roesler, Brett Harbison

FROM Robert Carnazzo

THRU Julie Ramirez and Jason Dayton

SUBJECT Floodplain Certification—Brewster North, 7-3(103), CN 80902

Brewster North is a resurfacing project located in Blaine County, Nebraska, along Highway N-7. The project will begin at the junction of N-7 and N-91 (MM 0.00) and extend north to 2.45 miles south of the Blaine-Brown County line (MM 8.86).

Improvements to the project will consist of milling and resurfacing the existing roadway and surfaced shoulders, where present, with asphalt, work at select culverts, ditch cleanout at select locations, bridge repairs including removing and replacing the guardrail, and updating the existing street lighting in the Village of Brewster. The roadway resurfacing work will remove two-and-a-half (2.5) inches of existing asphalt by milling and then place a three (3) inch overlay of asphaltic concrete, resulting in a one-half (1/2) inch rise in pavement elevation.

Please review the attached mapping showing where this project encroaches into flood zones. Enclosed you will find certifications for these encroachments:

#### Community of Blaine County

Blaine County has no FEMA Floodplain mapping and does not participate in the National Flood Insurance Program (NFIP). NDOT policy in unmapped communities is to classify drainage with greater than 640 acres of drainage area as Potential Base Floodplains. State Minimum Standards require that all activity within Potential Base Floodplains meet a “Less Than 1-foot Rise” criteria. A Permit is not required from the non-participating county, the certification provided for the location below will be retained in its stead.

#### **North Loup River, Blaine County, Section 27 T23N R22W (S007 00071)**

The project encroaches upon the potential base floodplain for the North Loup River at this location. The North Loup River base flow is conveyed through the highway at a 112-foot long bridge. Bridge work will consist of removing the existing asphalt overlay, retrofit drain outlets, partial depth deck repairs, and placement of a 3 inch ACC overlay. This will result in a 1 inch increase in the bridge pavement elevation. An analysis completed in 2014 for scour assessment at the bridge determine that the base flood (100-year event) of 4000 cfs, is conveyed by the bridge at an elevation of 2476.6 feet NAVD88 which does not overtop the highway elevation of 2381.6 feet. The project work at this location will not cause the base flood elevation to increase.

#### **North Loup River, Blaine County, Section 22 T23N R22W**

The project encroaches upon the potential base floodplain of the North Loup River at this location. The North Loup River base flow is conveyed parallel to the highway in its natural channel east of the highway. The project work in this location consists of milling and overlaying the highway pavement for an increase of one-half (0.5) in pavement elevation. There will be no culvert work or highway embankment work in this location. An analysis completed in 2014 for scour assessment at the bridge determine that the base flood (100-year event) of 4000 cfs, is conveyed

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by the bridge at an elevation of 2476.6 feet NAVD88. The lowest highway elevation in this location, downstream of the bridge, is 2479.9 feet. This value exceeds the base flood elevation that is upstream of the bridge and which would be significantly higher than the natural channel flow downstream of the bridge. Therefore the project work for the highway is completed above the base flood elevation and will not cause the base flood elevation to increase.

**Unnamed Drainage, Blaine County, Section 15 T23N R22W**

The project encroaches upon the potential base floodplain of an Unnamed Drainage in Section 15, T23N, R22W. The Unnamed Drainage is a shallow concentrated flow that generally flows up against the highway at this location, and eventually is conveyed across the highway by a 24-inch culvert. The project work in this location consists of milling and overlaying the highway pavement for an increase of one-half (0.5) in pavement elevation. Assuming the base flood flow exceeds the capacity of the 24-inch culvert and overtops the highway, the one-half inch increase in pavement elevation will cause a one-half (0.5) inch increase in the base flood elevation. This meets the minimum state standards of no more than 1-foot increase.

**Unnamed Drainage, Blaine County, Section 10 T23N R22W**

The project encroaches upon the potential base floodplain of an Unnamed Drainage in Section 10, T23N, R22W. The Unnamed Drainage is a concentrated flow in a natural swale along the west side of the highway at this location. The project work in this location consists of milling and overlaying the highway pavement for an increase of one-half (0.5) in pavement elevation. Assuming the base flood flow exceeds the capacity of the natural swale and overtops the highway, the one-half inch increase in pavement elevation will cause a one-half (0.5) inch increase in the base flood elevation. This meets the minimum state standards of no more than 1-foot increase.

**Unnamed Drainage, Blaine County, Section 03 T23N R22W**

The project encroaches upon the potential base floodplain of an Unnamed Drainage in Section 03, T23N, R22W. The Unnamed Drainage is a shallow concentrated flow that generally flows up against the highway at this location, and eventually is conveyed across the highway by a 48-inch culvert. The project work in this location consists of milling and overlaying the highway pavement for an increase of one-half (0.5) in pavement elevation. Assuming the base flood flow exceeds the capacity of the 48-inch culvert and overtops the highway, the one-half inch increase in pavement elevation will cause a one-half (0.5) inch increase in the base flood elevation. This meets the minimum state standards of no more than 1-foot increase.

**Unnamed Drainage, Blaine County, Section 34 T24N R22W**

The project encroaches upon the potential base floodplain of an Unnamed Drainage in Section 34, T24N, R22W. The Unnamed Drainage is a shallow concentrated flow that generally flows up against the highway at this location, and eventually is conveyed across the highway by a 36-inch culvert. The project work in this location consists of milling and overlaying the highway pavement for an increase of one-half (0.5) in pavement elevation. Assuming the base flood flow exceeds the capacity of the 36-inch culvert and overtops the highway, the one-half inch increase in pavement elevation will cause a one-half (0.5) inch increase in the base flood elevation. This meets the minimum state standards of no more than 1-foot increase.

**Unnamed Drainage, Blaine County, Section 27/22 T24N R22W**

The project encroaches upon the potential base floodplain of an Unnamed Drainage in Sections 27 and 22, T24N, R22W. The Unnamed Drainage is a shallow concentrated flow that generally flows up against the highway at this location, and eventually is conveyed across the highway by two 24-inch culverts. The project work in this location consists of milling and overlaying the highway pavement for an increase of one-half (0.5) in pavement elevation, the extension of the existing 24-inch culverts, and the placement of three additional 30-inch culverts. Assuming the

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base flood flow exceeds the capacity of the multiple culverts and overtops the highway, the one-half inch increase in pavement elevation will cause a one-half (0.5) inch increase in the base flood elevation. This meets the minimum state standards of no more than 1-foot increase.

**Unnamed Drainage, Blaine County, Section 15 T24N R22W**

The project encroaches upon the potential base floodplain of an Unnamed Drainage in Section 15, T24N, R22W. The Unnamed Drainage is a shallow concentrated flow that generally flows up against the highway at this location, and eventually is conveyed across the highway by a 24-inch culvert. The project work in this location consists of milling and overlaying the highway pavement for an increase of one-half (0.5) in pavement elevation, the extension of the existing 24-inch culvert, and the placement of an additional 24-inch culvert. Assuming the base flood flow exceeds the capacity of the two 24-inch culverts and overtops the highway, the one-half inch increase in pavement elevation will cause a one-half (0.5) inch increase in the base flood elevation. This meets the minimum state standards of no more than 1-foot increase.

Enclosures:       Certificates of Compliance (8)  
                      State Minimum Standards Mapping (11)  
                      Project Location Map

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**Permit Information:**

Community of Blaine County

**North Loup River, Blaine County, Section 27 T23N R22W (S007 00071)**

Is the work substantial improvement?	No
Is the work in an identified floodplain?	Potential Base Floodplain
Elevation of the base flood (100-year event)?	2476.6 NAVD 88
Elevation/floodproofing requirement (if applicable)?	NA
Is the work in a designated floodway?	No

**North Loup River, Blaine County, Section 22 T23N R22W**

Is the work substantial improvement?	No
Is the work in an identified floodplain?	Potential Base Floodplain
Elevation of the base flood (100-year event)?	No Change
Elevation/floodproofing requirement (if applicable)?	NA
Is the work in a designated floodway?	No

**Unnamed Drainage, Blaine County, Section 15 T23N R22W**

Is the work substantial improvement?	No
Is the work in an identified floodplain?	Potential Base Floodplain
Elevation of the base flood (100-year event)?	0.5-inch Increase
Elevation/floodproofing requirement (if applicable)?	NA
Is the work in a designated floodway?	No

**Unnamed Drainage, Blaine County, Section 10 T23N R22W**

Is the work substantial improvement?	No
Is the work in an identified floodplain?	Potential Base Floodplain
Elevation of the base flood (100-year event)?	0.5-inch Increase
Elevation/floodproofing requirement (if applicable)?	NA
Is the work in a designated floodway?	No

**Unnamed Drainage, Blaine County, Section 03 T23N R22W**

Is the work substantial improvement?	No
Is the work in an identified floodplain?	Potential Base Floodplain
Elevation of the base flood (100-year event)?	0.5-inch Increase
Elevation/floodproofing requirement (if applicable)?	NA
Is the work in a designated floodway?	No

**Unnamed Drainage, Blaine County, Section 34 T24N R22W**

Is the work substantial improvement?	No
Is the work in an identified floodplain?	Potential Base Floodplain
Elevation of the base flood (100-year event)?	0.5-inch Increase
Elevation/floodproofing requirement (if applicable)?	NA
Is the work in a designated floodway?	No

**Unnamed Drainage, Blaine County, Section 27/22 T24N R22W**

Is the work substantial improvement?	No
Is the work in an identified floodplain?	Potential Base Floodplain
Elevation of the base flood (100-year event)?	0.5-inch Increase
Elevation/floodproofing requirement (if applicable)?	NA
Is the work in a designated floodway?	No

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**Unnamed Drainage, Blaine County, Section 15 T24N R22W**

Is the work substantial improvement?	No
Is the work in an identified floodplain?	Potential Base Floodplain
Elevation of the base flood (100-year event)?	0.5-inch Increase
Elevation/floodproofing requirement (if applicable)?	NA
Is the work in a designated floodway?	No

*Certification of Compliance  
Floodplain and Floodway Regulations*

FLOODPLAIN/ FLOODWAY LOCATION

Project Name Brewster North Stream North Loup River  
Project No. 7-3(103) County Blaine  
Control No. 80902 Section(s) 27 T 23 N R 22 W

FEMA LOCATION

County/Community Blaine County  
Panel No. State Minimum Standards  
Effective Date N/A

TYPE OF STRUCTURE

☒ Bridge ☐ Culvert ☐ Roadway

Structure No. S007 00071 ☐

TYPE OF IMPROVEMENT

☒ Modify Existing ☐ Replace Existing ☐ Other

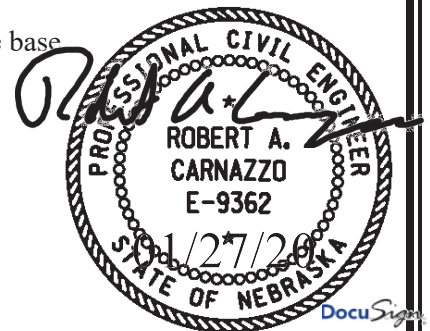
Details Bridge repair consisting of asphalt overlay removal, retro fit drain outlets, deck repair,  
placement of 3-inch asphalt overlay, guardrail removal and replacement, 1-inch increase

Highway Profile Change: ☒ Yes ☐ No

THE FOLLOWING IS HEREBY CERTIFIED

- ☒ Floodplain in Un-mapped Community (State Minimum Standards Apply)  
Proposed construction will not increase the base  
(100 year) flood heights more than one foot at any location.
- ☐ Floodplain (without Designated Floodway) or Flood Fringe  
Proposed construction will not increase the base  
(100 year) flood heights more than one foot at any location.
- ☐ Designated Floodway  
Proposed construction will result in no rise along the base  
(100 year) floodway water surface profile.

Completed By: ROBERT A. CARNAZZO, P.E., CFM  
NDOT Roadway Design Hydraulics



*Certification of Compliance  
Floodplain and Floodway Regulations*

FLOODPLAIN/ FLOODWAY LOCATION

Project Name Brewster North Stream North Loup River  
Project No. 7-3(103) County Blaine  
Control No. 80902 Section(s) 22 T 23 N R 22 W

FEMA LOCATION

County/Community Blaine County  
Panel No. State Minimum Standards  
Effective Date N/A

TYPE OF STRUCTURE

☐ Bridge ☐ Culvert ☒ Roadway  
Structure No.                      ☒ Natural channel flow along highway

TYPE OF IMPROVEMENT

☐ Modify Existing ☐ Replace Existing ☒ Other

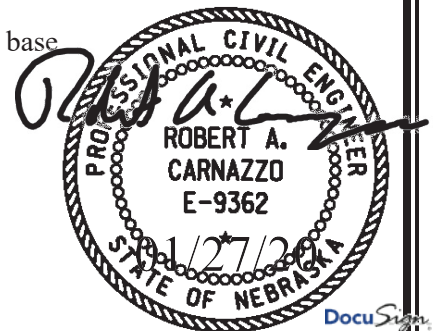
Details Remove 2.5-inch of asphalt pavement by milling, then place a 3-inch asphalt overlay for a 0.5-inch increase in pavement elevation.

Highway Profile Change: ☒ Yes ☐ No

THE FOLLOWING IS HEREBY CERTIFIED

- ☒ Floodplain in Un-mapped Community (State Minimum Standards Apply)  
Proposed construction will not increase the base  
(100 year) flood heights more than one foot at any location.
- ☐ Floodplain (without Designated Floodway) or Flood Fringe  
Proposed construction will not increase the base  
(100 year) flood heights more than one foot at any location.
- ☐ Designated Floodway  
Proposed construction will result in no rise along the base  
(100 year) floodway water surface profile.

Completed By: ROBERT A. CARNAZZO, P.E., CFM  
NDOT Roadway Design Hydraulics



*Certification of Compliance  
Floodplain and Floodway Regulations*

FLOODPLAIN/ FLOODWAY LOCATION

Project Name Brewster North Stream Unnamed Drainage  
Project No. 7-3(103) County Blaine  
Control No. 80902 Section(s) 15 T 23 N R 22 W

FEMA LOCATION

County/Community Blaine County  
Panel No. State Minimum Standards  
Effective Date N/A

TYPE OF STRUCTURE

☐ Bridge ☒ Culvert 24-inch Pipe Culvert ☒ Roadway

Structure No. \_\_\_\_\_ ☐ \_\_\_\_\_

TYPE OF IMPROVEMENT

☐ Modify Existing ☐ Replace Existing ☒ Other

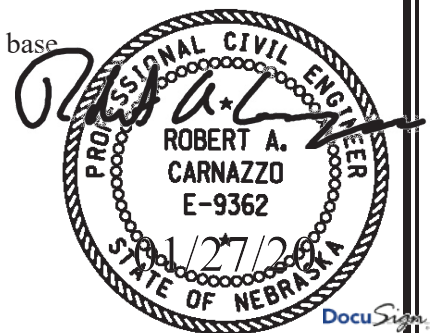
Details Remove 2.5-inch of asphalt pavement by milling, then place a 3-inch asphalt overlay for a 0.5-inch increase in pavement elevation. No Culvert work.

Highway Profile Change: ☒ Yes ☐ No

THE FOLLOWING IS HEREBY CERTIFIED

- ☒ Floodplain in Un-mapped Community (State Minimum Standards Apply)  
Proposed construction will not increase the base  
(100 year) flood heights more than one foot at any location.
- ☐ Floodplain (without Designated Floodway) or Flood Fringe  
Proposed construction will not increase the base  
(100 year) flood heights more than one foot at any location.
- ☐ Designated Floodway  
Proposed construction will result in no rise along the base  
(100 year) floodway water surface profile.

Completed By: ROBERT A. CARNAZZO, P.E., CFM  
NDOT Roadway Design Hydraulics



*Certification of Compliance  
Floodplain and Floodway Regulations*

FLOODPLAIN/ FLOODWAY LOCATION

Project Name Brewster North Stream Unnamed Drainage  
Project No. 7-3(103) County Blaine  
Control No. 80902 Section(s) 10 T 23 N R 22 W

FEMA LOCATION

County/Community Blaine County  
Panel No. State Minimum Standards  
Effective Date N/A

TYPE OF STRUCTURE

☐ Bridge ☐ Culvert ☒ Roadway  
Structure No. \_\_\_\_\_ ☒ Natural flow in adjacent swale

TYPE OF IMPROVEMENT

☐ Modify Existing ☐ Replace Existing ☒ Other

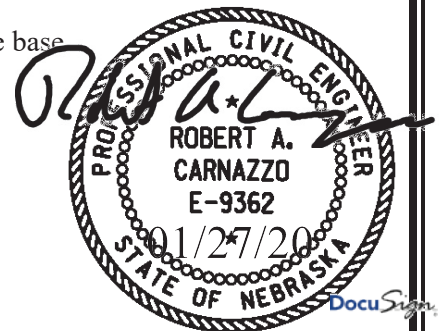
Details Remove 2.5-inch of asphalt pavement by milling, then place a 3-inch asphalt overlay for a 0.5-inch increase in pavement elevation.

Highway Profile Change: ☒ Yes ☐ No

THE FOLLOWING IS HEREBY CERTIFIED

- ☒ Floodplain in Un-mapped Community (State Minimum Standards Apply)  
Proposed construction will not increase the base  
(100 year) flood heights more than one foot at any location.
- ☐ Floodplain (without Designated Floodway) or Flood Fringe  
Proposed construction will not increase the base  
(100 year) flood heights more than one foot at any location.
- ☐ Designated Floodway  
Proposed construction will result in no rise along the base  
(100 year) floodway water surface profile.

Completed By: ROBERT A. CARNAZZO, P.E., CFM  
NDOT Roadway Design Hydraulics



*Certification of Compliance  
Floodplain and Floodway Regulations*

FLOODPLAIN/ FLOODWAY LOCATION

Project Name Brewster North Stream Unnamed Drainage  
Project No. 7-3(103) County Blaine  
Control No. 80902 Section(s) 03 T 23 N R 22 W

FEMA LOCATION

County/Community Blaine County  
Panel No. State Minimum Standards  
Effective Date N/A

TYPE OF STRUCTURE

☐ Bridge ☒ Culvert 48-inch Pipe Culvert ☒ Roadway

Structure No. \_\_\_\_\_ ☐ \_\_\_\_\_

TYPE OF IMPROVEMENT

☐ Modify Existing ☐ Replace Existing ☒ Other

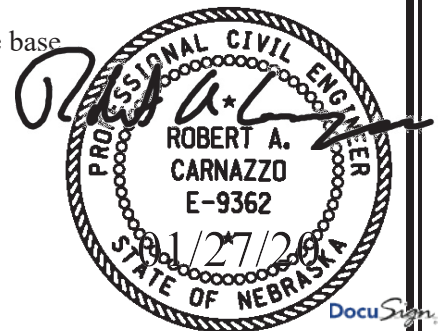
Details Remove 2.5-inch of asphalt pavement by milling, then place a 3-inch asphalt overlay for a 0.5-inch increase in pavement elevation. No Culvert work.

Highway Profile Change: ☒ Yes ☐ No

THE FOLLOWING IS HEREBY CERTIFIED

- ☒ Floodplain in Un-mapped Community (State Minimum Standards Apply)  
Proposed construction will not increase the base  
(100 year) flood heights more than one foot at any location.
- ☐ Floodplain (without Designated Floodway) or Flood Fringe  
Proposed construction will not increase the base  
(100 year) flood heights more than one foot at any location.
- ☐ Designated Floodway  
Proposed construction will result in no rise along the base  
(100 year) floodway water surface profile.

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NDOT Roadway Design Hydraulics



*Certification of Compliance  
Floodplain and Floodway Regulations*

FLOODPLAIN/ FLOODWAY LOCATION

Project Name Brewster North Stream Unnamed Drainage  
Project No. 7-3(103) County Blaine  
Control No. 80902 Section(s) 34 T 24 N R 22 W

FEMA LOCATION

County/Community Blaine County  
Panel No. State Minimum Standards  
Effective Date N/A

TYPE OF STRUCTURE

☐ Bridge ☒ Culvert 36-inch Pipe Culvert ☒ Roadway

Structure No. \_\_\_\_\_ ☐ \_\_\_\_\_

TYPE OF IMPROVEMENT

☐ Modify Existing ☐ Replace Existing ☒ Other

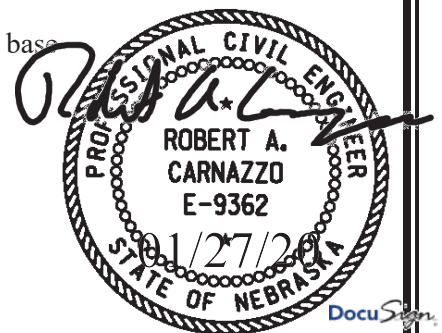
Details Remove 2.5-inch of asphalt pavement by milling, then place a 3-inch asphalt overlay for a 0.5-inch increase in pavement elevation. No Culvert work.

Highway Profile Change: ☒ Yes ☐ No

THE FOLLOWING IS HEREBY CERTIFIED

- ☒ Floodplain in Un-mapped Community (State Minimum Standards Apply)  
Proposed construction will not increase the base  
(100 year) flood heights more than one foot at any location.
- ☐ Floodplain (without Designated Floodway) or Flood Fringe  
Proposed construction will not increase the base  
(100 year) flood heights more than one foot at any location.
- ☐ Designated Floodway  
Proposed construction will result in no rise along the base  
(100 year) floodway water surface profile.

Completed By: ROBERT A. CARNAZZO, P.E., CFM  
NDOT Roadway Design Hydraulics



*Certification of Compliance  
Floodplain and Floodway Regulations*

FLOODPLAIN/ FLOODWAY LOCATION

Project Name Brewster North Stream Unnamed Drainage  
Project No. 7-3(103) County Blaine  
Control No. 80902 Section(s) 27 & 22 T 24 N R 22 W

FEMA LOCATION

County/Community Blaine County  
Panel No. State Minimum Standards  
Effective Date N/A

TYPE OF STRUCTURE

☐ Bridge ☒ Culvert Two 24-inch Pipe Culverts ☒ Roadway

Structure No. \_\_\_\_\_ ☐ \_\_\_\_\_

TYPE OF IMPROVEMENT

☒ Modify Existing ☐ Replace Existing ☒ Other

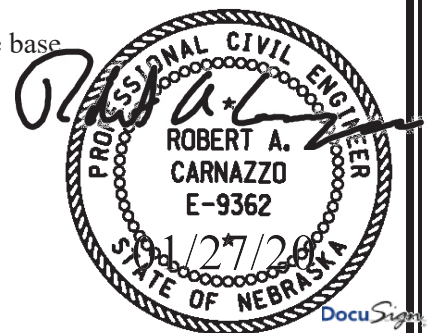
Details Remove 2.5-inch of asphalt pavement by milling, then place a 3-inch asphalt overlay for a 0.5-inch increase in pavement elevation. Extend culverts, add three 30-inch pipe culverts.

Highway Profile Change: ☒ Yes ☐ No

THE FOLLOWING IS HEREBY CERTIFIED

- ☒ Floodplain in Un-mapped Community (State Minimum Standards Apply)  
Proposed construction will not increase the base  
(100 year) flood heights more than one foot at any location.
- ☐ Floodplain (without Designated Floodway) or Flood Fringe  
Proposed construction will not increase the base  
(100 year) flood heights more than one foot at any location.
- ☐ Designated Floodway  
Proposed construction will result in no rise along the base  
(100 year) floodway water surface profile.

Completed By: ROBERT A. CARNAZZO, P.E., CFM  
NDOT Roadway Design Hydraulics



*Certification of Compliance  
Floodplain and Floodway Regulations*

FLOODPLAIN/ FLOODWAY LOCATION

Project Name Brewster North Stream Unnamed Drainage  
Project No. 7-3(103) County Blaine  
Control No. 80902 Section(s) 15 T 24 N R 22 W

FEMA LOCATION

County/Community Blaine County  
Panel No. State Minimum Standards  
Effective Date N/A

TYPE OF STRUCTURE

☐ Bridge ☒ Culvert 24-inch Pipe Culverts ☒ Roadway

Structure No. \_\_\_\_\_ ☐ \_\_\_\_\_

TYPE OF IMPROVEMENT

☒ Modify Existing ☐ Replace Existing ☒ Other

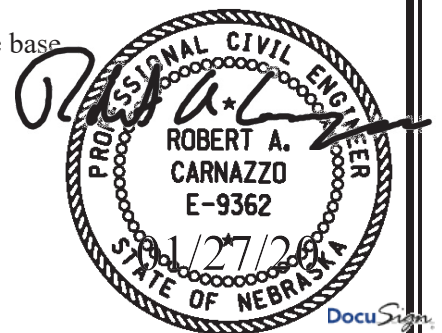
Details Remove 2.5-inch of asphalt pavement by milling, then place a 3-inch asphalt overlay for a 0.5-inch increase in pavement elevation. Extend culvert, add one 24-inch pipe culvert.

Highway Profile Change: ☒ Yes ☐ No

THE FOLLOWING IS HEREBY CERTIFIED

- ☒ Floodplain in Un-mapped Community (State Minimum Standards Apply)  
Proposed construction will not increase the base  
(100 year) flood heights more than one foot at any location.
- ☐ Floodplain (without Designated Floodway) or Flood Fringe  
Proposed construction will not increase the base  
(100 year) flood heights more than one foot at any location.
- ☐ Designated Floodway  
Proposed construction will result in no rise along the base  
(100 year) floodway water surface profile.

Completed By: ROBERT A. CARNAZZO, P.E., CFM  
NDOT Roadway Design Hydraulics



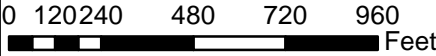
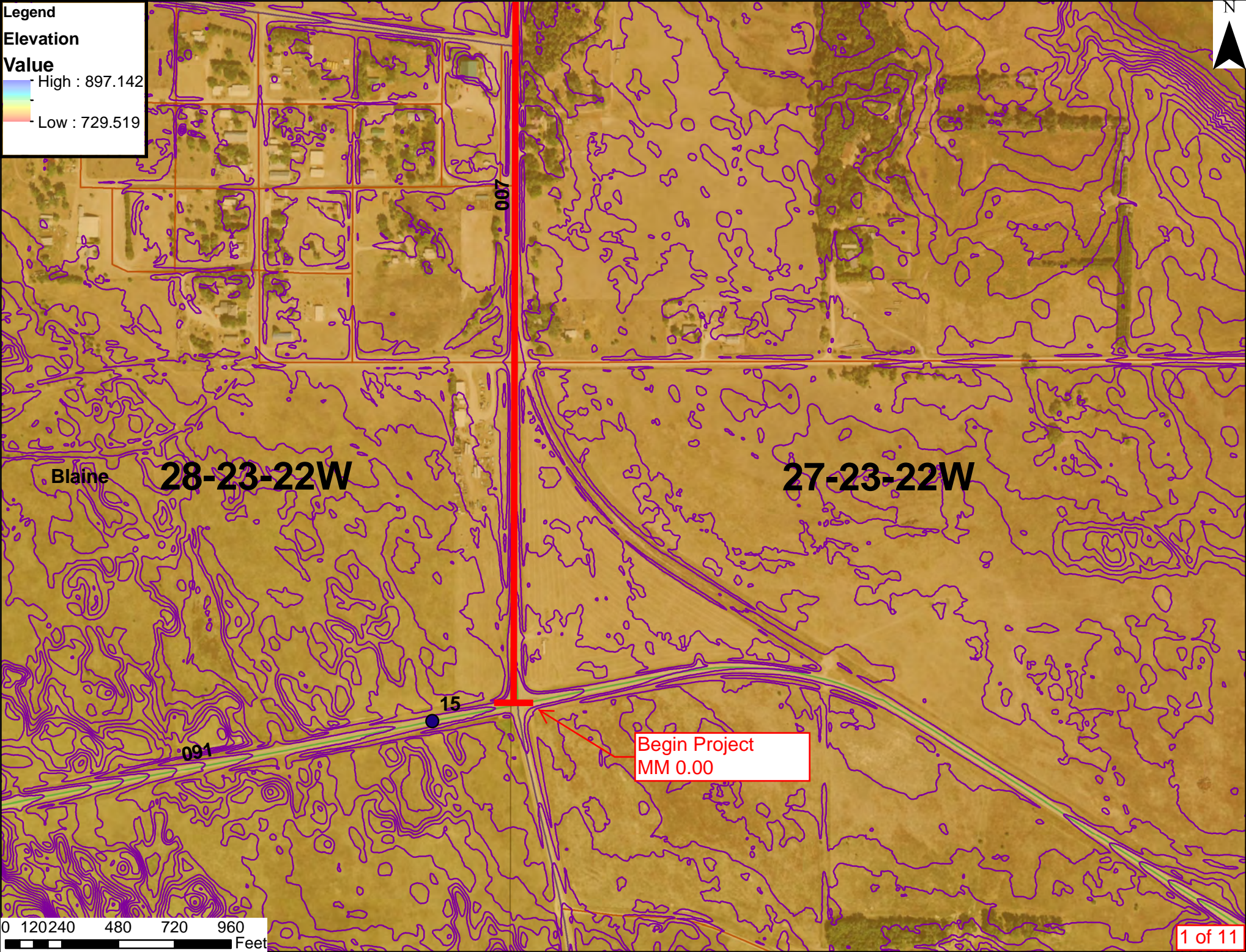
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**Elevation**

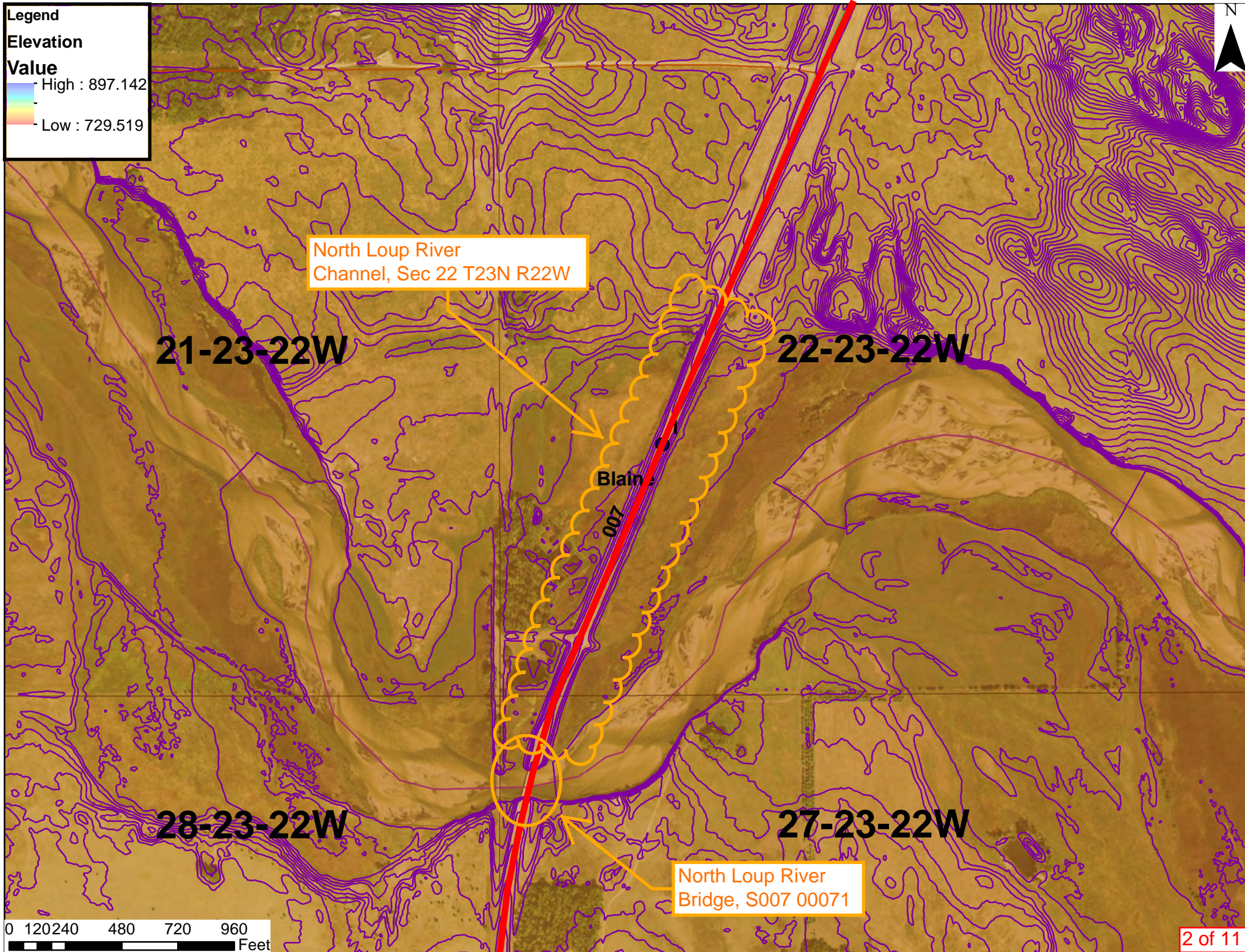
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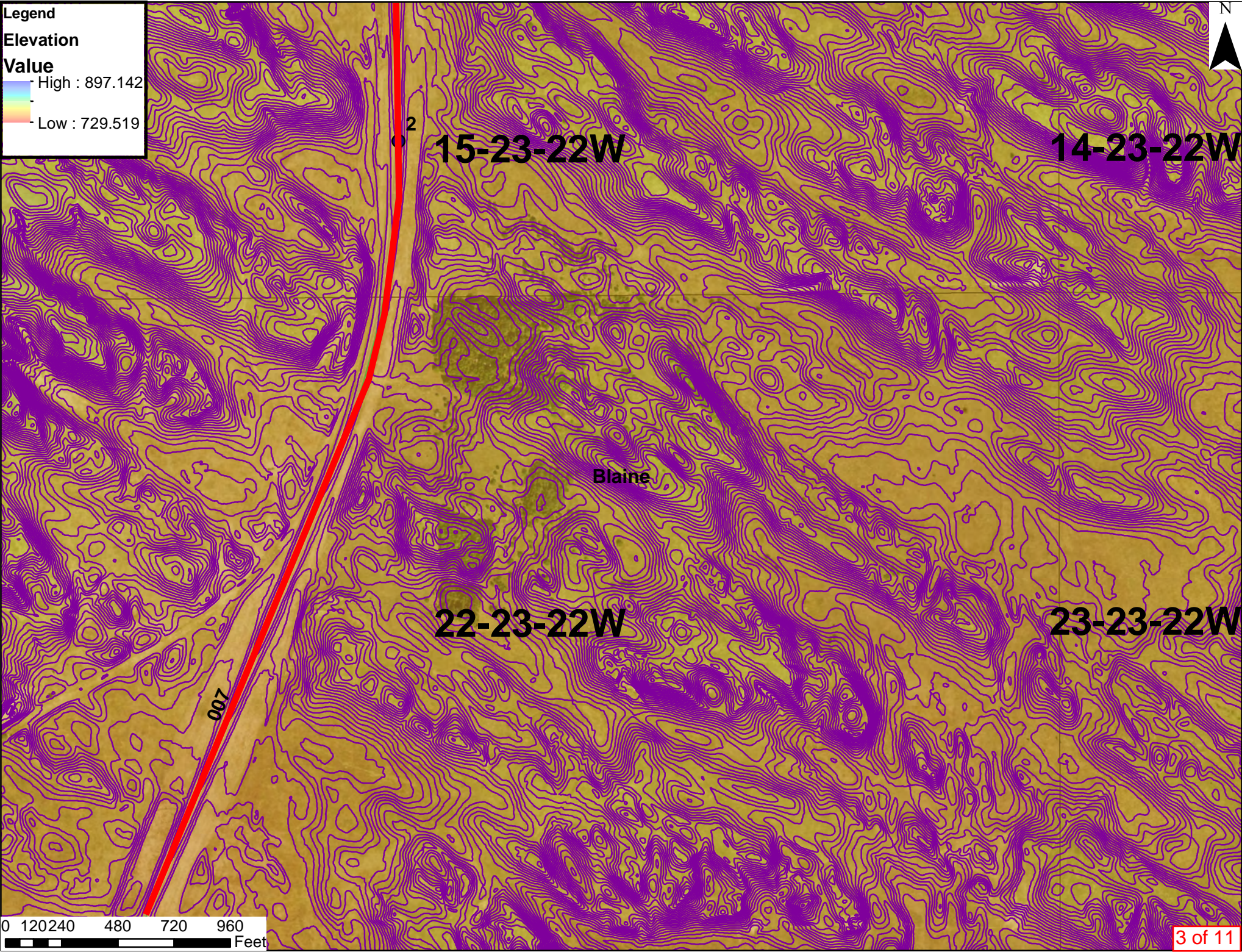
Low : 729.519



**Legend**  
**Elevation**  
**Value**  
High : 897.142  
Low : 729.519



**Legend**  
**Elevation**  
**Value**  
High : 897.142  
Low : 729.519



**Legend**

**Elevation**

**Value**

High : 897.142

Low : 729.519



10-23-22W

11-23-22

Watershed >640 acres

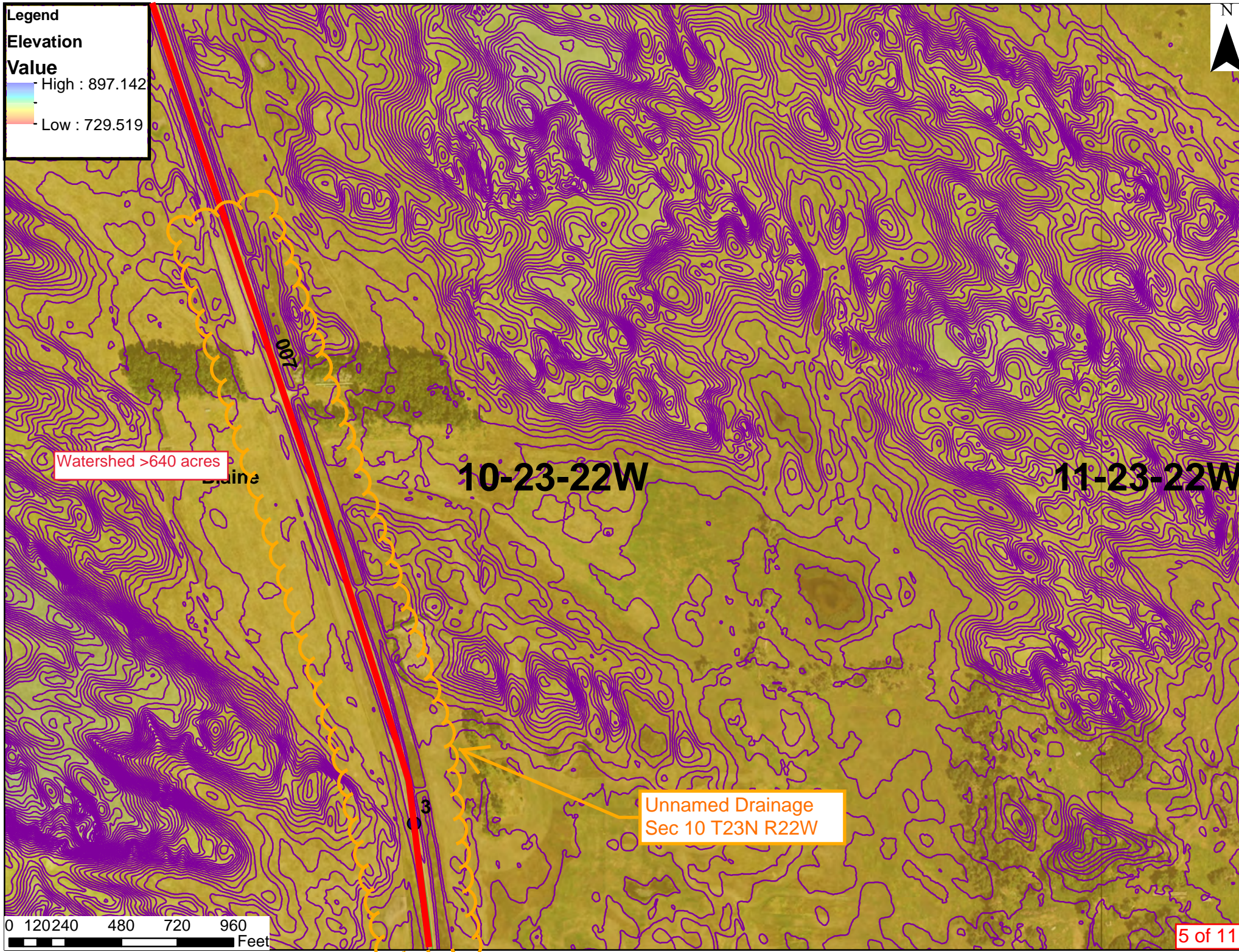
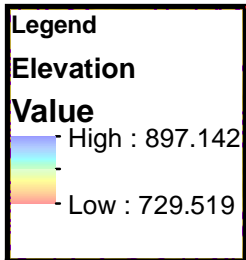
Blaine

15-23-22W

14-23-22W

Unnamed Drainage  
Sec 15 T23N R22W

0 120240 480 720 960 Feet



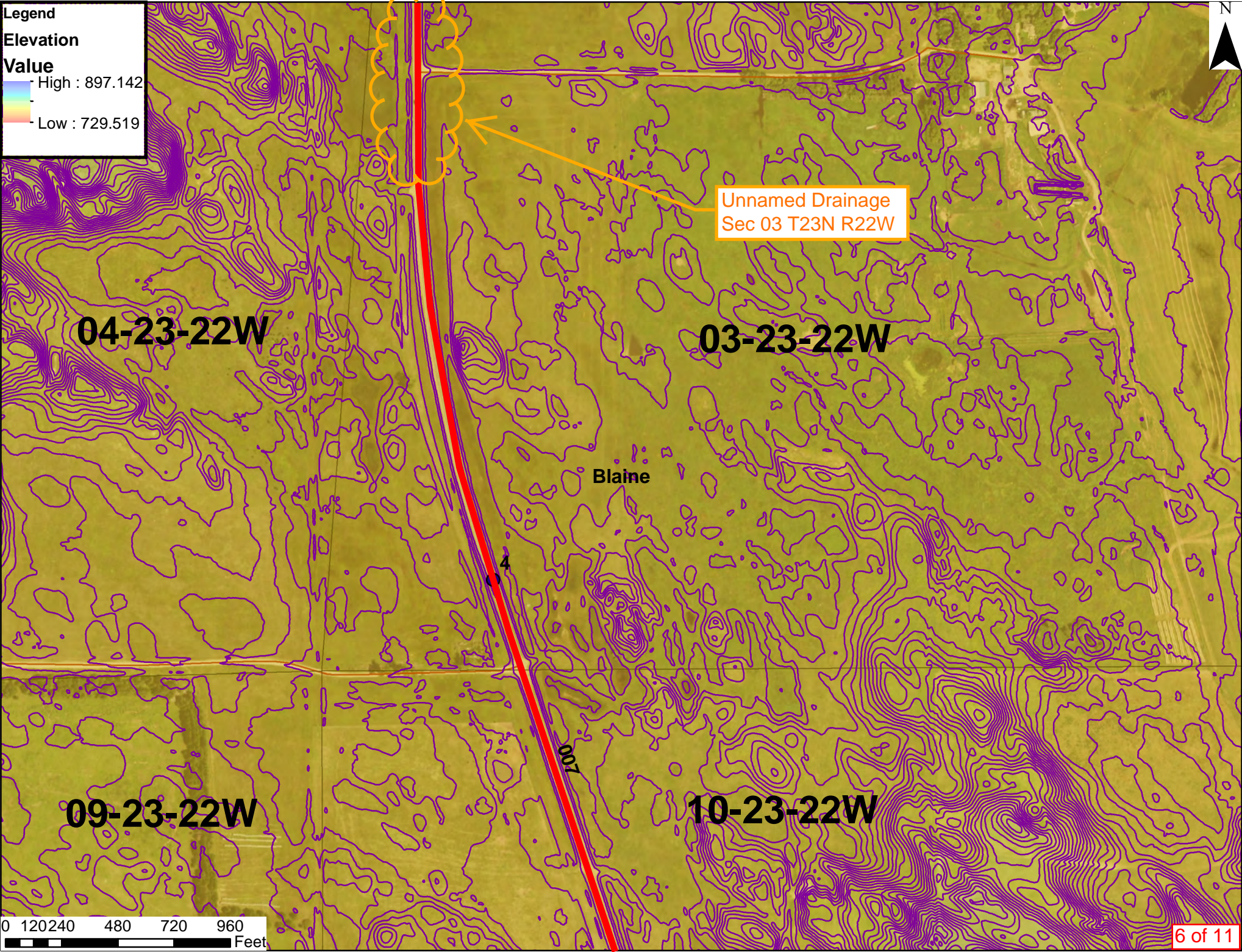
**Legend**

**Elevation**

**Value**

High : 897.142

Low : 729.519



Unnamed Drainage  
Sec 03 T23N R22W

04-23-22W

03-23-22W

Blaine

09-23-22W

10-23-22W

0 120 240 480 720 960 Feet

**Legend**  
**Elevation**  
**Value**  
High : 897.142  
Low : 729.519



**33-24-22W**

**34-24-22W**

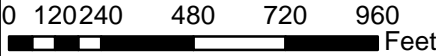
Blaine

**04-23-22W**

**03-23-22W**

Watershed >640 acres

Unnamed Drainage  
Sec 03 T23N R22W



**Legend**

**Elevation**

**Value**

High : 897.142

Low : 729.519



**28-24-22W**

**27-24-22W**

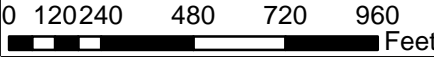
Watershed >640 acres

Unnamed Drainage  
Sec 34 T24N R22W

Blaine

**33-24-22W**

**34-24-22W**



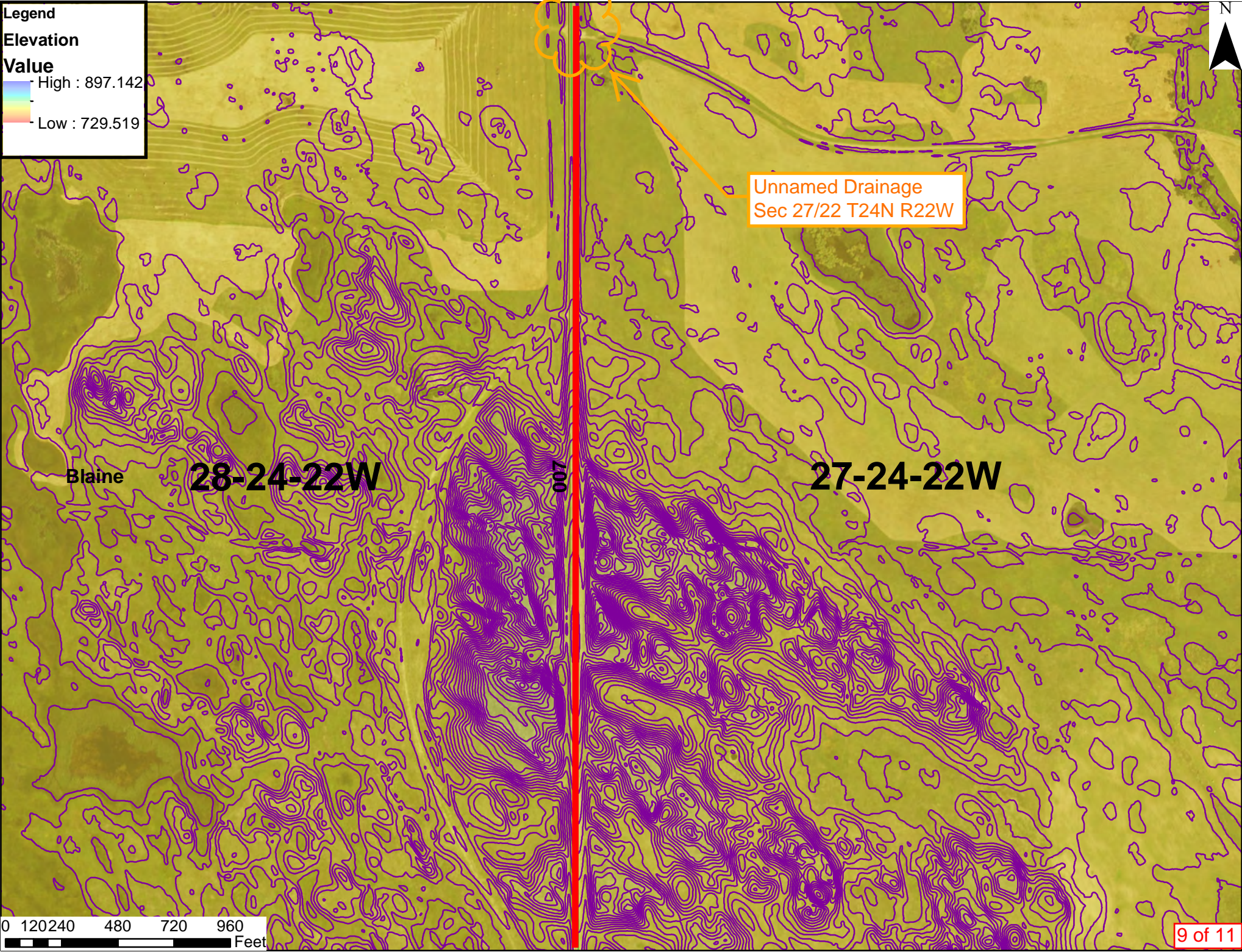
**Legend**

**Elevation**

**Value**

High : 897.142

Low : 729.519



Unnamed Drainage  
Sec 27/22 T24N R22W

Blaine

28-24-22W

200

27-24-22W

0 120 240 480 720 960 Feet

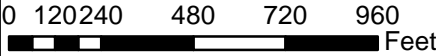
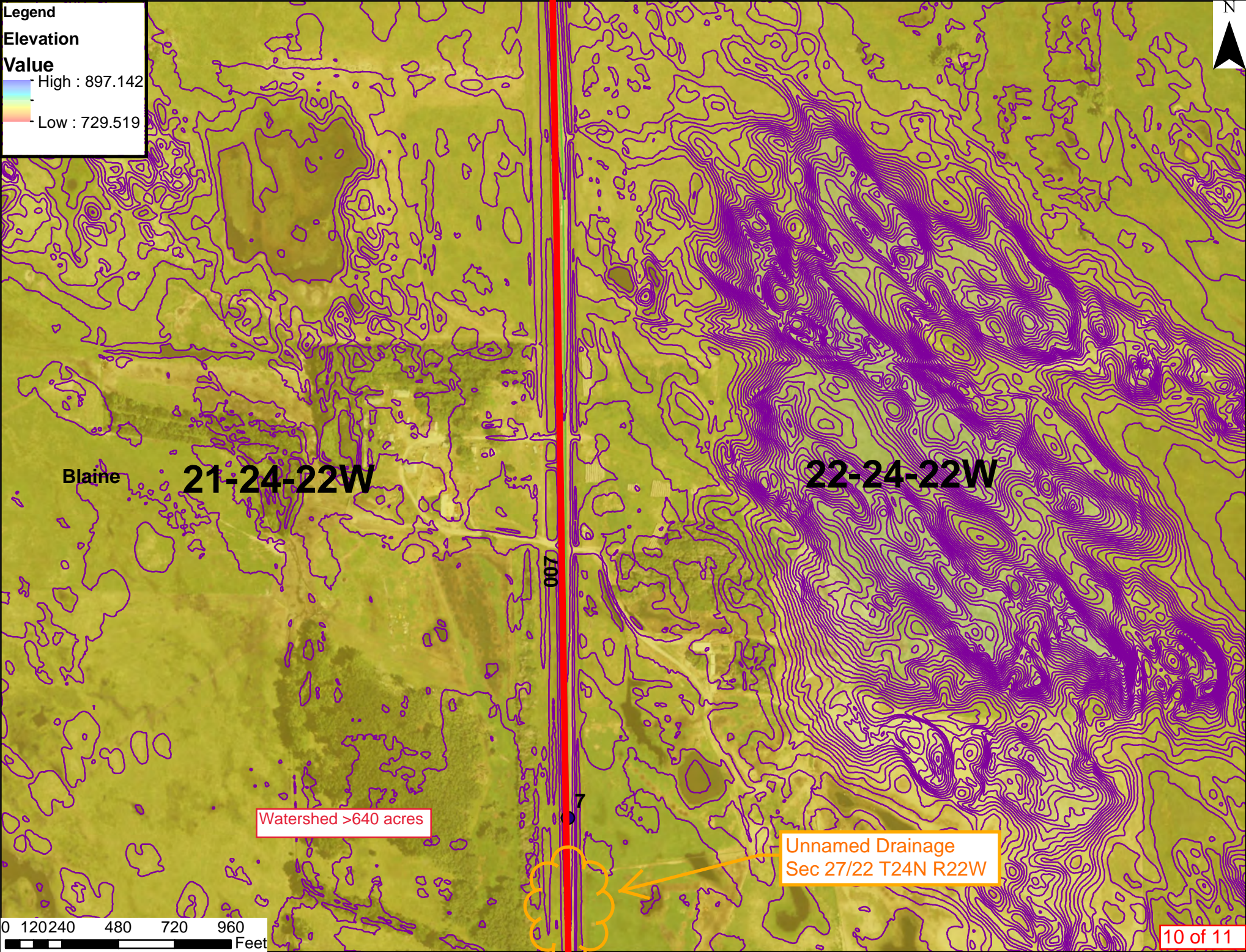
**Legend**

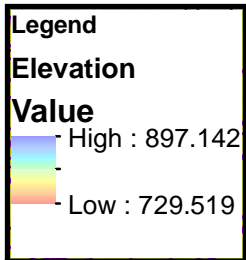
**Elevation**

**Value**

High : 897.142

Low : 729.519





End Project  
MM 8.86

16-24-22W

15-24-22W

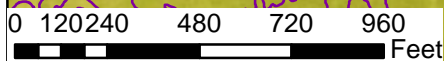
Watershed >640 acres

Blaine

Unnamed Drainage  
Sec 15 T24N R22W

21-24-22W

22-24-22W



# BREWSTER NORTH

## 7-3(103)

C.N. 80902      BOOK 5849  
BLAINE COUNTY

