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HIGHWOOD RIVER HAZARD STUDY

Design Flood Hazard Mapping Report

Submitted to:
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DRAFT

REPORT

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Executive Summary

Alberta Environment and Parks (AEP) commissioned Golder Associates Ltd. (Golder) in September 2015 to undertake the Highwood River Hazard Study. The primary purpose of the study is to identify and assess river and flood hazards along the Highwood River (from a location upstream of Longview to its confluence with Bow River) and the Little Bow River (from the overland flow area south of the Town of High River to a location approximately 2 km downstream of Highway 2). The project stakeholders include the Government of Alberta, Foothills County, Town of High River, Village of Longview, and the public.

The study includes multiple components and deliverables. This report summarizes the work of the design flood hazard mapping component of the study. Open water floodway criteria maps and design flood hazard maps are the key deliverables of this project component. The main task associated with this work involves defining a flood hazard area, composed of floodway and flood fringe zones, using floodway determination criteria and mapping standards from the provincial FHIP (Flood Hazard Identification Program) guidelines and the study Terms of Reference.

The floodway in previously unmapped areas is delineated primarily as the area of highest hazard, defined where flood depths are 1 m or deeper or where local flow velocities are 1 m/s or higher. Areas of higher hazard that fall outside of the floodway zone (defined primarily by flood depth and local flow velocity) can be identified within the flood fringe zone, and referred to as “high hazard flood fringe” areas. Dedicated flood control structures are assumed to be effective and protected areas are not mapped as flooded, unless these structures are overtopped. In addition, flood hazard maps prepared include incremental areas at risk of flooding for the 200-year and 500-year open water floods.

The study area includes the river reaches summarized in Table i.

Table i: Study Area River Reaches

River	Reach Description	Length
Highwood River	A location upstream of Longview to its confluence with Bow River	93 km
Little Bow River	An overland flow area south of High River to a location approximately 2 km downstream of Highway 2	14 km

The main results of the design flood hazard mapping component are delineation of the floodway, high hazard flood and flood fringe zones, definition of the floodway limit stations and governing criteria at individual model cross sections, and determination of the design flood profile and design flood water levels.



The following residential, commercial and industrial areas are in the floodway:

Highwood River

- The residence on the right floodplain near cross section 262;
- Small low-lying areas on the right floodplain between Highwood Diversion Headgates and the upstream end of the Town of High River;
- Hoeh Dyke 2, Bews Dike, Baker Creek Dike 1, Baker Creek Dike 2, and Beachwood Dike;
- Low-lying areas in the Highwood Golf Course;
- The community on the left floodplain downstream of the Highway 2A Bridge;
- Low lying areas on the right floodplain west and northwest of the Town Dike;
- Small low-lying areas on the right floodplain north of the Little Bow Canal Dike;
- Low-lying areas on the left floodplain upstream of the Highway 543 Bridge;
- Natures Hideaway Campground; and
- The residence on the right floodplain near the Highwood River confluence.

Little Bow River

- Low lying areas of farmland south of 12 Avenue SW; and
- Residential area on the left floodplain between the 12th Avenue Culvert and 6th Street SE Bridge.

In addition, there are several golf courses and public parks in the floodway within the study area.

The high hazard flood fringe and flood fringe zones includes a large number of residential, commercial and industrial areas along the study reaches of Highwood River and Little Bow River.



Acknowledgements

Golder Associates Ltd. (Golder) acknowledges the contributions of the following staff of Alberta Environment and Parks (AEP):

- Mr. Jim Choles, AEP's project manager for the study, coordinated the participation from AEP, and provided technical advice and review comments on this report.
- Mr. Muhammad Durrani, AEP's project manager for the study, supplied the available and relevant information from AEP and provided technical advice and review comments on this report.
- Mr. Peter Onyshko, AEP's technical advisor for the study, provided technical review and overall technical guidance to the study.

The contributions of the following staff from Golder are acknowledged:

- Dr. Hua Zhang, Golder's project manager, was responsible for regular communications with AEP, and overseeing HEC-RAS modelling and flood hazard mapping as well as preparation of this report.
- Dr. Dejiang Long, project director and senior reviewer for this study, was responsible for providing senior inputs and review, quality control and assurance for the study, and reviewing this report.
- Mr. Jie Chen, a hydrodynamic modelling specialist and project engineer for this study, was responsible for conducting the HEC-RAS modelling, overseeing preparation of the flood hazard maps, and preparing this report.
- Mr. Amir Gharavi, Golder's hydrodynamic modelling specialist. He was responsible for the coupled 1D/2D HEC-RAS model setup and calibration as well as floodway delineation.
- Dr. Wolf Ploeger, Golder's senior reviewer. He was involved in the conceptual planning for the model setup and reviewed the modelling, mapping results and floodway delineation.
- Mr. Peter Thiede, a senior GIS specialist, was responsible for preparation of the flood hazard maps and provided inputs to this report.
- Mr. Sean Kurash, a GIS specialist, was involved with preparation of the flood hazard maps.



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Simulated Climate-Affected Flood Profiles and Water Levels

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1.0 INTRODUCTION

1.1 Study Objectives

Alberta Environment and Parks (AEP) commissioned Golder Associates Ltd. (Golder) in September 2015 to undertake the Highwood River Hazard Study. The primary purpose of the study is to assess and identify river and flood hazards along the Highwood River and the upper reach of the Little Bow River. The project stakeholders include the Government of Alberta, Foothills County, Town of High River, Village of Longview, and the public.

The study was conducted under the provincial Flood Hazard Identification Program (FHIP) Guidelines (AEP 2011), the goals of which include enhancement of public safety and reduction of future flood damages through the identification of river and flood hazards. The study consists of the following components: (i) Survey and Base Data Collection, (ii) Hydraulic Model Creation and Calibration, (iii) Open Water Flood Inundation Map Production, (iv) Open Water Flood Hazard Identification, (v) Governing Design Flood Hazard Map Production, (vi) Flood Risk Assessment and Inventory, and (vii) Channel Stability Investigation. The Design Flood Hazard Mapping is one of the key study components. A stand-alone report was prepared for each of these components.

This report summarizes the work of the design flood hazard mapping component of the Highwood River Hazard Study. The main task associated with this work involves defining a flood hazard area, composed of floodway and flood fringe zones, using floodway determination criteria and mapping standards outlined in the FHIP guidelines and the study Terms of Reference.

There is one previous FHIP study and mapping completed within the Highwood River study area (i.e., 1992 Highwood River Flood Risk Mapping Study by nhc). The floodway in previously unmapped areas is delineated primarily as the area of highest hazard, defined where flood depths are 1 m or deeper or where local flow velocities are 1 m/s or higher. Previously mapped floodways do not typically become larger, and can become smaller if deemed appropriate. Areas of higher hazard that fall outside of the floodway zone (defined primarily by flood depth and local flow velocity) can be identified within the flood fringe zone, and referred to as “high hazard flood fringe” areas.

Dedicated flood control structures are assumed to be effective and protected areas are not mapped as flooded unless these structures are overtopped. In addition, flood hazard maps will include incremental areas at risk of flooding for the 200-year and 500-year open water floods. The design flood hazard mapping component supports the associated flood risk assessment and inventory component of the overall project.

This report documents the methodology and results of the design flood hazard mapping component.



1.2 Study Area and Reaches

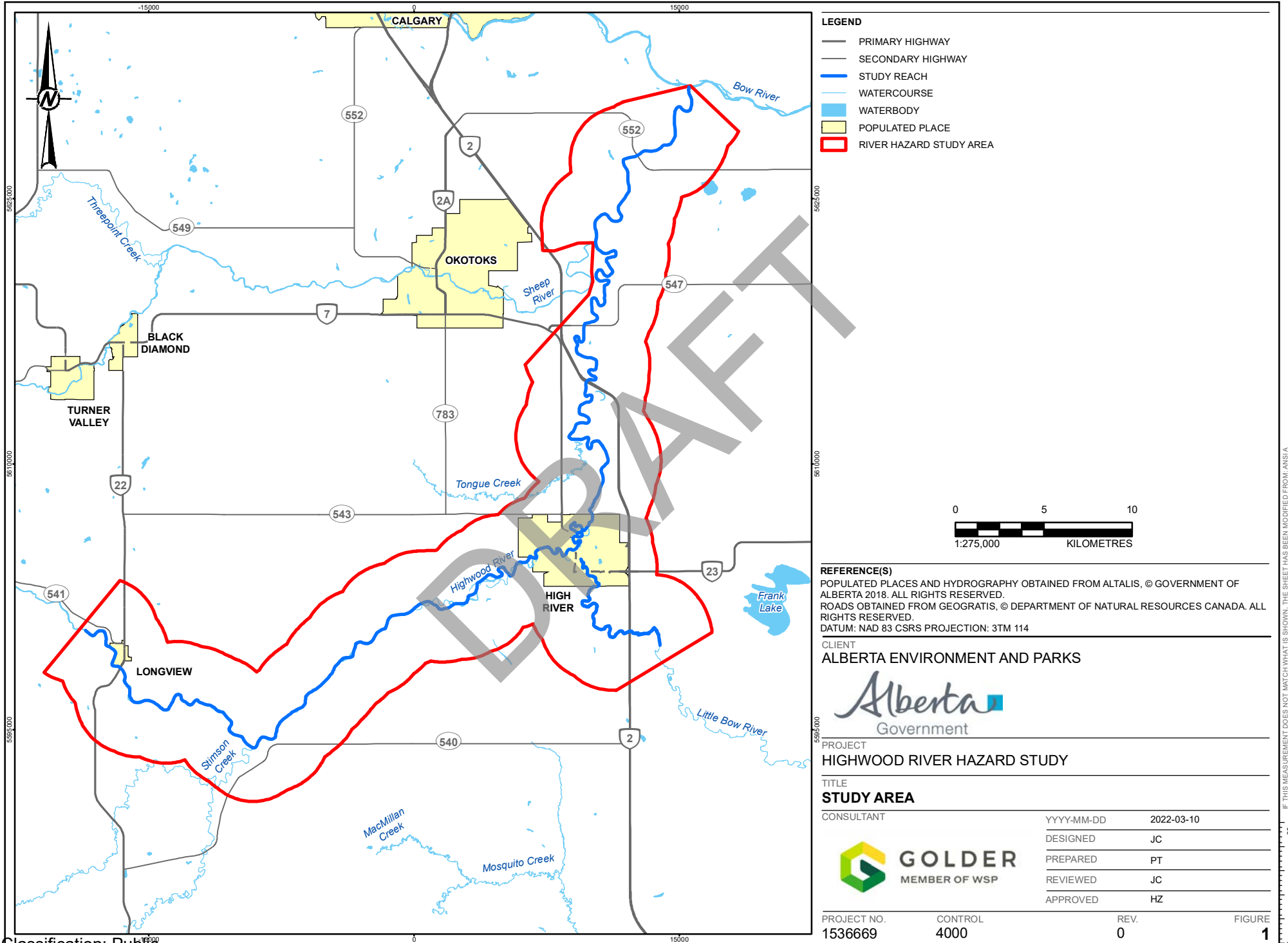
The study area includes approximately 93 km of the Highwood River reach and approximately 14 km of the Little Bow River reach as shown in Table 1 and Figure 1. The Highwood River study reach extends from a location upstream of Longview to its confluence with the Bow River. There are two major tributaries along the Highwood River study reach (i.e., Stimson Creek and Sheep River). The Little Bow River study reach extends from the overland flow area south of the Town of High River to a location approximately 2 km downstream of Highway 2.

The study area includes the communities of Village of Longview, Town of High River, and Municipal District of Foothills.

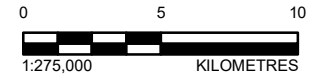
Table 1: River Reaches in the Study Area

River	Reach Description	Length
Highwood River	A location upstream of Longview to its confluence with Bow River	93 km
Little Bow River	An overland flow area south of High River to a location approximately 2 km downstream of Highway 2	14 km

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- LEGEND**
- PRIMARY HIGHWAY
 - SECONDARY HIGHWAY
 - STUDY REACH
 - WATERCOURSE
 - WATERBODY
 - POPULATED PLACE
 - RIVER HAZARD STUDY AREA



REFERENCE(S)
 POPULATED PLACES AND HYDROGRAPHY OBTAINED FROM ALTALIS, © GOVERNMENT OF ALBERTA 2018. ALL RIGHTS RESERVED.
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 DATUM: NAD 83 CSRS PROJECTION: 3TM 114

CLIENT
ALBERTA ENVIRONMENT AND PARKS



PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
STUDY AREA

CONSULTANT	YYYY-MM-DD	2022-03-10
DESIGNED	JC	
PREPARED	PT	
REVIEWED	JC	
APPROVED	HZ	

PROJECT NO. 1536669 CONTROL 4000 REV. 0 FIGURE 1



2.0 AVAILABLE DATA

2.1 Flood Hydrology

Table 2 provides a summary of the 100-year design flood flow estimates as well as the 200-year and 500-year flood flow estimates at key flow change locations used in this study. These estimates are the instantaneous flood peak discharges for the natural flow conditions, based on the Bow, Elbow, Highwood, and Sheep River Hydrology Assessment Report (Golder 2020), regional hydrologic analysis, and the analysis presented in the Hydraulic Model Creation and Calibration for the Highwood River Hazard Study (Golder 2023).

Table 2: Flood Flow Frequency Estimates at the Key Locations Used in the HEC-RAS Model

Location	River	HEC-RAS Cross Section	Flood Peak Discharges (m ³ /s)		
			100-year	200-year	500-year
Highwood River Upstream Boundary	Highwood River	93299	1,080	1,700	2,780
Highwood River downstream of Stimson Creek Confluence	Highwood River	77158	1,560	2,600	4,380
Highwood River downstream of Sheep River confluence	Highwood River	14239	2,009	2,960	4,412
Little Bow River	Little Bow River	2D Model Area	402	769	1,725

m³/s = cubic metres per second.

Flows for the overflow from the Highwood River to the Little Bow River and the subsequent Highwood River flows downstream of the overflow were calculated by the HEC-RAS program.

2.2 Survey and DTM Details

As per FHIP specifications, a digital terrain model (DTM) used to represent the floodplain topography must have a ±0.15 m minimum vertical accuracy, at 95% confidence.

AEP commissioned development of a new DTM based on the LiDAR data acquired in October 2015. Independent ground truth surveys were conducted for quality assurance and control. The accuracy of the new DTM along the Highwood River and Little Bow River was determined to be within ±0.15 m, at 95% confidence. A more detailed description of the LiDAR DTM data and survey data is provided in the Survey and Base Data Collection Report of the Highwood River Hazard Study (Golder 2017).

The aerial imagery of the study area was collected by GeodesyGroup Inc. on May 6, 2016. The imagery has a 30 cm Ground Sampling Distance (GSD) resolution and is delivered as 4-band orthophotos and stereo images. The deliverables include aerial triangulation data, metadata, camera calibration reports, flight report and an index of the aerial imagery tiles. The orthophotos were used as a base imagery in all open water flood inundation maps. A technical memorandum describing the 2016 aerial imagery acquisition is provided in Appendix E of the Survey and Base Data Collection Report prepared for this study (Golder 2017).

Topographic, control point, and shallow-water surveys were performed using Real-time Kinematic (RTK) GPS units for most cross sections along the Highwood River and Little Bow River. Bathymetric surveys were conducted at some cross sections of the Highwood River and Little Bow River using an Acoustic Doppler Profiler (ADP) in combination with a boat-mounted RTK unit where flow depths were too deep to wade. Bridge survey



data were collected using either a RTK or total station. The features surveyed as part of this project are summarized in Table 3.

Table 3: Summary of Survey Features

Features	Total Number for Each Study Reach	
	Highwood River	Little Bow River
Cross Sections - Main Channel (Side Channels)	856 (23)	138 (1)
Bridges and Culverts	11	8
Weirs	1	-
Dams	-	-
Flood Control Structures	11	-

More details of the DTM data, aerial imagery and survey data collection are provided in the Survey and Base Data Collection report (Golder 2017).

Three flood control structures (Southwest Dike, 5th Street Dike North and South) have been constructed since the completion of the survey and base data collection. These new dikes were included in the hydraulic modelling and mapping analyses. The details for Southwest Dike, 5 Street Dike North and South were provided by Advisian on behalf of the Town of High River.

2.3 HEC-RAS Model

A coupled one/two-dimensional (1D/2D) hydraulic model was created for the study area using HEC-RAS (Version 5.0.7) based on the post-dike conditions in the Town of High River area. The model was calibrated for both low and high flow conditions using the recorded flow and water level data and surveyed highwater marks. Model parameters based on the high flow calibration were used to calculate flood profiles for the 2-, 5-, 10-, 20-, 35-, 50-, 75-, 100-, 200-, 350-, 500-, 750-, and 1,000-year open water floods. A detailed description of the model is provided in the Hydraulic Model Creation and Calibration Report prepared for this study (Golder 2023).



3.0 DESIGN FLOOD HAZARD DETERMINATION

3.1 Design Flood Details

The 100-year open water flood was selected as the design flood throughout the study area, in accordance with provincial FHIP guidelines (AEP 2011). The design flood water levels are the same as the open water 100-year flood water level throughout the study area.

3.2 Floodway and Flood Fringe Terminology

The flood hazard area is the area of land that will be flooded during the design flood event. The flood hazard area is typically divided into two zones: floodway and flood fringe. Flood hazard maps can also show additional flood hazard information, including areas of high hazard within the flood fringe and incremental areas at risk for more severe floods such as the 200-year and 500-year floods. Flood hazard mapping is typically used for long-term flood hazard area management and land-use planning. The floodway and flood fringe zones are defined as follows:

- **Floodway:** When a floodway is first defined on a flood hazard map, it typically represents the area of highest flood hazard where flows are deepest, fastest, and most destructive during the 100-year design flood. The floodway generally includes areas where the water is 1 m deep or greater and the local velocities are 1 m/s or faster. The floodway typically includes the main channel of a stream and a portion of the adjacent overbank area. Previously mapped floodways do not typically become larger when a flood hazard map is updated, even if the flood hazard area gets larger or design flood levels get higher.
- **Flood Fringe:** The flood fringe is the portion of the flood hazard area outside of the floodway. The flood fringe typically represents areas with shallower (less than 1 m deep), slower (less than 1 m/s velocity), and less destructive flooding during the 100-year design flood. However, areas with deep or fast moving water may also be identified as high hazard flood fringe within the flood fringe. Areas at risk behind flood berms may also be mapped as protected flood fringe areas. Floodway Determination Criteria

In areas being mapped for the first time, the floodway typically represents the area of highest hazard where flows are deepest, fastest, and most destructive during the design flood. The following criteria, based on those described in the current FHIP guidelines, are used to delineate the floodway in such cases:

- Areas in which the depth of water exceeds 1 m or the flow velocities are greater than 1 m/s shall be part of the floodway.
- Exceptions may be made for small backwater areas, ineffective flow areas, and to support creation of a hydraulically smooth floodway.
- For reaches of supercritical flow, the floodway boundary should correspond to the edge of inundation or the main channel, whichever is larger.

When a flood hazard map is updated, an existing floodway will not change in most circumstances. Exceptions to this would be: (1) a floodway could get larger if a main channel shifts outside of a previously-defined floodway or (2) a floodway could get smaller if an area of previously-defined floodway is no longer flooded by the design flood.

Areas of deeper or faster moving water outside of the floodway are identified as high hazard flood fringe. These high hazard flood fringe zones are identified in all areas, whether they are newly-mapped or have an existing floodway.



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

- The depth and velocity criteria used to define high hazard flood fringe zones will be aligned with the 1 m depth and 1 m/s velocity floodway determination criteria for newly-mapped areas.
- All areas protected by dedicated flood berms that are not overtopped during the design flood are excluded from the floodway. Areas behind flood berms will still be mapped as flooded if they are overtopped, but areas at risk of flooding behind dedicated flood berms that are not overtopped will be mapped as a protected flood fringe zone.

The floodway determination criteria for the left and right floodway limits at each cross section are provided together with the design flood levels in Table 4 (Highwood River), and Table 5 (Side Channels).

3.3 Design Flood Profile

The open water levels for the design flood were predicted using the HEC-RAS model. The open water design flood profile information is provided in Table 4 (Highwood River) and Table 5 (Side Channels).

Table 4: Floodway Limit Stations and Governing Criteria – Highwood River

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	US To Rge300	93,299	1203.64	17.22	66.16	Inundation Limit ⁽¹⁾	1 m Depth Criteria
Highwood River	US To Rge300	93,213	1203.40	10.19	73.89	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	93,134	1202.74	11.53	82.77	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	93,053	1202.30	12.07	83.23	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	92,974	1201.94	9.71	91.35	1 m/s Velocity Criteria	Mixed
Highwood River	US To Rge300	92,894	1201.42	49.68	119.48	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	92,813	1201.37	90.23	185.89	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	92,741	1200.77	89.41	178.78	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	92,650	1200.35	112.70	183.00	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	92,571	1200.14	78.66	150.13	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	92,489	1199.80	37.76	108.07	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	92,410	1199.47	17.88	97.11	Mixed	1 m Depth Criteria
Highwood River	US To Rge300	92,330	1199.29	9.29	92.46	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	92,244	1198.81	10.16	86.25	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	92,161	1198.69	12.29	97.00	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	92,077	1198.42	6.77	103.33	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	91,990	1197.74	17.03	112.62	1 m Depth Criteria	1 m/s Velocity Criteria



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	US To Rge300	91,905	1197.46	13.67	117.87	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	91,820	1196.72	18.32	138.00	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	91,738	1196.17	25.97	169.74	Mixed	1 m Depth Criteria
Highwood River	US To Rge300	91,655	1196.04	30.07	178.09	Main Channel ⁽²⁾	1 m Depth Criteria
Highwood River	US To Rge300	91,576	1195.79	29.38	148.91	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	91,495	1195.25	10.03	98.95	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	91,415	1195.11	48.19	152.09	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	91,334	1194.98	26.50	133.04	1 m/s Velocity Criteria	Main Channel ⁽²⁾
Highwood River	US To Rge300	91,254	1194.62	35.81	129.99	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	91,171	1194.57	80.62	180.73	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	91,109	1194.27	89.99	187.27	1 m Depth Criteria	Mixed
Highwood River	US To Rge300	91,066	1193.75	87.14	161.59	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	91,006	1193.18	84.34	154.23	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	90,920	1192.97	87.08	177.77	Mixed	1 m/s Velocity Criteria
Highwood River	US To Rge300	90,844	1192.64	48.77	172.58	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	90,763	1192.48	21.09	158.31	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	90,699	1192.36	30.51	159.68	1 m Depth Criteria	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	90,602	1192.21	26.12	133.55	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	90,506	1191.91	17.33	119.28	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	90,436	1191.70	7.93	113.33	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	90,331	1190.89	12.03	94.25	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	90,254	1190.49	8.39	97.34	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	90,172	1190.12	11.73	108.33	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	90,091	1189.54	11.06	116.88	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	90,012	1189.41	10.59	123.96	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	89,930	1189.24	70.67	185.07	Main Channel ⁽²⁾	1 m Depth Criteria



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	US To Rge300	89,832	1188.76	115.26	226.49	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	89,743	1188.51	124.14	249.71	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	89,616	1188.20	141.50	247.21	1 m Depth Criteria	Main Channel ⁽²⁾
Highwood River	US To Rge300	89,513	1187.99	35.52	209.92	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	89,433	1188.01	42.24	221.94	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	89,353	1187.99	15.18	220.54	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	89,280	1187.97	13.50	229.42	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	89,185	1187.86	42.55	271.11	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	89,104	1185.28	37.66	99.77	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	89,026	1185.26	25.24	169.07	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	88,944	1184.72	16.77	132.90	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	88,864	1184.62	17.57	154.63	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	88,782	1184.13	25.29	167.27	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	88,703	1183.81	15.10	158.63	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	88,622	1183.49	17.04	158.59	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	88,557	1183.07	11.17	174.20	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	88,459	1182.46	76.37	236.48	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	88,377	1182.46	122.33	325.41	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	88,305	1182.37	131.04	288.04	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	88,225	1182.13	145.43	273.94	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	88,164	1181.95	167.74	283.39	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	88,061	1181.25	167.30	263.18	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	87,984	1180.71	119.47	247.70	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	87,904	1180.27	73.93	250.31	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	87,844	1180.15	14.61	233.78	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	87,743	1180.12	23.04	238.83	1 m Depth Criteria	1 m Depth Criteria



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	US To Rge300	87,661	1179.91	15.11	185.26	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	87,494	1178.57	24.57	147.07	Main Channel ⁽²⁾	1 m/s Velocity Criteria
Highwood River	US To Rge300	87,405	1177.98	25.93	178.69	1 m Depth Criteria	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	87,332	1177.63	46.03	195.58	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	87,282	1177.46	62.40	228.01	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	87,245	1177.40	66.00	257.64	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	87,171	1177.21	77.75	267.09	1 m/s Velocity Criteria	Mixed
Highwood River	US To Rge300	87,143	1176.86	78.57	214.92	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	87,069	1176.66	85.57	196.91	1 m/s Velocity Criteria	Main Channel ⁽²⁾
Highwood River	US To Rge300	86,950	1176.11	153.62	249.11	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	86,863	1175.84	151.60	298.21	Mixed	1 m Depth Criteria
Highwood River	US To Rge300	86,764	1175.26	172.66	346.02	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	86,698	1175.07	177.51	348.78	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	86,596	1174.67	157.89	314.25	Inundation Limit ⁽¹⁾	1 m Depth Criteria
Highwood River	US To Rge300	86,441	1173.75	71.49	224.63	Inundation Limit ⁽¹⁾	1 m Depth Criteria
Highwood River	US To Rge300	86,332	1173.22	51.61	198.46	Inundation Limit ⁽¹⁾	1 m Depth Criteria
Highwood River	US To Rge300	86,228	1172.78	29.18	252.79	Inundation Limit ⁽¹⁾	1 m Depth Criteria
Highwood River	US To Rge300	86,151	1172.59	20.79	259.39	Inundation Limit ⁽¹⁾	1 m Depth Criteria
Highwood River	US To Rge300	86,051	1172.27	15.70	236.75	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	85,946	1171.75	22.95	203.29	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	85,869	1171.45	26.30	195.57	Main Channel ⁽²⁾	1 m/s Velocity Criteria
Highwood River	US To Rge300	85,807	1171.29	26.98	183.90	Main Channel ⁽²⁾	1 m/s Velocity Criteria
Highwood River	US To Rge300	85,706	1170.98	39.75	185.18	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	85,603	1170.65	16.41	122.37	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	85,501	1170.21	24.05	114.49	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	85,380	1169.40	21.93	107.03	1 m/s Velocity Criteria	1 m/s Velocity Criteria



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	US To Rge300	85,291	1169.14	52.44	151.57	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	85,175	1168.60	82.27	239.87	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	85,081	1168.19	140.61	288.27	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	84,963	1167.93	193.34	320.63	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	84,862	1167.65	224.37	341.98	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	84,795	1167.38	225.82	335.72	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	84,709	1166.77	234.19	333.70	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	84,576	1165.61	201.16	282.95	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	84,513	1165.39	158.39	250.82	1 m/s Velocity Criteria	Main Channel ⁽²⁾
Highwood River	US To Rge300	84,431	1164.96	118.17	225.23	1 m/s Velocity Criteria	Main Channel ⁽²⁾
Highwood River	US To Rge300	84,350	1164.79	74.68	194.77	1 m Depth Criteria	Main Channel ⁽²⁾
Highwood River	US To Rge300	84,284	1164.71	29.43	160.97	1 m Depth Criteria	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	84,201	1164.42	30.14	119.96	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	84,124	1163.98	29.43	102.66	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	84,042	1163.04	32.75	106.20	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	83,952	1162.73	59.53	141.00	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	83,924	1162.88	66.15	151.12	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	83,868	1162.43	69.49	143.06	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	83,808	1161.84	36.59	103.76	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	83,731	1161.88	21.56	101.74	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	83,645	1161.03	16.77	85.46	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	83,564	1160.59	15.97	83.82	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	83,479	1160.51	19.19	113.02	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	83,376	1159.77	15.14	86.66	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	83,292	1158.87	26.86	105.73	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	83,217	1158.35	50.65	159.25	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	US To Rge300	83,161	1158.38	58.54	170.36	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	83,080	1158.03	45.33	147.60	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	82,996	1157.38	23.62	88.78	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	82,917	1156.60	20.41	87.17	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	82,837	1156.47	19.61	101.31	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	82,757	1156.33	43.80	122.45	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	82,673	1155.99	76.12	150.38	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	82,591	1155.84	86.39	181.94	1 m/s Velocity Criteria	Main Channel ⁽²⁾
Highwood River	US To Rge300	82,479	1154.86	93.74	173.70	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	82,396	1154.14	58.02	134.30	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	82,319	1153.91	51.49	147.93	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	82,246	1153.72	50.94	161.72	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	82,176	1153.37	73.21	199.67	Inundation Limit ⁽¹⁾	1 m Depth Criteria
Highwood River	US To Rge300	82,094	1153.28	55.01	191.86	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	82,042	1153.19	12.30	144.92	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	81,910	1152.19	20.45	89.19	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	81,860	1152.14	31.03	113.83	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	81,790	1152.10	31.93	137.42	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	81,694	1151.87	24.70	145.20	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	81,604	1151.34	27.52	136.74	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	81,529	1150.87	32.45	131.26	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	81,445	1150.52	33.84	143.23	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	81,368	1150.25	67.91	208.26	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	81,282	1149.82	83.32	240.20	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	81,209	1149.49	94.24	244.22	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	81,115	1148.88	82.72	231.50	1 m/s Velocity Criteria	1 m/s Velocity Criteria



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	US To Rge300	81,027	1148.55	100.19	248.76	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	80,947	1148.29	113.30	270.89	Mixed	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	80,871	1147.98	91.59	237.51	1 m Depth Criteria	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	80,815	1147.82	91.95	228.23	1 m Depth Criteria	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	80,733	1147.41	83.16	209.55	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	80,649	1147.19	49.66	197.68	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	80,568	1147.07	24.79	185.69	Main Channel ⁽²⁾	1 m Depth Criteria
Highwood River	US To Rge300	80,505	1146.84	16.97	150.45	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	80,415	1146.51	26.50	158.21	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	80,329	1145.77	26.85	175.67	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	80,245	1145.38	31.03	184.92	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	80,133	1144.77	71.16	210.87	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	80,030	1144.47	94.62	216.60	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	79,930	1143.88	35.90	200.15	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	79,859	1143.31	115.57	257.58	Inundation Limit ⁽³⁾	1 m/s Velocity Criteria
Highwood River	US To Rge300	79,771	1143.15	116.47	275.28	Inundation Limit ⁽³⁾	1 m Depth Criteria
Highwood River	US To Rge300	79,727	1143.10	114.05	271.05	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	79,686	1143.03	93.70	256.05	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	79,622	1142.89	60.24	219.89	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	79,525	1142.41	9.88	166.93	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	79,438	1142.08	18.26	151.06	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	79,341	1141.62	19.30	111.29	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	79,288	1141.05	14.74	97.61	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	79,240	1141.08	22.57	99.44	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	79,206	1140.97	29.46	105.19	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	79,119	1140.90	62.87	153.43	1 m Depth Criteria	1 m Depth Criteria



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	US To Rge300	79,029	1140.15	74.77	149.25	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	78,948	1139.36	95.19	158.17	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	78,869	1139.03	124.46	199.15	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	78,788	1138.93	125.56	206.63	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	78,706	1138.46	87.55	164.38	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	78,627	1138.02	61.52	139.76	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	78,548	1137.64	39.77	119.14	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	78,514	1137.42	43.00	127.68	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	78,469	1137.03	54.03	138.42	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	78,389	1136.44	77.64	164.32	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	78,310	1136.24	69.15	189.29	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	78,229	1136.22	20.71	165.25	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	78,142	1136.04	4.18	138.68	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	78,050	1135.64	4.99	97.90	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	77,982	1135.05	7.78	80.78	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	77,902	1134.96	14.61	101.99	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	77,821	1134.71	26.07	115.28	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	77,741	1134.50	55.33	136.95	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	77,660	1133.85	79.67	147.77	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	77,580	1133.73	105.85	176.13	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	77,499	1133.53	132.57	207.19	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	77,420	1133.51	161.37	250.98	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	77,344	1133.54	178.84	287.14	Mixed	1 m Depth Criteria
Highwood River	US To Rge300	77,280	1133.63	168.01	302.83	Mixed	Mixed
Highwood River	US To Rge300	77,158	1133.35	150.28	300.92	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	77,031	1131.86	166.09	283.58	Mixed	1 m Depth Criteria



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	US To Rge300	76,909	1131.47	126.08	229.46	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	76,784	1131.34	65.65	218.98	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	76,669	1130.64	103.62	235.12	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	76,542	1129.88	136.99	224.70	Interior Boundary	Interior Boundary
Highwood River	US To Rge300	76,418	1129.93	78.63	214.09	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	76,237	1128.73	10.74	96.83	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	76,119	1128.14	15.53	106.88	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	76,000	1127.95	42.69	179.67	1 m/s Velocity Criteria	Main Channel ⁽²⁾
Highwood River	US To Rge300	75,892	1127.92	116.54	268.38	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	75,734	1126.84	167.60	263.47	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	75,653	1126.55	203.01	316.96	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	75,521	1126.39	238.82	373.28	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	75,416	1126.11	231.24	360.62	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	75,255	1124.79	225.04	323.33	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	75,126	1124.65	131.78	269.10	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	74,995	1124.28	89.09	228.51	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	74,874	1123.82	59.57	204.20	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	74,756	1123.45	15.29	132.44	1 m Depth Criteria	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	74,632	1122.83	11.06	101.91	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	74,512	1122.53	13.48	101.95	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	74,386	1121.55	15.00	112.41	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	74,269	1121.08	11.86	130.33	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	74,145	1120.79	17.44	141.56	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	74,025	1120.51	16.11	164.78	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	73,904	1120.11	17.73	154.98	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	73,792	1119.87	15.52	147.68	Inundation Limit ⁽¹⁾	1 m Depth Criteria



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	US To Rge300	73,667	1118.54	22.42	141.68	Inundation Limit ⁽¹⁾	1 m/s Velocity Criteria
Highwood River	US To Rge300	73,547	1118.13	26.44	157.84	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	73,427	1117.99	67.13	249.76	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	73,314	1117.40	171.70	337.70	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	73,179	1117.12	102.82	246.78	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	72,951	1116.29	128.70	289.93	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	72,808	1115.82	160.20	333.06	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	72,688	1115.30	165.85	337.32	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	72,566	1114.31	195.96	280.30	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	72,434	1114.47	86.20	202.18	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	72,212	1113.33	11.96	104.44	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	72,089	1112.82	9.24	104.24	Inundation Limit ⁽¹⁾	1 m/s Velocity Criteria
Highwood River	US To Rge300	71,980	1112.14	11.07	94.11	Inundation Limit ⁽¹⁾	1 m/s Velocity Criteria
Highwood River	US To Rge300	71,855	1111.21	15.28	111.63	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	71,725	1110.92	59.25	205.47	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	71,606	1110.68	93.37	261.75	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	71,475	1110.40	141.35	280.58	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	71,365	1109.76	148.72	246.92	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	71,240	1109.26	163.82	267.04	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	71,120	1108.92	159.34	275.38	Inundation Limit ⁽¹⁾	Mixed
Highwood River	US To Rge300	70,999	1108.41	108.47	248.23	Inundation Limit ⁽¹⁾	Mixed
Highwood River	US To Rge300	70,882	1107.74	130.69	242.02	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	70,765	1107.24	161.23	262.06	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	70,646	1107.02	159.65	276.63	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	70,523	1106.47	46.21	238.42	Mixed	1 m Depth Criteria
Highwood River	US To Rge300	70,376	1106.21	12.76	254.38	Inundation Limit ⁽³⁾	1 m/s Velocity Criteria



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	US To Rge300	70,276	1105.80	12.72	236.59	Inundation Limit ⁽³⁾	1 m/s Velocity Criteria
Highwood River	US To Rge300	70,165	1105.57	13.67	248.97	Inundation Limit ⁽³⁾	1 m/s Velocity Criteria
Highwood River	US To Rge300	70,039	1105.07	11.64	185.48	Inundation Limit ⁽³⁾	1 m/s Velocity Criteria
Highwood River	US To Rge300	69,918	1104.79	9.33	139.57	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	69,793	1104.06	24.98	160.23	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	69,671	1103.52	24.36	191.40	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	69,553	1103.03	18.31	201.72	1 m/s Velocity Criteria	Mixed
Highwood River	US To Rge300	69,442	1102.49	12.04	227.16	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	69,304	1101.94	19.62	266.21	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	69,160	1101.35	32.89	372.71	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	69,022	1100.79	55.35	502.13	Mixed	1 m Depth Criteria
Highwood River	US To Rge300	68,903	1100.37	28.30	517.96	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	68,783	1100.03	41.72	448.17	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	68,669	1099.73	28.03	334.47	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	68,543	1098.94	36.30	264.05	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	68,426	1098.37	66.13	272.62	Mixed	Inundation Limit ⁽¹⁾
Highwood River	US To Rge300	68,310	1098.02	92.57	306.19	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	68,186	1097.40	106.92	373.11	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	68,072	1096.96	139.47	425.55	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	67,947	1096.83	182.55	460.60	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	67,819	1096.15	246.60	488.73	Inundation Limit ⁽¹⁾	1 m/s Velocity Criteria
Highwood River	US To Rge300	67,704	1095.92	277.81	539.78	Inundation Limit ⁽¹⁾	1 m Depth Criteria
Highwood River	US To Rge300	67,577	1095.18	405.47	636.36	Inundation Limit ⁽¹⁾	1 m Depth Criteria
Highwood River	US To Rge300	67,445	1094.51	411.54	665.48	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	67,341	1094.24	542.71	797.96	1 m Depth Criteria	Mixed
Highwood River	US To Rge300	67,214	1094.01	573.75	845.23	1 m Depth Criteria	1 m Depth Criteria



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	US To Rge300	67,180	1093.85	559.64	835.37	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	67,093	1093.58	546.22	865.48	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	66,967	1093.17	503.29	854.49	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	66,849	1092.65	486.76	835.31	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	66,720	1092.20	469.02	778.51	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	66,586	1091.50	505.71	754.71	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	66,480	1091.03	552.63	751.27	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	66,349	1090.60	553.95	744.27	1 m Depth Criteria	Main Channel ⁽²⁾
Highwood River	US To Rge300	66,225	1089.94	540.54	721.43	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	66,094	1089.40	537.15	792.70	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	65,971	1088.97	569.15	809.66	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	65,847	1088.51	535.89	793.58	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	65,706	1088.19	464.58	784.08	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	65,583	1087.99	424.50	807.64	1 m Depth Criteria	Mixed
Highwood River	US To Rge300	65,459	1087.42	354.09	800.27	1 m Depth Criteria	Mixed
Highwood River	US To Rge300	65,340	1087.12	233.88	783.82	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	65,217	1086.94	173.52	817.06	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	65,074	1086.34	218.11	825.36	Inundation Limit ⁽¹⁾	Mixed
Highwood River	US To Rge300	64,963	1085.75	192.38	843.62	Inundation Limit ⁽¹⁾	Mixed
Highwood River	US To Rge300	64,837	1085.17	162.03	799.60	Inundation Limit ⁽¹⁾	1 m Depth Criteria
Highwood River	US To Rge300	64,717	1084.82	213.05	815.60	Inundation Limit ⁽¹⁾	1 m Depth Criteria
Highwood River	US To Rge300	64,597	1084.34	236.29	779.51	Mixed	1 m Depth Criteria
Highwood River	US To Rge300	64,473	1083.84	210.70	773.11	Inundation Limit ⁽³⁾	1 m/s Velocity Criteria
Highwood River	US To Rge300	64,352	1083.43	192.22	681.78	Inundation Limit ⁽³⁾	Mixed
Highwood River	US To Rge300	64,227	1082.95	105.77	581.64	Inundation Limit ⁽³⁾	1 m Depth Criteria
Highwood River	US To Rge300	64,123	1082.42	23.61	451.53	1 m Depth Criteria	1 m Depth Criteria



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	US To Rge300	63,988	1081.86	42.70	444.57	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	US To Rge300	63,856	1081.42	39.98	483.77	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	63,775	1081.20	20.50	494.60	1 m/s Velocity Criteria	Mixed
Highwood River	US To Rge300	63,655	1080.92	22.84	395.82	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	63,558	1080.55	23.86	334.20	1 m Depth Criteria	1 m Depth Criteria
Highwood River	US To Rge300	63,427	1080.09	14.31	408.39	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	63,304	1079.76	10.97	365.83	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	63,177	1079.13	9.80	345.73	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	US To Rge300	63,057	1078.69	6.70	290.11	Main Channel ⁽²⁾	Previous Floodway
Highwood River	US To Rge300	62,934	1078.43	12.22	449.74	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	US To Rge300	62,822	1078.16	11.46	519.57	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	US To Rge300	62,696	1077.57	32.19	574.99	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	US To Rge300	62,576	1076.74	11.33	580.34	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	US To Rge300	62,527	1076.51	10.73	583.83	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	US To Rge300	62,493	1076.34	16.39	600.78	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	US To Rge300	62,397	1075.94	38.41	616.42	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	Rge300 To Rge295	62,349	1075.94	110.99	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁵⁾
Highwood River	Rge300 To Rge295	62,171	1075.29	116.28	-	Previous Floodway	No Floodway Line ⁽⁵⁾
Highwood River	Rge300 To Rge295	62,052	1074.88	145.89	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁵⁾
Highwood River	Rge300 To Rge295	61,918	1073.93	270.91	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁵⁾
Highwood River	Rge300 To Rge295	61,796	1073.56	432.38	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁵⁾
Highwood River	Rge300 To Rge295	61,637	1073.52	435.73	-	Previous Floodway	No Floodway Line ⁽⁵⁾
Highwood River	Rge300 To Rge295	61,540	1073.42	444.55	-	Previous Floodway	No Floodway Line ⁽⁵⁾
Highwood River	Rge300 To Rge295	61,409	1073.19	449.95	-	Previous Floodway	No Floodway Line ⁽⁵⁾
Highwood River	Rge300 To Rge295	61,284	1072.88	460.27	-	Inundation Limit ⁽⁶⁾	No Floodway Line ⁽⁵⁾
Highwood River	Rge300 To Rge295	61,165	1072.30	505.68	-	Inundation Limit ⁽⁶⁾	No Floodway Line ⁽⁵⁾



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	Rge300 To Rge295	61,055	1071.93	529.13	-	Previous Floodway	No Floodway Line ⁽⁵⁾
Highwood River	Rge300 To Rge295	61,004	1071.82	522.29	-	Previous Floodway	No Floodway Line ⁽⁵⁾
Highwood River	Rge300 To Rge295	60,900	1071.64	529.64	-	Previous Floodway	No Floodway Line ⁽⁵⁾
Highwood River	Rge300 To Rge295	60,757	1071.05	429.63	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁵⁾
Highwood River	Rge300 To Rge295	60,634	1070.53	423.77	-	Previous Floodway	No Floodway Line ⁽⁵⁾
Highwood River	Rge300 To Rge295	60,457	1070.06	435.62	-	Previous Floodway	No Floodway Line ⁽⁵⁾
Highwood River	Rge300 To Rge295	60,325	1069.90	462.09	-	Previous Floodway	No Floodway Line ⁽⁵⁾
Highwood River	Rge300 To Rge295	60,222	1069.78	493.29	-	Previous Floodway	No Floodway Line ⁽⁵⁾
Highwood River	Rge300 To Rge295	60,131	1069.68	563.66	-	Previous Floodway	No Floodway Line ⁽⁵⁾
Highwood River	LitBowToDS	60,061	1069.68	583.05	1083.70	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	59,984	1069.44	624.27	1102.74	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	59,857	1068.72	659.67	1223.77	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	59,699	1067.95	683.16	1317.88	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	59,610	1067.59	673.41	1363.50	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	59,507	1067.24	675.78	1372.80	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	59,429	1067.02	679.13	1349.10	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	59,319	1066.48	667.22	1305.02	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	59,236	1066.09	654.83	1345.98	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	59,145	1065.82	660.29	1404.33	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	59,012	1065.39	653.06	1491.78	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	58,892	1065.07	608.09	1479.57	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	58,788	1064.74	612.27	1466.55	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	58,674	1064.52	569.92	1557.07	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	58,493	1063.39	569.87	1618.86	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	58,376	1062.90	567.87	1860.10	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	58,336	1062.80	578.67	1880.34	Previous Floodway	Previous Floodway



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	LitBowToDS	58,246	1062.66	622.96	1889.78	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	58,206	1062.41	723.50	1990.16	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	58,153	1062.22	771.56	2061.68	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	58,050	1061.93	728.11	2082.48	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	57,934	1061.66	722.34	2064.45	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	57,862	1061.58	732.60	2056.03	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	57,785	1061.39	660.73	1980.58	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	57,690	1061.09	602.90	-	Inundation Limit ⁽¹⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	57,522	1060.44	572.67	-	Inundation Limit ⁽¹⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	57,448	1060.13	668.21	-	Inundation Limit ⁽¹⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	57,343	1059.74	665.42	-	Inundation Limit ⁽¹⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	57,256	1059.30	636.72	-	Inundation Limit ⁽¹⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	57,184	1058.87	596.12	-	Inundation Limit ⁽¹⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	57,085	1058.54	557.32	-	Inundation Limit ⁽¹⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	56,968	1058.18	551.83	-	Inundation Limit ⁽¹⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	56,885	1057.99	535.77	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	56,804	1057.79	598.59	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	56,734	1057.63	665.66	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	56,685	1057.45	697.61	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	56,565	1056.92	736.38	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	56,402	1056.28	878.12	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	56,282	1055.88	972.84	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	56,142	1055.40	920.68	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	55,969	1055.00	863.80	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	55,840	1054.84	731.04	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	55,743	1054.80	676.97	-	Previous Floodway	No Floodway Line ⁽⁷⁾



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	LitBowToDS	55,580	1054.51	445.38	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	55,417	1054.12	307.52	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	55,288	1053.74	234.43	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	55,225	1053.50	261.82	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	55,136	1053.32	400.73	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	55,093	1053.16	606.06	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	55,003	1052.98	628.27	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	54,884	1052.68	733.28	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	54,751	1052.50	790.18	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	54,603	1052.40	783.94	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	54,535	1052.11	777.55	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	54,407	1051.40	790.01	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	54,284	1051.22	689.18	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	54,162	1050.71	627.74	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	54,042	1050.29	558.22	-	Mixed	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	53,922	1049.87	509.02	-	Inundation Limit ⁽⁶⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	53,801	1049.56	398.68	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	53,681	1049.15	343.07	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	53,546	1048.77	281.96	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	53,468	1048.56	209.27	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	53,398	1048.39	200.43	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	53,315	1047.95	226.39	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	53,198	1047.45	361.13	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	53,136	1047.24	341.77	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	53,028	1046.85	351.30	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	52,946	1046.69	408.35	-	Inundation Limit ⁽⁶⁾	No Floodway Line ⁽⁷⁾



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	LitBowToDS	52,906	1046.58	453.97	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	52,814	1046.37	454.26	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	52,578	1045.95	728.69	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	52,499	1045.59	828.53	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	52,430	1045.23	957.25	-	Inundation Limit ⁽⁶⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	52,366	1045.15	1154.49	-	Inundation Limit ⁽⁶⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	52,254	1044.83	1139.88	-	Inundation Limit ⁽⁶⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	52,187	1044.68	1124.72	-	Inundation Limit ⁽⁶⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	52,094	1044.36	1058.31	-	Inundation Limit ⁽⁶⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	52,017	1044.19	931.63	-	Inundation Limit ⁽¹⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	51,933	1044.00	860.96	-	Inundation Limit ⁽¹⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	51,851	1043.78	792.02	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	51,774	1043.56	910.43	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	51,687	1043.26	868.01	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	51,607	1043.06	904.50	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	51,527	1042.83	665.56	-	Inundation Limit ⁽⁶⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	51,444	1042.68	605.60	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	51,363	1042.53	567.17	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	51,282	1042.42	534.61	-	Previous Floodway	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	51,206	1042.29	526.14	-	Inundation Limit ⁽⁶⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	51,124	1042.13	651.80	-	Inundation Limit ⁽⁶⁾	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	51,040	1041.88	940.30	1792.85	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	50,961	1041.65	961.95	1776.27	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	50,879	1041.42	993.22	1850.56	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	50,798	1041.24	989.69	1821.00	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	50,717	1041.12	968.57	1741.75	Previous Floodway	Previous Floodway



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	LitBowToDS	50,633	1041.03	971.91	1678.71	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	50,539	1040.93	971.48	1569.98	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	50,437	1040.83	988.81	1591.90	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	50,343	1040.71	1029.95	1658.18	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	50,243	1040.65	1284.96	1933.43	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	50,157	1040.57	1340.14	1910.02	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	50,077	1040.48	1418.54	1925.02	Main Channel ⁽⁴⁾	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	49,967	1040.24	1569.09	2015.62	Main Channel ⁽⁴⁾	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	49,884	1040.11	1607.17	2006.11	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	49,805	1040.03	1556.17	1897.31	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	49,724	1039.95	1379.04	1697.91	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	49,641	1039.91	1265.00	1601.38	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	49,552	1039.86	1242.01	1526.82	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	49,487	1039.78	1215.53	1462.28	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	49,399	1039.64	1204.48	1448.30	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	49,319	1039.51	1186.56	1408.13	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	49,234	1039.30	1163.12	1336.01	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	49,154	1039.22	1109.93	1271.71	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	49,075	1038.84	1019.50	1162.21	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	48,989	1038.60	992.01	1105.11	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	48,900	1038.57	667.50	1133.35	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	48,811	1038.36	588.29	1280.34	Inundation Limit ⁽⁶⁾	Previous Floodway
Highwood River	LitBowToDS	48,730	1038.07	587.45	1304.73	Inundation Limit ⁽⁶⁾	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	48,673	1038.02	585.47	1307.42	Inundation Limit ⁽⁶⁾	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	48,646	1038.00	569.38	1302.39	Inundation Limit ⁽⁶⁾	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	48,613	1037.90	560.77	1297.00	Inundation Limit ⁽⁶⁾	Inundation Limit ⁽⁶⁾



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	LitBowToDS	48,568	1037.78	551.04	1321.56	Inundation Limit ⁽⁶⁾	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	48,489	1037.65	551.57	1338.32	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	48,407	1037.48	513.04	1336.78	Inundation Limit ⁽⁶⁾	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	48,328	1037.14	16.48	848.58	Inundation Limit ⁽⁶⁾	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	48,246	1036.96	35.72	931.09	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	48,166	1036.92	36.77	1022.27	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	48,136	1036.91	38.05	1068.54	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	48,102	1036.88	38.20	1129.81	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	48,036	1036.85	39.23	1217.38	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	47,980	1036.83	41.72	1301.42	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	47,885	1036.82	45.80	1405.20	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	47,799	1036.80	46.42	1479.13	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	47,719	1036.78	49.44	1450.47	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	47,642	1036.76	253.17	1577.89	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	47,551	1036.71	262.77	1470.18	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	47,473	1036.64	77.98	1209.45	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	47,393	1036.54	91.58	1169.65	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	47,311	1036.41	115.55	1099.92	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	47,224	1036.28	115.73	1071.37	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	47,128	1036.14	160.61	1119.43	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	47,034	1036.08	174.96	1150.20	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	46,940	1036.02	181.72	1151.60	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	46,855	1035.95	185.29	1191.56	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	46,745	1035.87	185.81	1218.39	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	46,630	1035.80	203.95	1059.54	Inundation Limit ⁽⁶⁾	Previous Floodway
Highwood River	LitBowToDS	46,556	1035.77	200.14	1048.88	Previous Floodway	Previous Floodway



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	LitBowToDS	46,396	1035.74	202.55	1192.27	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	46,332	1035.74	203.08	1267.59	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	46,268	1035.74	205.54	1288.43	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	46,139	1035.72	193.19	1141.13	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	46,079	1035.71	190.08	1113.03	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	46,019	1035.69	191.25	1119.89	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	45,917	1035.67	169.33	1210.63	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	45,838	1035.66	160.06	1272.96	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	45,774	1035.64	250.25	1388.10	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	45,704	1035.63	457.30	1574.67	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	45,626	1035.61	549.57	1694.68	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	45,550	1035.60	676.89	1897.75	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	45,517	1035.59	567.23	1810.92	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	45,493	1035.59	520.79	1764.86	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	45,381	1035.58	476.81	1762.47	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	45,325	1035.58	478.11	1713.96	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	45,210	1035.56	510.85	1738.61	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	45,149	1035.55	603.30	1793.08	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	45,097	1035.55	598.55	1799.04	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	45,051	1035.54	602.21	1741.96	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	44,972	1035.54	606.29	1585.12	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	44,890	1035.53	612.97	1520.99	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	44,811	1035.52	620.89	1488.56	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	44,726	1035.51	653.92	1524.27	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	44,639	1035.51	405.24	1581.85	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	44,557	1035.50	373.16	1667.84	Previous Floodway	Previous Floodway



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	LitBowToDS	44,489	1035.50	365.79	1536.97	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	44,401	1035.50	360.98	1472.85	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	44,321	1035.50	356.75	1326.80	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	44,240	1035.49	351.52	1227.94	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	44,160	1035.48	342.91	1103.08	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	44,076	1035.47	340.22	958.64	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	44,014	1035.44	1359.95	1918.81	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	43,913	1035.39	1418.67	1923.78	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	43,840	1035.36	1547.50	1931.94	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	43,757	1035.34	1609.76	1924.98	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	43,668	1035.33	1504.57	1948.26	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	43,596	1035.29	1536.37	1934.57	Previous Floodway	Inundation Limit ⁽¹⁾
Highwood River	LitBowToDS	43,514	1035.24	1534.47	1921.44	Previous Floodway	Inundation Limit ⁽¹⁾
Highwood River	LitBowToDS	43,432	1035.20	1543.63	1904.75	Previous Floodway	Inundation Limit ⁽¹⁾
Highwood River	LitBowToDS	43,352	1035.14	1552.35	1864.89	Inundation Limit ⁽⁶⁾	Inundation Limit ⁽¹⁾
Highwood River	LitBowToDS	43,265	1035.07	1567.94	1844.10	Inundation Limit ⁽⁶⁾	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	43,187	1034.97	1595.21	1744.77	Inundation Limit ⁽⁶⁾	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	43,106	1034.66	1621.10	1727.04	Inundation Limit ⁽⁶⁾	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	43,071	1034.75	1579.58	1763.19	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	42,953	1034.75	1592.12	1754.38	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	42,817	1034.71	1642.47	1829.70	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	42,701	1034.62	1706.15	1853.36	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	42,579	1034.56	1760.09	1894.32	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	42,461	1034.45	1829.20	1951.87	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	42,343	1034.40	1887.36	2006.19	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	42,224	1034.41	1921.54	2045.71	Previous Floodway	Previous Floodway



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	LitBowToDS	42,105	1034.37	1985.57	2109.38	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	41,981	1034.34	2080.47	2219.05	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	41,873	1034.28	2114.08	2218.91	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	41,751	1034.22	2126.35	2239.10	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	41,635	1034.19	2132.37	2258.94	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	41,514	1034.15	2176.30	2299.11	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	41,394	1034.13	2210.11	2333.52	Previous Floodway	Interior Boundary
Highwood River	LitBowToDS	41,274	1034.11	2243.64	2367.35	Previous Floodway	Interior Boundary
Highwood River	LitBowToDS	41,158	1034.07	2257.79	2383.42	Previous Floodway	Interior Boundary
Highwood River	LitBowToDS	41,034	1034.01	2271.85	2386.05	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	40,914	1033.97	2268.20	2378.56	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	40,792	1033.92	2247.59	2363.07	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	40,670	1033.89	2236.68	2375.80	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	40,551	1033.84	2216.59	2335.02	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	40,435	1033.79	2278.00	2387.79	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	40,315	1033.74	2392.72	2510.04	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	40,197	1033.71	2553.43	2670.57	Interior Boundary	Previous Floodway
Highwood River	LitBowToDS	40,075	1033.68	2726.27	2844.05	Interior Boundary	Previous Floodway
Highwood River	LitBowToDS	39,957	1033.66	2856.36	2975.51	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	39,834	1033.63	2910.02	3028.30	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	39,714	1033.53	2955.25	3053.07	Previous Floodway	Interior Boundary
Highwood River	LitBowToDS	39,593	1033.48	2939.46	3042.44	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	39,473	1033.43	2880.00	2988.40	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	39,351	1033.36	2792.47	2901.45	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	39,233	1033.30	2737.58	2843.25	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	39,113	1033.19	2654.92	2767.58	Previous Floodway	Interior Boundary



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	LitBowToDS	38,993	1033.18	2644.24	2770.32	Previous Floodway	Interior Boundary
Highwood River	LitBowToDS	38,874	1033.18	2676.38	2819.06	Previous Floodway	Interior Boundary
Highwood River	LitBowToDS	38,755	1033.19	2718.07	2852.45	Previous Floodway	Interior Boundary
Highwood River	LitBowToDS	38,636	1033.17	2758.38	2866.44	Previous Floodway	Interior Boundary
Highwood River	LitBowToDS	38,520	1033.16	2761.21	2858.55	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	38,400	1033.13	2747.16	2837.81	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	38,280	1033.11	2647.71	2748.95	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	38,155	1033.09	2539.72	2658.79	Previous Floodway	Interior Boundary
Highwood River	LitBowToDS	38,028	1033.08	2490.22	2601.09	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	37,906	1033.08	2385.95	2460.65	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	37,787	1033.07	2124.27	2205.29	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	37,651	1033.05	1843.22	1921.47	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	37,528	1033.01	1804.94	1892.08	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	37,408	1032.97	1892.37	1997.97	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	37,287	1032.96	1982.53	2098.97	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	37,164	1032.92	2104.53	2282.64	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	37,027	1032.85	2189.52	2283.65	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	36,923	1032.76	2170.81	2234.21	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	36,804	1032.69	2069.78	2165.58	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	36,689	1032.61	1957.06	2046.24	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	36,574	1032.50	1839.09	1912.83	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	36,454	1032.47	1635.12	1705.88	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	36,334	1032.43	1347.40	1429.81	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	36,213	1032.47	1009.37	1080.68	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	36,045	1032.37	586.35	649.36	Main Channel ⁽⁴⁾	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	35,937	1032.32	381.39	455.30	Inundation Limit ⁽⁶⁾	Previous Floodway



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	LitBowToDS	35,813	1032.30	249.00	347.41	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	35,628	1032.26	253.14	363.18	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	35,479	1032.22	342.67	440.87	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	35,326	1032.18	392.26	507.79	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	35,176	1032.10	477.86	560.73	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	35,025	1032.05	528.05	630.29	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	34,879	1031.96	619.03	706.47	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	34,725	1031.92	731.78	826.89	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	34,574	1031.90	891.44	966.94	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	34,419	1031.88	964.53	1042.43	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	34,272	1031.85	1028.60	1132.04	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	34,119	1031.82	1084.94	1174.59	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	33,965	1031.79	1066.93	1154.76	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	33,809	1031.74	1003.83	1084.62	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	33,658	1031.71	859.93	946.29	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	33,504	1031.67	717.75	806.60	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	33,358	1031.60	524.58	593.37	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	33,207	1031.61	471.08	541.88	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	33,057	1031.48	411.86	490.50	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	32,909	1031.45	519.10	599.69	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	32,759	1031.41	692.34	764.56	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	32,608	1031.32	741.32	840.12	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	32,458	1031.31	727.09	932.13	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	32,323	1031.14	395.39	477.60	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	32,300	1030.77	397.13	483.66	Previous Floodway	Inundation Limit ⁽⁶⁾
Highwood River	LitBowToDS	32,155	1030.68	365.42	552.36	Previous Floodway	Main Channel ⁽⁴⁾



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	LitBowToDS	32,005	1030.67	419.00	566.37	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	31,846	1030.67	414.49	600.04	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	31,690	1030.68	349.46	479.96	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	31,541	1030.63	227.57	320.17	Inundation Limit ⁽⁶⁾	Previous Floodway
Highwood River	LitBowToDS	31,388	1030.61	286.74	423.43	Inundation Limit ⁽¹⁾	Previous Floodway
Highwood River	LitBowToDS	31,237	1030.52	289.23	467.37	Inundation Limit ⁽¹⁾	Previous Floodway
Highwood River	LitBowToDS	31,089	1030.49	297.23	411.21	Previous Floodway	Previous Floodway
Highwood River	LitBowToDS	30,936	1030.42	282.27	383.22	Previous Floodway	Main Channel ⁽⁴⁾
Highwood River	LitBowToDS	30,786	1030.28	353.88	420.59	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	30,714	1030.08	216.83	297.27	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	30,693	1029.50	213.47	291.50	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	30,639	1029.41	479.65	578.44	Main Channel ⁽⁴⁾	Previous Floodway
Highwood River	LitBowToDS	30,608	1029.24	151.27	-	Main Channel ⁽⁴⁾	No Floodway Line ⁽⁵⁾
Highwood River	LitBowToDS	30,585	1028.25	196.50	-	Inundation Limit ⁽⁶⁾	No Floodway Line ⁽⁵⁾
Highwood River	LitBowToDS	30,484	1028.27	307.85	503.88	Inundation Limit ⁽¹⁾	1 m Depth Criteria
Highwood River	LitBowToDS	30,333	1028.32	436.29	624.09	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	30,183	1028.10	544.46	-	1 m Depth Criteria	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	30,019	1028.02	546.24	-	Mixed	No Floodway Line ⁽⁷⁾
Highwood River	LitBowToDS	29,845	1027.59	559.38	700.89	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	29,697	1027.38	470.67	593.87	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	29,542	1027.19	453.35	548.17	Inundation Limit ⁽¹⁾	1 m Depth Criteria
Highwood River	LitBowToDS	29,382	1026.97	38.56	156.67	Inundation Limit ⁽¹⁾	1 m Depth Criteria
Highwood River	LitBowToDS	29,237	1026.83	65.53	163.80	Inundation Limit ⁽¹⁾	1 m Depth Criteria
Highwood River	LitBowToDS	29,082	1026.61	200.92	302.12	Inundation Limit ⁽¹⁾	1 m Depth Criteria
Highwood River	LitBowToDS	28,928	1026.33	152.56	313.06	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	28,775	1025.98	208.43	482.10	1 m Depth Criteria	1 m/s Velocity Criteria



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	LitBowToDS	28,623	1025.82	168.60	498.04	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	28,463	1025.71	241.81	531.22	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	28,304	1025.48	331.69	494.38	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	28,152	1025.20	300.64	431.47	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	27,997	1024.98	243.39	347.88	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	27,845	1024.89	120.13	224.23	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	27,700	1024.61	57.15	142.97	Inundation Limit ⁽¹⁾	1 m Depth Criteria
Highwood River	LitBowToDS	27,547	1024.43	51.25	135.65	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	27,398	1024.21	84.42	171.36	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	27,248	1024.11	78.47	197.47	Mixed	1 m Depth Criteria
Highwood River	LitBowToDS	27,091	1023.60	46.72	139.93	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	26,943	1023.56	157.05	297.55	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	26,794	1023.59	211.91	430.18	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	26,638	1023.24	286.07	424.88	1 m Depth Criteria	Inundation Limit ⁽¹⁾
Highwood River	LitBowToDS	26,492	1023.06	149.67	498.90	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	26,342	1023.08	71.11	361.09	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	26,180	1022.93	18.21	202.74	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	26,048	1022.51	23.16	111.80	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	25,876	1022.36	78.93	196.10	Inundation Limit ⁽¹⁾	1m Depth Criteria
Highwood River	LitBowToDS	25,744	1022.16	122.69	246.84	Mixed	1 m/s Velocity Criteria
Highwood River	LitBowToDS	25,564	1021.80	159.62	276.08	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	25,397	1021.43	130.56	244.57	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	25,248	1021.14	117.50	209.53	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	25,099	1021.04	62.20	196.10	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	24,949	1020.73	71.13	176.83	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	24,799	1020.50	25.74	130.41	1 m Depth Criteria	1 m Depth Criteria



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	LitBowToDS	24,644	1020.11	26.04	122.19	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	24,593	1019.49	44.97	119.30	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	24,536	1019.09	15.94	91.69	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	24,351	1018.38	17.75	87.65	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	24,203	1018.44	25.21	107.13	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	24,051	1018.21	30.14	111.14	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	23,899	1018.13	153.73	237.59	1 m/s Velocity Criteria	Mixed
Highwood River	LitBowToDS	23,754	1017.93	251.37	330.29	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	23,609	1017.28	236.79	316.49	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	23,447	1016.83	188.15	269.58	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	23,298	1016.84	39.63	116.07	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	23,152	1016.14	14.49	82.26	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	23,000	1015.81	22.62	99.65	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	22,843	1015.87	23.28	111.46	Main Channel ⁽²⁾	1 m Depth Criteria
Highwood River	LitBowToDS	22,696	1015.76	15.18	161.58	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	22,548	1015.44	21.80	107.14	1 m Depth Criteria	Inundation Limit ⁽¹⁾
Highwood River	LitBowToDS	22,391	1014.74	14.05	83.02	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	22,269	1014.51	14.52	90.73	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	22,090	1014.03	15.46	87.18	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	21,939	1013.69	12.59	82.25	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	21,791	1013.59	97.10	180.71	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	21,685	1013.07	142.72	212.68	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	21,634	1012.81	154.07	223.84	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	21,583	1012.67	146.63	233.11	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	21,482	1012.47	132.27	229.53	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	21,326	1011.83	132.20	205.47	1 m Depth Criteria	1 m/s Velocity Criteria



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	LitBowToDS	21,181	1011.54	50.49	128.91	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	21,028	1011.41	35.72	127.73	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	20,876	1010.55	18.69	107.68	1 m Depth Criteria	Inundation Limit ⁽¹⁾
Highwood River	LitBowToDS	20,732	1010.45	63.51	133.10	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	20,579	1010.19	73.86	140.96	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	20,435	1009.73	24.03	87.36	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	20,253	1009.06	17.91	81.24	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	20,135	1008.70	49.12	113.72	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	19,965	1008.11	107.79	171.20	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	19,813	1007.84	60.19	120.62	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	19,663	1007.75	52.07	117.11	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	19,521	1007.74	18.12	88.01	Main Channel ⁽²⁾	1 m Depth Criteria
Highwood River	LitBowToDS	19,357	1006.89	21.49	83.34	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	19,204	1006.35	20.98	89.99	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	19,047	1005.76	19.47	131.05	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	18,890	1005.51	16.47	81.80	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	18,741	1004.89	15.48	81.60	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	LitBowToDS	18,587	1004.33	14.76	83.15	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	18,432	1003.84	22.75	80.78	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	18,282	1003.50	14.45	82.14	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	18,142	1002.94	27.78	88.56	1 m/s Velocity Criteria	Main Channel ⁽²⁾
Highwood River	LitBowToDS	17,989	1002.41	14.97	87.27	1 m/s Velocity Criteria	Main Channel ⁽²⁾
Highwood River	LitBowToDS	17,837	1001.76	16.73	93.38	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	LitBowToDS	17,680	1001.13	23.52	98.79	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	17,557	1000.68	34.22	86.39	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	17,408	1000.01	50.41	102.23	1 m/s Velocity Criteria	1 m/s Velocity Criteria



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	LitBowToDS	17,259	999.38	18.37	83.88	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	17,107	998.81	22.58	102.11	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	16,959	998.62	26.61	96.60	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	16,813	997.90	9.94	71.09	Inundation Limit ⁽¹⁾	1 m/s Velocity Criteria
Highwood River	LitBowToDS	16,671	997.33	15.24	73.11	Inundation Limit ⁽¹⁾	1 m/s Velocity Criteria
Highwood River	LitBowToDS	16,509	996.46	11.66	76.74	Inundation Limit ⁽¹⁾	1 m Depth Criteria
Highwood River	LitBowToDS	16,366	995.66	11.61	80.25	Inundation Limit ⁽¹⁾	1 m/s Velocity Criteria
Highwood River	LitBowToDS	16,220	994.90	21.68	90.48	Inundation Limit ⁽¹⁾	1 m/s Velocity Criteria
Highwood River	LitBowToDS	16,059	993.85	36.27	96.72	Inundation Limit ⁽¹⁾	1 m/s Velocity Criteria
Highwood River	LitBowToDS	15,906	992.77	62.43	129.28	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	15,722	991.69	42.62	98.86	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	15,598	991.16	22.41	88.29	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	15,448	990.76	12.16	71.61	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	15,295	990.13	13.31	67.51	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	15,143	989.57	43.00	101.37	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	14,993	989.16	16.29	72.83	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	14,843	988.68	15.44	74.57	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	14,692	988.13	10.23	70.33	Main Channel ⁽²⁾	Inundation Limit ⁽¹⁾
Highwood River	LitBowToDS	14,541	987.49	16.98	94.05	Main Channel ⁽²⁾	Inundation Limit ⁽¹⁾
Highwood River	LitBowToDS	14,392	986.92	18.26	101.09	1 m Depth Criteria	Inundation Limit ⁽¹⁾
Highwood River	LitBowToDS	14,239	986.92	95.76	191.59	Inundation Limit ⁽¹⁾	1 m/s Velocity Criteria
Highwood River	LitBowToDS	14,067	986.44	49.80	170.19	Inundation Limit ⁽¹⁾	1 m/s Velocity Criteria
Highwood River	LitBowToDS	13,908	986.28	21.91	153.80	Main Channel ⁽²⁾	1 m Depth Criteria
Highwood River	LitBowToDS	13,759	986.11	55.13	185.75	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	13,596	985.73	105.87	216.46	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	13,444	985.15	55.24	158.28	1 m/s Velocity Criteria	1 m/s Velocity Criteria



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	LitBowToDS	13,289	984.52	19.00	102.78	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	13,137	984.04	9.53	87.78	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	12,984	983.53	10.03	102.70	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	12,830	983.39	14.13	121.78	Main Channel ⁽²⁾	1 m Depth Criteria
Highwood River	LitBowToDS	12,678	983.23	10.93	119.07	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	12,517	982.24	13.72	116.00	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	12,348	981.74	9.32	86.48	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	12,190	981.23	8.91	105.32	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	12,038	980.78	13.28	155.99	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	11,888	980.38	42.08	137.38	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	11,747	979.96	47.00	141.44	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	11,597	979.42	42.89	131.88	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	11,457	978.98	38.92	135.50	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	11,311	978.60	13.39	118.96	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	11,174	978.11	38.19	122.90	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	LitBowToDS	10,999	977.40	78.86	148.80	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	LitBowToDS	10,864	976.87	105.68	178.88	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	10,713	976.63	18.78	109.77	Inundation Limit ⁽¹⁾	1 m Depth Criteria
Highwood River	LitBowToDS	10,569	976.08	7.75	91.81	Main Channel ⁽²⁾	1 m/s Velocity Criteria
Highwood River	LitBowToDS	10,416	975.59	7.70	87.70	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	10,258	975.12	6.81	97.52	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	10,107	975.02	9.26	110.96	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	9,960	974.69	20.46	113.62	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	9,810	974.11	25.44	103.57	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	9,658	974.13	48.89	134.99	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	9,508	973.67	75.83	174.22	Mixed	1 m Depth Criteria



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	LitBowToDS	9,342	972.73	118.44	220.68	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	9,188	972.37	70.47	170.04	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	9,041	971.99	38.94	135.36	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	8,893	971.85	20.52	135.04	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	8,734	971.83	19.64	142.68	1 m Depth Criteria	Inundation Limit ⁽¹⁾
Highwood River	LitBowToDS	8,568	971.20	12.98	99.85	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	8,425	970.75	327.19	415.60	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	8,252	970.43	378.19	487.39	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	8,111	970.07	186.56	284.37	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	7,956	969.74	468.12	571.47	Mixed	1 m/s Velocity Criteria
Highwood River	LitBowToDS	7,816	969.04	320.05	408.01	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	7,672	969.26	218.64	309.41	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	7,604	969.07	31.56	134.05	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	7,491	968.80	6.96	96.12	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	7,370	968.43	12.56	107.15	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	7,255	968.30	13.67	134.22	1 m Depth Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	7,194	967.98	10.17	126.08	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	7,069	968.23	17.32	126.37	1 m Depth Criteria	Mixed
Highwood River	LitBowToDS	6,957	968.17	51.38	166.60	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	6,892	967.78	80.95	195.56	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	6,840	967.82	102.79	194.56	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	6,768	967.54	105.22	194.26	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	6,731	966.39	109.21	190.56	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	6,668	966.22	82.23	170.95	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	6,561	966.35	128.84	225.65	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	6,445	965.82	133.85	215.93	1 m/s Velocity Criteria	1 m/s Velocity Criteria



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	LitBowToDS	6,330	965.60	62.41	157.62	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	6,262	965.40	30.45	118.63	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	6,163	965.07	7.62	92.10	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	6,049	964.74	26.69	135.96	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	5,950	964.98	40.44	168.56	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	LitBowToDS	5,823	964.35	74.12	193.54	1 m Depth Criteria	Inundation Limit ⁽¹⁾
Highwood River	LitBowToDS	5,736	964.06	82.86	188.09	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	LitBowToDS	5,651	963.83	91.02	193.86	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	LitBowToDS	5,562	963.57	68.66	186.35	1 m/s Velocity Criteria	Inundation Limit ⁽¹⁾
Highwood River	LitBowToDS	5,403	963.19	18.31	180.04	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	5,254	962.81	41.83	230.53	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	5,109	962.45	115.59	247.19	Inundation Limit ⁽¹⁾	1 m/s Velocity Criteria
Highwood River	LitBowToDS	4,939	961.99	135.98	267.14	Inundation Limit ⁽¹⁾	Mixed
Highwood River	LitBowToDS	4,776	961.75	232.34	377.59	Inundation Limit ⁽¹⁾	Mixed
Highwood River	LitBowToDS	4,649	961.24	247.21	370.69	1 m/s Velocity Criteria	Main Channel ⁽²⁾
Highwood River	LitBowToDS	4,499	960.85	220.63	358.17	Mixed	1 m/s Velocity Criteria
Highwood River	LitBowToDS	4,350	960.45	230.32	438.36	Inundation Limit ⁽³⁾	Main Channel ⁽²⁾
Highwood River	LitBowToDS	4,203	960.12	263.02	548.10	Inundation Limit ⁽³⁾	Main Channel ⁽²⁾
Highwood River	LitBowToDS	4,062	959.81	438.01	725.47	Inundation Limit ⁽³⁾	1 m/s Velocity Criteria
Highwood River	LitBowToDS	3,909	959.44	526.88	760.36	Inundation Limit ⁽³⁾	1 m/s Velocity Criteria
Highwood River	LitBowToDS	3,800	959.15	577.09	751.81	Inundation Limit ⁽³⁾	Main Channel ⁽²⁾
Highwood River	LitBowToDS	3,606	958.66	425.33	566.91	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	3,458	958.33	114.86	318.46	1 m/s Velocity Criteria	Mixed
Highwood River	LitBowToDS	3,312	957.97	8.05	267.86	1 m Depth Criteria	Mixed
Highwood River	LitBowToDS	3,161	957.62	11.18	311.43	1 m/s Velocity Criteria	Mixed
Highwood River	LitBowToDS	3,008	957.20	335.22	660.36	Mixed	1 m Depth Criteria



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
Highwood River	LitBowToDS	2,862	956.90	506.58	896.93	1 m/s Velocity Criteria	Mixed
Highwood River	LitBowToDS	2,711	956.57	550.82	1055.95	Inundation Limit ⁽¹⁾	Mixed
Highwood River	LitBowToDS	2,553	956.40	318.49	947.15	Inundation Limit ⁽¹⁾	Mixed
Highwood River	LitBowToDS	2,398	956.11	123.76	745.93	1 m/s Velocity Criteria	Mixed
Highwood River	LitBowToDS	2,241	955.96	63.92	678.96	1 m/s Velocity Criteria	Mixed
Highwood River	LitBowToDS	1,982	955.43	101.15	615.49	1 m Depth Criteria	Mixed
Highwood River	LitBowToDS	1,828	954.97	74.16	546.59	Mixed	Mixed
Highwood River	LitBowToDS	1,676	954.97	40.06	453.35	Mixed	Mixed
Highwood River	LitBowToDS	1,524	954.85	54.87	404.90	Mixed	1 m Depth Criteria
Highwood River	LitBowToDS	1,367	954.16	140.85	366.15	Mixed	1 m Depth Criteria
Highwood River	LitBowToDS	1,199	953.66	245.27	395.67	1 m Depth Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	1,063	953.32	349.81	467.03	1 m/s Velocity Criteria	1 m Depth Criteria
Highwood River	LitBowToDS	921	952.97	367.27	505.16	1 m/s Velocity Criteria	1 m/s Velocity Criteria
Highwood River	LitBowToDS	737	952.10	334.83	533.61	Inundation Limit ⁽¹⁾	Mixed
Highwood River	LitBowToDS	583	951.68	211.97	528.26	Inundation Limit ⁽¹⁾	Mixed

Notes

- (1) Design flood flows are contained within main channel
- (2) Floodway follows the bank lines
- (3) No viable flood fringe
- (4) The previous floodway is inside the main channel, so the previous floodway had to be moved to the main channel
- (5) No floodway because the right ends of the cross sections are adjacent to the side channel
- (6) The previous floodway is outside the inundation limit
- (7) No floodway because the right ends of the cross sections are connected to the 2D model area.



HIGHWOOD RIVER DESIGN FLOOD HAZARD MAPPING

Table 5: Floodway Limit Stations and Governing Criteria – Side Channels

River	Reach	River Station	Design Flood Water Level (m)	Floodway Station Limits		Governing Floodway Criteria	
				Left Station (m)	Right Station (m)	Left Station	Right Station
SideRge300To295	SideRge300To295	1446	1075.94	-	419.29	No Floodway Line ⁽¹⁾	Previous Floodway
SideRge300To295	SideRge300To295	1335	1075.57	-	367.58	No Floodway Line ⁽¹⁾	Previous Floodway
SideRge300To295	SideRge300To295	1216	1075.13	-	353.56	No Floodway Line ⁽¹⁾	Previous Floodway
SideRge300To295	SideRge300To295	1100	1074.82	-	411.52	No Floodway Line ⁽¹⁾	Previous Floodway
SideRge300To295	SideRge300To295	1021	1074.57	-	190.57	No Floodway Line ⁽¹⁾	Previous Floodway
SideRge300To295	SideRge300To295	950	1074.23	-	179.00	No Floodway Line ⁽¹⁾	Main Channel ⁽²⁾
SideRge300To295	SideRge300To295	853	1073.88	-	190.00	No Floodway Line ⁽¹⁾	Main Channel ⁽²⁾
SideRge300To295	SideRge300To295	732	1073.37	-	185.23	No Floodway Line ⁽¹⁾	Main Channel ⁽²⁾
SideRge300To295	SideRge300To295	625	1073.02	-	190.36	No Floodway Line ⁽¹⁾	Previous Floodway
SideRge300To295	SideRge300To295	490	1072.48	-	248.18	No Floodway Line ⁽¹⁾	Previous Floodway
SideRge300To295	SideRge300To295	420	1072.28	-	237.37	No Floodway Line ⁽¹⁾	Previous Floodway
SideRge300To295	SideRge300To295	339	1071.99	-	209.68	No Floodway Line ⁽¹⁾	Previous Floodway
SideRge300To295	SideRge300To295	274	1071.69	-	199.17	No Floodway Line ⁽¹⁾	Previous Floodway
SideRge300To295	SideRge300To295	178	1071.59	-	141.92	No Floodway Line ⁽¹⁾	Previous Floodway
SideRge300To295	SideRge300To295	88	1069.68	-	63.62	No Floodway Line ⁽¹⁾	Inundation Limit ⁽³⁾

Notes

- (1) No floodway because the left ends of the cross sections were adjacent to the Highwood River
- (2) The previous floodway is inside the main channel, so the previous floodway had to be moved to the main channel
- (3) The previous floodway is outside the inundation limit



4.0 DESIGN FLOOD HAZARD MAP PRODUCTION

4.1 Floodway Mapping Methodology

The following procedure was used in ArcGIS to develop inundation extents for the design flood:

- 1) Assigned design flood water levels at each section to the cross section polyline features as attributes. The result was one polyline feature that included the simulated water levels.
- 2) Created a continuous water surface elevation TIN between cross sections.
- 3) Manually adjusted the water surface elevation TIN in special areas as described in the inundation mapping report prepared for this study (Golder 2022). Adjustments were made by using 3D break lines to separate manually adjusted TIN sub-elements from the automatically generated TIN, and appropriately interpolated water surface elevations between select cross sections were applied.
- 4) Converted the adjusted TIN into a water surface elevation raster with the same resolution and cell alignment as the DTM raster.
- 5) Subtracted the DTM raster from the water surface elevation raster to define wet areas.
- 6) Assigned “NoData” to dry raster cells (with water depths smaller than 0.01 m).
- 7) Converted the wet areas into a flood inundation polygon dataset and deleted all features not directly connected to the main river channels.
- 8) Simplified polygons by filing holes smaller than 25 m².
- 9) Smoothed polygons outlines using the PAEK algorithm with a threshold of 15 m.

In addition to the above general procedure, backwater inundation for relatively large tributaries was included based on the design water levels at the main channel at the confluences of those tributaries. This method was applied to the Stimson Creek and Sheep River, which are the major tributaries that join the Highwood River study reach.

Dedicated flood control structures are assumed to be effective and protected areas are not mapped as flooded unless these structures are overtopped. Low-lying areas behind dedicated flood control structures that would potentially be flooded if the control structure would fail are designated as protected flood fringe zones. Flood hazard maps also show areas that are at risk of flooding during the 200-year and 500-year open water floods.



4.2 Floodway Criteria Maps

Floodway criteria maps show the basis for determining the floodway and flood fringe zones for the design flood and documenting the modelling results on water levels, depths and flow velocities. The floodway criteria maps include the following information:

- the location and extent of all cross sections used in the HEC-RAS model with appropriate labels;
- the extent of the open water design flood, showing areas of dry ground;
- areas meeting or exceeding the 1 m design flood depths;
- portions along each model cross section where flow velocities are calculated to be 1 m/s or greater;
- the locations of the main channel top of bank;
- the proposed floodway boundary, as well as associated floodway stations corresponding to the floodway determination criteria;
- the previous floodway boundary (nhc 1992);
- background aerial imagery collected during the study (Golder 2017); and
- roads, bridges and flood control structures.

The open water floodway criteria maps were prepared in a scale of 1:7,500 except for the Town of High River where the scale is 1:15,000 using the study datum and coordinate system (CSRS NAD83, 114° 3TM). The maps are provided in Appendix A.

4.3 Flood Hazard Maps

4.3.1 Overview

Flood hazard mapping identifies the area flooded for the 100-year design flood, and this flood hazard area is typically divided into floodway, high hazard flood fringe and flood fringe zones. The flood hazard maps prepared as part of this project component illustrate a flood hazard area delineated using the floodway determination criteria and mapping standards than those outlined in the FHIP guidelines and study Terms of Reference, including areas of higher hazard within the flood fringe and incremental areas at risk of flooding for the 200-year and 500-year open water floods.

The flood hazard maps were prepared in a scale of 1:7,500 except for the Town of High River where the scale is 1:15,000 using the study datum and coordinate system (CSRS NAD83, 114° 3TM). The maps are provided in Appendix B.



4.3.2 Areas in the Floodway

The development areas and structures within the floodway zone are listed below.

Highwood River

- Parts of the Hogg Park;
- The residence on the right floodplain near cross section 262;
- Small low-lying areas on the right floodplain between Highwood Diversion Headgates and the upstream end of the Town of High River;
- Hoeh Dyke 2, Bews Dike, Baker Creek Dike 1, and Baker Creek Dike 2;
- Low-lying areas in the Highwood Golf Course;
- The community on the left floodplain downstream of the Highway 2A Bridge;
- Low-lying areas on the right floodplain west and northwest of the Town Dike;
- Low-lying areas on the left floodplain upstream of the Highway 543 Bridge; and
- Natures Hideaway Campground.

Little Bow River

- Low-lying areas of farmland around Southwest Dike; and
- The residence on the right floodplain east of the railroad and west of the 88 Street East.

4.3.3 Areas in the High Hazard Flood Fringe

The development areas in the high hazard flood fringe zone within the study area are listed below.

Highwood River

- Upstream segment of the Highwood Diversion Canal;
- Some low-lying areas on the left floodplain between cross sections 319 and 356;
- Low-lying areas on the right floodplain between Highwood Diversion Headgates and Hoeh Dike 1;
- Hoeh Dike 1;
- Portions of the Golf Course and areas on both sides of the Centre Street south of the Golf Course Dike and Lineham Canal Dike;
- The residence on the right floodplain near cross section 608;
- Low-lying areas on both right and left floodplains of Highwood River from downstream of High River to Highway 2 bridge crossing;
- The residence on the left floodplain downstream of the Train Bridge; and
- Three residences on the right floodplain upstream of the Highway 2 Bridge.



Little Bow River

- Portions of farmland on both sides of the 72nd Street East and south of the 12th Avenue.

4.3.4 Areas in the Flood Fringe

The development areas in the flood fringe zone within the study area are listed below.

Highwood River

- Parts of the low-lying areas on the right floodplain between Highwood Diversion Headgates and the upstream end of the Town of High River;
- The residence on the right floodplain near the Range Road 300 (8th Street E);
- The residence on the left floodplain near cross section 355;
- Two residences on the right floodplain between the Range Roads 295 and 294;
- The residence on the right floodplain downstream of the Range Road 294;
- Four residences on the right floodplain between the Range Road 293 (56th Street E) and 72th Street E;
- Small part of the left floodplain immediately upstream of the Highway 543;
- Part of the left and right floodplains downstream of the Highway 543;
- The residence on the right floodplain near cross section 596; and
- The residence on the right floodplain near cross section 608.

Little Bow River

- Residences between the railway and Range Road 291;
- The residence on the left floodplain downstream of the Hifab Culvert;
- The residence on the right floodplain near Little Bow River (Station 8,600 m);
- The residence on the right floodplain near Little Bow River (Station 8,300 m);
- The residence on the right floodplain upstream of the Little Bow Range Road 290 Bridge;
- The residence on the left floodplain downstream of the Little Bow Range Road 290 Bridge;
- Two residences on the right floodplain downstream of the Little Bow Range Road 290 Bridge; and
- The residence on the left floodplain near cross section 1030.



5.0 DESIGN FLOOD GRIDS

5.1 Water Surface Elevation Grids

The water surface elevation grid was created by converting the water surface elevation TIN into a raster file with the same resolution (0.5 m) and alignment as the DTM. The water surface elevation raster was then clipped to the directly-inundated areas and protected flood fringe areas.

5.2 Flood Depth Grids

The flood depth grid was created by subtracting the water surface elevation grid from the DTM. The flood depth grid has the same resolution (0.5 m) and alignment as the DTM. The extent of the depth grid is limited to the directly-inundated areas and protected flood fringe areas.

5.3 General Comments

Water surface elevation TINs cover all areas between cross sections and in special inundation areas within the study area including dry areas, with the exception that isolated areas and areas behind flood control structures be clipped out if not overtopped. Corresponding raster were clipped to the inundation extents of the design flood.

All GIS data was created in ArcGIS Version 10.8 compatible format in the native study coordinate system [Canadian Spatial Reference System, North American Datum of 1983 (CSRS NAD83), Epoch 2002 and 3-Degree Transverse Mercator projection with the Central Meridian of 114° (3TM 114)].

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6.0 POTENTIAL CLIMATE CHANGE IMPACTS

In addition to the design flood water levels determined in Section 3.4, a cursory examination of potential increases in 100-year design water levels associated with climate change were performed in order to better understand the possible impacts of climate change on flood levels. The effect of more severe 100-year flood conditions was assessed under three additional flow scenarios: (i) 100-year open water discharge + 10%; (ii) 100-year open water discharge + 20%; and (iii) 100-year open water discharge + 30%.

No hydraulic modelling parameters were varied other than discharges. Water level profiles were produced along the study reaches for all three additional flow scenarios. If a lower flow profile results in higher water levels, or if numerical instabilities or unreasonable results occur, model parameters may be adjusted to resolve these issues. Water level differences compared to the base 100-year open water discharge was calculated. These water level differences were identified as potential “freeboards” that could be applied to the design water levels to account for flow changes that could result from climate change.

For the Highwood River reach, the average increases in flood levels are 0.17 m for a 10 percent increase in flow; 0.33 m for a 20 percent increase in flow, and 0.49 m for a 30 percent increase in flow.

For the Little Bow River reach, the average increase in flood levels are 0.10 m for a 10 percent increase in flow, 0.19 m for a 20 percent increase in flow, and 0.27 m for a 30 percent increase in flow.

For the Overland Flood Route, the average increase in flood levels are 0.07 m for a 10 percent increase in flow, 0.13 m for a 20 percent increase in flow, and 0.19 m for a 30 percent increase in flow.

The above analyses are not based on a regional climate change impact assessment but on a simplified assumption that climate change will result in increased flood peak flows. The presented values can be viewed as a general range of potential climate change “freeboard” that could be considered in addition to the computed design flood water levels.

The simulated three additional climate-affected flood profiles along the Highwood River study reach are presented in Figures C-1a to C-1j in Appendix C. The simulated three additional climate-affected open water flood water levels at individual cross sections are compared to the base 100-year open water discharge in Tables C.1 and C.2 in Appendix C.

The simulated three additional climate-affected flood profiles along the Little Bow River study reach are presented in Figures C-2 in Appendix C. The simulated three additional climate-affected open water flood water levels at individual cross sections are compared to the base 100-year open water discharge in Table C.3 in Appendix C.

The simulated three additional climate-affected flood profiles along the Overland Flood Route are presented in Figures C-3 in Appendix C. The simulated three additional climate-affected open water flood water levels at individual cross sections are compared to the base 100-year open water discharge in Table C.4 in Appendix C.



7.0 CONCLUSION

This report summarizes the work of design flood hazard mapping component of the Highwood River Hazard Study. The main task associated with this work involves defining a flood hazard area, composed of floodway, high hazard flood fringe and flood fringe zones, using floodway determination criteria and mapping standards from those outlined in the FHIP Guidelines and study Terms of Reference:

- The floodway in previously unmapped areas is delineated primarily as the area of highest hazard, defined where flood depths are 1 m or deeper or where local flow velocities are 1 m/s or higher.
- Previously mapped floodways do not typically become larger, and can become smaller if deemed appropriate. Areas of higher hazard that fall outside of the floodway zone (defined primarily by flood depth and local flow velocity) can be identified within the flood fringe zone, and referred to as “high hazard flood fringe” areas.
- Dedicated flood control structures are assumed to be effective and protected areas are not mapped as flooded unless these structures are overtopped.
- Flood hazard maps will include incremental areas at risk of flooding for the 200-year and 500-year open water floods.

The results of design flood hazard mapping are the delineation of the floodway and flood fringe zones and determination of the open water design flood water levels. The design flood hazard mapping component supports the associated flood risk assessment and inventory component of the overall project.

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Report Signature Page

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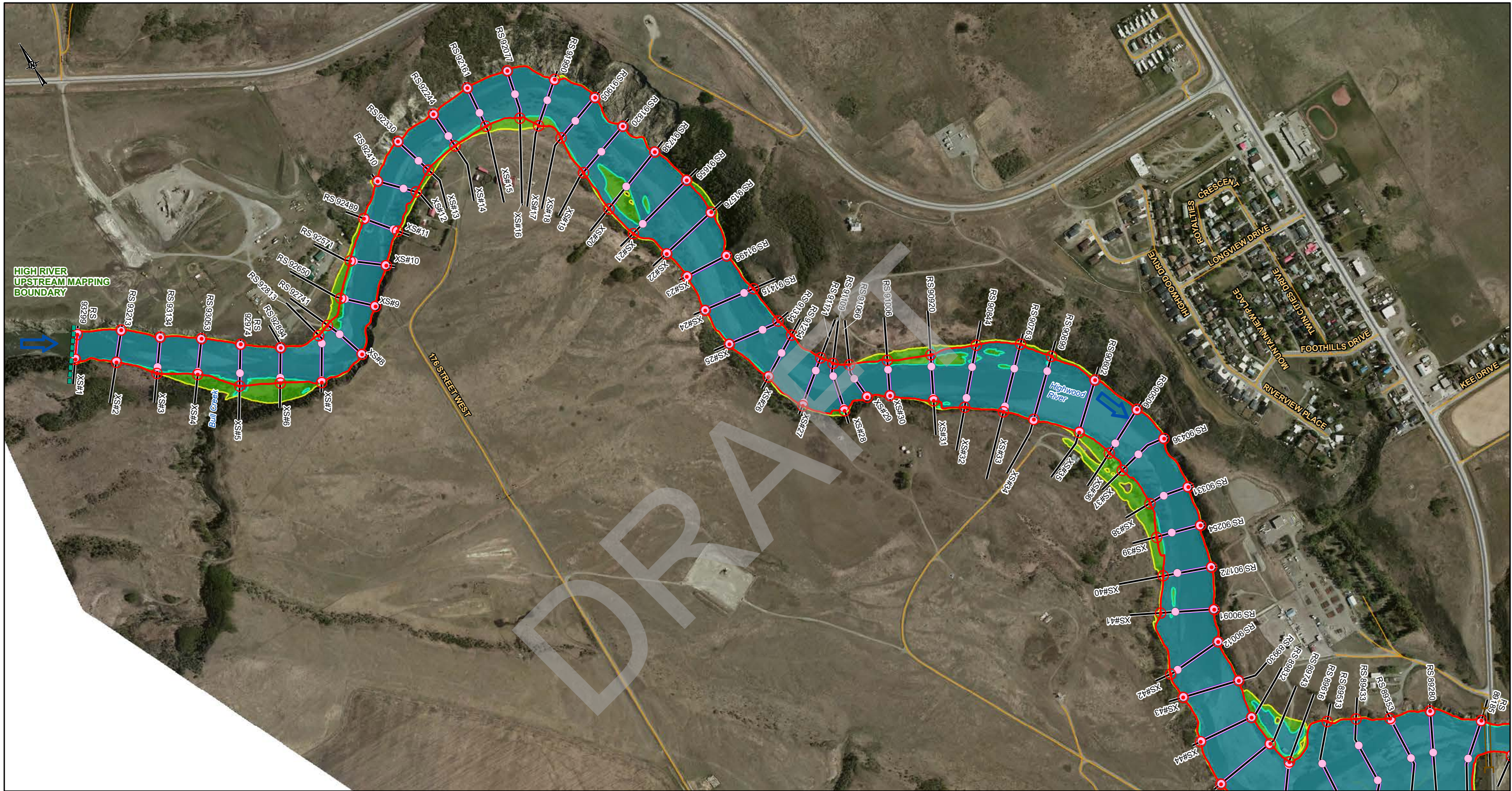
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APPENDIX A

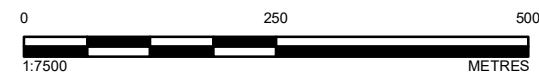
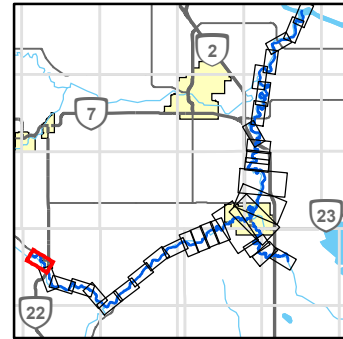
Floodway Criteria Maps

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LEGEND

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XS#100 CROSS SECTION NUMBER	◊ CULVERT	○ PROPOSED FLOODWAY STATION
RS 304 RIVER STATION (M)	□ WEIR	▭ PREVIOUS FLOODWAY
▬ STUDY BOUNDARY	— BRIDGE	■ DEPTH ≥ 1 M
➔ FLOW DIRECTION		■ 100-YEAR DESIGN FLOOD EXTENT
— LOCAL ROAD		■ VELOCITY ≥ 1 M/S
— PRIMARY HIGHWAY		▨ PROTECTED FLOOD AREA
— SECONDARY HIGHWAY		▨ DESIGN DISCHARGE
— RAILWAY		HIGHWOOD RIVER UPSTREAM OF STIMSON CREEK = 1080 M ³ /S



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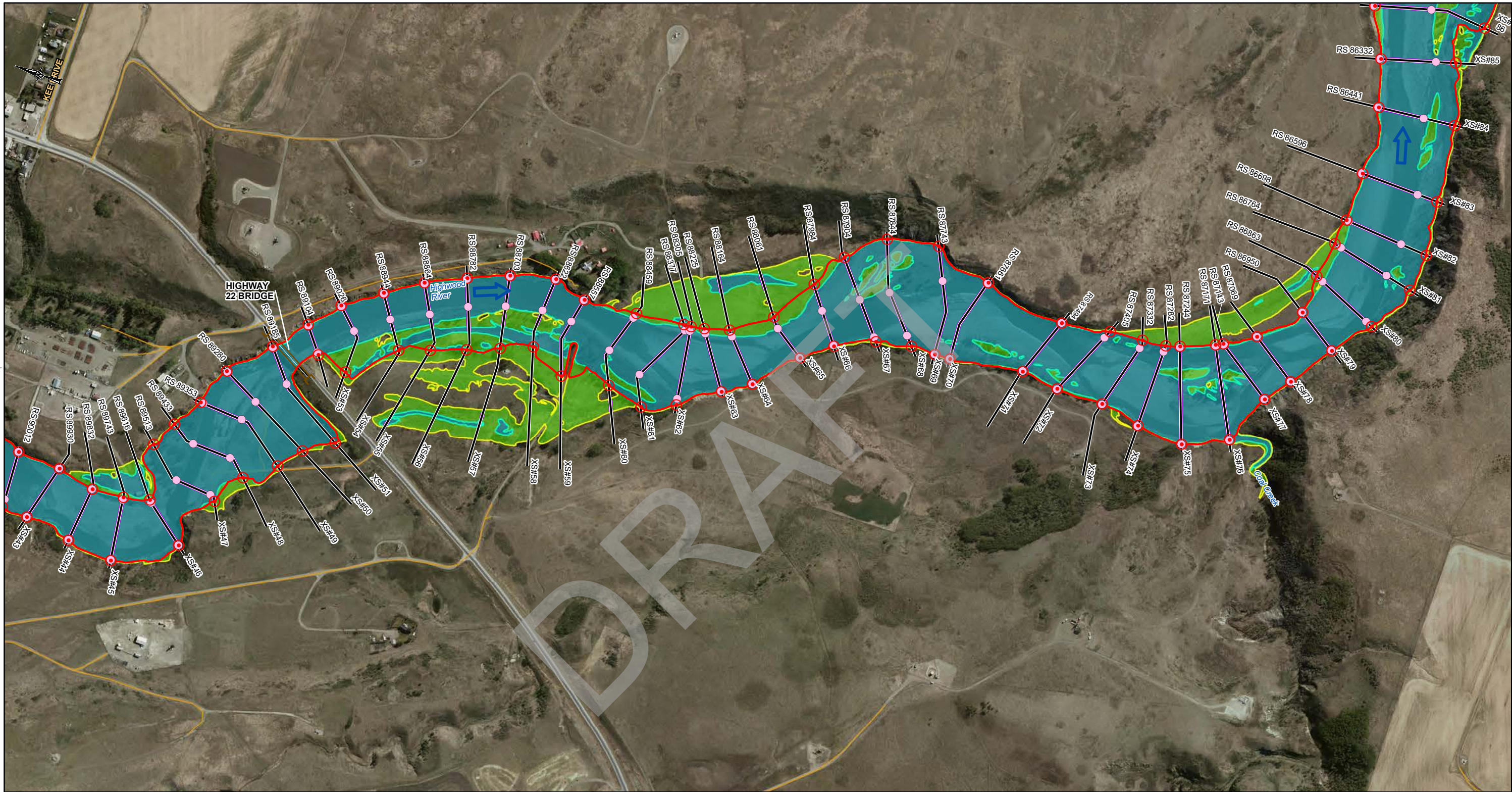
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HIGHWOOD RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

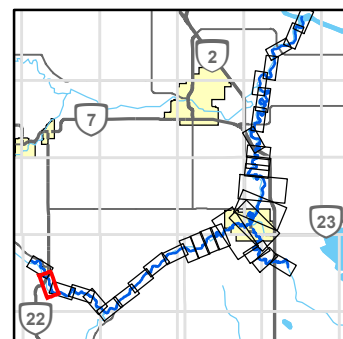
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SHEET 1 ↑

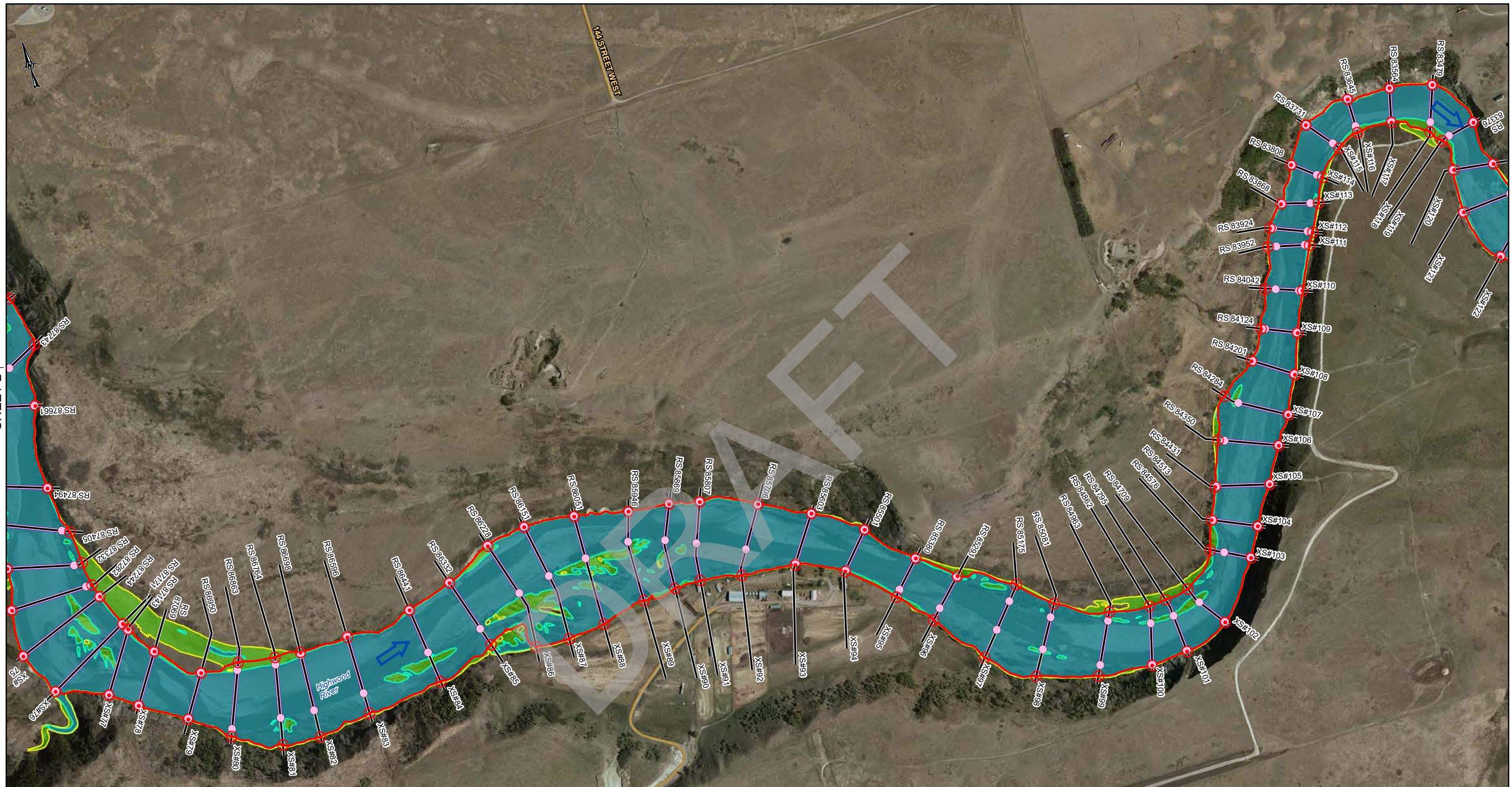
↓ SHEET 3

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—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
→	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
+	RAILWAY
—	FLOOD CONTROL STRUCTURE
⬡	CULVERT
⬡	WEIR
⬡	BRIDGE
⬡	PROPOSED FLOODWAY BOUNDARY
●	BANK STATION
⊙	PROPOSED FLOODWAY STATION
⬡	PREVIOUS FLOODWAY
⬡	DEPTH ≥ 1 M
⬡	100-YEAR DESIGN FLOOD EXTENT
⬡	VELOCITY ≥ 1 M/S
⬡	PROTECTED FLOOD AREA
⬡	DESIGN DISCHARGE
HIGHWOOD RIVER UPSTREAM OF STIMSON CREEK = 1080 M ³ /S	



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DESIGNED	PT	2022-06-22
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APPROVED	WP	

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PROJECT		
HIGHWOOD RIVER HAZARD STUDY		
TITLE		
FLOODWAY CRITERIA MAP		
PROJECT NO.	CONTROL	REV.
1536669	4000	0
		FIGURE
		SHEET 2 of 33

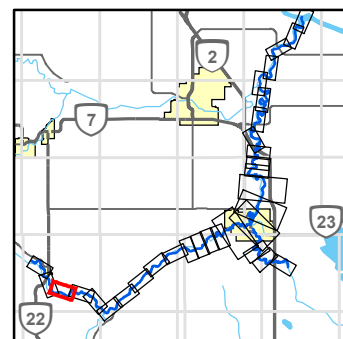


SHEET 2 ↑

↓ SHEET 4

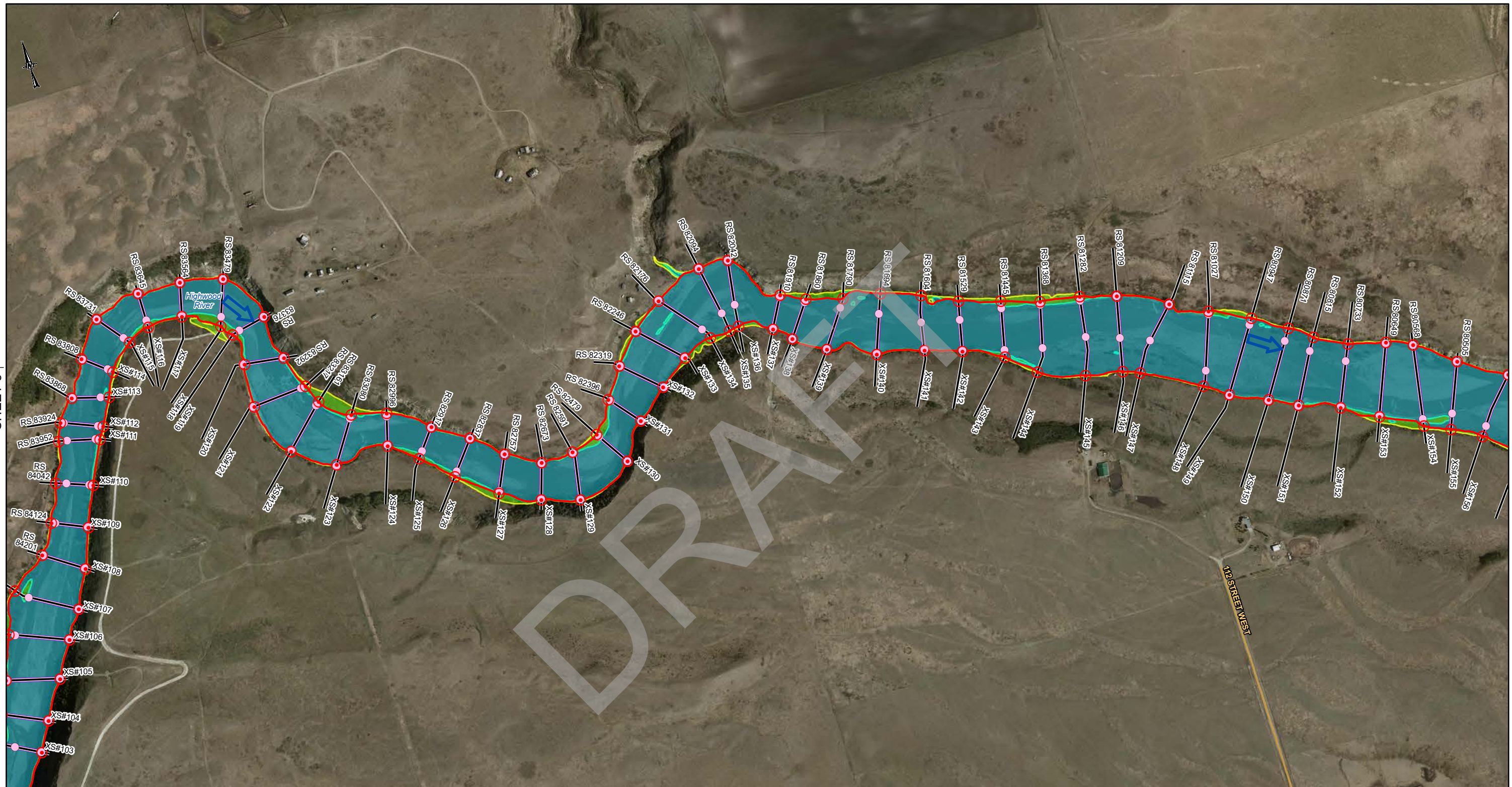
LEGEND

● 2D DOMAIN PROFILE STATION	▬ FLOOD CONTROL STRUCTURE	▭ PROPOSED FLOODWAY BOUNDARY
— CROSS SECTION	HYDRAULIC STRUCTURES	● BANK STATION
XS#100 CROSS SECTION NUMBER	◻ CULVERT	● PROPOSED FLOODWAY STATION
RS 304 RIVER STATION (M)	◻ WEIR	▭ PREVIOUS FLOODWAY
▬ STUDY BOUNDARY	▭ BRIDGE	▭ DEPTH ≥ 1 M
➔ FLOW DIRECTION		▭ 100-YEAR DESIGN FLOOD EXTENT
— LOCAL ROAD		▭ VELOCITY ≥ 1 M/S
— PRIMARY HIGHWAY		▭ PROTECTED FLOOD AREA
— SECONDARY HIGHWAY		▭ DESIGN DISCHARGE
— RAILWAY		HIGHWOOD RIVER UPSTREAM OF STIMSON CREEK = 1080 M ³ /S



CLIENT ALBERTA ENVIRONMENT AND PARKS	ALBERTA Government										
CONSULTANT GOLDER MEMBER OF WSP	<table border="0"> <tr> <td>YYYY-MM-DD</td> <td>2022-06-22</td> </tr> <tr> <td>DESIGNED</td> <td>PT</td> </tr> <tr> <td>PREPARED</td> <td>NB</td> </tr> <tr> <td>REVIEWED</td> <td>JC</td> </tr> <tr> <td>APPROVED</td> <td>WP</td> </tr> </table>	YYYY-MM-DD	2022-06-22	DESIGNED	PT	PREPARED	NB	REVIEWED	JC	APPROVED	WP
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PROJECT HIGHWOOD RIVER HAZARD STUDY	
TITLE FLOODWAY CRITERIA MAP	
PROJECT NO. 1536669	CONTROL 4000
REV. 0	FIGURE SHEET 3 of 33

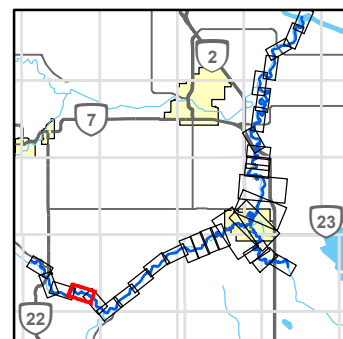


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SHEET 3 ↑

↑ SHEET 5

LEGEND			
●	2D DOMAIN PROFILE STATION	▬▬▬	FLOOD CONTROL STRUCTURE
—	CROSS SECTION	○	PROPOSED FLOODWAY STATION
XS#100	CROSS SECTION NUMBER	◻	PREVIOUS FLOODWAY
RS 304	RIVER STATION (M)	■	DEPTH ≥ 1 M
▬▬▬	STUDY BOUNDARY	■	100-YEAR DESIGN FLOOD EXTENT
➔	FLOW DIRECTION	▨	VELOCITY ≥ 1 M/S
—	LOCAL ROAD	▨	PROTECTED FLOOD AREA
—	PRIMARY HIGHWAY	▨	DESIGN DISCHARGE
—	SECONDARY HIGHWAY	▨	HIGHWOOD RIVER UPSTREAM OF STIMSON CREEK = 1080 M ³ /S
—	RAILWAY		
		◻	CULVERT
		▭	WEIR
		▭	BRIDGE
		○	BANK STATION
		○	PROPOSED FLOODWAY STATION



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DATUM: NAD 83 CSRS PROJECTION: 3TM 114			
PROJECT			
HIGHWOOD RIVER HAZARD STUDY			
TITLE			
FLOODWAY CRITERIA MAP			
PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 4 of 33

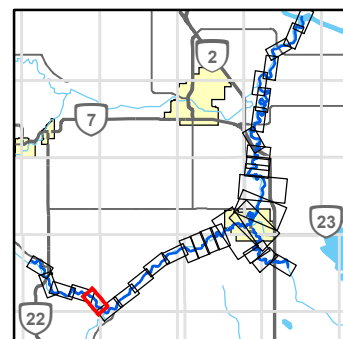
SHEET 4 ↑

↑ SHEET 6



LEGEND

● 2D DOMAIN PROFILE STATION	FLOOD CONTROL STRUCTURE	□ PROPOSED FLOODWAY BOUNDARY
— CROSS SECTION	HYDRAULIC STRUCTURES	○ BANK STATION
XS#100 CROSS SECTION NUMBER	◊ CULVERT	⊙ PROPOSED FLOODWAY STATION
RS 304 RIVER STATION (M)	□ WEIR	▤ PREVIOUS FLOODWAY
▬ STUDY BOUNDARY	⌄ BRIDGE	■ DEPTH ≥ 1 M
➔ FLOW DIRECTION		■ 100-YEAR DESIGN FLOOD EXTENT
— LOCAL ROAD		■ VELOCITY ≥ 1 M/S
— PRIMARY HIGHWAY		▨ PROTECTED FLOOD AREA
— SECONDARY HIGHWAY		▨ DESIGN DISCHARGE
— RAILWAY		HIGHWOOD RIVER UPSTREAM OF STIMSON CREEK = 1080 M ³ /S



CLIENT ALBERTA ENVIRONMENT AND PARKS	ALBERTA Government										
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PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO. 1536669	CONTROL 4000	REV. 0	FIGURE SHEET 5 of 33
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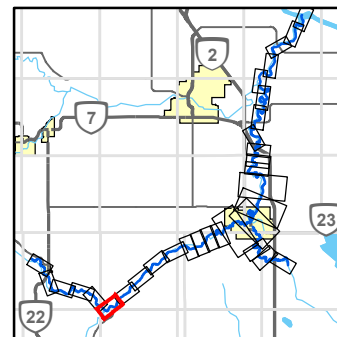
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LEGEND

- | | | |
|-----------------------------|-----------------------------|---|
| ● 2D DOMAIN PROFILE STATION | FLOOD CONTROL STRUCTURE | □ PROPOSED FLOODWAY BOUNDARY |
| — CROSS SECTION | HYDRAULIC STRUCTURES | ○ BANK STATION |
| XS#100 CROSS SECTION NUMBER | ◻ CULVERT | ○ PROPOSED FLOODWAY STATION |
| RS 304 RIVER STATION (M) | ◻ WEIR | ▭ PREVIOUS FLOODWAY |
| ▬ STUDY BOUNDARY | ▬ BRIDGE | ■ DEPTH ≥ 1 M |
| ➔ FLOW DIRECTION | | ■ 100-YEAR DESIGN FLOOD EXTENT |
| — LOCAL ROAD | | ■ VELOCITY ≥ 1 M/S |
| — PRIMARY HIGHWAY | | ▨ PROTECTED FLOOD AREA |
| — SECONDARY HIGHWAY | | DESIGN DISCHARGE |
| — RAILWAY | | HIGHWOOD RIVER UPSTREAM OF STIMSON CREEK = 1080 M ³ /S |
| | | HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M ³ /S |



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PROJECT		
HIGHWOOD RIVER HAZARD STUDY		
TITLE		
FLOODWAY CRITERIA MAP		
PROJECT NO.	CONTROL	REV.
1536669	4000	0
FIGURE		
SHEET 6 of 33		

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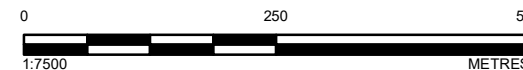
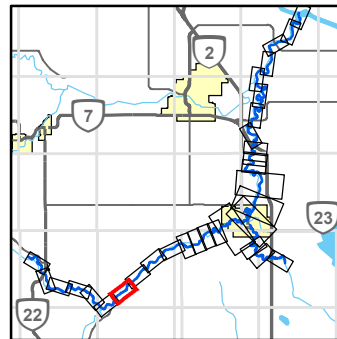


SHEET 6 ↑

↑ SHEET 8

LEGEND

- 2D DOMAIN PROFILE STATION
- CROSS SECTION
- XS#100 CROSS SECTION NUMBER
- RS 304 RIVER STATION (M)
- ▬ STUDY BOUNDARY
- ➔ FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- ▬ FLOOD CONTROL STRUCTURE
- HYDRAULIC STRUCTURES**
- ◻ CULVERT
- ◻ WEIR
- ▬ BRIDGE
- ▭ PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- ▭ PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S
- ▨ PROTECTED FLOOD AREA
- DESIGN DISCHARGE**
- HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M³/S



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PROJECT
HIGHWOOD RIVER HAZARD STUDY

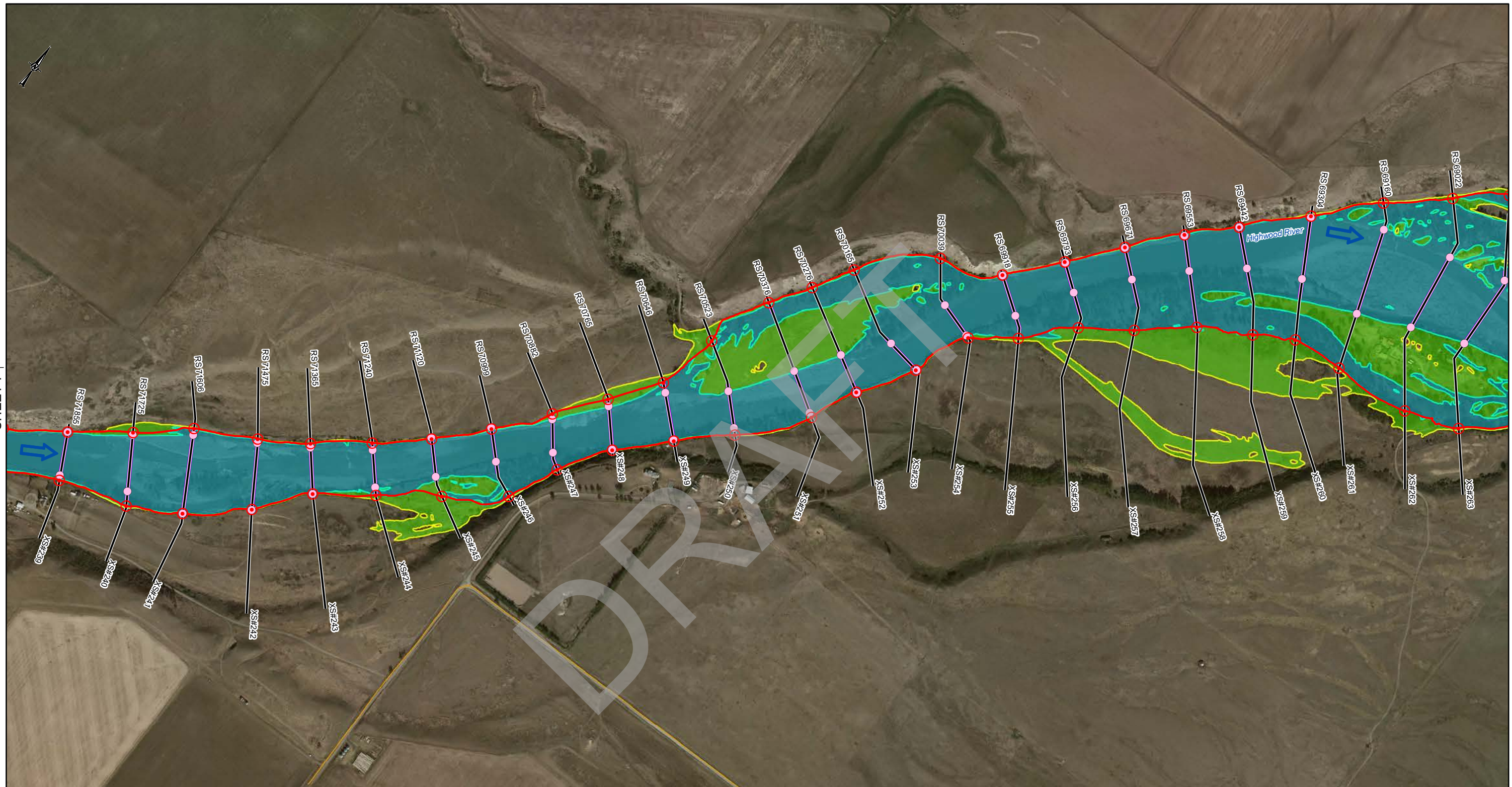
TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 7 of 33



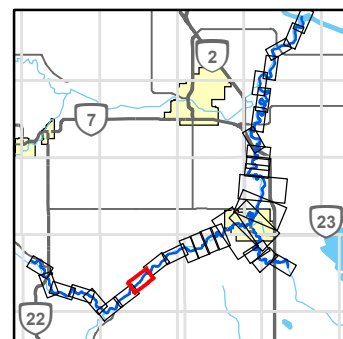
SHEET 7 ↑

↑ SHEET 6



LEGEND

● 2D DOMAIN PROFILE STATION	FLOOD CONTROL STRUCTURE	□ PROPOSED FLOODWAY BOUNDARY
— CROSS SECTION	HYDRAULIC STRUCTURES	○ BANK STATION
XS#100 CROSS SECTION NUMBER	◊ CULVERT	⊙ PROPOSED FLOODWAY STATION
RS 304 RIVER STATION (M)	□ WEIR	▤ PREVIOUS FLOODWAY
▬ STUDY BOUNDARY	⌄ BRIDGE	■ DEPTH ≥ 1 M
➡ FLOW DIRECTION		■ 100-YEAR DESIGN FLOOD EXTENT
— LOCAL ROAD		■ VELOCITY ≥ 1 M/S
— PRIMARY HIGHWAY		▨ PROTECTED FLOOD AREA
— SECONDARY HIGHWAY		▨ DESIGN DISCHARGE
— RAILWAY		HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M ³ /S



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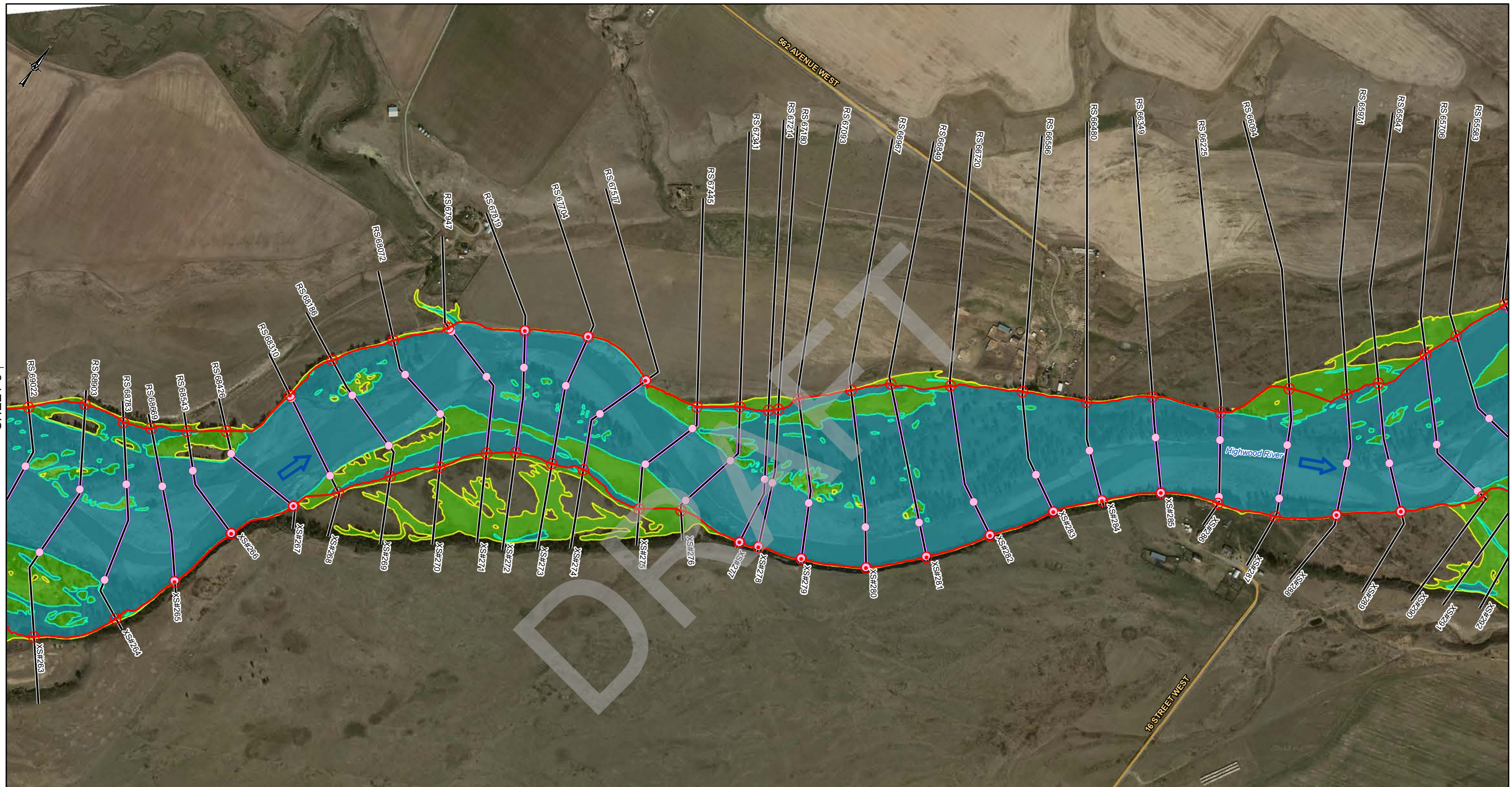
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PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO. 1536669	CONTROL 4000	REV. 0	FIGURE SHEET 8 of 33
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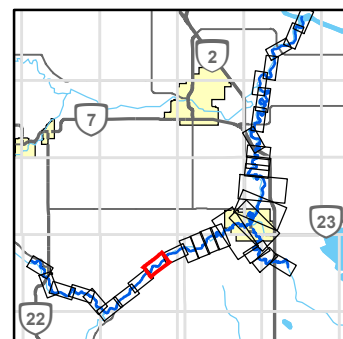
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SHEET 8 ↑

↓ SHEET 10

LEGEND			
●	2D DOMAIN PROFILE STATION	▬▬▬	FLOOD CONTROL STRUCTURE
—	CROSS SECTION	○	PROPOSED FLOODWAY STATION
XS#100	CROSS SECTION NUMBER	◻	PREVIOUS FLOODWAY
RS 304	RIVER STATION (M)	■	DEPTH ≥ 1 M
▬▬▬	STUDY BOUNDARY	■	100-YEAR DESIGN FLOOD EXTENT
➔	FLOW DIRECTION	▨	VELOCITY ≥ 1 M/S
—	LOCAL ROAD	▨	PROTECTED FLOOD AREA
—	PRIMARY HIGHWAY	▨	DESIGN DISCHARGE
—	SECONDARY HIGHWAY	▨	HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M ³ /S
+	RAILWAY		
		◻	CULVERT
		◻	WEIR
		▬▬▬	BRIDGE
		○	BANK STATION
		○	PROPOSED FLOODWAY STATION

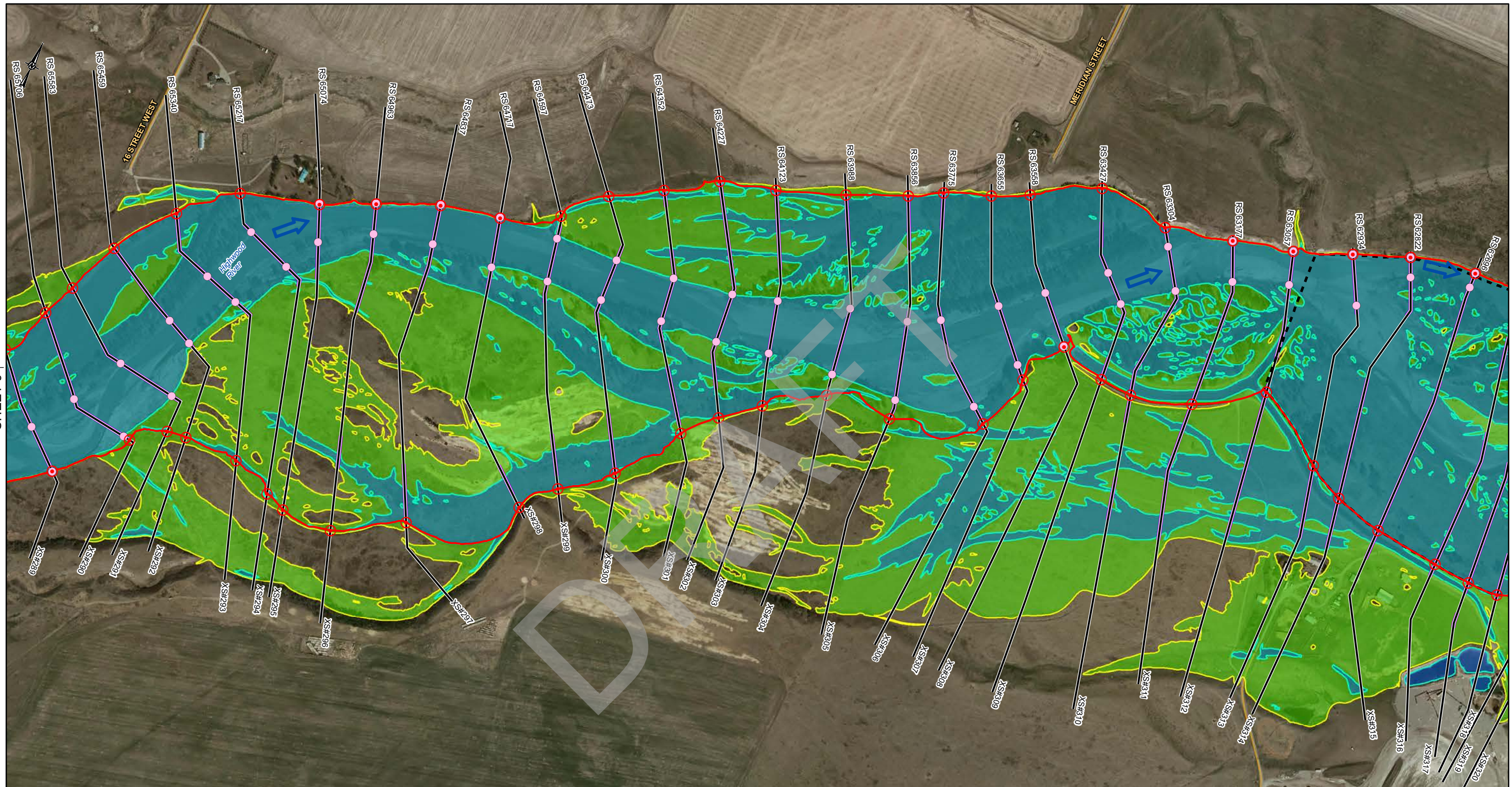


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HIGHWOOD RIVER HAZARD STUDY		
TITLE		
FLOODWAY CRITERIA MAP		
PROJECT NO.	CONTROL	REV.
1536669	4000	0
		FIGURE
		SHEET 9 of 33

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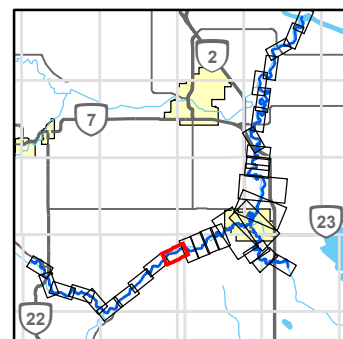
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SHEET 9 ↑

SHEET 11 ↓

LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
+	RAILWAY
—	FLOOD CONTROL STRUCTURE
⬡	CULVERT
⬡	WEIR
⬡	BRIDGE
⬡	PROPOSED FLOODWAY BOUNDARY
●	BANK STATION
⊙	PROPOSED FLOODWAY STATION
⬡	PREVIOUS FLOODWAY
⬡	DEPTH ≥ 1 M
⬡	100-YEAR DESIGN FLOOD EXTENT
⬡	VELOCITY ≥ 1 M/S
⬡	PROTECTED FLOOD AREA
⬡	DESIGN DISCHARGE HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M ³ /S



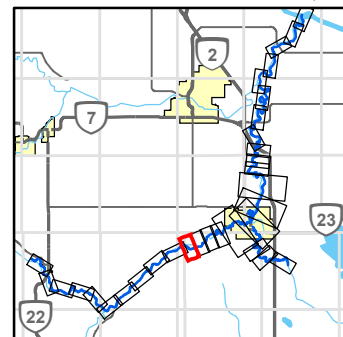
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HIGHWOOD RIVER HAZARD STUDY			
TITLE			
FLOODWAY CRITERIA MAP			
PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 10 of 33

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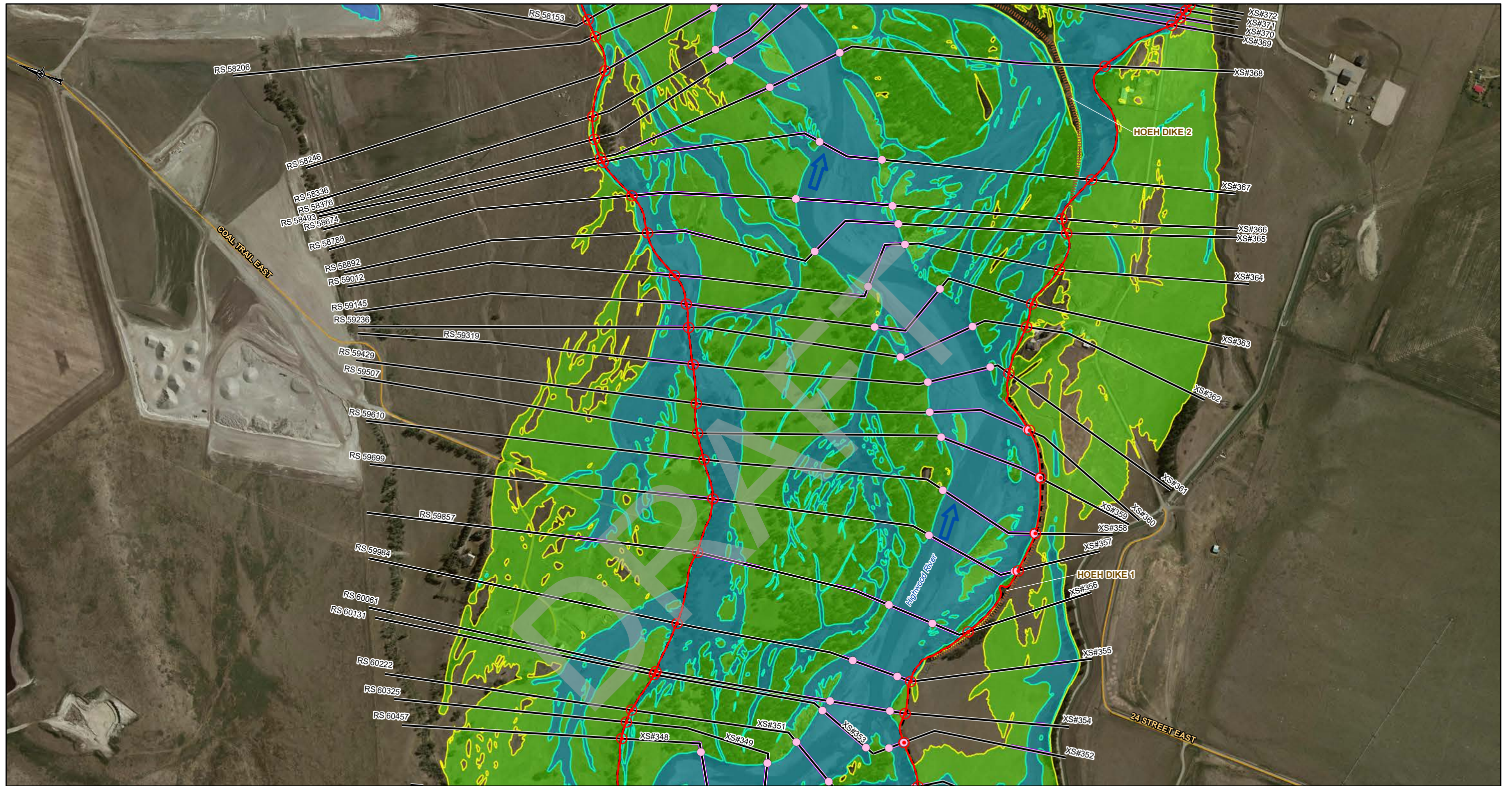


LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
—	RAILWAY
	FLOOD CONTROL STRUCTURE
HYDRAULIC STRUCTURES	
◻	CULVERT
◻	WEIR
—	BRIDGE
◻	PROPOSED FLOODWAY BOUNDARY
●	BANK STATION
○	PROPOSED FLOODWAY STATION
—	PREVIOUS FLOODWAY
■	DEPTH ≥ 1 M
■	100-YEAR DESIGN FLOOD EXTENT
■	VELOCITY ≥ 1 M/S
///	PROTECTED FLOOD AREA
DESIGN DISCHARGE	
HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M ³ /S	
HIGHWOOD RIVER DOWNSTREAM OF SPLIT POINT = 577 M ³ /S	
HIGHWOOD RIVER SIDE CHANNEL = 983 M ³ /S	

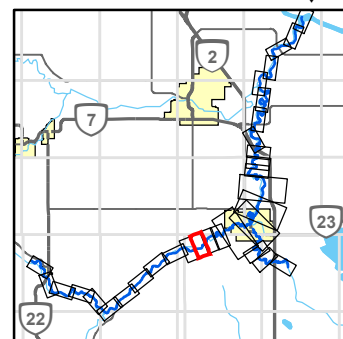


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HIGHWOOD RIVER HAZARD STUDY		
TITLE		
FLOODWAY CRITERIA MAP		
PROJECT NO.	CONTROL	REV.
1536669	4000	0
FIGURE	SHEET 11 of 33	

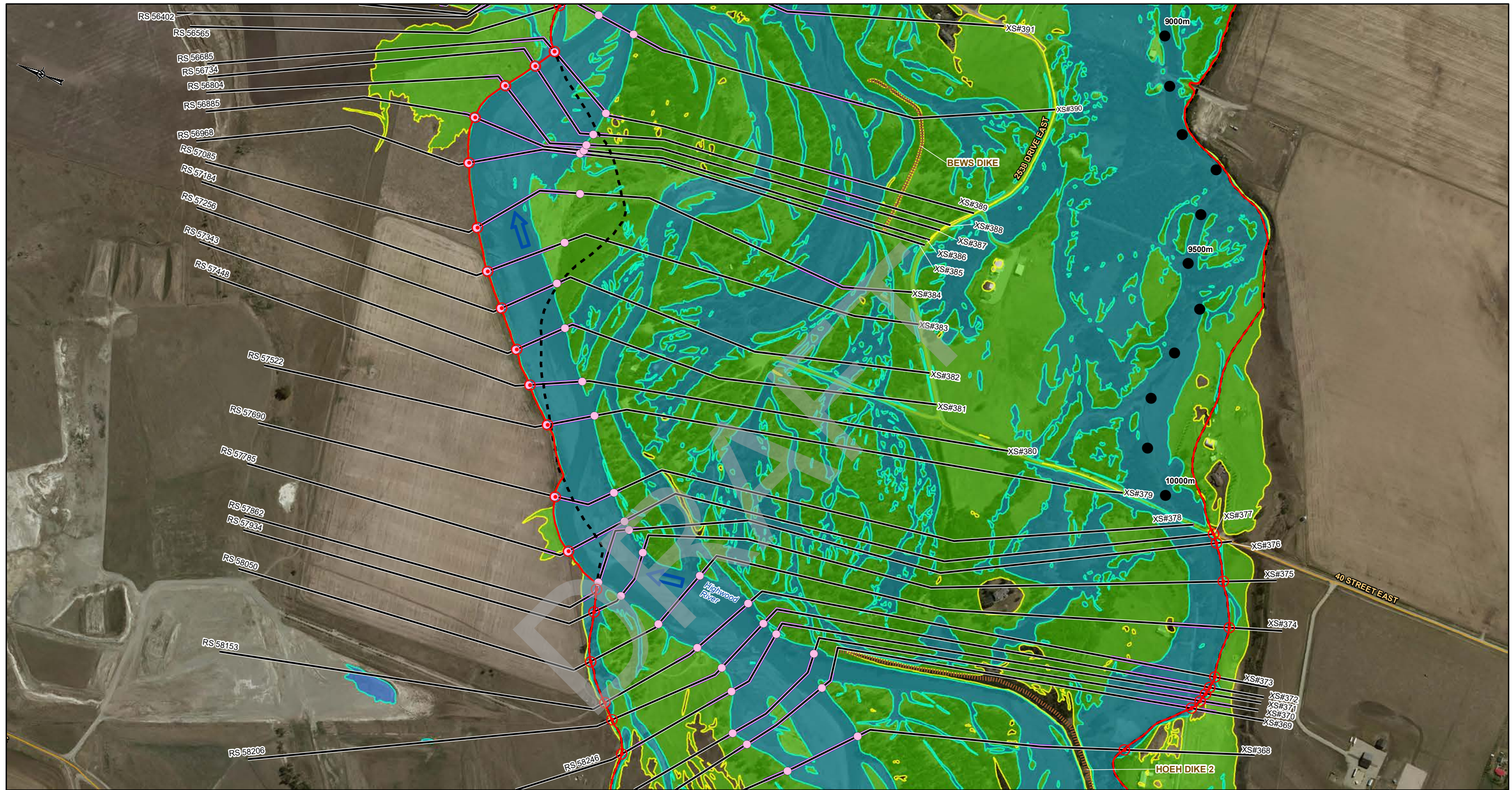


LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
—	RAILWAY
	FLOOD CONTROL STRUCTURE
⬡	CULVERT
⬡	WEIR
⬡	BRIDGE
□	PROPOSED FLOODWAY BOUNDARY
●	BANK STATION
⊙	PROPOSED FLOODWAY STATION
⊖	PREVIOUS FLOODWAY
■	DEPTH ≥ 1 M
■	100-YEAR DESIGN FLOOD EXTENT
■	VELOCITY ≥ 1 M/S
///	PROTECTED FLOOD AREA
DESIGN DISCHARGE HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M ³ /S	

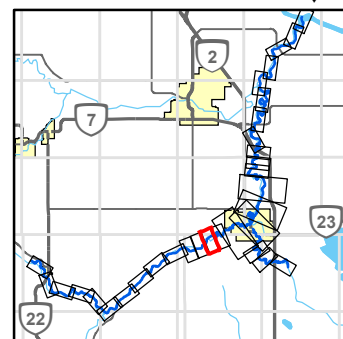


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PROJECT HIGHWOOD RIVER HAZARD STUDY		
TITLE FLOODWAY CRITERIA MAP		
PROJECT NO. 1536669	CONTROL 4000	REV. 0
		FIGURE SHEET 12 of 33

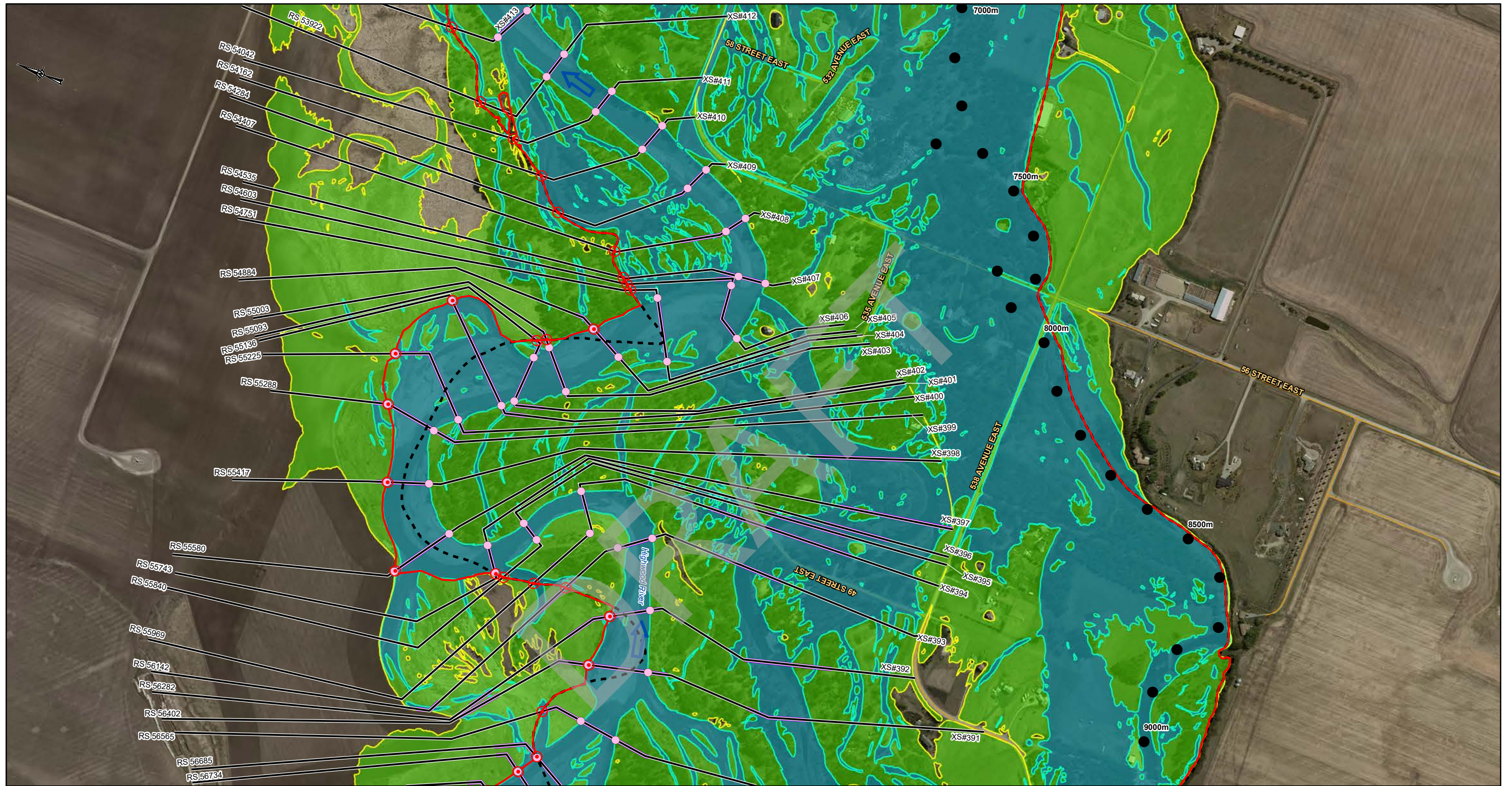


LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
+	RAILWAY
	FLOOD CONTROL STRUCTURE
HYDRAULIC STRUCTURES	
◻	CULVERT
◻	WEIR
—	BRIDGE
□	PROPOSED FLOODWAY BOUNDARY
●	BANK STATION
○	PROPOSED FLOODWAY STATION
---	PREVIOUS FLOODWAY
■	DEPTH ≥ 1 M
■	100-YEAR DESIGN FLOOD EXTENT
■	VELOCITY ≥ 1 M/S
///	PROTECTED FLOOD AREA
DESIGN DISCHARGE	
HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M ³ /S	

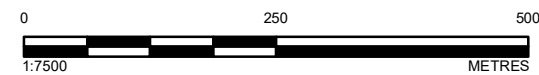
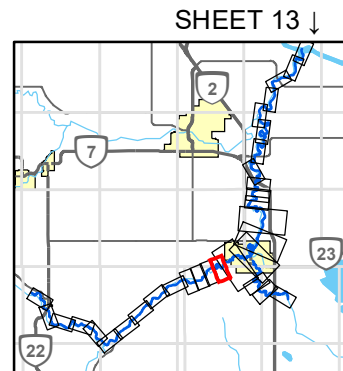


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CONSULTANT	GOLDER MEMBER OF WSP	
DESIGNED	PT	2022-06-22
PREPARED	NB	
REVIEWED	JC	
APPROVED	WP	

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PROJECT: HIGHWOOD RIVER HAZARD STUDY		
TITLE: FLOODWAY CRITERIA MAP		
PROJECT NO.	CONTROL	REV.
1536669	4000	0
FIGURE SHEET 13 of 33		



LEGEND			
●	2D DOMAIN PROFILE STATION	▬▬▬▬	FLOOD CONTROL STRUCTURE
—	CROSS SECTION	○	PROPOSED FLOODWAY STATION
XS#100	CROSS SECTION NUMBER	▬▬▬▬	PREVIOUS FLOODWAY
RS 304	RIVER STATION (M)	■	DEPTH ≥ 1 M
▬▬▬▬	STUDY BOUNDARY	■	100-YEAR DESIGN FLOOD EXTENT
➔	FLOW DIRECTION	▬▬▬▬	VELOCITY ≥ 1 M/S
—	LOCAL ROAD	▬▬▬▬	PROTECTED FLOOD AREA
—	PRIMARY HIGHWAY	▬▬▬▬	DESIGN DISCHARGE
—	SECONDARY HIGHWAY	▬▬▬▬	HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M ³ /S
+	RAILWAY	○	BANK STATION
		○	PROPOSED FLOODWAY STATION
		▬▬▬▬	CULVERT
		▬▬▬▬	WEIR
		▬▬▬▬	BRIDGE

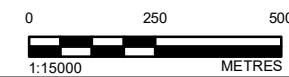
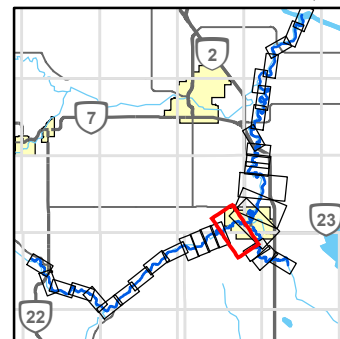


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DATUM: NAD 83 CSRS PROJECTION: 3TM 114			
PROJECT			
HIGHWOOD RIVER HAZARD STUDY			
TITLE			
FLOODWAY CRITERIA MAP			
PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 14 of 33



LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
▬▬▬	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
—	RAILWAY
▬▬▬▬	FLOOD CONTROL STRUCTURE
⬡	CULVERT
⬡	WEIR
⬡	BRIDGE
▭	PROPOSED FLOODWAY BOUNDARY
●	BANK STATION
⊙	PROPOSED FLOODWAY STATION
▭	PREVIOUS FLOODWAY
▭	DEPTH ≥ 1 M
▭	100-YEAR DESIGN FLOOD EXTENT
▭	VELOCITY ≥ 1 M/S
▭	PROTECTED FLOOD AREA
▭	DESIGN DISCHARGE
HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M ³ /S	



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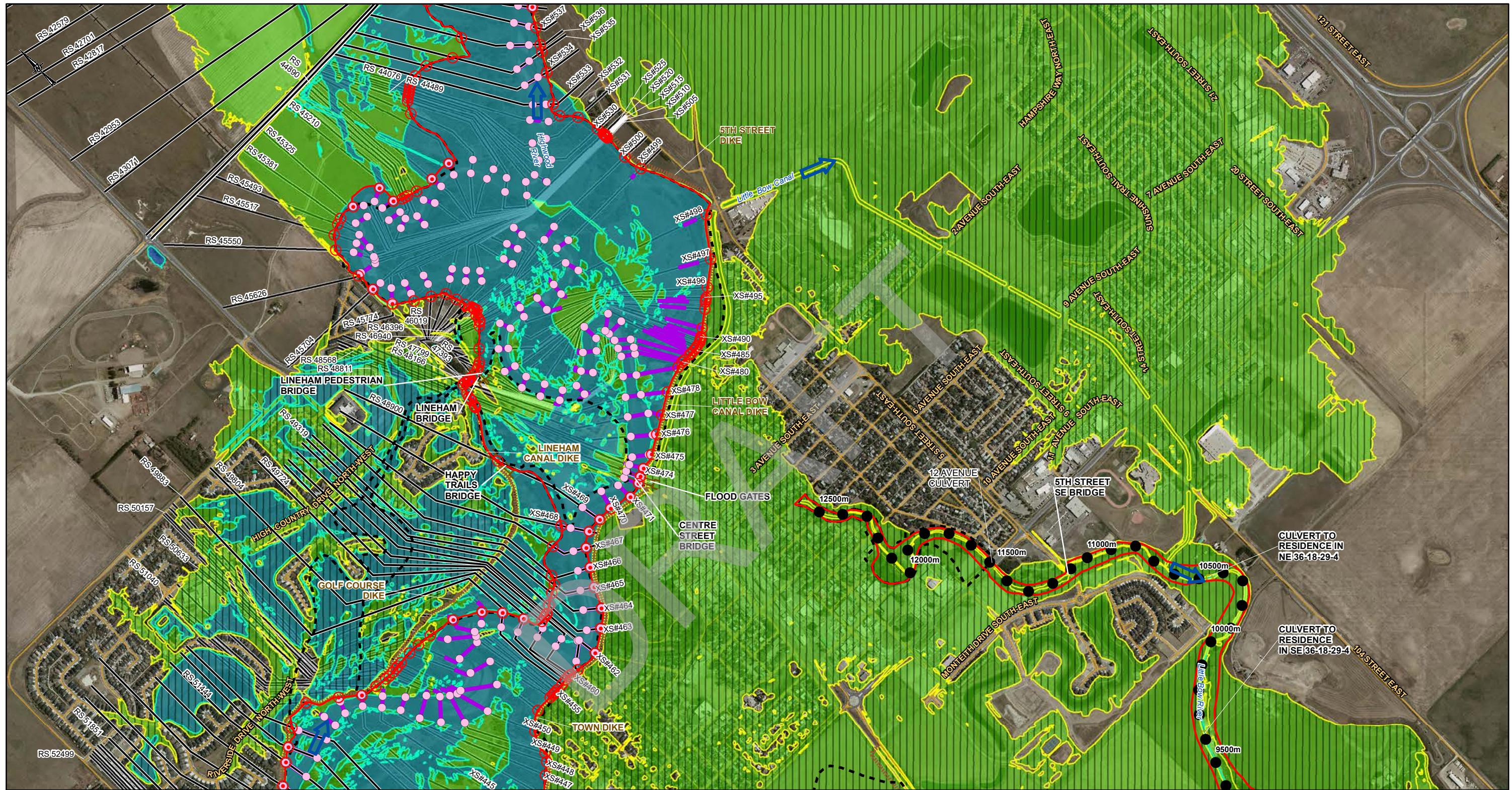
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PREPARED	NB
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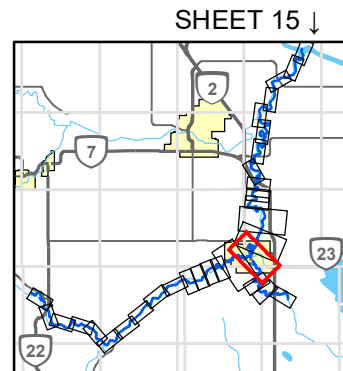
PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 15 of 33



LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
—	RAILWAY
▬▬▬	FLOOD CONTROL STRUCTURE
⬡	HYDRAULIC STRUCTURES
⬡	CULVERT
⬡	WEIR
⬡	BRIDGE
▭	PROPOSED FLOODWAY BOUNDARY
●	BANK STATION
⊙	PROPOSED FLOODWAY STATION
▭	PREVIOUS FLOODWAY
▭	DEPTH ≥ 1 M
▭	100-YEAR DESIGN FLOOD EXTENT
▭	VELOCITY ≥ 1 M/S
▭	PROTECTED FLOOD AREA
DESIGN DISCHARGE	
HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M ³ /S	
HIGHWOOD RIVER DOWNSTREAM OF HIGH RIVER = 1159 M ³ /S	

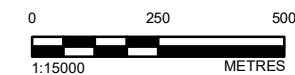
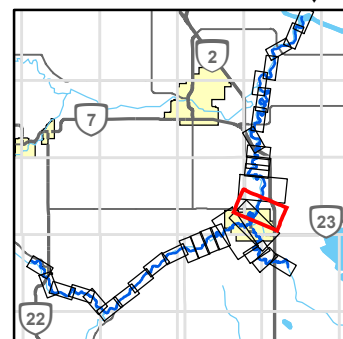


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PROJECT	HIGHWOOD RIVER HAZARD STUDY
TITLE	FLOODWAY CRITERIA MAP
PROJECT NO.	1536669
CONTROL	4000
REV.	0
FIGURE	SHEET 16 OF 33



LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
—	RAILWAY
—	FLOOD CONTROL STRUCTURE
◻	CULVERT
◻	WEIR
—	BRIDGE
◻	PROPOSED FLOODWAY BOUNDARY
●	BANK STATION
●	PROPOSED FLOODWAY STATION
◻	PREVIOUS FLOODWAY
◻	DEPTH ≥ 1 M
◻	100-YEAR DESIGN FLOOD EXTENT
◻	VELOCITY ≥ 1 M/S
◻	PROTECTED FLOOD AREA
—	DESIGN DISCHARGE
HIGHWOOD RIVER DOWNSTREAM OF HIGH RIVER = 1159 M ³ /S	

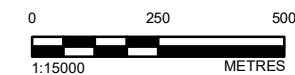
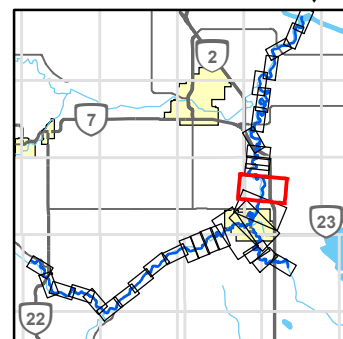


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DATUM: NAD 83 CSRS PROJECTION: 3TM 114		
PROJECT		
HIGHWOOD RIVER HAZARD STUDY		
TITLE		
FLOODWAY CRITERIA MAP		
PROJECT NO.	CONTROL	REV.
1536669	4000	0
FIGURE		SHEET 17 OF 33



LEGEND			
●	2D DOMAIN PROFILE STATION	▬▬▬▬	FLOOD CONTROL STRUCTURE
—	CROSS SECTION	○	PROPOSED FLOODWAY STATION
XS#100	CROSS SECTION NUMBER	◻	PREVIOUS FLOODWAY
RS 304	RIVER STATION (M)	■	DEPTH ≥ 1 M
▬▬▬▬	STUDY BOUNDARY	■	100-YEAR DESIGN FLOOD EXTENT
➔	FLOW DIRECTION	▬▬▬▬	VELOCITY ≥ 1 M/S
—	LOCAL ROAD	▬▬▬▬	PROTECTED FLOOD AREA
—	PRIMARY HIGHWAY	▬▬▬▬	DESIGN DISCHARGE
—	SECONDARY HIGHWAY	▬▬▬▬	HIGHWOOD RIVER DOWNSTREAM OF HIGH RIVER = 1159 M ³ /S
—	RAILWAY	▬▬▬▬	
		○	BANK STATION
		◻	CULVERT
		▬▬▬▬	WEIR
		▬▬▬▬	BRIDGE

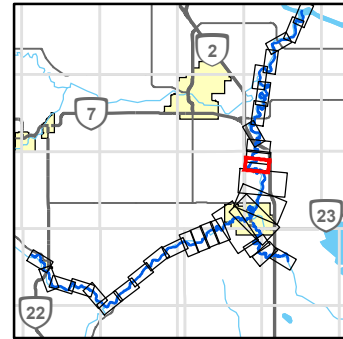


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PROJECT		
HIGHWOOD RIVER HAZARD STUDY		
TITLE		
FLOODWAY CRITERIA MAP		
PROJECT NO.	CONTROL	REV.
1536669	4000	0
FIGURE		
SHEET 18 of 33		



LEGEND			
●	2D DOMAIN PROFILE STATION	▬▬▬ FLOOD CONTROL STRUCTURE	
—	CROSS SECTION	○ PROPOSED FLOODWAY STATION	
XS#100	CROSS SECTION NUMBER	◻ PREVIOUS FLOODWAY	
RS 304	RIVER STATION (M)	■ DEPTH ≥ 1 M	
▬▬▬	STUDY BOUNDARY	■ 100-YEAR DESIGN FLOOD EXTENT	
➔	FLOW DIRECTION	▬▬▬ VELOCITY ≥ 1 M/S	
—	LOCAL ROAD	▬▬▬ PROTECTED FLOOD AREA	
—	PRIMARY HIGHWAY	▬▬▬ DESIGN DISCHARGE	
—	SECONDARY HIGHWAY	HIGHWOOD RIVER DOWNSTREAM OF HIGH RIVER = 1159 M ³ /S	
+	RAILWAY	○ BANK STATION	
		◻ CULVERT	
		▬ WEIR	
		▬ BRIDGE	



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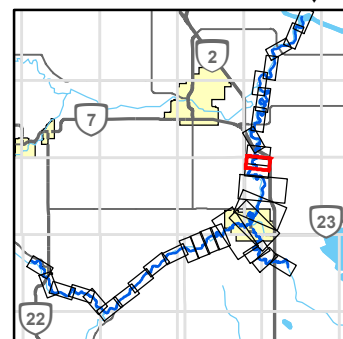
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DATUM: NAD 83 CSRS PROJECTION: 3TM 114		
PROJECT		
HIGHWOOD RIVER HAZARD STUDY		
TITLE		
FLOODWAY CRITERIA MAP		
PROJECT NO.	CONTROL	REV.
1536669	4000	0
FIGURE		SHEET 19 of 33

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

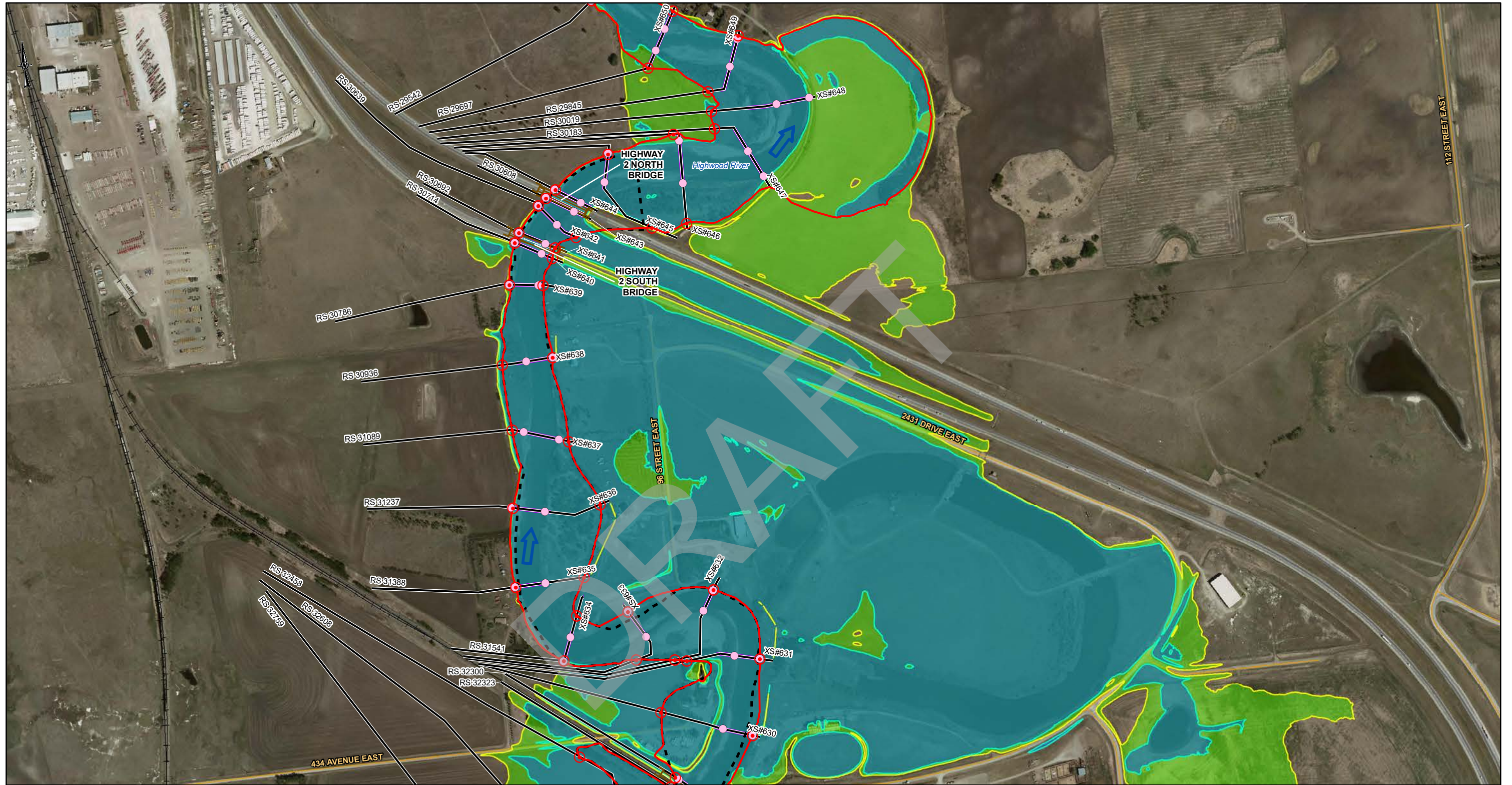


LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
—	RAILWAY
—	FLOOD CONTROL STRUCTURE
⬡	CULVERT
⬡	WEIR
⬡	BRIDGE
—	PROPOSED FLOODWAY BOUNDARY
●	BANK STATION
⊙	PROPOSED FLOODWAY STATION
—	PREVIOUS FLOODWAY
—	DEPTH ≥ 1 M
—	100-YEAR DESIGN FLOOD EXTENT
—	VELOCITY ≥ 1 M/S
—	PROTECTED FLOOD AREA
—	DESIGN DISCHARGE HIGHWOOD RIVER DOWNSTREAM OF HIGH RIVER = 1159 M ³ /S

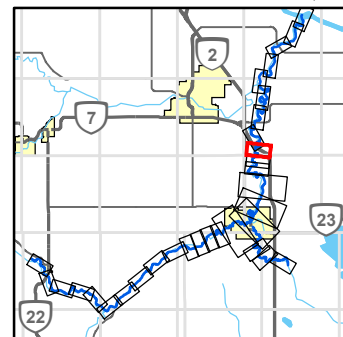


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PROJECT		
HIGHWOOD RIVER HAZARD STUDY		
TITLE		
FLOODWAY CRITERIA MAP		
PROJECT NO.	CONTROL	REV.
1536669	4000	0
FIGURE		
SHEET 20 of 33		



LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
—	RAILWAY
	FLOOD CONTROL STRUCTURE
⬡	CULVERT
⬡	WEIR
⬡	BRIDGE
□	PROPOSED FLOODWAY BOUNDARY
●	BANK STATION
⊙	PROPOSED FLOODWAY STATION
⊖	PREVIOUS FLOODWAY
■	DEPTH ≥ 1 M
■	100-YEAR DESIGN FLOOD EXTENT
■	VELOCITY ≥ 1 M/S
///	PROTECTED FLOOD AREA
DESIGN DISCHARGE HIGHWOOD RIVER DOWNSTREAM OF HIGH RIVER = 1159 M ³ /S	



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PROJECT	HIGHWOOD RIVER HAZARD STUDY		
TITLE	FLOODWAY CRITERIA MAP		
PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 21 of 33

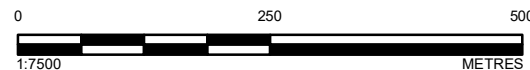
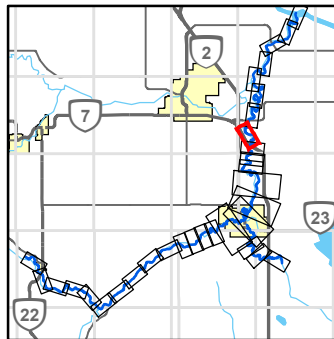


SHEET 21 ↑

↑ SHEET 23

LEGEND

- 2D DOMAIN PROFILE STATION
- CROSS SECTION
- XS#100 CROSS SECTION NUMBER
- RS 304 RIVER STATION (M)
- ▬ STUDY BOUNDARY
- ➔ FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- ▬ FLOOD CONTROL STRUCTURE
- HYDRAULIC STRUCTURES**
- ◻ CULVERT
- ◻ WEIR
- ▬ BRIDGE
- ▭ PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- ▭ PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S
- ▨ PROTECTED FLOOD AREA
- DESIGN DISCHARGE
HIGHWOOD RIVER DOWNSTREAM OF HIGH RIVER = 1159 M³/S



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DATUM: NAD 83 CSRS PROJECTION: 3TM 114

PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

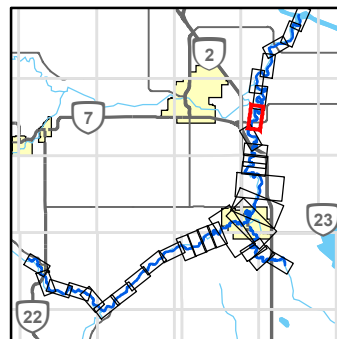
PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 22 of 33



SHEET 22 ↑

↓ SHEET 24

LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
—	RAILWAY
—	FLOOD CONTROL STRUCTURE
⬡	CULVERT
⬡	WEIR
⬡	BRIDGE
⬡	PROPOSED FLOODWAY BOUNDARY
●	BANK STATION
⊙	PROPOSED FLOODWAY STATION
⬡	PREVIOUS FLOODWAY
⬡	DEPTH ≥ 1 M
⬡	100-YEAR DESIGN FLOOD EXTENT
⬡	VELOCITY ≥ 1 M/S
⬡	PROTECTED FLOOD AREA
⬡	DESIGN DISCHARGE
HIGHWOOD RIVER DOWNSTREAM OF HIGH RIVER = 1159 M ³ /S	



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DATUM: NAD 83 CSRS PROJECTION: 3TM 114

PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 23 of 33

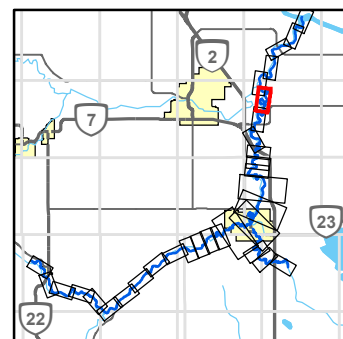
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SHEET 23 ↑



SHEET 25 ↓

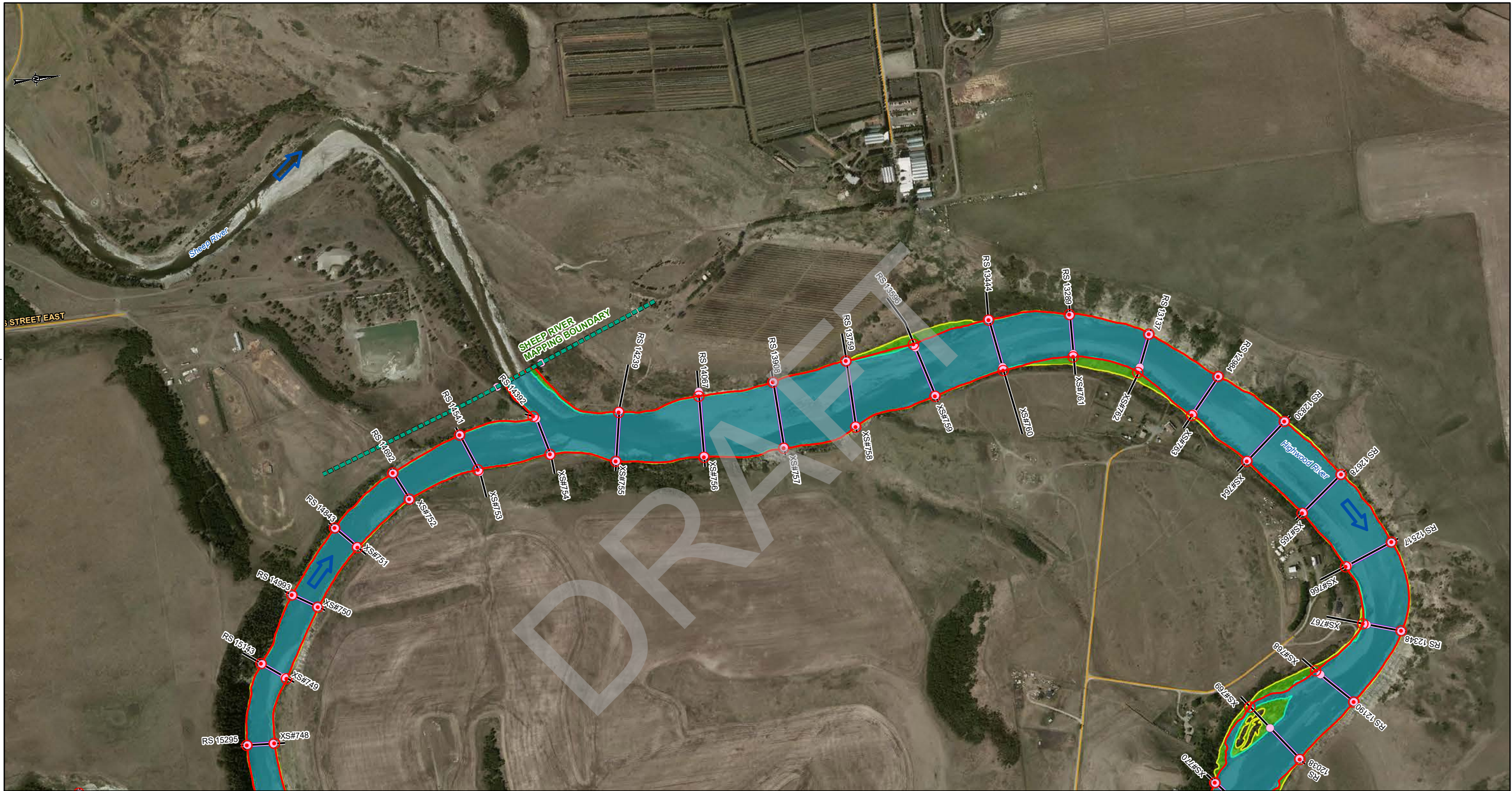
LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
+	RAILWAY
—	FLOOD CONTROL STRUCTURE
⬡	CULVERT
⬡	WEIR
—	BRIDGE
⬡	PROPOSED FLOODWAY BOUNDARY
●	BANK STATION
⊙	PROPOSED FLOODWAY STATION
⬡	PREVIOUS FLOODWAY
⬡	DEPTH ≥ 1 M
⬡	100-YEAR DESIGN FLOOD EXTENT
⬡	VELOCITY ≥ 1 M/S
⬡	PROTECTED FLOOD AREA
⬡	DESIGN DISCHARGE
HIGHWOOD RIVER DOWNSTREAM OF HIGH RIVER = 1159 M ³ /S	



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APPROVED	WP	

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PROJECT		
HIGHWOOD RIVER HAZARD STUDY		
TITLE		
FLOODWAY CRITERIA MAP		
PROJECT NO.	CONTROL	REV.
1536669	4000	0
FIGURE		
SHEET 24 of 33		

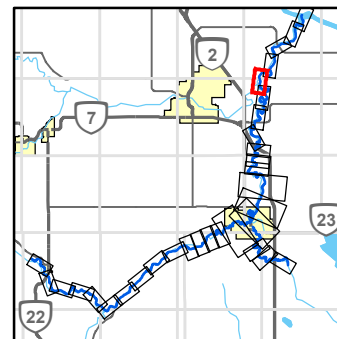
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SHEET 24 ↑

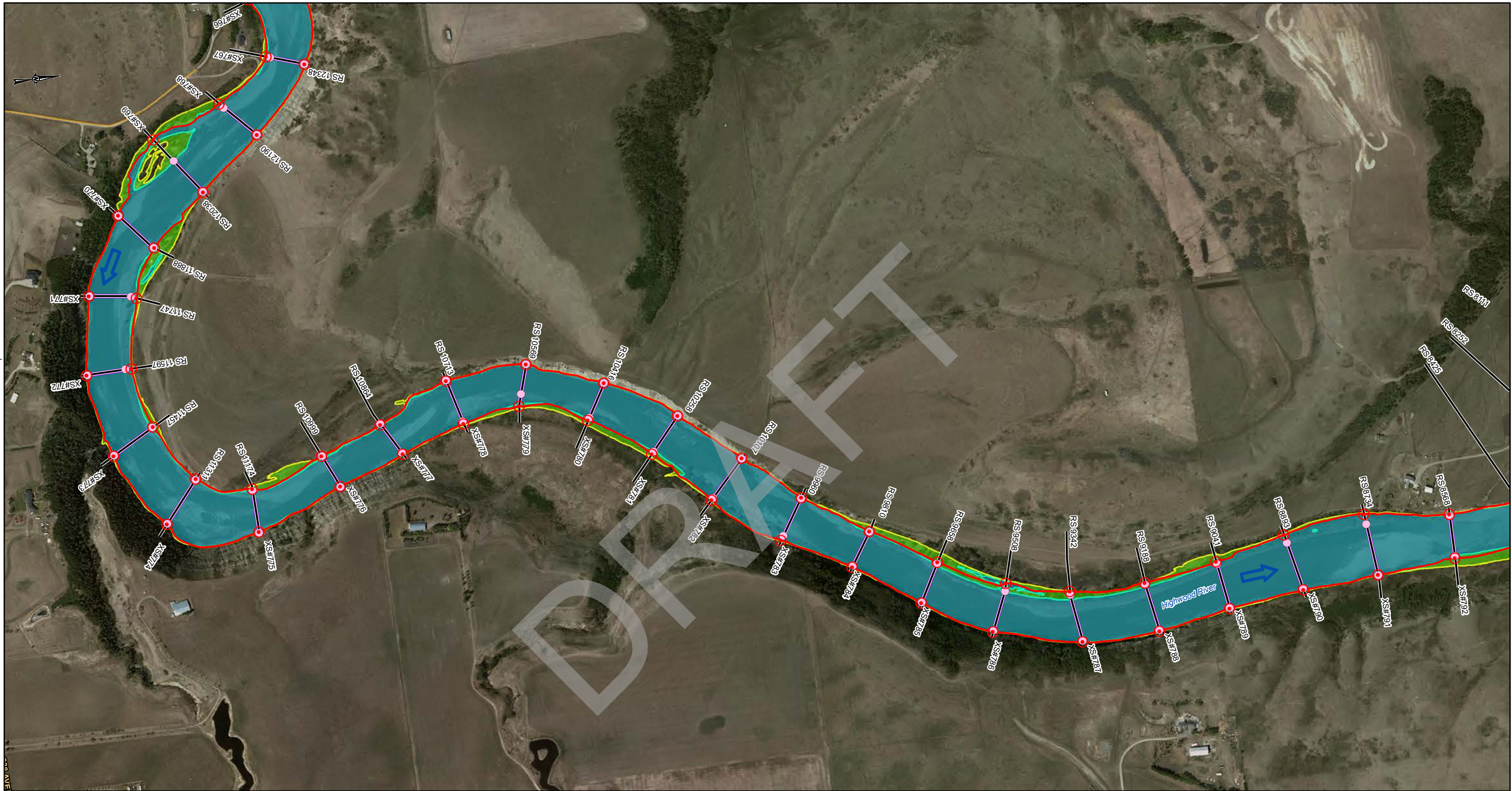
↑ SHEET 26

LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
—	RAILWAY
—	FLOOD CONTROL STRUCTURE
⬡	CULVERT
⬡	WEIR
—	BRIDGE
⬡	PROPOSED FLOODWAY BOUNDARY
●	BANK STATION
⊙	PROPOSED FLOODWAY STATION
⬡	PREVIOUS FLOODWAY
⬡	DEPTH ≥ 1 M
⬡	100-YEAR DESIGN FLOOD EXTENT
⬡	VELOCITY ≥ 1 M/S
⬡	PROTECTED FLOOD AREA
DESIGN DISCHARGE	
HIGHWOOD RIVER DOWNSTREAM OF HIGH RIVER = 1159 M ³ /S	
HIGHWOOD RIVER DOWNSTREAM OF SHEEP RIVER = 2009 M ³ /S	



CLIENT	ALBERTA ENVIRONMENT AND PARKS
CONSULTANT	GOLDER MEMBER OF WSP
DATE	2022-06-22
DESIGNED	PT
PREPARED	NB
REVIEWED	JC
APPROVED	WP

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PROJECT	HIGHWOOD RIVER HAZARD STUDY
TITLE	FLOODWAY CRITERIA MAP
PROJECT NO.	1536669
CONTROL	4000
REV.	0
FIGURE	SHEET 25 of 33

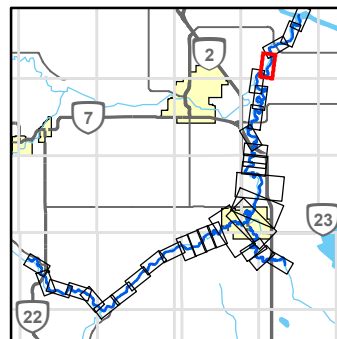


SHEET 25 ↑

↑ SHEET 27

LEGEND

- 2D DOMAIN PROFILE STATION
- CROSS SECTION
- XS#100 CROSS SECTION NUMBER
- RS 304 RIVER STATION (M)
- ▬ STUDY BOUNDARY
- ➔ FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- ▬ FLOOD CONTROL STRUCTURE
- HYDRAULIC STRUCTURES**
- ◻ CULVERT
- ◻ WEIR
- ▬ BRIDGE
- ▭ PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- ▭ PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S
- ▨ PROTECTED FLOOD AREA
- DESIGN DISCHARGE**
- HIGHWOOD RIVER DOWNSTREAM OF SHEEP RIVER = 2009 M³/S



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PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 26 of 33

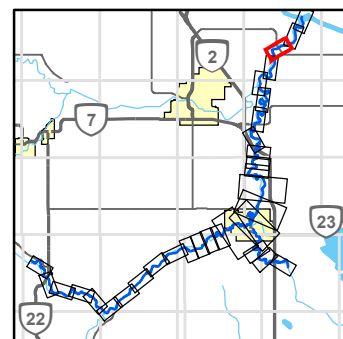
SHEET 26 ↑

↑ SHEET 28



LEGEND

● 2D DOMAIN PROFILE STATION	FLOOD CONTROL STRUCTURE	□ PROPOSED FLOODWAY BOUNDARY
— CROSS SECTION	HYDRAULIC STRUCTURES	○ BANK STATION
XS#100 CROSS SECTION NUMBER	◊ CULVERT	○ PROPOSED FLOODWAY STATION
RS 304 RIVER STATION (M)	□ WEIR	▭ PREVIOUS FLOODWAY
▬ STUDY BOUNDARY	▬ BRIDGE	■ DEPTH ≥ 1 M
➡ FLOW DIRECTION		■ 100-YEAR DESIGN FLOOD EXTENT
— LOCAL ROAD		■ VELOCITY ≥ 1 M/S
— PRIMARY HIGHWAY		▨ PROTECTED FLOOD AREA
— SECONDARY HIGHWAY		DESIGN DISCHARGE
— RAILWAY		HIGHWOOD RIVER DOWNSTREAM OF SHEEP RIVER = 2009 M ³ /S



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GOLDER
MEMBER OF WSP

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PROJECT
HIGHWOOD RIVER HAZARD STUDY

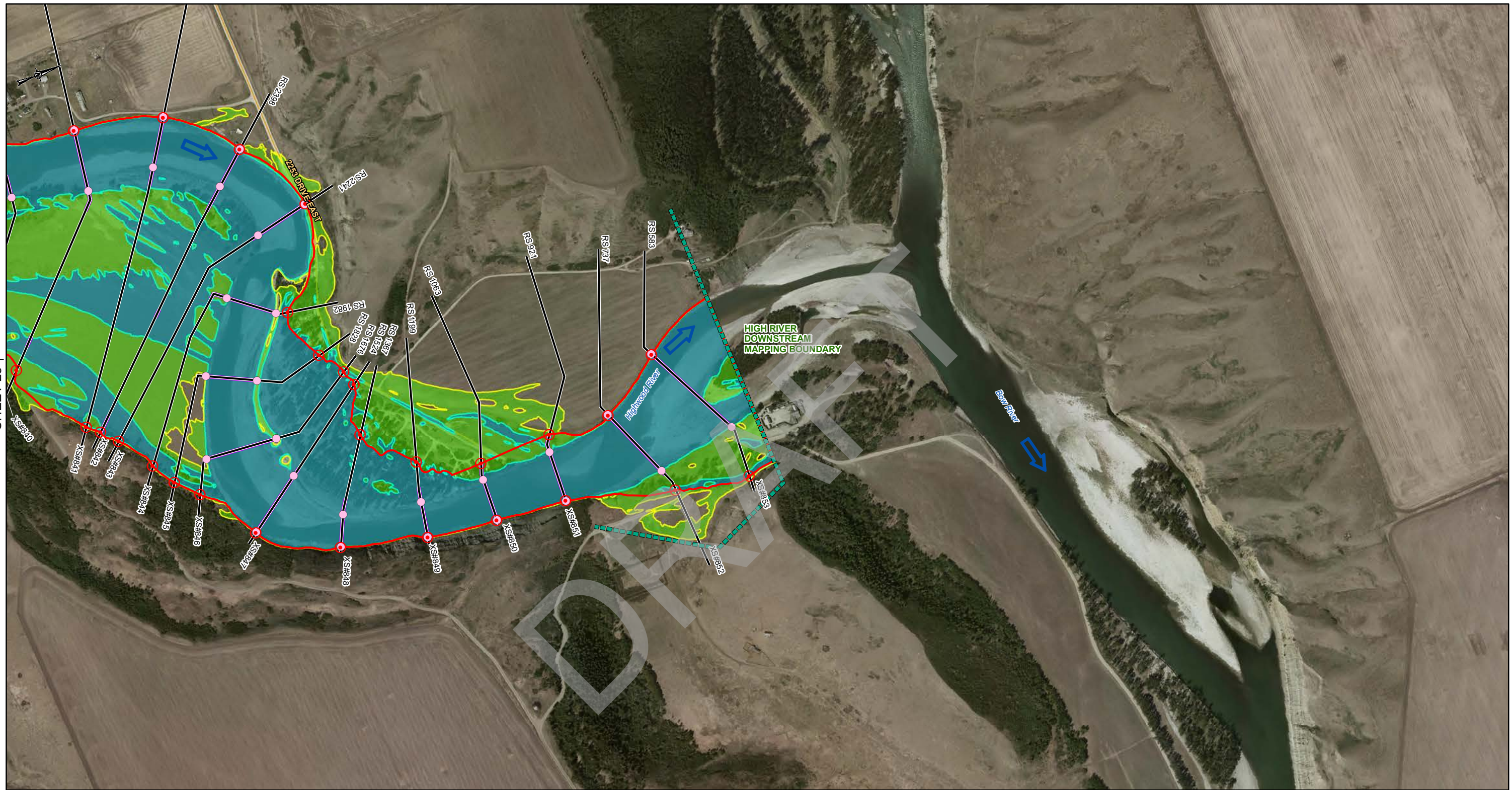
TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 27 of 33

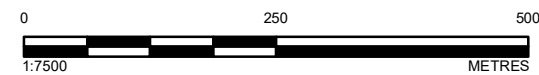
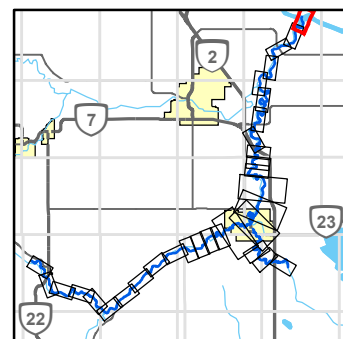
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26mm IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

SHEET 28 ↑



LEGEND			
●	2D DOMAIN PROFILE STATION	▬▬▬	FLOOD CONTROL STRUCTURE
—	CROSS SECTION	○	PROPOSED FLOODWAY STATION
XS#100	CROSS SECTION NUMBER	◻	PROPOSED FLOODWAY BOUNDARY
RS 304	RIVER STATION (M)	◻	BANK STATION
▬▬▬	STUDY BOUNDARY	◻	PREVIOUS FLOODWAY
➡	FLOW DIRECTION	■	DEPTH ≥ 1 M
—	LOCAL ROAD	■	100-YEAR DESIGN FLOOD EXTENT
—	PRIMARY HIGHWAY	▨	VELOCITY ≥ 1 M/S
—	SECONDARY HIGHWAY	▨	PROTECTED FLOOD AREA
+	RAILWAY	▨	DESIGN DISCHARGE
			HIGHWOOD RIVER DOWNSTREAM OF SHEEP RIVER = 2009 M ³ /S



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AND PARKS



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DESIGNED	PT
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DATUM: NAD 83 CSRS PROJECTION: 3TM 114

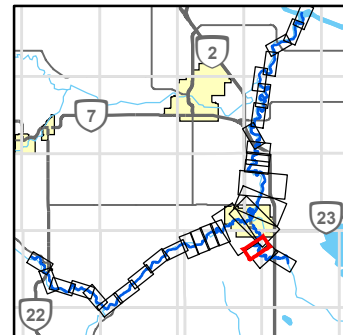
PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 29 of 33



LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
▬	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
+	RAILWAY
▬▬▬▬	FLOOD CONTROL STRUCTURE
⬡	CULVERT
⬡	WEIR
⬡	BRIDGE
▭	PROPOSED FLOODWAY BOUNDARY
●	BANK STATION
⊙	PROPOSED FLOODWAY STATION
▭	PREVIOUS FLOODWAY
▭	DEPTH ≥ 1 M
▭	100-YEAR DESIGN FLOOD EXTENT
▭	VELOCITY ≥ 1 M/S
▭	PROTECTED FLOOD AREA
▭	DESIGN DISCHARGE
LITTLE BOW RIVER DOWNSTREAM OF HIGH RIVER = 402 M ³ /S	

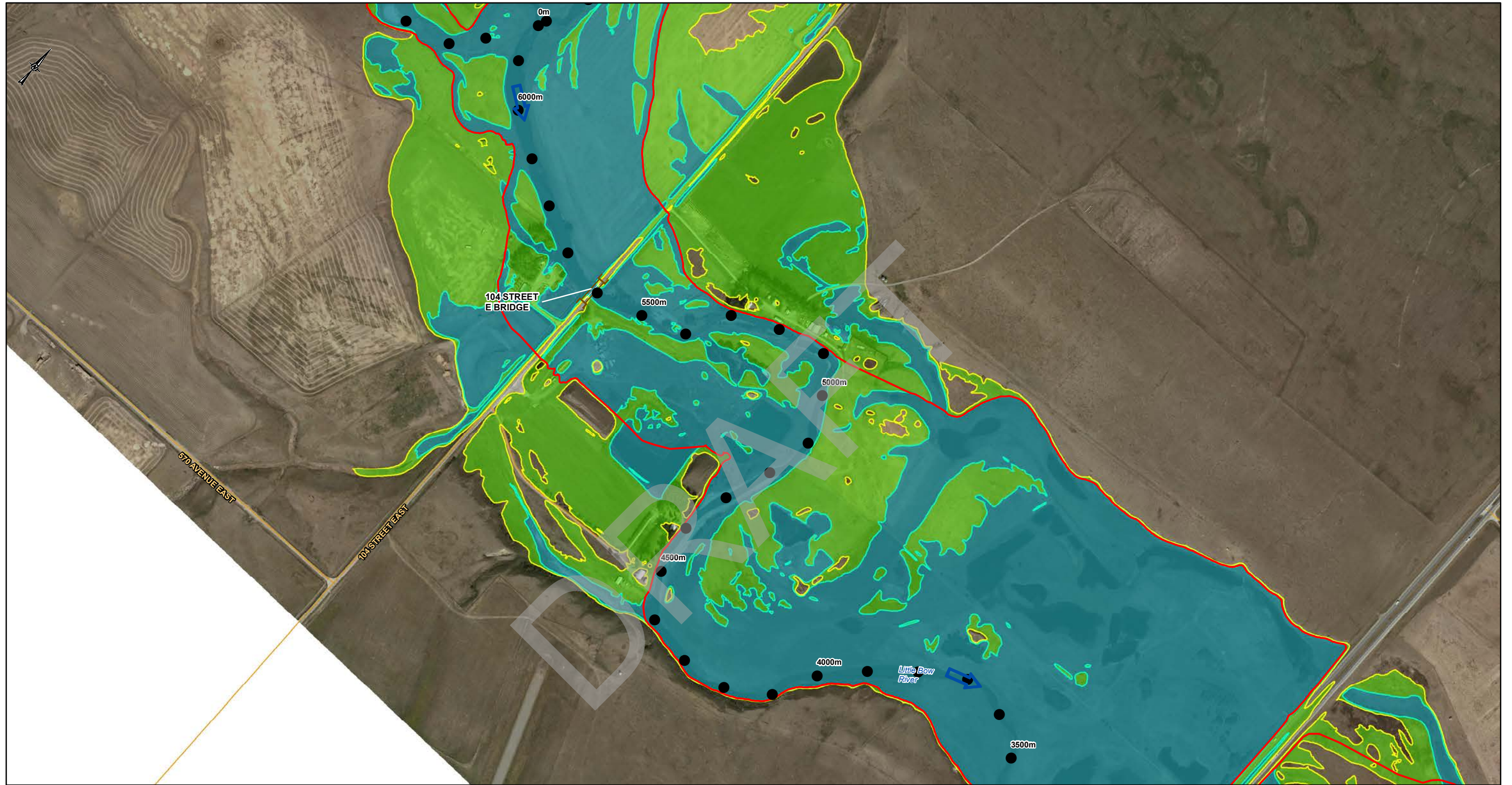


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CONSULTANT	GOLDER MEMBER OF WSP	
DESIGNED	PT	2022-06-22
PREPARED	NB	
REVIEWED	JC	
APPROVED	WP	

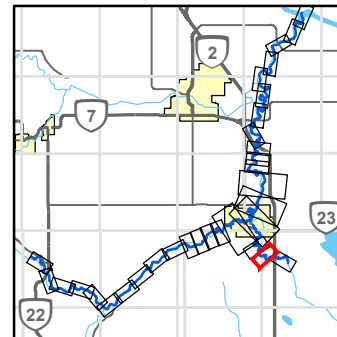
REFERENCE(S)		
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PROJECT		
HIGHWOOD RIVER HAZARD STUDY		
TITLE		
FLOODWAY CRITERIA MAP		
PROJECT NO.	CONTROL	REV.
1536669	4000	0
FIGURE		
SHEET 30 of 33		

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LEGEND			
●	2D DOMAIN PROFILE STATION		FLOOD CONTROL STRUCTURE
—	CROSS SECTION	○	PROPOSED FLOODWAY STATION
XS#100	CROSS SECTION NUMBER	◻	PREVIOUS FLOODWAY
RS 304	RIVER STATION (M)	◻	DEPTH ≥ 1 M
▬	STUDY BOUNDARY	◻	100-YEAR DESIGN FLOOD EXTENT
➔	FLOW DIRECTION	▬	VELOCITY ≥ 1 M/S
—	LOCAL ROAD	▬	PROTECTED FLOOD AREA
—	PRIMARY HIGHWAY	▬	DESIGN DISCHARGE
—	SECONDARY HIGHWAY	▬	LITTLE BOW RIVER DOWNSTREAM OF HIGH RIVER = 402 M ³ /S
+	RAILWAY	▬	
		◻	PROPOSED FLOODWAY BOUNDARY
		○	BANK STATION
		◻	HYDRAULIC STRUCTURES
		◻	CULVERT
		◻	WEIR
		▬	BRIDGE



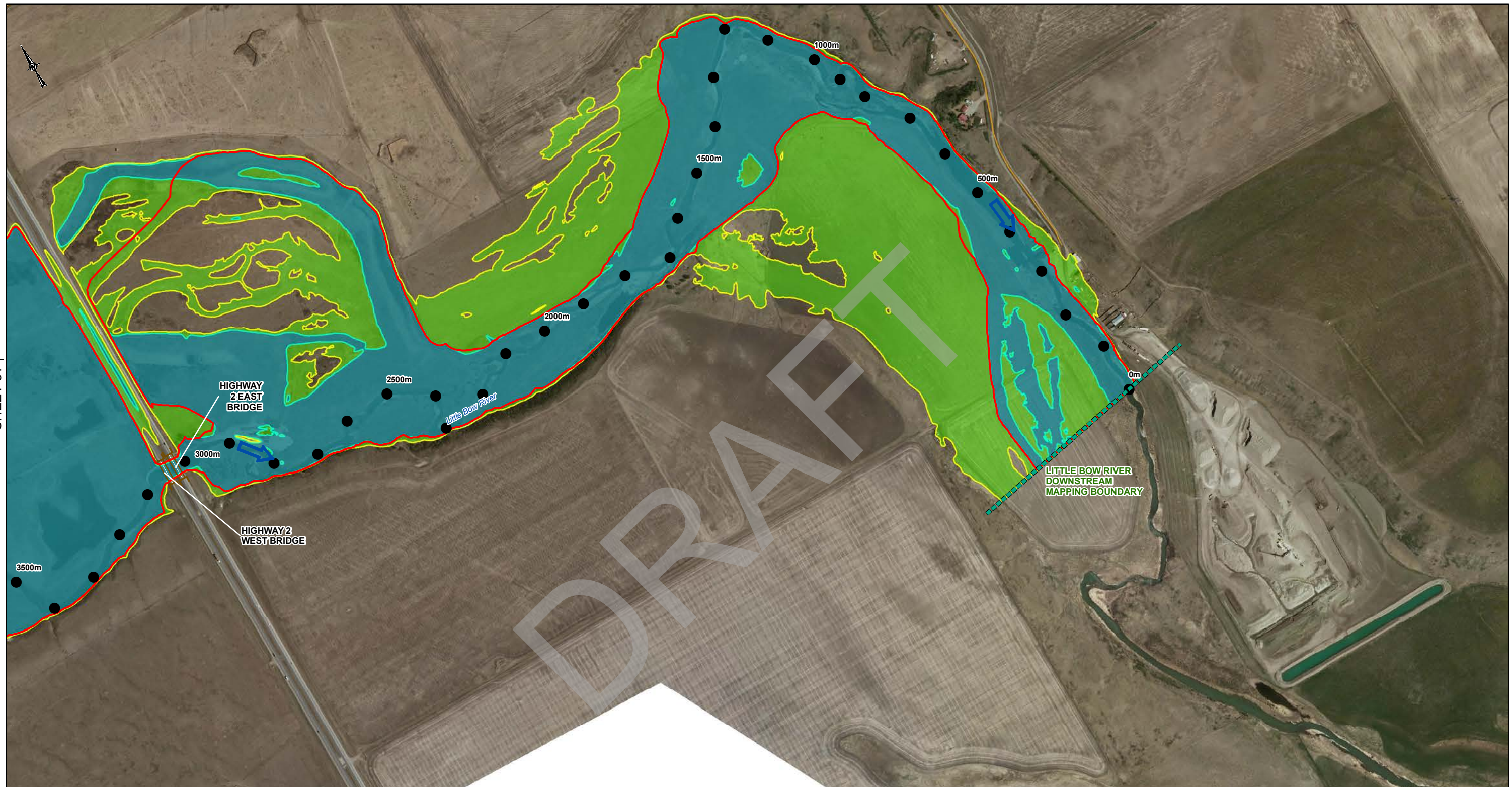
CLIENT	ALBERTA ENVIRONMENT AND PARKS	
CONSULTANT	GOLDER MEMBER OF WSP	
DESIGNED	YYYY-MM-DD	2022-06-22
PREPARED	PT	
REVIEWED	NB	
APPROVED	JC	
	WP	

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PROJECT		
HIGHWOOD RIVER HAZARD STUDY		
TITLE		
FLOODWAY CRITERIA MAP		
PROJECT NO.	CONTROL	REV.
1536669	4000	0
		FIGURE
		SHEET 31 of 33

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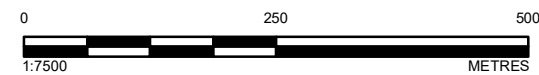
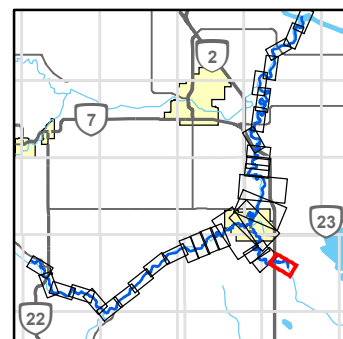
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SHEET 31 ↑



LEGEND

● 2D DOMAIN PROFILE STATION	▬ FLOOD CONTROL STRUCTURE	▭ PROPOSED FLOODWAY BOUNDARY
— CROSS SECTION	HYDRAULIC STRUCTURES	● BANK STATION
XS#100 CROSS SECTION NUMBER	◊ CULVERT	⊙ PROPOSED FLOODWAY STATION
RS 304 RIVER STATION (M)	□ WEIR	▭ PREVIOUS FLOODWAY
▬ STUDY BOUNDARY	▬ BRIDGE	■ DEPTH ≥ 1 M
➔ FLOW DIRECTION		■ 100-YEAR DESIGN FLOOD EXTENT
— LOCAL ROAD		■ VELOCITY ≥ 1 M/S
— PRIMARY HIGHWAY		▨ PROTECTED FLOOD AREA
— SECONDARY HIGHWAY		▬ DESIGN DISCHARGE
— RAILWAY		LITTLE BOW RIVER DOWNSTREAM OF HIGH RIVER = 402 M ³ /S



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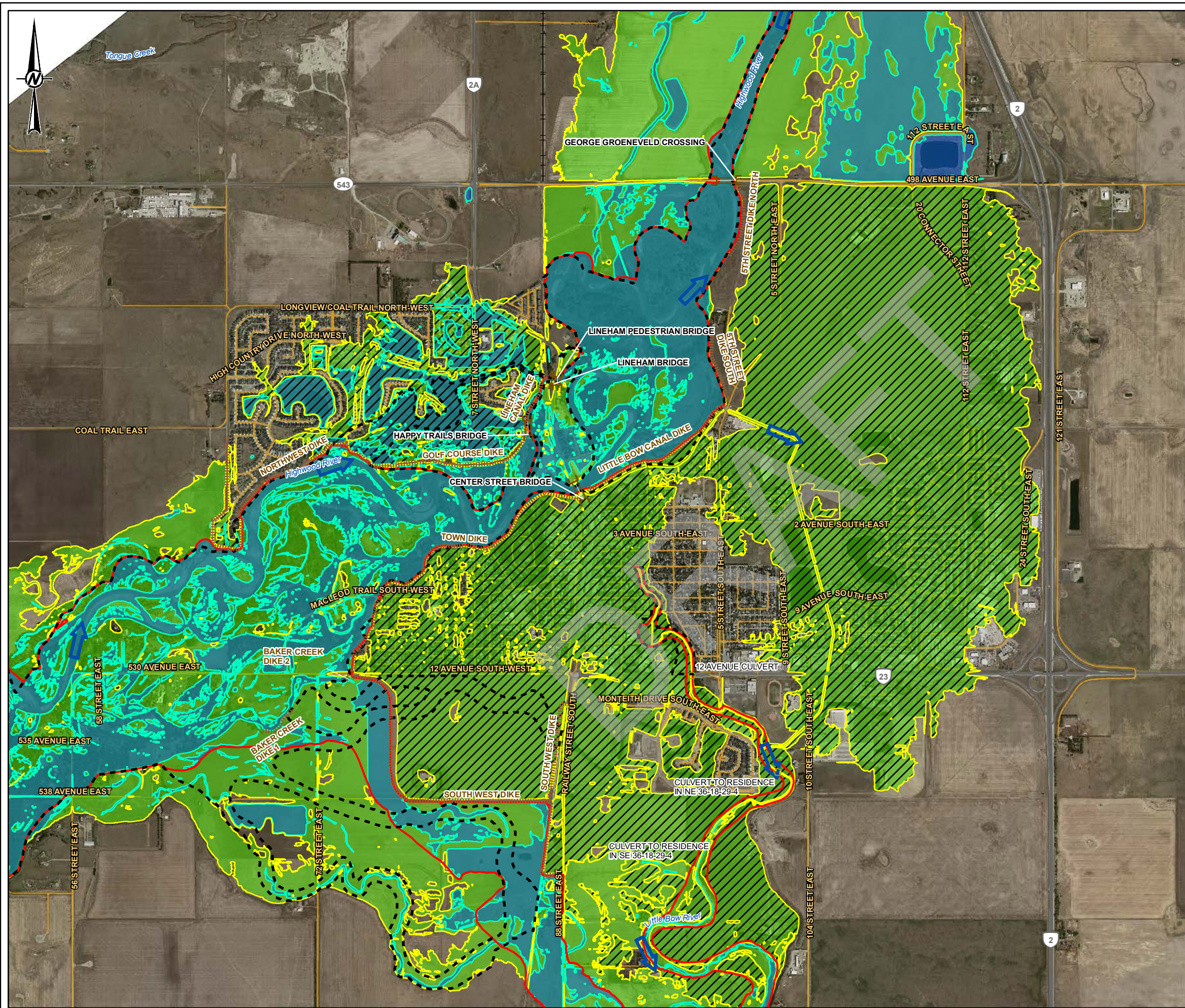
YYYY-MM-DD	2022-06-22
DESIGNED	PT
PREPARED	NB
REVIEWED	JC
APPROVED	WP

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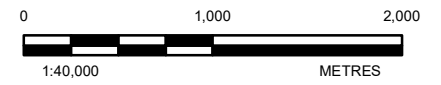
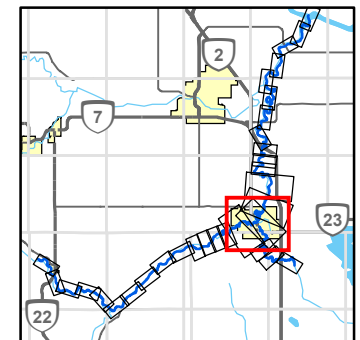
PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 32 of 33



- LEGEND**
- FLOW DIRECTION
 - LOCAL ROAD
 - PRIMARY HIGHWAY
 - SECONDARY HIGHWAY
 - RAILWAY
 - FLOOD CONTROL STRUCTURE
 - HYDRAULIC STRUCTURES**
 - CULVERT
 - WEIR
 - BRIDGE
- FLOODWAY CRITERIA**
- PREVIOUS FLOODWAY
 - PROPOSED FLOODWAY BOUNDARY
 - DEPTH ≥ 1 M
 - 100-YEAR DESIGN FLOOD EXTENT
 - PROTECTED FLOOD AREA



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CLIENT
ALBERTA ENVIRONMENT AND PARKS

PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
**FLOODWAY CRITERIA MAP
 OVERFLOW AREA AT HIGH RIVER**

CONSULTANT	YYYY-MM-DD	2022-06-22
DESIGNED	PT	
PREPARED	NB	
REVIEWED	JC	
APPROVED	WP	

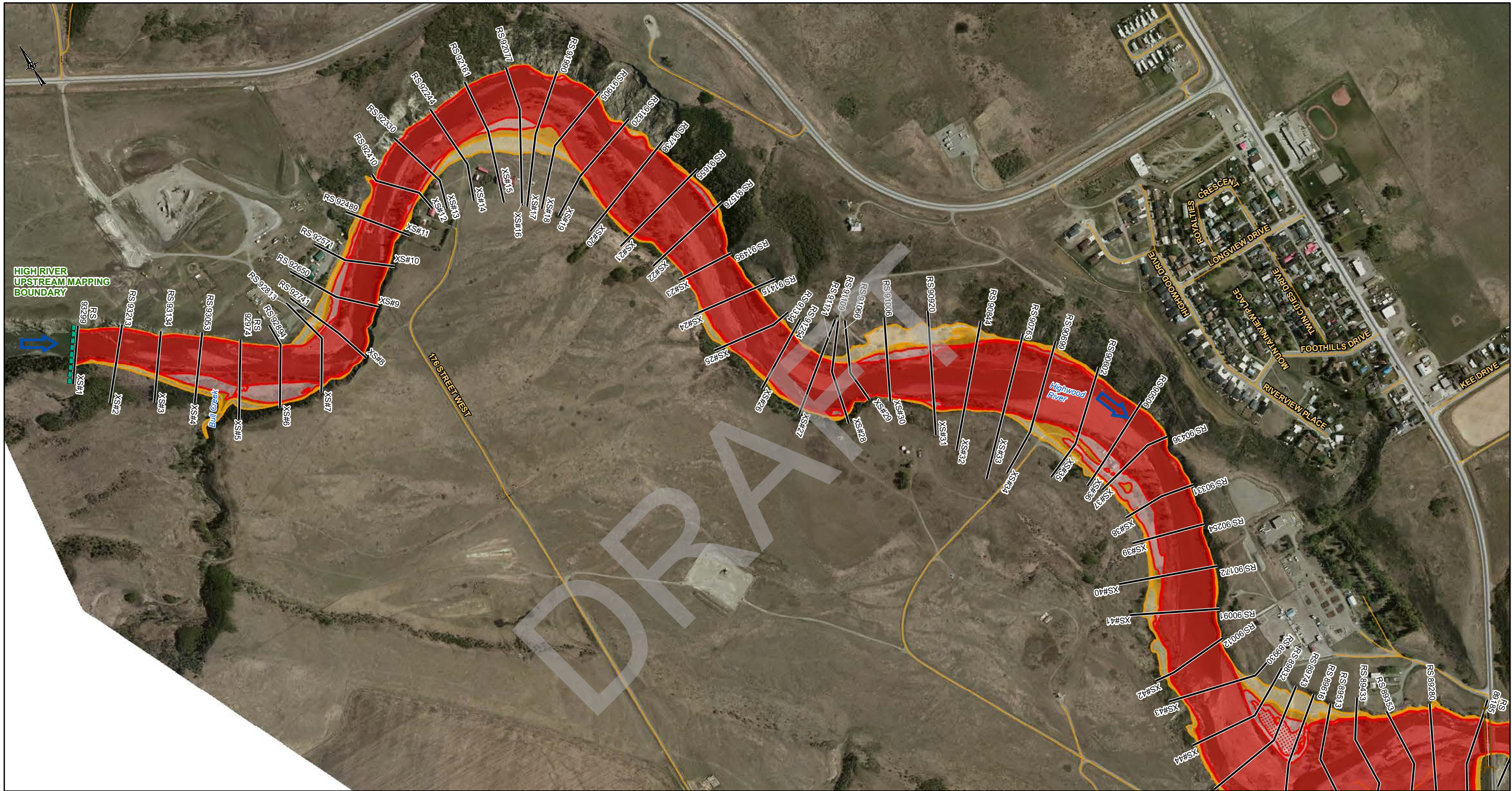
PROJECT NO. 1536669 CONTROL 4000 REV. 0 FIGURE SHEET 33 of 33



APPENDIX B

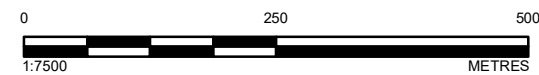
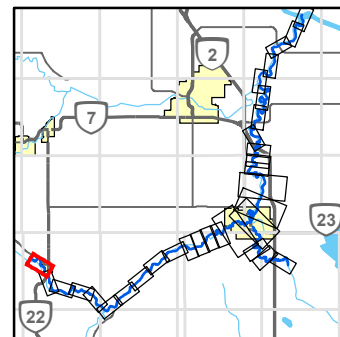
Design Flood Hazard Maps

DRAFT



SHEET 2

LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
—	RAILWAY
	FLOOD CONTROL STRUCTURE
⬡	CULVERT
⬡	WEIR
⬡	BRIDGE
■	FLOODWAY
■	HIGH HAZARD FLOOD FRINGE
■	FLOOD FRINGE
■	PROTECTED FLOOD FRINGE
■	200-YEAR FLOOD EXTENT
■	500-YEAR FLOOD EXTENT
DESIGN DISCHARGE HIGHWOOD RIVER UPSTREAM OF STIMSON CREEK = 1080 M ³ /S	

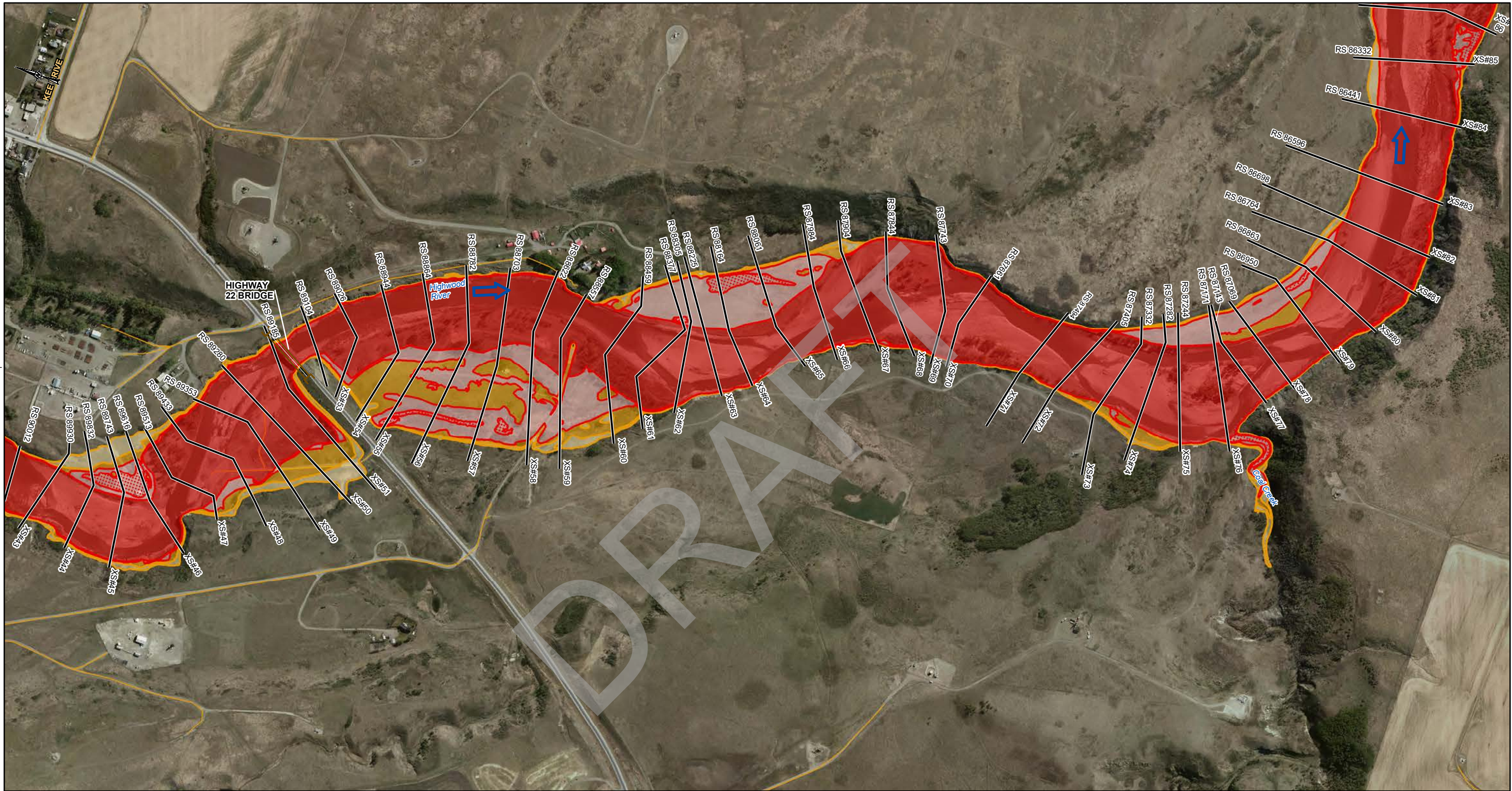


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PREPARED	NB
REVIEWED	JC
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PROJECT	HIGHWOOD RIVER HAZARD STUDY
TITLE	FLOOD HAZARD MAP
PROJECT NO.	1536669
CONTROL	4000
REV.	0
FIGURE	SHEET 1 of 33

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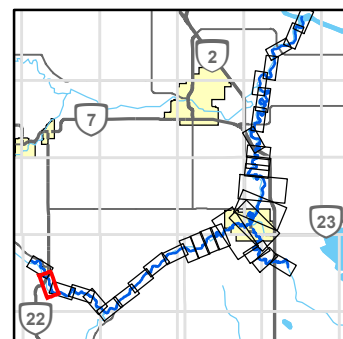
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SHEET 1 ↑

↓ SHEET 3

LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
—	RAILWAY
—	FLOOD CONTROL STRUCTURE
◻	HYDRAULIC STRUCTURES
◻	CULVERT
◻	WEIR
—	BRIDGE
■	FLOODWAY
■	HIGH HAZARD FLOOD FRINGE
■	FLOOD FRINGE
■	PROTECTED FLOOD FRINGE
■	200-YEAR FLOOD EXTENT
■	500-YEAR FLOOD EXTENT
DESIGN DISCHARGE HIGHWOOD RIVER UPSTREAM OF STIMSON CREEK = 1080 M ³ /S	



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CONSULTANT	GOLDER MEMBER OF WSP
DATE	2022-06-22
DESIGNED	PT
PREPARED	NB
REVIEWED	JC
APPROVED	WP

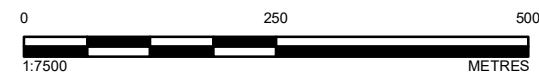
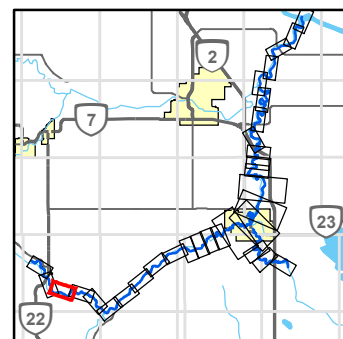
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PROJECT	HIGHWOOD RIVER HAZARD STUDY
TITLE	FLOOD HAZARD MAP
PROJECT NO.	1536669
CONTROL	4000
REV.	0
FIGURE	SHEET 2 of 33



LEGEND

● 2D DOMAIN PROFILE STATION	▬ FLOOD CONTROL STRUCTURE	■ FLOODWAY
— CROSS SECTION	▬ HYDRAULIC STRUCTURES	▨ HIGH HAZARD FLOOD FRINGE
XS#100 CROSS SECTION NUMBER	◊ CULVERT	▨ FLOOD FRINGE
RS 304 RIVER STATION (M)	□ WEIR	▨ PROTECTED FLOOD FRINGE
▬ STUDY BOUNDARY	▬ BRIDGE	■ 200-YEAR FLOOD EXTENT
➡ FLOW DIRECTION		■ 500-YEAR FLOOD EXTENT
— LOCAL ROAD		
— PRIMARY HIGHWAY		
— SECONDARY HIGHWAY		
— RAILWAY		

DESIGN DISCHARGE
HIGHWOOD RIVER UPSTREAM OF STIMSON CREEK = 1080 M³/S



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ALBERTA ENVIRONMENT AND PARKS

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-22
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PREPARED	NB
REVIEWED	JC
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DATUM: NAD 83 CSRS PROJECTION: 3TM 114

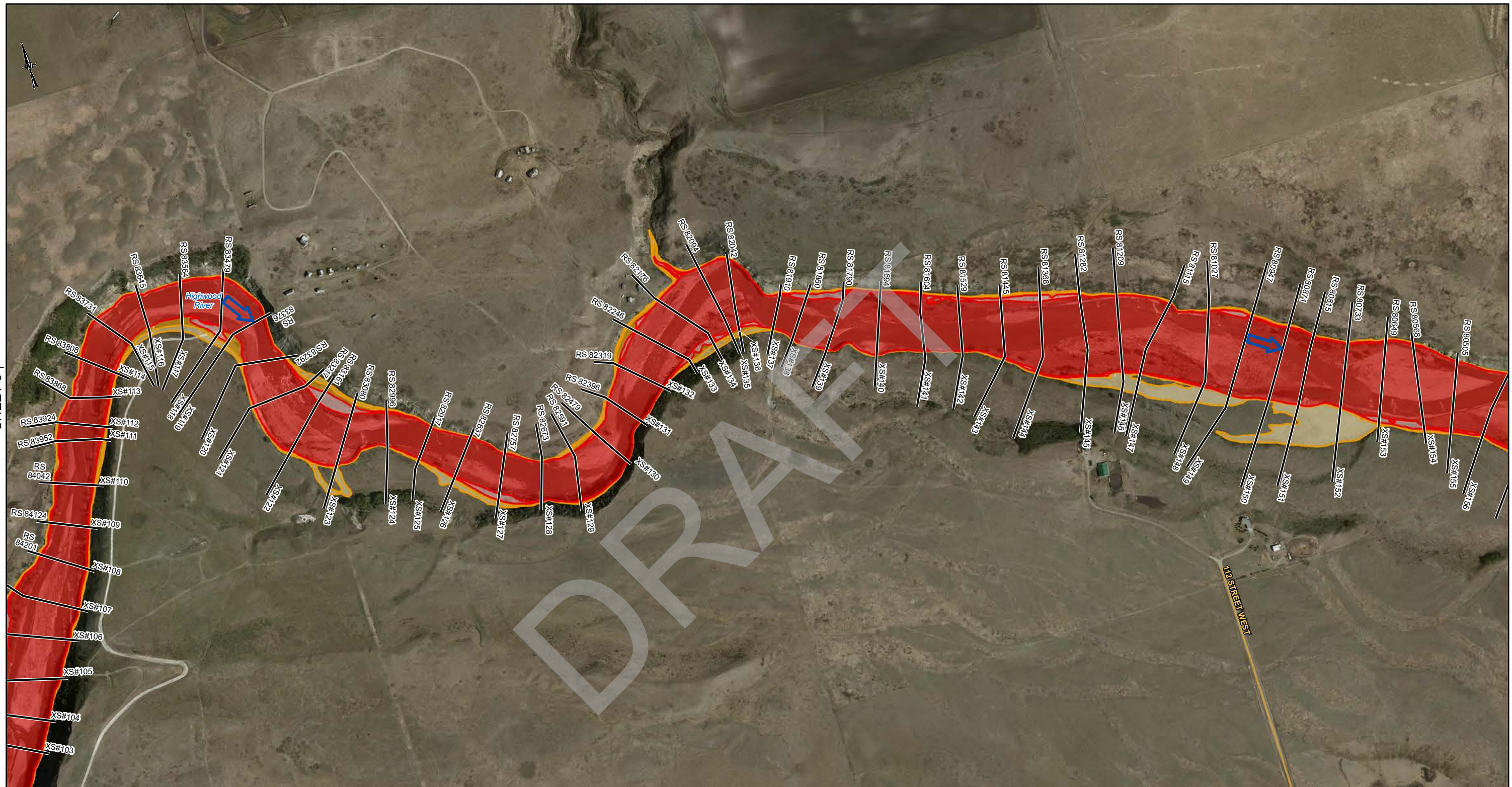
PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 3 of 33

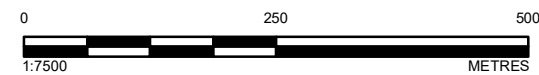
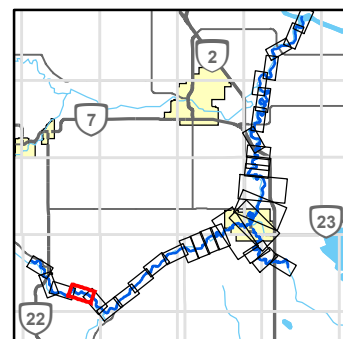
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



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LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
+	RAILWAY
	FLOOD CONTROL STRUCTURE
⬡	CULVERT
⬡	WEIR
⬡	BRIDGE
■	FLOODWAY
■	HIGH HAZARD FLOOD FRINGE
■	FLOOD FRINGE
■	PROTECTED FLOOD FRINGE
■	200-YEAR FLOOD EXTENT
■	500-YEAR FLOOD EXTENT
DESIGN DISCHARGE HIGHWOOD RIVER UPSTREAM OF STIMSON CREEK = 1080 M ³ /S	



CLIENT	ALBERTA ENVIRONMENT AND PARKS
CONSULTANT	GOLDER MEMBER OF WSP
DATE	2022-06-22
DESIGNED	PT
PREPARED	NB
REVIEWED	JC
APPROVED	WP

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DATUM: NAD 83 CSRS PROJECTION: 3TM 114	
PROJECT	HIGHWOOD RIVER HAZARD STUDY
TITLE	FLOOD HAZARD MAP
PROJECT NO.	1536669
CONTROL	4000
REV.	0
FIGURE	SHEET 4 of 33

SHEET 4 ↑

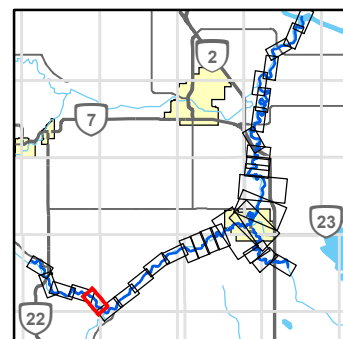
↑ SHEET 6



LEGEND

● 2D DOMAIN PROFILE STATION	FLOOD CONTROL STRUCTURE	■ FLOODWAY
— CROSS SECTION	HYDRAULIC STRUCTURES	■ HIGH HAZARD FLOOD FRINGE
XS#100 CROSS SECTION NUMBER	◊ CULVERT	■ FLOOD FRINGE
RS 304 RIVER STATION (M)	□ WEIR	■ PROTECTED FLOOD FRINGE
▬ STUDY BOUNDARY	▬ BRIDGE	■ 200-YEAR FLOOD EXTENT
➔ FLOW DIRECTION		■ 500-YEAR FLOOD EXTENT
— LOCAL ROAD		
— PRIMARY HIGHWAY		
— SECONDARY HIGHWAY		
— RAILWAY		

DESIGN DISCHARGE
HIGHWOOD RIVER UPSTREAM OF STIMSON CREEK = 1080 M³/S



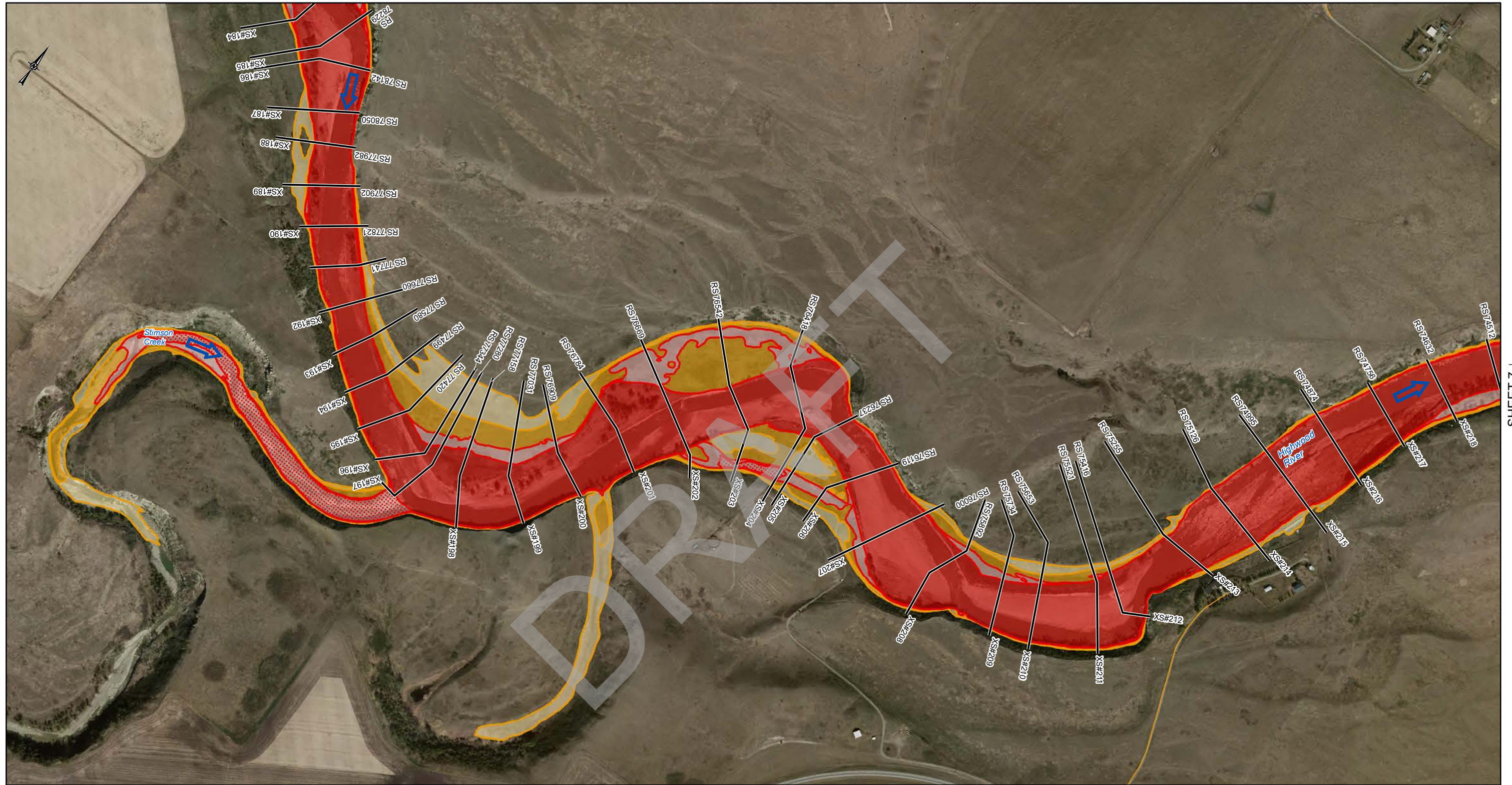
CLIENT ALBERTA ENVIRONMENT AND PARKS	ALBERTA Government										
CONSULTANT GOLDER MEMBER OF WSP	<table border="0"> <tr> <td>YYYY-MM-DD</td> <td>2022-06-22</td> </tr> <tr> <td>DESIGNED</td> <td>PT</td> </tr> <tr> <td>PREPARED</td> <td>NB</td> </tr> <tr> <td>REVIEWED</td> <td>JC</td> </tr> <tr> <td>APPROVED</td> <td>WP</td> </tr> </table>	YYYY-MM-DD	2022-06-22	DESIGNED	PT	PREPARED	NB	REVIEWED	JC	APPROVED	WP
YYYY-MM-DD	2022-06-22										
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DATUM: NAD 83 CSRS PROJECTION: 3TM 114

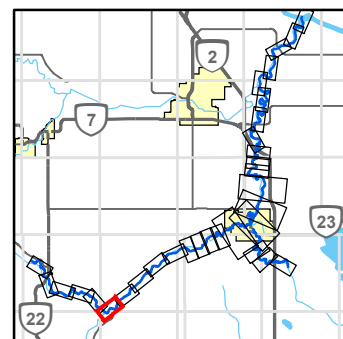
PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO. 1536669	CONTROL 4000	REV. 0	FIGURE SHEET 5 of 33
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LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
→	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
+	RAILWAY
	FLOOD CONTROL STRUCTURE
⬡	CULVERT
⬡	WEIR
⬡	BRIDGE
■	FLOODWAY
■	HIGH HAZARD FLOOD FRINGE
■	FLOOD FRINGE
■	PROTECTED FLOOD FRINGE
■	200-YEAR FLOOD EXTENT
■	500-YEAR FLOOD EXTENT
DESIGN DISCHARGE	
HIGHWOOD RIVER UPSTREAM OF STIMSON CREEK = 1080 M ³ /S	
HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M ³ /S	



CLIENT	ALBERTA ENVIRONMENT AND PARKS
CONSULTANT	GOLDER MEMBER OF WSP
DATE	2022-06-22
DESIGNED	PT
PREPARED	NB
REVIEWED	JC
APPROVED	WP

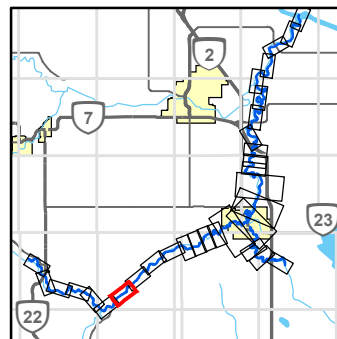
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PROJECT	HIGHWOOD RIVER HAZARD STUDY
TITLE	FLOOD HAZARD MAP
PROJECT NO.	1536669
CONTROL	4000
REV.	0
FIGURE	SHEET 6 of 33



SHEET 6 ↑

↑ SHEET 8

LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
+	RAILWAY
—	FLOOD CONTROL STRUCTURE
◻	CULVERT
◻	WEIR
—	BRIDGE
■	FLOODWAY
■	HIGH HAZARD FLOOD FRINGE
■	FLOOD FRINGE
■	PROTECTED FLOOD FRINGE
■	200-YEAR FLOOD EXTENT
■	500-YEAR FLOOD EXTENT
DESIGN DISCHARGE HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M ³ /S	



CLIENT
ALBERTA ENVIRONMENT
AND PARKS



CONSULTANT



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DATUM: NAD 83 CSRS PROJECTION: 3TM 114

PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 7 of 33



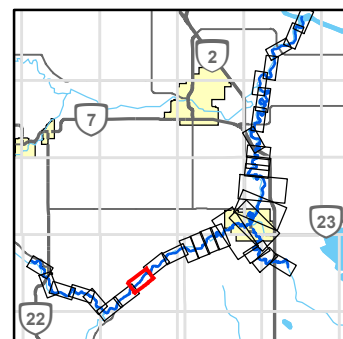
SHEET 7 ↑

↑ SHEET 6

LEGEND

● 2D DOMAIN PROFILE STATION	FLOOD CONTROL STRUCTURE	■ FLOODWAY
— CROSS SECTION	HYDRAULIC STRUCTURES	■ HIGH HAZARD FLOOD FRINGE
XS#100 CROSS SECTION NUMBER	◊ CULVERT	■ FLOOD FRINGE
RS 304 RIVER STATION (M)	□ WEIR	■ PROTECTED FLOOD FRINGE
▬ STUDY BOUNDARY	▬ BRIDGE	■ 200-YEAR FLOOD EXTENT
➡ FLOW DIRECTION		■ 500-YEAR FLOOD EXTENT
— LOCAL ROAD		
— PRIMARY HIGHWAY		
— SECONDARY HIGHWAY		
— RAILWAY		

DESIGN DISCHARGE
HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M³/S



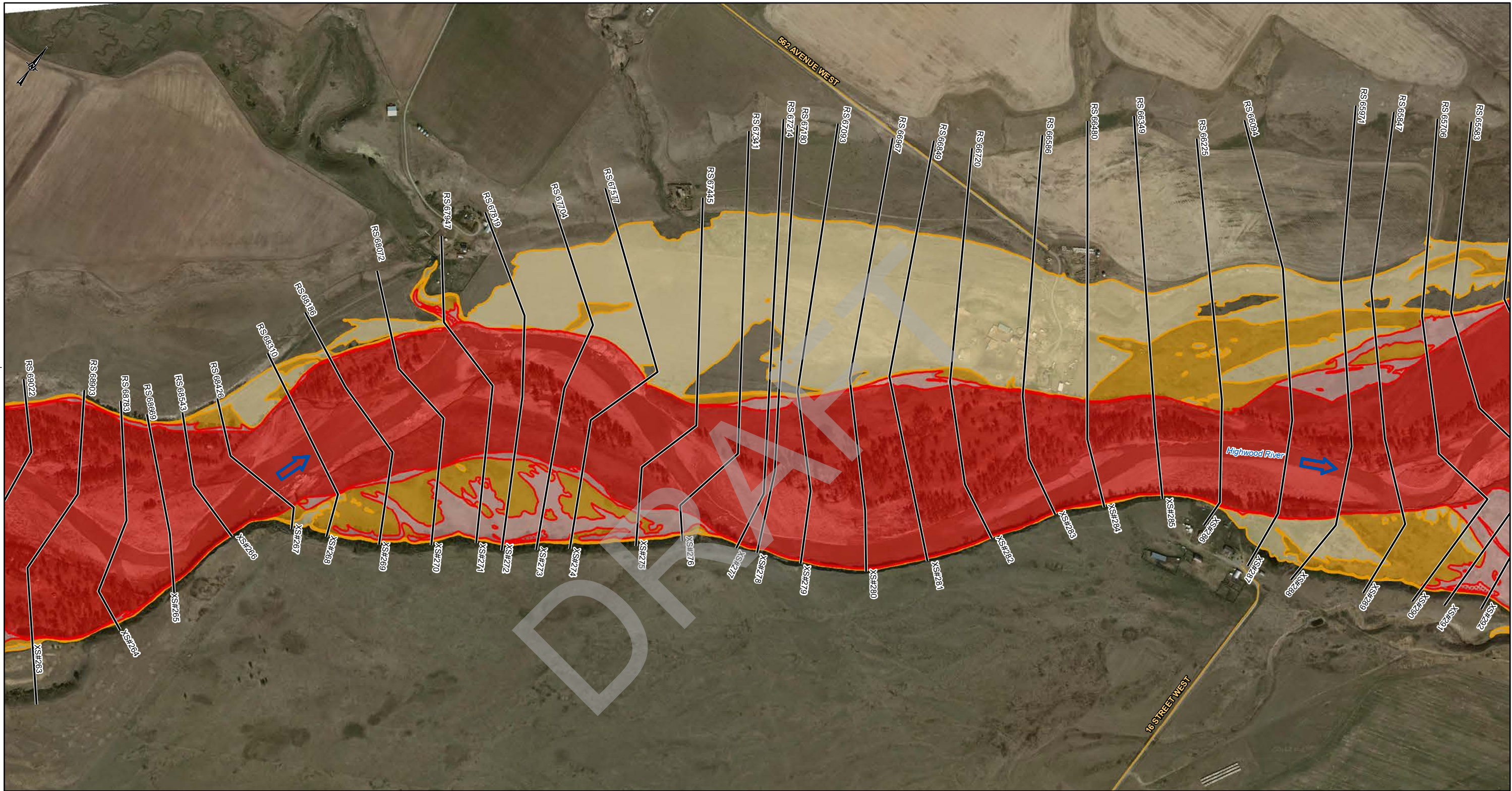
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CONSULTANT GOLDER MEMBER OF WSP	<table border="0"> <tr> <td>YYYY-MM-DD</td> <td>2022-06-22</td> </tr> <tr> <td>DESIGNED</td> <td>PT</td> </tr> <tr> <td>PREPARED</td> <td>NB</td> </tr> <tr> <td>REVIEWED</td> <td>JC</td> </tr> <tr> <td>APPROVED</td> <td>WP</td> </tr> </table>	YYYY-MM-DD	2022-06-22	DESIGNED	PT	PREPARED	NB	REVIEWED	JC	APPROVED	WP
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DATUM: NAD 83 CSRS PROJECTION: 3TM 114

PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO. 1536669	CONTROL 4000	REV. 0	FIGURE SHEET 8 of 33
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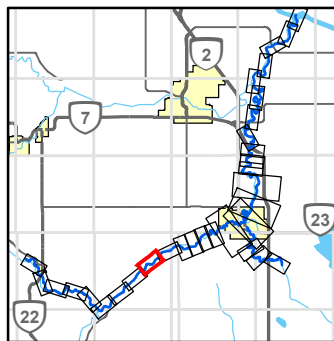


SHEET 8 ↑

↑ SHEET 10

LEGEND

- 2D DOMAIN PROFILE STATION
- CROSS SECTION
- XS#100 CROSS SECTION NUMBER
- RS 304 RIVER STATION (M)
- ▬ STUDY BOUNDARY
- ➔ FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- ▬ FLOOD CONTROL STRUCTURE
- HYDRAULIC STRUCTURES**
- ◻ CULVERT
- ◻ WEIR
- ▬ BRIDGE
- FLOODWAY
- ▨ HIGH HAZARD FLOOD FRINGE
- ▨ FLOOD FRINGE
- ▨ PROTECTED FLOOD FRINGE
- 200-YEAR FLOOD EXTENT
- 500-YEAR FLOOD EXTENT
- DESIGN DISCHARGE**
HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M³/S



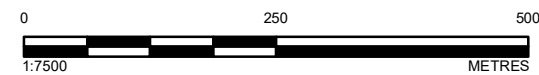
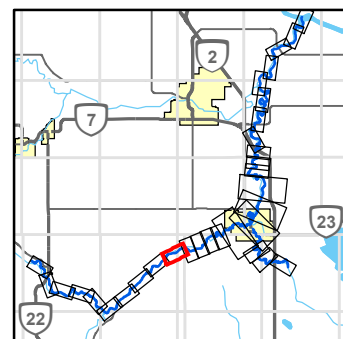
CLIENT	ALBERTA ENVIRONMENT AND PARKS	
CONSULTANT	GOLDER MEMBER OF WSP	
DESIGNED	PT	2022-06-22
PREPARED	NB	
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PROJECT		
HIGHWOOD RIVER HAZARD STUDY		
TITLE		
FLOOD HAZARD MAP		
PROJECT NO.	CONTROL	REV.
1536669	4000	0
		FIGURE
		SHEET 9 of 33

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LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
+	RAILWAY
	FLOOD CONTROL STRUCTURE
⬡	CULVERT
⬡	WEIR
⬡	BRIDGE
■	FLOODWAY
■	HIGH HAZARD FLOOD FRINGE
■	FLOOD FRINGE
■	PROTECTED FLOOD FRINGE
■	200-YEAR FLOOD EXTENT
■	500-YEAR FLOOD EXTENT
DESIGN DISCHARGE HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M ³ /S	



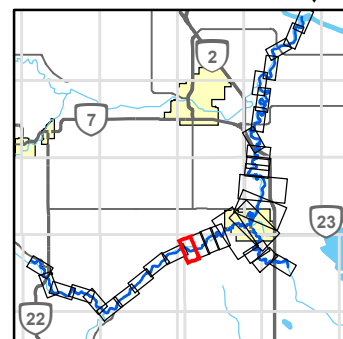
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CONSULTANT	GOLDER MEMBER OF WSP
DATE	2022-06-22
DESIGNED	PT
PREPARED	NB
REVIEWED	JC
APPROVED	WP

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DATUM: NAD 83 CSRS PROJECTION: 3TM 114			
PROJECT			
HIGHWOOD RIVER HAZARD STUDY			
TITLE			
FLOOD HAZARD MAP			
PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 10 of 33

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

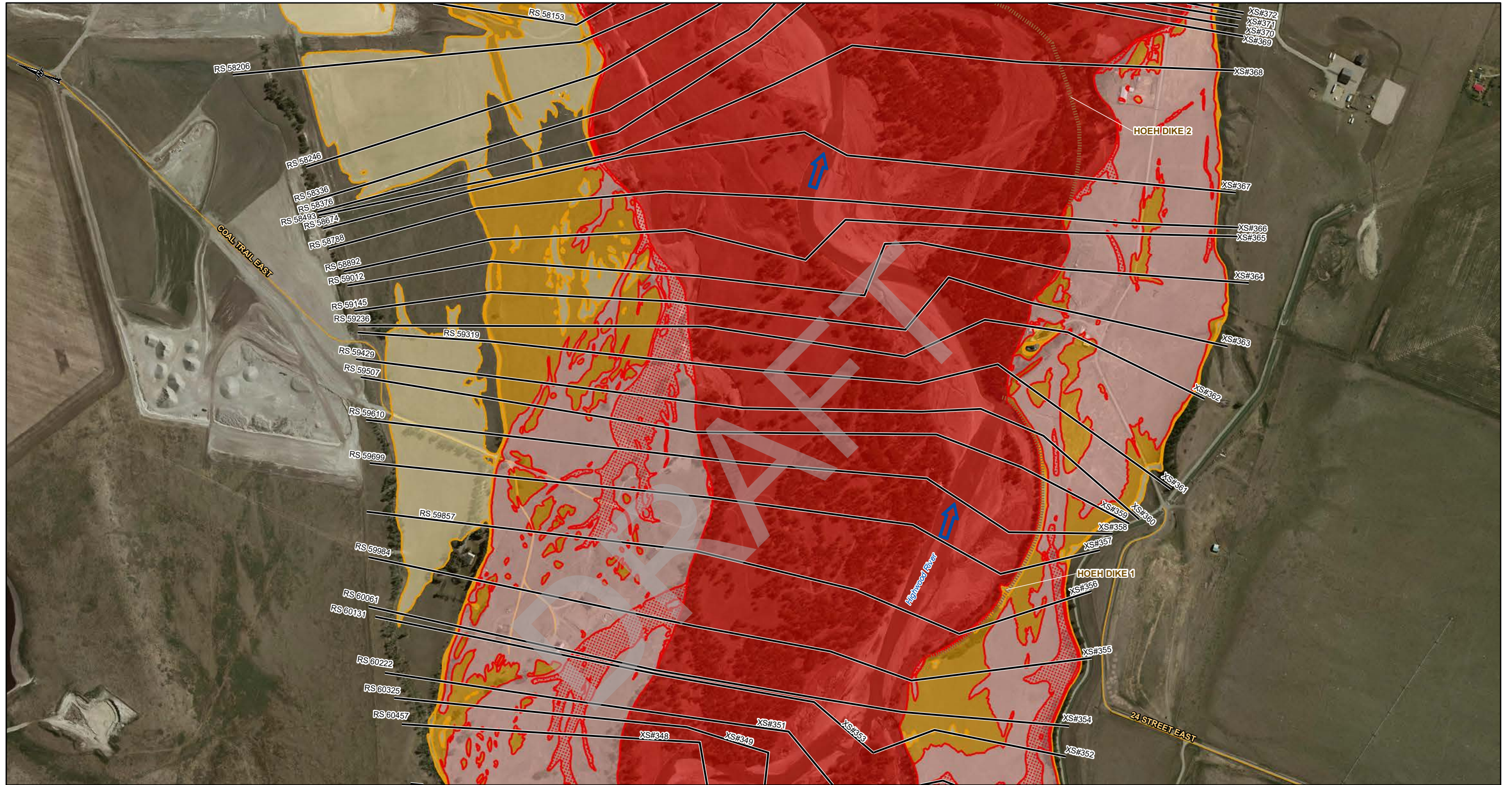


LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
+	RAILWAY
	FLOOD CONTROL STRUCTURE
⬡	CULVERT
⬡	WEIR
⬡	BRIDGE
■	FLOODWAY
▨	HIGH HAZARD FLOOD FRINGE
▨	FLOOD FRINGE
▨	PROTECTED FLOOD FRINGE
■	200-YEAR FLOOD EXTENT
■	500-YEAR FLOOD EXTENT
DESIGN DISCHARGE	
HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M ³ /S	
HIGHWOOD RIVER DOWNSTREAM OF SPLIT POINT = 577 M ³ /S	
HIGHWOOD RIVER SIDE CHANNEL = 983 M ³ /S	

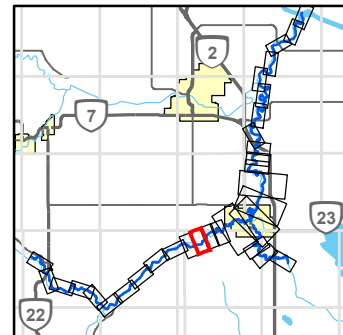


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PROJECT: HIGHWOOD RIVER HAZARD STUDY		
TITLE: FLOOD HAZARD MAP		
PROJECT NO.	CONTROL	REV.
1536669	4000	0
FIGURE		SHEET 11 of 33

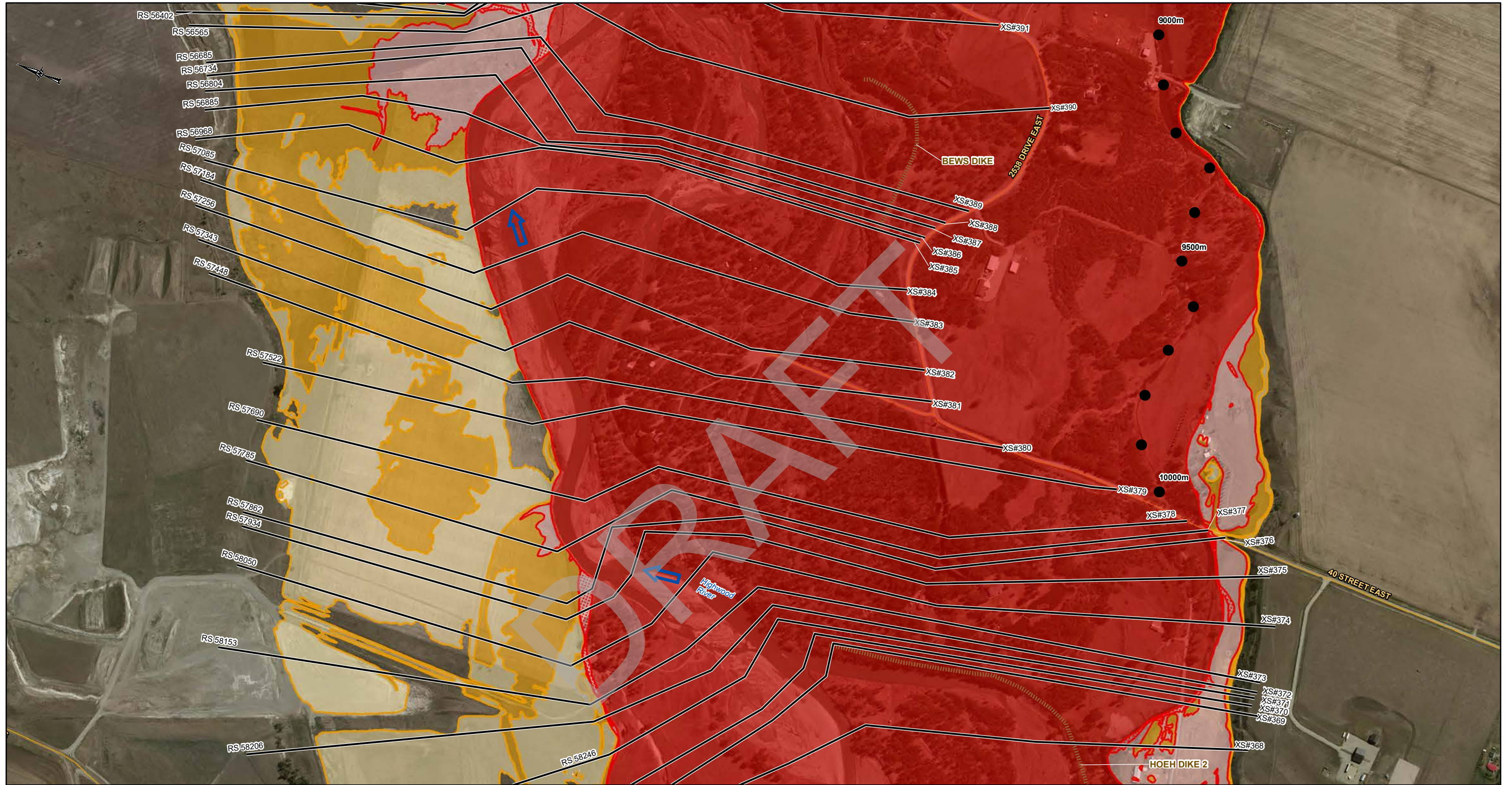


LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
+	RAILWAY
	FLOOD CONTROL STRUCTURE
⬡	HYDRAULIC STRUCTURES
⬡	CULVERT
⬡	WEIR
⬡	BRIDGE
■	FLOODWAY
▨	HIGH HAZARD FLOOD FRINGE
▨	FLOOD FRINGE
▨	PROTECTED FLOOD FRINGE
■	200-YEAR FLOOD EXTENT
■	500-YEAR FLOOD EXTENT
DESIGN DISCHARGE HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M ³ /S	

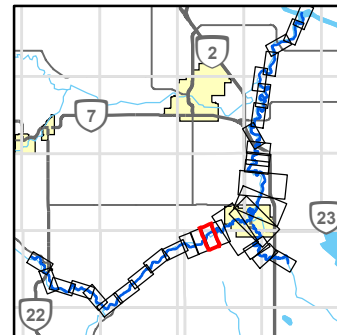


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CONSULTANT	GOLDER MEMBER OF WSP	
DESIGNED	PT	2022-06-22
PREPARED	NB	
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PROJECT HIGHWOOD RIVER HAZARD STUDY		
TITLE FLOOD HAZARD MAP		
PROJECT NO. 1536669	CONTROL 4000	REV. 0
		FIGURE SHEET 12 of 33

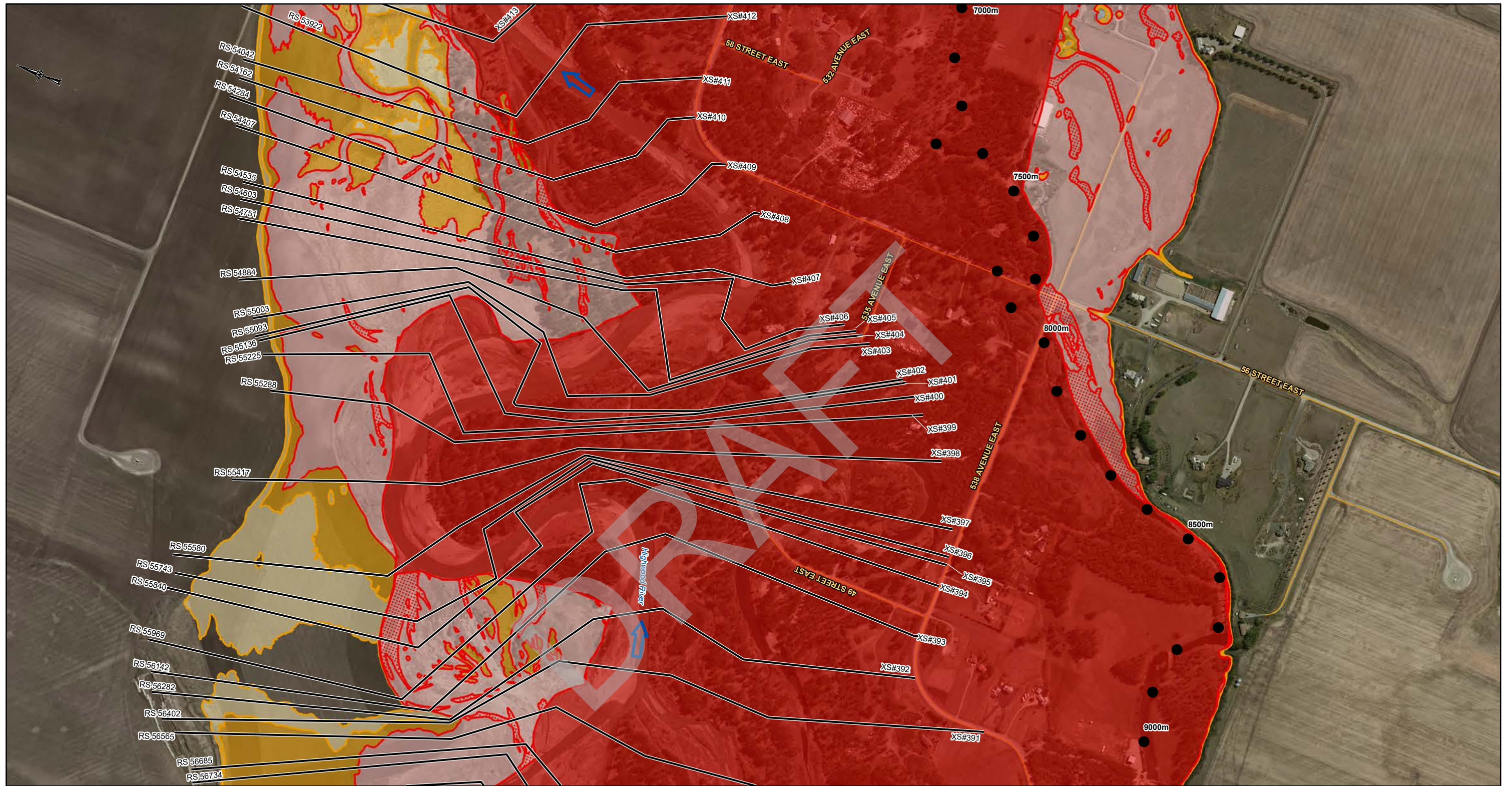


LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
+	RAILWAY
	FLOOD CONTROL STRUCTURE
⬡	HYDRAULIC STRUCTURES
⬡	CULVERT
⬡	WEIR
⬡	BRIDGE
■	FLOODWAY
■	HIGH HAZARD FLOOD FRINGE
■	FLOOD FRINGE
■	PROTECTED FLOOD FRINGE
■	200-YEAR FLOOD EXTENT
■	500-YEAR FLOOD EXTENT
DESIGN DISCHARGE HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M ³ /S	

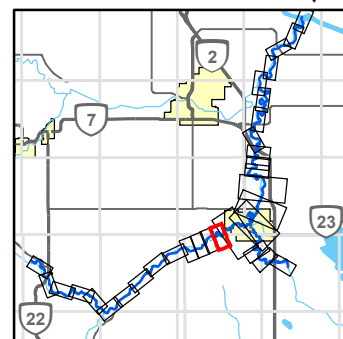


CLIENT	ALBERTA ENVIRONMENT AND PARKS
CONSULTANT	GOLDER MEMBER OF WSP
DATE	2022-06-22
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PREPARED	NB
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DATUM: NAD 83 CSRS PROJECTION: 3TM 114			
PROJECT			
HIGHWOOD RIVER HAZARD STUDY			
TITLE			
FLOOD HAZARD MAP			
PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 13 of 33

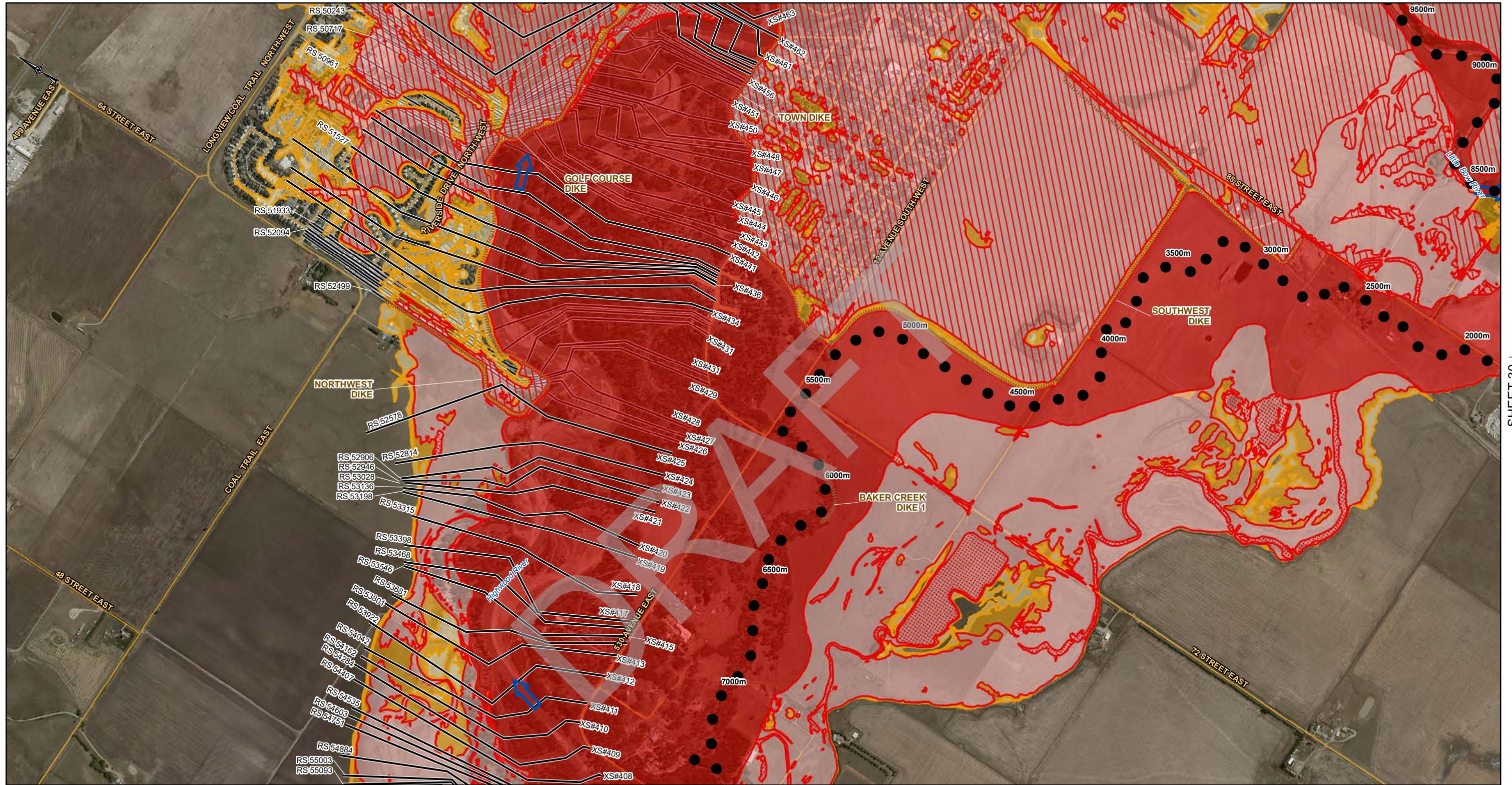


LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
—	RAILWAY
	FLOOD CONTROL STRUCTURE
⬡	CULVERT
⬡	WEIR
⬡	BRIDGE
■	FLOODWAY
▨	HIGH HAZARD FLOOD FRINGE
▨	FLOOD FRINGE
▨	PROTECTED FLOOD FRINGE
▨	200-YEAR FLOOD EXTENT
▨	500-YEAR FLOOD EXTENT
DESIGN DISCHARGE HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M ³ /S	



CLIENT	ALBERTA ENVIRONMENT AND PARKS
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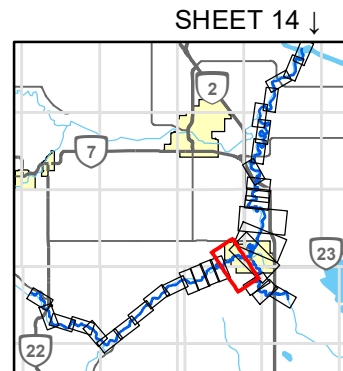
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DATUM: NAD 83 CSRS PROJECTION: 3TM 114			
PROJECT			
HIGHWOOD RIVER HAZARD STUDY			
TITLE			
FLOOD HAZARD MAP			
PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 14 of 33



LEGEND

● 2D DOMAIN PROFILE STATION	FLOOD CONTROL STRUCTURE	■ FLOODWAY
— CROSS SECTION	■ HIGH HAZARD FLOOD FRINGE	■ FLOOD FRINGE
XS#100 CROSS SECTION NUMBER	■ PROTECTED FLOOD FRINGE	■ 200-YEAR FLOOD EXTENT
RS 304 RIVER STATION (M)	■ 500-YEAR FLOOD EXTENT	
■ STUDY BOUNDARY	□ CULVERT	
➡ FLOW DIRECTION	□ WEIR	
— LOCAL ROAD	□ BRIDGE	
— PRIMARY HIGHWAY		
— SECONDARY HIGHWAY		
— RAILWAY		

DESIGN DISCHARGE
HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M³/S



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ALBERTA ENVIRONMENT AND PARKS

CONSULTANT
GOLDER MEMBER OF WSP

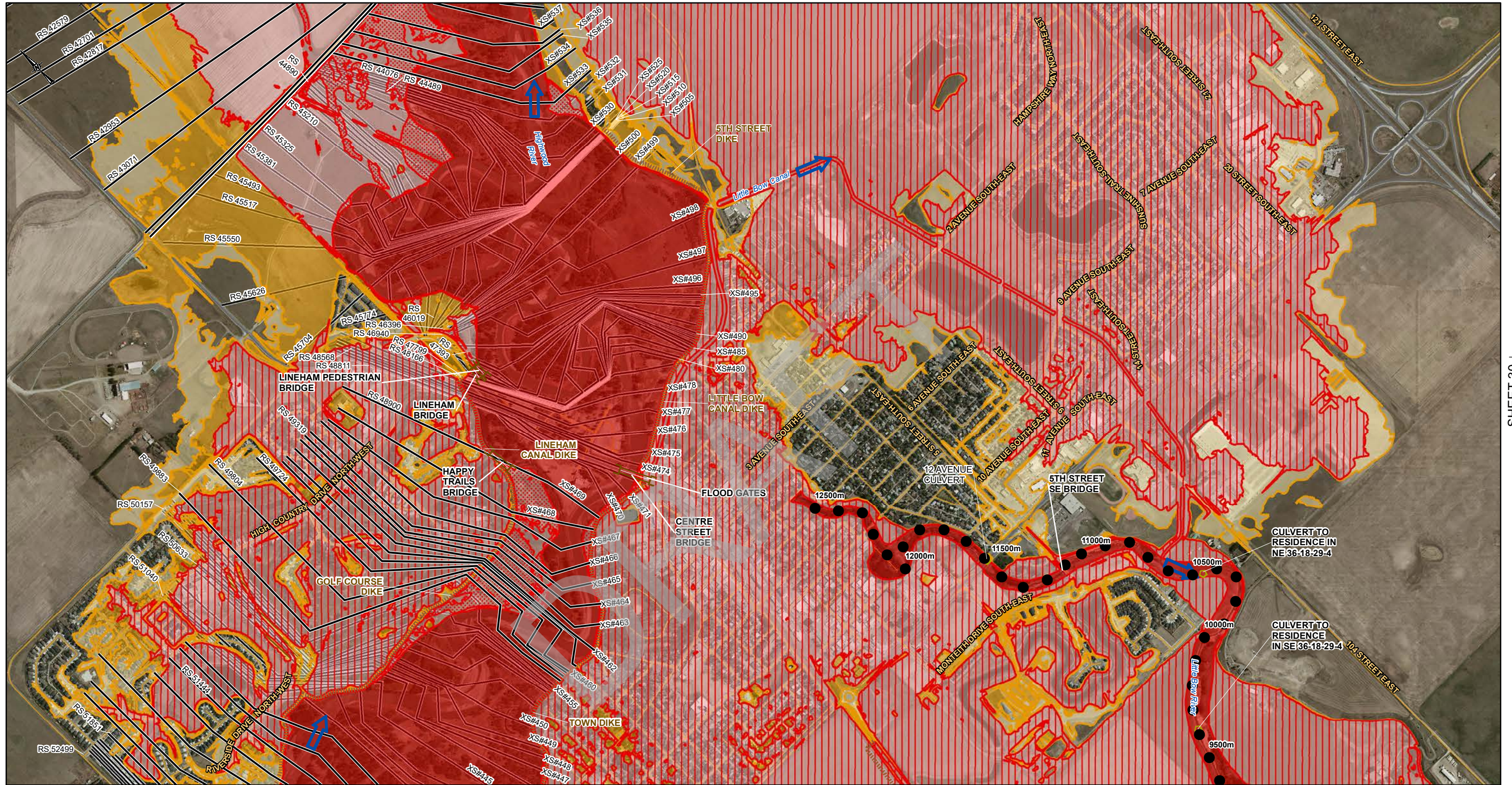
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PREPARED	NB
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APPROVED	WP

REFERENCE(S)
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PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

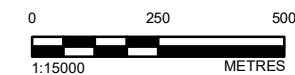
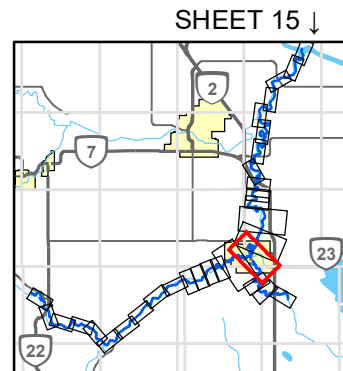
PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 15 of 33



LEGEND

● 2D DOMAIN PROFILE STATION	FLOOD CONTROL STRUCTURE	■ FLOODWAY
— CROSS SECTION	HYDRAULIC STRUCTURES	▨ HIGH HAZARD FLOOD FRINGE
XS#100 CROSS SECTION NUMBER	◻ CULVERT	▧ FLOOD FRINGE
RS 304 RIVER STATION (M)	◻ WEIR	▨ PROTECTED FLOOD FRINGE
▬ STUDY BOUNDARY	— BRIDGE	■ 200-YEAR FLOOD EXTENT
➔ FLOW DIRECTION		■ 500-YEAR FLOOD EXTENT
— LOCAL ROAD		
— PRIMARY HIGHWAY		
— SECONDARY HIGHWAY		
— RAILWAY		

DESIGN DISCHARGE
 HIGHWOOD RIVER DOWNSTREAM OF STIMSON CREEK = 1560 M³/S
 HIGHWOOD RIVER DOWNSTREAM OF HIGH RIVER = 1159 M³/S



CLIENT
ALBERTA ENVIRONMENT AND PARKS

CONSULTANT
GOLDER
MEMBER OF WSP

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DESIGNED	PT
PREPARED	NB
REVIEWED	JC
APPROVED	WP

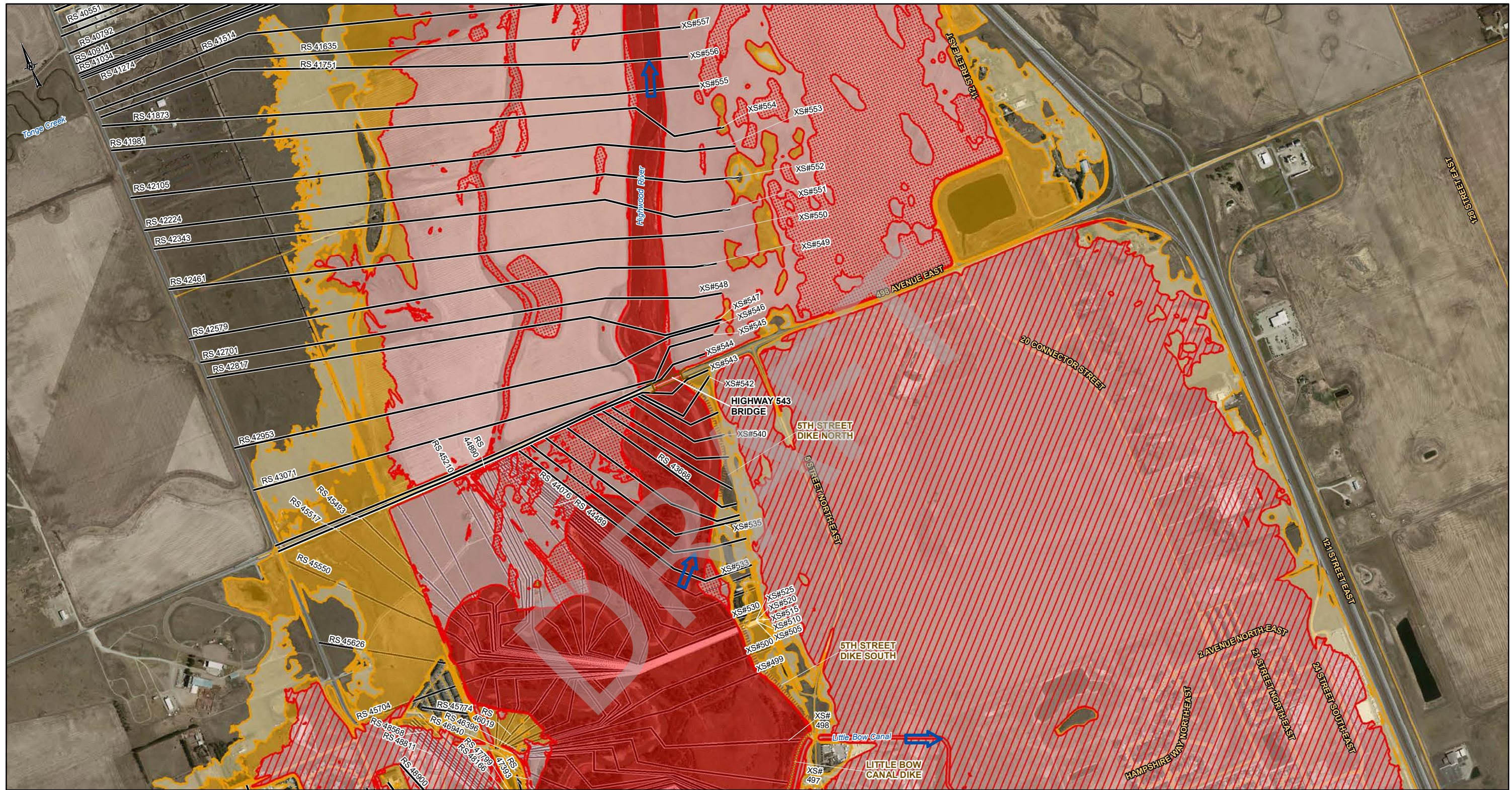
ALBERTA Government

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 DATUM: NAD 83 CSRS PROJECTION: 3TM 114

PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

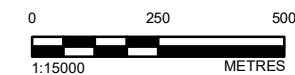
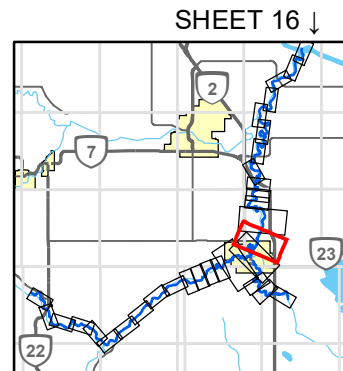
PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 16 of 33



LEGEND

● 2D DOMAIN PROFILE STATION	FLOOD CONTROL STRUCTURE	■ FLOODWAY
— CROSS SECTION	HYDRAULIC STRUCTURES	▨ HIGH HAZARD FLOOD FRINGE
XS#100 CROSS SECTION NUMBER	◊ CULVERT	▩ FLOOD FRINGE
RS 304 RIVER STATION (M)	□ WEIR	▨ PROTECTED FLOOD FRINGE
▬ STUDY BOUNDARY	— BRIDGE	■ 200-YEAR FLOOD EXTENT
➡ FLOW DIRECTION		■ 500-YEAR FLOOD EXTENT
— LOCAL ROAD		
— PRIMARY HIGHWAY		
— SECONDARY HIGHWAY		
— RAILWAY		

DESIGN DISCHARGE
HIGHWOOD RIVER DOWNSTREAM OF HIGH RIVER = 1159 M³/S



CLIENT
ALBERTA ENVIRONMENT AND PARKS

CONSULTANT
GOLDER
MEMBER OF WSP

Alberta Government

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DATUM: NAD 83 CSRS PROJECTION: 3TM 114

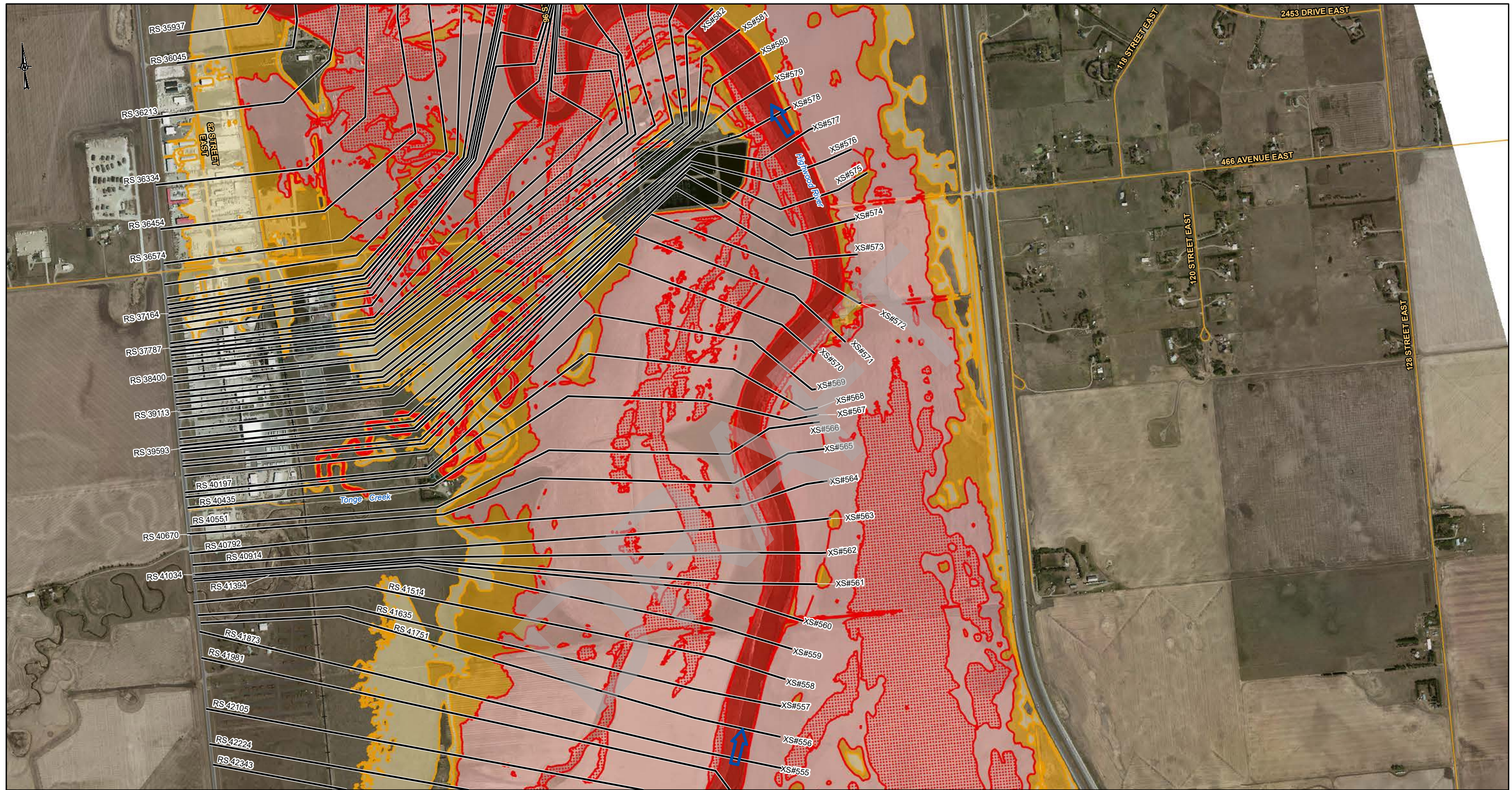
PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

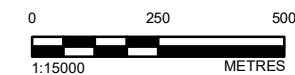
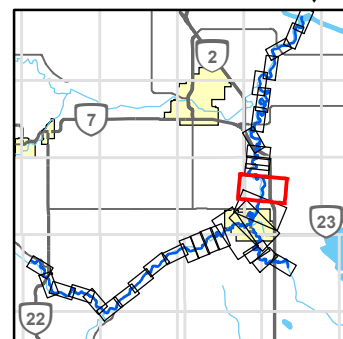
PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 17 of 33

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20mm IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

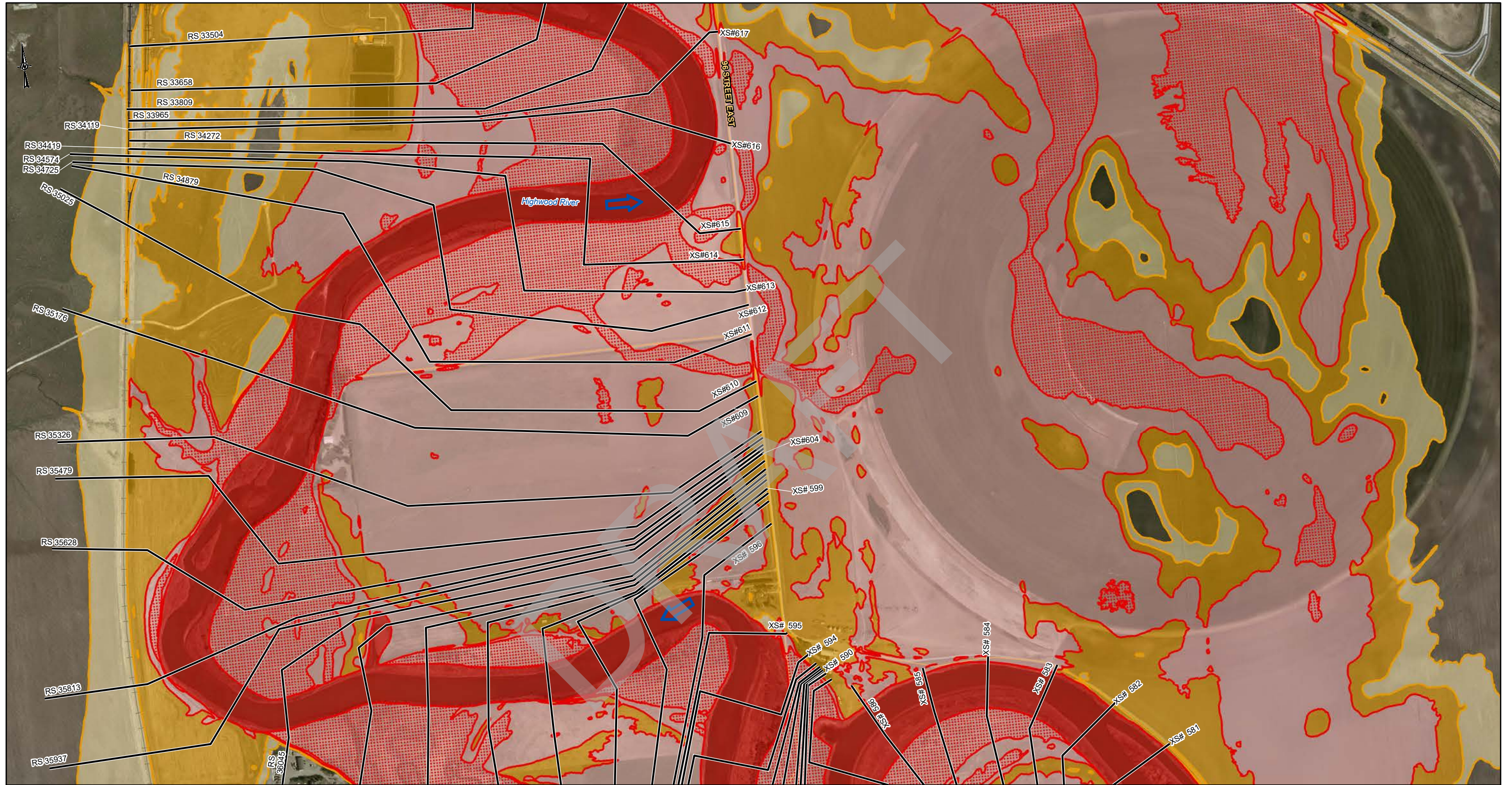


LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
—	RAILWAY
	FLOOD CONTROL STRUCTURE
◻	CULVERT
◻	WEIR
—	BRIDGE
■	FLOODWAY
▨	HIGH HAZARD FLOOD FRINGE
▨	FLOOD FRINGE
▨	PROTECTED FLOOD FRINGE
■	200-YEAR FLOOD EXTENT
■	500-YEAR FLOOD EXTENT
DESIGN DISCHARGE HIGHWOOD RIVER DOWNSTREAM OF HIGH RIVER = 1159 M ³ /S	

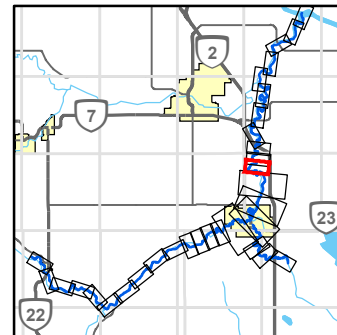


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CONSULTANT	GOLDER MEMBER OF WSP
DATE	2022-06-22
DESIGNED	PT
PREPARED	NB
REVIEWED	JC
APPROVED	WP

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PROJECT	HIGHWOOD RIVER HAZARD STUDY
TITLE	FLOOD HAZARD MAP
PROJECT NO.	1536669
CONTROL	4000
REV.	0
FIGURE	SHEET 18 of 33

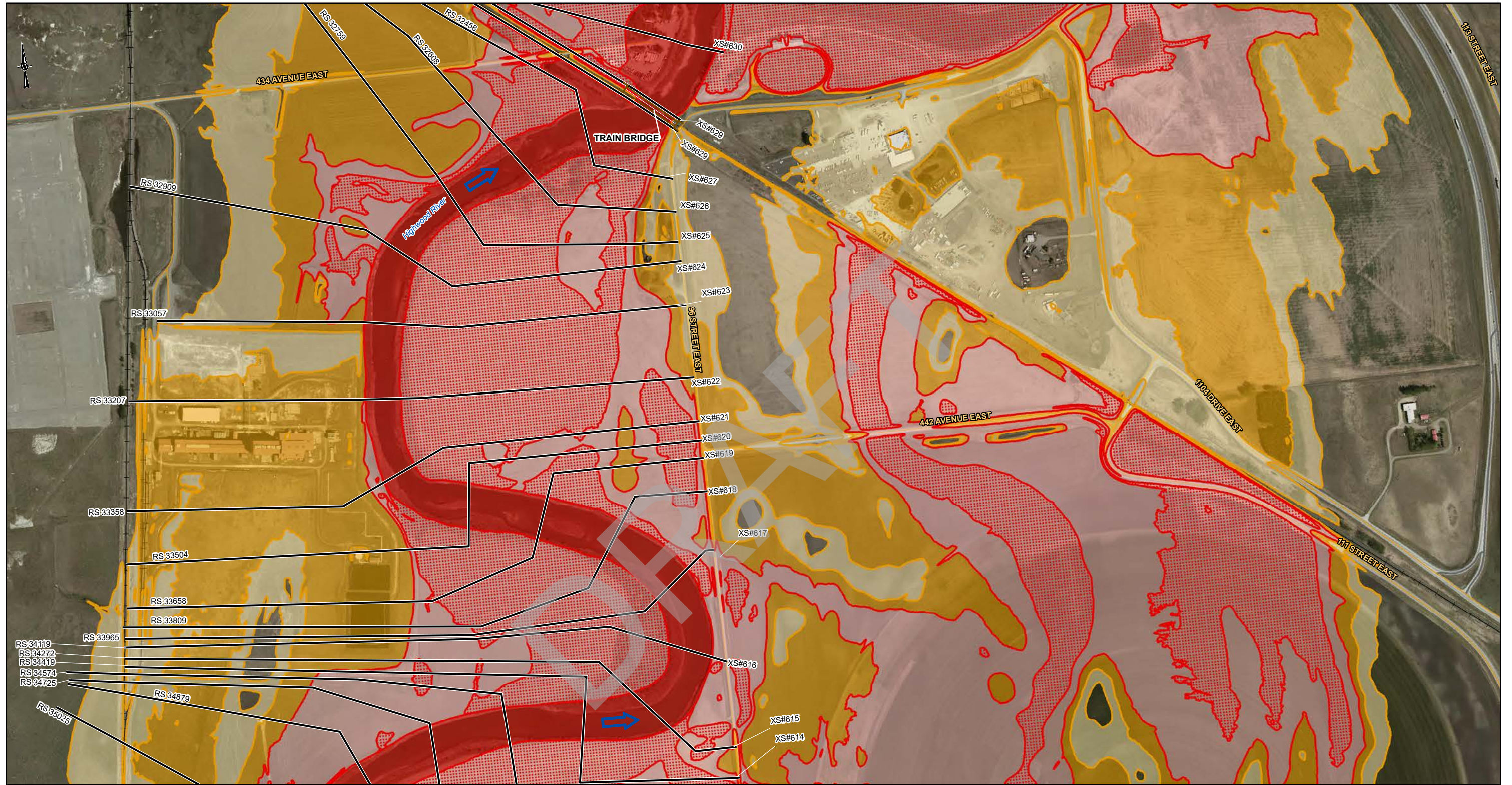


LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
+	RAILWAY
	FLOOD CONTROL STRUCTURE
⬡	CULVERT
⬡	WEIR
⬡	BRIDGE
■	FLOODWAY
▨	HIGH HAZARD FLOOD FRINGE
▨	FLOOD FRINGE
▨	PROTECTED FLOOD FRINGE
■	200-YEAR FLOOD EXTENT
■	500-YEAR FLOOD EXTENT
DESIGN DISCHARGE HIGHWOOD RIVER DOWNSTREAM OF HIGH RIVER = 1159 M ³ /S	

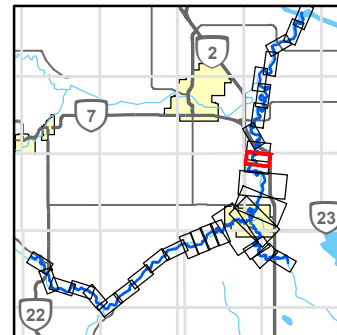


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CONSULTANT	GOLDER MEMBER OF WSP
DATE	2022-06-22
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PREPARED	NB
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DATUM: NAD 83 CSRS PROJECTION: 3TM 114	
PROJECT	HIGHWOOD RIVER HAZARD STUDY
TITLE	FLOOD HAZARD MAP
PROJECT NO.	1536669
CONTROL	4000
REV.	0
FIGURE	SHEET 19 OF 33

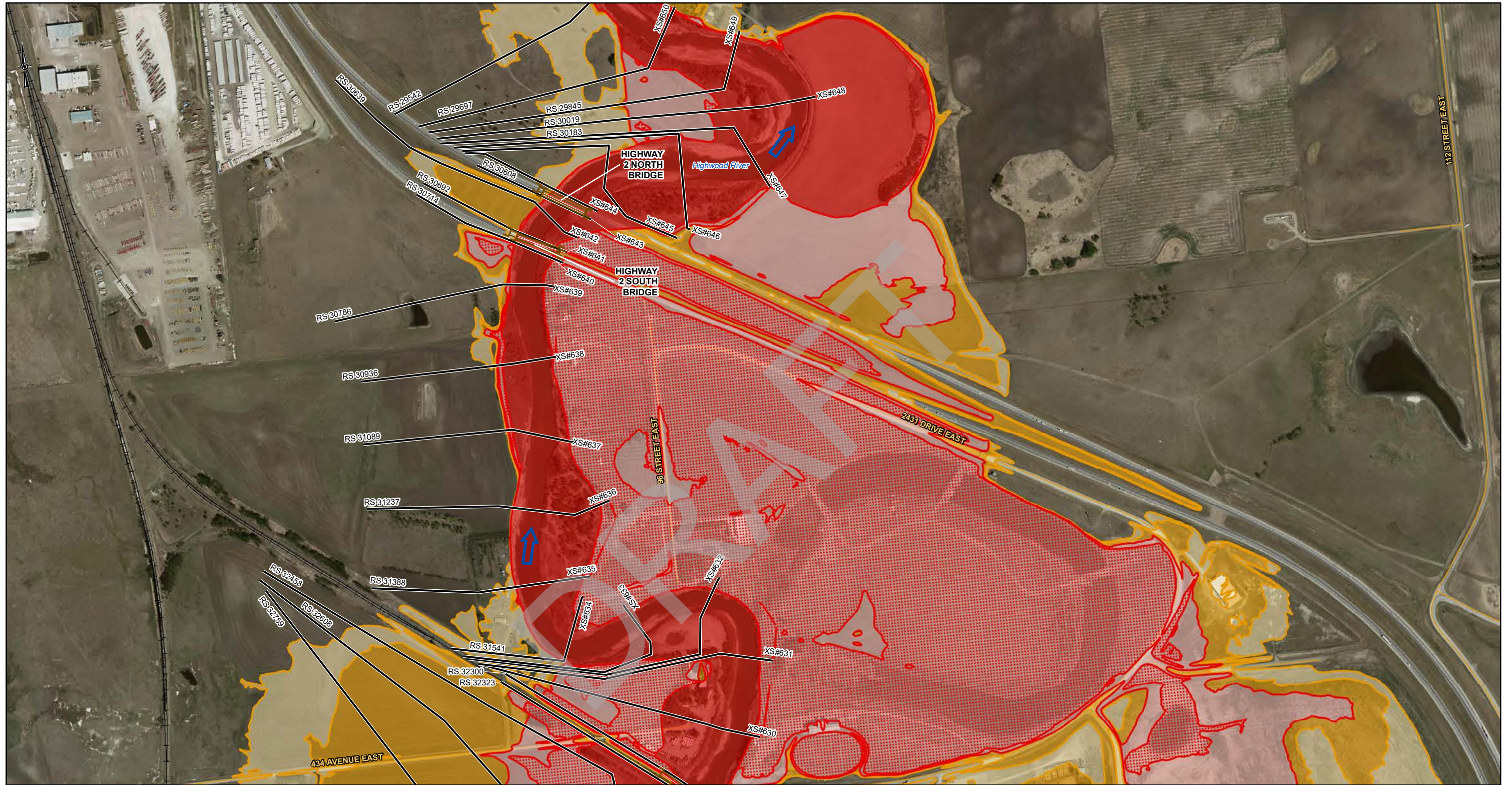


LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
—	RAILWAY
	FLOOD CONTROL STRUCTURE
◻	CULVERT
◻	WEIR
—	BRIDGE
■	FLOODWAY
▨	HIGH HAZARD FLOOD FRINGE
□	FLOOD FRINGE
▨	PROTECTED FLOOD FRINGE
■	200-YEAR FLOOD EXTENT
■	500-YEAR FLOOD EXTENT
DESIGN DISCHARGE HIGHWOOD RIVER DOWNSTREAM OF HIGH RIVER = 1159 M ³ /S	



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CONSULTANT	GOLDER MEMBER OF WSP
DATE	2022-06-22
DESIGNED	PT
PREPARED	NB
REVIEWED	JC
APPROVED	WP

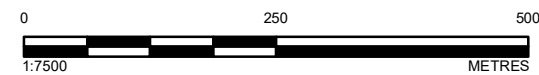
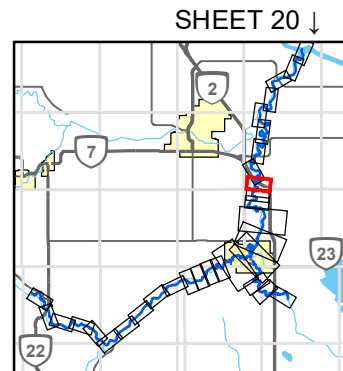
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PROJECT	HIGHWOOD RIVER HAZARD STUDY
TITLE	FLOOD HAZARD MAP
PROJECT NO.	1536669
CONTROL	4000
REV.	0
FIGURE	SHEET 20 OF 33



LEGEND

● 2D DOMAIN PROFILE STATION	FLOOD CONTROL STRUCTURE	■ FLOODWAY
— CROSS SECTION	HYDRAULIC STRUCTURES	▨ HIGH HAZARD FLOOD FRINGE
XS#100 CROSS SECTION NUMBER	◊ CULVERT	▩ FLOOD FRINGE
RS 304 RIVER STATION (M)	□ WEIR	▨ PROTECTED FLOOD FRINGE
▬ STUDY BOUNDARY	⌈ BRIDGE	■ 200-YEAR FLOOD EXTENT
➡ FLOW DIRECTION		■ 500-YEAR FLOOD EXTENT
— LOCAL ROAD		
— PRIMARY HIGHWAY		
— SECONDARY HIGHWAY		
— RAILWAY		

DESIGN DISCHARGE
HIGHWOOD RIVER DOWNSTREAM OF HIGH RIVER = 1159 M³/S



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GOLDER
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PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 21 of 33

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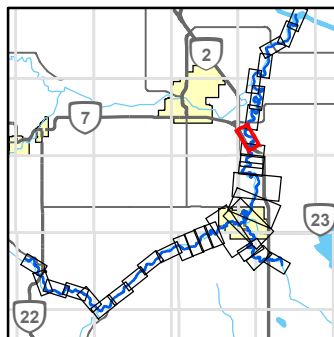


SHEET 21 ↑

↑ SHEET 23

LEGEND

- 2D DOMAIN PROFILE STATION
- CROSS SECTION
- XS#100 CROSS SECTION NUMBER
- RS 304 RIVER STATION (M)
- ▬ STUDY BOUNDARY
- ➔ FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- ▬ FLOOD CONTROL STRUCTURE
- HYDRAULIC STRUCTURES**
- ◻ CULVERT
- ◻ WEIR
- ▬ BRIDGE
- FLOODWAY
- ▨ HIGH HAZARD FLOOD FRINGE
- FLOOD FRINGE
- ▨ PROTECTED FLOOD FRINGE
- 200-YEAR FLOOD EXTENT
- 500-YEAR FLOOD EXTENT
- DESIGN DISCHARGE**
HIGHWOOD RIVER DOWNSTREAM OF HIGH RIVER = 1159 M³/S



CLIENT	ALBERTA ENVIRONMENT AND PARKS	ALBERTA Government
CONSULTANT	GOLDER MEMBER OF WSP	
DESIGNED	PT	2022-06-22
PREPARED	NB	
REVIEWED	JC	
APPROVED	WP	

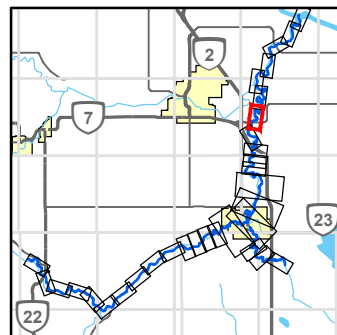
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DATUM: NAD 83 CSRS PROJECTION: 3TM 114		
PROJECT		
HIGHWOOD RIVER HAZARD STUDY		
TITLE		
FLOOD HAZARD MAP		
PROJECT NO.	CONTROL	REV.
1536669	4000	0
		FIGURE
		SHEET 22 of 33



SHEET 22 ↑

↓ SHEET 24

LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
+	RAILWAY
	FLOOD CONTROL STRUCTURE
⬡	CULVERT
⬡	WEIR
⬡	BRIDGE
■	FLOODWAY
■	HIGH HAZARD FLOOD FRINGE
■	FLOOD FRINGE
■	PROTECTED FLOOD FRINGE
■	200-YEAR FLOOD EXTENT
■	500-YEAR FLOOD EXTENT
DESIGN DISCHARGE HIGHWOOD RIVER DOWNSTREAM OF HIGH RIVER = 1159 M ³ /S	



CLIENT	ALBERTA ENVIRONMENT AND PARKS
CONSULTANT	GOLDER MEMBER OF WSP
DATE	2022-06-22
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PROJECT	HIGHWOOD RIVER HAZARD STUDY
TITLE	FLOOD HAZARD MAP
PROJECT NO.	1536669
CONTROL	4000
REV.	0
FIGURE	SHEET 23 of 33

SHEET 23 ↑

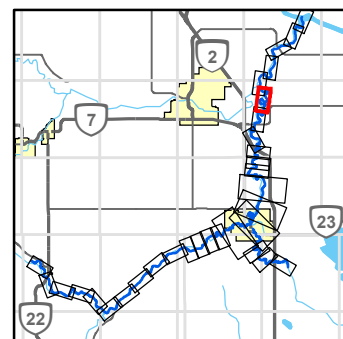
↓ SHEET 25



LEGEND

● 2D DOMAIN PROFILE STATION	FLOOD CONTROL STRUCTURE	■ FLOODWAY
— CROSS SECTION	HYDRAULIC STRUCTURES	■ HIGH HAZARD FLOOD FRINGE
XS#100 CROSS SECTION NUMBER	◊ CULVERT	■ FLOOD FRINGE
RS 304 RIVER STATION (M)	□ WEIR	▨ PROTECTED FLOOD FRINGE
— STUDY BOUNDARY	— BRIDGE	■ 200-YEAR FLOOD EXTENT
➔ FLOW DIRECTION		■ 500-YEAR FLOOD EXTENT
— LOCAL ROAD		
— PRIMARY HIGHWAY		
— SECONDARY HIGHWAY		
— RAILWAY		

DESIGN DISCHARGE
HIGHWOOD RIVER DOWNSTREAM OF HIGH RIVER = 1159 M³/S



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GOLDER
MEMBER OF WSP

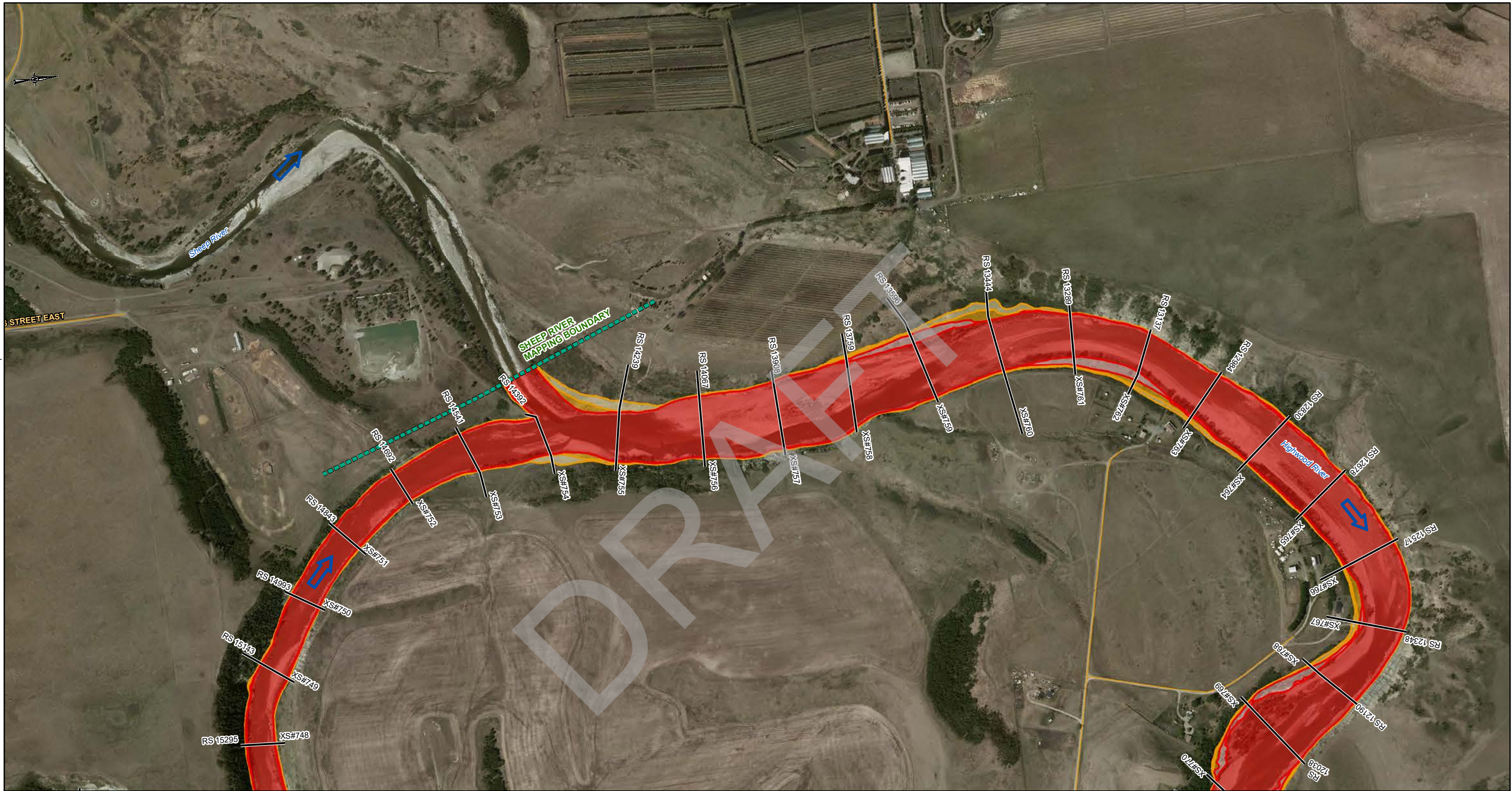
YYYY-MM-DD	2022-06-22
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PREPARED	NB
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DATUM: NAD 83 CSRS PROJECTION: 3TM 114

PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 24 of 33

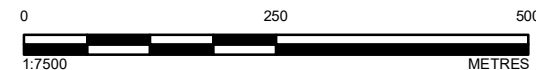
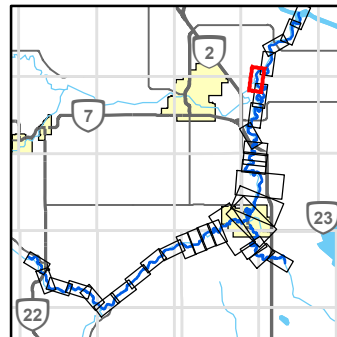


SHEET 24 ↑

↑ SHEET 26

LEGEND

- | | | |
|-----------------------------|-----------------------------|----------------------------|
| ● 2D DOMAIN PROFILE STATION | FLOOD CONTROL STRUCTURE | ■ FLOODWAY |
| — CROSS SECTION | HYDRAULIC STRUCTURES | ■ HIGH HAZARD FLOOD FRINGE |
| XS#100 CROSS SECTION NUMBER | ◊ CULVERT | ■ FLOOD FRINGE |
| RS 304 RIVER STATION (M) | □ WEIR | ■ PROTECTED FLOOD FRINGE |
| — STUDY BOUNDARY | — BRIDGE | ■ 200-YEAR FLOOD EXTENT |
| ➔ FLOW DIRECTION | | ■ 500-YEAR FLOOD EXTENT |
| — LOCAL ROAD | | |
| — PRIMARY HIGHWAY | | |
| — SECONDARY HIGHWAY | | |
| — RAILWAY | | |
- DESIGN DISCHARGE**
 HIGHWOOD RIVER DOWNSTREAM OF HIGH RIVER = 1159 M³/S
 HIGHWOOD RIVER DOWNSTREAM OF SHEEP RIVER = 2009 M³/S



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 AND PARKS



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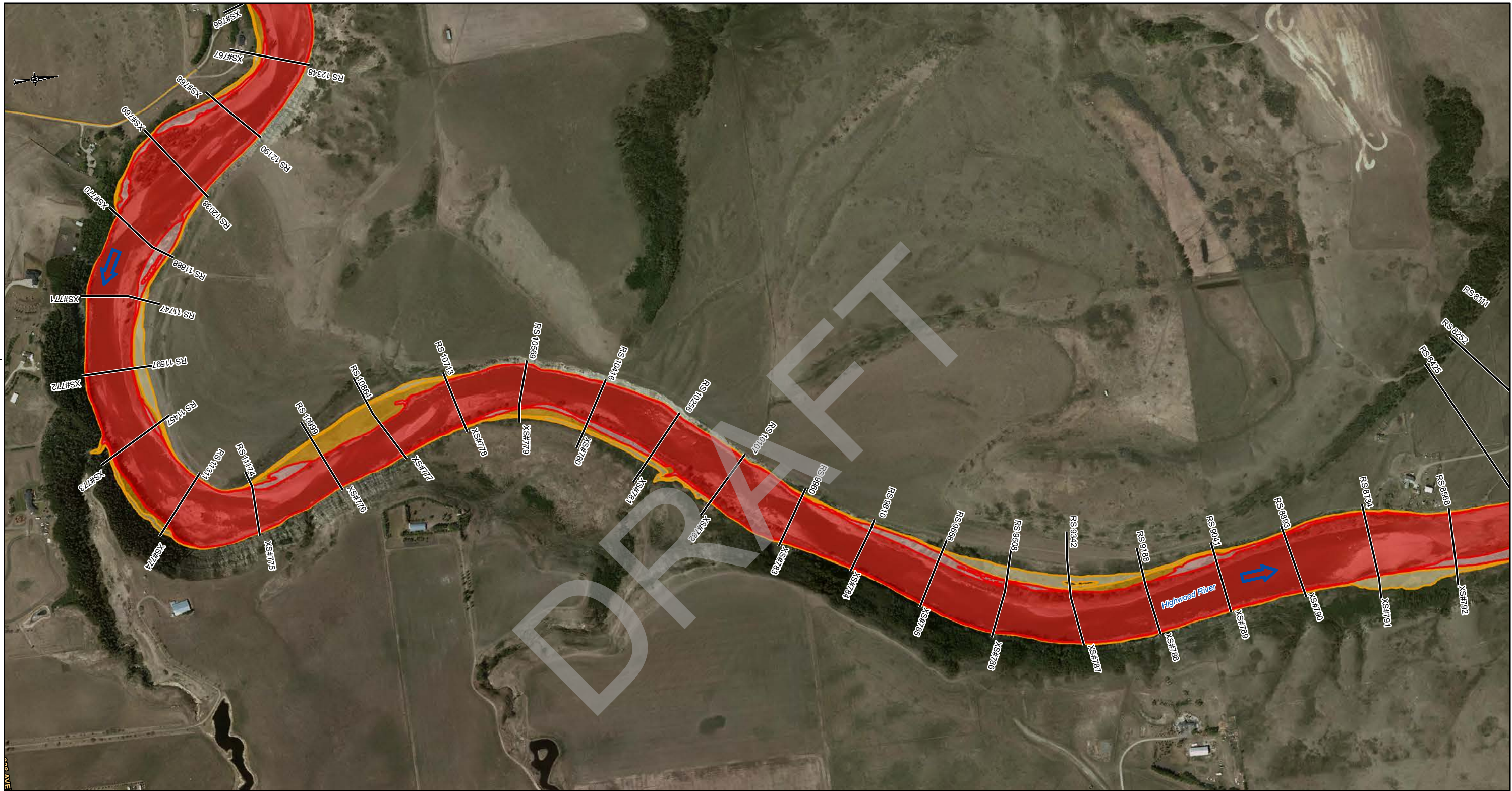
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PROJECT
 HIGHWOOD RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

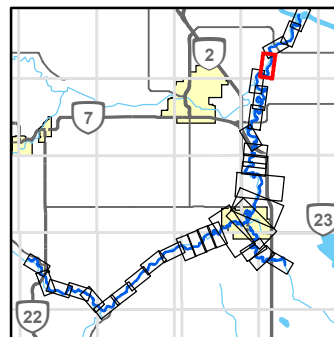
PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 25 of 33



SHEET 25 ↑

↑ SHEET 27

LEGEND	
●	2D DOMAIN PROFILE STATION
—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
+	RAILWAY
—	FLOOD CONTROL STRUCTURE
◻	CULVERT
◻	WEIR
—	BRIDGE
■	FLOODWAY
■	HIGH HAZARD FLOOD FRINGE
■	FLOOD FRINGE
■	PROTECTED FLOOD FRINGE
■	200-YEAR FLOOD EXTENT
■	500-YEAR FLOOD EXTENT
DESIGN DISCHARGE HIGHWOOD RIVER DOWNSTREAM OF SHEEP RIVER = 2009 M ³ /S	



CLIENT	ALBERTA ENVIRONMENT AND PARKS	ALBERTA Government
CONSULTANT	GOLDER MEMBER OF WSP	
DATE	2022-06-22	
DESIGNED	PT	
PREPARED	NB	
REVIEWED	JC	
APPROVED	WP	

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PROJECT HIGHWOOD RIVER HAZARD STUDY		
TITLE FLOOD HAZARD MAP		
PROJECT NO. 1536669	CONTROL 4000	REV. 0
		FIGURE SHEET 26 of 33

SHEET 26 ↑

↑ SHEET 28



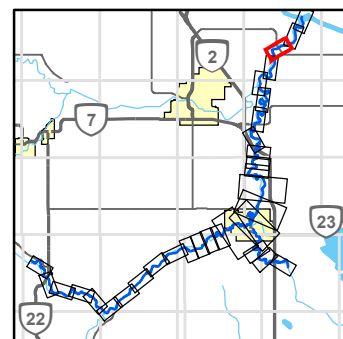
LEGEND

● 2D DOMAIN PROFILE STATION	FLOOD CONTROL STRUCTURE	■ FLOODWAY
— CROSS SECTION	■ HIGH HAZARD FLOOD FRINGE	■ FLOOD FRINGE
XS#100 CROSS SECTION NUMBER	■ PROTECTED FLOOD FRINGE	■ 200-YEAR FLOOD EXTENT
RS 304 RIVER STATION (M)	■ 500-YEAR FLOOD EXTENT	
■ STUDY BOUNDARY		
➔ FLOW DIRECTION		
— LOCAL ROAD		
— PRIMARY HIGHWAY		
— SECONDARY HIGHWAY		
— RAILWAY		

HYDRAULIC STRUCTURES

◻ CULVERT
◻ WEIR
— BRIDGE

DESIGN DISCHARGE
HIGHWOOD RIVER DOWNSTREAM OF SHEEP RIVER = 2009 M³/S



CLIENT
ALBERTA ENVIRONMENT AND PARKS

CONSULTANT
GOLDER
MEMBER OF WSP

YYYY-MM-DD	2022-06-22
DESIGNED	PT
PREPARED	NB
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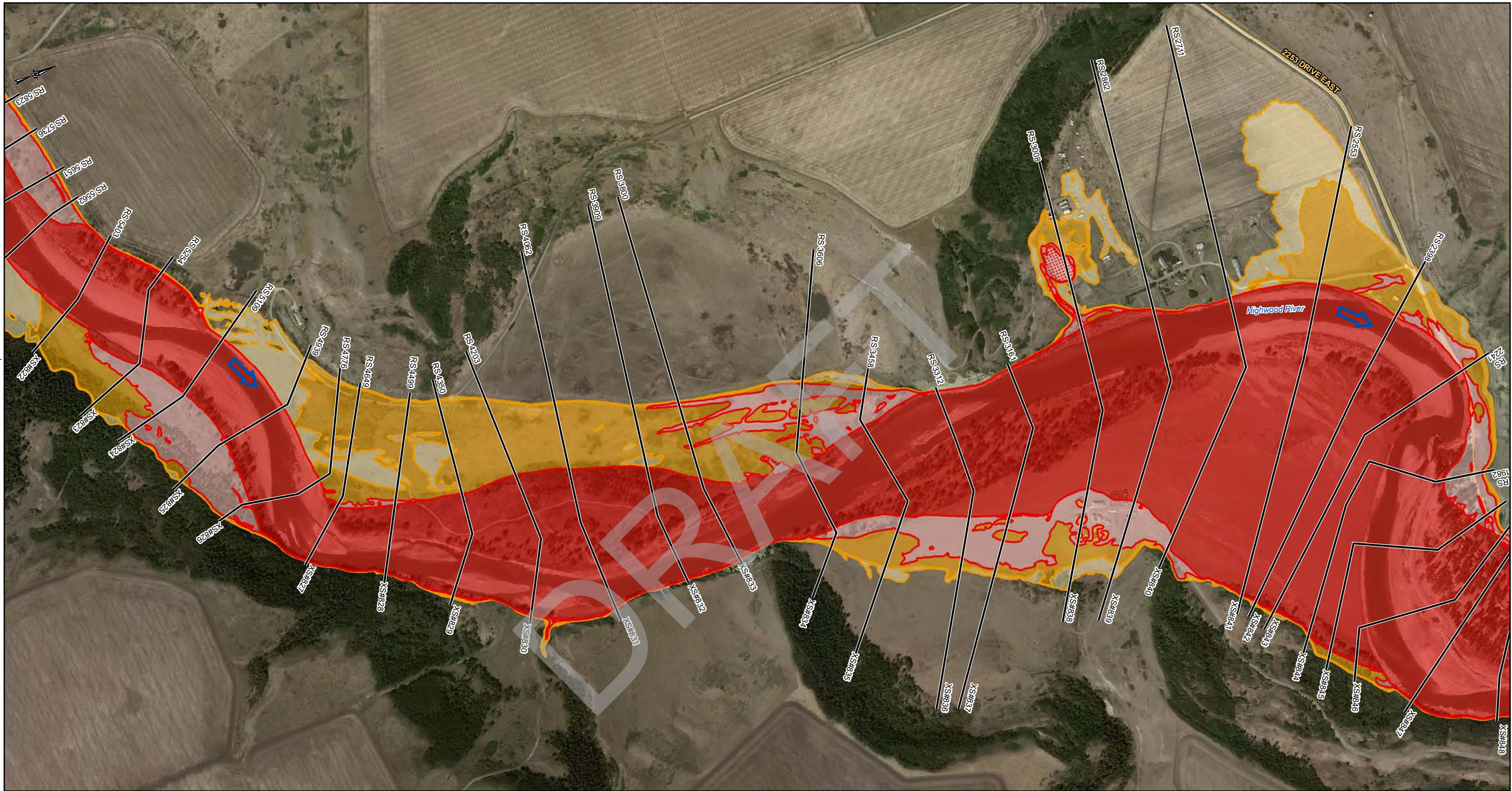
PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 27 of 33

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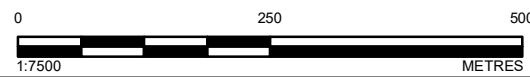
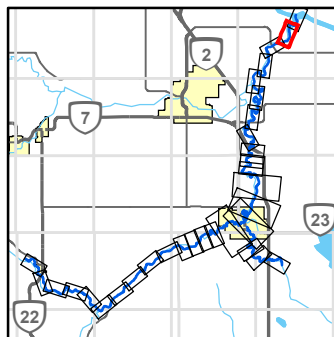


SHEET 27 ↑

↑ SHEET 28

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| XS#100 CROSS SECTION NUMBER | ◊ CULVERT | ■ FLOOD FRINGE |
| RS 304 RIVER STATION (M) | □ WEIR | ▨ PROTECTED FLOOD FRINGE |
| ▬ STUDY BOUNDARY | ⌄ BRIDGE | ■ 200-YEAR FLOOD EXTENT |
| ➡ FLOW DIRECTION | | ■ 500-YEAR FLOOD EXTENT |
| — LOCAL ROAD | | |
| — PRIMARY HIGHWAY | | |
| — SECONDARY HIGHWAY | | |
| — RAILWAY | | |
- DESIGN DISCHARGE**
HIGHWOOD RIVER DOWNSTREAM OF SHEEP RIVER = 2009 M³/S



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AND PARKS



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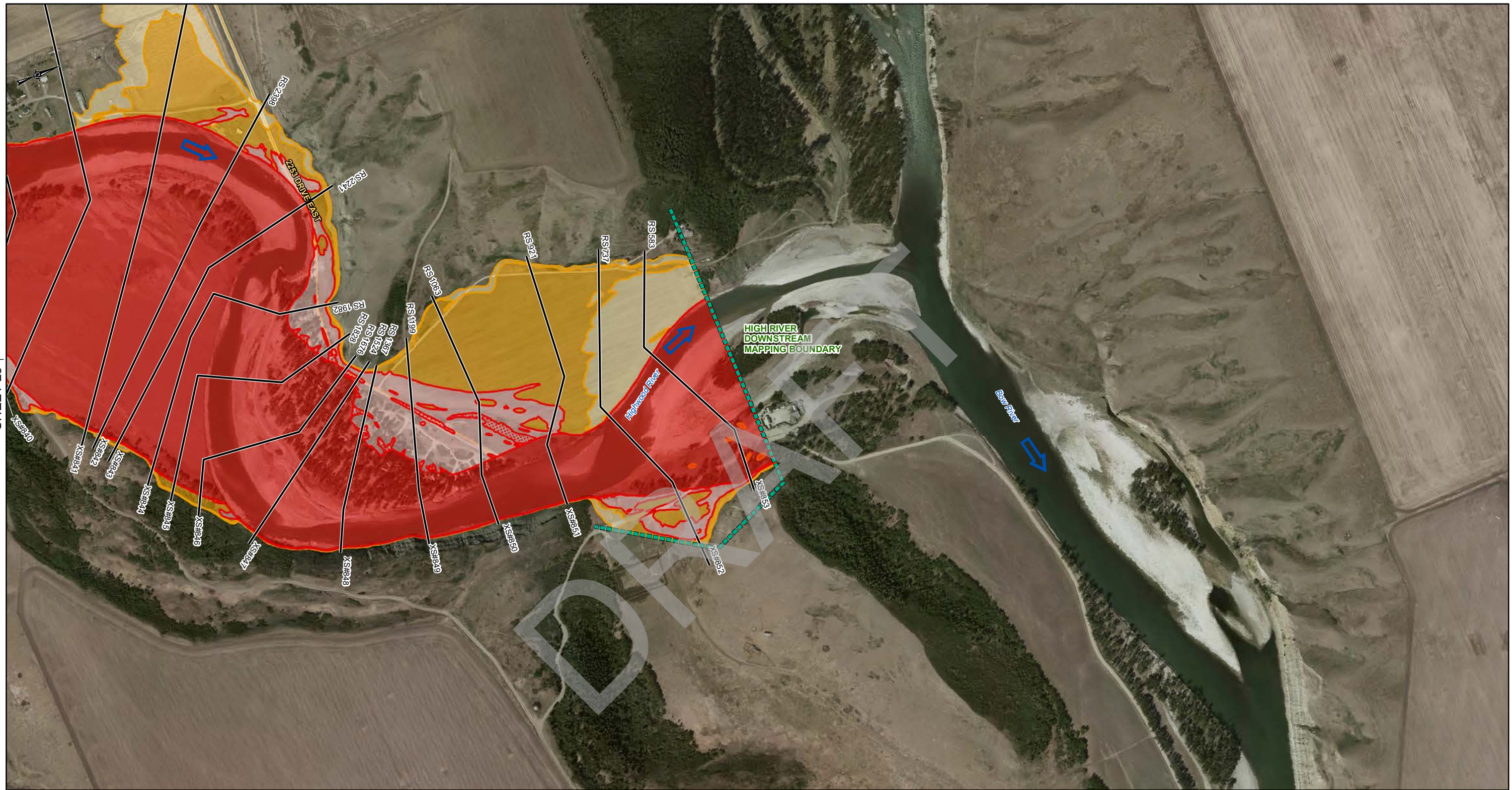
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PROJECT
HIGHWOOD RIVER HAZARD STUDY

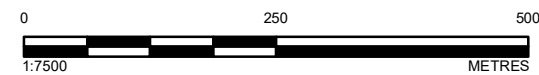
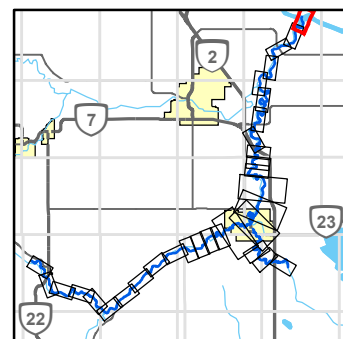
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FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1536669	4000	0	SHEET 28 of 33

SHEET 28 ↑



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—	CROSS SECTION
XS#100	CROSS SECTION NUMBER
RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
+	RAILWAY
—	FLOOD CONTROL STRUCTURE
◻	CULVERT
◻	WEIR
—	BRIDGE
■	FLOODWAY
■	HIGH HAZARD FLOOD FRINGE
■	FLOOD FRINGE
■	PROTECTED FLOOD FRINGE
■	200-YEAR FLOOD EXTENT
■	500-YEAR FLOOD EXTENT
DESIGN DISCHARGE HIGHWOOD RIVER DOWNSTREAM OF SHEEP RIVER = 2009 M ³ /S	



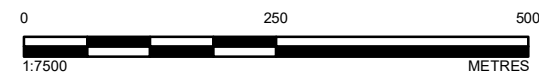
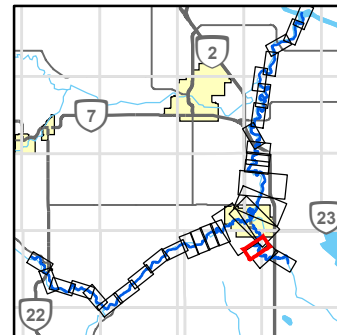
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CONSULTANT	GOLDER MEMBER OF WSP
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PREPARED	NB
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PROJECT	HIGHWOOD RIVER HAZARD STUDY
TITLE	FLOOD HAZARD MAP
PROJECT NO.	1536669
CONTROL	4000
REV.	0
FIGURE	SHEET 29 of 33



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| ● 2D DOMAIN PROFILE STATION | FLOOD CONTROL STRUCTURE | ■ FLOODWAY |
| — CROSS SECTION | HYDRAULIC STRUCTURES | ▨ HIGH HAZARD FLOOD FRINGE |
| XS#100 CROSS SECTION NUMBER | ◊ CULVERT | ▧ FLOOD FRINGE |
| RS 304 RIVER STATION (M) | □ WEIR | ▨ PROTECTED FLOOD FRINGE |
| ▬ STUDY BOUNDARY | ▬ BRIDGE | ■ 200-YEAR FLOOD EXTENT |
| ➔ FLOW DIRECTION | | ■ 500-YEAR FLOOD EXTENT |
| — LOCAL ROAD | | DESIGN DISCHARGE |
| — PRIMARY HIGHWAY | | LITTLE BOW RIVER DOWNSTREAM OF HIGH RIVER = 402 M ³ /S |
| — SECONDARY HIGHWAY | | |
| — RAILWAY | | |

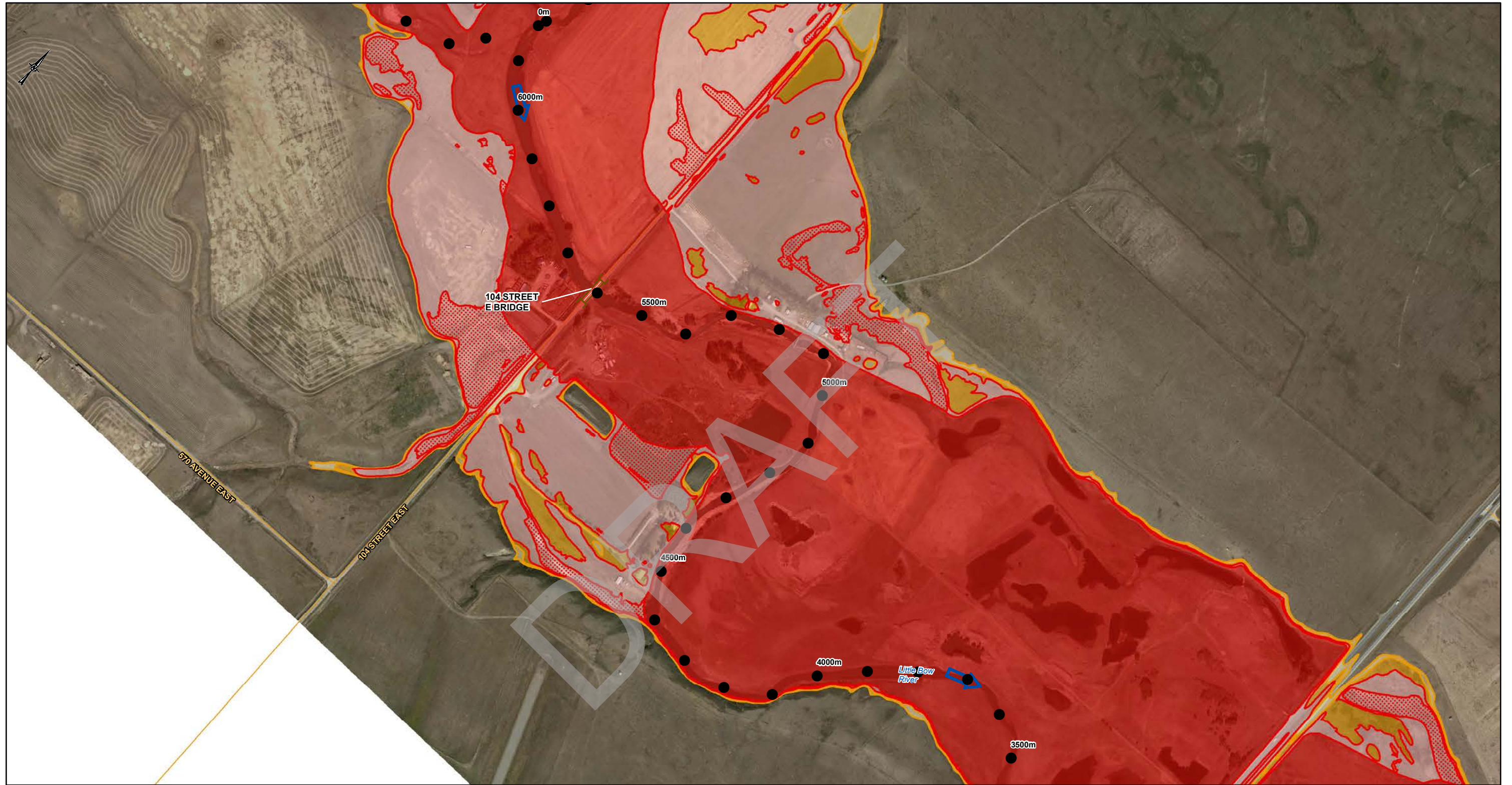


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CONSULTANT	GOLDER MEMBER OF WSP	
DESIGNED	PT	2022-06-22
PREPARED	NB	
REVIEWED	JC	
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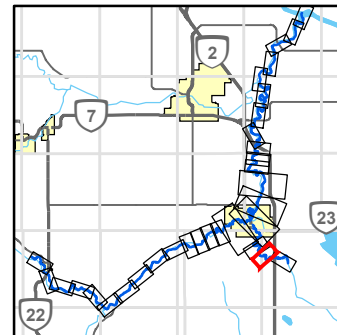
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PROJECT		
HIGHWOOD RIVER HAZARD STUDY		
TITLE		
FLOOD HAZARD MAP		
PROJECT NO.	CONTROL	REV.
1536669	4000	0
FIGURE		
SHEET 30 of 33		

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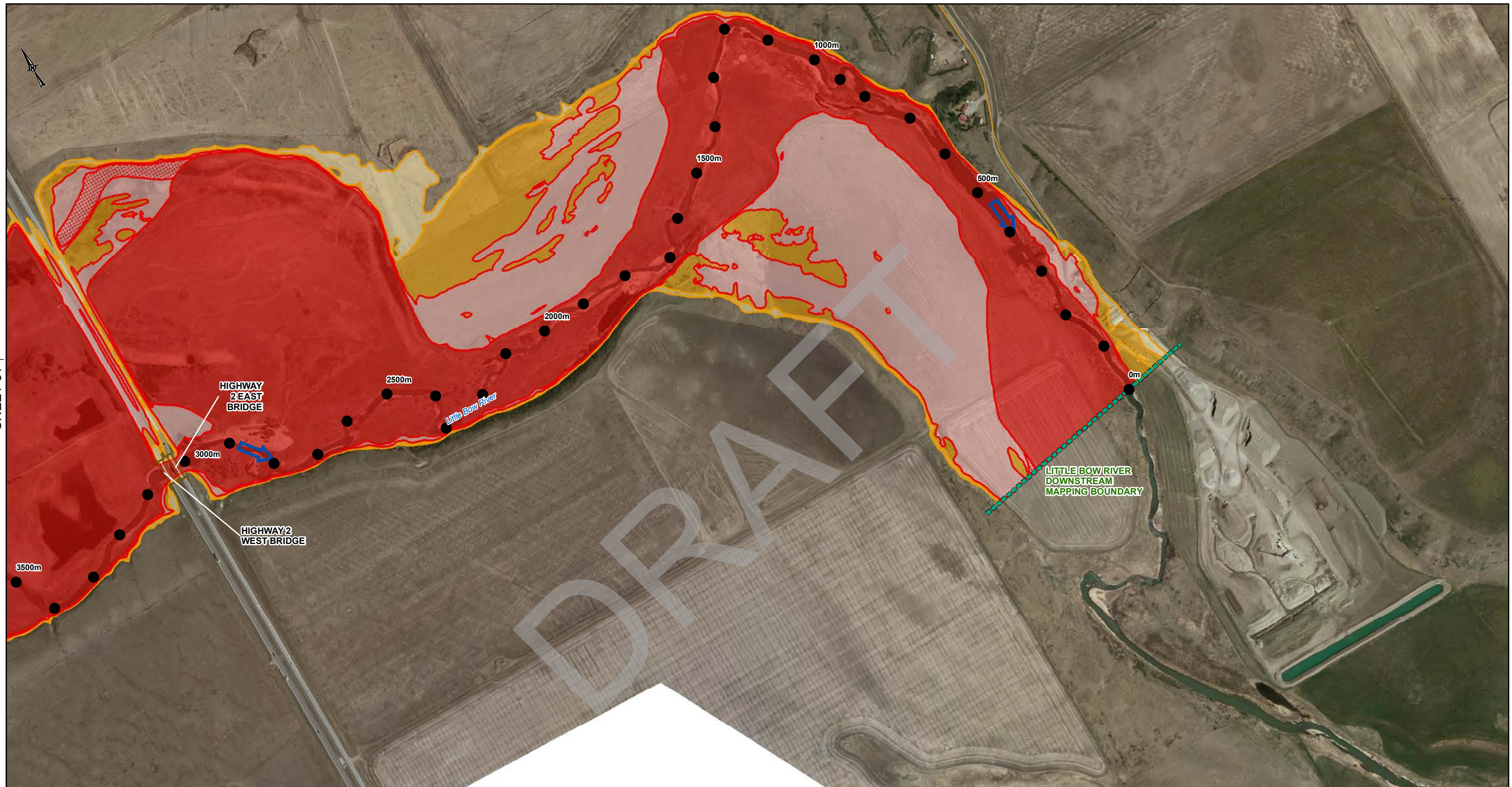
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➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
+	RAILWAY
	FLOOD CONTROL STRUCTURE
◻	CULVERT
◻	WEIR
—	BRIDGE
■	FLOODWAY
▨	HIGH HAZARD FLOOD FRINGE
□	FLOOD FRINGE
▨	PROTECTED FLOOD FRINGE
■	200-YEAR FLOOD EXTENT
■	500-YEAR FLOOD EXTENT
DESIGN DISCHARGE	
LITTLE BOW RIVER DOWNSTREAM OF HIGH RIVER = 402 M ³ /S	



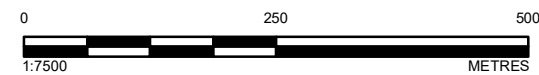
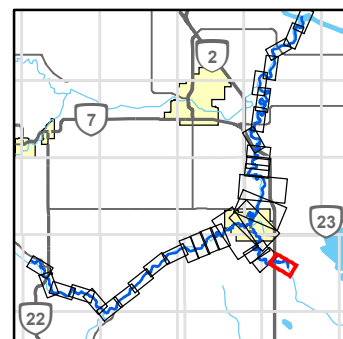
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PROJECT	HIGHWOOD RIVER HAZARD STUDY
TITLE	FLOOD HAZARD MAP
PROJECT NO.	1536669
CONTROL	4000
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FIGURE	SHEET 31 of 33

SHEET 31 ↑

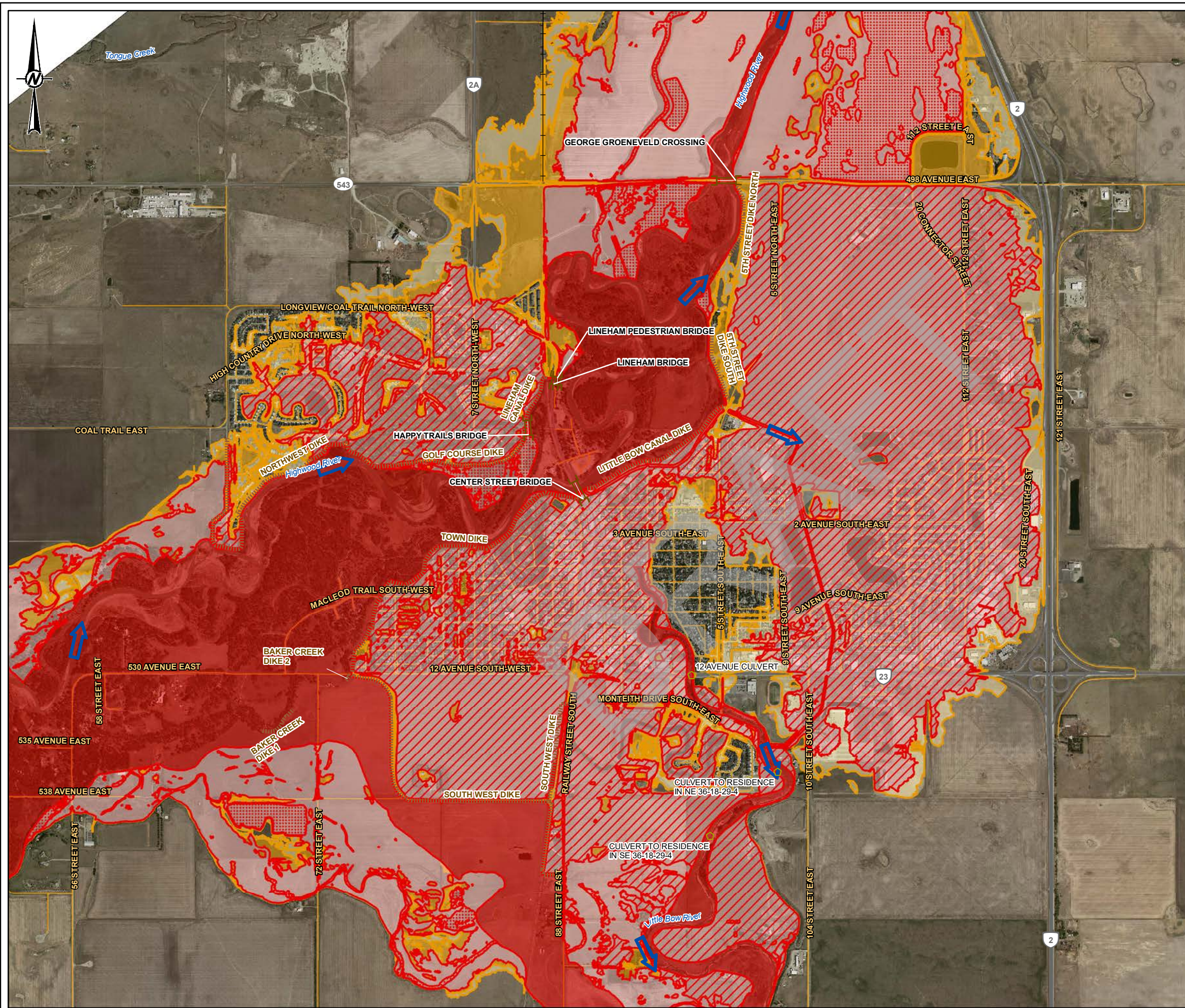


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RS 304	RIVER STATION (M)
—	STUDY BOUNDARY
➔	FLOW DIRECTION
—	LOCAL ROAD
—	PRIMARY HIGHWAY
—	SECONDARY HIGHWAY
—	RAILWAY
—	FLOOD CONTROL STRUCTURE
◻	CULVERT
◻	WEIR
—	BRIDGE
■	FLOODWAY
■	HIGH HAZARD FLOOD FRINGE
■	FLOOD FRINGE
■	PROTECTED FLOOD FRINGE
■	200-YEAR FLOOD EXTENT
■	500-YEAR FLOOD EXTENT
DESIGN DISCHARGE LITTLE BOW RIVER DOWNSTREAM OF HIGH RIVER = 402 M ³ /S	



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PROJECT HIGHWOOD RIVER HAZARD STUDY		
TITLE FLOOD HAZARD MAP		
PROJECT NO.	CONTROL	REV.
1536669	4000	0
FIGURE		SHEET 32 of 33

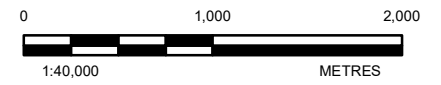
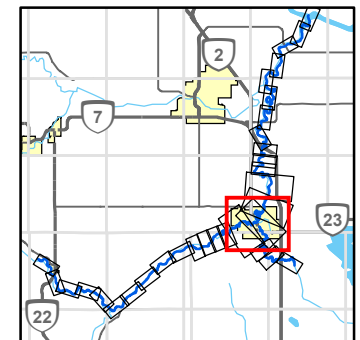


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FLOW DIRECTION
 LOCAL ROAD
 PRIMARY HIGHWAY
 SECONDARY HIGHWAY
 RAILWAY
 FLOOD CONTROL STRUCTURE
HYDRAULIC STRUCTURES
 CULVERT
 WEIR
 BRIDGE

FLOOD HAZARD

FLOODWAY
 HIGH HAZARD FLOOD FRINGE
 FLOOD FRINGE
 PROTECTED FLOOD FRINGE
 200-YEAR FLOOD EXTENT
 500-YEAR FLOOD EXTENT



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PROJECT
HIGHWOOD RIVER HAZARD STUDY

TITLE
**FLOOD HAZARD MAP
 OVERFLOW AREA AT HIGH RIVER**

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DESIGNED	PT	
PREPARED	NB	
REVIEWED	JC	
APPROVED	WP	

PROJECT NO. 1536669 CONTROL 4000 REV. 0 FIGURE SHEET 33 of 33

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APPENDIX C

Simulated Climate-Affected Flood Profiles and Water Levels

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Figure C-1a: Simulated Water Surface Profiles along the Highwood River Study Reach due to Climate Change - Part 1

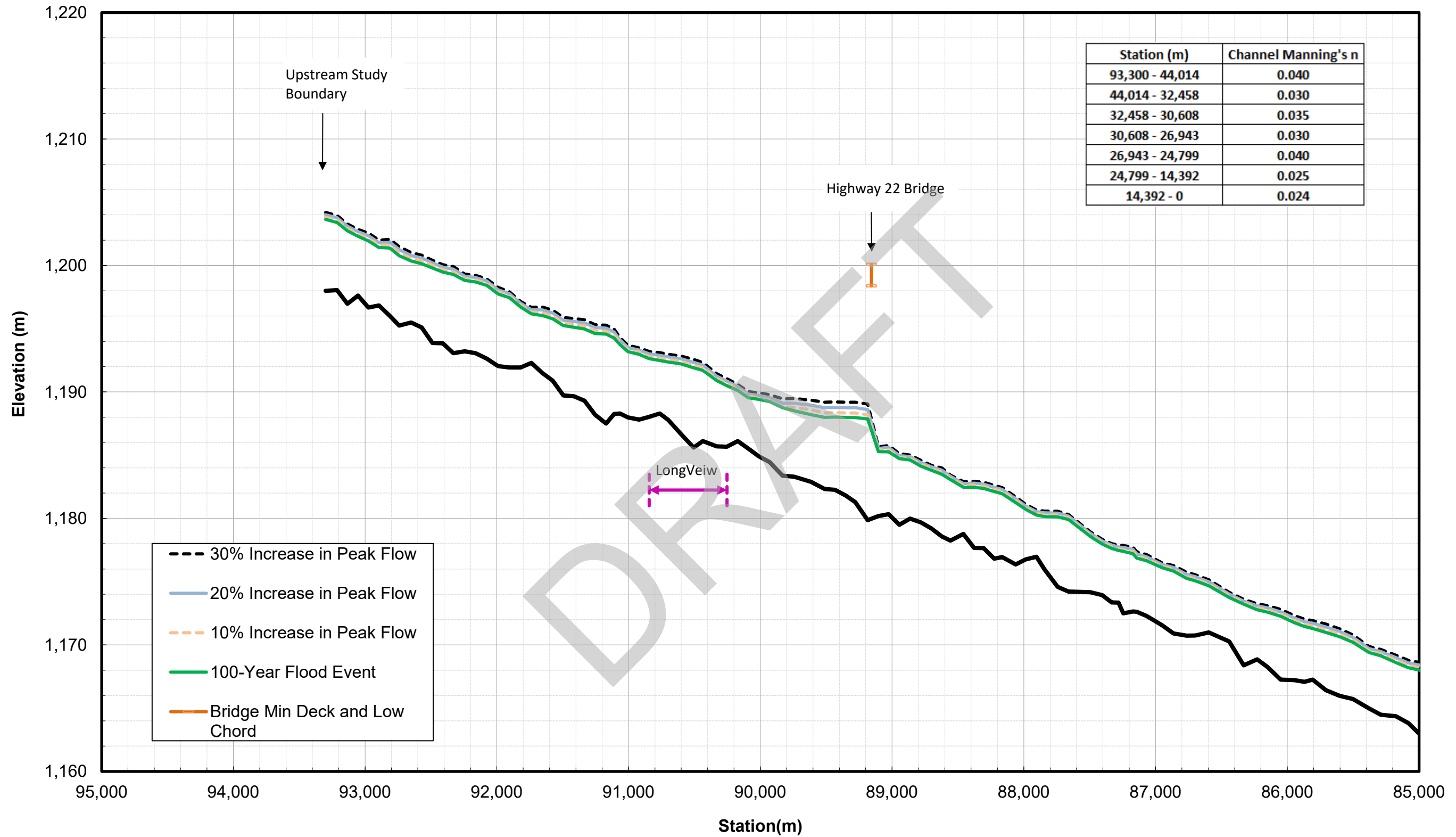
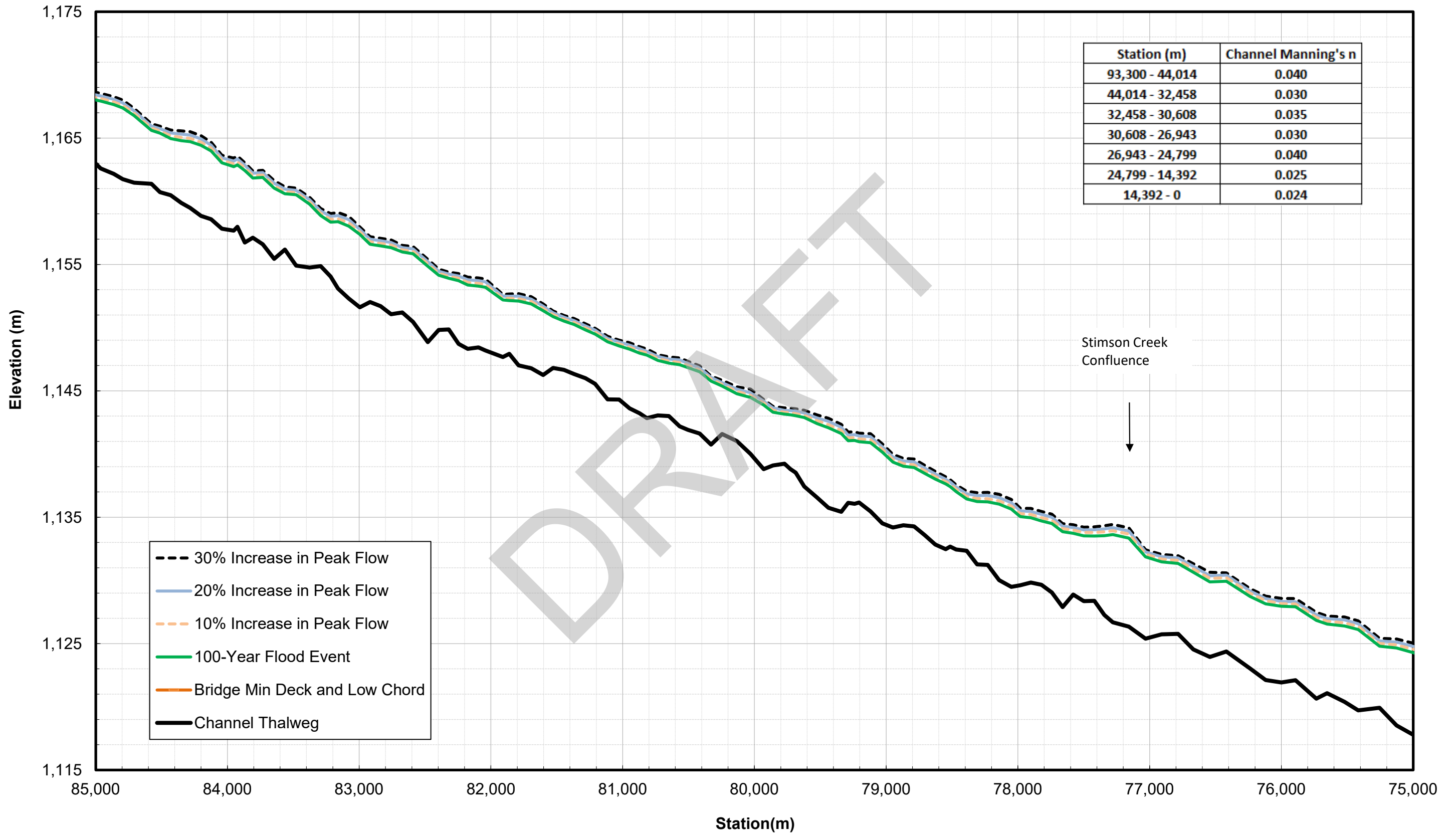


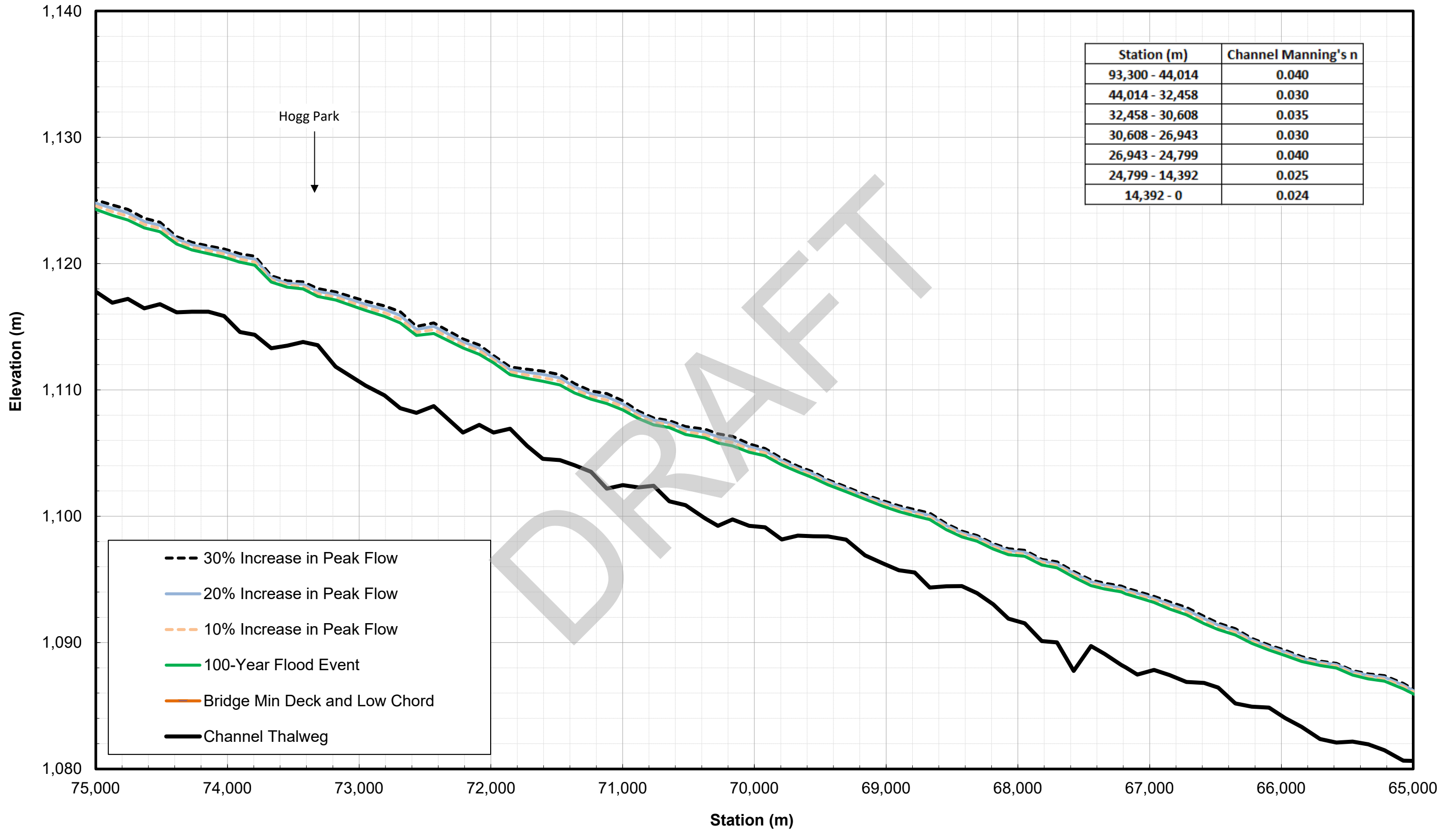
Figure C-1b: Simulated Water Surface Profiles along the Highwood River Study Reach due to Climate Change - Part 2



Station (m)	Channel Manning's n
93,300 - 44,014	0.040
44,014 - 32,458	0.030
32,458 - 30,608	0.035
30,608 - 26,943	0.030
26,943 - 24,799	0.040
24,799 - 14,392	0.025
14,392 - 0	0.024

- 30% Increase in Peak Flow
- 20% Increase in Peak Flow
- 10% Increase in Peak Flow
- 100-Year Flood Event
- Bridge Min Deck and Low Chord
- Channel Thalweg

Figure C-1c: Simulated Water Surface Profiles along the Highwood River Study Reach due to Climate Change - Part 3



Station (m)	Channel Manning's n
93,300 - 44,014	0.040
44,014 - 32,458	0.030
32,458 - 30,608	0.035
30,608 - 26,943	0.030
26,943 - 24,799	0.040
24,799 - 14,392	0.025
14,392 - 0	0.024

- 30% Increase in Peak Flow
- 20% Increase in Peak Flow
- 10% Increase in Peak Flow
- 100-Year Flood Event
- Bridge Min Deck and Low Chord
- Channel Thalweg

Figure C-1d: Simulated Water Surface Profiles along the Highwood River Study Reach due to Climate Change - Part 4

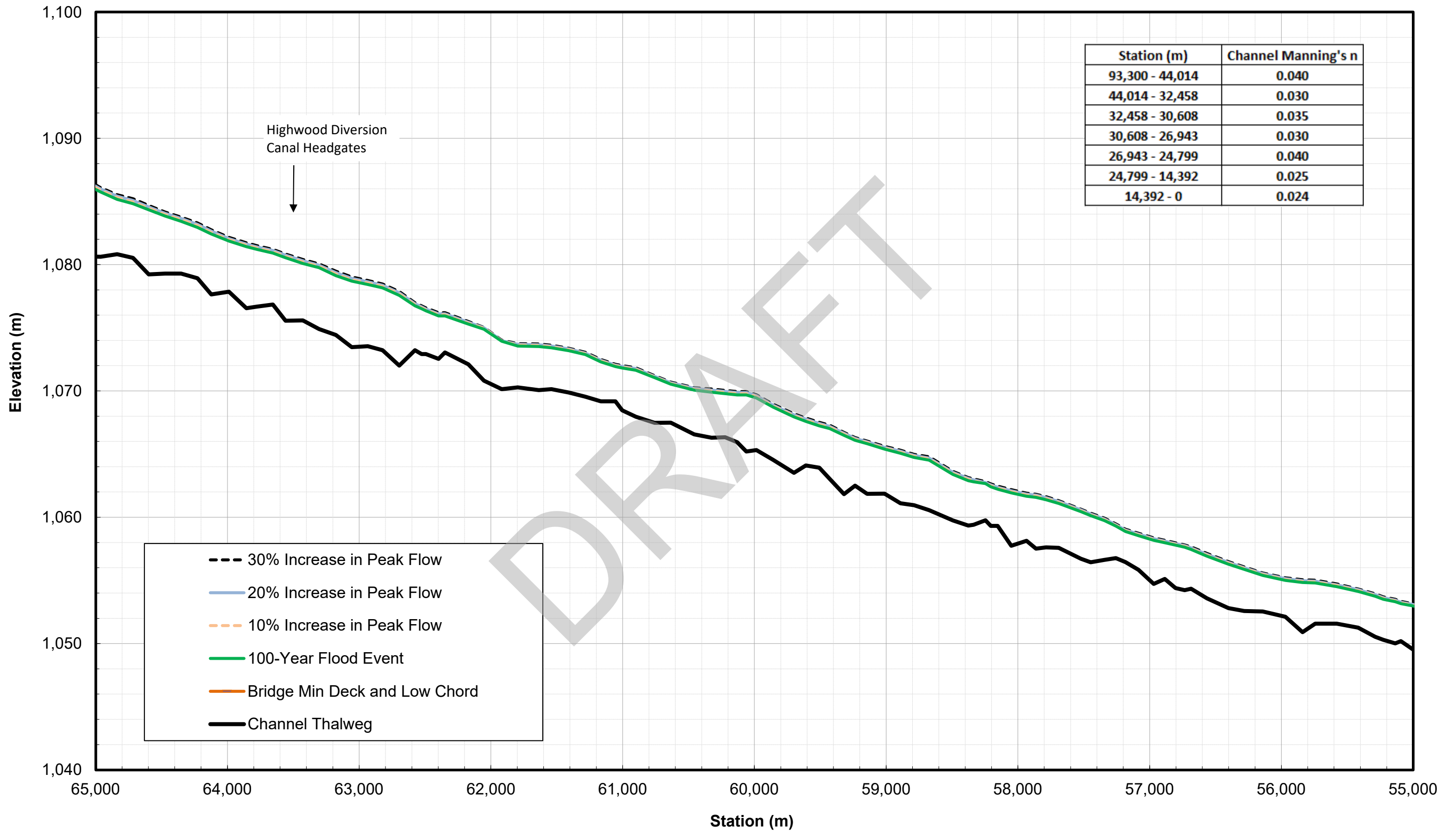
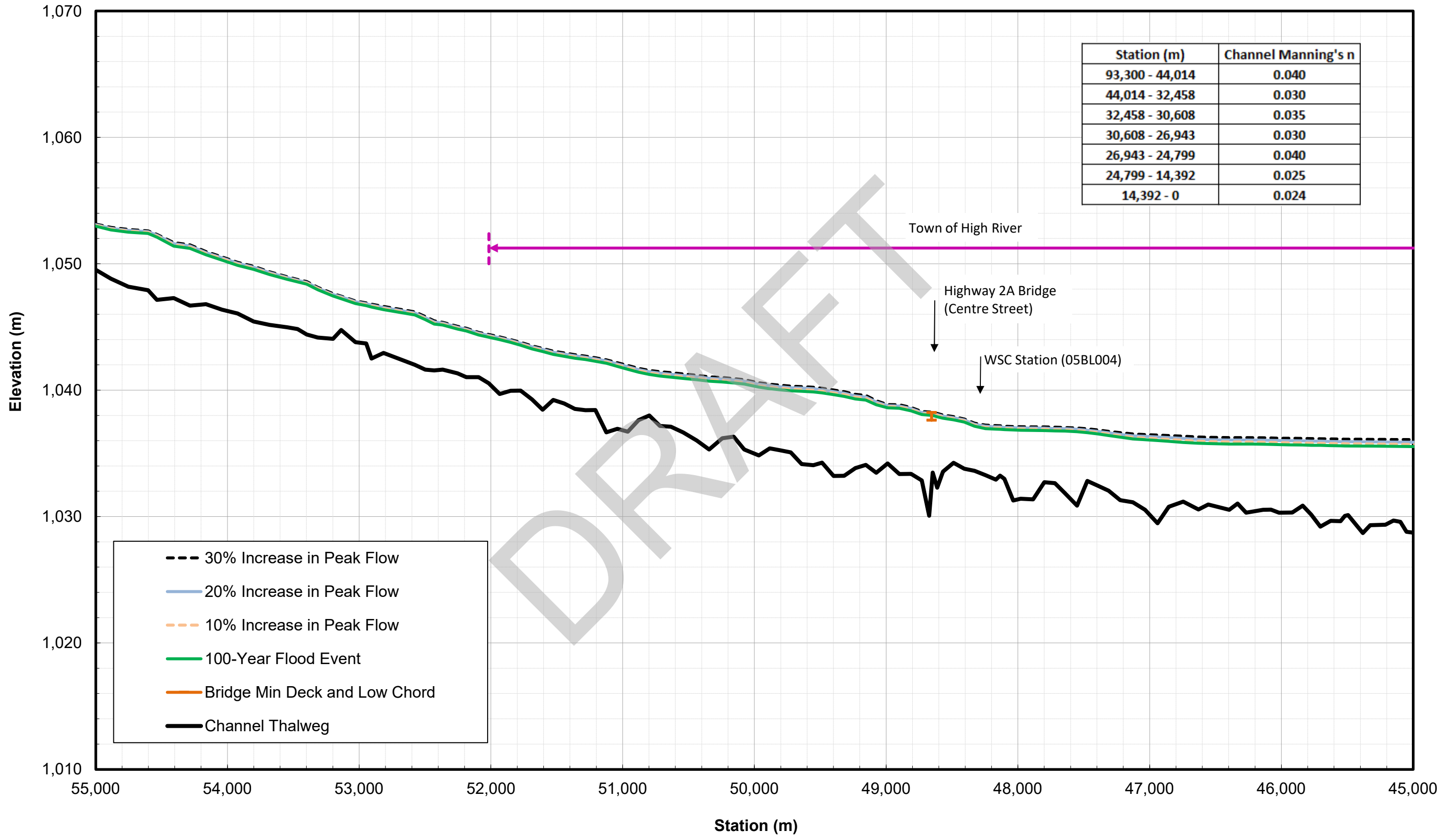


Figure C-1e: Simulated Water Surface Profiles along the Highwood River Study Reach due to Climate Change - Part 5



Station (m)	Channel Manning's n
93,300 - 44,014	0.040
44,014 - 32,458	0.030
32,458 - 30,608	0.035
30,608 - 26,943	0.030
26,943 - 24,799	0.040
24,799 - 14,392	0.025
14,392 - 0	0.024

- 30% Increase in Peak Flow
- 20% Increase in Peak Flow
- - - 10% Increase in Peak Flow
- 100-Year Flood Event
- Bridge Min Deck and Low Chord
- Channel Thalweg

Figure C-1f: Simulated Water Surface Profiles along the Highwood River Study Reach due to Climate Change - Part 6

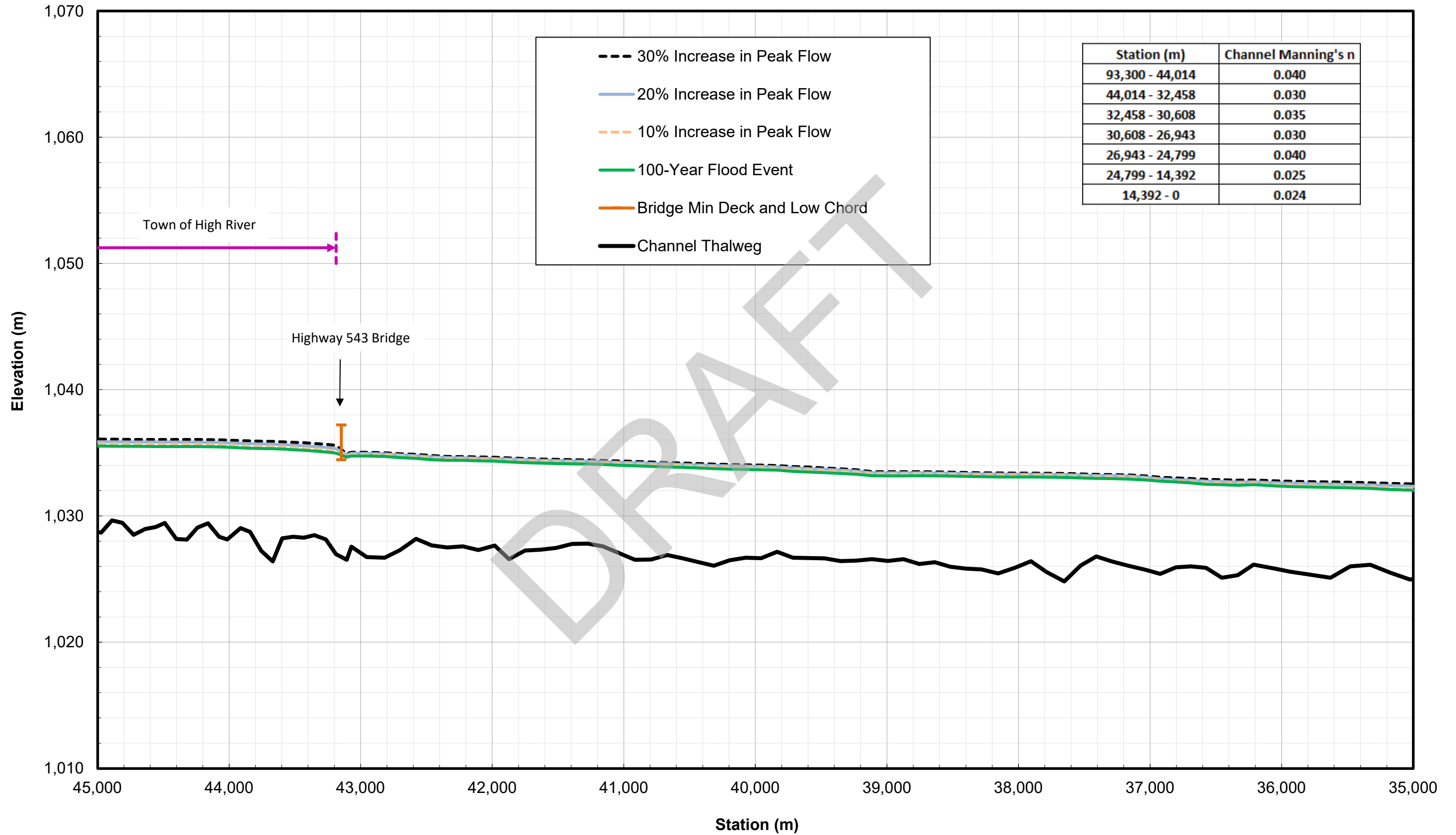


Figure C-1g: Simulated Water Surface Profiles along the Highwood River Study Reach due to Climate Change - Part 7

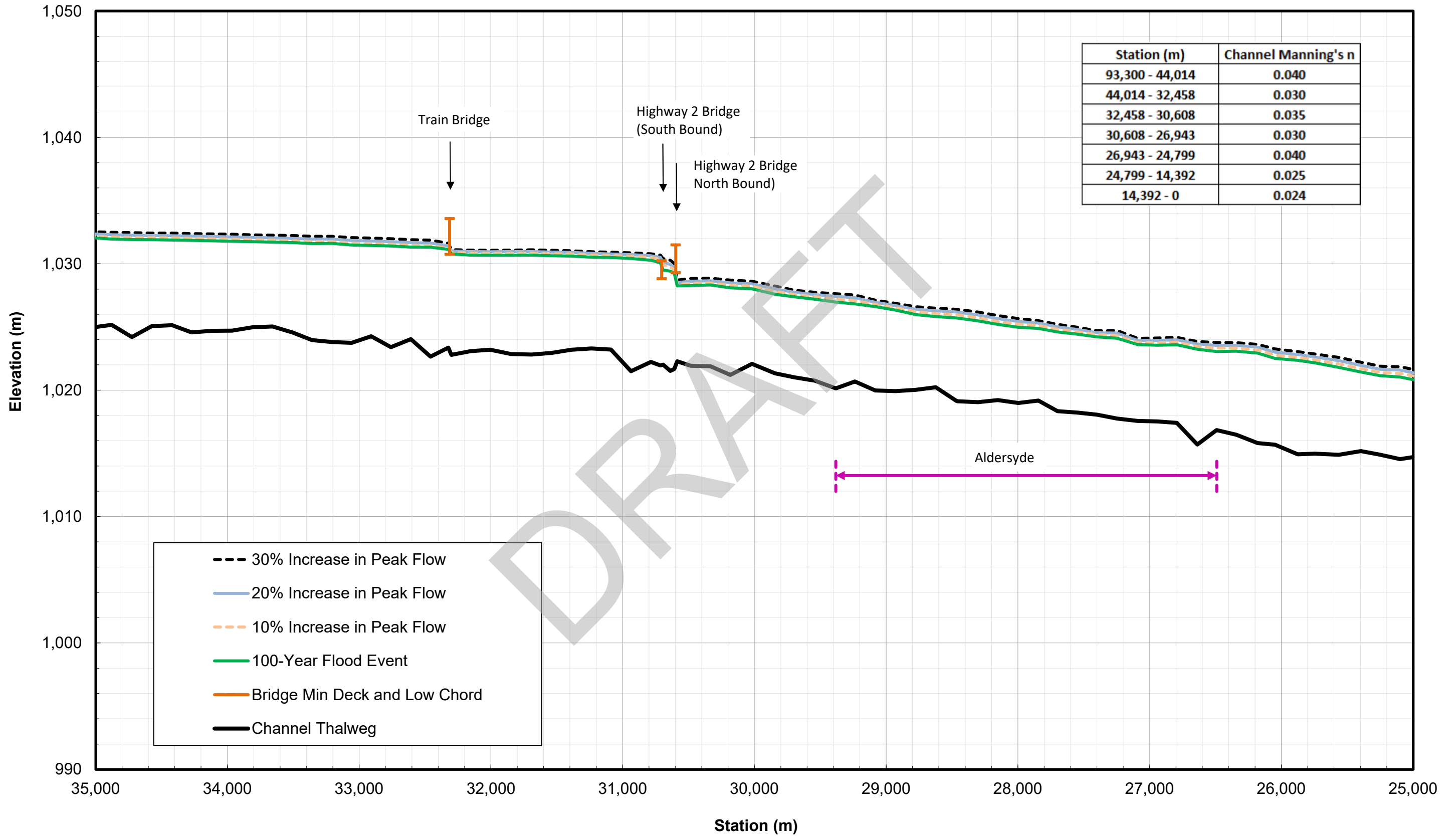


Figure C-1h: Simulated Water Surface Profiles along the Highway 547 River Study Reach due to Climate Change - Part 8

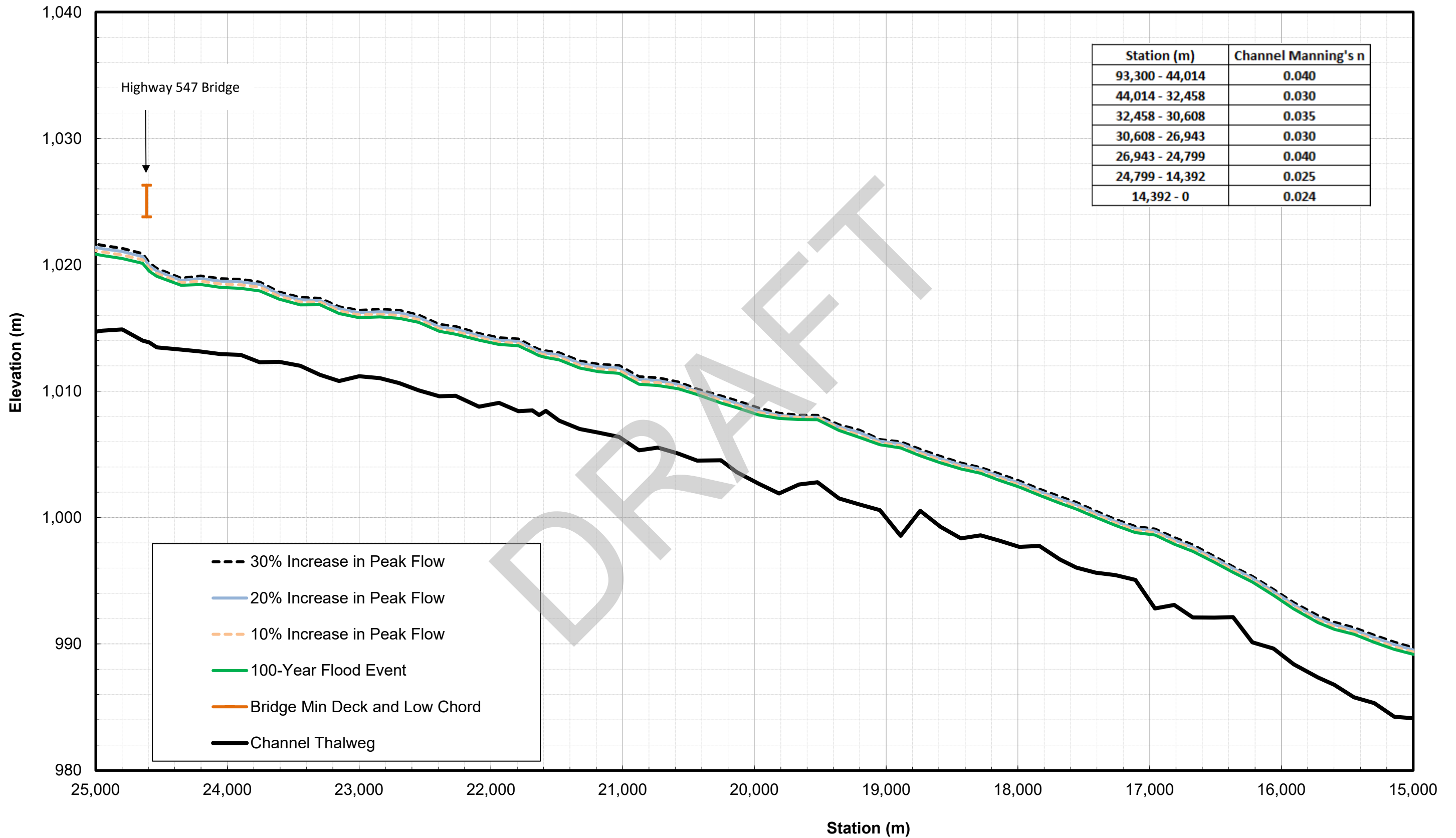


Figure C-1i: Simulated Water Surface Profiles along the Highwood River Study Reach due to Climate Change - Part 9

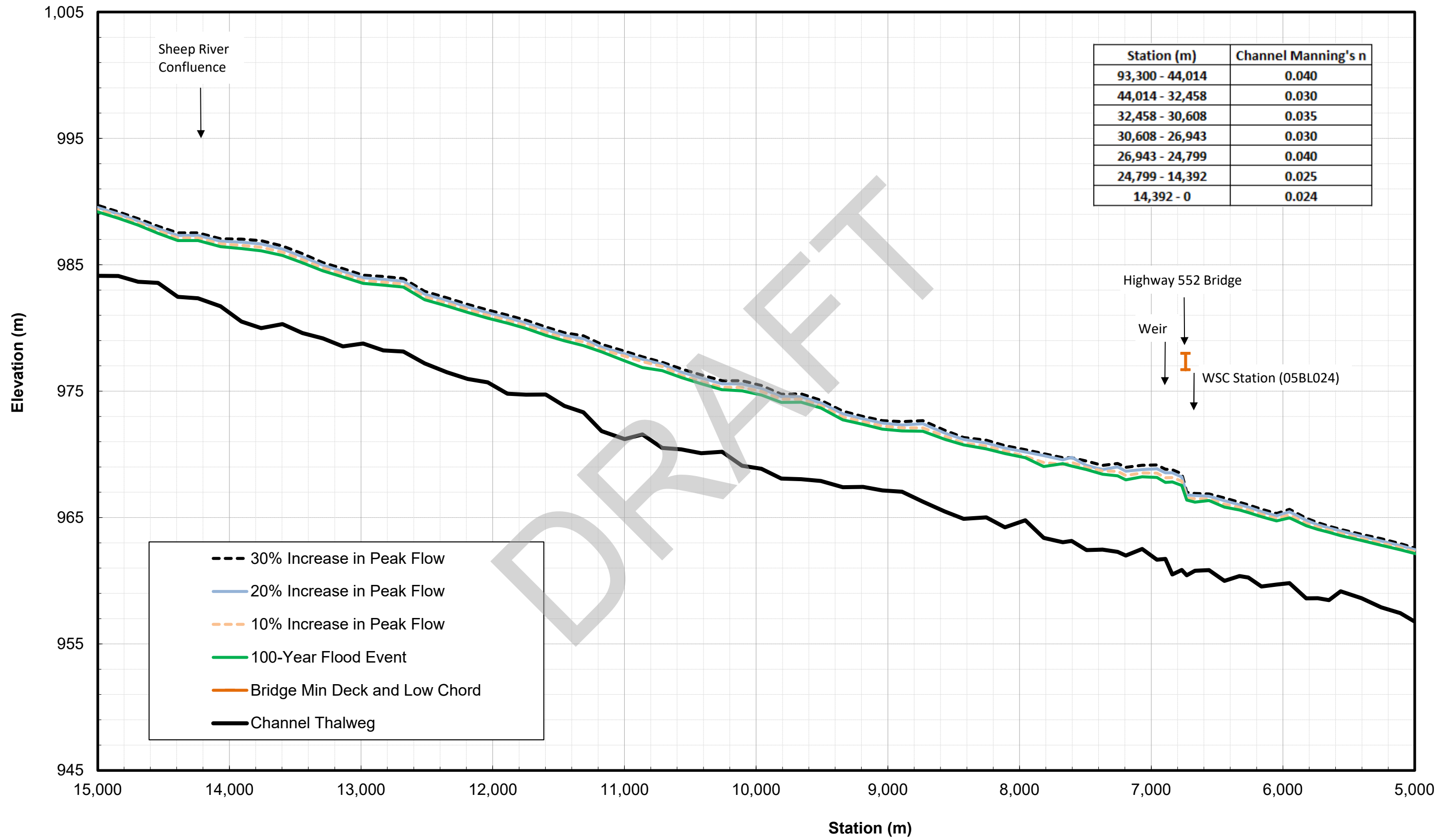


Figure C-1j: Simulated Water Surface Profiles along the Highwood River Study Reach due to Climate Change - Part 10

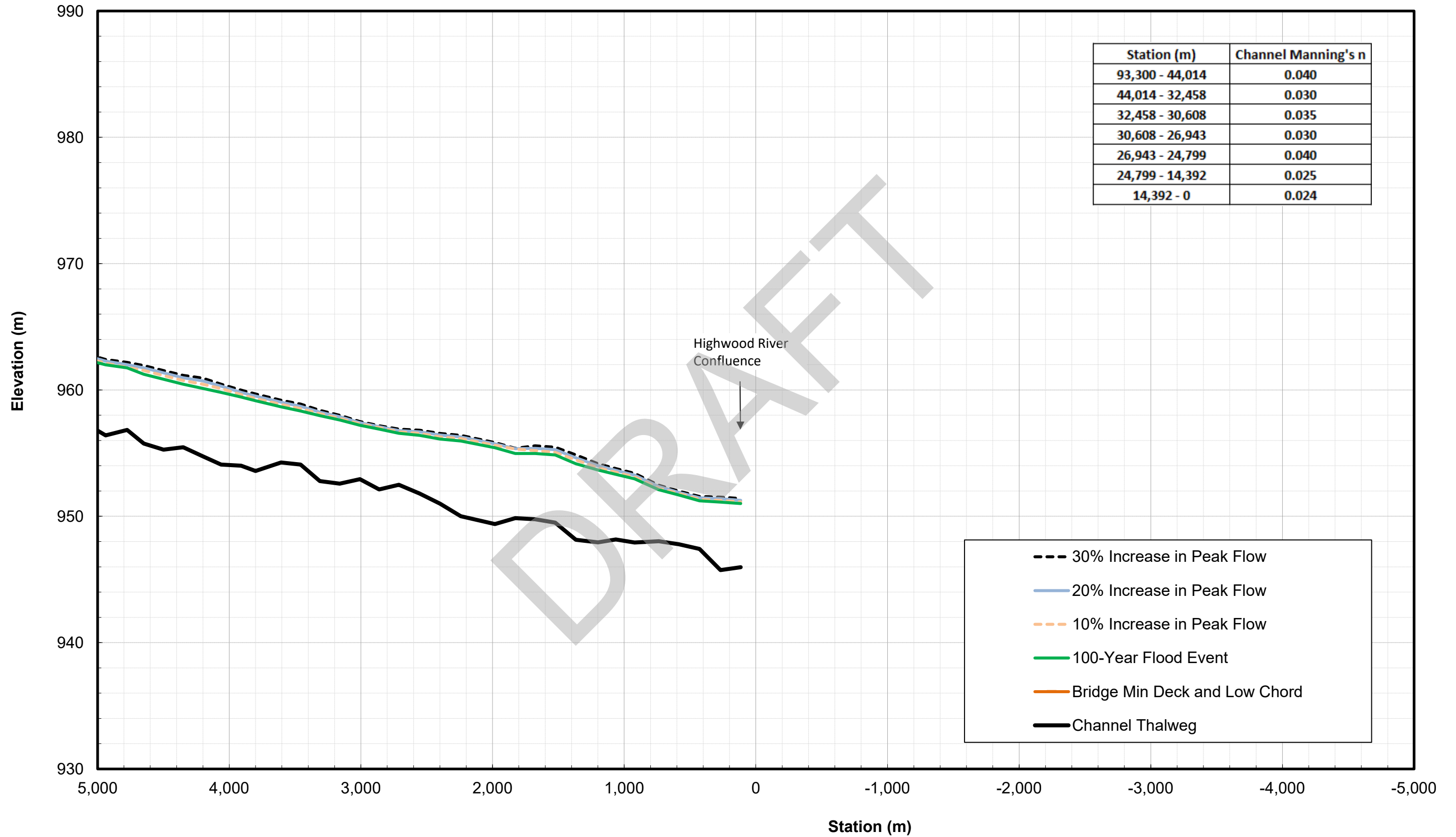


Figure C-2: Simulated Water Surface Profiles along the Little Bow River Study Reach due to Climate Change

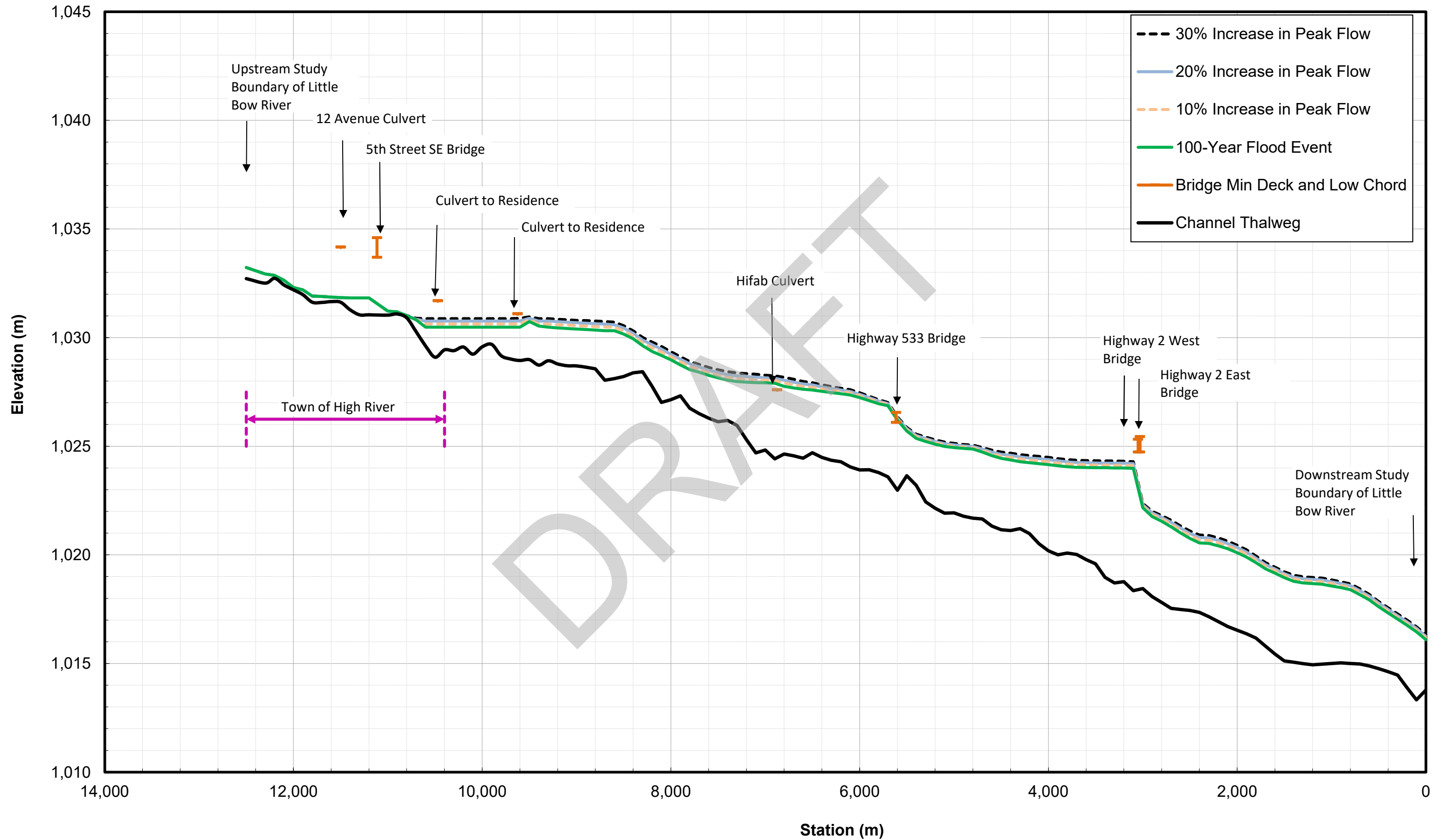


Figure C-3: Simulated Water Surface Profiles along Overland Flood Route due to Climate Change

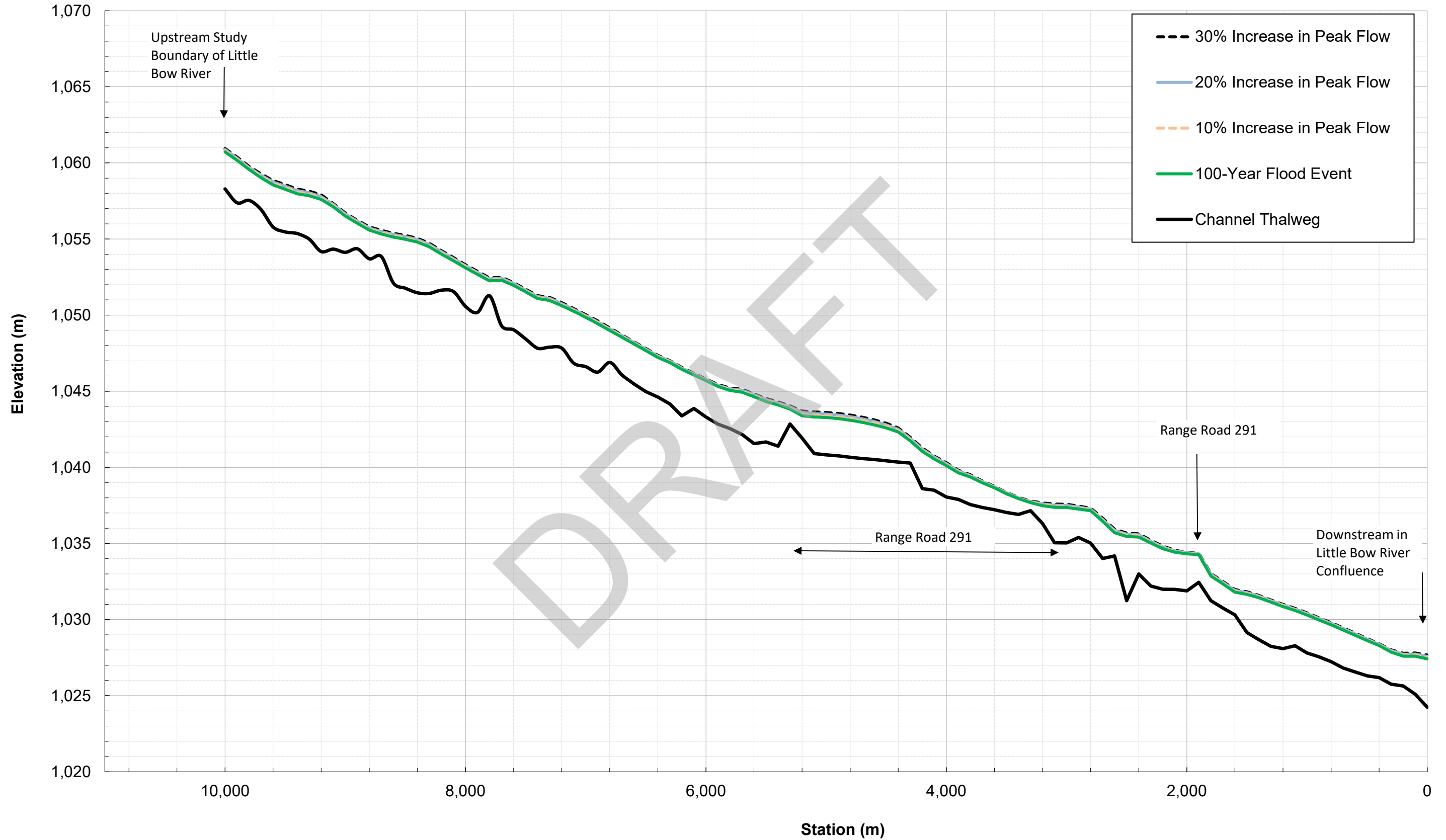


Table C.1 Water Level Difference along the Highwood River due to Climate Change

Station in Flood Mapping	HEC-RAS Station	Water Level for 100-Year (Base Case)	Water Level for 10% Increase in Peak Flow	Difference due to 10% Increase in Peak Flow	Water Level for 20% Increase in Peak Flow	Difference due to 20% Increase in Peak Flow	Water Level for 30% Increase in Peak Flow	Difference due to 30% Increase in Peak Flow
1	93299	1203.64	1203.82	0.18	1204.01	0.37	1204.20	0.56
2	93213	1203.40	1203.58	0.18	1203.77	0.37	1203.95	0.55
3	93134	1202.74	1202.91	0.17	1203.10	0.36	1203.27	0.53
4	93053	1202.30	1202.48	0.18	1202.67	0.37	1202.85	0.55
5	92974	1201.94	1202.15	0.21	1202.36	0.42	1202.56	0.62
6	92894	1201.42	1201.60	0.18	1201.80	0.38	1201.99	0.57
7	92813	1201.37	1201.60	0.23	1201.84	0.47	1202.06	0.69
8	92741	1200.77	1201.01	0.24	1201.25	0.48	1201.49	0.72
9	92650	1200.35	1200.56	0.21	1200.79	0.44	1201.01	0.66
10	92571	1200.14	1200.36	0.22	1200.59	0.45	1200.81	0.67
11	92489	1199.80	1200.00	0.20	1200.21	0.41	1200.41	0.61
12	92410	1199.47	1199.67	0.20	1199.87	0.40	1200.06	0.59
13	92330	1199.29	1199.49	0.20	1199.71	0.42	1199.91	0.62
14	92244	1198.81	1198.97	0.16	1199.15	0.34	1199.31	0.50
15	92161	1198.69	1198.86	0.17	1199.05	0.36	1199.22	0.53
16	92077	1198.42	1198.59	0.17	1198.77	0.35	1198.93	0.51
17	91990	1197.74	1197.92	0.18	1198.08	0.34	1198.26	0.52
18	91905	1197.46	1197.62	0.16	1197.77	0.31	1197.92	0.46
19	91820	1196.72	1196.86	0.14	1197.01	0.29	1197.15	0.43
20	91738	1196.17	1196.32	0.15	1196.50	0.33	1196.69	0.52
21	91655	1196.04	1196.26	0.22	1196.48	0.44	1196.71	0.67
22	91576	1195.79	1196.00	0.21	1196.24	0.45	1196.46	0.67
23	91495	1195.25	1195.45	0.20	1195.67	0.42	1195.88	0.63
24	91415	1195.11	1195.33	0.22	1195.57	0.46	1195.80	0.69
25	91334	1194.98	1195.22	0.24	1195.46	0.48	1195.70	0.72
26	91254	1194.62	1194.85	0.23	1195.09	0.47	1195.32	0.70
27	91171	1194.57	1194.80	0.23	1195.04	0.47	1195.27	0.70
28	91109	1194.27	1194.50	0.23	1194.74	0.47	1194.97	0.70
29	91066	1193.75	1193.93	0.18	1194.12	0.37	1194.30	0.55
30	91006	1193.18	1193.34	0.16	1193.51	0.33	1193.68	0.50
31	90920	1192.97	1193.14	0.17	1193.31	0.34	1193.48	0.51
32	90844	1192.64	1192.82	0.18	1193.01	0.37	1193.20	0.56
33	90763	1192.48	1192.68	0.20	1192.89	0.41	1193.10	0.62
34	90699	1192.36	1192.56	0.20	1192.77	0.41	1192.97	0.61
35	90602	1192.21	1192.41	0.20	1192.62	0.41	1192.83	0.62
36	90506	1191.91	1192.12	0.21	1192.34	0.43	1192.56	0.65
37	90436	1191.70	1191.90	0.20	1192.12	0.42	1192.33	0.63
38	90331	1190.89	1191.06	0.17	1191.25	0.36	1191.43	0.54
39	90254	1190.49	1190.68	0.19	1190.86	0.37	1191.04	0.55
40	90172	1190.12	1190.26	0.14	1190.43	0.31	1190.59	0.47
41	90091	1189.54	1189.67	0.13	1189.83	0.29	1190.02	0.48
42	90012	1189.41	1189.54	0.13	1189.72	0.31	1189.93	0.52
43	89930	1189.24	1189.36	0.12	1189.55	0.31	1189.78	0.54
44	89832	1188.76	1188.83	0.07	1189.12	0.36	1189.45	0.69
45	89743	1188.51	1188.77	0.26	1189.11	0.60	1189.48	0.97
46	89616	1188.20	1188.59	0.39	1188.96	0.76	1189.35	1.15
47	89513	1187.99	1188.34	0.35	1188.75	0.76	1189.18	1.19
48	89433	1188.01	1188.36	0.35	1188.77	0.76	1189.21	1.20
49	89353	1187.99	1188.34	0.35	1188.76	0.77	1189.19	1.20
50	89280	1187.97	1188.33	0.36	1188.75	0.78	1189.19	1.22
51	89185	1187.86	1188.20	0.34	1188.61	0.75	1189.05	1.19
52	89104	1185.28	1185.40	0.12	1185.53	0.25	1185.66	0.38
53	89026	1185.26	1185.44	0.18	1185.62	0.36	1185.76	0.50
54	88944	1184.72	1184.84	0.12	1184.97	0.25	1185.11	0.39
55	88864	1184.62	1184.75	0.13	1184.89	0.27	1185.01	0.39
56	88782	1184.13	1184.28	0.15	1184.43	0.30	1184.59	0.46
57	88703	1183.81	1183.95	0.14	1184.08	0.27	1184.20	0.39
58	88622	1183.49	1183.66	0.17	1183.81	0.32	1183.98	0.49
59	88557	1183.07	1183.18	0.11	1183.32	0.25	1183.42	0.35
60	88459	1182.46	1182.61	0.15	1182.76	0.30	1182.91	0.45
61	88377	1182.46	1182.63	0.17	1182.79	0.33	1182.94	0.48
62	88305	1182.37	1182.54	0.17	1182.70	0.33	1182.85	0.48
63	88225	1182.13	1182.30	0.17	1182.46	0.33	1182.61	0.48
64	88164	1181.95	1182.13	0.18	1182.29	0.34	1182.44	0.49
65	88061	1181.25	1181.41	0.16	1181.55	0.30	1181.69	0.44
66	87984	1180.71	1180.84	0.13	1180.97	0.26	1181.10	0.39
67	87904	1180.27	1180.40	0.13	1180.53	0.26	1180.66	0.39
68	87844	1180.15	1180.29	0.14	1180.44	0.29	1180.57	0.42
69	87743	1180.12	1180.27	0.15	1180.42	0.30	1180.56	0.44
70	87661	1179.91	1180.05	0.14	1180.19	0.28	1180.31	0.40
71	87494	1178.57	1178.68	0.11	1178.81	0.24	1178.93	0.36
72	87405	1177.98	1178.10	0.12	1178.22	0.24	1178.34	0.36
73	87332	1177.63	1177.76	0.13	1177.89	0.26	1178.01	0.38
74	87282	1177.46	1177.59	0.13	1177.74	0.28	1177.88	0.42
75	87245	1177.40	1177.55	0.15	1177.71	0.31	1177.86	0.46
76	87171	1177.21	1177.38	0.17	1177.55	0.34	1177.72	0.51

Table C.1 Water Level Difference along the Highwood River due to Climate Change

Station in Flood Mapping	HEC-RAS Station	Water Level for 100-Year (Base Case)	Water Level for 10% Increase in Peak Flow	Difference due to 10% Increase in Peak Flow	Water Level for 20% Increase in Peak Flow	Difference due to 20% Increase in Peak Flow	Water Level for 30% Increase in Peak Flow	Difference due to 30% Increase in Peak Flow
77	87143	1176.86	1177.03	0.17	1177.20	0.34	1177.36	0.50
78	87069	1176.66	1176.81	0.15	1176.97	0.31	1177.14	0.48
79	86950	1176.11	1176.23	0.12	1176.36	0.25	1176.48	0.37
80	86863	1175.84	1175.97	0.13	1176.12	0.28	1176.26	0.42
81	86764	1175.26	1175.41	0.15	1175.58	0.32	1175.74	0.48
82	86698	1175.07	1175.22	0.15	1175.39	0.32	1175.54	0.47
83	86596	1174.67	1174.83	0.16	1174.99	0.32	1175.15	0.48
84	86441	1173.75	1173.88	0.13	1174.02	0.27	1174.15	0.40
85	86332	1173.22	1173.34	0.12	1173.47	0.25	1173.60	0.38
86	86228	1172.78	1172.93	0.15	1173.09	0.31	1173.25	0.47
87	86151	1172.59	1172.76	0.17	1172.93	0.34	1173.10	0.51
88	86051	1172.27	1172.44	0.17	1172.62	0.35	1172.80	0.53
89	85946	1171.75	1171.93	0.18	1172.12	0.37	1172.30	0.55
90	85869	1171.45	1171.64	0.19	1171.84	0.39	1172.04	0.59
91	85807	1171.29	1171.49	0.20	1171.71	0.42	1171.92	0.63
92	85706	1170.98	1171.19	0.21	1171.42	0.44	1171.64	0.66
93	85603	1170.65	1170.85	0.20	1171.07	0.42	1171.27	0.62
94	85501	1170.21	1170.39	0.18	1170.59	0.38	1170.78	0.57
95	85380	1169.40	1169.55	0.15	1169.71	0.31	1169.87	0.47
96	85291	1169.14	1169.30	0.16	1169.48	0.34	1169.64	0.50
97	85175	1168.60	1168.79	0.19	1168.99	0.39	1169.18	0.58
98	85081	1168.19	1168.38	0.19	1168.58	0.39	1168.78	0.59
99	84963	1167.93	1168.13	0.20	1168.33	0.40	1168.53	0.60
100	84862	1167.65	1167.85	0.20	1168.06	0.41	1168.27	0.62
101	84795	1167.38	1167.58	0.20	1167.79	0.41	1168.00	0.62
102	84709	1166.77	1166.96	0.19	1167.15	0.38	1167.34	0.57
103	84576	1165.61	1165.78	0.17	1165.95	0.34	1166.13	0.52
104	84513	1165.39	1165.55	0.16	1165.74	0.35	1165.93	0.54
105	84431	1164.96	1165.17	0.21	1165.40	0.44	1165.63	0.67
106	84350	1164.79	1165.04	0.25	1165.31	0.52	1165.56	0.77
107	84284	1164.71	1164.97	0.26	1165.24	0.53	1165.50	0.79
108	84201	1164.42	1164.67	0.25	1164.93	0.51	1165.18	0.76
109	84124	1163.98	1164.21	0.23	1164.44	0.46	1164.66	0.68
110	84042	1163.04	1163.24	0.20	1163.44	0.40	1163.64	0.60
111	83952	1162.73	1162.95	0.22	1163.18	0.45	1163.41	0.68
112	83924	1162.88	1163.11	0.23	1163.35	0.47	1163.58	0.70
113	83868	1162.43	1162.63	0.20	1162.85	0.42	1163.04	0.61
114	83808	1161.84	1162.02	0.18	1162.21	0.37	1162.39	0.55
115	83731	1161.88	1162.07	0.19	1162.27	0.39	1162.45	0.57
116	83645	1161.03	1161.22	0.19	1161.43	0.40	1161.63	0.60
117	83564	1160.59	1160.74	0.15	1160.96	0.37	1161.14	0.55
118	83479	1160.51	1160.68	0.17	1160.86	0.35	1161.04	0.53
119	83376	1159.77	1159.94	0.17	1160.12	0.35	1160.31	0.54
120	83292	1158.87	1159.04	0.17	1159.24	0.37	1159.43	0.56
121	83217	1158.35	1158.56	0.21	1158.80	0.45	1159.02	0.67
122	83161	1158.38	1158.61	0.23	1158.87	0.49	1159.11	0.73
123	83080	1158.03	1158.28	0.25	1158.55	0.52	1158.80	0.77
124	82996	1157.38	1157.57	0.19	1157.77	0.39	1157.97	0.59
125	82917	1156.60	1156.79	0.19	1157.00	0.40	1157.19	0.59
126	82837	1156.47	1156.66	0.19	1156.87	0.40	1157.07	0.60
127	82757	1156.33	1156.53	0.20	1156.74	0.41	1156.94	0.61
128	82673	1155.99	1156.15	0.16	1156.33	0.34	1156.50	0.51
129	82591	1155.84	1156.04	0.20	1156.23	0.39	1156.42	0.58
130	82479	1154.86	1155.03	0.17	1155.22	0.36	1155.40	0.54
131	82396	1154.14	1154.30	0.16	1154.46	0.32	1154.63	0.49
132	82319	1153.91	1154.06	0.15	1154.23	0.32	1154.39	0.48
133	82246	1153.72	1153.90	0.18	1154.08	0.36	1154.27	0.55
134	82176	1153.37	1153.58	0.21	1153.79	0.42	1153.99	0.62
135	82094	1153.28	1153.50	0.22	1153.72	0.44	1153.93	0.65
136	82042	1153.19	1153.41	0.22	1153.62	0.43	1153.84	0.65
137	81910	1152.19	1152.32	0.13	1152.49	0.30	1152.62	0.43
138	81860	1152.14	1152.32	0.18	1152.48	0.34	1152.66	0.52
139	81790	1152.10	1152.28	0.18	1152.50	0.40	1152.68	0.58
140	81694	1151.87	1152.07	0.20	1152.25	0.38	1152.45	0.58
141	81604	1151.34	1151.50	0.16	1151.70	0.36	1151.87	0.53
142	81529	1150.87	1151.03	0.16	1151.17	0.30	1151.32	0.45
143	81445	1150.52	1150.65	0.13	1150.82	0.30	1150.96	0.44
144	81368	1150.25	1150.41	0.16	1150.56	0.31	1150.72	0.47
145	81282	1149.82	1149.97	0.15	1150.13	0.31	1150.30	0.48
146	81209	1149.49	1149.65	0.16	1149.80	0.31	1149.94	0.45
147	81115	1148.88	1149.01	0.13	1149.15	0.27	1149.31	0.43
148	81027	1148.55	1148.70	0.15	1148.87	0.32	1149.01	0.46
149	80947	1148.29	1148.45	0.16	1148.61	0.32	1148.80	0.51
150	80871	1147.98	1148.14	0.16	1148.34	0.36	1148.48	0.50
151	80815	1147.82	1147.99	0.17	1148.12	0.30	1148.31	0.49
152	80733	1147.41	1147.55	0.14	1147.73	0.32	1147.85	0.44

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153	80649	1147.19	1147.36	0.17	1147.51	0.32	1147.69	0.50
154	80568	1147.07	1147.23	0.16	1147.44	0.37	1147.60	0.53
155	80505	1146.84	1147.02	0.18	1147.17	0.33	1147.33	0.49
156	80415	1146.51	1146.64	0.13	1146.81	0.30	1146.98	0.47
157	80329	1145.77	1145.92	0.15	1146.06	0.29	1146.17	0.40
158	80245	1145.38	1145.50	0.12	1145.64	0.26	1145.83	0.45
159	80133	1144.77	1144.96	0.19	1145.14	0.37	1145.31	0.54
160	80030	1144.47	1144.64	0.17	1144.84	0.37	1145.13	0.66
161	79930	1143.88	1144.05	0.17	1144.19	0.31	1144.31	0.43
162	79859	1143.31	1143.46	0.15	1143.65	0.34	1143.77	0.46
163	79771	1143.15	1143.30	0.15	1143.45	0.30	1143.65	0.50
164	79727	1143.10	1143.27	0.17	1143.44	0.34	1143.63	0.53
165	79686	1143.03	1143.19	0.16	1143.40	0.37	1143.58	0.55
166	79622	1142.89	1143.06	0.17	1143.25	0.36	1143.46	0.57
167	79525	1142.41	1142.63	0.22	1142.85	0.44	1143.09	0.68
168	79438	1142.08	1142.32	0.24	1142.58	0.50	1142.83	0.75
169	79341	1141.62	1141.86	0.24	1142.11	0.49	1142.35	0.73
170	79288	1141.05	1141.27	0.22	1141.49	0.44	1141.73	0.68
171	79240	1141.08	1141.30	0.22	1141.53	0.45	1141.76	0.68
172	79206	1140.97	1141.19	0.22	1141.43	0.46	1141.65	0.68
173	79119	1140.90	1141.13	0.23	1141.38	0.48	1141.61	0.71
174	79029	1140.15	1140.36	0.21	1140.57	0.42	1140.79	0.64
175	78948	1139.36	1139.56	0.20	1139.77	0.41	1139.97	0.61
176	78869	1139.03	1139.23	0.20	1139.45	0.42	1139.65	0.62
177	78788	1138.93	1139.14	0.21	1139.37	0.44	1139.60	0.67
178	78706	1138.46	1138.66	0.20	1138.88	0.42	1139.09	0.63
179	78627	1138.02	1138.21	0.19	1138.42	0.40	1138.62	0.60
180	78548	1137.64	1137.82	0.18	1138.01	0.37	1138.19	0.55
181	78514	1137.42	1137.60	0.18	1137.79	0.37	1137.97	0.55
182	78469	1137.03	1137.21	0.18	1137.39	0.36	1137.56	0.53
183	78389	1136.44	1136.63	0.19	1136.85	0.41	1137.05	0.61
184	78310	1136.24	1136.47	0.23	1136.71	0.47	1136.94	0.70
185	78229	1136.22	1136.46	0.24	1136.72	0.50	1136.97	0.75
186	78142	1136.04	1136.29	0.25	1136.55	0.51	1136.81	0.77
187	78050	1135.64	1135.89	0.25	1136.15	0.51	1136.40	0.76
188	77982	1135.05	1135.27	0.22	1135.50	0.45	1135.71	0.66
189	77902	1134.96	1135.21	0.25	1135.46	0.50	1135.70	0.74
190	77821	1134.71	1134.96	0.25	1135.22	0.51	1135.46	0.75
191	77741	1134.50	1134.75	0.25	1135.00	0.50	1135.24	0.74
192	77660	1133.85	1134.09	0.24	1134.29	0.44	1134.49	0.64
193	77580	1133.73	1133.98	0.25	1134.19	0.46	1134.40	0.67
194	77499	1133.53	1133.79	0.26	1134.00	0.47	1134.21	0.68
195	77420	1133.51	1133.79	0.28	1134.01	0.50	1134.23	0.72
196	77344	1133.54	1133.84	0.30	1134.07	0.53	1134.32	0.78
197	77280	1133.63	1133.93	0.30	1134.17	0.54	1134.42	0.79
198	77158	1133.35	1133.66	0.31	1133.91	0.56	1134.16	0.81
199	77031	1131.86	1132.08	0.22	1132.25	0.39	1132.42	0.56
200	76909	1131.47	1131.69	0.22	1131.87	0.40	1132.05	0.58
201	76784	1131.34	1131.58	0.24	1131.77	0.43	1131.95	0.61
202	76669	1130.64	1130.90	0.26	1131.12	0.48	1131.32	0.68
203	76542	1129.88	1130.16	0.28	1130.37	0.49	1130.65	0.77
204	76418	1129.93	1130.21	0.28	1130.41	0.48	1130.60	0.67
205	76237	1128.73	1128.98	0.25	1129.16	0.43	1129.35	0.62
206	76119	1128.14	1128.40	0.26	1128.56	0.42	1128.75	0.61
207	76000	1127.95	1128.16	0.21	1128.34	0.39	1128.57	0.62
208	75892	1127.92	1128.13	0.21	1128.31	0.39	1128.56	0.64
209	75734	1126.84	1127.07	0.23	1127.28	0.44	1127.47	0.63
210	75653	1126.55	1126.78	0.23	1126.98	0.43	1127.18	0.63
211	75521	1126.39	1126.64	0.25	1126.87	0.48	1127.10	0.71
212	75416	1126.11	1126.35	0.24	1126.57	0.46	1126.80	0.69
213	75255	1124.79	1125.01	0.22	1125.21	0.42	1125.41	0.62
214	75126	1124.65	1124.90	0.25	1125.12	0.47	1125.36	0.71
215	74995	1124.28	1124.54	0.26	1124.77	0.49	1125.02	0.74
216	74874	1123.82	1124.11	0.29	1124.38	0.56	1124.65	0.83
217	74756	1123.45	1123.75	0.30	1124.01	0.56	1124.29	0.84
218	74632	1122.83	1123.10	0.27	1123.34	0.51	1123.59	0.76
219	74512	1122.53	1122.79	0.26	1123.03	0.50	1123.27	0.74
220	74386	1121.55	1121.76	0.21	1121.95	0.40	1122.13	0.58
221	74269	1121.08	1121.30	0.22	1121.49	0.41	1121.68	0.60
222	74145	1120.79	1121.01	0.22	1121.20	0.41	1121.39	0.60
223	74025	1120.51	1120.75	0.24	1120.95	0.44	1121.16	0.65
224	73904	1120.11	1120.35	0.24	1120.56	0.45	1120.77	0.66
225	73792	1119.87	1120.12	0.25	1120.35	0.48	1120.58	0.71
226	73667	1118.54	1118.71	0.17	1118.88	0.34	1119.04	0.50
227	73547	1118.13	1118.29	0.16	1118.44	0.31	1118.63	0.50
228	73427	1117.99	1118.18	0.19	1118.36	0.37	1118.55	0.56

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229	73314	1117.40	1117.61	0.21	1117.81	0.41	1118.02	0.62
230	73179	1117.12	1117.34	0.22	1117.55	0.43	1117.76	0.64
231	72951	1116.29	1116.54	0.25	1116.78	0.49	1117.03	0.74
232	72808	1115.82	1116.11	0.29	1116.38	0.56	1116.65	0.83
233	72688	1115.30	1115.61	0.31	1115.90	0.60	1116.19	0.89
234	72566	1114.31	1114.56	0.25	1114.79	0.48	1115.02	0.71
235	72434	1114.47	1114.77	0.30	1115.04	0.57	1115.31	0.84
236	72212	1113.33	1113.58	0.25	1113.81	0.48	1114.04	0.71
237	72089	1112.82	1113.08	0.26	1113.31	0.49	1113.55	0.73
238	71980	1112.14	1112.34	0.20	1112.53	0.39	1112.72	0.58
239	71855	1111.21	1111.42	0.21	1111.61	0.40	1111.81	0.60
240	71725	1110.92	1111.17	0.25	1111.40	0.48	1111.64	0.72
241	71606	1110.68	1110.97	0.29	1111.23	0.55	1111.49	0.81
242	71475	1110.40	1110.70	0.30	1110.95	0.55	1111.21	0.81
243	71365	1109.76	1110.02	0.26	1110.25	0.49	1110.49	0.73
244	71240	1109.26	1109.49	0.23	1109.70	0.44	1109.91	0.65
245	71120	1108.92	1109.19	0.27	1109.45	0.53	1109.71	0.79
246	70999	1108.41	1108.67	0.26	1108.90	0.49	1109.14	0.73
247	70882	1107.74	1107.95	0.21	1108.14	0.40	1108.32	0.58
248	70765	1107.24	1107.44	0.20	1107.61	0.37	1107.78	0.54
249	70646	1107.02	1107.22	0.20	1107.39	0.37	1107.56	0.54
250	70523	1106.47	1106.69	0.22	1106.89	0.42	1107.09	0.62
251	70376	1106.21	1106.45	0.24	1106.67	0.46	1106.89	0.68
252	70276	1105.80	1106.05	0.25	1106.28	0.48	1106.52	0.72
253	70165	1105.57	1105.83	0.26	1106.08	0.51	1106.32	0.75
254	70039	1105.07	1105.30	0.23	1105.51	0.44	1105.73	0.66
255	69918	1104.79	1105.00	0.21	1105.18	0.39	1105.36	0.57
256	69793	1104.06	1104.24	0.18	1104.40	0.34	1104.57	0.51
257	69671	1103.52	1103.68	0.16	1103.79	0.27	1103.96	0.44
258	69553	1103.03	1103.19	0.16	1103.35	0.32	1103.50	0.47
259	69442	1102.49	1102.63	0.14	1102.76	0.27	1102.88	0.39
260	69304	1101.94	1102.07	0.13	1102.19	0.25	1102.32	0.38
261	69160	1101.35	1101.48	0.13	1101.59	0.24	1101.71	0.36
262	69022	1100.79	1100.94	0.15	1101.08	0.29	1101.22	0.43
263	68903	1100.37	1100.53	0.16	1100.68	0.31	1100.83	0.46
264	68783	1100.03	1100.20	0.17	1100.35	0.32	1100.52	0.49
265	68669	1099.73	1099.91	0.18	1100.07	0.34	1100.24	0.51
266	68543	1098.94	1099.11	0.17	1099.26	0.32	1099.40	0.46
267	68426	1098.37	1098.54	0.17	1098.68	0.31	1098.82	0.45
268	68310	1098.02	1098.18	0.16	1098.32	0.30	1098.46	0.44
269	68186	1097.40	1097.56	0.16	1097.70	0.30	1097.83	0.43
270	68072	1096.96	1097.13	0.17	1097.27	0.31	1097.42	0.46
271	67947	1096.83	1096.99	0.16	1097.14	0.31	1097.30	0.47
272	67819	1096.15	1096.33	0.18	1096.46	0.31	1096.59	0.44
273	67704	1095.92	1096.07	0.15	1096.22	0.30	1096.38	0.46
274	67577	1095.18	1095.34	0.16	1095.48	0.30	1095.62	0.44
275	67445	1094.51	1094.66	0.15	1094.81	0.30	1094.95	0.44
276	67341	1094.24	1094.40	0.16	1094.55	0.31	1094.70	0.46
277	67214	1094.01	1094.17	0.16	1094.32	0.31	1094.47	0.46
278	67180	1093.85	1094.02	0.17	1094.17	0.32	1094.32	0.47
279	67093	1093.58	1093.75	0.17	1093.90	0.32	1094.05	0.47
280	66967	1093.17	1093.35	0.18	1093.50	0.33	1093.66	0.49
281	66849	1092.65	1092.86	0.21	1093.03	0.38	1093.21	0.56
282	66720	1092.20	1092.40	0.20	1092.59	0.39	1092.78	0.58
283	66586	1091.50	1091.70	0.20	1091.89	0.39	1092.07	0.57
284	66480	1091.03	1091.21	0.18	1091.38	0.35	1091.54	0.51
285	66349	1090.60	1090.78	0.18	1090.93	0.33	1091.09	0.49
286	66225	1089.94	1090.09	0.15	1090.21	0.27	1090.33	0.39
287	66094	1089.40	1089.54	0.14	1089.67	0.27	1089.80	0.40
288	65971	1088.97	1089.12	0.15	1089.25	0.28	1089.39	0.42
289	65847	1088.51	1088.64	0.13	1088.76	0.25	1088.89	0.38
290	65706	1088.19	1088.32	0.13	1088.43	0.24	1088.53	0.34
291	65583	1087.99	1088.13	0.14	1088.25	0.26	1088.35	0.36
292	65459	1087.42	1087.55	0.13	1087.68	0.26	1087.78	0.36
293	65340	1087.12	1087.27	0.15	1087.40	0.28	1087.52	0.40
294	65217	1086.94	1087.10	0.16	1087.25	0.31	1087.37	0.43
295	65074	1086.34	1086.50	0.16	1086.63	0.29	1086.77	0.43
296	64963	1085.75	1085.89	0.14	1085.99	0.24	1086.09	0.34
297	64837	1085.17	1085.31	0.14	1085.42	0.25	1085.53	0.36
298	64717	1084.82	1084.95	0.13	1085.07	0.25	1085.21	0.39
299	64597	1084.34	1084.46	0.12	1084.57	0.23	1084.68	0.34
300	64473	1083.84	1083.96	0.12	1084.06	0.22	1084.16	0.32
301	64352	1083.43	1083.55	0.12	1083.65	0.22	1083.76	0.33
302	64227	1082.95	1083.08	0.13	1083.19	0.24	1083.30	0.35
303	64123	1082.42	1082.54	0.12	1082.65	0.23	1082.75	0.33
304	63988	1081.86	1081.97	0.11	1082.06	0.20	1082.16	0.30

Table C.1 Water Level Difference along the Highwood River due to Climate Change

Station in Flood Mapping	HEC-RAS Station	Water Level for 100-Year (Base Case)	Water Level for 10% Increase in Peak Flow	Difference due to 10% Increase in Peak Flow	Water Level for 20% Increase in Peak Flow	Difference due to 20% Increase in Peak Flow	Water Level for 30% Increase in Peak Flow	Difference due to 30% Increase in Peak Flow
305	63856	1081.42	1081.53	0.11	1081.63	0.21	1081.73	0.31
306	63775	1081.20	1081.31	0.11	1081.40	0.20	1081.50	0.30
307	63655	1080.92	1081.02	0.10	1081.12	0.20	1081.21	0.29
308	63558	1080.55	1080.65	0.10	1080.75	0.20	1080.84	0.29
309	63427	1080.09	1080.20	0.11	1080.30	0.21	1080.40	0.31
310	63304	1079.76	1079.86	0.10	1079.95	0.19	1080.05	0.29
311	63177	1079.13	1079.25	0.12	1079.37	0.24	1079.48	0.35
312	63057	1078.69	1078.80	0.11	1078.91	0.22	1079.02	0.33
313	62934	1078.43	1078.54	0.11	1078.64	0.21	1078.74	0.31
314	62822	1078.16	1078.27	0.11	1078.36	0.20	1078.46	0.30
315	62696	1077.57	1077.68	0.11	1077.77	0.20	1077.87	0.30
316	62576	1076.74	1076.83	0.09	1076.90	0.16	1076.98	0.24
317	62527	1076.51	1076.59	0.08	1076.66	0.15	1076.74	0.23
318	62493	1076.34	1076.42	0.08	1076.49	0.15	1076.57	0.23
319	62397	1075.94	1076.03	0.09	1076.11	0.17	1076.19	0.25
321	62349	1075.94	1076.03	0.09	1076.11	0.17	1076.19	0.25
323	62171	1075.29	1075.36	0.07	1075.43	0.14	1075.49	0.20
325	62052	1074.88	1074.96	0.08	1075.00	0.12	1075.02	0.14
327	61918	1073.93	1073.95	0.02	1073.97	0.04	1074.01	0.08
328	61796	1073.56	1073.63	0.07	1073.69	0.13	1073.75	0.19
329	61637	1073.52	1073.59	0.07	1073.65	0.13	1073.72	0.20
330	61540	1073.42	1073.49	0.07	1073.56	0.14	1073.62	0.20
332	61409	1073.19	1073.26	0.07	1073.32	0.13	1073.38	0.19
335	61284	1072.88	1072.94	0.06	1073.00	0.12	1073.06	0.18
337	61165	1072.30	1072.37	0.07	1072.43	0.13	1072.49	0.19
339	61055	1071.93	1071.99	0.06	1072.05	0.12	1072.11	0.18
341	61004	1071.82	1071.89	0.07	1071.94	0.12	1072.00	0.18
343	60900	1071.64	1071.71	0.07	1071.77	0.13	1071.83	0.19
345	60757	1071.05	1071.11	0.06	1071.16	0.11	1071.20	0.15
347	60634	1070.53	1070.59	0.06	1070.65	0.12	1070.70	0.17
348	60457	1070.06	1070.13	0.07	1070.20	0.14	1070.26	0.20
349	60325	1069.90	1070.00	0.10	1070.07	0.17	1070.15	0.25
351	60222	1069.78	1069.88	0.10	1069.96	0.18	1070.04	0.26
353	60131	1069.68	1069.78	0.10	1069.87	0.19	1069.95	0.27
354	60061	1069.68	1069.78	0.10	1069.87	0.19	1069.95	0.27
355	59984	1069.44	1069.54	0.10	1069.62	0.18	1069.69	0.25
356	59857	1068.72	1068.80	0.08	1068.87	0.15	1068.95	0.23
357	59699	1067.95	1068.03	0.08	1068.11	0.16	1068.18	0.23
358	59610	1067.59	1067.69	0.10	1067.77	0.18	1067.85	0.26
359	59507	1067.24	1067.33	0.09	1067.42	0.18	1067.51	0.27
360	59429	1067.02	1067.12	0.10	1067.20	0.18	1067.29	0.27
361	59319	1066.48	1066.57	0.09	1066.65	0.17	1066.72	0.24
362	59236	1066.09	1066.17	0.08	1066.24	0.15	1066.31	0.22
363	59145	1065.82	1065.90	0.08	1065.96	0.14	1066.03	0.21
364	59012	1065.39	1065.47	0.08	1065.54	0.15	1065.61	0.22
365	58892	1065.07	1065.15	0.08	1065.23	0.16	1065.30	0.23
366	58788	1064.74	1064.82	0.08	1064.90	0.16	1064.98	0.24
367	58674	1064.52	1064.61	0.09	1064.69	0.17	1064.78	0.26
368	58493	1063.39	1063.48	0.09	1063.55	0.16	1063.63	0.24
369	58376	1062.90	1062.99	0.09	1063.07	0.17	1063.14	0.24
370	58336	1062.80	1062.88	0.08	1062.96	0.16	1063.03	0.23
371	58246	1062.66	1062.67	0.01	1062.74	0.08	1062.82	0.16
372	58206	1062.41	1062.49	0.08	1062.56	0.15	1062.64	0.23
373	58153	1062.22	1062.31	0.09	1062.38	0.16	1062.46	0.24
374	58050	1061.93	1062.02	0.09	1062.10	0.17	1062.18	0.25
375	57934	1061.66	1061.75	0.09	1061.83	0.17	1061.91	0.25
376	57862	1061.58	1061.67	0.09	1061.75	0.17	1061.82	0.24
377	57785	1061.39	1061.47	0.08	1061.55	0.16	1061.62	0.23
378	57690	1061.09	1061.17	0.08	1061.24	0.15	1061.31	0.22
379	57522	1060.44	1060.51	0.07	1060.58	0.14	1060.64	0.20
380	57448	1060.13	1060.19	0.06	1060.25	0.12	1060.32	0.19
381	57343	1059.74	1059.80	0.06	1059.86	0.12	1059.92	0.18
382	57256	1059.30	1059.36	0.06	1059.41	0.11	1059.47	0.17
383	57184	1058.87	1058.93	0.06	1058.99	0.12	1059.05	0.18
384	57085	1058.54	1058.61	0.07	1058.67	0.13	1058.73	0.19
385	56968	1058.18	1058.24	0.06	1058.30	0.12	1058.36	0.18
386	56885	1057.99	1058.05	0.06	1058.11	0.12	1058.17	0.18
387	56804	1057.79	1057.86	0.07	1057.91	0.12	1057.97	0.18
388	56734	1057.63	1057.69	0.06	1057.75	0.12	1057.81	0.18
389	56685	1057.45	1057.52	0.07	1057.58	0.13	1057.65	0.20
390	56565	1056.92	1056.99	0.07	1057.06	0.14	1057.13	0.21
391	56402	1056.28	1056.36	0.08	1056.42	0.14	1056.49	0.21
392	56282	1055.88	1055.95	0.07	1056.01	0.13	1056.07	0.19
393	56142	1055.40	1055.47	0.07	1055.53	0.13	1055.59	0.19
394	55969	1055.00	1055.07	0.07	1055.14	0.14	1055.21	0.21
395	55840	1054.84	1054.91	0.07	1054.98	0.14	1055.05	0.21

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Station in Flood Mapping	HEC-RAS Station	Water Level for 100-Year (Base Case)	Water Level for 10% Increase in Peak Flow	Difference due to 10% Increase in Peak Flow	Water Level for 20% Increase in Peak Flow	Difference due to 20% Increase in Peak Flow	Water Level for 30% Increase in Peak Flow	Difference due to 30% Increase in Peak Flow
396	55743	1054.80	1054.88	0.08	1054.94	0.14	1055.01	0.21
397	55580	1054.51	1054.59	0.08	1054.65	0.14	1054.72	0.21
398	55417	1054.12	1054.19	0.07	1054.26	0.14	1054.32	0.20
399	55288	1053.74	1053.81	0.07	1053.87	0.13	1053.94	0.20
400	55225	1053.50	1053.57	0.07	1053.63	0.13	1053.70	0.20
401	55136	1053.32	1053.38	0.06	1053.44	0.12	1053.50	0.18
402	55093	1053.16	1053.22	0.06	1053.28	0.12	1053.34	0.18
403	55003	1052.98	1053.04	0.06	1053.10	0.12	1053.15	0.17
404	54884	1052.68	1052.75	0.07	1052.81	0.13	1052.88	0.20
405	54751	1052.50	1052.58	0.08	1052.64	0.14	1052.71	0.21
406	54603	1052.40	1052.48	0.08	1052.54	0.14	1052.60	0.20
407	54535	1052.11	1052.20	0.09	1052.26	0.15	1052.32	0.21
408	54407	1051.40	1051.50	0.10	1051.59	0.19	1051.68	0.28
409	54284	1051.22	1051.32	0.10	1051.41	0.19	1051.50	0.28
410	54162	1050.71	1050.80	0.09	1050.88	0.17	1050.97	0.26
411	54042	1050.29	1050.39	0.10	1050.47	0.18	1050.55	0.26
412	53922	1049.87	1049.96	0.09	1050.04	0.17	1050.12	0.25
413	53801	1049.56	1049.65	0.09	1049.72	0.16	1049.80	0.24
414	53681	1049.15	1049.23	0.08	1049.30	0.15	1049.37	0.22
415	53546	1048.77	1048.84	0.07	1048.91	0.14	1048.97	0.20
416	53468	1048.56	1048.63	0.07	1048.69	0.13	1048.76	0.20
417	53398	1048.39	1048.46	0.07	1048.52	0.13	1048.59	0.20
418	53315	1047.95	1048.03	0.08	1048.07	0.12	1048.13	0.18
419	53198	1047.45	1047.50	0.05	1047.57	0.12	1047.64	0.19
420	53136	1047.24	1047.31	0.07	1047.38	0.14	1047.44	0.20
421	53028	1046.85	1046.93	0.08	1046.99	0.14	1047.06	0.21
422	52946	1046.69	1046.77	0.08	1046.84	0.15	1046.91	0.22
423	52906	1046.58	1046.66	0.08	1046.73	0.15	1046.80	0.22
424	52814	1046.37	1046.46	0.09	1046.54	0.17	1046.62	0.25
425	52578	1045.95	1046.04	0.09	1046.11	0.16	1046.19	0.24
426	52499	1045.59	1045.67	0.08	1045.74	0.15	1045.82	0.23
427	52430	1045.23	1045.31	0.08	1045.39	0.16	1045.48	0.25
428	52366	1045.15	1045.23	0.08	1045.30	0.15	1045.37	0.22
429	52254	1044.83	1044.91	0.08	1044.98	0.15	1045.05	0.22
430	52187	1044.68	1044.76	0.08	1044.82	0.14	1044.90	0.22
431	52094	1044.36	1044.43	0.07	1044.50	0.14	1044.57	0.21
432	52017	1044.19	1044.26	0.07	1044.33	0.14	1044.40	0.21
433	51933	1044.00	1044.07	0.07	1044.14	0.14	1044.21	0.21
434	51851	1043.78	1043.86	0.08	1043.93	0.15	1044.00	0.22
435	51774	1043.56	1043.64	0.08	1043.71	0.15	1043.78	0.22
436	51687	1043.26	1043.35	0.09	1043.43	0.17	1043.50	0.24
437	51607	1043.06	1043.15	0.09	1043.23	0.17	1043.30	0.24
438	51527	1042.83	1042.92	0.09	1043.00	0.17	1043.09	0.26
439	51444	1042.68	1042.77	0.09	1042.86	0.18	1042.94	0.26
440	51363	1042.53	1042.63	0.10	1042.71	0.18	1042.80	0.27
441	51282	1042.42	1042.51	0.09	1042.60	0.18	1042.69	0.27
442	51206	1042.29	1042.39	0.10	1042.48	0.19	1042.57	0.28
443	51124	1042.13	1042.22	0.09	1042.31	0.18	1042.40	0.27
444	51040	1041.88	1041.98	0.10	1042.07	0.19	1042.17	0.29
445	50961	1041.65	1041.76	0.11	1041.85	0.20	1041.95	0.30
446	50879	1041.42	1041.53	0.11	1041.62	0.20	1041.73	0.31
447	50798	1041.24	1041.35	0.11	1041.46	0.22	1041.56	0.32
448	50717	1041.12	1041.24	0.12	1041.35	0.23	1041.46	0.34
449	50633	1041.03	1041.15	0.12	1041.26	0.23	1041.38	0.35
450	50539	1040.93	1041.05	0.12	1041.16	0.23	1041.28	0.35
451	50437	1040.83	1040.95	0.12	1041.06	0.23	1041.18	0.35
452	50343	1040.71	1040.83	0.12	1040.94	0.23	1041.06	0.35
453	50243	1040.65	1040.77	0.12	1040.88	0.23	1041.00	0.35
454	50157	1040.57	1040.70	0.13	1040.81	0.24	1040.92	0.35
455	50077	1040.48	1040.60	0.12	1040.71	0.23	1040.82	0.34
456	49967	1040.24	1040.36	0.12	1040.47	0.23	1040.59	0.35
457	49884	1040.11	1040.24	0.13	1040.35	0.24	1040.47	0.36
458	49805	1040.03	1040.16	0.13	1040.27	0.24	1040.39	0.36
459	49724	1039.95	1040.08	0.13	1040.19	0.24	1040.32	0.37
460	49641	1039.91	1040.04	0.13	1040.16	0.25	1040.28	0.37
461	49552	1039.86	1039.99	0.13	1040.11	0.25	1040.23	0.37
462	49487	1039.78	1039.91	0.13	1040.03	0.25	1040.15	0.37
463	49399	1039.64	1039.77	0.13	1039.89	0.25	1040.01	0.37
464	49319	1039.51	1039.64	0.13	1039.76	0.25	1039.88	0.37
465	49234	1039.30	1039.44	0.14	1039.55	0.25	1039.67	0.37
466	49154	1039.22	1039.35	0.13	1039.46	0.24	1039.58	0.36
467	49075	1038.84	1038.95	0.11	1039.06	0.22	1039.16	0.32
468	48989	1038.60	1038.69	0.09	1038.77	0.17	1038.86	0.26
469	48900	1038.57	1038.67	0.10	1038.75	0.18	1038.84	0.27
470	48811	1038.36	1038.45	0.09	1038.54	0.18	1038.63	0.27
471	48730	1038.07	1038.15	0.08	1038.23	0.16	1038.31	0.24

Table C.1 Water Level Difference along the Highwood River due to Climate Change

Station in Flood Mapping	HEC-RAS Station	Water Level for 100-Year (Base Case)	Water Level for 10% Increase in Peak Flow	Difference due to 10% Increase in Peak Flow	Water Level for 20% Increase in Peak Flow	Difference due to 20% Increase in Peak Flow	Water Level for 30% Increase in Peak Flow	Difference due to 30% Increase in Peak Flow
472	48673	1038.02	1038.11	0.09	1038.19	0.17	1038.27	0.25
473	48646	1038.00	1038.09	0.09	1038.17	0.17	1038.25	0.25
474	48613	1037.90	1037.99	0.09	1038.07	0.17	1038.16	0.26
475	48568	1037.78	1037.87	0.09	1037.95	0.17	1038.03	0.25
476	48489	1037.65	1037.74	0.09	1037.82	0.17	1037.91	0.26
477	48407	1037.48	1037.57	0.09	1037.64	0.16	1037.72	0.24
478	48328	1037.14	1037.22	0.08	1037.30	0.16	1037.39	0.25
479	48246	1036.96	1037.05	0.09	1037.14	0.18	1037.23	0.27
480	48166	1036.92	1037.01	0.09	1037.09	0.17	1037.19	0.27
481	48136	1036.91	1037.00	0.09	1037.09	0.18	1037.18	0.27
482	48102	1036.88	1036.97	0.09	1037.05	0.17	1037.15	0.27
483	48036	1036.85	1036.94	0.09	1037.03	0.18	1037.12	0.27
484	47980	1036.83	1036.93	0.10	1037.01	0.18	1037.11	0.28
485	47885	1036.82	1036.91	0.09	1037.00	0.18	1037.10	0.28
486	47799	1036.80	1036.90	0.10	1036.99	0.19	1037.09	0.29
487	47719	1036.78	1036.87	0.09	1036.96	0.18	1037.07	0.29
488	47642	1036.76	1036.85	0.09	1036.95	0.19	1037.05	0.29
489	47551	1036.71	1036.80	0.09	1036.90	0.19	1037.00	0.29
490	47473	1036.64	1036.74	0.10	1036.83	0.19	1036.94	0.30
491	47393	1036.54	1036.64	0.10	1036.74	0.20	1036.85	0.31
492	47311	1036.41	1036.52	0.11	1036.62	0.21	1036.74	0.33
493	47224	1036.28	1036.39	0.11	1036.50	0.22	1036.64	0.36
494	47128	1036.14	1036.27	0.13	1036.39	0.25	1036.54	0.40
495	47034	1036.08	1036.21	0.13	1036.34	0.26	1036.49	0.41
496	46940	1036.02	1036.15	0.13	1036.29	0.27	1036.45	0.43
497	46855	1035.95	1036.10	0.15	1036.24	0.29	1036.41	0.46
498	46745	1035.87	1036.03	0.16	1036.18	0.31	1036.36	0.49
499	46630	1035.80	1035.96	0.16	1036.11	0.31	1036.30	0.50
500	46556	1035.77	1035.93	0.16	1036.08	0.31	1036.27	0.50
501	46396	1035.74	1035.90	0.16	1036.06	0.32	1036.25	0.51
502	46332	1035.74	1035.90	0.16	1036.06	0.32	1036.25	0.51
503	46268	1035.74	1035.90	0.16	1036.06	0.32	1036.25	0.51
504	46139	1035.72	1035.88	0.16	1036.04	0.32	1036.23	0.51
505	46079	1035.71	1035.87	0.16	1036.03	0.32	1036.22	0.51
506	46019	1035.69	1035.85	0.16	1036.01	0.32	1036.20	0.51
507	45917	1035.67	1035.83	0.16	1036.00	0.33	1036.19	0.52
508	45838	1035.66	1035.82	0.16	1035.99	0.33	1036.18	0.52
509	45774	1035.64	1035.80	0.16	1035.97	0.33	1036.17	0.53
510	45704	1035.63	1035.79	0.16	1035.96	0.33	1036.15	0.52
511	45626	1035.61	1035.78	0.17	1035.94	0.33	1036.14	0.53
512	45550	1035.60	1035.76	0.16	1035.93	0.33	1036.13	0.53
513	45517	1035.59	1035.76	0.17	1035.93	0.34	1036.12	0.53
514	45493	1035.59	1035.75	0.16	1035.92	0.33	1036.12	0.53
515	45381	1035.58	1035.75	0.17	1035.92	0.34	1036.12	0.54
516	45325	1035.58	1035.74	0.16	1035.91	0.33	1036.11	0.53
517	45210	1035.56	1035.73	0.17	1035.90	0.34	1036.10	0.54
518	45149	1035.55	1035.72	0.17	1035.89	0.34	1036.09	0.54
519	45097	1035.55	1035.71	0.16	1035.89	0.34	1036.09	0.54
520	45051	1035.54	1035.71	0.17	1035.88	0.34	1036.09	0.55
521	44972	1035.54	1035.71	0.17	1035.88	0.34	1036.08	0.54
522	44890	1035.53	1035.70	0.17	1035.87	0.34	1036.08	0.55
523	44811	1035.52	1035.69	0.17	1035.87	0.35	1036.07	0.55
524	44726	1035.51	1035.68	0.17	1035.86	0.35	1036.06	0.55
525	44639	1035.51	1035.68	0.17	1035.85	0.34	1036.06	0.55
526	44557	1035.50	1035.67	0.17	1035.85	0.35	1036.06	0.56
527	44489	1035.50	1035.67	0.17	1035.85	0.35	1036.06	0.56
528	44401	1035.50	1035.67	0.17	1035.85	0.35	1036.05	0.55
529	44321	1035.50	1035.67	0.17	1035.84	0.34	1036.05	0.55
530	44240	1035.49	1035.66	0.17	1035.84	0.35	1036.05	0.56
531	44160	1035.48	1035.65	0.17	1035.83	0.35	1036.04	0.56
532	44076	1035.47	1035.64	0.17	1035.82	0.35	1036.03	0.56
533	44014	1035.44	1035.61	0.17	1035.79	0.35	1036.00	0.56
534	43913	1035.39	1035.56	0.17	1035.75	0.36	1035.96	0.57
535	43840	1035.36	1035.54	0.18	1035.72	0.36	1035.94	0.58
536	43757	1035.34	1035.51	0.17	1035.70	0.36	1035.92	0.58
537	43668	1035.33	1035.50	0.17	1035.69	0.36	1035.90	0.57
538	43596	1035.29	1035.46	0.17	1035.65	0.36	1035.87	0.58
539	43514	1035.24	1035.42	0.18	1035.60	0.36	1035.83	0.59
540	43432	1035.20	1035.38	0.18	1035.56	0.36	1035.80	0.60
541	43352	1035.14	1035.31	0.17	1035.50	0.36	1035.74	0.60
542	43265	1035.07	1035.24	0.17	1035.43	0.36	1035.67	0.60
543	43187	1034.97	1035.13	0.16	1035.33	0.36	1035.58	0.61
544	43106	1034.66	1034.76	0.10	1034.84	0.18	1034.94	0.28
545	43071	1034.75	1034.85	0.10	1034.95	0.20	1035.04	0.29
546	42953	1034.75	1034.86	0.11	1034.95	0.20	1035.04	0.29
547	42817	1034.71	1034.82	0.11	1034.91	0.20	1035.00	0.29

Table C.1 Water Level Difference along the Highwood River due to Climate Change

Station in Flood Mapping	HEC-RAS Station	Water Level for 100-Year (Base Case)	Water Level for 10% Increase in Peak Flow	Difference due to 10% Increase in Peak Flow	Water Level for 20% Increase in Peak Flow	Difference due to 20% Increase in Peak Flow	Water Level for 30% Increase in Peak Flow	Difference due to 30% Increase in Peak Flow
548	42701	1034.62	1034.73	0.11	1034.83	0.21	1034.92	0.30
549	42579	1034.56	1034.67	0.11	1034.77	0.21	1034.87	0.31
550	42461	1034.45	1034.58	0.13	1034.68	0.23	1034.79	0.34
551	42343	1034.40	1034.52	0.12	1034.62	0.22	1034.71	0.31
552	42224	1034.41	1034.52	0.11	1034.61	0.20	1034.70	0.29
553	42105	1034.37	1034.48	0.11	1034.57	0.20	1034.67	0.30
554	41981	1034.34	1034.45	0.11	1034.55	0.21	1034.64	0.30
555	41873	1034.28	1034.40	0.12	1034.50	0.22	1034.60	0.32
556	41751	1034.22	1034.35	0.13	1034.45	0.23	1034.55	0.33
557	41635	1034.19	1034.31	0.12	1034.42	0.23	1034.51	0.32
558	41514	1034.15	1034.28	0.13	1034.38	0.23	1034.48	0.33
559	41394	1034.13	1034.25	0.12	1034.36	0.23	1034.45	0.32
560	41274	1034.11	1034.23	0.12	1034.33	0.22	1034.43	0.32
561	41158	1034.07	1034.19	0.12	1034.29	0.22	1034.39	0.32
562	41034	1034.01	1034.14	0.13	1034.25	0.24	1034.35	0.34
563	40914	1033.97	1034.10	0.13	1034.21	0.24	1034.31	0.34
564	40792	1033.92	1034.05	0.13	1034.16	0.24	1034.26	0.34
565	40670	1033.89	1034.02	0.13	1034.13	0.24	1034.23	0.34
566	40551	1033.84	1033.97	0.13	1034.08	0.24	1034.19	0.35
567	40435	1033.79	1033.93	0.14	1034.04	0.25	1034.15	0.36
568	40315	1033.74	1033.89	0.15	1034.00	0.26	1034.10	0.36
569	40197	1033.71	1033.86	0.15	1033.97	0.26	1034.08	0.37
570	40075	1033.68	1033.82	0.14	1033.94	0.26	1034.05	0.37
571	39957	1033.66	1033.81	0.15	1033.92	0.26	1034.03	0.37
572	39834	1033.63	1033.77	0.14	1033.88	0.25	1033.99	0.36
573	39714	1033.53	1033.68	0.15	1033.80	0.27	1033.91	0.38
574	39593	1033.48	1033.64	0.16	1033.75	0.27	1033.87	0.39
575	39473	1033.43	1033.58	0.15	1033.69	0.26	1033.80	0.37
576	39351	1033.36	1033.51	0.15	1033.63	0.27	1033.73	0.37
577	39233	1033.30	1033.44	0.14	1033.56	0.26	1033.66	0.36
578	39113	1033.19	1033.32	0.13	1033.41	0.22	1033.50	0.31
579	38993	1033.18	1033.31	0.13	1033.41	0.23	1033.50	0.32
580	38874	1033.18	1033.31	0.13	1033.41	0.23	1033.50	0.32
581	38755	1033.19	1033.32	0.13	1033.41	0.22	1033.50	0.31
582	38636	1033.17	1033.30	0.13	1033.40	0.23	1033.49	0.32
583	38520	1033.16	1033.29	0.13	1033.38	0.22	1033.47	0.31
584	38400	1033.13	1033.26	0.13	1033.35	0.22	1033.44	0.31
585	38280	1033.11	1033.24	0.13	1033.33	0.22	1033.42	0.31
586	38155	1033.09	1033.21	0.12	1033.31	0.22	1033.40	0.31
587	38028	1033.08	1033.21	0.13	1033.30	0.22	1033.39	0.31
588	37906	1033.08	1033.21	0.13	1033.30	0.22	1033.39	0.31
589	37787	1033.07	1033.20	0.13	1033.29	0.22	1033.38	0.31
590	37651	1033.05	1033.17	0.12	1033.27	0.22	1033.36	0.31
591	37528	1033.01	1033.14	0.13	1033.23	0.22	1033.32	0.31
592	37408	1032.97	1033.10	0.13	1033.20	0.23	1033.29	0.32
593	37287	1032.96	1033.09	0.13	1033.19	0.23	1033.28	0.32
594	37164	1032.92	1033.06	0.14	1033.16	0.24	1033.25	0.33
595	37027	1032.85	1032.95	0.10	1033.06	0.21	1033.16	0.31
596	36923	1032.76	1032.83	0.07	1032.94	0.18	1033.06	0.30
597	36804	1032.69	1032.76	0.07	1032.87	0.18	1033.01	0.32
598	36689	1032.61	1032.71	0.10	1032.83	0.22	1032.96	0.35
599	36574	1032.50	1032.63	0.13	1032.76	0.26	1032.90	0.40
600	36454	1032.47	1032.60	0.13	1032.73	0.26	1032.87	0.40
601	36334	1032.43	1032.55	0.12	1032.68	0.25	1032.83	0.40
602	36213	1032.47	1032.59	0.12	1032.71	0.24	1032.84	0.37
603	36045	1032.37	1032.49	0.12	1032.63	0.26	1032.78	0.41
604	35937	1032.32	1032.45	0.13	1032.59	0.27	1032.74	0.42
605	35813	1032.30	1032.42	0.12	1032.56	0.26	1032.72	0.42
606	35628	1032.26	1032.39	0.13	1032.53	0.27	1032.69	0.43
607	35479	1032.22	1032.35	0.13	1032.49	0.27	1032.66	0.44
608	35326	1032.18	1032.31	0.13	1032.46	0.28	1032.63	0.45
609	35176	1032.10	1032.24	0.14	1032.40	0.30	1032.58	0.48
610	35025	1032.05	1032.19	0.14	1032.36	0.31	1032.54	0.49
611	34879	1031.96	1032.12	0.16	1032.30	0.34	1032.49	0.53
612	34725	1031.92	1032.07	0.15	1032.26	0.34	1032.46	0.54
613	34574	1031.90	1032.05	0.15	1032.23	0.33	1032.43	0.53
614	34419	1031.88	1032.04	0.16	1032.22	0.34	1032.42	0.54
615	34272	1031.85	1032.00	0.15	1032.19	0.34	1032.39	0.54
616	34119	1031.82	1031.97	0.15	1032.16	0.34	1032.36	0.54
617	33965	1031.79	1031.94	0.15	1032.12	0.33	1032.33	0.54
618	33809	1031.74	1031.89	0.15	1032.08	0.34	1032.29	0.55
619	33658	1031.71	1031.86	0.15	1032.05	0.34	1032.26	0.55
620	33504	1031.67	1031.82	0.15	1032.01	0.34	1032.23	0.56
621	33358	1031.60	1031.75	0.15	1031.95	0.35	1032.17	0.57
622	33207	1031.61	1031.75	0.14	1031.95	0.34	1032.17	0.56
623	33057	1031.48	1031.63	0.15	1031.84	0.36	1032.07	0.59
624	32909	1031.45	1031.59	0.14	1031.80	0.35	1032.03	0.58

Table C.1 Water Level Difference along the Highwood River due to Climate Change

Station in Flood Mapping	HEC-RAS Station	Water Level for 100-Year (Base Case)	Water Level for 10% Increase in Peak Flow	Difference due to 10% Increase in Peak Flow	Water Level for 20% Increase in Peak Flow	Difference due to 20% Increase in Peak Flow	Water Level for 30% Increase in Peak Flow	Difference due to 30% Increase in Peak Flow
625	32759	1031.41	1031.54	0.13	1031.75	0.34	1031.98	0.57
626	32608	1031.32	1031.46	0.14	1031.67	0.35	1031.90	0.58
627	32458	1031.31	1031.43	0.12	1031.64	0.33	1031.87	0.56
628	32323	1031.14	1031.24	0.10	1031.42	0.28	1031.63	0.49
629	32300	1030.77	1030.91	0.14	1031.01	0.24	1031.12	0.35
630	32155	1030.68	1030.84	0.16	1030.96	0.28	1031.08	0.40
631	32005	1030.67	1030.83	0.16	1030.95	0.28	1031.07	0.40

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Table C.1 Water Level Difference along the Highwood River due to Climate Change

Station in Flood Mapping	HEC-RAS Station	Water Level for 100-Year (Base Case)	Water Level for 10% Increase in Peak Flow	Difference due to 10% Increase in Peak Flow	Water Level for 20% Increase in Peak Flow	Difference due to 20% Increase in Peak Flow	Water Level for 30% Increase in Peak Flow	Difference due to 30% Increase in Peak Flow
632	31846	1030.67	1030.83	0.16	1030.96	0.29	1031.08	0.41
633	31690	1030.68	1030.84	0.16	1030.97	0.29	1031.10	0.42
634	31541	1030.63	1030.80	0.17	1030.93	0.30	1031.06	0.43
635	31388	1030.61	1030.77	0.16	1030.90	0.29	1031.03	0.42
636	31237	1030.52	1030.69	0.17	1030.82	0.30	1030.95	0.43
637	31089	1030.49	1030.66	0.17	1030.78	0.29	1030.91	0.42
638	30936	1030.42	1030.60	0.18	1030.72	0.30	1030.86	0.44
639	30786	1030.28	1030.50	0.22	1030.64	0.36	1030.79	0.51
640	30714	1030.08	1030.35	0.27	1030.51	0.43	1030.68	0.60
641	30693	1029.50	1029.92	0.42	1030.12	0.62	1030.41	0.91
642	30639	1029.41	1029.76	0.35	1029.95	0.54	1030.28	0.87
643	30608	1029.24	1029.51	0.27	1029.66	0.42	1030.03	0.79
644	30585	1028.25	1028.38	0.13	1028.51	0.26	1028.70	0.45
645	30484	1028.27	1028.44	0.17	1028.62	0.35	1028.83	0.56
646	30333	1028.32	1028.48	0.16	1028.65	0.33	1028.86	0.54
647	30183	1028.10	1028.30	0.20	1028.49	0.39	1028.70	0.60
648	30019	1028.02	1028.22	0.20	1028.42	0.40	1028.62	0.60
649	29845	1027.59	1027.82	0.23	1028.02	0.43	1028.23	0.64
650	29697	1027.38	1027.57	0.19	1027.74	0.36	1027.91	0.53
651	29542	1027.19	1027.38	0.19	1027.56	0.37	1027.74	0.55
652	29382	1026.97	1027.21	0.24	1027.42	0.45	1027.63	0.66
653	29237	1026.83	1027.08	0.25	1027.31	0.48	1027.53	0.70
654	29082	1026.61	1026.79	0.18	1026.95	0.34	1027.12	0.51
655	28928	1026.33	1026.52	0.19	1026.69	0.36	1026.86	0.53
656	28775	1025.98	1026.20	0.22	1026.40	0.42	1026.60	0.62
657	28623	1025.82	1026.07	0.25	1026.28	0.46	1026.49	0.67
658	28463	1025.71	1025.96	0.25	1026.18	0.47	1026.40	0.69
659	28304	1025.48	1025.73	0.25	1025.95	0.47	1026.18	0.70
660	28152	1025.20	1025.42	0.22	1025.66	0.46	1025.90	0.70
661	27997	1024.98	1025.21	0.23	1025.43	0.45	1025.66	0.68
662	27845	1024.89	1025.11	0.22	1025.30	0.41	1025.50	0.61
663	27700	1024.61	1024.82	0.21	1025.01	0.40	1025.20	0.59
664	27547	1024.43	1024.62	0.19	1024.80	0.37	1024.98	0.55
665	27398	1024.21	1024.39	0.18	1024.54	0.33	1024.69	0.48
666	27248	1024.11	1024.32	0.21	1024.52	0.41	1024.72	0.61
667	27091	1023.60	1023.77	0.17	1023.94	0.34	1024.10	0.50
668	26943	1023.56	1023.75	0.19	1023.93	0.37	1024.12	0.56
669	26794	1023.59	1023.79	0.20	1023.98	0.39	1024.17	0.58
670	26638	1023.24	1023.45	0.21	1023.65	0.41	1023.85	0.61
671	26492	1023.06	1023.32	0.26	1023.54	0.48	1023.77	0.71
672	26342	1023.08	1023.32	0.24	1023.54	0.46	1023.76	0.68
673	26180	1022.93	1023.18	0.25	1023.40	0.47	1023.62	0.69
674	26048	1022.51	1022.77	0.26	1023.01	0.50	1023.26	0.75
675	25876	1022.36	1022.59	0.23	1022.82	0.46	1023.05	0.69
676	25744	1022.16	1022.40	0.24	1022.63	0.47	1022.86	0.70
677	25564	1021.80	1022.07	0.27	1022.33	0.53	1022.59	0.79
678	25397	1021.43	1021.70	0.27	1021.95	0.52	1022.21	0.78
679	25248	1021.14	1021.40	0.26	1021.65	0.51	1021.89	0.75
680	25099	1021.04	1021.32	0.28	1021.59	0.55	1021.85	0.81
681	24949	1020.73	1021.01	0.28	1021.27	0.54	1021.53	0.80
682	24799	1020.50	1020.78	0.28	1021.05	0.55	1021.30	0.80
683	24644	1020.11	1020.39	0.28	1020.65	0.54	1020.88	0.77
684	24593	1019.49	1019.72	0.23	1019.94	0.45	1020.15	0.66
685	24536	1019.09	1019.32	0.23	1019.52	0.43	1019.71	0.62
686	24351	1018.38	1018.58	0.20	1018.77	0.39	1018.94	0.56
687	24203	1018.44	1018.70	0.26	1018.91	0.47	1019.11	0.67
688	24051	1018.21	1018.48	0.27	1018.70	0.49	1018.89	0.68
689	23899	1018.13	1018.42	0.29	1018.65	0.52	1018.85	0.72
690	23754	1017.93	1018.23	0.30	1018.45	0.52	1018.63	0.70
691	23609	1017.28	1017.50	0.22	1017.68	0.40	1017.84	0.56
692	23447	1016.83	1017.05	0.22	1017.24	0.41	1017.41	0.58
693	23298	1016.84	1017.04	0.20	1017.17	0.33	1017.35	0.51
694	23152	1016.14	1016.33	0.19	1016.52	0.38	1016.68	0.54
695	23000	1015.81	1016.03	0.22	1016.21	0.40	1016.39	0.58
696	22843	1015.87	1016.08	0.21	1016.28	0.41	1016.47	0.60
697	22696	1015.76	1015.99	0.23	1016.20	0.44	1016.40	0.64
698	22548	1015.44	1015.65	0.21	1015.84	0.40	1016.02	0.58
699	22391	1014.74	1014.92	0.18	1015.09	0.35	1015.28	0.54
700	22269	1014.51	1014.72	0.21	1014.91	0.40	1015.11	0.60
701	22090	1014.03	1014.21	0.18	1014.39	0.36	1014.56	0.53
702	21939	1013.69	1013.87	0.18	1014.04	0.35	1014.22	0.53
703	21791	1013.59	1013.77	0.18	1013.94	0.35	1014.12	0.53
704	21685	1013.07	1013.23	0.16	1013.38	0.31	1013.54	0.47
705	21634	1012.81	1012.97	0.16	1013.12	0.31	1013.29	0.48
706	21583	1012.67	1012.85	0.18	1013.02	0.35	1013.19	0.52
707	21482	1012.47	1012.67	0.20	1012.85	0.38	1013.03	0.56

Table C.1 Water Level Difference along the Highwood River due to Climate Change

Station in Flood Mapping	HEC-RAS Station	Water Level for 100-Year (Base Case)	Water Level for 10% Increase in Peak Flow	Difference due to 10% Increase in Peak Flow	Water Level for 20% Increase in Peak Flow	Difference due to 20% Increase in Peak Flow	Water Level for 30% Increase in Peak Flow	Difference due to 30% Increase in Peak Flow
708	21326	1011.83	1012.03	0.20	1012.21	0.38	1012.38	0.55
709	21181	1011.54	1011.75	0.21	1011.93	0.39	1012.12	0.58
710	21028	1011.41	1011.64	0.23	1011.83	0.42	1012.03	0.62
711	20876	1010.55	1010.76	0.21	1010.93	0.38	1011.14	0.59
712	20732	1010.45	1010.67	0.22	1010.84	0.39	1011.05	0.60
713	20579	1010.19	1010.40	0.21	1010.53	0.34	1010.73	0.54
714	20435	1009.73	1009.92	0.19	1009.99	0.26	1010.17	0.44
715	20253	1009.06	1009.25	0.19	1009.44	0.38	1009.62	0.56
716	20135	1008.70	1008.89	0.19	1009.05	0.35	1009.24	0.54
717	19965	1008.11	1008.30	0.19	1008.45	0.34	1008.65	0.54
718	19813	1007.84	1008.00	0.16	1008.09	0.25	1008.25	0.41
719	19663	1007.75	1007.91	0.16	1007.95	0.20	1008.10	0.35
720	19521	1007.74	1007.91	0.17	1007.93	0.19	1008.09	0.35
721	19357	1006.89	1007.06	0.17	1007.17	0.28	1007.34	0.45
722	19204	1006.35	1006.50	0.15	1006.74	0.39	1006.92	0.57
723	19047	1005.76	1005.90	0.14	1006.04	0.28	1006.17	0.41
724	18890	1005.51	1005.69	0.18	1005.84	0.33	1005.99	0.48
725	18741	1004.89	1005.06	0.17	1005.22	0.33	1005.39	0.50
726	18587	1004.33	1004.50	0.17	1004.66	0.33	1004.83	0.50
727	18432	1003.84	1004.01	0.17	1004.16	0.32	1004.32	0.48
728	18282	1003.50	1003.66	0.16	1003.81	0.31	1003.95	0.45
729	18142	1002.94	1003.11	0.17	1003.28	0.34	1003.45	0.51
730	17989	1002.41	1002.57	0.16	1002.73	0.32	1002.89	0.48
731	17837	1001.76	1001.93	0.17	1002.08	0.32	1002.25	0.49
732	17680	1001.13	1001.31	0.18	1001.47	0.34	1001.65	0.52
733	17557	1000.68	1000.86	0.18	1001.03	0.35	1001.20	0.52
734	17408	1000.01	1000.18	0.17	1000.34	0.33	1000.51	0.50
735	17259	999.38	999.54	0.16	999.70	0.32	999.85	0.47
736	17107	998.81	998.98	0.17	999.13	0.32	999.29	0.48
737	16959	998.62	998.79	0.17	998.94	0.32	999.09	0.47
738	16813	997.90	998.08	0.18	998.24	0.34	998.41	0.51
739	16671	997.33	997.50	0.17	997.66	0.33	997.83	0.50
740	16509	996.46	996.62	0.16	996.77	0.31	996.92	0.46
741	16366	995.66	995.82	0.16	995.96	0.30	996.11	0.45
742	16220	994.90	995.05	0.15	995.20	0.30	995.34	0.44
743	16059	993.85	994.00	0.15	994.15	0.30	994.30	0.45
744	15906	992.77	992.94	0.17	993.10	0.33	993.26	0.49
745	15722	991.69	991.88	0.19	992.05	0.36	992.23	0.54
746	15598	991.16	991.35	0.19	991.53	0.37	991.72	0.56
747	15448	990.76	990.94	0.18	991.11	0.35	991.28	0.52
748	15295	990.13	990.32	0.19	990.51	0.38	990.69	0.56
749	15143	989.57	989.76	0.19	989.95	0.38	990.14	0.57
750	14993	989.16	989.34	0.18	989.51	0.35	989.68	0.52
751	14843	988.68	988.85	0.17	989.02	0.34	989.19	0.51
752	14692	988.13	988.30	0.17	988.47	0.34	988.64	0.51
753	14541	987.49	987.68	0.19	987.86	0.37	988.04	0.55
754	14392	986.92	987.12	0.20	987.32	0.40	987.52	0.60
755	14239	986.92	987.12	0.20	987.32	0.40	987.52	0.60
756	14067	986.44	986.65	0.21	986.86	0.42	987.06	0.62
757	13908	986.28	986.53	0.25	986.79	0.51	987.03	0.75
758	13759	986.11	986.38	0.27	986.65	0.54	986.90	0.79
759	13596	985.73	985.99	0.26	986.24	0.51	986.48	0.75
760	13444	985.15	985.39	0.24	985.64	0.49	985.87	0.72
761	13289	984.52	984.74	0.22	984.96	0.44	985.17	0.65
762	13137	984.04	984.26	0.22	984.48	0.44	984.69	0.65
763	12984	983.53	983.75	0.22	983.97	0.44	984.18	0.65
764	12830	983.39	983.62	0.23	983.85	0.46	984.07	0.68
765	12678	983.23	983.46	0.23	983.69	0.46	983.91	0.68
766	12517	982.24	982.46	0.22	982.68	0.44	982.89	0.65
767	12348	981.74	981.96	0.22	982.17	0.43	982.38	0.64
768	12190	981.23	981.45	0.22	981.66	0.43	981.87	0.64
769	12038	980.78	981.00	0.22	981.21	0.43	981.42	0.64
770	11888	980.38	980.60	0.22	980.81	0.43	981.02	0.64
771	11747	979.96	980.18	0.22	980.40	0.44	980.61	0.65
772	11597	979.42	979.64	0.22	979.87	0.45	980.08	0.66
773	11457	978.98	979.20	0.22	979.42	0.44	979.62	0.64
774	11311	978.60	978.90	0.30	979.15	0.55	979.38	0.78
775	11174	978.11	978.29	0.18	978.49	0.38	978.70	0.59
776	10999	977.40	977.77	0.37	977.96	0.56	978.16	0.76
777	10864	976.87	977.34	0.47	977.52	0.65	977.71	0.84
778	10713	976.63	976.96	0.33	977.12	0.49	977.29	0.66
779	10569	976.08	976.24	0.16	976.51	0.43	976.76	0.68
780	10416	975.59	975.76	0.17	976.04	0.45	976.28	0.69
781	10258	975.12	975.30	0.18	975.58	0.46	975.82	0.70
782	10107	975.02	975.29	0.27	975.57	0.55	975.83	0.81
783	9960	974.69	974.98	0.29	975.22	0.53	975.44	0.75

Table C.1 Water Level Difference along the Highwood River due to Climate Change

Station in Flood Mapping	HEC-RAS Station	Water Level for 100-Year (Base Case)	Water Level for 10% Increase in Peak Flow	Difference due to 10% Increase in Peak Flow	Water Level for 20% Increase in Peak Flow	Difference due to 20% Increase in Peak Flow	Water Level for 30% Increase in Peak Flow	Difference due to 30% Increase in Peak Flow
784	9810	974.11	974.36	0.25	974.57	0.46	974.76	0.65
785	9658	974.13	974.37	0.24	974.56	0.43	974.79	0.66
786	9508	973.67	973.85	0.18	974.07	0.40	974.28	0.61
787	9342	972.73	972.96	0.23	973.21	0.48	973.41	0.68
788	9188	972.37	972.58	0.21	972.81	0.44	973.00	0.63
789	9041	971.99	972.24	0.25	972.47	0.48	972.67	0.68
790	8893	971.85	972.10	0.25	972.32	0.47	972.59	0.74
791	8734	971.83	972.09	0.26	972.42	0.59	972.66	0.83
792	8568	971.20	971.43	0.23	971.69	0.49	971.90	0.70
793	8425	970.75	970.89	0.14	971.18	0.43	971.33	0.58
794	8252	970.43	970.65	0.22	970.90	0.47	971.12	0.69
795	8111	970.07	970.26	0.19	970.50	0.43	970.69	0.62
796	7956	969.74	969.85	0.11	970.19	0.45	970.37	0.63
797	7816	969.04	969.36	0.32	969.90	0.86	970.05	1.01
798	7672	969.26	969.20	-0.06	969.57	0.31	969.73	0.47
799	7604	969.07	969.37	0.30	969.76	0.69	969.74	0.67
800	7491	968.80	968.96	0.16	969.12	0.32	969.47	0.67
801	7370	968.43	968.68	0.25	968.80	0.37	969.12	0.69
802	7255	968.30	968.65	0.35	969.01	0.71	969.28	0.98
803	7194	967.98	968.32	0.34	968.67	0.69	968.97	0.99
804	7069	968.23	968.53	0.30	968.79	0.56	969.14	0.91
805	6957	968.17	968.51	0.34	968.86	0.69	969.16	0.99
806	6892	967.78	968.15	0.37	968.54	0.76	968.82	1.04
807	6840	967.82	968.16	0.34	968.54	0.72	968.78	0.96
808	6768	967.54	967.88	0.34	968.21	0.67	968.47	0.93
809	6731	966.39	966.53	0.14	966.79	0.40	966.99	0.60
810	6668	966.22	966.48	0.26	966.74	0.52	966.91	0.69
811	6561	966.35	966.46	0.11	966.69	0.34	966.87	0.52
812	6445	965.82	966.06	0.24	966.33	0.51	966.55	0.73
813	6330	965.60	965.80	0.20	966.02	0.42	966.21	0.61
814	6262	965.40	965.60	0.20	965.82	0.42	966.01	0.61
815	6163	965.07	965.26	0.19	965.47	0.40	965.66	0.59
816	6049	964.74	964.93	0.19	965.14	0.40	965.32	0.58
817	5950	964.98	965.21	0.23	965.46	0.48	965.65	0.67
818	5823	964.35	964.53	0.18	964.78	0.43	964.95	0.60
819	5736	964.06	964.24	0.18	964.43	0.37	964.59	0.53
820	5651	963.83	964.00	0.17	964.18	0.35	964.32	0.49
821	5562	963.57	963.73	0.16	963.94	0.37	964.06	0.49
822	5403	963.19	963.33	0.14	963.52	0.33	963.67	0.48
823	5254	962.81	962.97	0.16	963.15	0.34	963.33	0.52
824	5109	962.45	962.60	0.15	962.78	0.33	962.93	0.48
825	4939	961.99	962.12	0.13	962.28	0.29	962.41	0.42
826	4776	961.75	961.79	0.04	962.00	0.25	962.18	0.43
827	4649	961.24	961.55	0.31	961.75	0.51	961.93	0.69
828	4499	960.85	961.14	0.29	961.35	0.50	961.53	0.68
829	4350	960.45	960.75	0.30	960.96	0.51	961.15	0.70
830	4203	960.12	960.46	0.34	960.72	0.60	960.94	0.82
831	4062	959.81	960.11	0.30	960.30	0.49	960.46	0.65
832	3909	959.44	959.63	0.19	959.81	0.37	959.98	0.54
833	3800	959.15	959.33	0.18	959.52	0.37	959.68	0.53
834	3606	958.66	958.85	0.19	959.03	0.37	959.19	0.53
835	3458	958.33	958.52	0.19	958.70	0.37	958.88	0.55
836	3312	957.97	958.12	0.15	958.25	0.28	958.38	0.41
837	3161	957.62	957.75	0.13	957.88	0.26	957.99	0.37
838	3008	957.20	957.30	0.10	957.41	0.21	957.50	0.30
839	2862	956.90	957.02	0.12	957.09	0.19	957.17	0.27
840	2711	956.57	956.68	0.11	956.79	0.22	956.90	0.33
841	2553	956.40	956.56	0.16	956.69	0.29	956.81	0.41
842	2398	956.11	956.28	0.17	956.43	0.32	956.56	0.45
843	2241	955.96	956.15	0.19	956.28	0.32	956.40	0.44
844	1982	955.43	955.62	0.19	955.73	0.30	955.83	0.40
845	1828	954.97	955.33	0.36	955.35	0.38	955.38	0.41
846	1676	954.97	955.20	0.23	955.38	0.41	955.58	0.61
847	1524	954.85	955.06	0.21	955.27	0.42	955.47	0.62
848	1367	954.16	954.46	0.30	954.63	0.47	954.86	0.70
849	1199	953.66	953.84	0.18	954.01	0.35	954.16	0.50
850	1063	953.32	953.48	0.16	953.64	0.32	953.78	0.46
851	921	952.97	953.12	0.15	953.26	0.29	953.39	0.42
852	737	952.10	952.23	0.13	952.35	0.25	952.45	0.35
853	583	951.68	951.79	0.11	951.89	0.21	951.99	0.31
854	428	951.22	951.34	0.12	951.46	0.24	951.57	0.35
855	269	951.12	951.25	0.13	951.39	0.27	951.52	0.40
856	116	951.01	951.14	0.13	951.27	0.26	951.41	0.40

Table C.2: Water Level Difference along the Side Channel due to Climate Change

Station in Flood Mapping	HEC-RAS Station	Water Level for 100-Year (Base Case)	Water Level for 10% Increase in Peak Flow	Difference due to 10% Increase in Peak Flow	Water Level for 20% Increase in Peak Flow	Difference due to 20% Increase in Peak Flow	Water Level for 30% Increase in Peak Flow	Difference due to 30% Increase in Peak Flow
320	1446	1075.94	1076.03	0.09	1076.11	0.17	1076.19	0.25
322	1335	1075.57	1075.65	0.08	1075.73	0.16	1075.81	0.24
324	1216	1075.13	1075.21	0.08	1075.29	0.16	1075.37	0.24
326	1100	1074.82	1074.91	0.09	1074.99	0.17	1075.07	0.25
331	1021	1074.57	1074.65	0.08	1074.73	0.16	1074.81	0.24
333	950	1074.23	1074.32	0.09	1074.40	0.17	1074.48	0.25
334	853	1073.88	1073.97	0.09	1074.05	0.17	1074.14	0.26
336	732	1073.37	1073.47	0.10	1073.56	0.19	1073.65	0.28
338	625	1073.02	1073.12	0.10	1073.21	0.19	1073.31	0.29
340	490	1072.48	1072.59	0.11	1072.69	0.21	1072.79	0.31
342	420	1072.28	1072.39	0.11	1072.49	0.21	1072.59	0.31
344	339	1071.99	1072.10	0.11	1072.21	0.22	1072.34	0.35
346	274	1071.69	1071.85	0.16	1071.98	0.29	1072.13	0.44
350	178	1071.59	1071.75	0.16	1071.89	0.30	1072.04	0.45
352	88	1069.68	1069.78	0.10	1069.87	0.19	1069.95	0.27

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Table C.3 Water Level Difference along the Little Bow River Climate Change

Station in Flood Mapping	HEC-RAS Station	Water Level for 100-Year (Base Case)	Water Level for 10% Increase in Peak Flow	Difference due to 10% Increase in Peak Flow	Water Level for 20% Increase in Peak Flow	Difference due to 20% Increase in Peak Flow	Water Level for 30% Increase in Peak Flow	Difference due to 30% Increase in Peak Flow
857	12500	1033.23	1033.23	0.00	1033.23	0.00	1033.23	0.00
858	12300	1032.93	1032.93	0.00	1032.93	0.00	1032.93	0.00
859	12200	1032.86	1032.86	0.00	1032.86	0.00	1032.86	0.00
860	12100	1032.64	1032.64	0.00	1032.64	0.00	1032.64	0.00
861	12000	1032.31	1032.31	0.00	1032.31	0.00	1032.31	0.00
862	11900	1032.20	1032.20	0.00	1032.20	0.00	1032.20	0.00
863	11800	1031.91	1031.91	0.00	1031.91	0.00	1031.91	0.00
864	11700	1031.89	1031.89	0.00	1031.89	0.00	1031.89	0.00
865	11600	1031.86	1031.86	0.00	1031.86	0.00	1031.86	0.00
866	11500	1031.84	1031.84	0.00	1031.84	0.00	1031.84	0.00
867	11400	1031.83	1031.83	0.00	1031.83	0.00	1031.83	0.00
868	11300	1031.83	1031.83	0.00	1031.83	0.00	1031.83	0.00
869	11200	1031.83	1031.83	0.00	1031.83	0.00	1031.83	0.00
870	11000	1031.22	1031.22	0.00	1031.22	0.00	1031.22	0.00
871	10900	1031.18	1031.18	0.00	1031.18	0.00	1031.18	0.00
872	10800	1031.01	1031.01	0.00	1031.01	0.00	1031.02	0.01
873	10700	1030.82	1030.82	0.00	1030.84	0.02	1030.89	0.07
874	10600	1030.48	1030.63	0.15	1030.76	0.28	1030.87	0.39
875	10500	1030.48	1030.63	0.15	1030.76	0.28	1030.87	0.39
876	10400	1030.48	1030.63	0.15	1030.76	0.28	1030.87	0.39
877	10300	1030.48	1030.63	0.15	1030.76	0.28	1030.87	0.39
878	10200	1030.48	1030.63	0.15	1030.76	0.28	1030.87	0.39
879	10100	1030.48	1030.63	0.15	1030.76	0.28	1030.87	0.39
880	10000	1030.48	1030.63	0.15	1030.76	0.28	1030.87	0.39
881	9900	1030.48	1030.63	0.15	1030.76	0.28	1030.87	0.39
882	9800	1030.48	1030.63	0.15	1030.76	0.28	1030.87	0.39
883	9700	1030.48	1030.63	0.15	1030.76	0.28	1030.87	0.39
884	9600	1030.48	1030.63	0.15	1030.77	0.29	1030.89	0.41
885	9500	1030.74	1030.82	0.08	1030.89	0.15	1030.95	0.21
886	9400	1030.53	1030.63	0.10	1030.76	0.23	1030.87	0.34
887	9300	1030.48	1030.62	0.14	1030.76	0.28	1030.87	0.39
888	9200	1030.44	1030.59	0.15	1030.73	0.29	1030.84	0.40
889	9100	1030.42	1030.58	0.16	1030.71	0.29	1030.82	0.40
890	9000	1030.40	1030.55	0.15	1030.69	0.29	1030.79	0.39
891	8900	1030.37	1030.53	0.16	1030.66	0.29	1030.78	0.41
892	8800	1030.35	1030.51	0.16	1030.64	0.29	1030.76	0.41
893	8700	1030.32	1030.49	0.17	1030.62	0.30	1030.74	0.42
894	8600	1030.32	1030.47	0.15	1030.59	0.27	1030.71	0.39
895	8500	1030.16	1030.31	0.15	1030.44	0.28	1030.55	0.39
896	8400	1029.95	1030.08	0.13	1030.20	0.25	1030.31	0.36
897	8300	1029.63	1029.76	0.13	1029.89	0.26	1030.01	0.38
898	8200	1029.36	1029.53	0.17	1029.67	0.31	1029.79	0.43
899	8100	1029.18	1029.34	0.16	1029.47	0.29	1029.59	0.41
900	8000	1028.98	1029.12	0.14	1029.23	0.25	1029.35	0.37
901	7900	1028.74	1028.89	0.15	1029.01	0.27	1029.12	0.38
902	7800	1028.53	1028.67	0.14	1028.79	0.26	1028.90	0.37
903	7700	1028.41	1028.55	0.14	1028.65	0.24	1028.76	0.35
904	7600	1028.26	1028.39	0.13	1028.50	0.24	1028.62	0.36
905	7500	1028.15	1028.28	0.13	1028.40	0.25	1028.52	0.37
906	7400	1028.04	1028.17	0.13	1028.30	0.26	1028.43	0.39
907	7300	1027.98	1028.11	0.13	1028.24	0.26	1028.37	0.39
908	7200	1027.95	1028.08	0.13	1028.21	0.26	1028.34	0.39
909	7100	1027.93	1028.06	0.13	1028.18	0.25	1028.31	0.38
910	7000	1027.92	1028.04	0.12	1028.15	0.23	1028.27	0.35
911	6900	1027.90	1028.02	0.12	1028.13	0.23	1028.24	0.34
912	6800	1027.76	1027.91	0.15	1028.04	0.28	1028.17	0.41
913	6700	1027.68	1027.82	0.14	1027.95	0.27	1028.08	0.40
914	6600	1027.62	1027.75	0.13	1027.87	0.25	1027.98	0.36
915	6500	1027.59	1027.71	0.12	1027.82	0.23	1027.92	0.33
916	6400	1027.53	1027.64	0.11	1027.73	0.20	1027.83	0.30
917	6300	1027.47	1027.57	0.10	1027.65	0.18	1027.74	0.27
918	6200	1027.42	1027.51	0.09	1027.59	0.17	1027.67	0.25
919	6100	1027.36	1027.45	0.09	1027.52	0.16	1027.60	0.24
920	6000	1027.24	1027.32	0.08	1027.39	0.15	1027.46	0.22
921	5900	1027.10	1027.17	0.07	1027.24	0.14	1027.30	0.20
922	5800	1026.96	1027.03	0.07	1027.08	0.12	1027.14	0.18
923	5700	1026.86	1026.92	0.06	1026.96	0.10	1027.01	0.15
924	5600	1026.20	1026.25	0.05	1026.29	0.09	1026.34	0.14
925	5500	1025.70	1025.76	0.06	1025.81	0.11	1025.86	0.16
926	5400	1025.36	1025.43	0.07	1025.49	0.13	1025.55	0.19
927	5300	1025.22	1025.29	0.07	1025.35	0.13	1025.42	0.20
928	5200	1025.09	1025.16	0.07	1025.22	0.13	1025.29	0.20
929	5100	1024.99	1025.06	0.07	1025.12	0.13	1025.19	0.20
930	5000	1024.94	1025.00	0.06	1025.06	0.12	1025.13	0.19
931	4900	1024.90	1024.96	0.06	1025.02	0.12	1025.08	0.18
932	4800	1024.87	1024.93	0.06	1024.99	0.12	1025.05	0.18
933	4700	1024.73	1024.80	0.07	1024.87	0.14	1024.94	0.21
934	4600	1024.57	1024.65	0.08	1024.73	0.16	1024.82	0.25
935	4500	1024.44	1024.54	0.10	1024.63	0.19	1024.73	0.29
936	4400	1024.37	1024.48	0.11	1024.58	0.21	1024.68	0.31
937	4300	1024.29	1024.41	0.12	1024.51	0.22	1024.61	0.32
938	4200	1024.24	1024.36	0.12	1024.46	0.22	1024.57	0.33
939	4100	1024.20	1024.32	0.12	1024.43	0.23	1024.53	0.33
940	4000	1024.15	1024.28	0.13	1024.38	0.23	1024.49	0.34
941	3900	1024.10	1024.22	0.12	1024.33	0.23	1024.43	0.33
942	3800	1024.06	1024.18	0.12	1024.28	0.22	1024.38	0.32
943	3700	1024.03	1024.15	0.12	1024.25	0.22	1024.35	0.32
944	3600	1024.02	1024.14	0.12	1024.24	0.22	1024.34	0.32

Table C.3 Water Level Difference along the Little Bow River Climate Change

Station in Flood Mapping	HEC-RAS Station	Water Level for 100-Year (Base Case)	Water Level for 10% Increase in Peak Flow	Difference due to 10% Increase in Peak Flow	Water Level for 20% Increase in Peak Flow	Difference due to 20% Increase in Peak Flow	Water Level for 30% Increase in Peak Flow	Difference due to 30% Increase in Peak Flow
945	3500	1024.01	1024.13	0.12	1024.23	0.22	1024.33	0.32
946	3400	1024.01	1024.13	0.12	1024.22	0.21	1024.32	0.31
947	3300	1024.00	1024.12	0.12	1024.22	0.22	1024.32	0.32
948	3200	1024.00	1024.12	0.12	1024.22	0.22	1024.31	0.31
949	3100	1023.98	1024.10	0.12	1024.20	0.22	1024.29	0.31
950	3000	1022.17	1022.24	0.07	1022.30	0.13	1022.36	0.19
951	2900	1021.76	1021.85	0.09	1021.93	0.17	1022.00	0.24
952	2800	1021.55	1021.65	0.10	1021.73	0.18	1021.81	0.26
953	2700	1021.29	1021.41	0.12	1021.50	0.21	1021.59	0.30
954	2600	1021.01	1021.13	0.12	1021.23	0.22	1021.33	0.32
955	2500	1020.76	1020.89	0.13	1020.99	0.23	1021.10	0.34
956	2400	1020.55	1020.69	0.14	1020.80	0.25	1020.91	0.36
957	2300	1020.53	1020.66	0.13	1020.78	0.25	1020.89	0.36
958	2200	1020.42	1020.56	0.14	1020.67	0.25	1020.78	0.36
959	2100	1020.28	1020.41	0.13	1020.52	0.24	1020.63	0.35
960	2000	1020.10	1020.23	0.13	1020.34	0.24	1020.44	0.34
961	1900	1019.90	1020.03	0.13	1020.13	0.23	1020.23	0.33
962	1800	1019.64	1019.75	0.11	1019.85	0.21	1019.94	0.30
963	1700	1019.36	1019.47	0.11	1019.55	0.19	1019.64	0.28
964	1600	1019.16	1019.27	0.11	1019.35	0.19	1019.43	0.27
965	1500	1018.95	1019.06	0.11	1019.14	0.19	1019.22	0.27
966	1400	1018.78	1018.89	0.11	1018.97	0.19	1019.06	0.28
967	1300	1018.71	1018.81	0.10	1018.90	0.19	1018.99	0.28
968	1200	1018.68	1018.78	0.10	1018.87	0.19	1018.96	0.28
969	1100	1018.65	1018.75	0.10	1018.84	0.19	1018.93	0.28
970	1000	1018.57	1018.68	0.11	1018.76	0.19	1018.85	0.28
971	900	1018.49	1018.59	0.10	1018.68	0.19	1018.76	0.27
972	800	1018.40	1018.50	0.10	1018.58	0.18	1018.66	0.26
973	700	1018.17	1018.27	0.10	1018.35	0.18	1018.43	0.26
974	600	1017.93	1018.02	0.09	1018.10	0.17	1018.18	0.25
975	500	1017.61	1017.70	0.09	1017.78	0.17	1017.85	0.24
976	400	1017.32	1017.41	0.09	1017.49	0.17	1017.56	0.24
977	300	1017.04	1017.12	0.08	1017.20	0.16	1017.28	0.24
978	200	1016.76	1016.84	0.08	1016.92	0.16	1017.00	0.24
979	100	1016.46	1016.54	0.08	1016.62	0.16	1016.69	0.23
980	0	1016.10	1016.18	0.08	1016.25	0.15	1016.33	0.23

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Table C.4 Water Level Difference along the Overland Flood Route Climate Change

Station in Flood Mapping	HEC-RAS Station	Water Level for 100-Year (Base Case)	Water Level for 10% Increase in Peak Flow	Difference due to 10% Increase in Peak Flow	Water Level for 20% Increase in Peak Flow	Difference due to 20% Increase in Peak Flow	Water Level for 30% Increase in Peak Flow	Difference due to 30% Increase in Peak Flow
981	10000	1060.73	1060.81	0.08	1060.88	0.15	1060.95	0.22
982	9900	1060.17	1060.25	0.08	1060.31	0.14	1060.38	0.21
983	9800	1059.57	1059.64	0.07	1059.70	0.13	1059.77	0.20
984	9700	1059.02	1059.11	0.09	1059.19	0.17	1059.27	0.25
985	9600	1058.55	1058.65	0.10	1058.74	0.19	1058.84	0.29
986	9500	1058.27	1058.38	0.11	1058.47	0.20	1058.57	0.30
987	9400	1057.97	1058.08	0.11	1058.18	0.21	1058.28	0.31
988	9300	1057.84	1057.95	0.11	1058.04	0.20	1058.14	0.30
989	9200	1057.60	1057.70	0.10	1057.78	0.18	1057.91	0.31
990	9100	1057.12	1057.20	0.08	1057.27	0.15	1057.33	0.21
991	9000	1056.51	1056.58	0.07	1056.65	0.14	1056.71	0.20
992	8900	1056.04	1056.11	0.07	1056.17	0.13	1056.23	0.19
993	8800	1055.58	1055.65	0.07	1055.72	0.14	1055.79	0.21
994	8700	1055.33	1055.42	0.09	1055.49	0.16	1055.57	0.24
995	8600	1055.13	1055.22	0.09	1055.30	0.17	1055.37	0.24
996	8500	1054.98	1055.07	0.09	1055.15	0.17	1055.23	0.25
997	8400	1054.80	1054.89	0.09	1054.97	0.17	1055.04	0.24
998	8300	1054.48	1054.56	0.08	1054.63	0.15	1054.71	0.23
999	8200	1054.01	1054.09	0.08	1054.16	0.15	1054.23	0.22
1000	8100	1053.57	1053.65	0.08	1053.71	0.14	1053.78	0.21
1001	8000	1053.11	1053.19	0.08	1053.25	0.14	1053.31	0.20
1002	7900	1052.67	1052.74	0.07	1052.80	0.13	1052.87	0.20
1003	7800	1052.25	1052.32	0.07	1052.38	0.13	1052.44	0.19
1004	7700	1052.29	1052.36	0.07	1052.42	0.13	1052.48	0.19
1005	7600	1051.96	1052.02	0.06	1052.08	0.12	1052.13	0.17
1006	7500	1051.53	1051.59	0.06	1051.64	0.11	1051.70	0.17
1007	7400	1051.09	1051.16	0.07	1051.22	0.13	1051.28	0.19
1008	7300	1050.96	1051.03	0.07	1051.10	0.14	1051.16	0.20
1009	7200	1050.62	1050.69	0.07	1050.75	0.13	1050.82	0.20
1010	7100	1050.24	1050.31	0.07	1050.37	0.13	1050.43	0.19
1011	7000	1049.85	1049.92	0.07	1049.97	0.12	1050.03	0.18
1012	6900	1049.44	1049.51	0.07	1049.56	0.12	1049.62	0.18
1013	6800	1049.00	1049.06	0.06	1049.11	0.11	1049.16	0.16
1014	6700	1048.55	1048.61	0.06	1048.66	0.11	1048.70	0.15
1015	6600	1048.10	1048.15	0.05	1048.20	0.10	1048.24	0.14
1016	6500	1047.67	1047.72	0.05	1047.77	0.10	1047.81	0.14
1017	6400	1047.22	1047.27	0.05	1047.31	0.09	1047.36	0.14
1018	6300	1046.88	1046.93	0.05	1046.97	0.09	1047.01	0.13
1019	6200	1046.44	1046.48	0.04	1046.52	0.08	1046.56	0.12
1020	6100	1046.06	1046.10	0.04	1046.14	0.08	1046.17	0.11
1021	6000	1045.70	1045.73	0.03	1045.77	0.07	1045.80	0.10
1022	5900	1045.31	1045.36	0.05	1045.39	0.08	1045.44	0.13
1023	5800	1045.05	1045.11	0.06	1045.16	0.11	1045.21	0.16
1024	5700	1044.93	1045.00	0.07	1045.07	0.14	1045.13	0.20
1025	5600	1044.64	1044.70	0.06	1044.76	0.12	1044.82	0.18
1026	5500	1044.32	1044.39	0.07	1044.45	0.13	1044.52	0.20
1027	5400	1044.10	1044.17	0.07	1044.23	0.13	1044.30	0.20
1028	5300	1043.82	1043.90	0.08	1043.97	0.15	1044.04	0.22
1029	5200	1043.39	1043.51	0.12	1043.60	0.21	1043.70	0.31
1030	5100	1043.31	1043.43	0.12	1043.53	0.22	1043.64	0.33
1031	5000	1043.27	1043.39	0.12	1043.50	0.23	1043.60	0.33
1032	4900	1043.20	1043.33	0.13	1043.43	0.23	1043.54	0.34
1033	4800	1043.09	1043.22	0.13	1043.33	0.24	1043.43	0.34
1034	4700	1042.96	1043.08	0.12	1043.19	0.23	1043.29	0.33
1035	4600	1042.79	1042.91	0.12	1043.01	0.22	1043.11	0.32
1036	4500	1042.59	1042.70	0.11	1042.79	0.20	1042.89	0.30
1037	4400	1042.32	1042.42	0.10	1042.50	0.18	1042.59	0.27
1038	4300	1041.74	1041.82	0.08	1041.90	0.16	1041.97	0.23
1039	4200	1041.04	1041.12	0.08	1041.19	0.15	1041.26	0.22
1040	4100	1040.54	1040.61	0.07	1040.68	0.14	1040.74	0.20
1041	4000	1040.11	1040.18	0.07	1040.24	0.13	1040.30	0.19
1042	3900	1039.64	1039.70	0.06	1039.76	0.12	1039.81	0.17
1043	3800	1039.36	1039.41	0.05	1039.46	0.10	1039.51	0.15
1044	3700	1038.98	1039.03	0.05	1039.07	0.09	1039.10	0.12
1045	3600	1038.65	1038.69	0.04	1038.72	0.07	1038.75	0.10
1046	3500	1038.26	1038.30	0.04	1038.32	0.06	1038.35	0.09
1047	3400	1037.94	1037.97	0.03	1037.99	0.05	1038.02	0.08
1048	3300	1037.68	1037.72	0.04	1037.75	0.07	1037.79	0.11
1049	3200	1037.48	1037.54	0.06	1037.60	0.12	1037.66	0.18
1050	3100	1037.37	1037.45	0.08	1037.51	0.14	1037.58	0.21
1051	3000	1037.36	1037.43	0.07	1037.50	0.14	1037.57	0.21
1052	2900	1037.26	1037.32	0.06	1037.38	0.12	1037.45	0.19
1053	2800	1037.15	1037.21	0.06	1037.26	0.11	1037.32	0.17
1054	2700	1036.45	1036.52	0.07	1036.58	0.13	1036.65	0.20
1055	2600	1035.70	1035.79	0.09	1035.86	0.16	1035.93	0.23
1056	2500	1035.46	1035.54	0.08	1035.61	0.15	1035.68	0.22
1057	2400	1035.42	1035.50	0.08	1035.56	0.14	1035.63	0.21
1058	2300	1035.02	1035.08	0.06	1035.14	0.12	1035.20	0.18
1059	2200	1034.66	1034.72	0.06	1034.77	0.11	1034.82	0.16
1060	2100	1034.42	1034.47	0.05	1034.51	0.09	1034.55	0.13
1061	2000	1034.32	1034.36	0.04	1034.39	0.07	1034.40	0.08
1062	1900	1034.26	1034.29	0.03	1034.32	0.06	1034.35	0.09
1063	1800	1032.86	1032.92	0.06	1032.97	0.11	1033.02	0.16
1064	1700	1032.34	1032.40	0.06	1032.45	0.11	1032.50	0.16
1065	1600	1031.80	1031.86	0.06	1031.92	0.12	1031.97	0.17
1066	1500	1031.65	1031.71	0.06	1031.77	0.12	1031.82	0.17
1067	1400	1031.43	1031.49	0.06	1031.54	0.11	1031.58	0.15
1068	1300	1031.14	1031.19	0.05	1031.24	0.10	1031.28	0.14

Table C.4 Water Level Difference along the Overland Flood Route Climate Change

Station in Flood Mapping	HEC-RAS Station	Water Level for 100-Year (Base Case)	Water Level for 10% Increase in Peak Flow	Difference due to 10% Increase in Peak Flow	Water Level for 20% Increase in Peak Flow	Difference due to 20% Increase in Peak Flow	Water Level for 30% Increase in Peak Flow	Difference due to 30% Increase in Peak Flow
1069	1200	1030.85	1030.91	0.06	1030.95	0.10	1031.00	0.15
1070	1100	1030.59	1030.64	0.05	1030.68	0.09	1030.73	0.14
1071	1000	1030.30	1030.35	0.05	1030.39	0.09	1030.44	0.14
1072	900	1029.97	1030.02	0.05	1030.07	0.10	1030.11	0.14
1073	800	1029.65	1029.71	0.06	1029.75	0.10	1029.79	0.14
1074	700	1029.31	1029.36	0.05	1029.41	0.10	1029.45	0.14
1075	600	1028.97	1029.02	0.05	1029.06	0.09	1029.10	0.13
1076	500	1028.62	1028.66	0.04	1028.70	0.08	1028.74	0.12
1077	400	1028.29	1028.33	0.04	1028.37	0.08	1028.41	0.12
1078	300	1027.86	1027.91	0.05	1027.96	0.10	1028.00	0.14
1079	200	1027.59	1027.66	0.07	1027.72	0.13	1027.78	0.19
1080	100	1027.59	1027.66	0.07	1027.73	0.14	1027.80	0.21
1081	0	1027.42	1027.51	0.09	1027.59	0.17	1027.67	0.25

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As a global, employee-owned organisation with over 50 years of experience, Golder Associates is driven by our purpose to engineer earth's development while preserving earth's integrity. We deliver solutions that help our clients achieve their sustainable development goals by providing a wide range of independent consulting, design and construction services in our specialist areas of earth, environment and energy.

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