GOLDER
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REPORT

Design Flood Hazard Mapping Report

Red Deer River Hazard Study

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Alberta Environment and Parks

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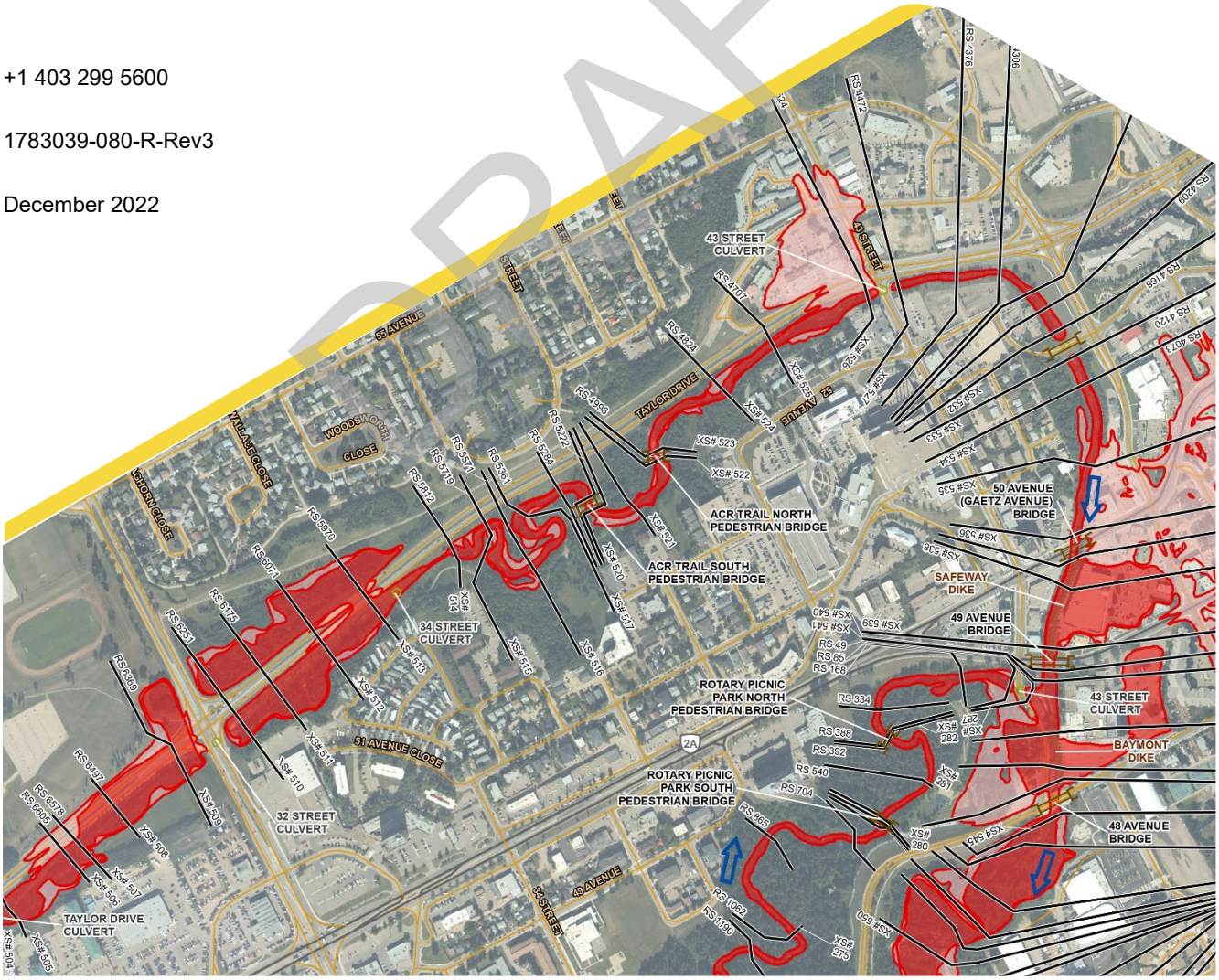

Distribution List

1 Electronic Copy: Alberta Environment and Parks

Executive Summary

Alberta Environment and Parks (AEP) retained Golder Associates Ltd. (Golder) in August 2017 to conduct the Red Deer River Hazard Study. The primary purpose of the study is to assess and identify river and flood hazards along the Red Deer River, Waskasoo Creek and Piper Creek through the City of Red Deer, the Town of Penhold, Lacombe County and Red Deer County.

The study is conducted under the provincial Flood Hazard Identification Program (FHIP), the goals of which include enhancement of public safety and reduction of future flood damages through the identification of river and flood hazards. Project stakeholders include the Government of Alberta, the City of Red Deer, the Town of Penhold, Lacombe County, Red Deer County and the public.

The study includes multiple components. This report documents the methodology and results of the open water flood hazard identification component and the design flood hazard map production component, which will support the flood risk assessment. The tasks associated with the open water flood hazard identification component include open water floodway delineation and open water floodway criteria mapping. The tasks associated with the design flood hazard map production component include development of the design flood level profile, production of the design flood hazard maps, development of the design flood water surface TIN, and development of the design flood depth grid.

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

Table i: River Reaches in the Study Area

River	Reach Description	Length (km)
Red Deer River	From Township Road 380 to the Highway 11 Bridge	51
Waskasoo Creek	From the Highway 2A Bridge to its confluence with the Red Deer River	35
Piper Creek	From Township Road 374 to its confluence with Waskasoo Creek	20

Acknowledgements

The Red Deer River Hazard Study was managed by Dr. Dejiang Long and Mr. Gaven Tang. The hydraulic modelling was conducted by Mr. Gaven Tang, Ms. Nancy Guo, Mr. Micah Richey and Mr. Amir Gharavi, with support from Mr. Wolf Ploeger. Floodway delineation was conducted by Mr. Gaven Tang and Mx. Richard Cunningham. The floodway criteria mapping and flood hazard mapping was conducted by Mr. Peter Thiede.

The authors express their special thanks to Mr. Abdullah Mamun & Ms. Jane Eaket, project managers for Alberta Environment and Parks (AEP), who provided overall study management, background data, and technical guidance to Golder's team throughout the hydraulic modelling and flood inundation mapping components.

The authors also express their gratitude to Peter Onyshko of AEP for his support, technical guidance, and for providing background information.

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1.0 INTRODUCTION

1.1 Study Background and Objectives

Alberta Environment and Parks (AEP) commissioned Golder Associates Ltd. (Golder) in August 2017 to conduct the Red Deer River Hazard Study. The primary purpose of the study is to assess and identify river and flood hazards along the Red Deer River reach from Township Road 380 to the Highway 11 Bridge, the Waskasoo Creek reach from the Highway 2A Bridge to its confluence with the Red Deer River, and the Piper Creek reach from Township Road 374 to its confluence with Waskasoo Creek.

The study is conducted under the provincial Flood Hazard Identification Program (FHIP), the goals of which include enhancement of public safety and reduction of future flood damages through the identification of river and flood hazards. Project stakeholders include the Government of Alberta, the City of Red Deer, the Town of Penhold, Lacombe County, Red Deer County and the public.

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1.2 Study Area and Reaches

The study area covers approximately 51 km reach of the Red Deer River, 35 km reach of Waskasoo Creek, and 20 km reach of Piper Creek through the City of Red Deer, the Town of Penhold, Lacombe County, and Red Deer County. The study area is shown in Figure 1. The study reaches are summarized in Table 1.

Table 1: River Reaches in the Study Area

River	Reach Description	Length (km)
Red Deer River	From Township Road 380 to the Highway 11 Bridge	51
Waskasoo Creek	From the Highway 2A Bridge to its confluence with the Red Deer River	35
Piper Creek	From Township Road 374 to its confluence with Waskasoo Creek	20

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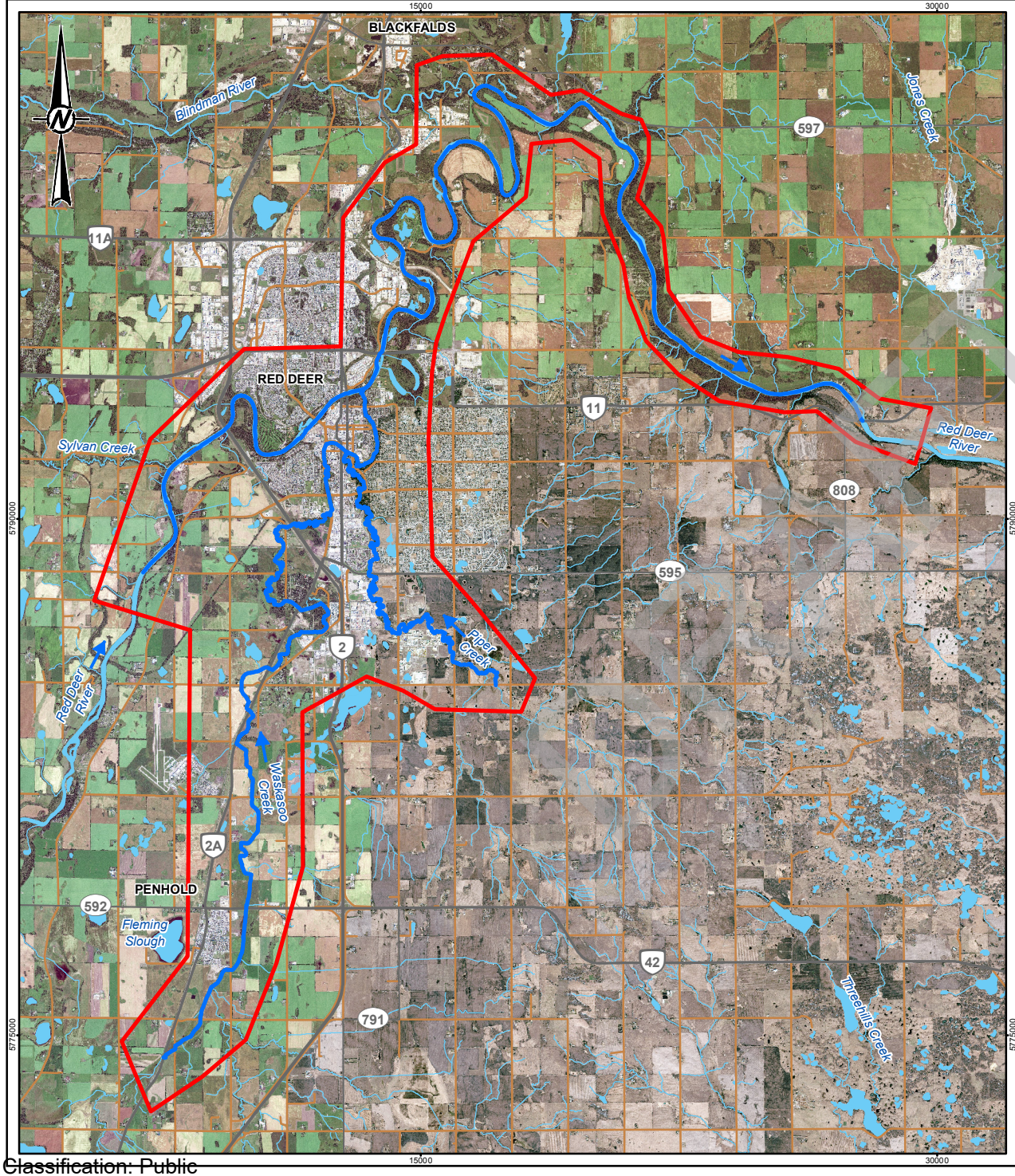

LEGEND

- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- LOCAL ROAD
- FLOW DIRECTION
- WATERCOURSE
- WATERBODY
- SURVEY REACH
- RIVER HAZARD STUDY AREA

0 5 10

1:175,000 KILOMETRES

REFERENCE(S)

POPULATED PLACES AND HYDROGRAPHY OBTAINED FROM ALTALIS, © GOVERNMENT OF ALBERTA 2017. ALL RIGHTS RESERVED.
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DATUM: NAD 83 CSRS PROJECTION: 3TM 114

CLIENT
ALBERTA ENVIRONMENT AND PARKS

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
LOCATION MAP OF THE STUDY AREA

CONSULTANT
GOLDER

YYYY-MM-DD	2019-07-25
DESIGNED	GT
PREPARED	BP
REVIEWED	GT
APPROVED	DL

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2.0 AVAILABLE DATA

2.1 Flood Hydrology

The flood flow frequency estimates for the Red Deer River, Waskasoo Creek, and Piper Creek are documented in a separate report entitled “Red Deer River and Upper Red Deer River Hazard Studies – Open Water Flood Hydrology Assessment” (Golder, 2021b). The 100-year flood flow estimates at key locations in the study area are summarized in Table 2. The Red Deer River Flood Peak Discharge estimates are based on regulated flows.

Table 2: 100-Year Flood Flow Frequency Estimates

River	Reach	100-Year Flood Peak Discharges (m^3/s)
Red Deer River	Above Waskasoo Creek	1,820
	Below Waskasoo Creek	1,870
	Below Blindman River	2,180
Waskasoo Creek	Above Highway 42	32.1
	Above Piper Creek	37.1
	Above Red Deer River	53.9
Piper Creek	Above Highway 595	17.5
	Above Waskasoo Creek	19.3

2.2 Survey and DTM Details

The topographic, control point, and shallow-water surveys were performed using Real-time Kinematic (RTK) GPS units or a total station. The bathymetric surveys were conducted on the Red Deer River using an Acoustic Doppler Profiler (ADP) in combination with a boat-mounted RTK unit where flow depths were too deep to wade. The bridge and culvert survey data were collected using RTK or total station. A reflectorless total station was used to survey bridges that were unsafe to access due to traffic volumes. The features surveyed as part of this study are summarized in Table 3.

Table 3: Summary of Survey Features

Feature	Number of Surveyed Cross Sections or Locations			
	Red Deer River	Waskasoo Creek	Piper Creek	Totals
Cross Sections	153	303	134	**590**
Bridges	9	35	8	**52**
Culverts	None	12	7	**19**
Flood Control Structures	2	4	None	**6**

A detailed description of the survey data is provided in a separate report entitled “Red Deer River Hazard Study – Survey and Base Data Collection Report” (Golder, 2021a).

The detailed Digital Terrain Model (DTM) for the study area was provided by AEP. It was developed using the 2017 LiDAR survey and is available as gridded raster with 0.5 m resolution, ESRI Terrain and Triangulated Irregular Network (TIN). The DTM was delivered in the local study coordinate system and datum (3TM 114°, NAD83 CSRS).

2.3 HEC-RAS Model

All river reaches in the study area are integrated into one HEC-RAS model. The model was calibrated for the following:

- the low flow conditions based on the water levels and discharges measured in September and October 2017;
- the high flow conditions based on the high water marks collected by AEP for the 1982, 1990, 2005, 2007, 2013, and 2018 flood events; and
- the stage-discharge rating curves for the Water Survey of Canada (WSC) gauging stations in the study area.

The calibrated main channel Manning's *n* values for the high flow conditions are listed in Table 4.

Table 4: Calibrated River Channel Roughness Values for the High Flow Conditions

Stream Reach	Calibrated Manning's n Value
Red Deer River Upper Reach (Upstream of Waskasoo Creek Confluence)	0.032
Red Deer River Lower Reach (Downstream of Waskasoo Creek Confluence)	0.036
Waskasoo Creek	0.033
Piper Creek	0.033

The calibrated model was used to simulate the open water surface profiles for the 2-, 5-, 10-, 20-, 35-, 50-, 75-, 100-, 200-, 350-, 500-, 750-, and 1,000-year flood events in the study area.

Model sensitivity was evaluated using the 100-year flood simulation results. The results of the sensitivity analysis show that variation of the river channel roughness values has a much higher influence on the simulated flood levels than variation of the floodplain roughness values, and that on average, the 100-year flood levels are estimated to be within a range of ±0.35 m of the simulated values along the Red Deer River, ±0.40 m along the Waskasoo Creek and ±0.10 m along the Piper Creek.

A detailed description of the open water HEC-RAS model is provided in a separate report entitled "Red Deer River Hazard Study – Hydraulic Modelling and Flood Inundation Mapping Report" (Golder 2022).

The calibrated model was used to determine the design flood levels and flow velocities required for the floodway criteria and flood hazard maps.

3.0 DESIGN FLOOD HAZARD DETERMINATION

3.1 Design Flood Details

For this study, the 100-year open water regulated flood was selected as the design flood. The corresponding peak instantaneous flood frequency discharge estimates from Table 2 were used for each flow zone within the study reach.

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 (i.e., the floodway and the flood fringe).

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. Typically, the floodway includes the river channel and adjacent overbank areas. 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. New development is discouraged in the floodway and may not be permitted in some communities.
- Flood Fringe: The flood fringe is the land along the edges of the flood hazard area that has relatively shallow water (less than 1 m deep) with lower velocities (less than 1 m/s); 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. New development in the flood fringe may be permitted in some communities.

3.3 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 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 included in the floodway.
- Exceptions may be made for ineffective flow areas, backwater areas or to accommodate a hydraulically smooth floodway.
- The floodway must include the main channel.
- 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. 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 stations at each cross section are listed in Table 5.

3.4 Design Flood Profile

The open water design water levels are provided in Table 5.

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
RedDeerRiver	UpperReach	XS 1	50826	867.21	86.56	235.56	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 2	50613	866.96	55.28	199.41	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 3	50269	866.64	98.47	255.83	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 4	49938	866.38	209.53	377.22	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 5	49656	866.05	348.67	515.06	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 6	49056	865.24	602.24	729.24	Previous Floodway	Main Channel
RedDeerRiver	UpperReach	XS 7	48749	865.05	488.60	639.25	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 8	48323	864.82	267.80	459.01	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 9	48001	864.43	174.32	334.96	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 10	47653	863.96	222.36	360.52	Previous Floodway	Inundation Limit[1]
RedDeerRiver	UpperReach	XS 11	47349	863.66	385.77	537.06	Previous Floodway	Inundation Limit[1]
RedDeerRiver	UpperReach	XS 12	46982	863.32	230.24	394.53	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 13	46522	862.98	493.40	689.58	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 14	46090	862.57	901.94	1055.38	Previous Floodway	Inundation Limit[1]
RedDeerRiver	UpperReach	XS 15	45605	862.27	1006.68	1155.38	Previous Floodway	Inundation Limit[1]
RedDeerRiver	UpperReach	XS 16	45436	862.04	1599.35	1737.59	Previous Floodway	Inundation Limit[1]
RedDeerRiver	UpperReach	XS 17	45353	861.97	1533.26	1685.71	Previous Floodway	Inundation Limit[2]
RedDeerRiver	UpperReach	XS 18	45246	861.77	1414.27	1581.01	Previous Floodway	Inundation Limit[1]
RedDeerRiver	UpperReach	XS 19	45174	861.74	1160.60	1402.20	Previous Floodway	Inundation Limit[1]
RedDeerRiver	UpperReach	XS 20	44937	861.62	901.02	1153.26	Previous Floodway	Inundation Limit[1]
RedDeerRiver	UpperReach	XS 21	44634	861.31	587.14	761.49	Previous Floodway	Inundation Limit[1]
RedDeerRiver	UpperReach	XS 22	44163	860.34	45.67	185.49	Main Channel	Previous Floodway
RedDeerRiver	UpperReach	XS 23	43862	859.77	53.48	156.93	Main Channel	Previous Floodway
RedDeerRiver	UpperReach	XS 24	43520	859.34	62.99	181.77	Inundation Limit[2]	Previous Floodway
RedDeerRiver	UpperReach	XS 25	43237	859.00	51.08	183.18	Inundation Limit[1]	Previous Floodway
RedDeerRiver	UpperReach	XS 26	42903	858.64	137.12	275.69	Inundation Limit[1]	Previous Floodway

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
RedDeerRiver	UpperReach	XS 27	42464	858.16	503.44	687.10	Inundation Limit(1)	Previous Floodway
RedDeerRiver	UpperReach	XS 28	42446	858.08	517.59	703.23	Inundation Limit(1)	Previous Floodway
RedDeerRiver	UpperReach	XS 29	42160	857.50	636.34	791.26	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 30	41789	857.03	607.59	765.78	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 31	41460	856.55	543.40	721.53	1 m Depth	Inundation Limit(1)
RedDeerRiver	UpperReach	XS 32	41212	856.33	471.23	637.28	Previous Floodway	Inundation Limit(1)
RedDeerRiver	UpperReach	XS 33	40939	856.08	388.67	580.78	Previous Floodway	Inundation Limit(1)
RedDeerRiver	UpperReach	XS 34	40682	855.84	292.03	443.68	Previous Floodway	Inundation Limit(1)
RedDeerRiver	UpperReach	XS 35	40402	855.43	236.85	355.07	Previous Floodway	Inundation Limit(1)
RedDeerRiver	UpperReach	XS 36	40215	855.30	966.89	1115.39	Previous Floodway	Inundation Limit(2)
RedDeerRiver	UpperReach	XS 37	40125	855.18	995.72	1144.71	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 38	39935	855.08	971.05	1137.52	1 m/s Velocity	Previous Floodway
RedDeerRiver	UpperReach	XS 39	39644	854.67	1113.33	1253.04	1 m/s Velocity	Previous Floodway
RedDeerRiver	UpperReach	XS 40	39413	854.46	994.49	1124.18	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 41	39381	854.30	979.02	1116.21	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 42	39317	854.21	548.52	676.23	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 43	39180	854.10	519.35	675.56	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 44	39145	854.03	501.79	661.74	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 45	39053	853.97	477.76	639.71	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 46	39011	853.85	517.99	678.46	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 47	38975	853.76	528.73	694.57	Previous Floodway	Previous Floodway
RedDeerRiver	UpperReach	XS 48	38770	853.60	598.50	788.82	1 m/s Velocity	Previous Floodway
RedDeerRiver	LowerReach	XS 49	38445	852.95	808.07	938.02	Inundation Limit(1)	Main Channel
RedDeerRiver	LowerReach	XS 50	38032	852.31	610.98	799.58	1 m/s Velocity	Inundation Limit(1)
RedDeerRiver	LowerReach	XS 51	37713	851.89	519.27	710.36	Inundation Limit(1)	Inundation Limit(1)
RedDeerRiver	LowerReach	XS 52	37427	851.51	404.67	594.36	Previous Floodway	Inundation Limit(1)

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River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
RedDeerRiver	LowerReach	XS 53	37323	851.23	431.77	587.70	Previous Floodway	Inundation Limit(1)
RedDeerRiver	LowerReach	XS 54	37225	850.92	408.85	552.55	Previous Floodway	Inundation Limit(1)
RedDeerRiver	LowerReach	XS 55	36832	850.53	270.26	596.00	Previous Floodway	Previous Floodway
RedDeerRiver	LowerReach	XS 56	36383	849.78	544.17	1053.76	Previous Floodway	Previous Floodway
RedDeerRiver	LowerReach	XS 57	35880	849.52	1075.68	1722.79	Previous Floodway	Previous Floodway
RedDeerRiver	LowerReach	XS 58	35602	849.18	1556.93	2106.41	Inundation Limit(1)	Inundation Limit(1)
RedDeerRiver	LowerReach	XS 59	35330	848.87	1955.63	2260.01	Previous Floodway	Inundation Limit(1)
RedDeerRiver	LowerReach	XS 60	34972	848.63	2198.50	2378.46	Previous Floodway	Inundation Limit(1)
RedDeerRiver	LowerReach	XS 61	34627	848.49	2224.56	2373.51	Inundation Limit(1)	Inundation Limit(1)
RedDeerRiver	LowerReach	XS 62	34292	848.29	2185.05	2331.60	Previous Floodway	Inundation Limit(1)
RedDeerRiver	LowerReach	XS 63	33836	848.15	1909.89	2269.60	Previous Floodway	Main Channel
RedDeerRiver	LowerReach	XS 64	33469	847.74	1608.27	1879.47	Previous Floodway	Previous Floodway
RedDeerRiver	LowerReach	XS 65	33150	846.99	1243.83	1391.52	Inundation Limit(1)	Inundation Limit(1)
RedDeerRiver	LowerReach	XS 66	32699	846.59	924.76	1171.44	Inundation Limit(1)	Previous Floodway
RedDeerRiver	LowerReach	XS 67	32432	846.04	830.58	1086.30	Inundation Limit(1)	Main Channel
RedDeerRiver	LowerReach	XS 68	32415	846.01	820.65	1080.63	Previous Floodway	Main Channel
RedDeerRiver	LowerReach	XS 69	32149	845.72	872.07	1142.89	Previous Floodway	Inundation Limit(1)
RedDeerRiver	LowerReach	XS 70	31855	845.52	829.58	1363.81	Previous Floodway	Inundation Limit(1)
RedDeerRiver	LowerReach	XS 71	31477	845.19	476.32	1114.18	Main Channel	Inundation Limit(1)
RedDeerRiver	LowerReach	XS 72	31193	844.99	163.21	696.84	Main Channel	Inundation Limit(1)
RedDeerRiver	LowerReach	XS 73	30821	844.52	182.32	370.57	1 m/s Velocity	Inundation Limit(1)
RedDeerRiver	LowerReach	XS 74	30352	844.24	821.43	960.23	1 m/s Velocity	Inundation Limit(1)
RedDeerRiver	LowerReach	XS 75	29824	843.36	606.77	756.36	Inundation Limit(1)	Previous Floodway
RedDeerRiver	LowerReach	XS 76	29182	842.64	1244.77	1399.98	Main Channel	Previous Floodway
RedDeerRiver	LowerReach	XS 77	28619	842.08	1748.07	1958.02	Previous Floodway	Main Channel
RedDeerRiver	LowerReach	XS 78	28184	841.37	1926.77	2054.83	Previous Floodway	Inundation Limit(2)

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
RedDeerRiver	LowerReach	XS 79	27721	840.71	1833.21	2009.63	Mixed	Inundation Limit[(2)]
RedDeerRiver	LowerReach	XS 80	27308	840.06	1691.29	1835.25	1 m Depth	Inundation Limit[(2)]
RedDeerRiver	LowerReach	XS 81	26906	839.56	1303.44	1469.11	1 m Depth	Inundation Limit[(2)]
RedDeerRiver	LowerReach	XS 82	26510	839.08	879.62	1035.98	Inundation Limit[(2)]	Inundation Limit[(2)]
RedDeerRiver	LowerReach	XS 83	26126	838.83	422.04	724.95	Inundation Limit[(2)]	Inundation Limit[(2)]
RedDeerRiver	LowerReach	XS 84	25725	837.99	171.84	304.97	Inundation Limit[(2)]	Inundation Limit[(2)]
RedDeerRiver	LowerReach	XS 85	25332	837.51	529.83	683.99	Inundation Limit[(2)]	1 m Depth
RedDeerRiver	LowerReach	XS 86	24924	837.07	161.87	331.39	Inundation Limit[(2)]	1 m Depth
RedDeerRiver	LowerReach	XS 87	24539	836.49	124.29	274.10	Inundation Limit[(2)]	1 m Depth
RedDeerRiver	LowerReach	XS 88	24141	836.00	42.77	190.01	Inundation Limit[(2)]	1 m Depth
RedDeerRiver	LowerReach	XS 89	23741	835.41	528.80	691.76	Inundation Limit[(2)]	1 m Depth
RedDeerRiver	LowerReach	XS 90	23340	834.92	985.75	1135.83	Inundation Limit[(2)]	1 m Depth
RedDeerRiver	LowerReach	XS 91	22938	834.53	1453.18	1626.64	Inundation Limit[(2)]	1 m Depth
RedDeerRiver	LowerReach	XS 92	22539	833.65	1888.70	2042.65	Inundation Limit[(2)]	1 m Depth
RedDeerRiver	LowerReach	XS 93	22137	832.84	2059.57	2181.64	1 m Depth	Inundation Limit[(2)]
RedDeerRiver	LowerReach	XS 94	21732	832.30	1869.92	2020.35	1 m Depth	Inundation Limit[(2)]
RedDeerRiver	LowerReach	XS 95	21332	831.82	1580.43	1742.34	Inundation Limit[(2)]	Inundation Limit[(2)]
RedDeerRiver	LowerReach	XS 96	20932	831.38	1201.37	1343.80	Inundation Limit[(2)]	1 m Depth
RedDeerRiver	LowerReach	XS 97	20531	831.01	976.53	1136.04	Inundation Limit[(2)]	Inundation Limit[(2)]
RedDeerRiver	LowerReach	XS 98	20130	830.63	731.21	878.40	1 m Depth	Inundation Limit[(2)]
RedDeerRiver	LowerReach	XS 99	19733	830.30	625.60	777.36	Inundation Limit[(2)]	Inundation Limit[(2)]
RedDeerRiver	LowerReach	XS 100	19336	829.93	522.26	666.35	1 m Depth	Inundation Limit[(2)]
RedDeerRiver	LowerReach	XS 101	18934	829.65	277.27	434.19	1 m Depth	Inundation Limit[(2)]
RedDeerRiver	LowerReach	XS 102	18535	828.91	39.63	169.26	Inundation Limit[(2)]	1 m Depth
RedDeerRiver	LowerReach	XS 103	18130	827.72	557.71	703.37	Inundation Limit[(2)]	1 m Depth
RedDeerRiver	LowerReach	XS 104	17732	827.14	221.40	528.92	1 m Depth	1 m Depth

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
RedDeerRiver	LowerReach	XS 105	17338	826.54	194.31	519.60	1 m Depth	Inundation Limit[2]
RedDeerRiver	LowerReach	XS 106	16933	826.02	128.34	312.31	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 107	16532	825.43	184.54	356.54	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 108	16131	824.83	366.05	529.81	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 109	15705	824.03	444.78	581.37	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 110	15318	823.57	306.73	476.37	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 111	14918	823.01	92.15	265.21	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 112	14459	822.14	66.13	209.61	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 113	14026	821.70	83.66	281.81	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 114	13799	821.46	108.20	330.74	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 115	13608	821.25	153.20	423.47	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 116	13388	821.01	267.87	565.47	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 117	13167	820.89	674.85	958.00	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 118	12986	820.64	843.39	1023.07	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 119	12768	820.13	152.34	295.11	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 120	12514	819.85	137.81	289.02	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 121	12096	819.27	168.22	295.59	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 122	11695	818.78	176.05	337.05	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 123	11295	818.45	341.94	578.78	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 124	10896	817.96	445.36	620.79	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 125	10494	817.28	457.54	586.22	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 126	10092	817.00	489.22	665.66	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 127	9661	816.69	415.45	677.22	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 128	9253	816.17	348.76	480.36	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 129	8854	815.80	271.30	414.87	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 130	8457	815.26	207.49	338.19	1 m Depth	1 m Depth

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
RedDeerRiver	LowerReach	XS 131	8051	814.86	181.18	327.10	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 132	7652	814.36	301.09	449.94	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 133	7233	813.90	438.99	576.23	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 134	6845	813.42	381.83	512.34	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 135	6442	813.03	317.75	508.45	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 136	6040	812.66	279.65	445.93	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 137	5989	812.61	269.49	435.82	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 138	5641	812.26	263.29	433.04	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 139	5241	811.85	280.78	442.13	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 140	4845	811.40	287.28	451.20	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 141	4471	811.04	356.03	524.56	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 142	4035	810.66	577.71	767.31	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 143	3639	810.24	818.58	986.49	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 144	3240	809.64	1180.15	1306.78	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 145	2838	809.25	815.59	967.54	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 146	2388	808.63	448.51	604.86	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 147	2040	808.31	370.31	589.15	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 148	1636	807.92	113.96	309.46	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 149	1233	807.31	123.83	265.98	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 150	824	806.88	94.33	245.52	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 151	429	806.49	206.09	391.31	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 152	183	806.16	372.15	537.78	1 m Depth	1 m Depth
RedDeerRiver	LowerReach	XS 153	58	806.00	842.11	1003.74	1 m Depth	1 m Depth
PiperCreek	PiperCreek	XS 154	19702	893.09	58.09	74.11	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 155	19556	892.98	184.61	203.64	Inundation Limit(2)	Inundation Limit(2)
PiperCreek	PiperCreek	XS 156	19410	892.94	319.14	337.12	Inundation Limit(2)	Inundation Limit(2)

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
PiperCreek	PiperCreek	XS 157	19205	892.93	382.23	390.95	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 158	19041	892.92	431.63	438.93	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 159	18773	892.91	386.32	408.54	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 160	18620	892.91	317.31	326.68	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 161	18607	892.91	314.51	321.54	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 162	18362	892.91	300.24	356.48	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 163	18208	892.90	440.60	473.10	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 164	18070	892.87	504.04	523.77	Main Channel	Mixed
PiperCreek	PiperCreek	XS 165	17843	892.80	568.93	586.27	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 166	17816	892.78	573.44	593.06	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 167	17627	892.71	647.86	677.03	Main Channel	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 168	17535	892.62	132.36	164.90	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 169	17495	892.54	143.25	161.54	Inundation Limit[(2)]	Mixed
PiperCreek	PiperCreek	XS 170	17332	892.48	147.69	165.44	Main Channel	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 171	17166	892.36	118.03	128.66	Main Channel	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 172	16989	892.25	28.51	39.44	Inundation Limit[(2)]	Mixed
PiperCreek	PiperCreek	XS 173	16832	892.13	28.31	42.99	Inundation Limit[(2)]	Mixed
PiperCreek	PiperCreek	XS 174	16648	891.94	123.77	130.00	Mixed	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 175	16436	891.76	26.50	42.61	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 176	16355	891.72	60.10	70.24	Inundation Limit[(2)]	Main Channel
PiperCreek	PiperCreek	XS 177	16159	891.55	173.39	183.06	Mixed	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 178	15939	891.27	59.95	75.84	Inundation Limit[(2)]	Main Channel
PiperCreek	PiperCreek	XS 179	15771	891.15	41.64	63.00	Inundation Limit[(2)]	Mixed
PiperCreek	PiperCreek	XS 180	15577	890.96	108.12	121.56	Main Channel	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 181	15448	890.78	69.41	78.70	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 182	15315	890.72	112.07	125.20	Inundation Limit[(2)]	Inundation Limit[(2)]

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
PiperCreek	PiperCreek	XS 183	15153	890.64	30.74	49.56	Inundation Limit(2)	Mixed
PiperCreek	PiperCreek	XS 184	15119	890.51	32.85	45.61	1 m/s Velocity	Main Channel
PiperCreek	PiperCreek	XS 185	14920	890.16	28.89	39.23	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 186	14816	889.93	23.72	34.63	Inundation Limit(2)	Inundation Limit(2)
PiperCreek	PiperCreek	XS 187	14614	889.64	112.33	126.14	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 188	14380	889.37	24.38	35.49	Inundation Limit(2)	Inundation Limit(2)
PiperCreek	PiperCreek	XS 189	14232	889.11	98.09	108.78	Main Channel	Inundation Limit(2)
PiperCreek	PiperCreek	XS 190	14036	888.64	68.45	78.22	Inundation Limit(2)	Inundation Limit(2)
PiperCreek	PiperCreek	XS 191	13897	888.55	35.99	47.68	Main Channel	Inundation Limit(2)
PiperCreek	PiperCreek	XS 192	13709	888.36	134.98	147.73	Inundation Limit(2)	Inundation Limit(2)
PiperCreek	PiperCreek	XS 193	13536	888.24	57.85	70.88	Mixed	Inundation Limit(2)
PiperCreek	PiperCreek	XS 194	13340	888.16	76.62	97.19	Inundation Limit(2)	Inundation Limit(2)
PiperCreek	PiperCreek	XS 195	13182	888.11	45.58	56.19	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 196	13105	888.10	102.92	133.05	Mixed	Main Channel
PiperCreek	PiperCreek	XS 197	12971	888.08	238.46	255.13	1 m Depth	Mixed
PiperCreek	PiperCreek	XS 198	12773	888.08	263.68	276.09	1 m Depth	Inundation Limit(2)
PiperCreek	PiperCreek	XS 199	12602	888.07	163.46	178.38	1 m Depth	1 m Depth
PiperCreek	PiperCreek	XS 200	12397	887.99	28.78	52.10	Inundation Limit(2)	1 m Depth
PiperCreek	PiperCreek	XS 201	12356	887.38	31.99	52.91	Inundation Limit(2)	Main Channel
PiperCreek	PiperCreek	XS 202	12254	887.36	79.34	98.85	Mixed	Main Channel
PiperCreek	PiperCreek	XS 203	12118	887.34	47.34	58.51	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 204	12072	886.96	47.31	63.14	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 205	11902	886.91	99.23	113.98	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 206	11730	886.87	213.52	231.21	Main Channel	Inundation Limit(2)
PiperCreek	PiperCreek	XS 207	11565	886.85	140.67	154.73	Inundation Limit(2)	Main Channel
PiperCreek	PiperCreek	XS 208	11544	886.11	149.88	168.07	Inundation Limit(2)	Inundation Limit(2)

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
PiperCreek	PiperCreek	XS 209	11356	885.99	272.61	285.37	Inundation Limit[(2)]	Main Channel
PiperCreek	PiperCreek	XS 210	11136	885.93	228.35	252.03	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 211	10900	885.80	34.65	51.93	Inundation Limit[(2)]	Main Channel
PiperCreek	PiperCreek	XS 212	10739	885.71	69.30	86.47	Inundation Limit[(2)]	Main Channel
PiperCreek	PiperCreek	XS 213	10586	885.50	174.50	184.37	Main Channel	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 214	10412	885.41	74.43	88.06	Main Channel	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 215	10255	885.28	141.28	154.17	Main Channel	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 216	10054	885.11	208.97	222.56	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 217	9860	884.96	127.85	141.66	Main Channel	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 218	9579	884.72	61.27	70.20	1 m Depth	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 219	9392	884.54	44.18	52.30	Main Channel	1 m Depth
PiperCreek	PiperCreek	XS 220	9214	884.39	34.92	42.32	Inundation Limit[(2)]	1 m Depth
PiperCreek	PiperCreek	XS 221	8943	884.17	220.66	232.43	1 m Depth	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 222	8704	884.00	148.68	164.35	Main Channel	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 223	8539	883.88	175.32	187.67	Main Channel	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 224	8278	883.76	46.36	58.06	Inundation Limit[(2)]	Main Channel
PiperCreek	PiperCreek	XS 225	8211	883.74	87.78	100.91	Main Channel	Main Channel
PiperCreek	PiperCreek	XS 226	8087	883.72	149.37	164.17	Inundation Limit[(2)]	Main Channel
PiperCreek	PiperCreek	XS 227	7859	883.69	98.32	120.45	1 m Depth	1 m Depth
PiperCreek	PiperCreek	XS 228	7703	883.62	80.82	98.80	Inundation Limit[(2)]	Main Channel
PiperCreek	PiperCreek	XS 229	7643	881.84	82.25	97.68	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 230	7570	881.66	77.70	87.20	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 231	7435	881.29	39.90	51.65	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 232	7258	880.99	40.03	49.47	Main Channel	1 m Depth
PiperCreek	PiperCreek	XS 233	7083	880.48	40.62	50.29	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 234	6869	879.79	74.82	83.54	Inundation Limit[(2)]	Inundation Limit[(2)]

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
PiperCreek	PiperCreek	XS 235	6698	879.43	45.96	64.26	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 236	6542	879.12	68.52	81.17	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 237	6523	879.12	68.26	84.89	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 238	6341	878.89	50.28	60.98	Inundation Limit[(2)]	Main Channel
PiperCreek	PiperCreek	XS 239	6093	878.61	121.94	138.61	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 240	5913	878.11	91.86	101.84	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 241	5799	877.91	67.20	78.18	Main Channel	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 242	5670	877.42	125.17	136.31	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 243	5508	877.18	62.18	79.19	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 244	5357	876.87	169.52	184.03	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 245	5267	876.65	190.33	205.60	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 246	5149	876.48	240.75	253.12	Main Channel	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 247	4912	876.07	166.08	181.89	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 248	4744	875.77	94.34	108.04	Inundation Limit[(2)]	Main Channel
PiperCreek	PiperCreek	XS 249	4559	875.42	128.90	141.50	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 250	4382	875.16	24.52	34.18	Inundation Limit[(2)]	Main Channel
PiperCreek	PiperCreek	XS 251	4271	874.87	116.60	130.89	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 252	4142	874.35	162.57	174.62	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 253	4021	874.27	74.84	93.96	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 254	3922	874.10	149.22	163.98	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 255	3769	873.71	181.65	193.63	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 256	3760	873.67	184.07	195.83	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 257	3576	873.17	80.48	93.85	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 258	3464	872.73	159.52	171.74	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 259	3186	871.80	279.17	298.16	Inundation Limit[(2)]	Main Channel
PiperCreek	PiperCreek	XS 260	3171	871.61	261.51	271.64	Inundation Limit[(2)]	Inundation Limit[(2)]

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
PiperCreek	PiperCreek	XS 261	3072	871.26	145.22	155.11	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 262	2869	870.66	52.30	66.10	Inundation Limit[(2)]	Main Channel
PiperCreek	PiperCreek	XS 263	2707	870.17	89.77	113.65	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 264	2572	869.67	169.69	182.41	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 265	2456	868.95	159.00	168.16	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 266	2392	868.45	163.28	171.45	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 267	2039	867.08	122.98	136.66	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 268	1829	866.58	155.91	169.75	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 269	1821	866.51	155.70	167.67	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 270	1651	865.81	160.87	172.83	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 271	1445	864.87	120.12	132.61	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 272	1346	864.32	129.67	141.83	Inundation Limit[(2)]	Main Channel
PiperCreek	PiperCreek	XS 273	1340	864.33	121.62	133.75	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 274	1190	863.20	56.71	65.77	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 275	1062	862.74	112.12	123.24	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 276	865	861.87	42.19	50.97	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 277	704	860.99	78.54	85.63	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 278	649	860.87	92.14	106.42	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 279	639	860.85	93.31	105.92	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 280	633	860.60	92.32	101.55	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 281	540	859.96	168.37	175.07	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 282	392	859.22	96.53	104.66	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 283	388	859.14	91.61	99.68	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 284	334	858.51	59.45	68.38	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 285	168	857.86	186.77	198.77	Inundation Limit[(2)]	Inundation Limit[(2)]
PiperCreek	PiperCreek	XS 286	85	857.78	278.09	294.29	Mixed	Main Channel

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
PiperCreek	PiperCreek	XS 287	49	857.33	306.02	318.73	Inundation Limit[1]	1 m Depth
WaskasooCreek	UpperReach	XS 288	34636	895.78	669.95	710.92	Mixed	Main Channel
WaskasooCreek	UpperReach	XS 289	34486	895.77	552.92	650.05	Mixed	1 m Depth
WaskasooCreek	UpperReach	XS 290	34338	895.77	208.72	482.38	1 m Depth	Mixed
WaskasooCreek	UpperReach	XS 291	34246	895.77	195.90	433.94	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 292	34117	895.55	148.81	327.79	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 293	34034	895.55	126.87	352.48	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 294	33883	895.54	138.21	370.43	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 295	33734	895.54	151.61	372.50	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 296	33584	895.54	134.74	430.96	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 297	33435	895.54	128.60	515.75	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 298	33284	895.54	138.04	576.42	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 299	33136	895.54	177.13	622.98	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 300	33018	895.52	236.44	511.44	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 301	32983	895.27	303.40	523.94	1 m/s Velocity	1 m Depth
WaskasooCreek	UpperReach	XS 302	32835	895.22	210.57	313.31	Mixed	1 m Depth
WaskasooCreek	UpperReach	XS 303	32683	895.17	286.18	355.47	Mixed	Mixed
WaskasooCreek	UpperReach	XS 304	32535	895.15	498.18	524.33	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 305	32385	895.14	540.41	594.22	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 306	32224	895.13	602.82	658.60	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 307	32203	895.12	600.20	720.14	Inundation Limit[2]	Mixed
WaskasooCreek	UpperReach	XS 308	32082	895.05	436.98	451.99	Inundation Limit[2]	Inundation Limit[2]
WaskasooCreek	UpperReach	XS 309	31935	894.80	369.42	383.38	Inundation Limit[2]c	Main Channel
WaskasooCreek	UpperReach	XS 310	31785	894.60	325.21	337.63	Inundation Limit[2]	Inundation Limit[2]
WaskasooCreek	UpperReach	XS 311	31636	894.54	287.10	295.50	Inundation Limit[2]	1 m Depth
WaskasooCreek	UpperReach	XS 312	31486	894.50	205.00	213.86	Main Channel	1 m Depth

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
WaskasooCreek	UpperReach	XS 313	31443	894.49	142.68	148.77	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 314	31421	894.49	144.69	151.63	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 315	31337	894.48	164.79	170.46	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 316	31188	894.43	313.27	325.11	Main Channel	1 m Depth
WaskasooCreek	UpperReach	XS 317	31167	894.29	332.38	346.94	Main Channel	Main Channel
WaskasooCreek	UpperReach	XS 318	31031	894.03	497.77	518.30	Mixed	Inundation Limit[(2)]
WaskasooCreek	UpperReach	XS 319	30872	893.93	603.65	622.79	Main Channel	Main Channel
WaskasooCreek	UpperReach	XS 320	30845	893.91	615.83	626.87	Main Channel	Main Channel
WaskasooCreek	UpperReach	XS 321	30734	893.86	754.21	761.39	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 322	30583	893.77	748.15	754.75	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 323	30426	893.74	754.77	762.58	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 324	30287	893.73	742.46	748.52	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 325	30140	893.72	724.59	731.05	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 326	29985	893.70	425.25	568.56	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 327	29834	893.70	367.77	508.43	Mixed	1 m Depth
WaskasooCreek	UpperReach	XS 328	29685	893.70	289.70	464.84	Mixed	1 m Depth
WaskasooCreek	UpperReach	XS 329	29529	893.69	306.25	634.23	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 330	29384	893.69	451.83	685.72	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 331	29266	893.60	446.40	562.97	1 m Depth	Mixed
WaskasooCreek	UpperReach	XS 332	29232	893.43	442.35	452.81	1 m Depth	Main Channel
WaskasooCreek	UpperReach	XS 333	29081	893.42	401.49	408.68	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 334	28926	893.41	372.67	380.26	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 335	28775	893.31	366.74	374.77	1 m Depth	1 m/s Velocity
WaskasooCreek	UpperReach	XS 336	28625	893.32	398.48	407.41	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 337	28474	893.30	433.68	450.42	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 338	28324	893.26	476.71	485.98	1 m Depth	1 m Depth

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
WaskasooCreek	UpperReach	XS 339	28176	893.24	430.24	439.23	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 340	28022	893.22	292.35	301.64	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 341	27877	893.15	293.33	302.05	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 342	27726	893.06	261.93	271.33	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 343	27578	893.01	257.30	267.57	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 344	27428	892.93	401.12	413.38	1 m Depth	Main Channel
WaskasooCreek	UpperReach	XS 345	27276	892.83	427.42	440.06	1 m Depth	Inundation Limit[(2)]
WaskasooCreek	UpperReach	XS 346	27124	892.71	313.71	328.05	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 347	26980	892.70	251.89	263.55	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 348	26845	892.64	365.02	379.85	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 349	26827	892.59	388.94	403.48	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 350	26667	892.52	491.72	505.33	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 351	26516	892.49	532.35	563.19	Mixed	1 m Depth
WaskasooCreek	UpperReach	XS 352	26367	892.47	371.78	628.45	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 353	26218	892.46	274.51	614.30	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 354	26072	892.45	134.12	578.69	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 355	25920	892.45	145.57	724.75	Mixed	Mixed
WaskasooCreek	UpperReach	XS 356	25769	892.45	307.73	656.59	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 357	25620	892.44	540.27	647.57	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 358	25465	892.44	391.64	505.32	1 m Depth	Mixed
WaskasooCreek	UpperReach	XS 359	25313	892.42	394.87	436.66	1 m Depth	Mixed
WaskasooCreek	UpperReach	XS 360	25213	892.23	284.02	297.61	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 361	25189	892.08	283.27	295.13	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 362	25132	892.03	104.80	149.68	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 363	25119	891.87	102.57	149.75	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 364	25006	891.74	139.75	213.10	1 m Depth	1 m Depth

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
WaskasooCreek	UpperReach	XS 365	24855	891.67	143.63	167.30	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 366	24705	891.55	595.98	606.11	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 367	24554	891.52	423.42	532.18	Mixed	1 m Depth
WaskasooCreek	UpperReach	XS 368	24402	891.41	534.82	548.60	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 369	24248	891.39	469.45	498.25	1 m Depth	Mixed
WaskasooCreek	UpperReach	XS 370	24230	891.38	460.42	475.57	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 371	24092	891.33	390.20	431.25	Mixed	1 m Depth
WaskasooCreek	UpperReach	XS 372	23941	891.26	399.44	409.82	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 373	23788	891.01	366.82	428.19	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 374	23640	890.99	273.33	401.63	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 375	23487	890.96	51.16	202.48	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 376	23329	890.93	39.34	118.82	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 377	23179	890.80	41.69	51.70	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 378	23028	890.67	114.09	122.04	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 379	22908	890.57	162.63	200.58	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 380	22882	890.51	166.36	189.96	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 381	22728	890.47	153.04	244.31	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 382	22575	890.44	105.10	225.17	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 383	22424	890.39	190.34	202.30	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 384	22274	890.33	130.00	143.36	1 m Depth	Inundation Limit[(2)]
WaskasooCreek	UpperReach	XS 385	22220	890.29	77.48	143.41	1 m Depth	Inundation Limit[(2)]
WaskasooCreek	UpperReach	XS 386	22175	890.18	226.80	245.32	Main Channel	Main Channel
WaskasooCreek	UpperReach	XS 387	22141	890.02	206.34	222.60	Main Channel	Inundation Limit[(2)]
WaskasooCreek	UpperReach	XS 388	22116	890.07	206.30	224.41	Main Channel	Main Channel
WaskasooCreek	UpperReach	XS 389	21971	889.84	184.73	384.93	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 390	21840	889.71	306.15	339.93	1 m Depth	Mixed

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
WaskasooCreek	UpperReach	XS 391	21668	889.68	295.61	372.16	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 392	21518	889.63	265.49	280.70	Mixed	1 m Depth
WaskasooCreek	UpperReach	XS 393	21352	889.47	123.45	139.62	Mixed	1 m Depth
WaskasooCreek	UpperReach	XS 394	21324	889.33	126.81	137.63	1 m/s Velocity	1 m/s Velocity
WaskasooCreek	UpperReach	XS 395	21212	889.32	493.17	506.54	1 m Depth	Main Channel
WaskasooCreek	UpperReach	XS 396	21061	889.18	722.36	753.19	Mixed	1 m Depth
WaskasooCreek	UpperReach	XS 397	20911	888.95	1084.57	1301.34	1 m Depth	Inundation Limit[(2)]
WaskasooCreek	UpperReach	XS 398	20758	889.01	1069.01	1380.53	Mixed	1 m Depth
WaskasooCreek	UpperReach	XS 399	20609	889.00	1205.67	1314.47	1 m Depth	Mixed
WaskasooCreek	UpperReach	XS 400	20456	888.99	1075.45	1141.62	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 401	20303	888.87	1104.40	1242.56	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 402	20275	888.85	1113.00	1134.28	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 403	20238	888.50	181.56	193.84	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 404	20157	888.48	213.41	226.23	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 405	20007	888.39	186.05	197.26	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 406	19993	888.38	193.03	204.89	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 407	19854	888.24	193.92	204.90	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 408	19728	888.18	203.42	214.10	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 409	19611	888.06	124.62	135.87	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 410	19495	887.84	181.02	190.46	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 411	19478	887.72	195.43	204.85	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 412	19396	887.70	303.94	429.27	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 413	19239	887.62	279.26	333.45	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 414	19090	887.49	196.16	221.04	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 415	18931	887.45	119.39	191.15	Mixed	1 m Depth
WaskasooCreek	UpperReach	XS 416	18782	887.37	179.41	242.52	1 m Depth	1 m Depth

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
WaskasooCreek	UpperReach	XS 417	18700	887.20	208.20	308.47	1 m Depth	Mixed
WaskasooCreek	UpperReach	XS 418	18667	887.17	320.38	335.00	1 m Depth	Inundation Limit[(2)]
WaskasooCreek	UpperReach	XS 419	18479	886.99	369.79	381.74	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 420	18328	886.94	567.20	588.17	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 421	18179	886.80	722.21	732.16	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 422	18025	886.65	837.70	848.32	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 423	17866	886.54	958.73	969.65	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 424	17683	886.35	989.93	1011.10	Inundation Limit[(2)]	Main Channel
WaskasooCreek	UpperReach	XS 425	17661	886.25	994.95	1011.13	Inundation Limit[(2)]	Inundation Limit[(2)]
WaskasooCreek	UpperReach	XS 426	17501	886.06	985.55	997.54	1 m Depth	Inundation Limit[(2)]
WaskasooCreek	UpperReach	XS 427	17383	885.94	888.58	904.91	Inundation Limit[(2)]	Inundation Limit[(2)]
WaskasooCreek	UpperReach	XS 428	17243	885.75	905.82	917.90	Inundation Limit[(2)]	1 m Depth
WaskasooCreek	UpperReach	XS 429	17086	885.60	1018.00	1037.39	Main Channel	Inundation Limit[(2)]
WaskasooCreek	UpperReach	XS 430	16964	885.49	1015.48	1034.57	Main Channel	Main Channel
WaskasooCreek	UpperReach	XS 431	16776	885.34	955.51	971.90	Main Channel	Inundation Limit[(2)]
WaskasooCreek	UpperReach	XS 432	16632	885.20	903.21	984.72	Main Channel	1 m Depth
WaskasooCreek	UpperReach	XS 433	16481	885.11	720.89	741.09	Inundation Limit[(2)]	Main Channel
WaskasooCreek	UpperReach	XS 434	16327	885.07	544.32	767.76	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 435	16177	885.04	342.44	527.73	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 436	15994	884.92	189.02	209.50	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 437	15959	884.32	175.11	194.85	Main Channel	Main Channel
WaskasooCreek	UpperReach	XS 438	15931	884.05	37.25	198.86	1 m Depth	Main Channel
WaskasooCreek	UpperReach	XS 439	15863	883.81	87.47	224.53	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 440	15713	883.71	257.71	265.39	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 441	15523	883.62	303.13	311.79	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 442	15503	883.61	304.03	311.20	1 m Depth	1 m Depth

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
WaskasooCreek	UpperReach	XS 443	15412	883.54	218.44	228.89	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 444	15264	883.46	74.62	188.87	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 445	15047	883.15	99.53	110.74	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 446	14988	883.07	92.06	99.19	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 447	14874	882.77	98.10	104.74	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 448	14701	882.61	61.82	72.49	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 449	14592	882.54	70.76	82.97	Main Channel	Main Channel
WaskasooCreek	UpperReach	XS 450	14580	882.28	69.21	83.93	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 451	14510	882.10	46.92	52.94	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 452	14343	881.87	48.07	54.28	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 453	14194	881.79	151.24	159.47	1 m Depth	Main Channel
WaskasooCreek	UpperReach	XS 454	14004	881.63	184.12	194.39	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 455	13803	881.40	90.10	101.61	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 456	13649	881.33	49.93	61.39	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 457	13465	881.30	43.24	102.76	Mixed	Mixed
WaskasooCreek	UpperReach	XS 458	13303	881.24	84.10	103.08	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 459	13077	881.15	126.00	146.99	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 460	12914	881.01	127.15	145.46	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 461	12668	880.63	78.68	88.99	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 462	12641	880.49	61.35	89.70	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 463	12396	880.40	72.78	148.10	Mixed	1 m Depth
WaskasooCreek	UpperReach	XS 464	12221	880.32	103.99	166.60	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 465	12068	880.25	218.41	234.64	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 466	11941	880.23	172.81	185.27	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 467	11667	880.20	49.78	123.49	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 468	11486	880.15	194.56	212.73	1 m Depth	1 m Depth

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
WaskasooCreek	UpperReach	XS 469	11460	880.11	195.97	214.37	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 470	11251	880.06	56.11	190.64	Mixed	1 m Depth
WaskasooCreek	UpperReach	XS 471	11082	880.04	45.36	143.93	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 472	10922	879.96	98.57	120.58	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 473	10770	879.97	86.76	167.13	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 474	10619	879.96	98.88	171.75	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 475	10547	879.95	63.31	144.03	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 476	10395	879.93	56.16	117.12	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 477	10251	879.92	45.65	158.35	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 478	10108	879.92	57.93	215.16	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 479	9938	879.90	86.57	182.05	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 480	9780	879.89	91.92	154.77	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 481	9617	879.89	388.52	573.51	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 482	9597	879.89	444.60	560.50	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 483	9504	879.85	462.09	597.16	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 484	9463	879.11	506.82	588.90	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 485	9429	878.94	548.22	584.46	1 m Depth	1 m Depth
WaskasooCreek	UpperReach	XS 486	9346	877.57	567.67	588.86	Main Channel	Main Channel
WaskasooCreek	UpperReach	XS 487	9148	877.52	205.76	235.17	Previous Floodway	Previous Floodway
WaskasooCreek	UpperReach	XS 488	9018	877.45	161.93	173.58	Previous Floodway	Main Channel
WaskasooCreek	UpperReach	XS 489	8846	877.26	253.49	281.40	Previous Floodway	Inundation Limit(1)
WaskasooCreek	UpperReach	XS 490	8737	877.20	231.08	249.13	Previous Floodway	Inundation Limit(1)
WaskasooCreek	UpperReach	XS 491	8715	877.06	225.57	248.89	Previous Floodway	Previous Floodway
WaskasooCreek	UpperReach	XS 492	8570	876.94	132.63	187.86	Previous Floodway	Previous Floodway
WaskasooCreek	UpperReach	XS 493	8439	876.84	192.57	269.12	Previous Floodway	Previous Floodway
WaskasooCreek	UpperReach	XS 494	8263	876.71	142.82	237.95	Previous Floodway	Previous Floodway

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
WaskasooCreek	UpperReach	XS 495	8079	876.47	123.36	155.91	Previous Floodway	Inundation Limit(1)
WaskasooCreek	UpperReach	XS 496	7820	876.16	186.60	206.06	Inundation Limit(1)	Previous Floodway
WaskasooCreek	UpperReach	XS 497	7670	875.88	86.00	98.88	Previous Floodway	Previous Floodway
WaskasooCreek	UpperReach	XS 498	7548	875.47	130.60	147.73	Previous Floodway	Previous Floodway
WaskasooCreek	UpperReach	XS 499	7376	875.31	105.70	119.72	Previous Floodway	Previous Floodway
WaskasooCreek	UpperReach	XS 500	7249	875.20	63.29	77.28	Inundation Limit(1)	Previous Floodway
WaskasooCreek	UpperReach	XS 501	7148	875.17	57.36	82.80	Previous Floodway	Previous Floodway
WaskasooCreek	UpperReach	XS 502	7021	875.14	55.73	68.13	Previous Floodway	Previous Floodway
WaskasooCreek	UpperReach	XS 503	6853	875.06	50.61	74.26	Previous Floodway	Main Channel
WaskasooCreek	UpperReach	XS 504	6764	873.54	83.54	98.54	Previous Floodway	Main Channel
WaskasooCreek	UpperReach	XS 505	6736	873.60	90.55	114.62	Previous Floodway	Main Channel
WaskasooCreek	UpperReach	XS 506	6605	873.59	46.20	70.65	Previous Floodway	Main Channel
WaskasooCreek	UpperReach	XS 507	6578	873.57	46.05	74.29	Previous Floodway	Previous Floodway
WaskasooCreek	UpperReach	XS 508	6497	873.57	58.29	73.58	Previous Floodway	Main Channel
WaskasooCreek	UpperReach	XS 509	6369	873.48	188.46	209.10	Previous Floodway	Main Channel
WaskasooCreek	UpperReach	XS 510	6251	871.75	172.17	206.52	Inundation Limit(1)	Main Channel
WaskasooCreek	UpperReach	XS 511	6175	871.81	138.03	169.81	Inundation Limit(1)	Main Channel
WaskasooCreek	UpperReach	XS 512	6071	871.79	123.71	154.09	Inundation Limit(1)	Main Channel
WaskasooCreek	UpperReach	XS 513	5970	871.68	116.72	149.32	Main Channel	Main Channel
WaskasooCreek	UpperReach	XS 514	5812	868.44	112.57	131.78	Inundation Limit(1)	Main Channel
WaskasooCreek	UpperReach	XS 515	5719	867.50	86.35	115.48	Inundation Limit(1)	Inundation Limit(1)
WaskasooCreek	UpperReach	XS 516	5571	867.17	154.76	178.02	Inundation Limit(1)	Inundation Limit(1)
WaskasooCreek	UpperReach	XS 517	5361	866.45	82.39	109.63	Inundation Limit(1)	Inundation Limit(1)
WaskasooCreek	UpperReach	XS 518	5284	866.15	64.76	77.89	Inundation Limit(1)	Inundation Limit(1)
WaskasooCreek	UpperReach	XS 519	5222	865.97	115.84	126.56	Inundation Limit(1)	Previous Floodway
WaskasooCreek	UpperReach	XS 520	5200	865.89	146.65	161.09	Inundation Limit(1)	Main Channel

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
WaskasooCreek	UpperReach	XS 521	5125	865.48	154.57	174.20	Inundation Limit(1)	Inundation Limit(1)
WaskasooCreek	UpperReach	XS 522	5013	864.35	141.69	152.80	Inundation Limit(1)	Inundation Limit(1)
WaskasooCreek	UpperReach	XS 523	4998	864.47	125.28	136.99	Inundation Limit(1)	Inundation Limit(1)
WaskasooCreek	UpperReach	XS 524	4824	863.85	117.28	137.94	Inundation Limit(1)	Main Channel
WaskasooCreek	UpperReach	XS 525	4707	863.63	135.08	149.59	Inundation Limit(1)	Inundation Limit(1)
WaskasooCreek	UpperReach	XS 526	4524	863.47	369.68	392.18	Previous Floodway	Main Channel
WaskasooCreek	UpperReach	XS 527	4472	861.33	333.90	344.65	Inundation Limit(1)	Main Channel
WaskasooCreek	UpperReach	XS 528	4376	860.42	500.68	511.54	Inundation Limit(1)	Main Channel
WaskasooCreek	UpperReach	XS 529	4306	859.58	534.79	542.42	Inundation Limit(1)	Main Channel
WaskasooCreek	UpperReach	XS 530	4243	859.74	597.07	613.85	Inundation Limit(1)	Main Channel
WaskasooCreek	UpperReach	XS 531	4209	859.73	588.35	606.81	Inundation Limit(1)	Main Channel
WaskasooCreek	UpperReach	XS 532	4168	859.71	502.99	523.34	Inundation Limit(1)	Main Channel
WaskasooCreek	UpperReach	XS 533	4120	858.64	459.51	473.74	Inundation Limit(1)	Main Channel
WaskasooCreek	UpperReach	XS 534	4073	858.31	465.26	479.79	Inundation Limit(1)	Main Channel
WaskasooCreek	UpperReach	XS 535	3936	857.99	560.49	583.91	Previous Floodway	Previous Floodway
WaskasooCreek	UpperReach	XS 536	3823	857.91	649.90	666.21	Inundation Limit(1)	Previous Floodway
WaskasooCreek	UpperReach	XS 537	3783	857.77	673.56	692.01	Inundation Limit(1)	Inundation Limit(1)
WaskasooCreek	UpperReach	XS 538	3738	857.63	707.79	732.42	Previous Floodway	Inundation Limit(1)
WaskasooCreek	UpperReach	XS 539	3635	857.41	789.19	810.17	Inundation Limit(1)	Inundation Limit(1)
WaskasooCreek	UpperReach	XS 540	3600	857.33	809.36	827.24	Inundation Limit(1)	Previous Floodway
WaskasooCreek	UpperReach	XS 541	3582	857.33	827.11	851.49	Inundation Limit(1)	Inundation Limit(1)
WaskasooCreek	LowerReach	XS 542	3498	857.02	882.08	901.10	Inundation Limit(1)	Previous Floodway
WaskasooCreek	LowerReach	XS 543	3444	856.98	658.17	706.58	Previous Floodway	Previous Floodway
WaskasooCreek	LowerReach	XS 544	3420	856.84	616.51	671.51	Previous Floodway	Previous Floodway
WaskasooCreek	LowerReach	XS 545	3360	856.78	566.07	607.11	Inundation Limit(1)	Previous Floodway
WaskasooCreek	LowerReach	XS 546	3316	856.54	441.85	491.70	Inundation Limit(1)	Previous Floodway

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
WaskasooCreek	LowerReach	XS 547	3176	856.42	459.10	495.89	Inundation Limit(1)	Previous Floodway
WaskasooCreek	LowerReach	XS 548	3115	856.03	483.25	496.15	Main Channel	Inundation Limit(1)
WaskasooCreek	LowerReach	XS 549	3074	856.04	500.43	547.61	Inundation Limit(1)	Previous Floodway
WaskasooCreek	LowerReach	XS 550	2990	855.96	513.97	592.04	Main Channel	Previous Floodway
WaskasooCreek	LowerReach	XS 551	2835	855.96	506.12	577.15	Previous Floodway	Previous Floodway
WaskasooCreek	LowerReach	XS 552	2754	855.88	469.63	532.06	Previous Floodway	Inundation Limit(1)
WaskasooCreek	LowerReach	XS 553	2662	855.77	484.43	508.44	Inundation Limit(1)	Inundation Limit(1)
WaskasooCreek	LowerReach	XS 554	2558	855.70	447.33	490.95	Inundation Limit(1)	Inundation Limit(1)
WaskasooCreek	LowerReach	XS 555	2476	855.54	472.86	501.73	Inundation Limit(1)	Previous Floodway
WaskasooCreek	LowerReach	XS 556	2460	855.52	503.39	532.39	Inundation Limit(1)	Previous Floodway
WaskasooCreek	LowerReach	XS 557	2340	855.39	479.23	529.18	Previous Floodway	Previous Floodway
WaskasooCreek	LowerReach	XS 558	2209	855.27	464.66	530.93	Inundation Limit(1)	Inundation Limit(1)
WaskasooCreek	LowerReach	XS 559	2095	855.13	491.27	519.83	Previous Floodway	Previous Floodway
WaskasooCreek	LowerReach	XS 560	2014	855.07	477.53	521.01	Previous Floodway	Previous Floodway
WaskasooCreek	LowerReach	XS 561	1996	855.03	484.62	525.62	Previous Floodway	Previous Floodway
WaskasooCreek	LowerReach	XS 562	1935	854.99	482.91	515.18	Previous Floodway	Inundation Limit(1)
WaskasooCreek	LowerReach	XS 563	1825	854.93	435.68	498.76	Previous Floodway	Inundation Limit(1)
WaskasooCreek	LowerReach	XS 564	1700	854.88	389.81	438.52	Previous Floodway	Previous Floodway
WaskasooCreek	LowerReach	XS 565	1605	854.77	381.67	428.04	Previous Floodway	Previous Floodway
WaskasooCreek	LowerReach	XS 566	1490	854.69	347.31	404.90	Previous Floodway	Previous Floodway
WaskasooCreek	LowerReach	XS 567	1426	854.61	343.71	388.46	Previous Floodway	Inundation Limit(1)
WaskasooCreek	LowerReach	XS 568	1380	854.62	331.78	362.26	Previous Floodway	Inundation Limit(1)
WaskasooCreek	LowerReach	XS 569	1357	854.48	340.60	356.92	Inundation Limit(1)	Inundation Limit(1)
WaskasooCreek	LowerReach	XS 570	1304	854.27	317.17	343.61	Inundation Limit(1)	Previous Floodway
WaskasooCreek	LowerReach	XS 571	1262	854.23	287.49	328.36	Previous Floodway	Previous Floodway
WaskasooCreek	LowerReach	XS 572	1245	854.30	365.05	405.35	Previous Floodway	Previous Floodway

Table 5: Floodway Extents and Determination Criteria

River	Reach	Cross Section	River Station	Design Flood Level (m)	Selected Floodway Extents		Determination Criteria	
					Left (m)	Right (m)	Left	Right
WaskasooCreek	LowerReach	XS 573	1195	854.23	344.97	390.39	Previous Floodway	Inundation Limit(1)
WaskasooCreek	LowerReach	XS 574	1094	854.13	312.38	343.95	Inundation Limit(1)	Inundation Limit(1)
WaskasooCreek	LowerReach	XS 575	995	854.03	216.21	288.08	Inundation Limit(1)	Inundation Limit(1)
WaskasooCreek	LowerReach	XS 576	969	854.04	202.13	268.41	Inundation Limit(1)	Inundation Limit(1)
WaskasooCreek	LowerReach	XS 577	911	853.99	177.24	222.20	Inundation Limit(1)	Inundation Limit(1)
WaskasooCreek	LowerReach	XS 578	844	853.91	157.82	175.40	Previous Floodway	Previous Floodway
WaskasooCreek	LowerReach	XS 579	827	853.88	154.08	171.83	Inundation Limit(1)	Previous Floodway
WaskasooCreek	LowerReach	XS 580	699	853.81	121.56	152.27	Previous Floodway	Inundation Limit(1)
WaskasooCreek	LowerReach	XS 581	616	853.79	106.23	155.05	Previous Floodway	Inundation Limit(1)
WaskasooCreek	LowerReach	XS 582	589	853.72	158.10	180.16	Previous Floodway	Inundation Limit(1)
WaskasooCreek	LowerReach	XS 583	558	853.72	158.38	194.19	Previous Floodway	Previous Floodway
WaskasooCreek	LowerReach	XS 584	499	853.71	158.71	198.59	Previous Floodway	Previous Floodway
WaskasooCreek	LowerReach	XS 585	380	853.72	135.70	199.46	Previous Floodway	Previous Floodway
WaskasooCreek	LowerReach	XS 586	301	853.72	120.31	176.86	Previous Floodway	Previous Floodway
WaskasooCreek	LowerReach	XS 587	220	853.70	93.37	131.76	Previous Floodway	Previous Floodway
WaskasooCreek	LowerReach	XS 588	165	853.71	57.75	120.49	Previous Floodway	Inundation Limit(2)
WaskasooCreek	LowerReach	XS 589	143	853.70	n/a	112.64	n/a	Inundation Limit(2)
WaskasooCreek	LowerReach	XS 590	63	853.70	n/a	162.21	n/a	Inundation Limit(2)

Note:
(1) Previous floodway is outside the inundation limit or interior edge of inundation.
(2) No viable flood fringe or interior flood fringe

4.0 DESIGN FLOOD HAZARD MAP PRODUCTION

4.1 Flood Mapping Methodology

Floodway criteria and flood hazard maps were prepared using a methodology similar to that for the flood inundation maps described in a separate Golder report (2022). The inundation extents were derived based on the following information:

- Simulated water levels at individual cross sections for the design flood event (i.e., 100-year open water flood event);
- Locations and extents of individual cross sections;
- LiDAR DTM; and
- Information about permanent flood control structures.

Additional information used to determine the floodway and flood fringe were added to the floodway criteria maps. On the flood hazard maps, the inundation extents of the design flood event are broken down into floodway, flood fringe, high hazard flood fringe, and protected flood fringe.

4.2 Floodway Criteria Maps

Floodway criteria maps are a tool for determining the floodway and flood fringe extents for the design flood and documenting the results of floodway delineation. The open water floodway criteria maps include the following information:

- The extent of the 100-year open water design flood.
- Areas meeting or exceeding the 1 m depth floodway determination criterion for the design flood.
- The location and extent of all cross sections used in the HEC-RAS model with appropriate labels.
- The locations along each model cross section where velocities are calculated to meet the 1 m/s velocity floodway determination criterion.
- The locations of the main channel top of bank along each model cross section.
- The proposed floodway boundary, as well as the associated floodway stations corresponding to the floodway determination criteria.
- The previously-mapped floodway boundary (where it exists).
- Background aerial imagery collected during the study.
- Roads, bridges, and flood control structures.

The floodway criteria maps were produced using the same layout and scale as the inundation maps. The maps are provided in Appendix A.

4.3 Flood Hazard Maps

The flood hazard maps show the floodway and flood fringe, including the high hazard flood fringe and protected flood fringe areas, for the design flood event. These maps have been developed in accordance with applicable provincial standards. The extent of the flood fringe includes all directly inundated areas outside the floodway at open water design flood levels, and may include high hazard flood fringe or protected flood fringe areas. The floodway shown was determined based on the floodway criteria. All areas within the floodway boundary are shown as part of the floodway, even if the water levels of the design flood would not indicate a location as inundated (i.e., “islands” within the floodway shown on the floodway criteria maps are not present on the flood hazard maps).

The flood hazard maps were produced using the same layout and scale as the inundation maps. The maps are provided in Appendix B.

The following sections provide additional information on the areas within the study area that would be located within the floodway and flood fringe.

4.3.1 Areas in the Floodway

The following areas are located in the open water floodway:

- The main channels of the Red Deer River, and Waskasoo and Piper Creeks.
- Along the Red Deer River:
  - Parts of the Red Deer Golf and Country Club, south of Fountain Drive;
  - Parts of Lions Campground on Riverside Drive;
  - Parts of McKenzie Trails Recreation Area downstream of the 67th Street (David Thompson Highway) Bridge, and parts of the Three Mile Bend recreation area approximately 1.3 km upstream of the Red Deer Wastewater Treatment Plant.
- Along Waskasoo Creek:
  - Farmland on both sides of the creek for approximately 1.9 km downstream from the upstream end of the main channel;
  - Farmland upstream of the Highway 42 Bridge;
  - Farmland approximately 750 m upstream of the Township Road 372 Bridge;
  - Farmland upstream of the CP rail bridge; and
  - Portions of Barrett Park adjacent to the river from 44 Street to the Ross Street Bridges.
- Along Piper Creek:
  - Small areas of farmland upstream of Range Road 272 Bridge.

4.3.2 Areas in the Flood Fringe

The following areas are located in the flood fringe:

- Larger areas of flood fringe along the Red Deer River that are not high hazard are rare. Notable exceptions include farmland at SE 2-39-27 W4M and SW 1-39-27 W4M, as well as farmland at NW 6-39-26 W4M.
- Large portions of the Waskasoo Creek floodplain on both sides of the creek, including farmland (especially between the upstream end of the study area and Township Road 372 Bridge as well as upstream of the CP Rail Bridge), properties Downtown near Safeway from the creek to 47 Street, Rotary Park, Barrett Park, and Coronation Park.
- Large portions of the Piper Creek floodplain on both sides of the creek between the upstream end of the study area and Range Road 272 Bridge.

The following areas are located in the high hazard flood fringe:

- On the Red Deer River:
  - Farmland on the right downstream bank, approximately 300 m from the upstream study boundary;
  - Farmland on the right bank, approximately 700m upstream from the CP Rail Bridge;
  - Parts of Maskepetoon Park, Heritage Ranch and Bower Ponds Recreation Area;
  - Great West Adventure Park in Riverside Meadows;
  - Gaetz Park and the Lions Campground downstream of the Gaetz Avenue Bridge;
  - A number of residential properties in the McKenzie Park area and several residential properties in the Waskasoo neighbourhood.
  - McKenzie Trails Recreation Area and the City of Red Deer Parks Nursery downstream of the 67 Avenue Bridge;
  - Three Mile Bend Recreation Area;
  - Riverbend Golf and Recreation Area; and
  - Farmland at NW 6-39-26 W4M.
- Areas of high hazard flood fringe are rare on Waskasoo Creek, with the notable exceptions of areas upstream and downstream of 32nd Street Bridge, Waskasoo Park, and Galbraith Park.

The following areas are located in the protected flood fringe.

- On the Red Deer River:
  - The Red Deer Wastewater Treatment Plant.

5.0 DESIGN FLOOD GRIDS

The following GIS data are provided for the floodway criteria and design flood hazard maps:

- floodway and flood fringe polygons;
- floodway limits;
- governing design flood level triangulated irregular network (TIN);
- governing design flood level raster; and
- governing design flood depths raster.

All GIS data are created in ArcGIS 10.7 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)]. All raster files have a spatial resolution of 0.5 m.

The floodway and flood fringe polygons, floodway limits, and raster files are stored in ArcGIS file geodatabases (Version 10.7). The flood level TIN is stored as ArcGIS Terrain dataset in a file geodatabase (Version 10.7).

The flood level data provided as Terrain dataset covers all areas between cross section lines within the study area, including dry areas. The flood level and depths rasters are clipped to the floodway and flood fringe extents.

6.0 CONCLUSIONS

The boundary between the floodway and flood fringe is determined through a floodway delineation process in consideration of various criteria as described in this report.

Where an existing floodway is updated, the 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. Areas behind dedicated flood berms that are not overtopped during the design flood are identified as protected flood fringe.

The results of the flood hazard identification are the delineation of the floodway and flood fringe zones and determination of the design flood water levels. The floodway criteria maps that support the delineation of floodway and flood fringe zones are presented in Appendix A.

The floodway and flood fringe areas are presented in the design flood hazard maps that are presented in Appendix B. Developed areas included in the floodway and flood fringe are described in section 4.3.

Signature Page

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Golder Associates Ltd.

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GOLDER ASSOCIATES LTD

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DATE: _____

PERMIT NUMBER: P005122
The Association of Professional Engineers and Geoscientists of Alberta (APEGA)

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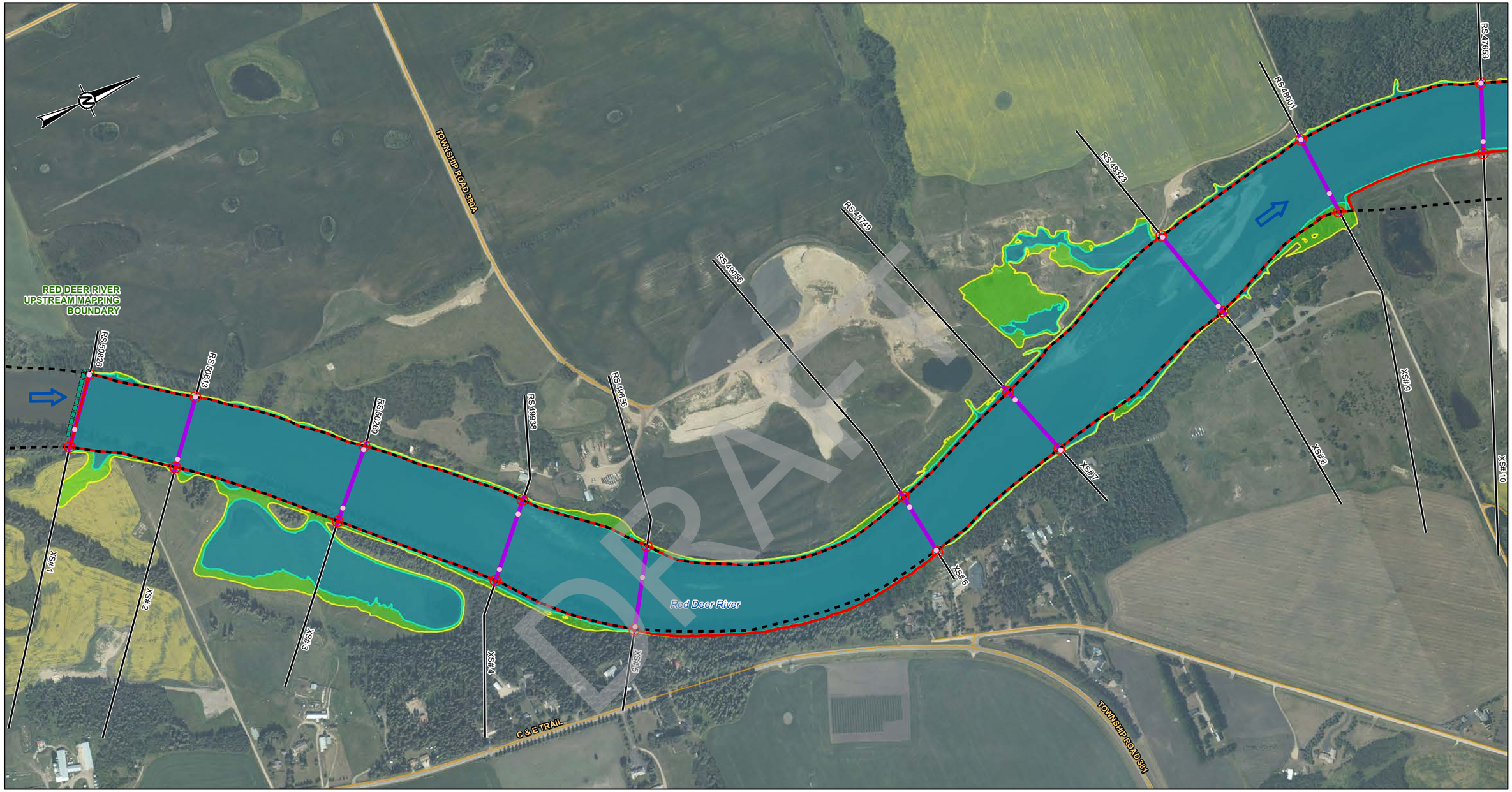
Golder. June 2022. *Red Deer River Hazard Study – Hydraulic Modelling and Flood Inundation Mapping Report*. A final report prepared for Alberta Environment and Parks.

APPENDIX A

Floodway Criteria Maps



SHEET 2 ↓

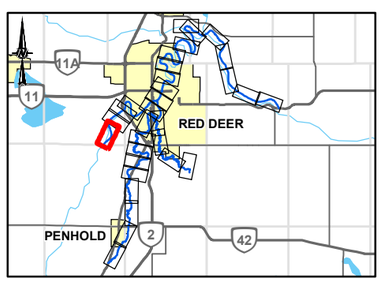
LEGEND

- 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
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

RED DEER RIVER ABOVE WASKASOO CREEK = 1820 M^3/S



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DATUM: NAD 83 CSRS PROJECTION: 3TM 114

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ALBERTA ENVIRONMENT AND PARKS

Alberta Government

CONSULTANT
GOLDER

YYYY-MM-DD	2022-12-07
DESIGNED	PT
PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 1 OF 31

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

25mm

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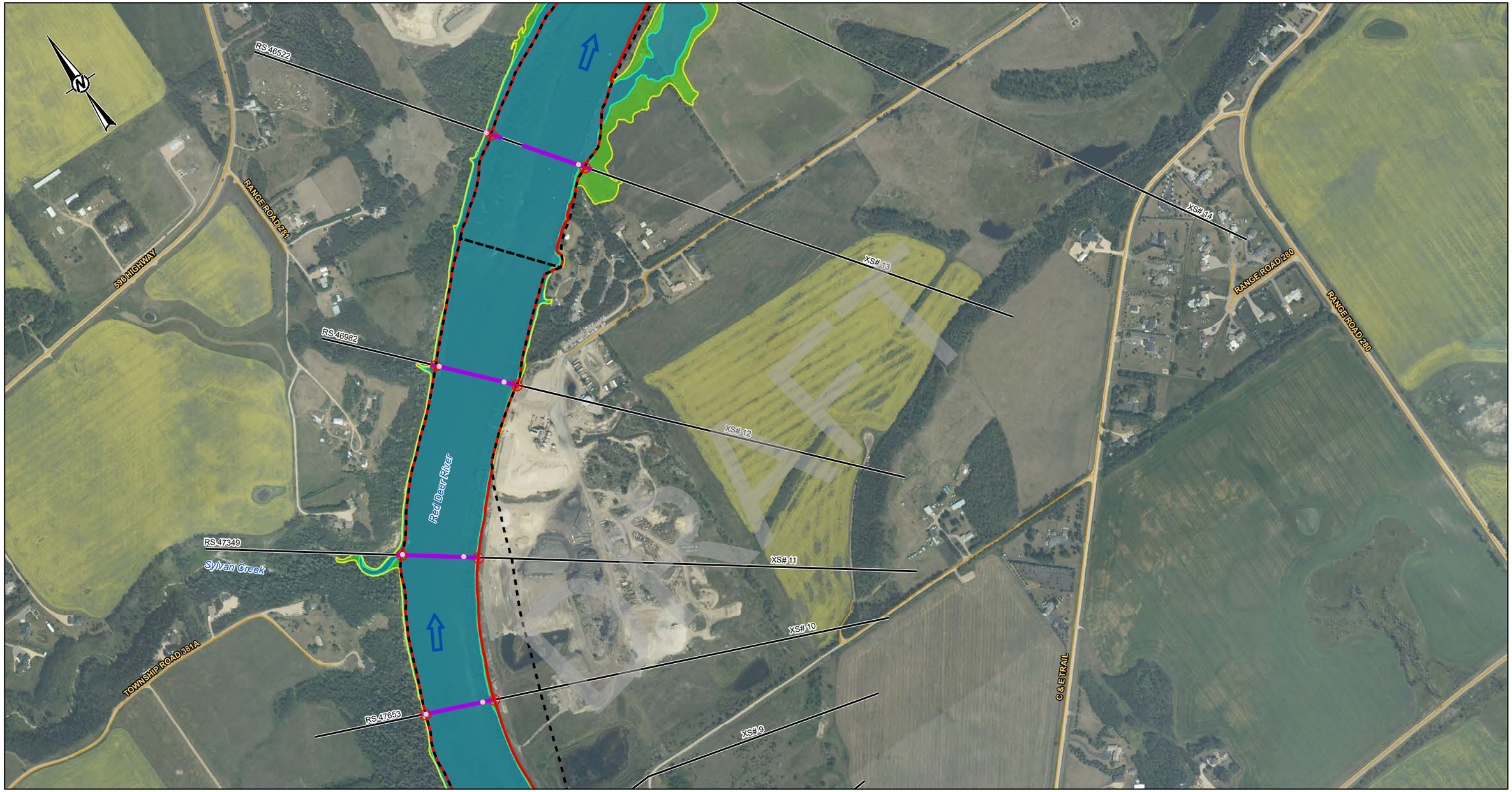
PATH: I:\CLIENT\GOVERNMENT_OF_ALBERTA\21452576_Red_DeerMapping\Products\Hydrology\05_Open Water Flood Hazard Identification\Rev3\1783039_Floodway_Criteria_Rev3.mxd PRINTED ON: 2022-12-07 AT: 8:23:26 AM

SHEET 3 ↑



LEGEND

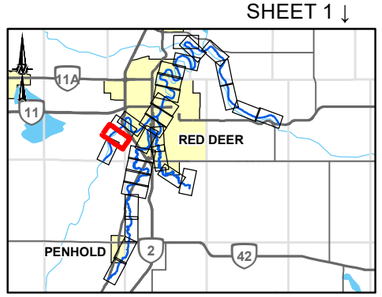
- CROSS SECTION
- *XS# 100* CROSS SECTION NUMBER
- *RS 304* RIVER STATION (M)
- STUDY BOUNDARY
- FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- FLOOD CONTROL STRUCTURE

HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

RED DEER RIVER ABOVE WASKASOO CREEK = 1820 M^3/S

SHEET 1 ↓



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Alberta Government

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GOLDER

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DESIGNED	PT
PREPARED	NB
REVIEWED	GT
APPROVED	DL

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PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 2 OF 31

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

25mm

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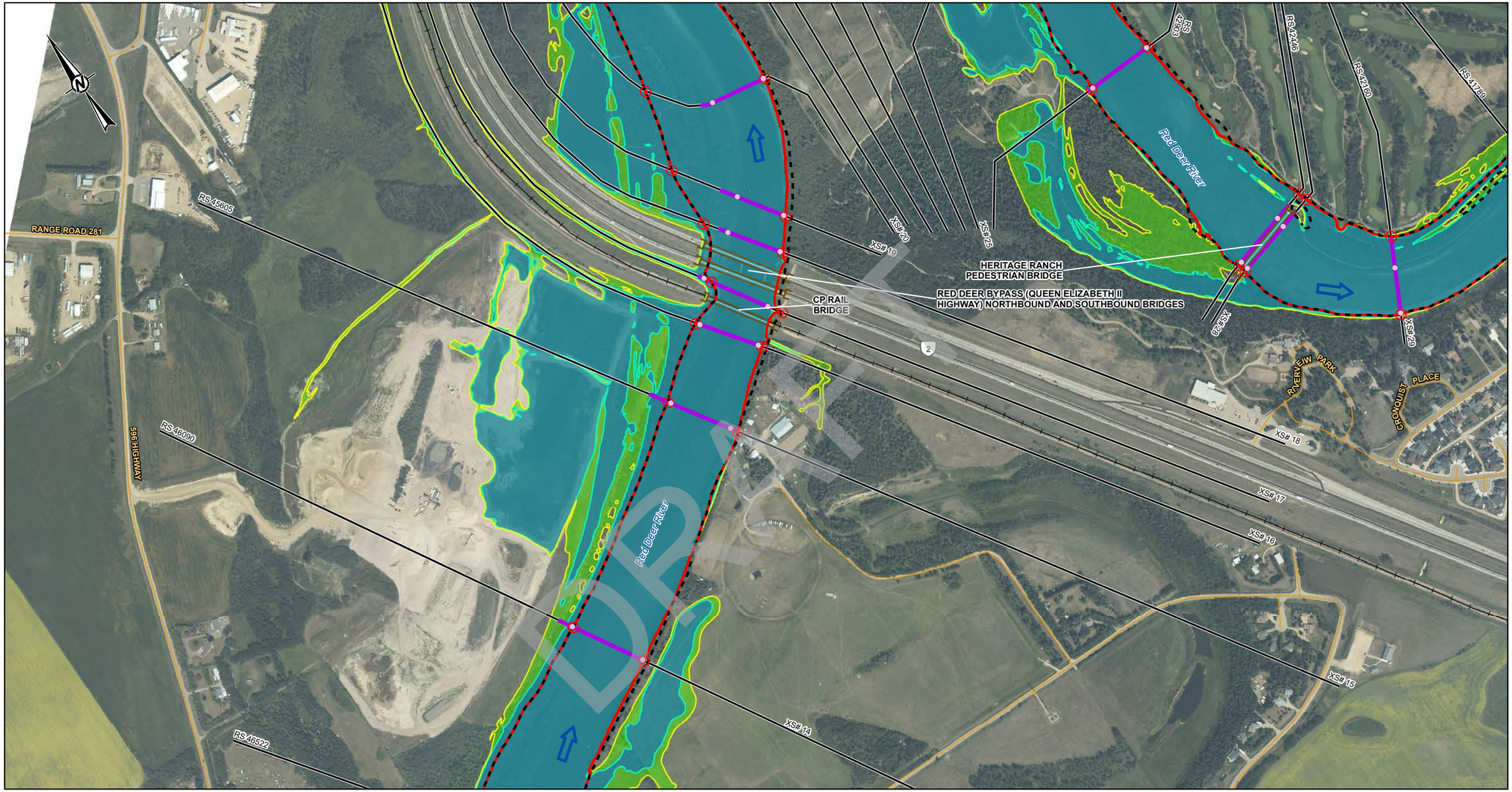
SHEET 4 ↑



LEGEND

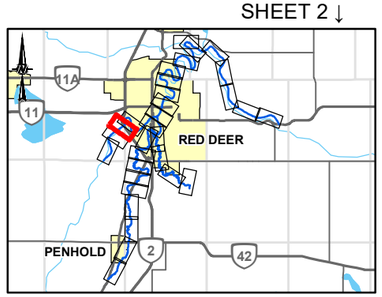
- CROSS SECTION
- *XS# 100* CROSS SECTION NUMBER
- *RS 304* RIVER STATION (M)
- STUDY BOUNDARY
- FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- FLOOD CONTROL STRUCTURE

HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

RED DEER RIVER ABOVE WASKASOO CREEK = 1820 M^3/S

SHEET 2 ↓



0 150 300
1:7,500 METRES

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DESIGNED	PT
PREPARED	NB
REVIEWED	GT
APPROVED	DL

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PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 3 OF 31

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

25mm

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SHEET 5 ↑

ORR DRIVE
OAKLANDS CRESCENT
OAKWOOD CLOSE
OWENS CLOSE
GREEN
ODSTONE
OXBOW STREET
ORESTON CLOSE
OTTERBURY AVENUE
OHIO CLOSE
KERRY WOOD DRIVE
FARRELL AVENUE
FLAGSTAFF CLOSE
FOUNTAIN DRIVE
PARK DRIVE
Red Deer River
RS 45436
RS 45353
RS 45174
RS 45246
RS 44937
RS 44634
RS 43862
RS 41169
RS 43520
RS 43237
RS 42306
RS 42446
RS 42160
RS 41789
RS 41460
RS 41212
RS 40939
RS 40682
RS 45605
XS# 34
XS# 33
XS# 32
XS# 31
XS# 30
XS# 29
XS# 28
XS# 27
XS# 26
XS# 25
XS# 24
XS# 23
XS# 22
XS# 21
XS# 20
XS# 19
XS# 18
HERITAGE RANCH PEDESTRIAN BRIDGE
RED DEER BYPASS (QUEEN ELIZABETH II HIGHWAY) NORTHBOUND AND SOUTHBOUND BRIDGES
CP RAIL BRIDGE

DRAFT

LEGEND

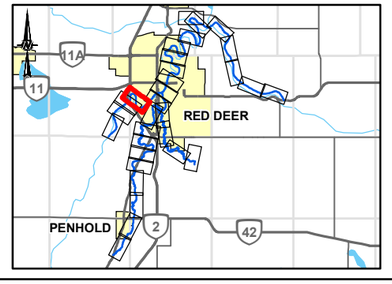
- CROSS SECTION
- *XS# 100* CROSS SECTION NUMBER
- *RS 304* RIVER STATION (M)
- STUDY BOUNDARY
- FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- FLOOD CONTROL STRUCTURE

HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

RED DEER RIVER ABOVE WASKASOO CREEK = 1820 M^3/S

SHEET 3 ↓



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APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 4 OF 31

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

25mm
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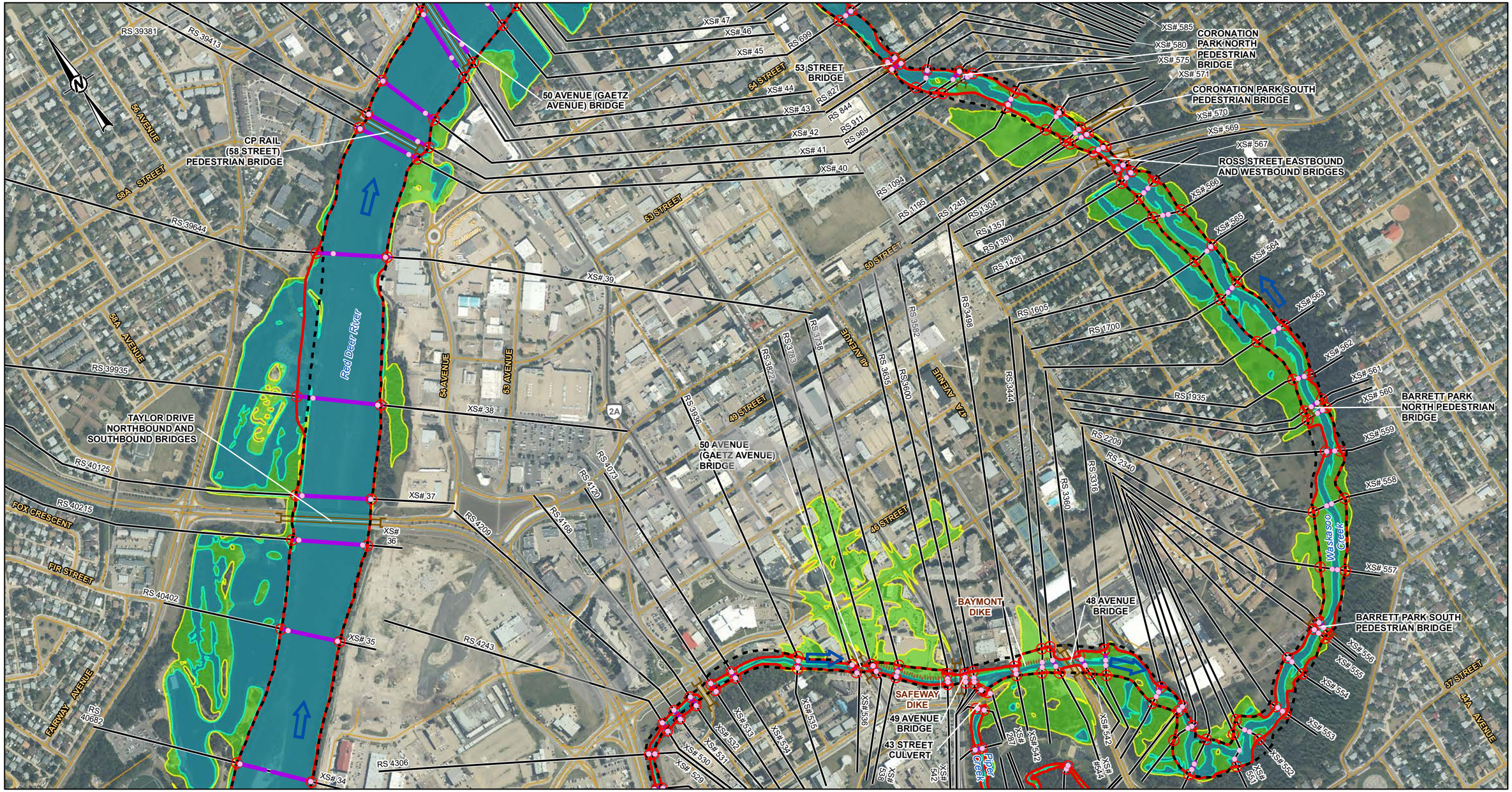
SHEET 6 ↑



SHEET 4, 26 & 30 ↓

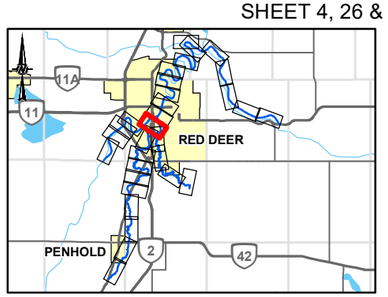
LEGEND

- 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
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

RED DEER RIVER ABOVE WASKASOO CREEK = 1820 M^3/S
WASKASOO CREEK ABOVE PIPER CREEK = 37.1 M^3/S
WASKASOO CREEK BELOW PIPER CREEK = 53.9 M^3/S
PIPER CREEK ABOVE WASKASOO CREEK = 19.3 M^3/S



0 150 300
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PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 5 OF 31

PATH: I:\CLIENTS\GOVERNMENT_OF_ALBERTA\21442576_Red_Deer\Mapping\Products\Hydrology\05_Open Water Flood Hazard Identification\Rev3\1783039_Floodway_Criteria_Rev3.mxd PRINTED ON: 2022-12-07 AT: 8:07:00 AM

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25mm

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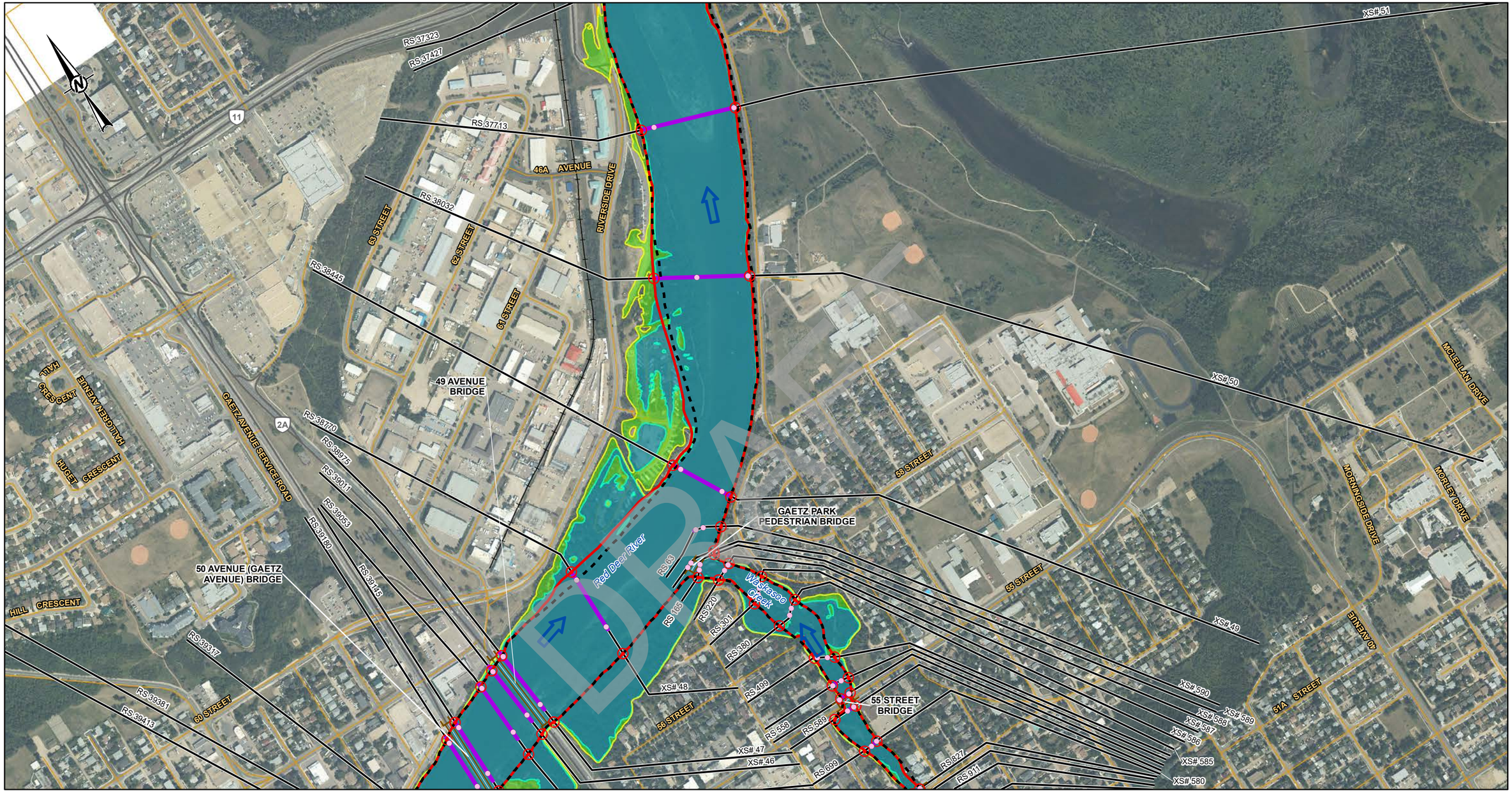
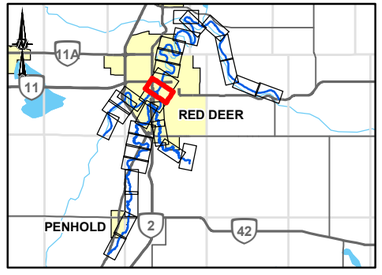
SHEET 7 ↑



SHEET 5 ↓



LEGEND

- 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
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

RED DEER RIVER ABOVE WASKASOO CREEK = 1820 M^3/S
RED DEER RIVER BELOW WASKASOO CREEK = 1870 M^3/S
WASKASOO CREEK BELOW PIPER CREEK = 53.9 M^3/S

0 150 300
1:7,500 METRES

REFERENCE(S)

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Alberta Government

CONSULTANT
GOLDER

YYYY-MM-DD	2022-12-07
DESIGNED	PT
PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 6 OF 31

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

25mm

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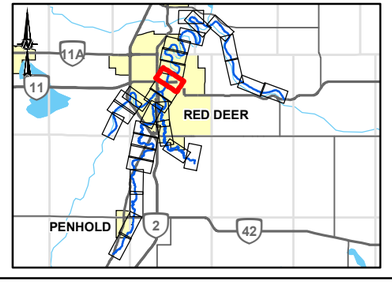
SHEET 8 ↑

SHEET 6 ↓



LEGEND

- 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
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

RED DEER RIVER BELOW WASKASOO CREEK = 1870 M^3/S

0 150 300
1:7,500 METRES

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YYYY-MM-DD	2022-12-07
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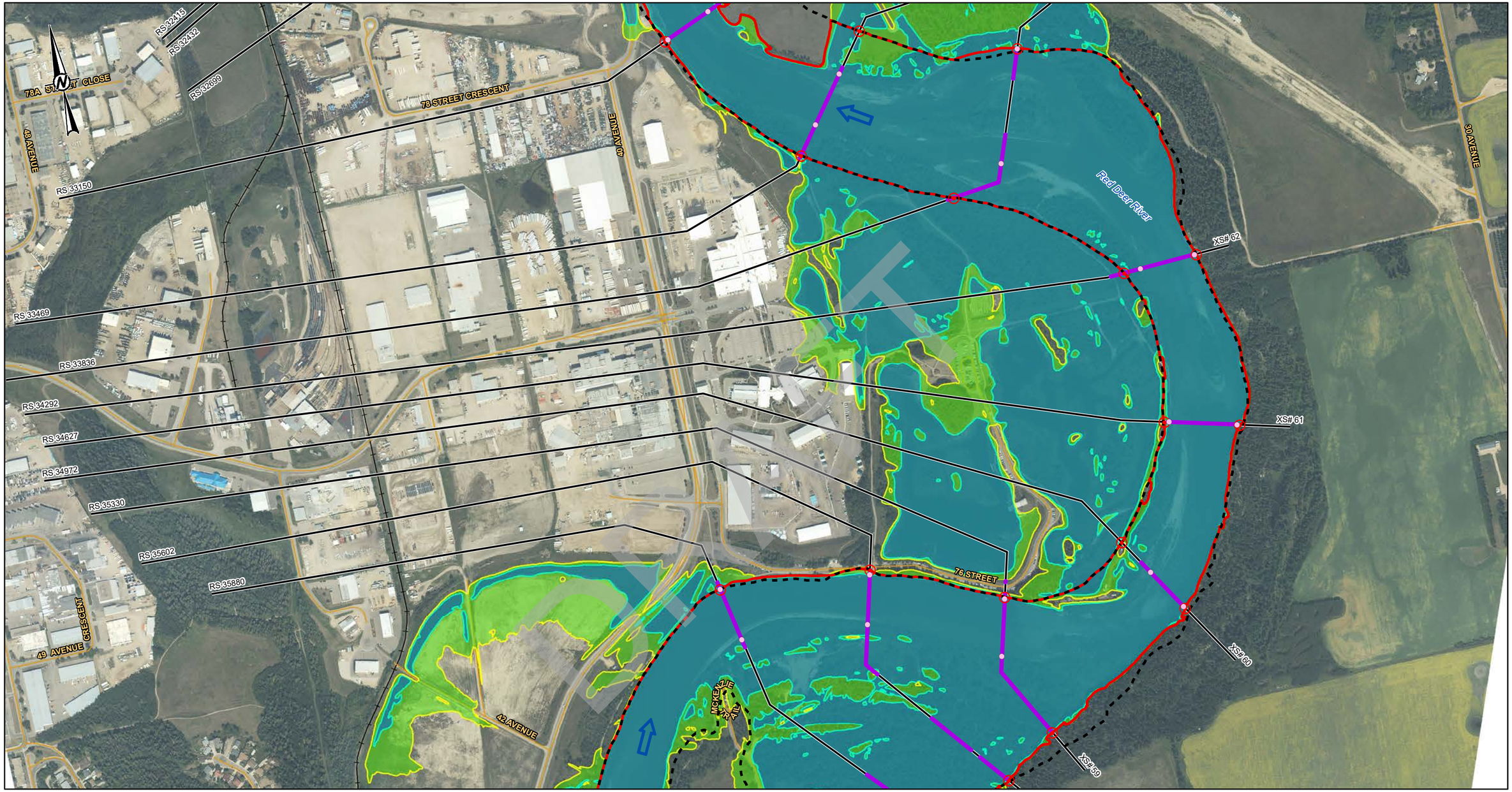
PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 7 OF 31

SHEET 9 ↑



SHEET 7 ↓

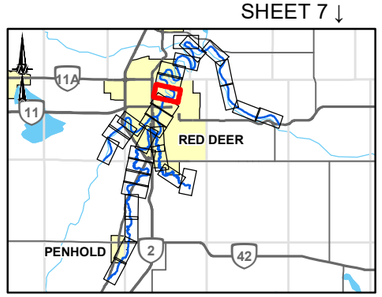
LEGEND

- 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
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

RED DEER RIVER BELOW WASKASOO CREEK = 1870 M^3/S



0 150 300
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YYYY-MM-DD	2022-12-07
DESIGNED	PT
PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 8 OF 31

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

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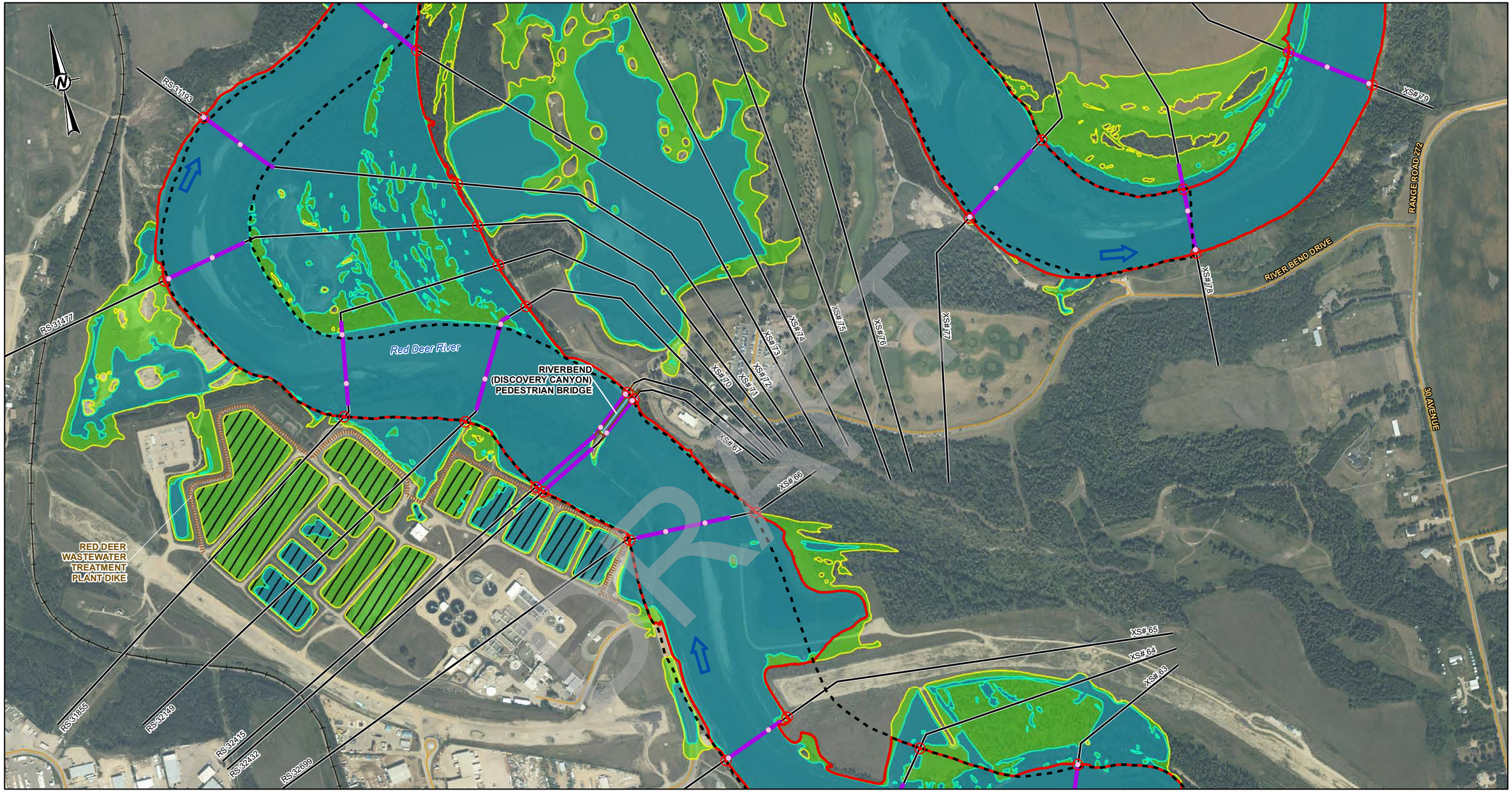
SHEET 10 ↑



LEGEND

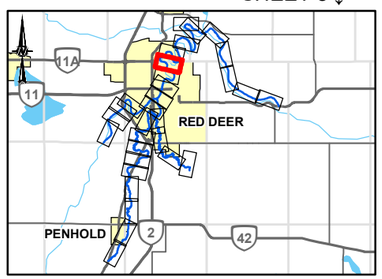
- CROSS SECTION
- *XS# 100* CROSS SECTION NUMBER
- *RS 304* RIVER STATION (M)
- STUDY BOUNDARY
- FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- FLOOD CONTROL STRUCTURE

HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- PROTECTED FLOOD AREA
- VELOCITY ≥ 1 M/S

RED DEER RIVER BELOW WASKASOO CREEK = 1870 M^3/S

SHEET 8 ↓



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Alberta Government

CONSULTANT
GOLDER

YYYY-MM-DD	2022-12-07
DESIGNED	PT
PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 9 OF 31

PATH: I:\CLIENTS\GOVERNMENT_OF_ALBERTA\21462576_Red_Deer\Mapping\Products\Hydrology\05_Open Water Flood Hazard Identification\Rev3\1783039_Floodway_Criteria_Rev3.mxd PRINTED ON: 2023-01-06 AT: 11:00:04 AM

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

25mm

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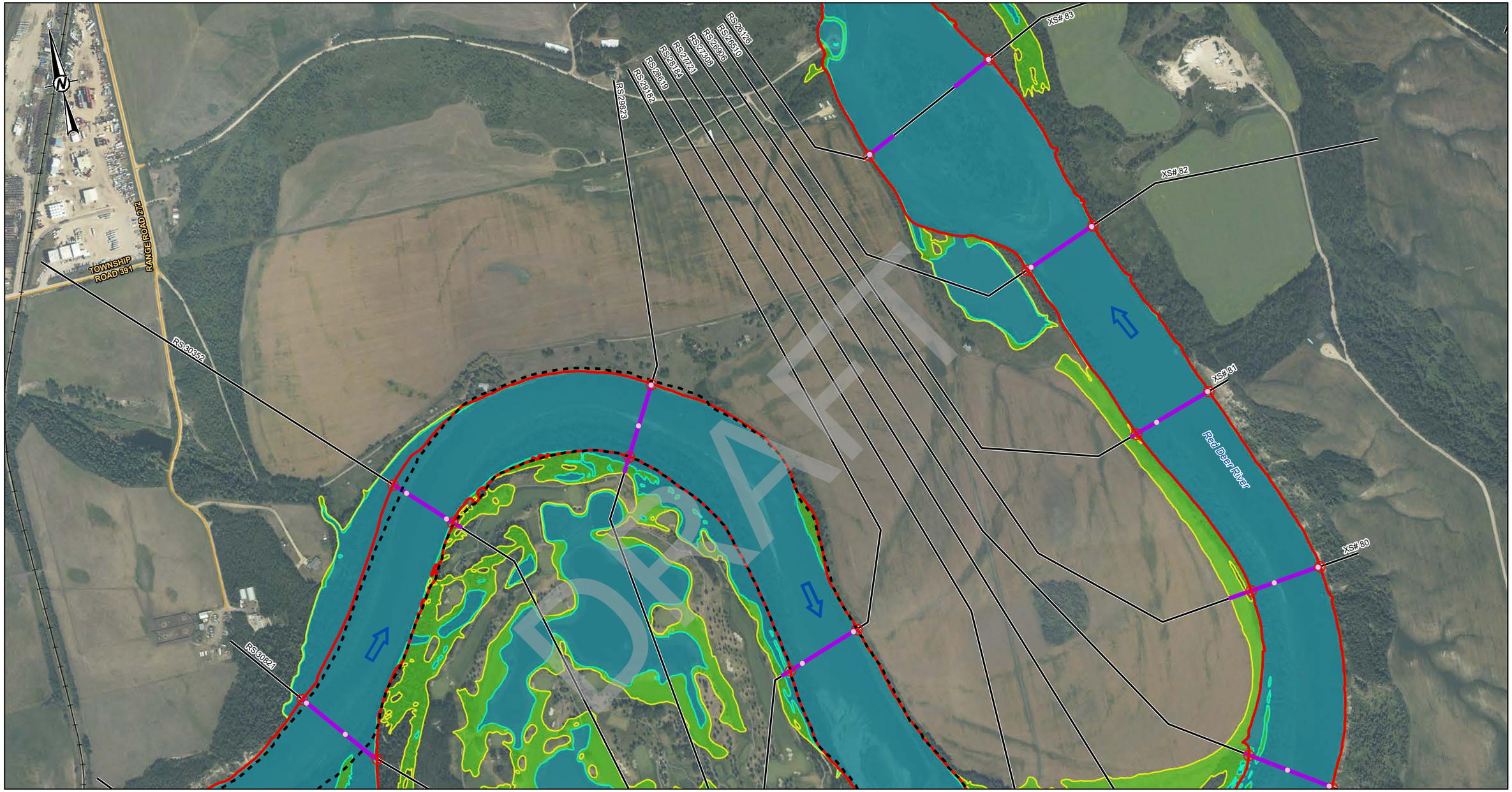
SHEET 11 ↑



LEGEND

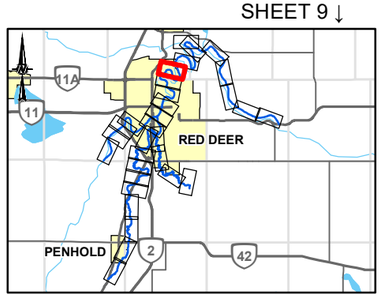
- CROSS SECTION
- *XS# 100* CROSS SECTION NUMBER
- *RS 304* RIVER STATION (M)
- STUDY BOUNDARY
- FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- FLOOD CONTROL STRUCTURE

HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

RED DEER RIVER BELOW WASKASOO CREEK = 1870 M^3/S

SHEET 9 ↓



0 150 300
1:7,500 METRES

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DATUM: NAD 83 CSRS PROJECTION: 3TM 114

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PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

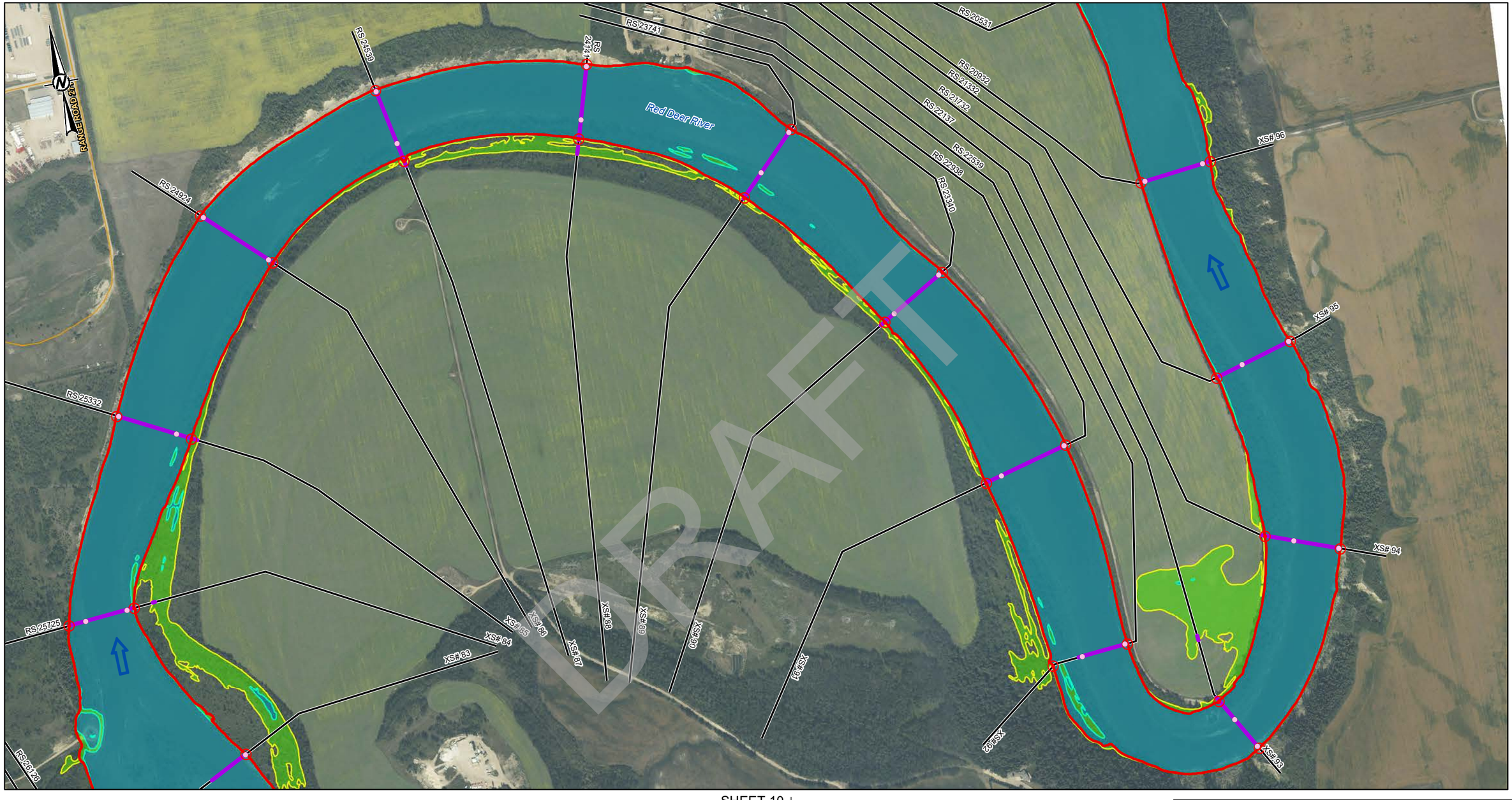
TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 10 OF 31

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

0 25mm

SHEET 12 ↑



LEGEND

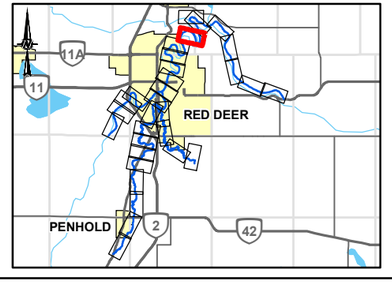
- CROSS SECTION
- XS# 100 CROSS SECTION NUMBER
- RS 304 RIVER STATION (M)
- STUDY BOUNDARY
- FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- FLOOD CONTROL STRUCTURE

HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

RED DEER RIVER BELOW WASKASOO CREEK = 1870 M^3/S

SHEET 10 ↓



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1:7,500 METRES

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APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 11 OF 31

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

25mm

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SHEET 13 ↑

SHEET 14 ↓

BRIGHT CLOSE
BURBANK ROAD
BURBANK PARKWAY
Red Deer River
Blindman River
RANGE ROAD 271

RS 18930
RS 18535
RS 17732
RS 17338
RS 16933
RS 16532
RS 16131
RS 19834
RS 19336
RS 19733
RS 20130
RS 20531

XS# 109
XS# 108
XS# 107
XS# 106
XS# 105
XS# 103
XS# 98
XS# 97
XS# 96

LEGEND

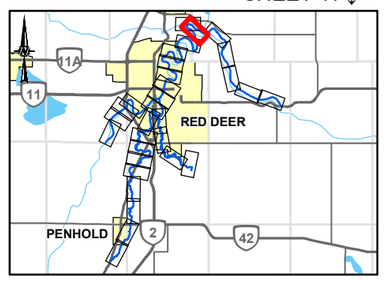
- CROSS SECTION
- XS# 100 CROSS SECTION NUMBER
- RS 304 RIVER STATION (M)
- STUDY BOUNDARY
- FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- FLOOD CONTROL STRUCTURE

HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

RED DEER RIVER BELOW WASKASOO CREEK = 1870 M^3/S
RED DEER RIVER BELOW BLINDMAN RIVER = 2180 M^3/S

SHEET 11 ↓



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PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 12 OF 31

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

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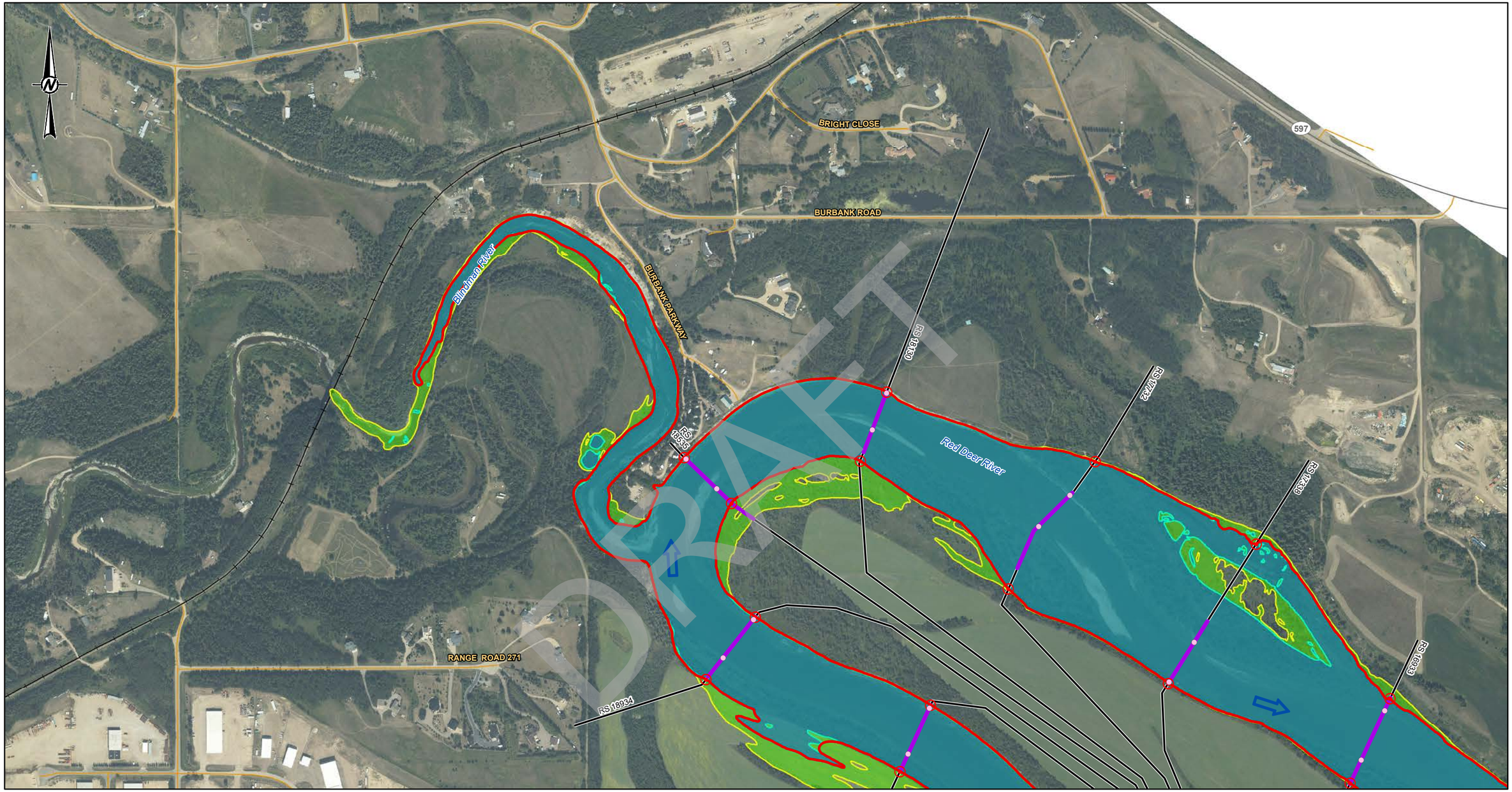


SHEET 14 ↓

LEGEND

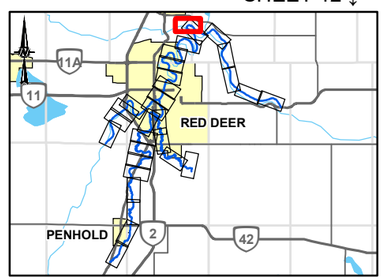
- CROSS SECTION
- *XS# 100* CROSS SECTION NUMBER
- *RS 304* RIVER STATION (M)
- STUDY BOUNDARY
- FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- FLOOD CONTROL STRUCTURE

HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

RED DEER RIVER BELOW WASKASOO CREEK = 1870 M^3/S
RED DEER RIVER BELOW BLINDMAN RIVER = 2180 M^3/S

SHEET 12 ↓



0 150 300
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APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 13 OF 31

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

25mm

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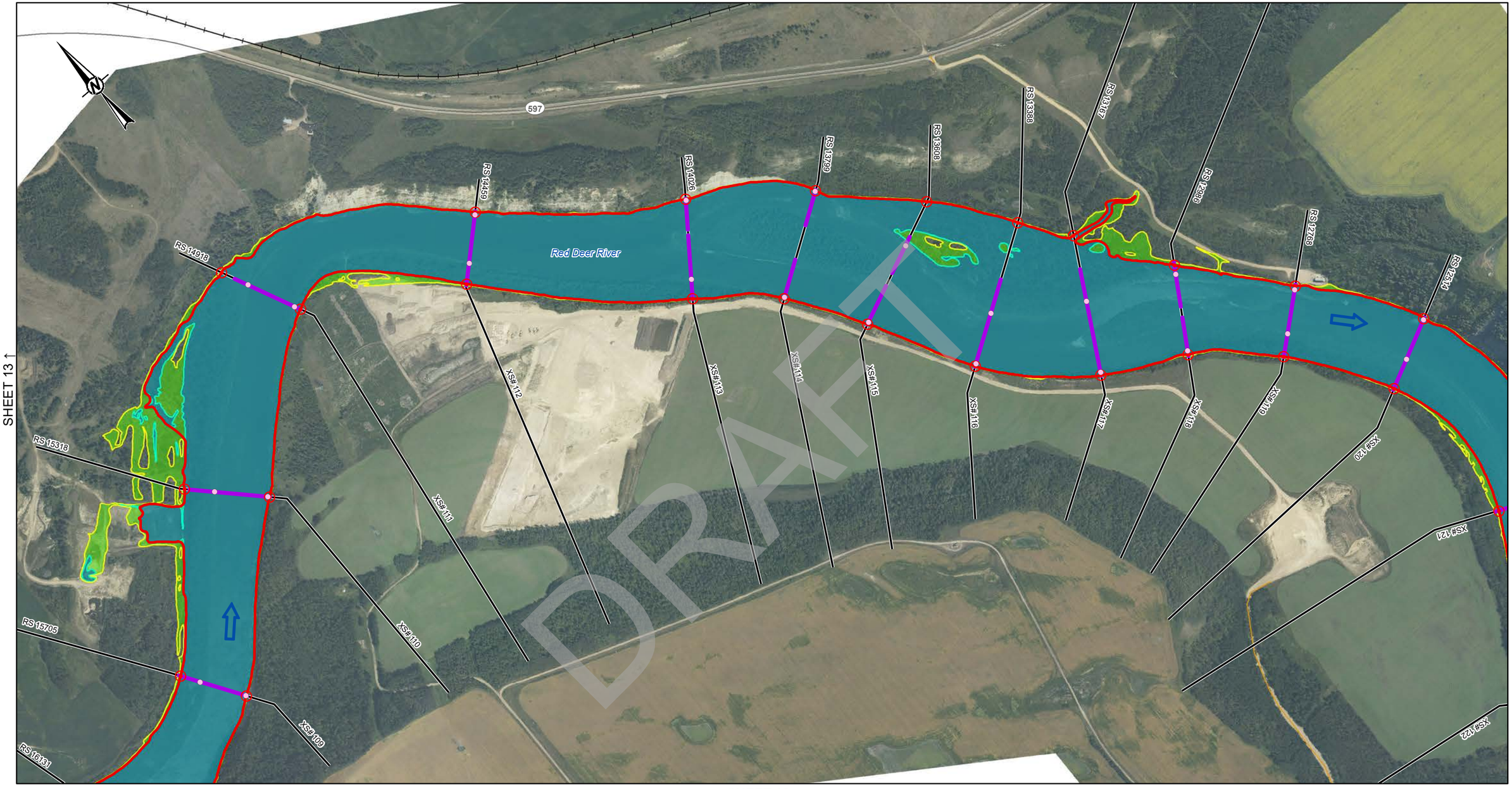


SHEET 13 ↑

SHEET 15 ↓

SHEET 12 ↓

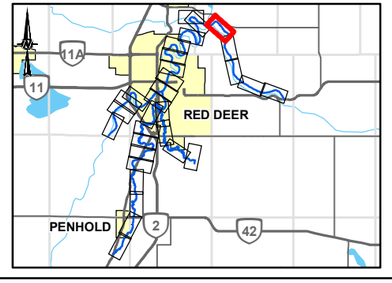
LEGEND

- 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
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

RED DEER RIVER BELOW BLINDMAN RIVER = 2180 M^3/S



0 150 300

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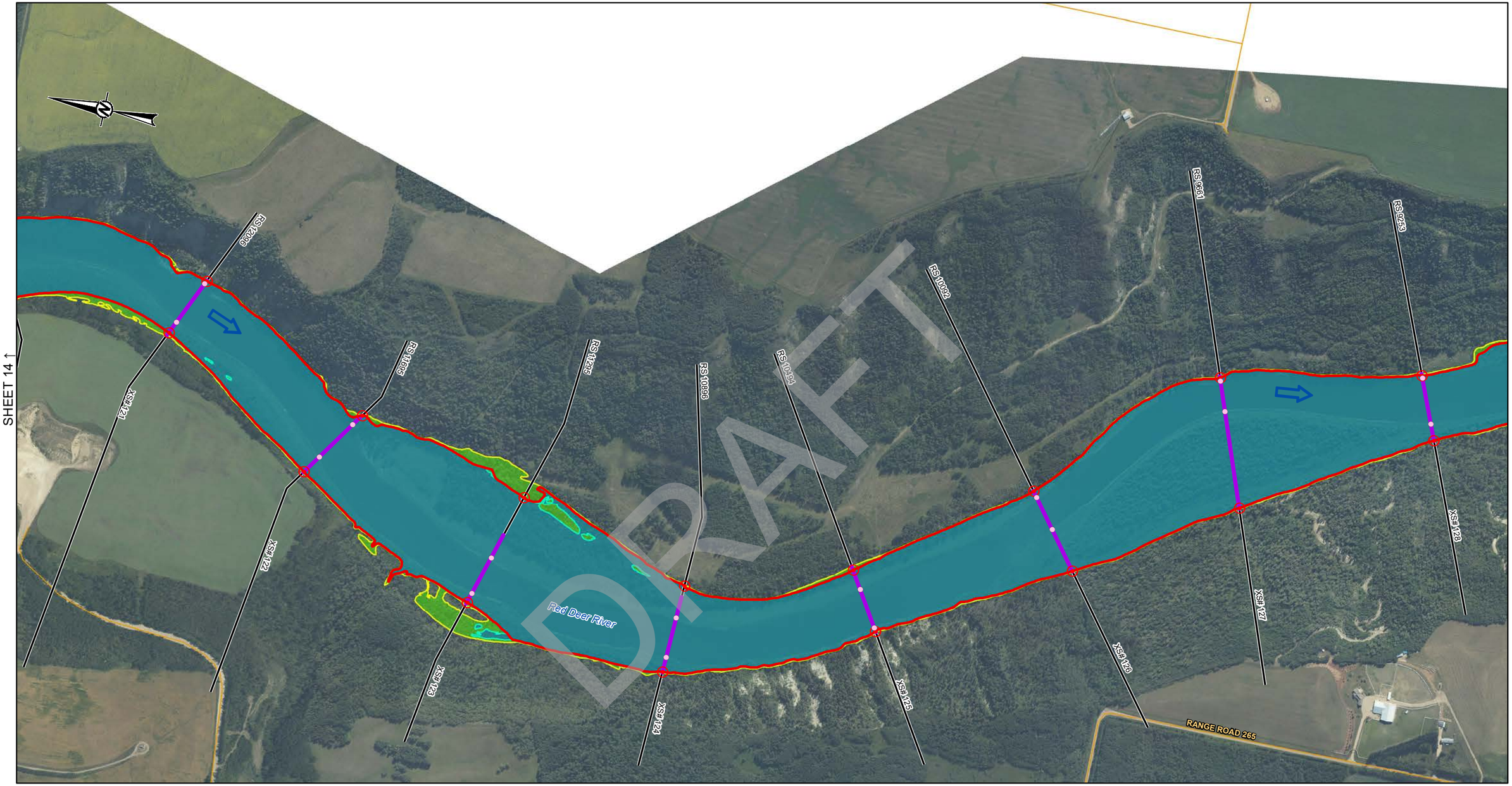
PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 14 OF 31



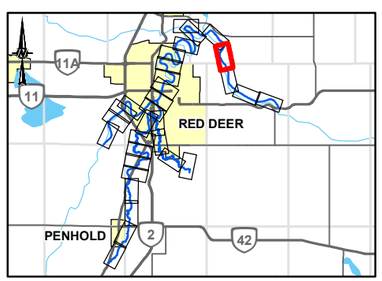
LEGEND

- 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
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

RED DEER RIVER BELOW BLINDMAN RIVER = 2180 M^3/S



0 150 300
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PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 15 OF 31

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

25mm

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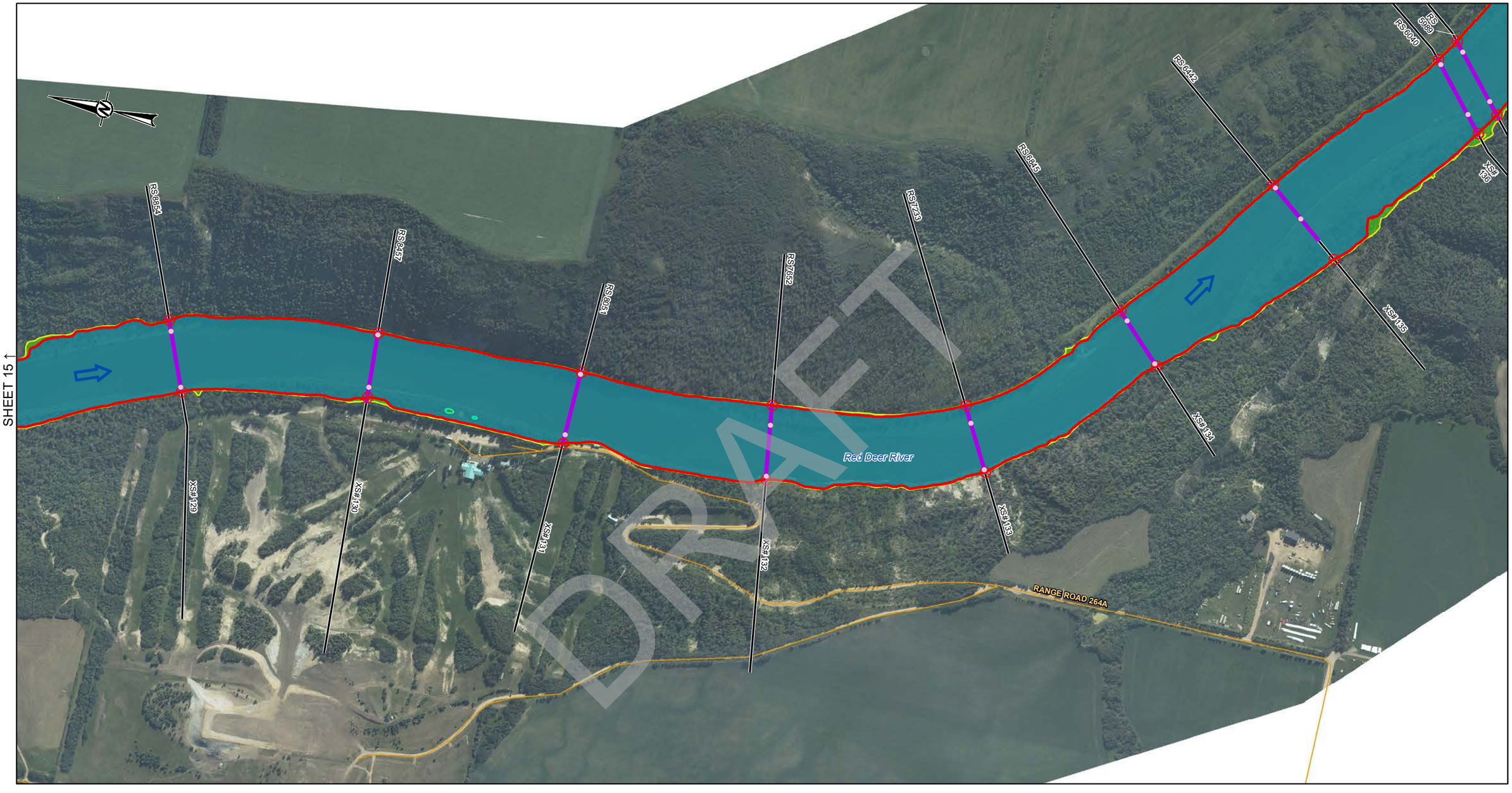


LEGEND

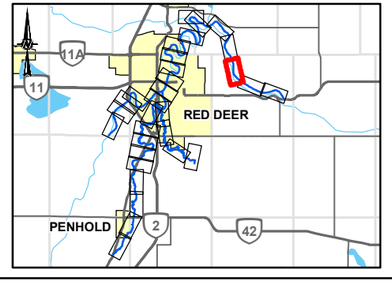
- CROSS SECTION
- *XS# 100* CROSS SECTION NUMBER
- *RS 304* RIVER STATION (M)
- STUDY BOUNDARY
- FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- FLOOD CONTROL STRUCTURE

HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE

- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

RED DEER RIVER BELOW BLINDMAN RIVER = 2180 M^3/S



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PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 16 OF 31

SHEET 16 ↑

SHEET 18 ↓

RS 6040
RS 5938
RS 5641
RS 5241
RS 4845
RS 4471
RS 4035
RS 3639
RS 3240

XS# 136
XS# 137
XS# 138
XS# 139
XS# 140
XS# 141
XS# 142
XS# 143

Red Deer River

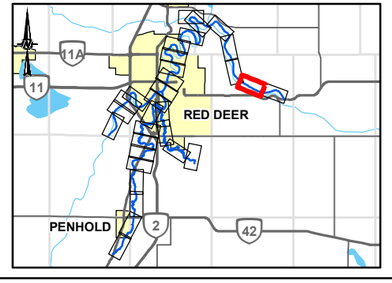
LEGEND

- 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
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

RED DEER RIVER BELOW BLINDMAN RIVER = 2180 M^3/S



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PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 17 OF 31

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

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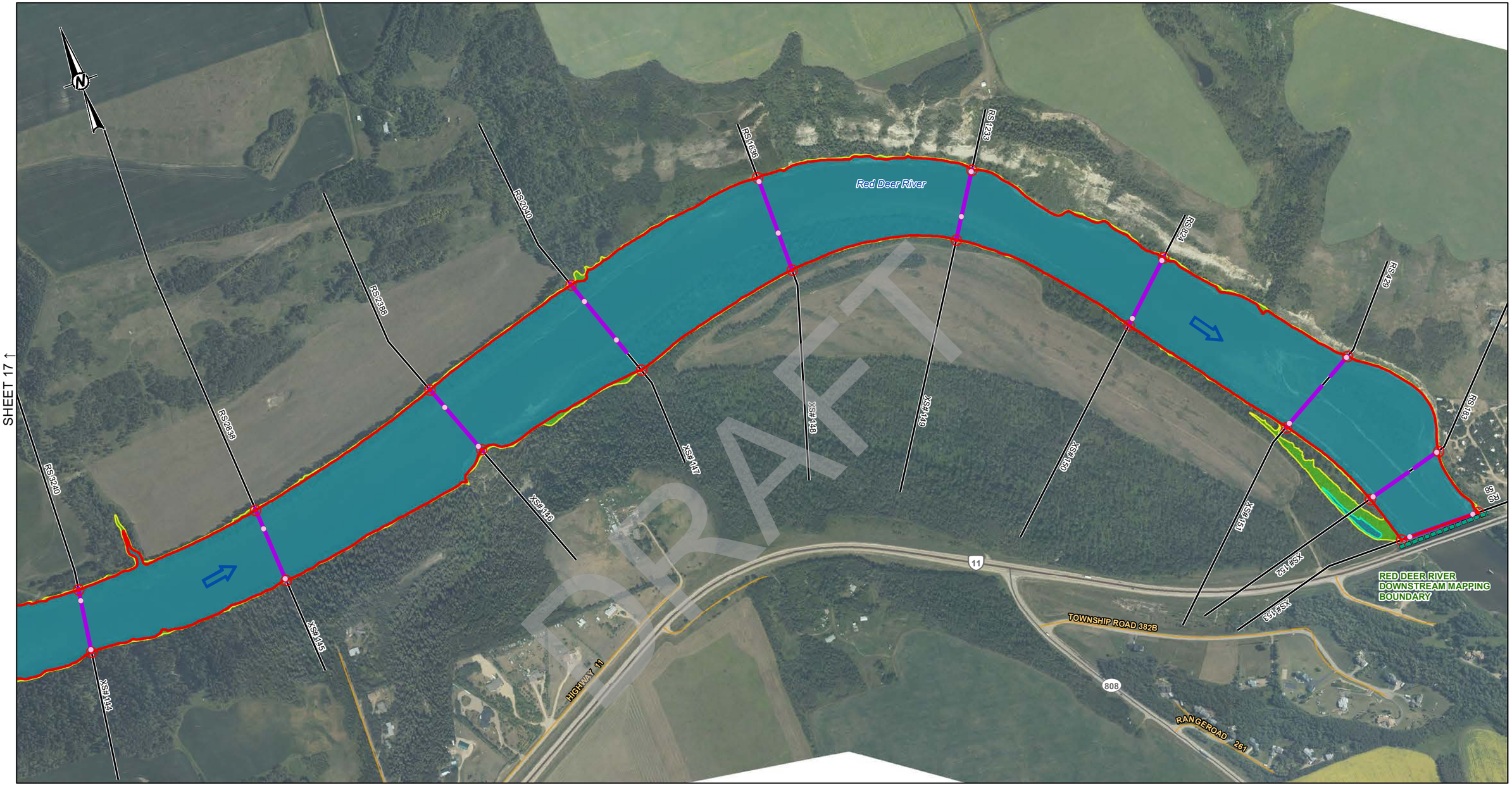
SHEET 17 ↑



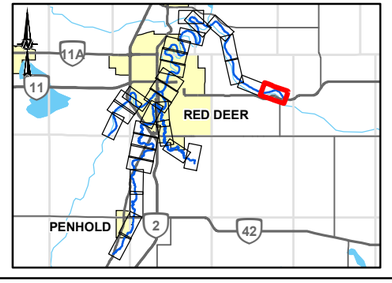
LEGEND

- 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
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

RED DEER RIVER BELOW BLINDMAN RIVER = 2180 M^3/S



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PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 18 OF 31

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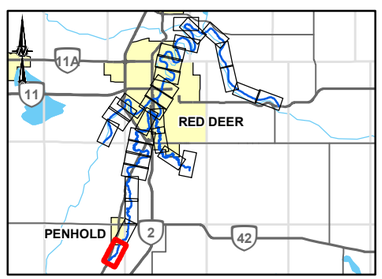
LEGEND

- 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
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

WASKASOO CREEK ABOVE HIGHWAY 42 = 32.1 M^3/S



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REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 19 OF 31

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25mm

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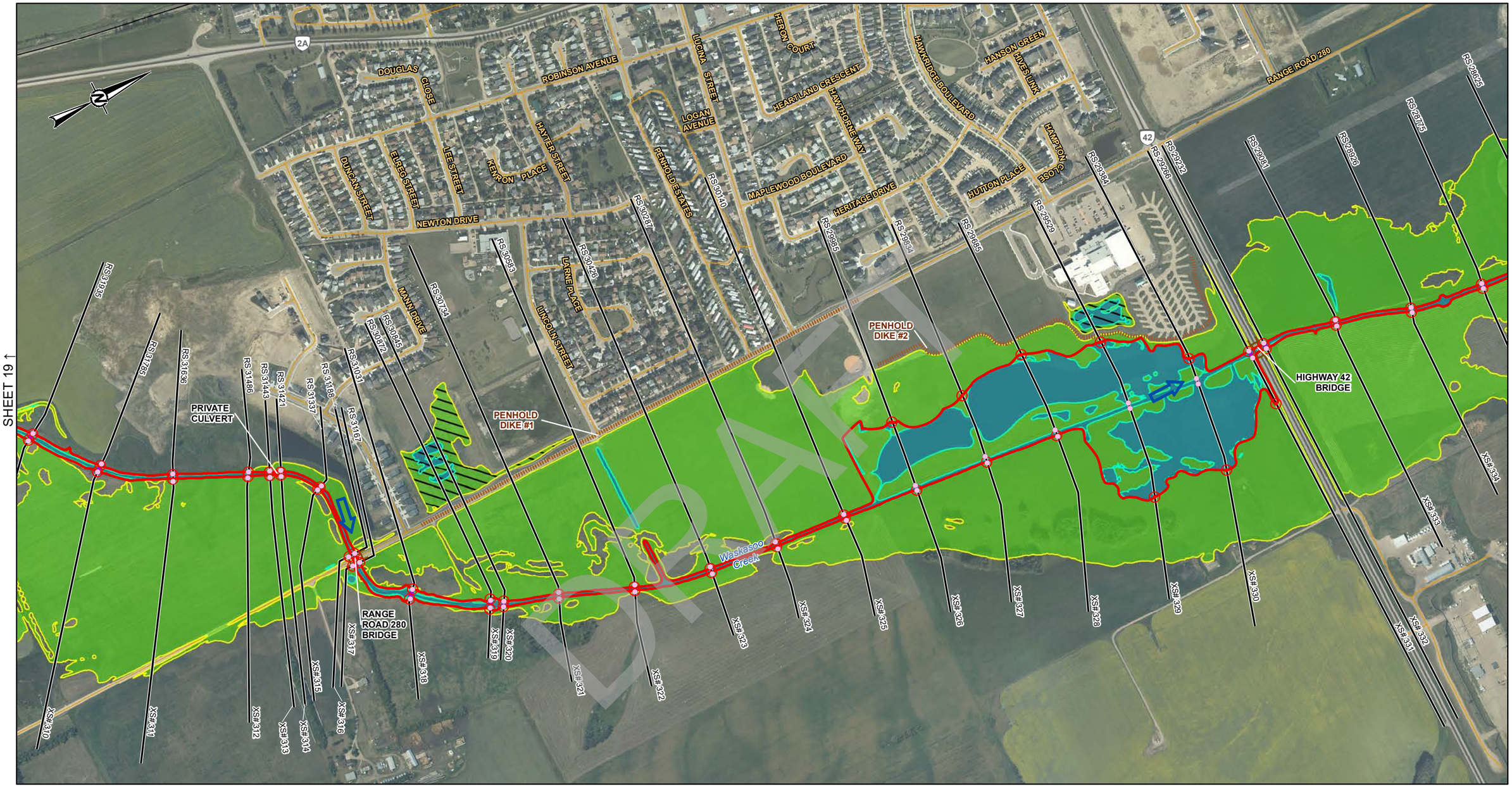


LEGEND

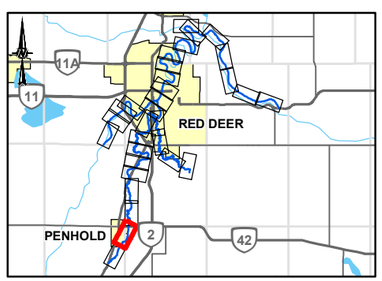
- CROSS SECTION
- *XS# 100* CROSS SECTION NUMBER
- *RS 304* RIVER STATION (M)
- STUDY BOUNDARY
- FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- FLOOD CONTROL STRUCTURE

HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE

- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- PROTECTED FLOOD AREA
- VELOCITY ≥ 1 M/S

WASKASOO CREEK ABOVE HIGHWAY 42 = 32.1 M^3/S
WASKASOO CREEK ABOVE PIPER CREEK = 37.1 M^3/S



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ALBERTA ENVIRONMENT AND PARKS

Alberta Government

CONSULTANT
GOLDER

YYYY-MM-DD	2022-12-07
DESIGNED	PT
PREPARED	NB
REVIEWED	GT
APPROVED	DL

REFERENCE(S)
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DATUM: NAD 83 CSRS PROJECTION: 3TM 114

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 20 OF 31

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

25mm

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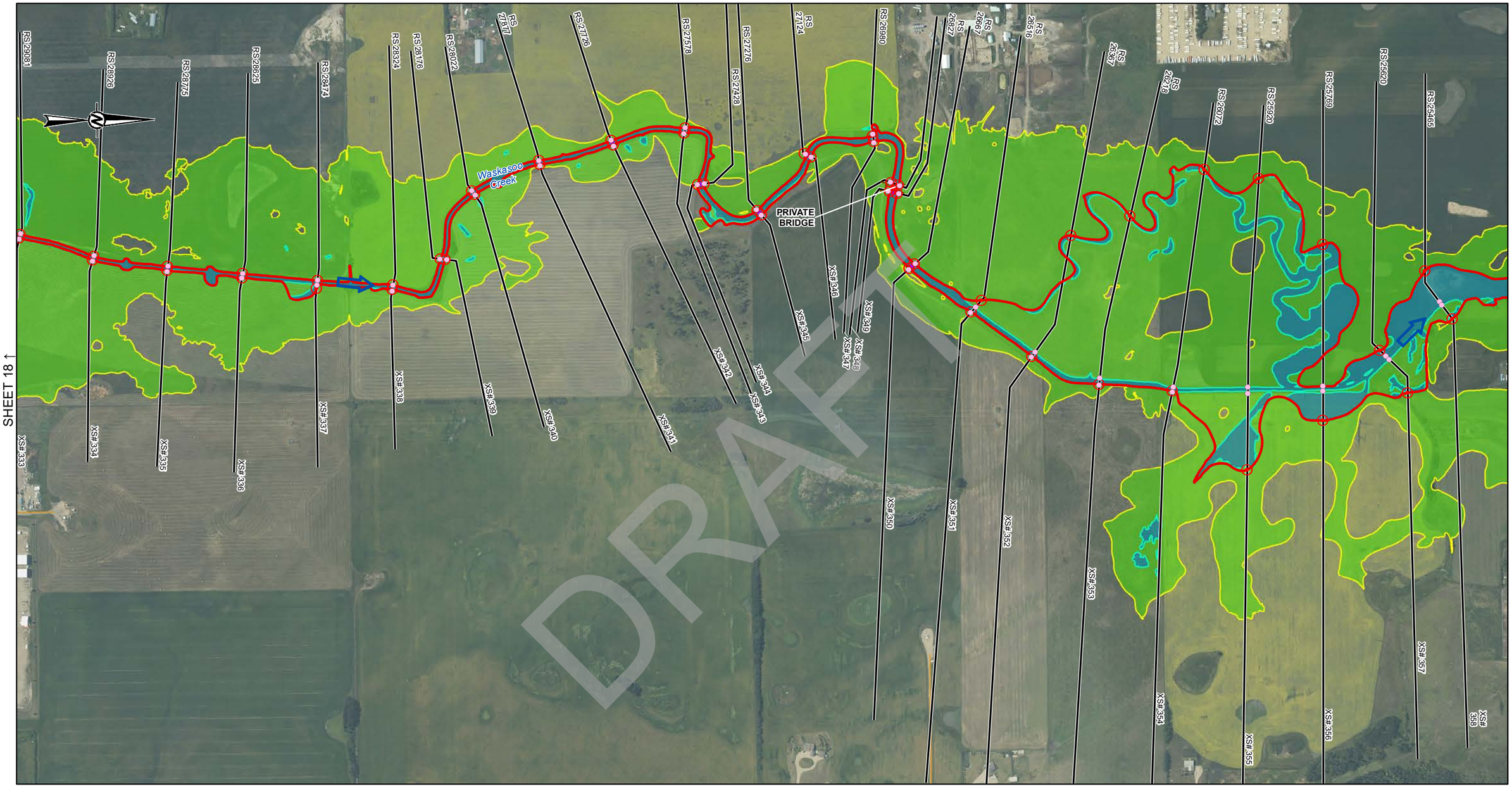
PATH: I:\CLIENT\GOVERNMENT_OF_ALBERTA\21452576_Red_Deer\Mapping\Products\Hydrology\05_Open Water Flood Hazard Identification\Rev3\1783039_Floodway_Criteria_Rev3.mxd PRINTED ON: 2023-01-06 AT: 11:43:09 AM



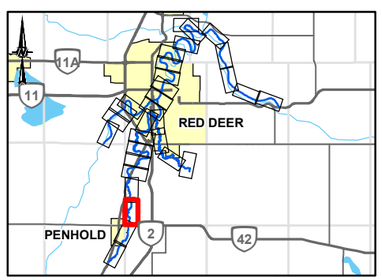
LEGEND

- 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
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

WASKASOO CREEK ABOVE PIPER CREEK = 37.1 M^3/S



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GOLDER

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DESIGNED	PT
PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 21 OF 31

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

25mm

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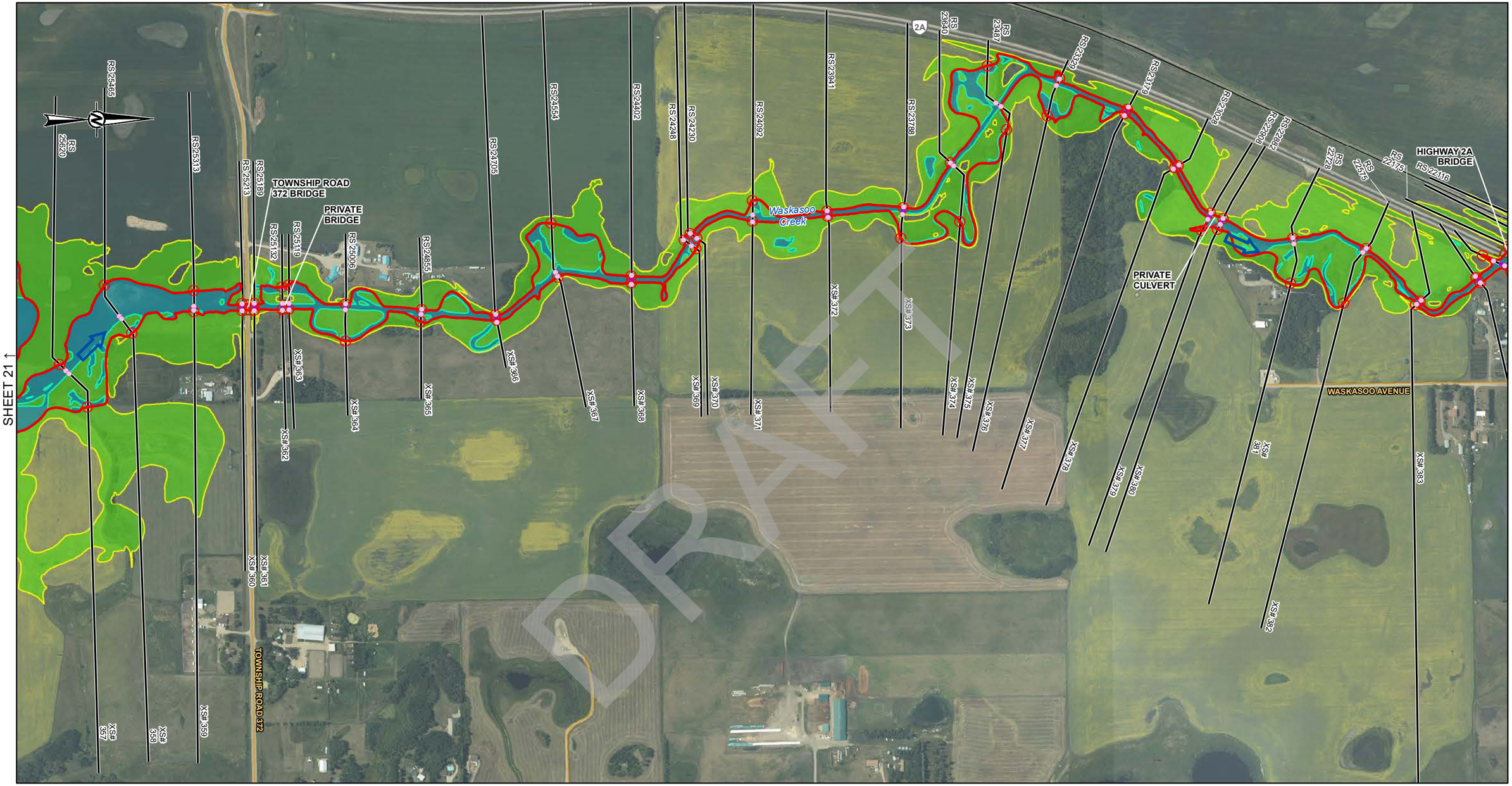


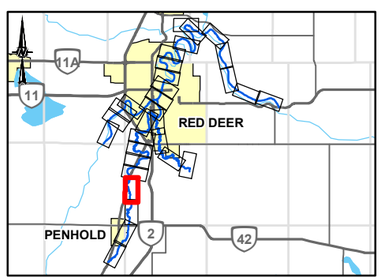
LEGEND

- 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
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

WASKASOO CREEK ABOVE PIPER CREEK = 37.1 M^3/S



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DESIGNED	PT
PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 22 OF 31

SHEET 24 ↑

LEGEND

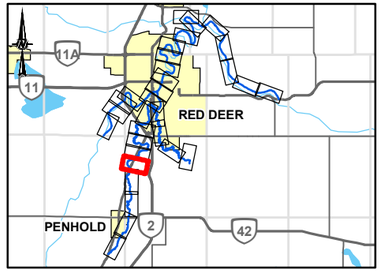
- CROSS SECTION
- XS# 100 CROSS SECTION NUMBER
- RS 304 RIVER STATION (M)
- STUDY BOUNDARY
- FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- FLOOD CONTROL STRUCTURE

HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

WASKASOO CREEK ABOVE PIPER CREEK = 37.1 M^3/S

SHEET 22 ↓



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DESIGNED	PT
PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 23 OF 31

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

PATH: I:\CLIENTS\GOVERNMENT_OF_ALBERTA\21452576_Red_Deer\Mapping\Products\Hydrology\05_Open Water Flood Hazard Identification\Rev3\1783039_Floodway_Criteria_Rev3.mxd PRINTED ON: 2022-12-07 AT: 8:16:11 AM

SHEET 25 ↑

RS 17383
RS 17501
RS 17661
RS 17683
RS 17866
RS 18025
RS 18179
RS 18328
RS 18479
RS 18667
RS 18700
RS 18782
RS 19090
RS 19239
RS 19396
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RS 20759
RS 20911
RS 20993
RS 20456

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XS# 425
XS# 424
XS# 423
XS# 422
XS# 421
XS# 420
XS# 419
XS# 418
XS# 417
XS# 416
XS# 415
XS# 414
XS# 413
XS# 412
XS# 411
XS# 410
XS# 409
XS# 408
XS# 407

TOWNSHIP ROAD 375 BRIDGE
LANTERN STREET BRIDGE
PRIVATE BRIDGE
PRIVATE BRIDGE

Waskasoo Creek
WASKASOO AVENUE
LANTERN STREET
LIBERTY AVENUE
LAKE STREET
RANGE ROAD 280
2A

SHEET 23 ↓

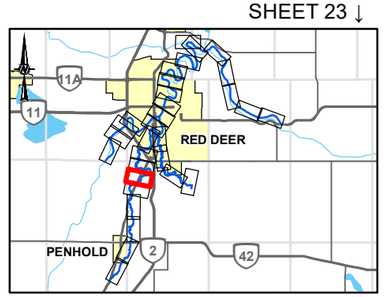
LEGEND

- 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
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

WASKASOO CREEK ABOVE PIPER CREEK = 37.1 M^3/S



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Alberta Government

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DESIGNED	PT
PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 24 OF 31

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

25mm

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SHEET 26 ↑

LEGEND

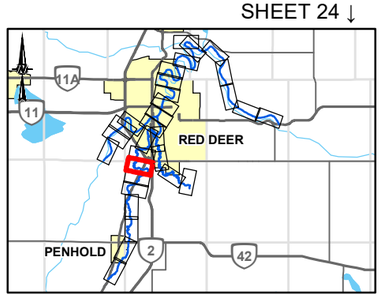
- CROSS SECTION
- *XS# 100* CROSS SECTION NUMBER
- *RS 304* RIVER STATION (M)
- STUDY BOUNDARY
- FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- FLOOD CONTROL STRUCTURE

HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

WASKASOO CREEK ABOVE PIPER CREEK = 37.1 M^3/S

SHEET 24 ↓



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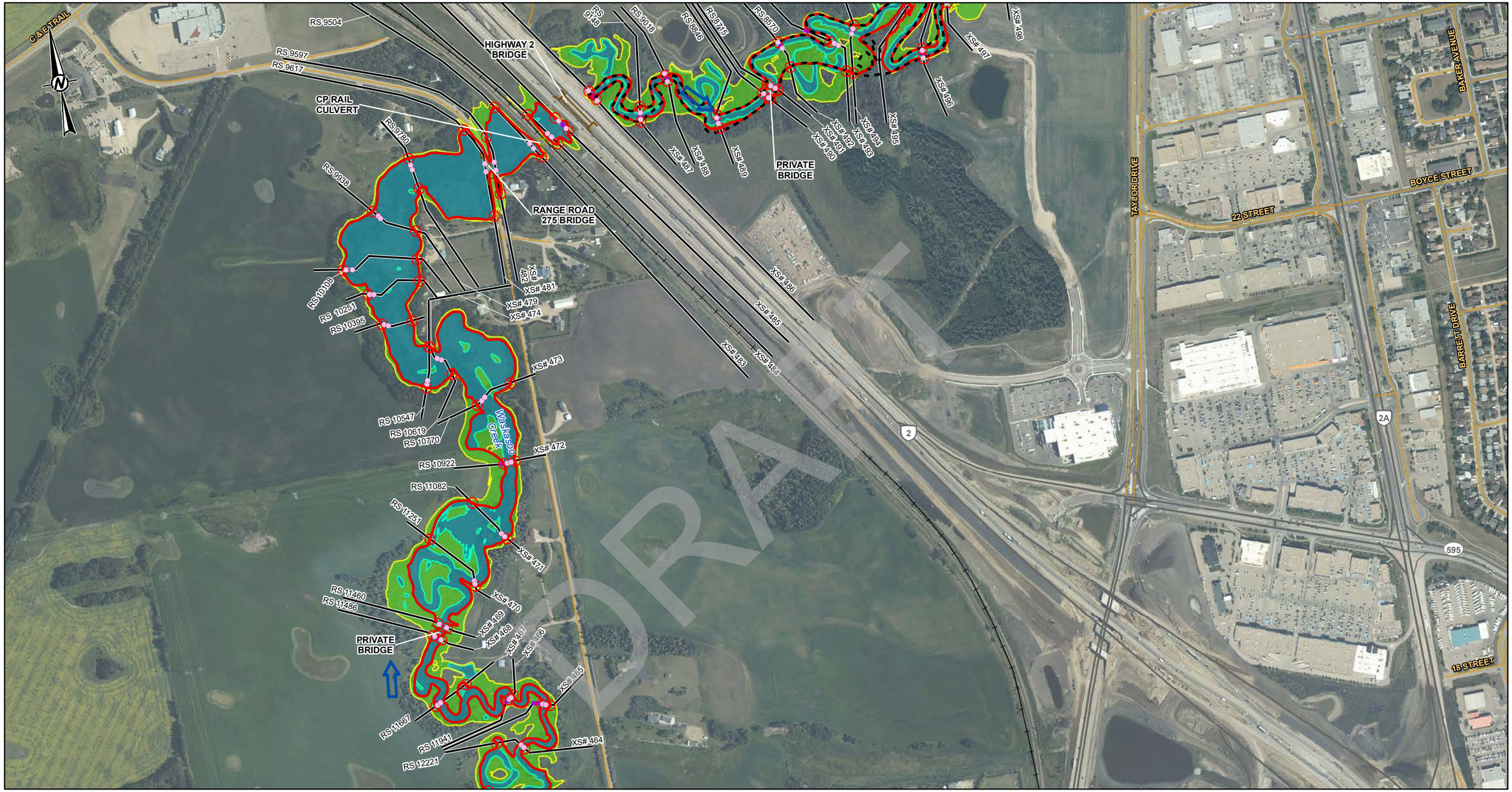
PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 25 OF 31

SHEET 27 ↑



LEGEND

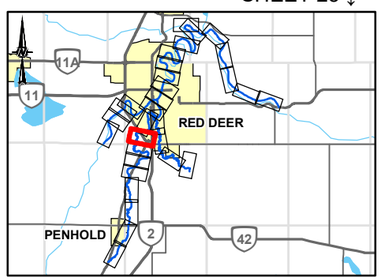
- CROSS SECTION
- XS# 100 CROSS SECTION NUMBER
- RS 304 RIVER STATION (M)
- STUDY BOUNDARY
- FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- FLOOD CONTROL STRUCTURE

HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

WASKASOO CREEK ABOVE PIPER CREEK = 37.1 M^3/S

SHEET 25 ↓



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REVIEWED	GT
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PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 26 OF 31

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

25mm

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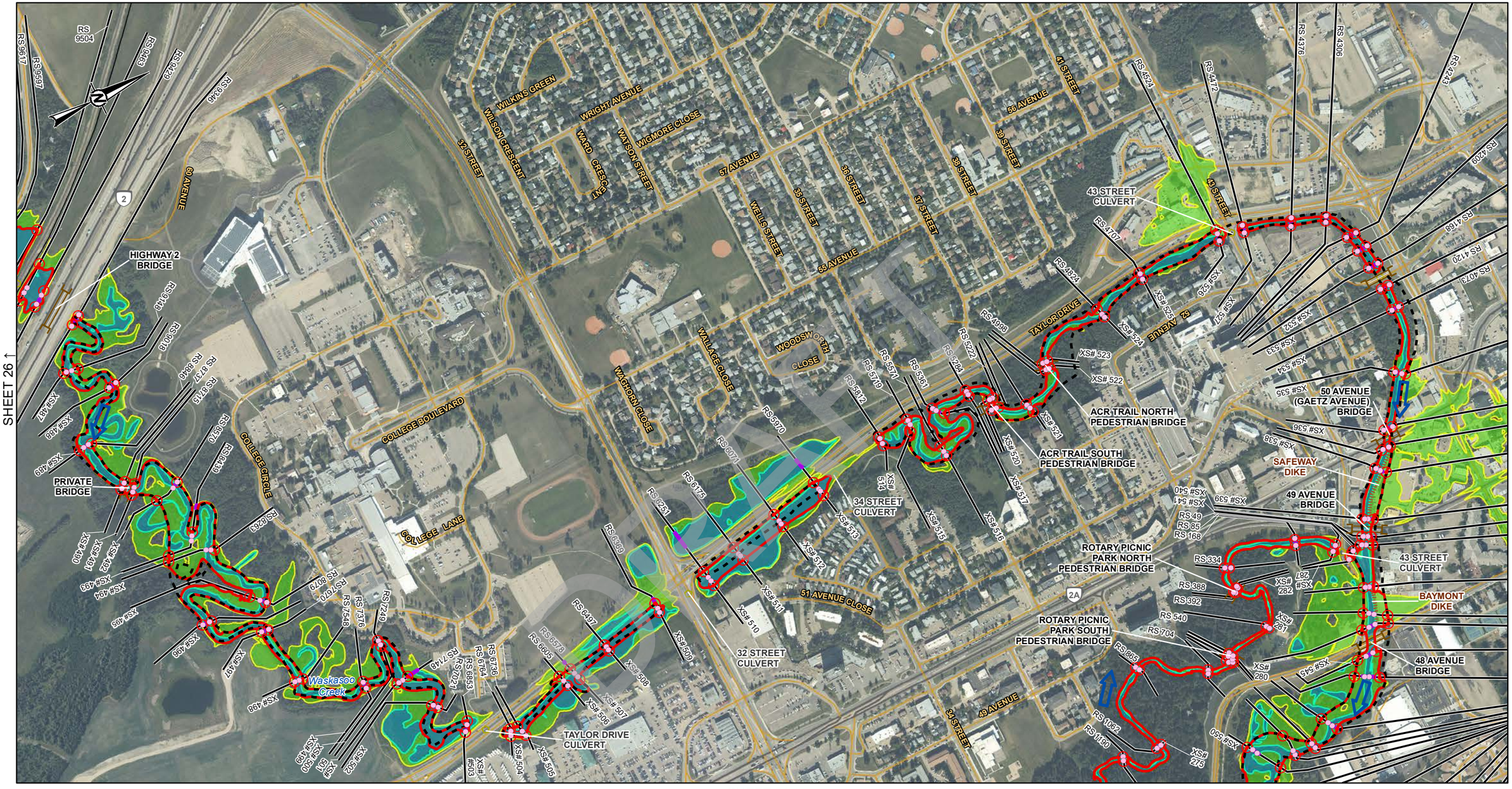
SHEET 26 ↑

SHEET 5 ↓



LEGEND

- 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

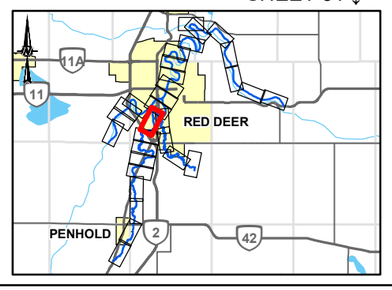
HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE

- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

WASKASOO CREEK ABOVE PIPER CREEK = 37.1 M^3/S
WASKASOO CREEK BELOW PIPER CREEK = 53.9 M^3/S
PIPER CREEK ABOVE WASKASOO CREEK = 19.3 M^3/S

SHEET 31 ↓



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Alberta Government

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DESIGNED	PT
PREPARED	NB
REVIEWED	GT
APPROVED	DL

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DATUM: NAD 83 CSRS PROJECTION: 3TM 114

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 27 OF 31

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

25mm

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SHEET 29 ↑

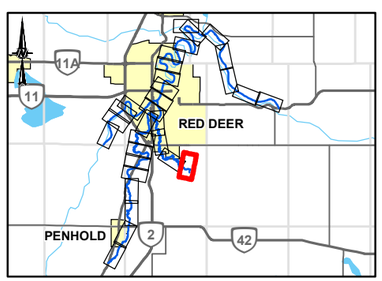
LEGEND

- 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
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

PIPER CREEK ABOVE HIGHWAY 595 = 17.5 M^3/S



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CONSULTANT
GOLDER

YYYY-MM-DD	2022-12-07
DESIGNED	PT
PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 28 OF 31

SHEET 28 ↑

SHEET 30 ↓

RANGE ROAD 272 BRIDGE

40 AVENUE CULVERT

PRIVATE CULVERT

PRIVATE CULVERT

CLEARWILL AVENUE

CLEARVIEW DRIVE

CLEARMILE AVENUE

WILLOW STREET

RANGE ROAD 272

Piper Creek

RS 17495 RS 17395 RS 17332 RS 17266 RS 16992 RS 16832 RS 16648 RS 16439 RS 16356 RS 16139 RS 15929 RS 15818 RS 15715 RS 15577 RS 15471 RS 15419 RS 15315 RS 15183 RS 15019 RS 14920 RS 14674 RS 14574 RS 14380 RS 14096 RS 13897 RS 13709 RS 13536 RS 13340 RS 13182 RS 13105 RS 12773 RS 12602 RS 12497 RS 12371 RS 12339 RS 12254 RS 12148 RS 12012 RS 11902 RS 11720 RS 11565 RS 11454 RS 11356 RS 11256 RS 10900

XS# 163 XS# 164 XS# 165 XS# 166 XS# 167 XS# 168 XS# 169 XS# 170 XS# 171 XS# 172 XS# 173 XS# 174 XS# 175 XS# 176 XS# 177 XS# 178 XS# 179 XS# 180 XS# 181 XS# 182 XS# 183 XS# 184 XS# 185 XS# 186 XS# 187 XS# 188 XS# 189 XS# 190 XS# 191 XS# 192 XS# 193 XS# 194 XS# 195 XS# 196 XS# 197 XS# 198 XS# 199 XS# 200 XS# 201 XS# 202 XS# 203 XS# 204 XS# 205 XS# 206 XS# 207 XS# 208 XS# 209 XS# 210 XS# 211 XS# 212 XS# 213 XS# 214

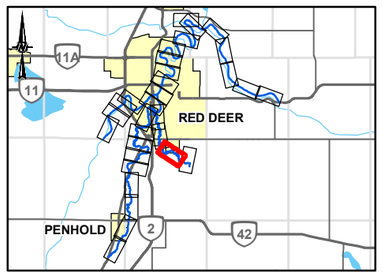
LEGEND

- 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
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

PIPER CREEK ABOVE HIGHWAY 595 = 17.5 M^3/S



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1:7,500 METRES

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ALBERTA ENVIRONMENT AND PARKS

Alberta Government

CONSULTANT
GOLDER

YYYY-MM-DD	2022-12-07
DESIGNED	PT
PREPARED	NB
REVIEWED	GT
APPROVED	DL

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DATUM: NAD 83 CSRS PROJECTION: 3TM 114

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 29 OF 31

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

25mm

0

PATH: I:\CLIENT\GOVERNMENT_OF_ALBERTA\21452676_Red_Deer\Mapping\Products\Hydrology\05_Open Water Flood Hazard Identification\Rev3\1783039_Floodway_Criteria_Rev3.mxd PRINTED ON: 2022-12-07 AT: 8:19:18 AM

SHEET 29 ↑

SHEET 31 ↓

WESTERNER DRIVE
46 AVENUE
BERRY AVENUE
BUNN CRESCENT
BAIRD STREET
BARNES CRESCENT
BARNER AVENUE
BETTENSON STREET
BROWN CLOSE
BOYCE STREET
BAKER AVENUE
BELL STREET
BAILE CLOSE
BEATTY CRESCENT
DELBURN ROAD (19 STREET) CULVERT
BANNERMAN CLOSE PEDESTRIAN BRIDGE
BANNERMAN CLOSE
BOWER WOODS EAST-WEST PEDESTRIAN BRIDGE
Piper Creek
595
18 STREET
SISSON AVENUE
SAGE LINK
40 AVENUE
SHAW CLOSE
SELKIRK ROAD LEVAD
2A

RS 9579, RS 9480, RS 10054, RS 10255, RS 10586, RS 10738, RS 10412, RS 9362, RS 9214, RS 8943, RS 8539, RS 8278, RS 8271, RS 8087, RS 7859, RS 7703, RS 7643, RS 7570, RS 7435, RS 7288, RS 7083, RS 6642, RS 6623, RS 6547, RS 6099, RS 6089, RS 5709, RS 5670, RS 5509, RS 5357, RS 5267, RS 5149, RS 4912, RS 4741, RS 4559, RS 4382, RS 4271, RS 4142, RS 4021, RS 3922, RS 3769, RS 3760, RS 3576, RS 3471, RS 3175

XS#212, XS#213, XS#214, XS#215, XS#216, XS#217, XS#218, XS#219, XS#220, XS#221, XS#222, XS#223, XS#224, XS#225, XS#226, XS#227, XS#228, XS#229, XS#230, XS#231, XS#232, XS#234, XS#235, XS#236, XS#237, XS#238, XS#239, XS#240, XS#241, XS#242, XS#243, XS#244, XS#245, XS#246, XS#247, XS#248, XS#249, XS#250, XS#251, XS#252, XS#253, XS#254, XS#255, XS#256

LEGEND

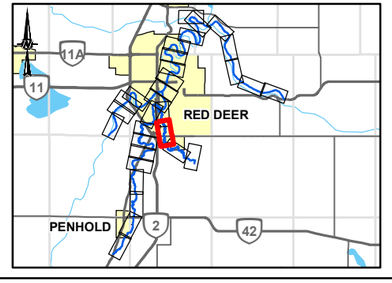
- CROSS SECTION
- XS# 100 CROSS SECTION NUMBER
- RS 304 RIVER STATION (M)
- STUDY BOUNDARY
- FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- FLOOD CONTROL STRUCTURE

HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE

- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

PIPER CREEK ABOVE HIGHWAY 595 = 17.5 M^3/S
PIPER CREEK ABOVE WASKASOO CREEK = 19.3 M^3/S



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Alberta Government

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GOLDER

YYYY-MM-DD	2022-12-07
DESIGNED	PT
PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 30 OF 31

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
25mm
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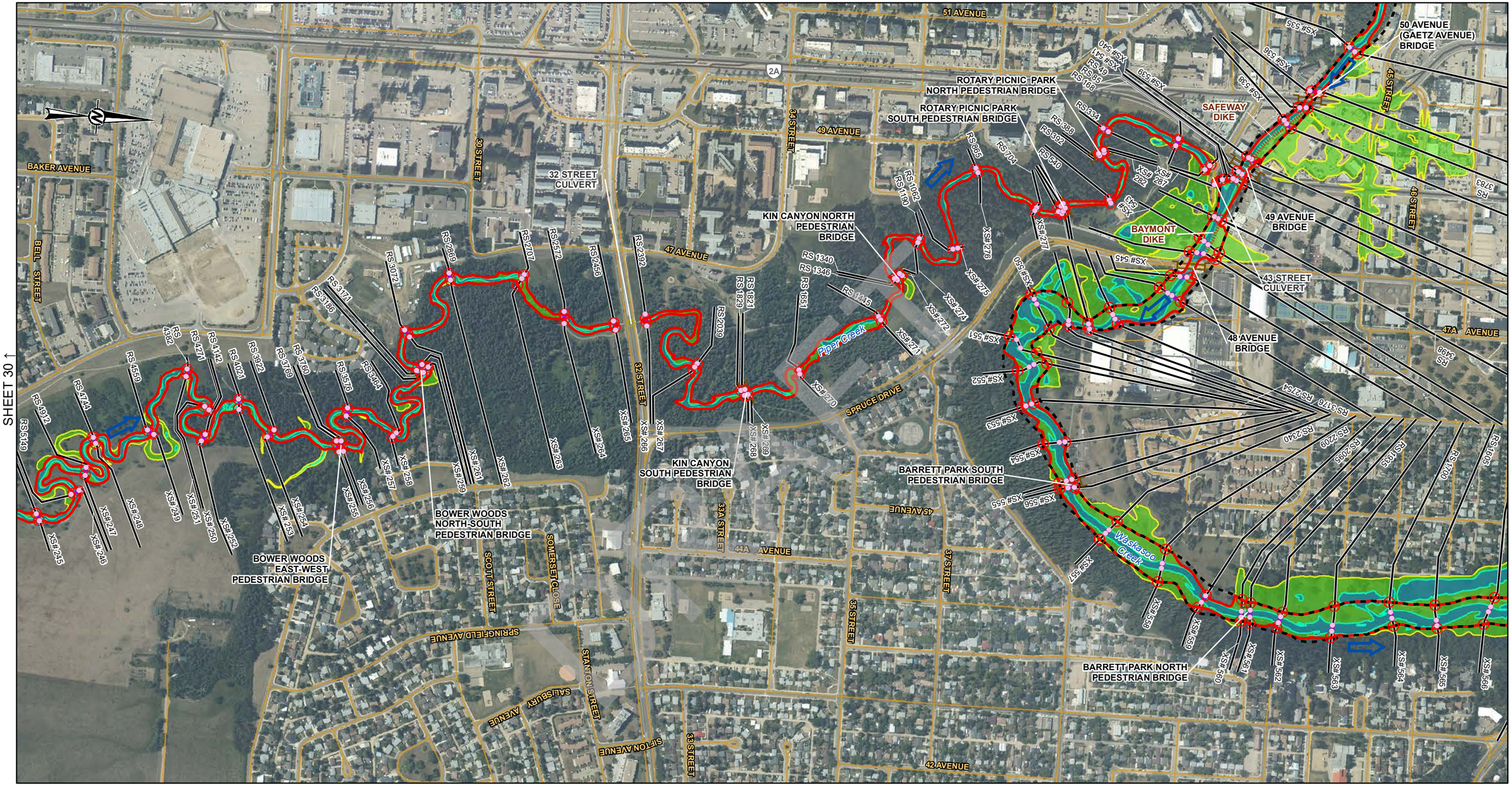
SHEET 27 ↑

SHEET 30 ↑

SHEET 5 ↓



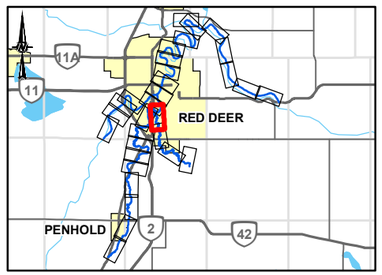
LEGEND

- 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
- BRIDGE
- PROPOSED FLOODWAY BOUNDARY
- BANK STATION
- PROPOSED FLOODWAY STATION
- PREVIOUS FLOODWAY
- DEPTH ≥ 1 M
- 100-YEAR DESIGN FLOOD EXTENT
- VELOCITY ≥ 1 M/S

PIPER CREEK ABOVE WASKASOO CREEK = 19.3 M^3/S
WASKASOO CREEK ABOVE PIPER CREEK = 37.1 M^3/S
WASKASOO CREEK BELOW PIPER CREEK = 53.9 M^3/S



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PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOODWAY CRITERIA MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	5000	3	SHEET 31 OF 31

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

25mm

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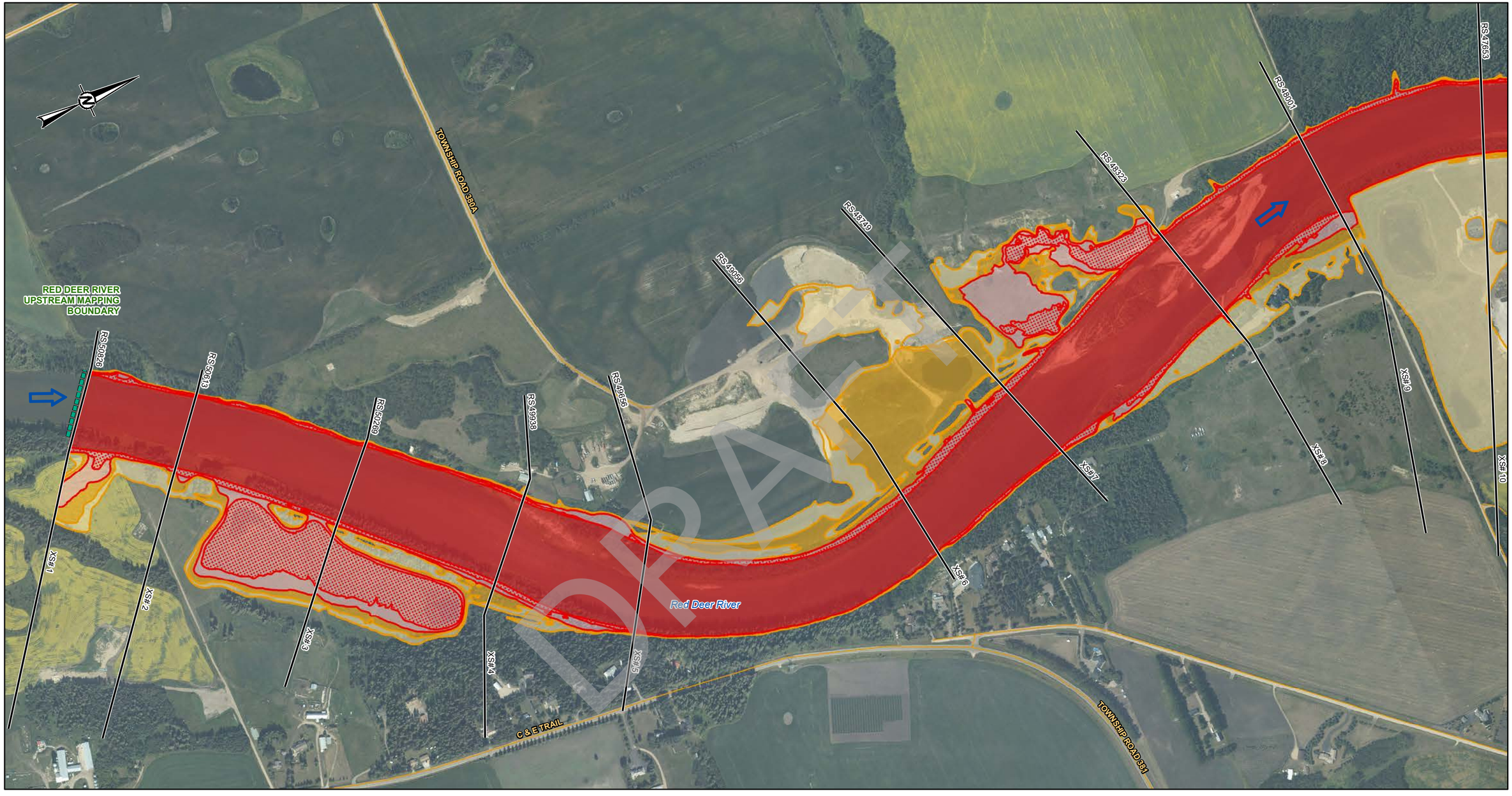
APPENDIX B

Flood Hazard Maps



LEGEND

- 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

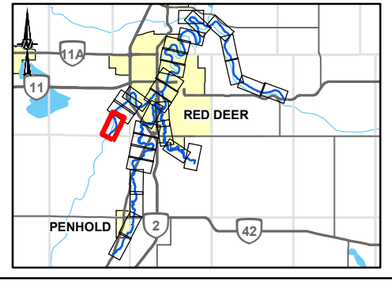
HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE

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

DISCHARGE

RED DEER RIVER ABOVE WASKASOO CREEK = 1820 M^3/S



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PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 1 OF 31

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

25mm

0

SHEET 3 ↑

LEGEND

- 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

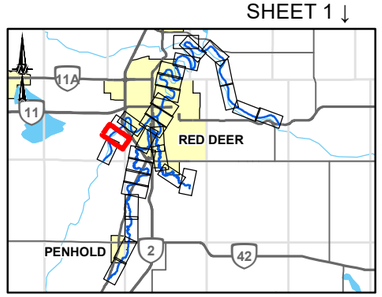
- CULVERT
- BRIDGE

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

DISCHARGE

RED DEER RIVER ABOVE WASKASOO CREEK = 1820 M^3/S

SHEET 1 ↓



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PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 2 OF 31

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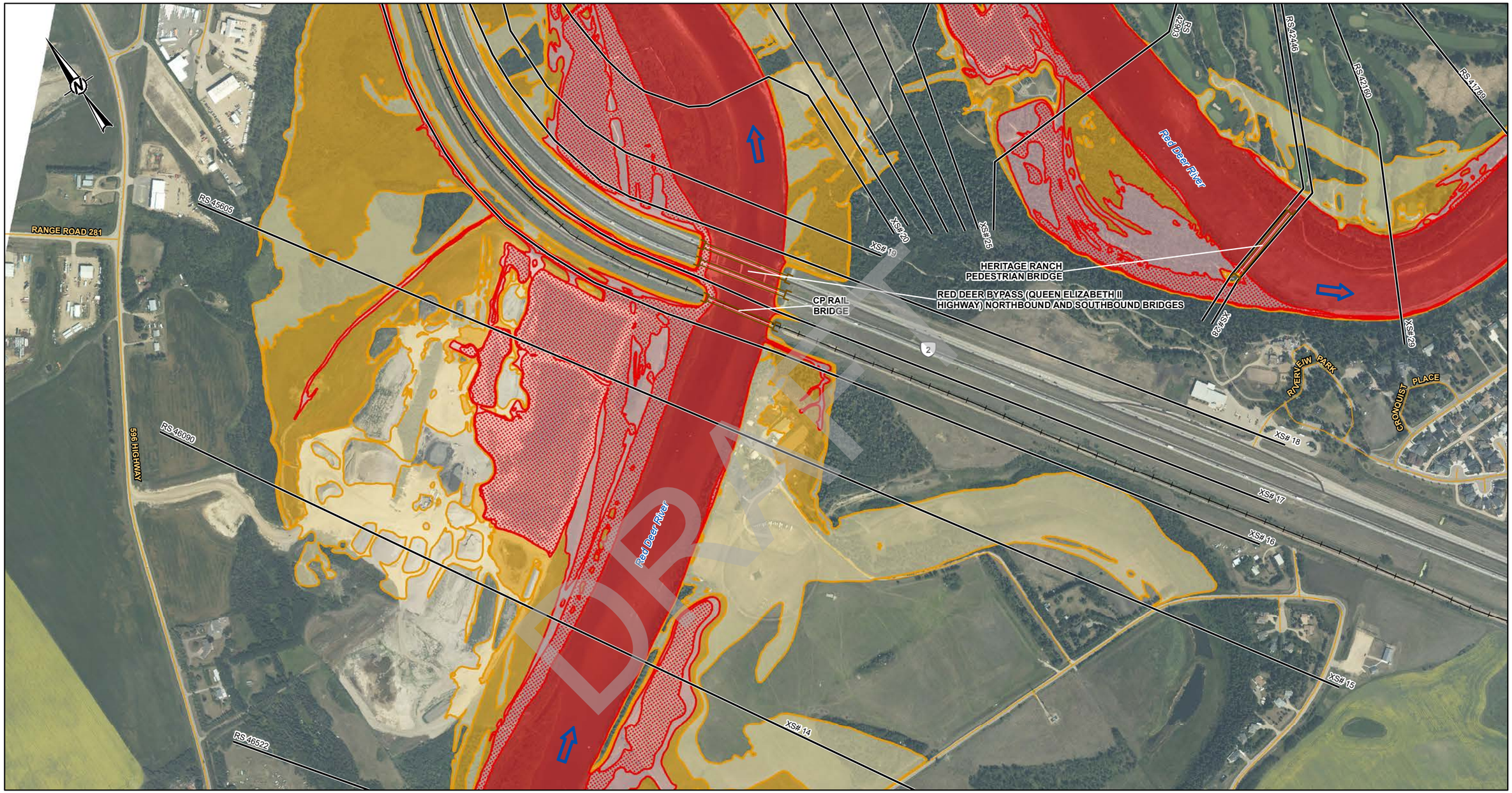
SHEET 4 ↑



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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

HYDRAULIC STRUCTURES

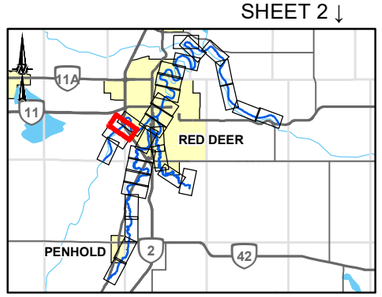
- CULVERT
- BRIDGE

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

DISCHARGE

RED DEER RIVER ABOVE WASKASOO CREEK = 1820 M^3/S

SHEET 2 ↓



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PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

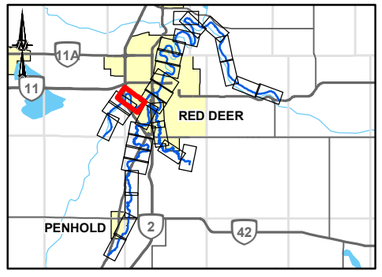
TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 3 OF 31

SHEET 5 ↑

ORR DRIVE
OAKLANDS CRESCENT
OAKWOOD CLOSE
OWENS CLOSE
GREEN
ODSTONE
OXBOW STREET
ORESTON CLOSE
OTTERBURY AVENUE
OHIO CLOSE
KERRY WOOD DRIVE
FLAGSTAFF AVENUE
FLAGSTAFF CLOSE
FOUNTAIN DRIVE
PARK DRIVE
RS 45436
RS 45353
RS 45174
RS 45246
RS 44634
RS 44937
RS 43862
RS 41163
RS 43520
RS 43237
RS 42306
RS 42446
RS 42160
RS 41789
RS 41460
RS 41212
RS 40939
RS 40682
RS 45605
XS# 19
XS# 20
XS# 21
XS# 22
XS# 23
XS# 24
XS# 25
XS# 26
XS# 27
XS# 28
XS# 29
XS# 30
XS# 31
XS# 32
XS# 33
XS# 34
Red Deer River
HERITAGE RANCH PEDESTRIAN BRIDGE
RED DEER BYPASS (QUEEN ELIZABETH II HIGHWAY) NORTHBOUND AND SOUTHBOUND BRIDGES
CP RAIL BRIDGE
2

SHEET 3 ↓



LEGEND

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

DISCHARGE

RED DEER RIVER ABOVE WASKASOO CREEK = 1820 M^3/S

0 150 300
1:7,500 METRES

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PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 4 OF 31

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

25mm

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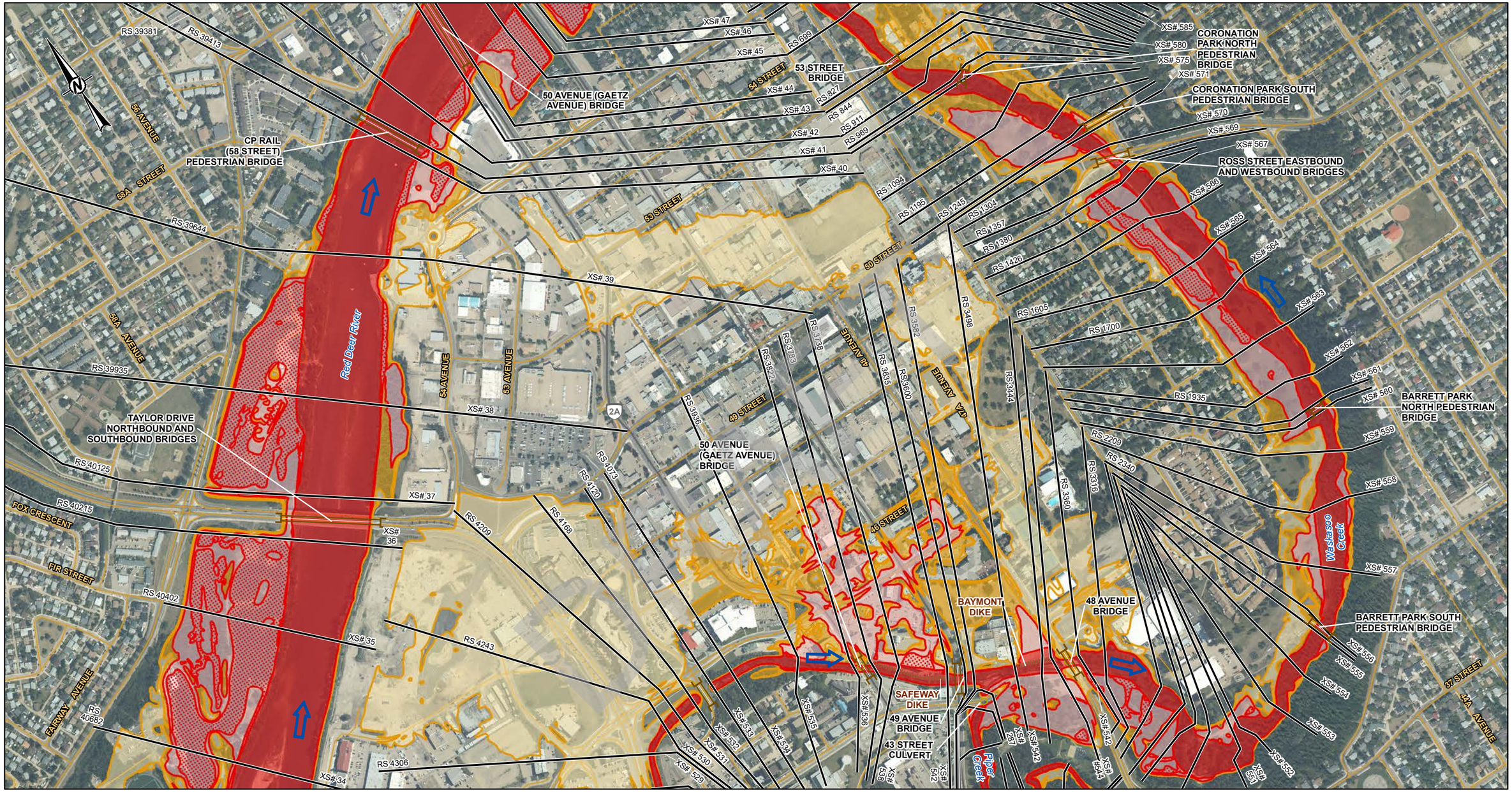
SHEET 6 ↑



SHEET 4, 26 & 30 ↓

LEGEND

- 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

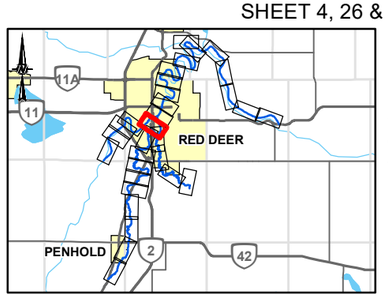
HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE

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

DISCHARGE

RED DEER RIVER ABOVE WASKASOO CREEK = 1820 M^3/S
WASKASOO CREEK ABOVE PIPER CREEK = 37.1 M^3/S
WASKASOO CREEK BELOW PIPER CREEK = 53.9 M^3/S
PIPER CREEK ABOVE WASKASOO CREEK = 19.3 M^3/S



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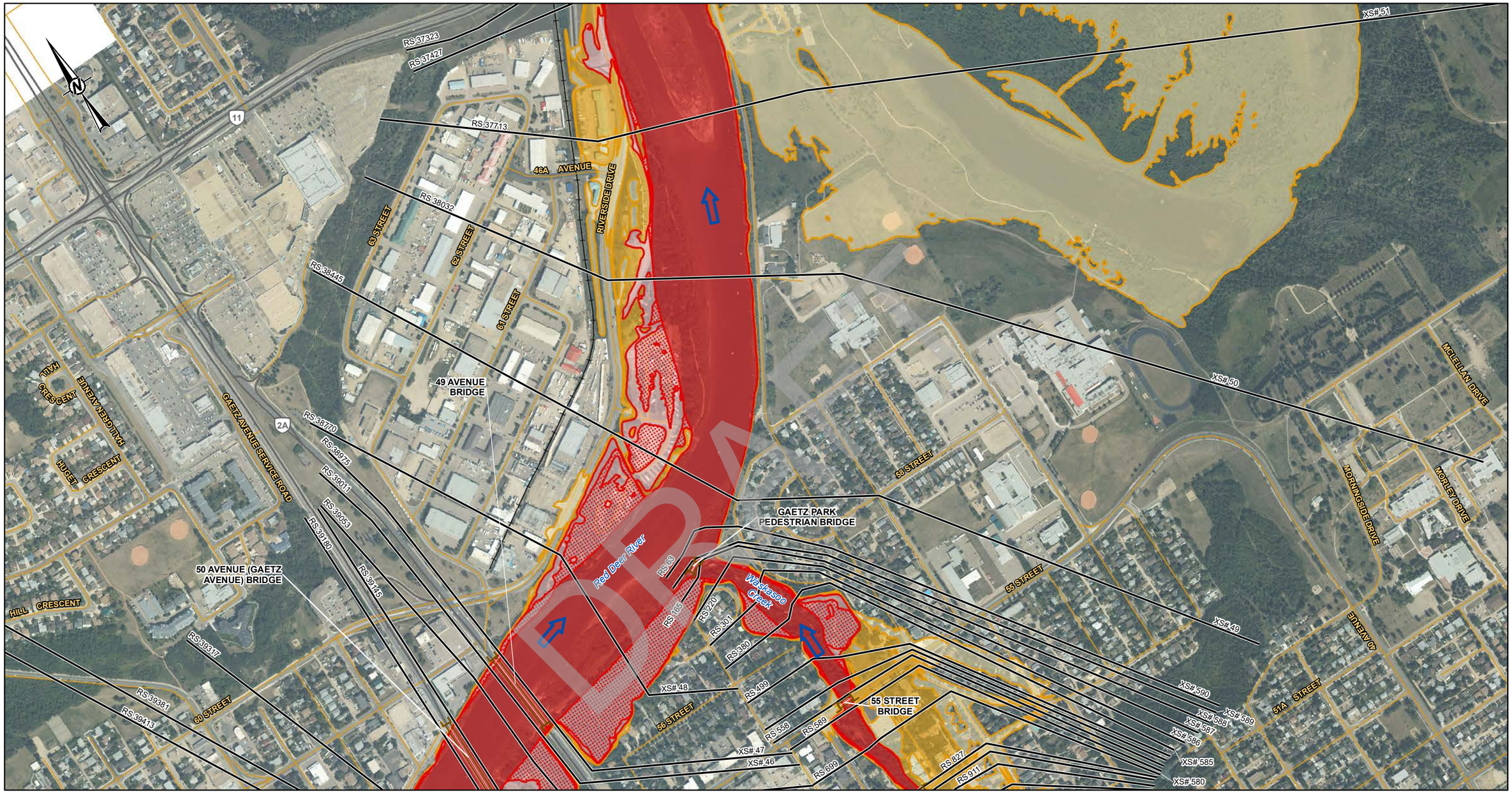
PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 5 OF 31

SHEET 7 ↑



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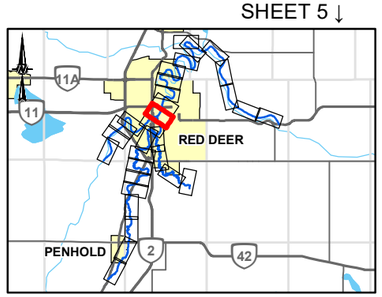

LEGEND

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

DISCHARGE

RED DEER RIVER ABOVE WASKASOO CREEK = 1820 M^3/S
RED DEER RIVER BELOW WASKASOO CREEK = 1870 M^3/S
WASKASOO CREEK BELOW PIPER CREEK = 53.9 M^3/S

0 150 300
1:7,500 METRES

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YYYY-MM-DD	2022-12-07
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PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 6 OF 31

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

25mm

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SHEET 8 ↑

LEGEND

- 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

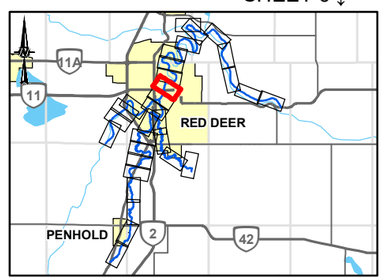
- CULVERT
- BRIDGE

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

DISCHARGE

RED DEER RIVER BELOW WASKASOO CREEK = 1870 M^3/S

SHEET 6 ↓



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PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 7 OF 31

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

25mm

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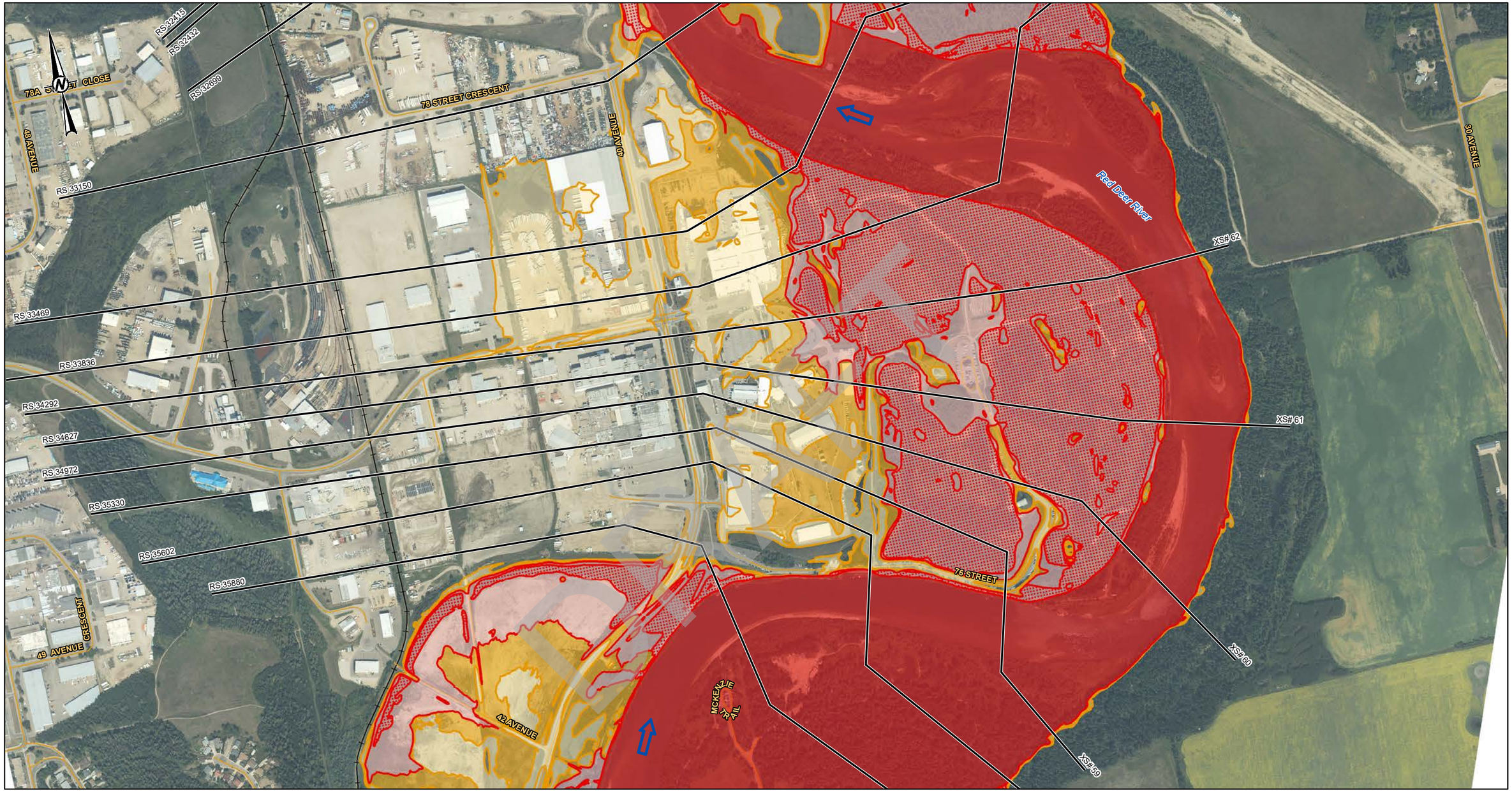
PATH: I:\CLIENT\GOVERNMENT_OF_ALBERTA\21452576_Red_Deer\Mapping\Products\Hydrology\06_Governing Design Flood Hazard Map Production\Rev3\1783039_Governing-Flood-Hazard_Rev3.mxd PRINTED ON: 2022-12-07 AT: 8:37:55 AM

SHEET 9 ↑



SHEET 7 ↓

LEGEND

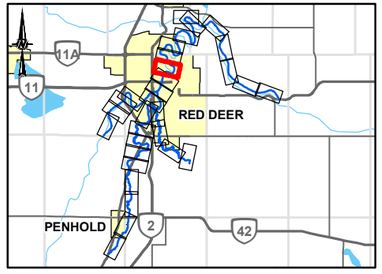
- CROSS SECTION
- XS#100 CROSS SECTION NUMBER
- RS 304 RIVER STATION (M)
- STUDY BOUNDARY
- FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- FLOOD CONTROL STRUCTURE

HYDRAULIC STRUCTURES

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

DISCHARGE

RED DEER RIVER BELOW WASKASOO CREEK = 1870 M^3/S



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1:7,500 METRES

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Alberta Government

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APPROVED	DL

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PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 8 OF 31

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

25mm

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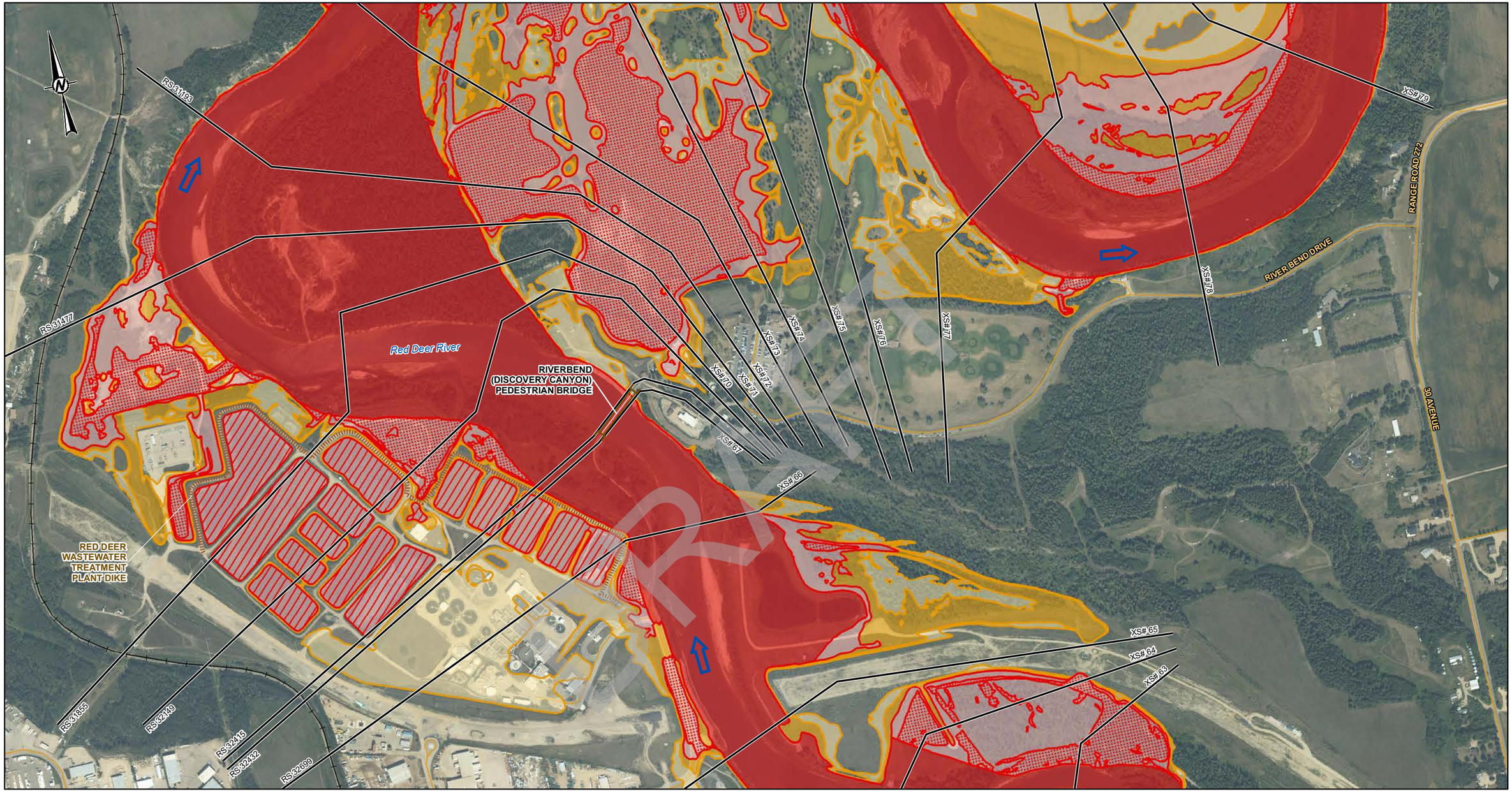


LEGEND

- 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

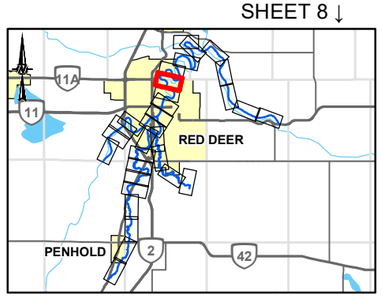
- CULVERT
- BRIDGE

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

DISCHARGE

RED DEER RIVER BELOW WASKASOO CREEK = 1870 M^3/S

SHEET 8 ↓



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REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 9 OF 31

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

25mm

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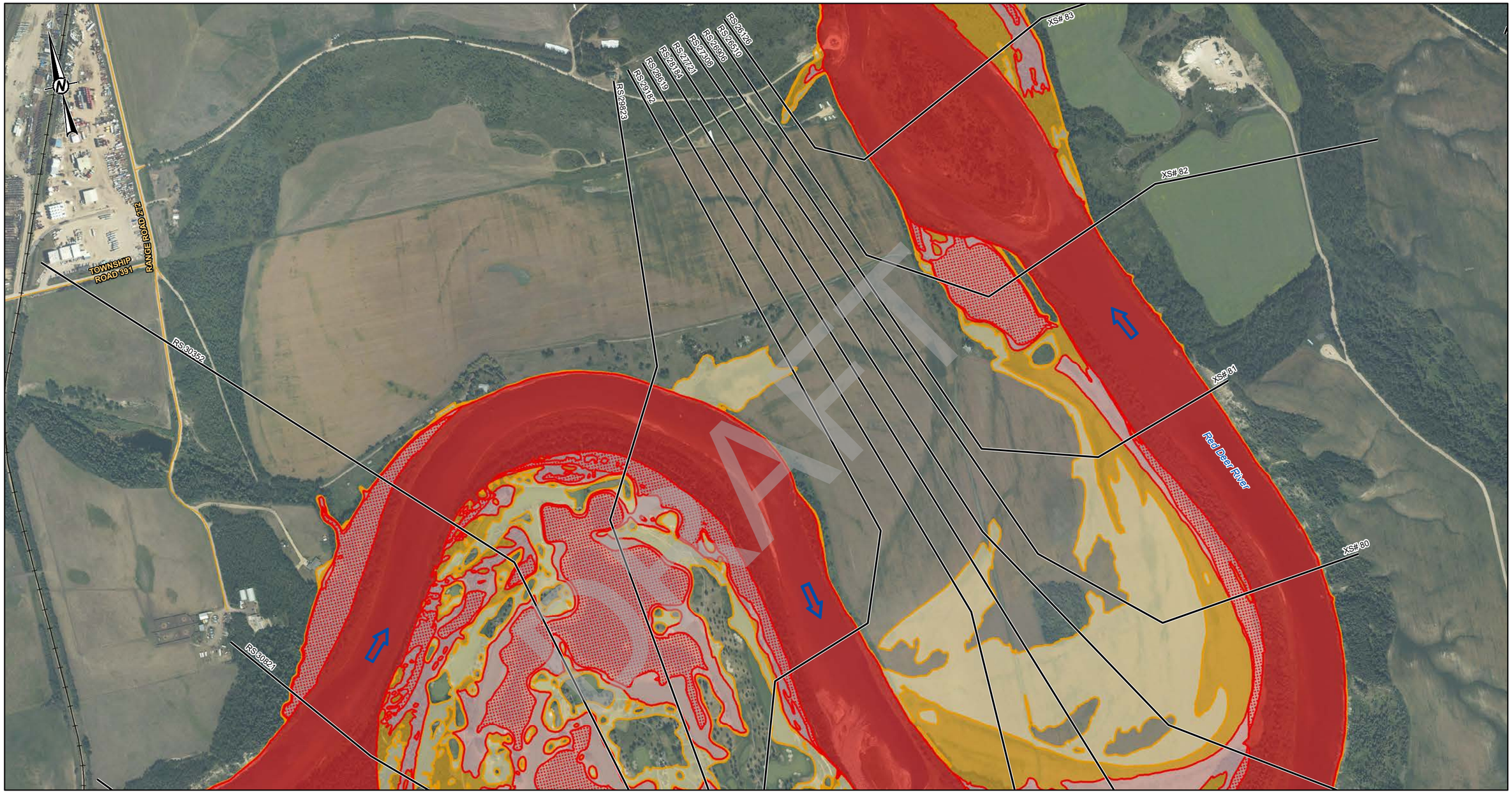
SHEET 11 ↑



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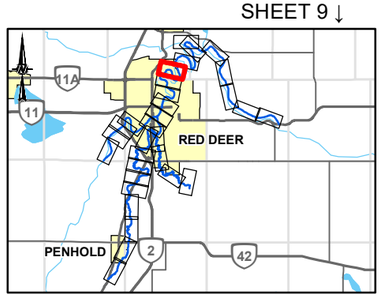

LEGEND

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

DISCHARGE

RED DEER RIVER BELOW WASKASOO CREEK = 1870 M^3/S

0 150 300

1:7,500 METRES

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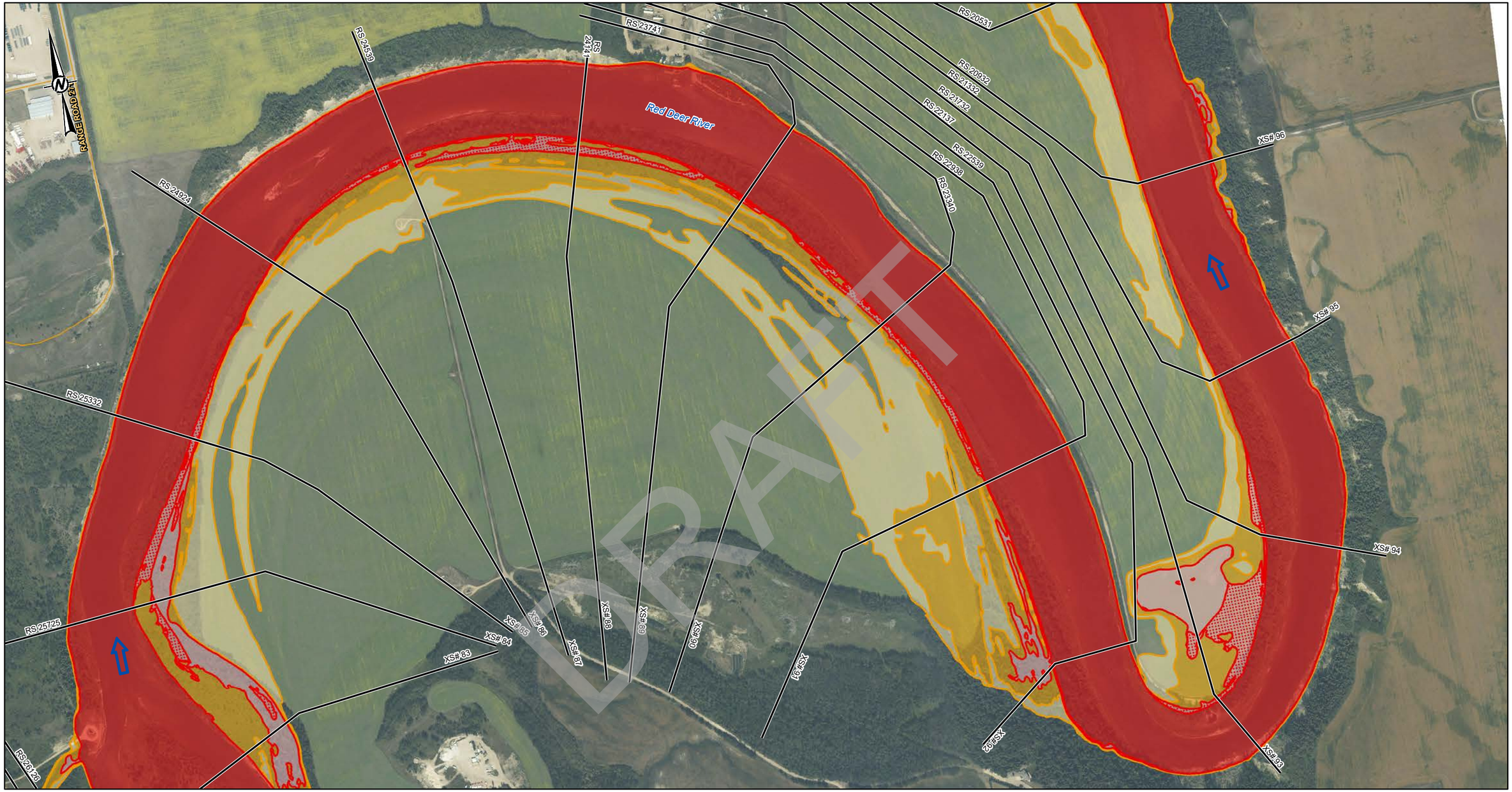
PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 10 OF 31

SHEET 12 ↑



LEGEND

- 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

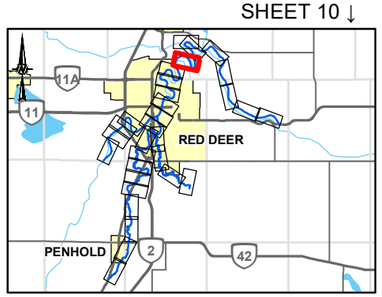
HYDRAULIC STRUCTURES

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

DISCHARGE

RED DEER RIVER BELOW WASKASOO CREEK = 1870 M^3/S

SHEET 10 ↓



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PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 11 OF 31

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25mm

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SHEET 13 ↑

SHEET 14 ↓

BRIGHT CLOSE

BURBANK ROAD

BURBANK PARKWAY

Red Deer River

Blindman River

RS 18535

RS 18930

RS 17722

RS 17338

RS 16933

RS 16532

RS 16131

XS# 109

XS# 108

XS# 107

XS# 106

XS# 105

XS# 103

XS# 98

XS# 97

XS# 96

RS 19934

RS 19336

RS 19733

RS 20130

RS 20531

RANGE ROAD 271

LEGEND

- 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

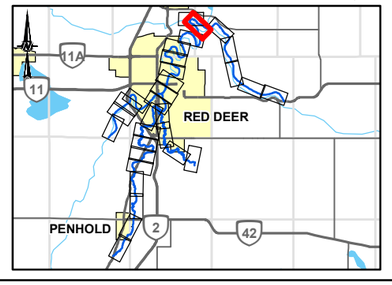
- CULVERT
- BRIDGE

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

DISCHARGE

RED DEER RIVER BELOW WASKASOO CREEK = 1870 M^3/S
RED DEER RIVER BELOW BLINDMAN RIVER = 2180 M^3/S

SHEET 11 ↓



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REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 12 OF 31

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

25mm

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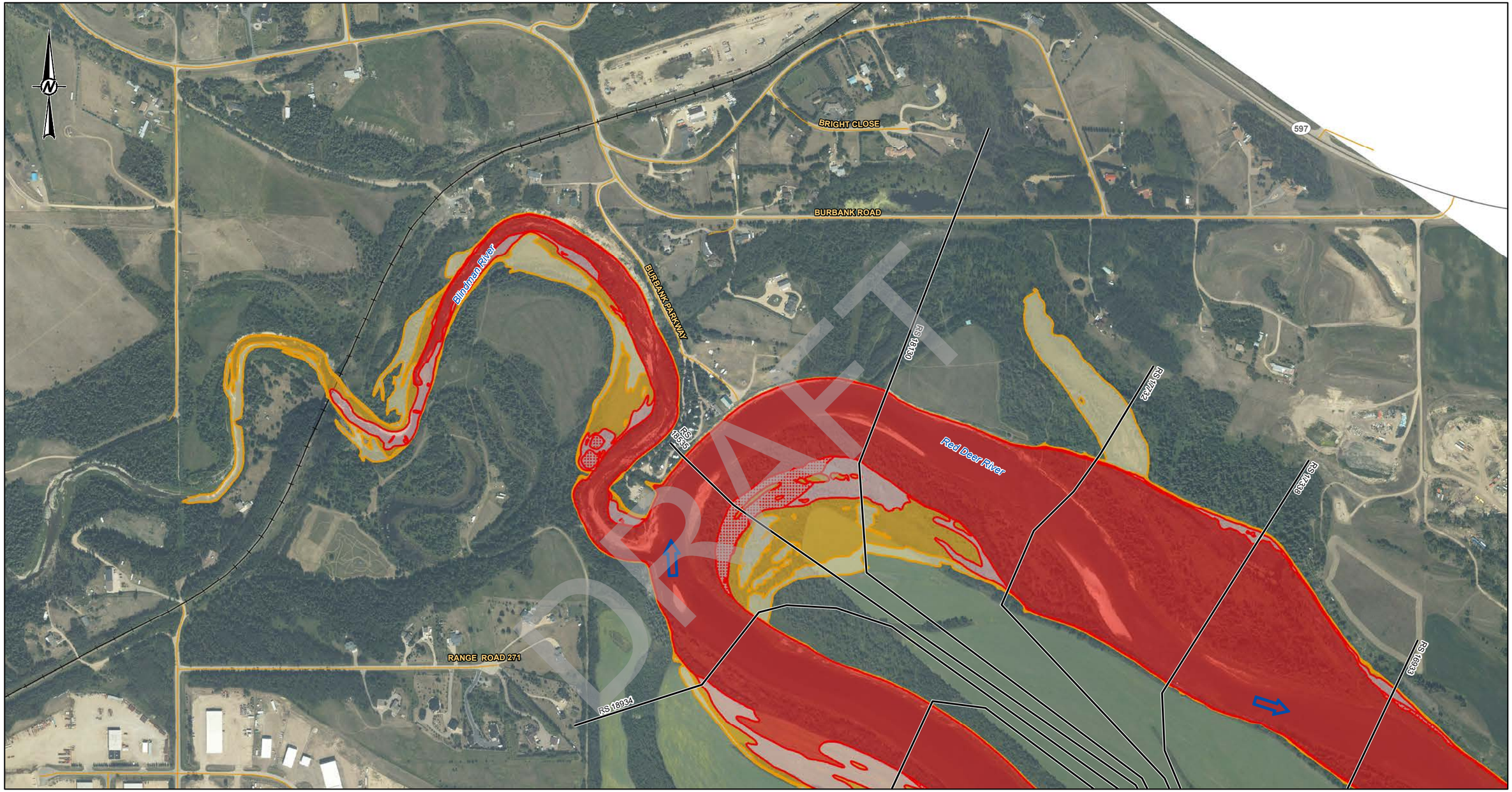


SHEET 14 ↓

LEGEND

- 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

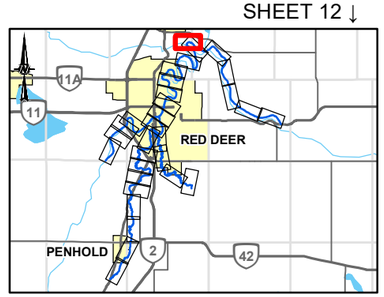
HYDRAULIC STRUCTURES

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

DISCHARGE

RED DEER RIVER BELOW WASKASOO CREEK = 1870 M^3/S
RED DEER RIVER BELOW BLINDMAN RIVER = 2180 M^3/S

SHEET 12 ↓



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PREPARED	NB
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APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 13 OF 31

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

25mm

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SHEET 13 ↑

SHEET 15 ↓

Red Deer River

597

RS 14918
RS 15318
RS 15705
RS 16131
RS 14459
RS 14026
RS 13729
RS 13608
RS 13388
RS 13147
RS 12989
RS 12769
RS 12514
XS#112
XS#111
XS#110
XS#109
XS#113
XS#114
XS#115
XS#116
XS#117
XS#118
XS#119
XS#120
XS#121
XS#122

LEGEND

- 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

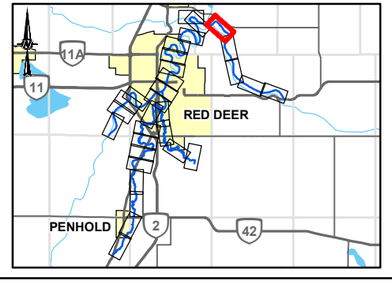
- CULVERT
- BRIDGE

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

DISCHARGE

RED DEER RIVER BELOW BLINDMAN RIVER = 2180 M^3/S

SHEET 12 ↓



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PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 14 OF 31

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

25mm

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LEGEND

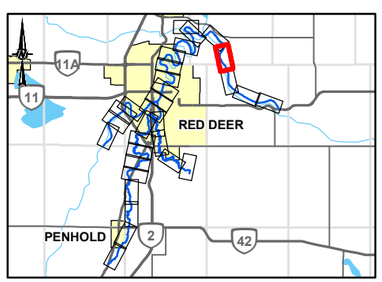
- CROSS SECTION
- *XS#100* CROSS SECTION NUMBER
- *RS 304* RIVER STATION (M)
- STUDY BOUNDARY
- FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- FLOOD CONTROL STRUCTURE

HYDRAULIC STRUCTURES

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

DISCHARGE

RED DEER RIVER BELOW BLINDMAN RIVER = 2180 M^3/S



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PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 15 OF 31

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

25mm

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LEGEND

- 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

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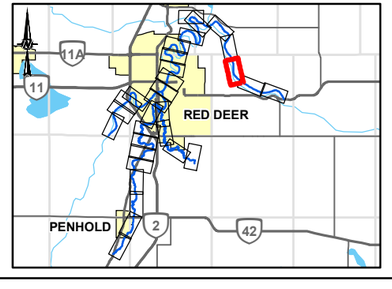
- HIGH HAZARD FLOOD FRINGE
- FLOOD FRINGE
- PROTECTED FLOOD FRINGE
- 200-YEAR FLOOD EXTENT
- 500-YEAR FLOOD EXTENT

DISCHARGE

RED DEER RIVER BELOW BLINDMAN RIVER = 2180 M^3/S



0 150 300

1:7,500 METRES

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REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 16 OF 31

LEGEND

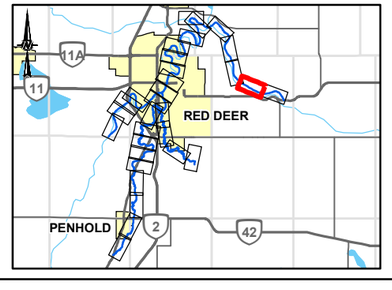
- CROSS SECTION
- XS#100 CROSS SECTION NUMBER
- RS 304 RIVER STATION (M)
- STUDY BOUNDARY
- FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- FLOOD CONTROL STRUCTURE

HYDRAULIC STRUCTURES

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

DISCHARGE

RED DEER RIVER BELOW BLINDMAN RIVER = 2180 M^3/S



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DATUM: NAD 83 CSRS PROJECTION: 3TM 114

CLIENT
ALBERTA ENVIRONMENT AND PARKS

Alberta Government

CONSULTANT
GOLDER

YYYY-MM-DD	2022-12-07
DESIGNED	GT
PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 17 OF 31

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

25mm

0

PATH: I:\CLIENTS\GOVERNMENT_OF_ALBERTA\21452576_Red_DeerMapping\Products\Hydrology\06_Governing Design Flood Hazard Map Production\Rev3\1783039_Governing-Flood-Hazard_Rev3.mxd PRINTED ON: 2022-12-07 AT: 10:01:08 AM

SHEET 17 ↑

LEGEND

- 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

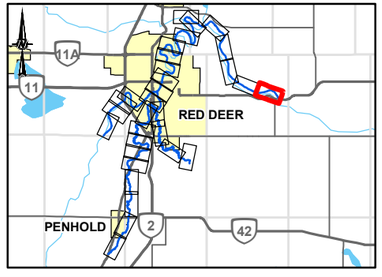
HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE

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

DISCHARGE

RED DEER RIVER BELOW BLINDMAN RIVER = 2180 M^3/S



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1:7,500 METRES

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PREPARED	NB
REVIEWED	GT
APPROVED	DL

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DATUM: NAD 83 CSRS PROJECTION: 3TM 114

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 18 OF 31

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

25mm

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LEGEND

- 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

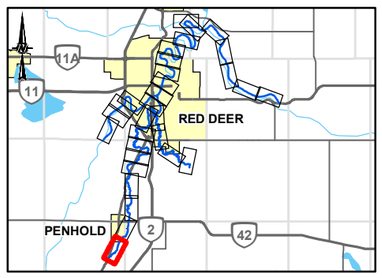
HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE

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

DISCHARGE

WASKASOO CREEK ABOVE HIGHWAY 42 = 32.1 M^3/S



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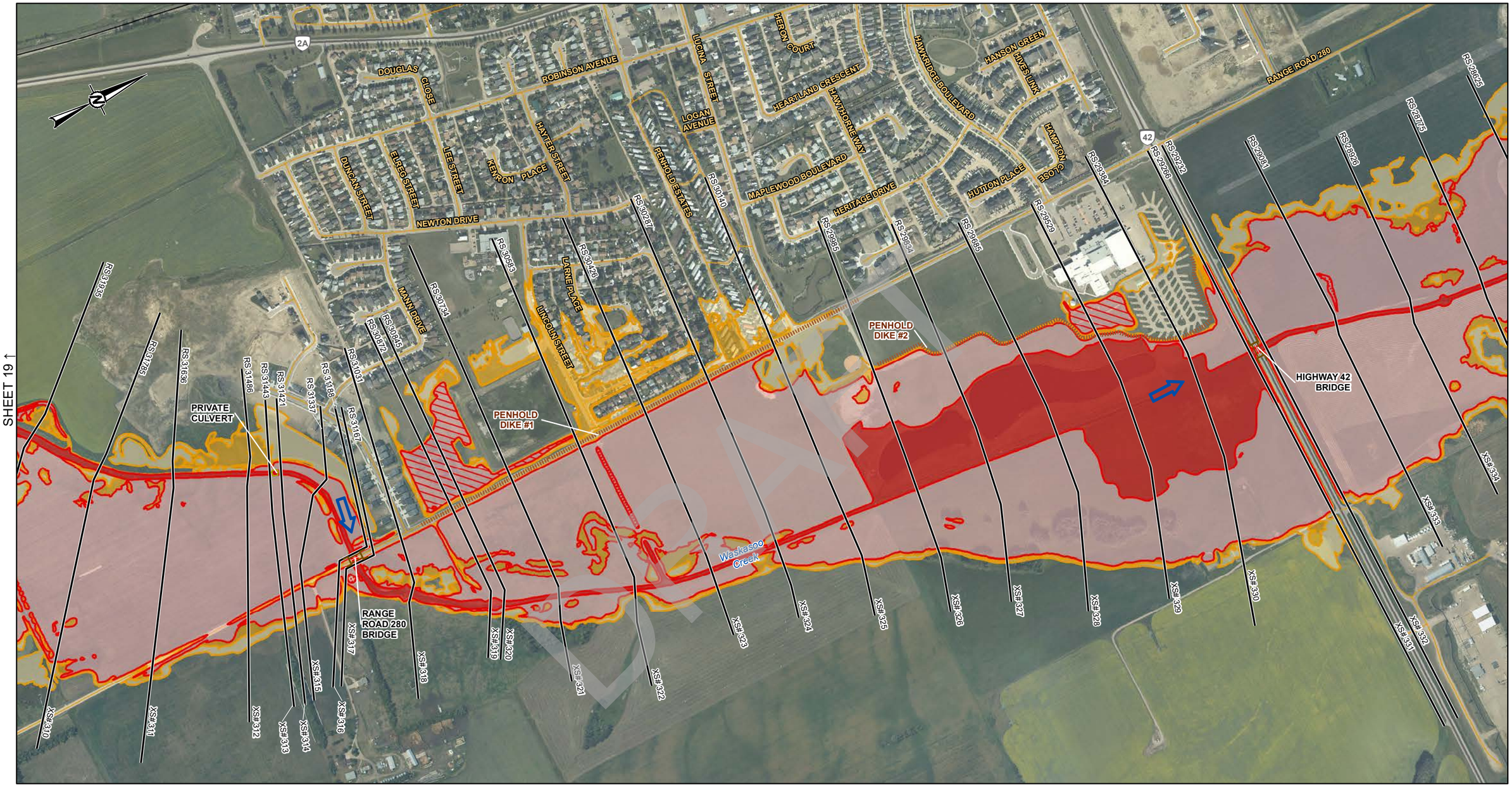
DESIGNED	GT
PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 19 OF 31



LEGEND

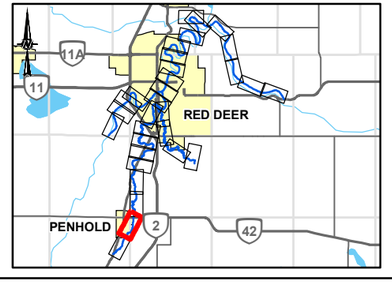
- CROSS SECTION
- *XS#100* CROSS SECTION NUMBER
- *RS 304* RIVER STATION (M)
- STUDY BOUNDARY
- FLOW DIRECTION
- LOCAL ROAD
- PRIMARY HIGHWAY
- SECONDARY HIGHWAY
- RAILWAY
- FLOOD CONTROL STRUCTURE

HYDRAULIC STRUCTURES

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

DISCHARGE

WASKASOO CREEK ABOVE HIGHWAY 42 = 32.1 M^3/S
WASKASOO CREEK ABOVE PIPER CREEK = 37.1 M^3/S



0 150 300
1:7,500 METRES

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PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 20 OF 31

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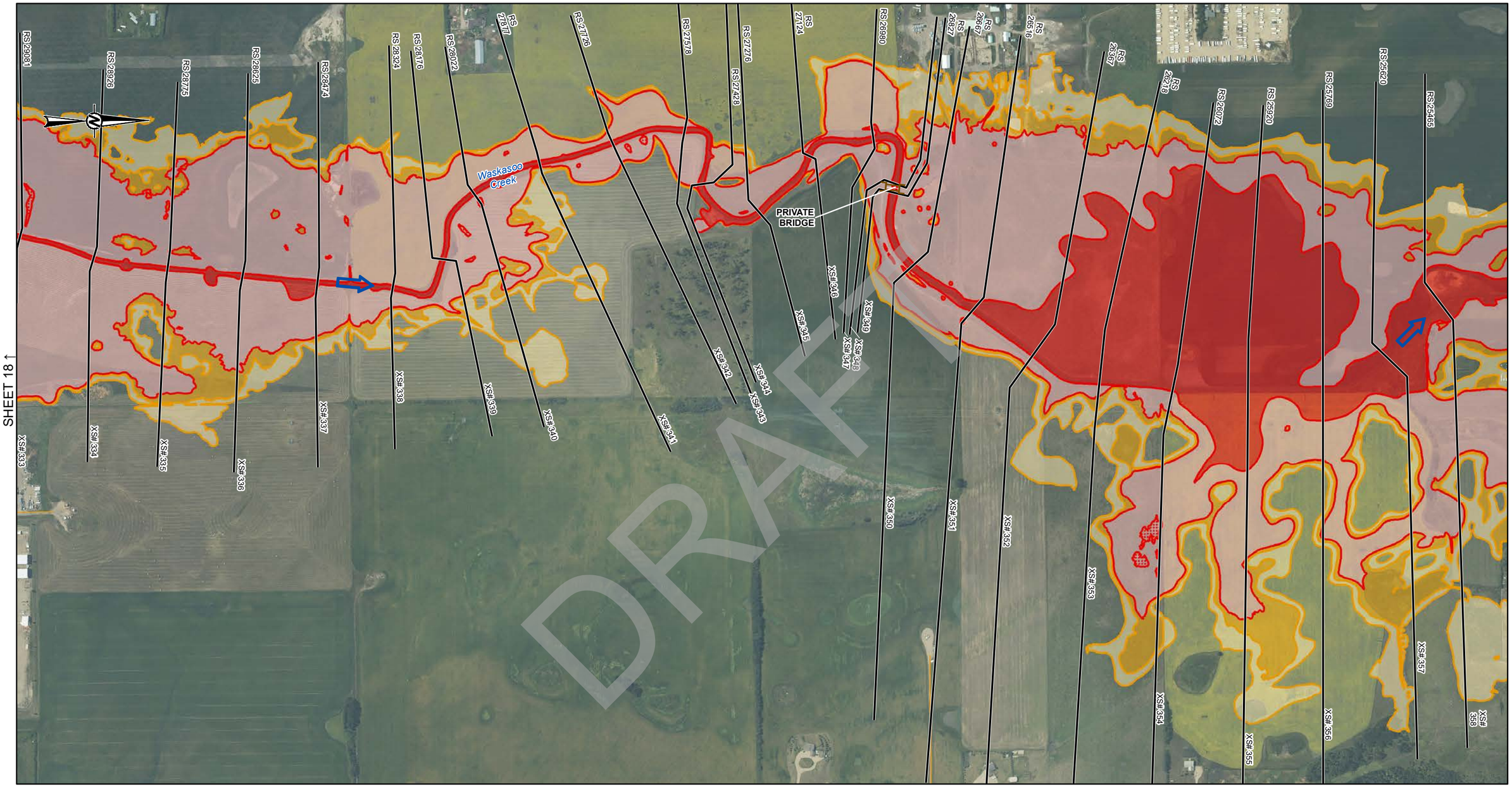


LEGEND

- 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

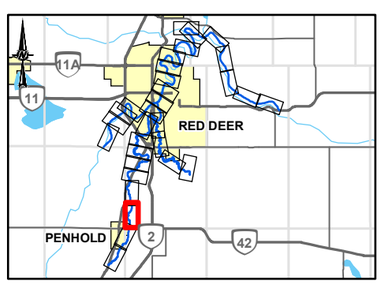
HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE

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

DISCHARGE

WASKASOO CREEK ABOVE PIPER CREEK = 37.1 M^3/S



0 150 300

1:7,500 METRES

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APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

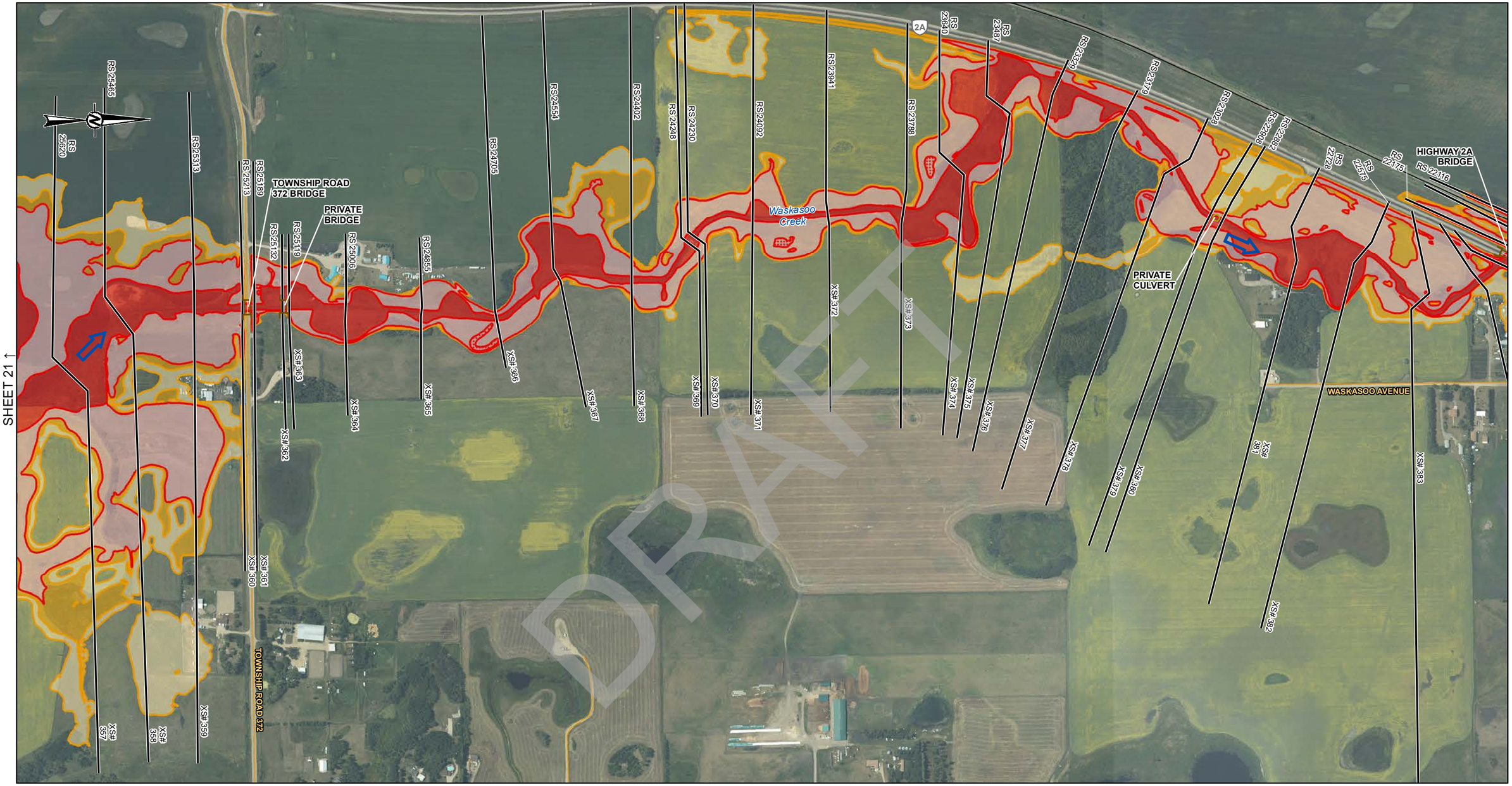
TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 21 OF 31

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

25mm

0



LEGEND

- 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

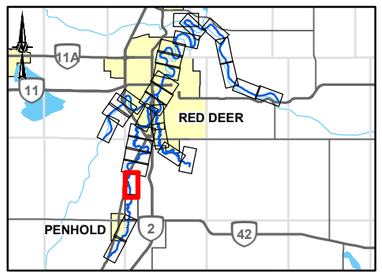
HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE

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

DISCHARGE

WASKASOO CREEK ABOVE PIPER CREEK = 37.1 M^3/S



0 150 300

1:7,500 METRES

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PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 22 OF 31

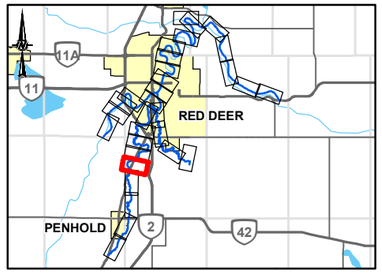
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25mm

0

SHEET 24 ↑

SHEET 22 ↓



LEGEND

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

DISCHARGE

WASKASOO CREEK ABOVE PIPER CREEK = 37.1 M^3/S

0 150 300

1:7,500 METRES

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PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 23 OF 31

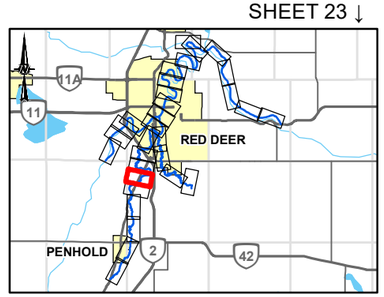
SHEET 25 ↑

RS 17383
RS 17501
RS 17661
RS 17683
RS 17866
RS 18025
RS 18179
RS 18328
RS 18479
RS 18667
RS 18700
RS 18782
RS 19090
RS 19239
RS 19396
RS 19478
RS 19495
RS 19611
RS 19728
RS 19854
RS 20157
RS 20275
RS 20908
RS 20609
RS 20759
RS 20911
RS 20456

XS# 426
XS# 425
XS# 424
XS# 423
XS# 422
XS# 421
XS# 420
XS# 419
XS# 418
XS# 417
XS# 416
XS# 415
XS# 414
XS# 413
XS# 412
XS# 411
XS# 410
XS# 409
XS# 408
XS# 407

TOWNSHIP ROAD 375 BRIDGE
LANTERN STREET BRIDGE
PRIVATE BRIDGE
PRIVATE BRIDGE
WASKASOO AVENUE
LIBERTY AVENUE
LANTERN STREET
LAKE STREET
Waskasoo Creek
RANGE ROAD 280
2A

SHEET 23 ↓



LEGEND

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

DISCHARGE

WASKASOO CREEK ABOVE PIPER CREEK = 37.1 M^3/S

0 150 300
1:7,500 METRES

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PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 24 OF 31

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

25mm

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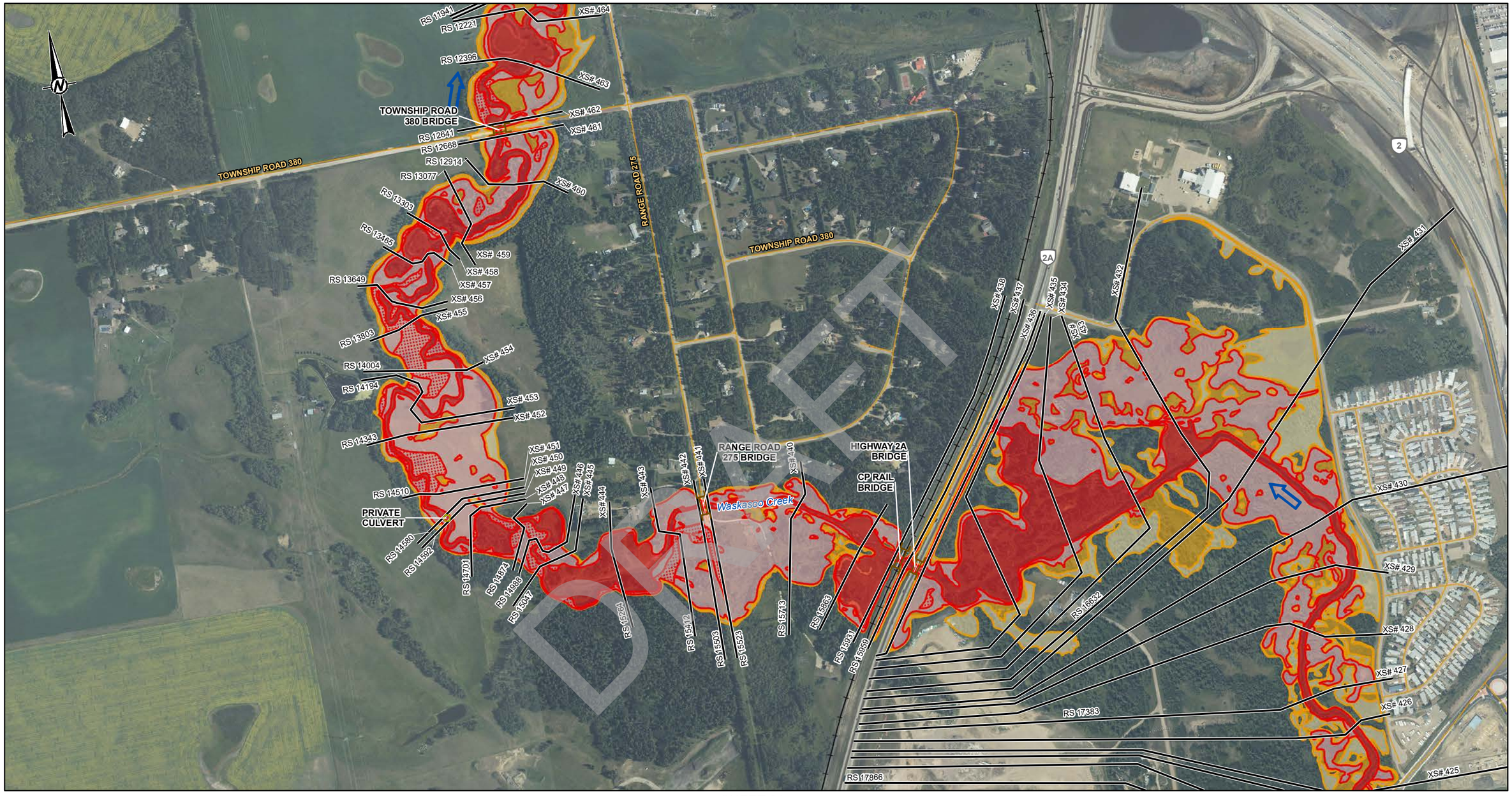
SHEET 26 ↑



LEGEND

- 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

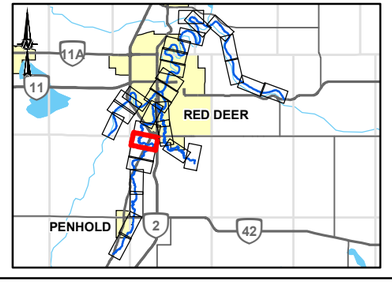
- CULVERT
- BRIDGE

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

DISCHARGE

WASKASOO CREEK ABOVE PIPER CREEK = 37.1 M^3/S

SHEET 24 ↓



0 150 300

1:7,500 METRES

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DATUM: NAD 83 CSRS PROJECTION: 3TM 114

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 25 OF 31

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

25mm

0

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SHEET 27 ↑

LEGEND

- 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

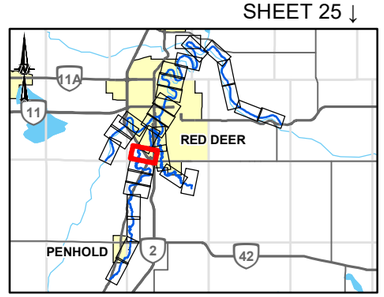
- CULVERT
- BRIDGE

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

DISCHARGE

WASKASOO CREEK ABOVE PIPER CREEK = 37.1 M^3/S

SHEET 25 ↓



0 150 300

1:7,500 METRES

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REVIEWED	GT
APPROVED	DL

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PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 26 OF 31

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

25mm

0

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SHEET 26 ↑

SHEET 5 ↓

RS 9504
RS 9617
RS 9697
RS 9463
RS 9429
RS 9346
RS 9148
RS 9018
RS 8737
RS 8646
RS 8716
RS 8510
RS 8439
RS 8268
RS 8079
RS 7970
RS 7548
RS 7376
RS 7249
RS 7148
RS 7027
RS 6855
RS 6736
RS 6704
RS 6578
RS 6435
RS 6497
RS 6389
RS 6251
RS 6175
RS 6071
RS 5970
RS 5812
RS 5719
RS 5571
RS 5361
RS 5222
RS 5284
RS 4938
RS 4824
RS 4707
RS 4624
RS 4472
RS 4376
RS 4306
RS 4243
RS 4209
RS 4168
RS 4120
RS 4073

WILKINS GREEN
WILSON CRESCENT
WRIGHT AVENUE
WARD CRESCENT
WATSON STREET
WIGMORE CLOSE
32 STREET
57 AVENUE
WELLS STREET
33 STREET
56 STREET
37 STREET
39 STREET
36 AVENUE
41 STREET
43 STREET
43 STREET CULVERT
55 AVENUE
WOODSWORTH CLOSE
WALLACE CLOSE
WAGHORN CLOSE
60 AVENUE
COLLEGE BOULEVARD
COLLEGE CIRCLE
COLLEGE LANE
TAYLOR DRIVE
62 AVENUE
51 AVENUE CLOSE
49 AVENUE
34 STREET
HIGHWAY 2 BRIDGE
PRIVATE BRIDGE
ACR TRAIL NORTH PEDESTRIAN BRIDGE
ACR TRAIL SOUTH PEDESTRIAN BRIDGE
34 STREET CULVERT
32 STREET CULVERT
TAYLOR DRIVE CULVERT
ROTARY PICNIC PARK NORTH PEDESTRIAN BRIDGE
ROTARY PICNIC PARK SOUTH PEDESTRIAN BRIDGE
50 AVENUE (GAETZ AVENUE) BRIDGE
49 AVENUE BRIDGE
48 AVENUE BRIDGE
43 STREET CULVERT
BAYMONT DIKE
SAFEWAY DIKE
Waskasoo Creek

XS# 487
XS# 488
XS# 489
XS# 490
XS# 491
XS# 492
XS# 493
XS# 494
XS# 495
XS# 496
XS# 497
XS# 498
XS# 499
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XS# 545
XS# 546
XS# 550
XS# 267
XS# 275
XS# 280
XS# 281
XS# 282

LEGEND

- 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

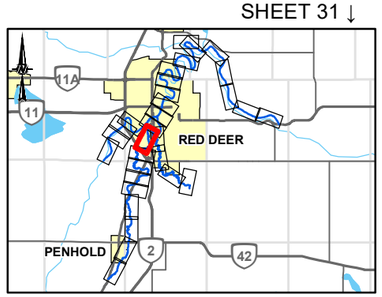
- CULVERT
- BRIDGE

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

DISCHARGE

WASKASOO CREEK ABOVE PIPER CREEK = 37.1 M^3/S
WASKASOO CREEK BELOW PIPER CREEK = 53.9 M^3/S
PIPER CREEK ABOVE WASKASOO CREEK = 19.3 M^3/S

SHEET 31 ↓



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Alberta Government

CONSULTANT
GOLDER

YYYY-MM-DD	2022-12-07
DESIGNED	GT
PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 27 OF 31

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

25mm

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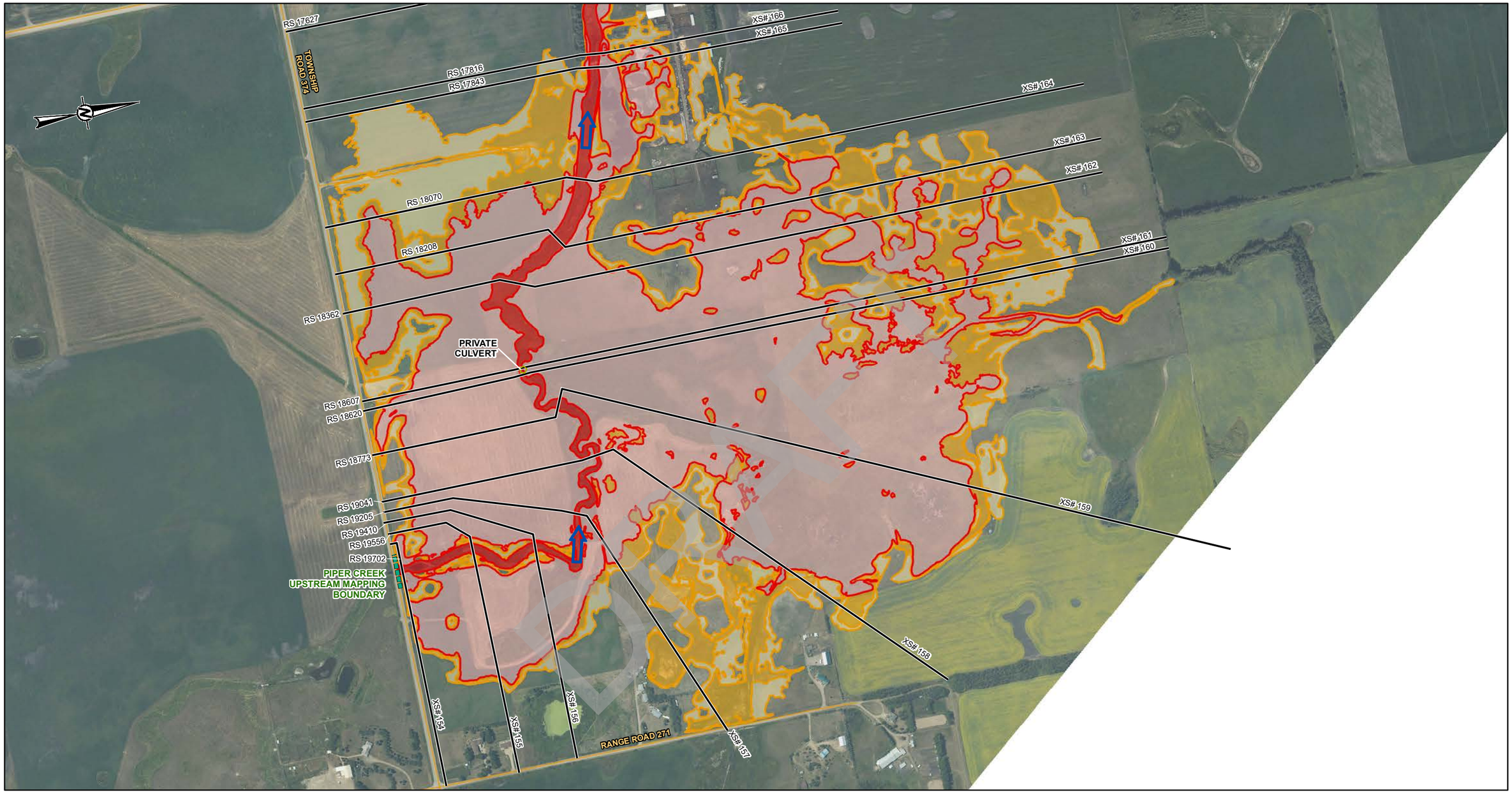
SHEET 29 ↑



LEGEND

- 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

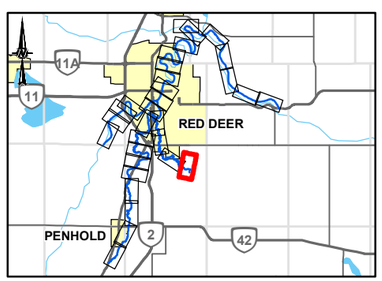
HYDRAULIC STRUCTURES

- CULVERT
- BRIDGE

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

DISCHARGE

PIPER CREEK ABOVE HIGHWAY 595 = 17.5 M^3/S



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APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 28 OF 31

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

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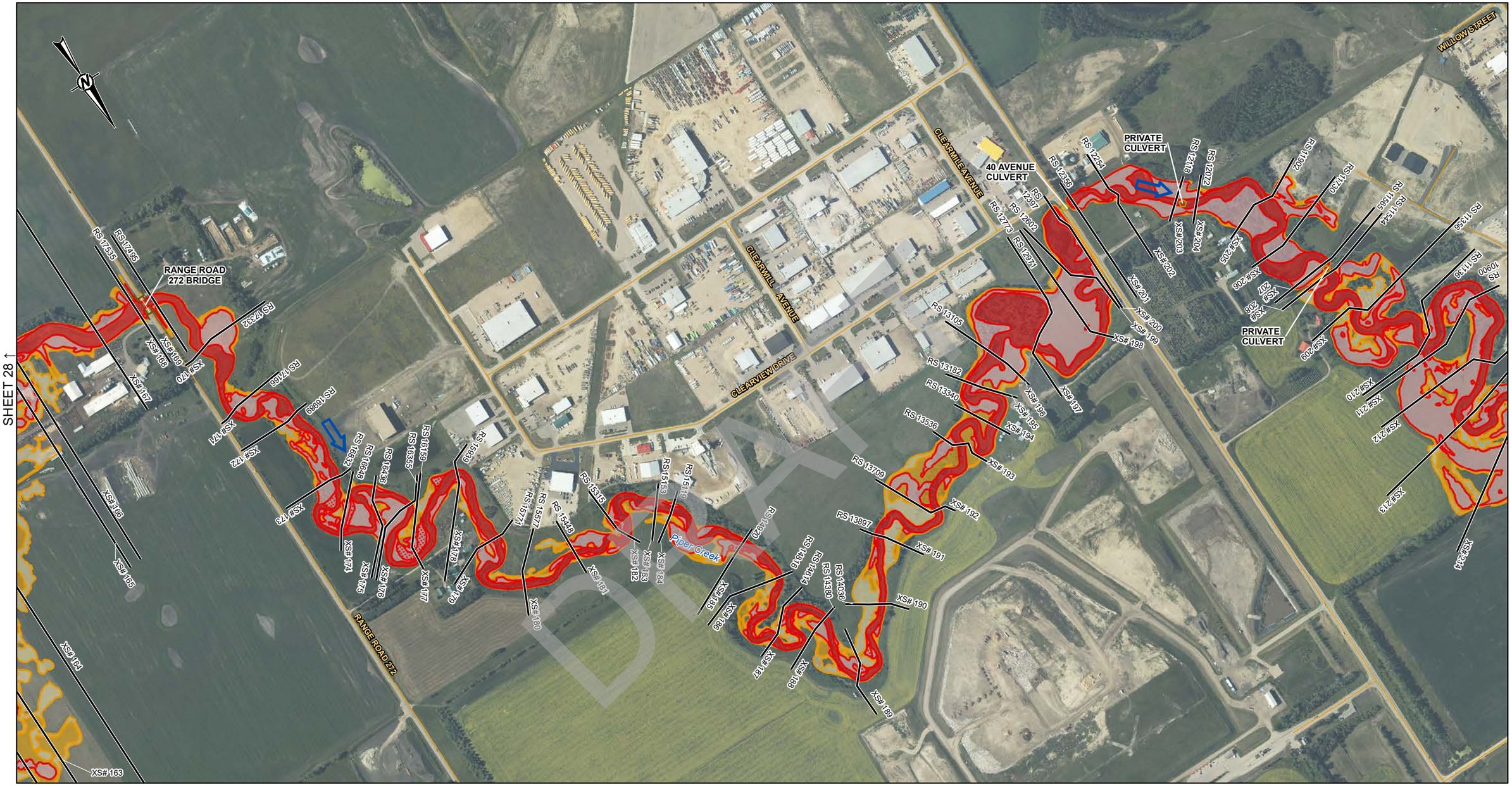

LEGEND

- CROSS SECTION
- XS#100 CROSS SECTION NUMBER
- RS 304 RIVER STATION (M)
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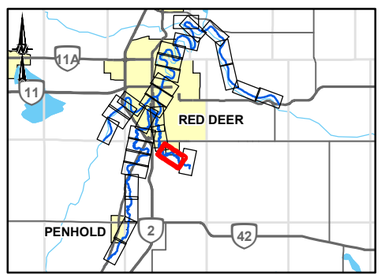
- 200-YEAR FLOOD EXTENT
- 500-YEAR FLOOD EXTENT

DISCHARGE

PIPER CREEK ABOVE HIGHWAY 595 = 17.5 M^3/S



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PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 29 OF 31

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25mm

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SHEET 29 ↑

SHEET 31 ↓

WESTERNER DRIVE
46 AVENUE
BERRY AVENUE
BUNN CRESCENT
BAIRD STREET
BARNES CRESCENT
BARNER AVENUE
BETTENSON STREET
BROWN CLOSE
BOYCE STREET
BAKER AVENUE
BELL STREET
BAILE CLOSE
BEATTY CRESCENT
DELBURN ROAD (19 STREET) CULVERT
BANNERMAN CLOSE PEDESTRIAN BRIDGE
BANNERMAN CLOSE
BOWER WOODS EAST-WEST PEDESTRIAN BRIDGE
Piper Creek
595
2A
18 STREET
SISSON AVENUE
SAGE LINK
40 AVENUE
SHAW CLOSE
SEARS BOULEVARD

RS 9579 RS 9382 RS 9214 RS 8943 RS 8539 RS 8278 RS 8271 RS 8087 RS 7859 RS 7607 RS 7543 RS 7470 RS 7435 RS 7358 RS 7083 RS 6990 RS 6699 RS 6642 RS 6623 RS 6547 RS 6096 RS 5970 RS 5709 RS 5673 RS 5267 RS 5087 RS 5009 RS 4912 RS 4744 RS 4559 RS 4382 RS 4271 RS 4142 RS 4021 RS 3822 RS 3709 RS 3600 RS 3576 RS 3471 RS 3159
RS 9860 RS 10054 RS 10255 RS 10412 RS 10586 RS 10738

XS#212 XS#213 XS#214 XS#215 XS#216 XS#217 XS#218 XS#219 XS#220 XS#221 XS#222 XS#223 XS#224 XS#225 XS#226 XS#227 XS#228 XS#229 XS#230 XS#231 XS#232 XS#233 XS#234 XS#235 XS#236 XS#237 XS#238 XS#239 XS#240 XS#241 XS#242 XS#243 XS#244 XS#245 XS#246 XS#247 XS#248 XS#249 XS#250 XS#251 XS#252 XS#253 XS#254 XS#255 XS#256

LEGEND

- CROSS SECTION
- *XS#100* CROSS SECTION NUMBER
- *RS 304* RIVER STATION (M)
- STUDY BOUNDARY
- FLOW DIRECTION
- LOCAL ROAD
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- RAILWAY
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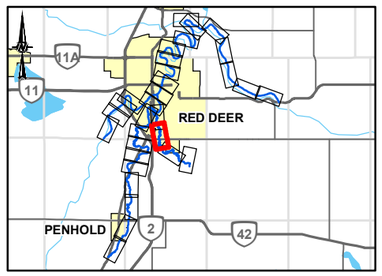
PIPER CREEK ABOVE WASKASOO CREEK = 19.3 M^3/S



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PREPARED	NB
REVIEWED	GT
APPROVED	DL

PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 30 OF 31

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25mm

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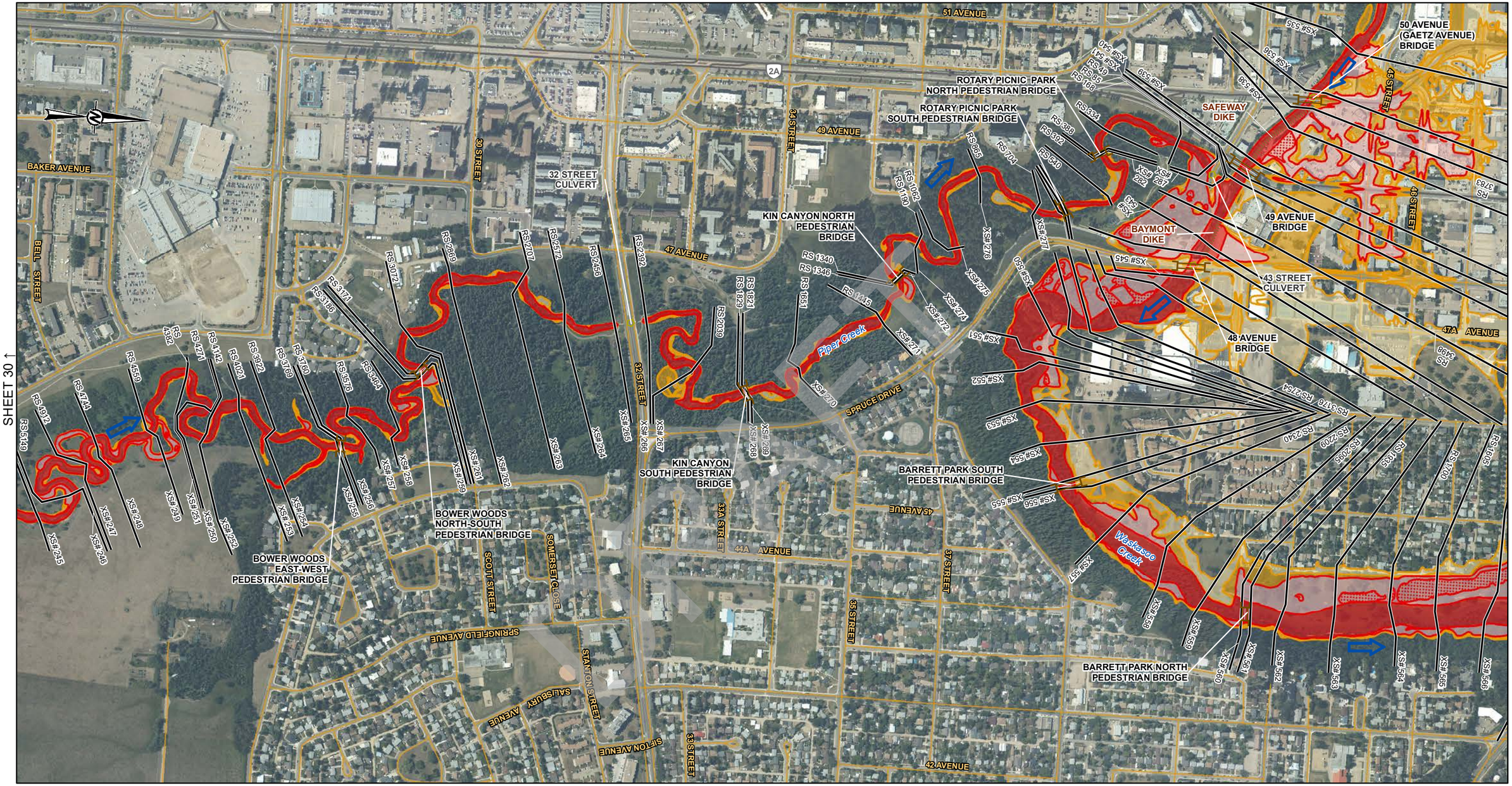
SHEET 27 ↑

SHEET 30 ↑

SHEET 5 ↓



LEGEND

- CROSS SECTION
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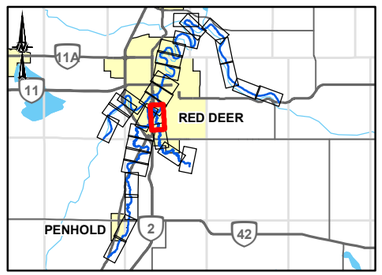

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PROJECT
RED DEER RIVER HAZARD STUDY

TITLE
FLOOD HAZARD MAP

PROJECT NO.	CONTROL	REV.	FIGURE
1783039	6000	3	SHEET 31 OF 31

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