APEGA Permit to Practice - P654

Prepared by:

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Reviewed by:

Gary Van Der Vinne, MSc, PEng
Principal

SANGUDO FLOOD STUDY

OPEN WATER FLOOD INUNDATION MAP LIBRARY

Prepared for:

Alberta

24 March 2022

NHC Ref. No. 1006073

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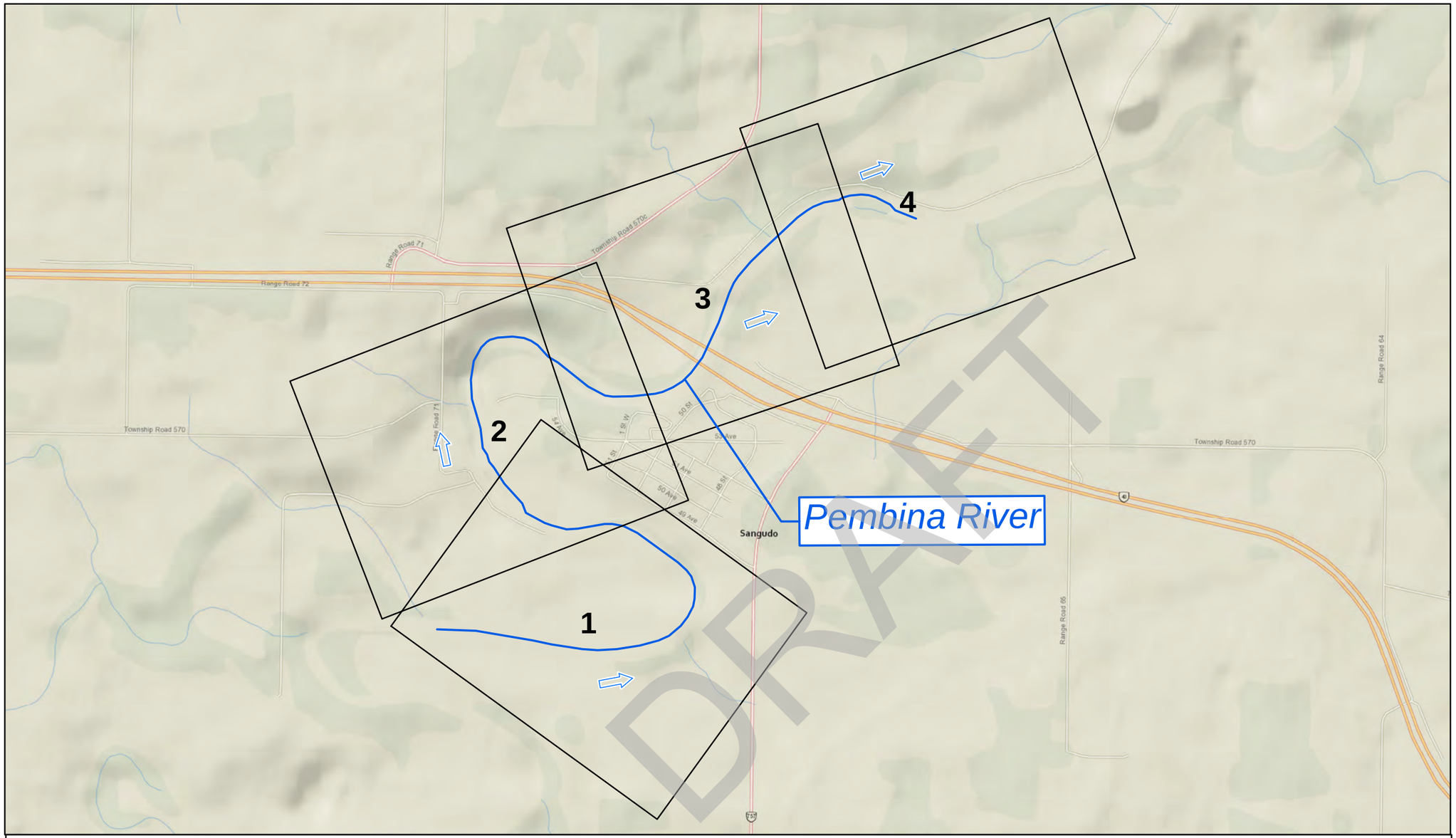
OPEN WATER FLOOD INUNDATION INDEX MAP



Notes to Users:

1. Please refer to the accompanying **Sangudo Flood Study Report** for important information concerning these maps.
2. Within the flood inundation areas shown on this map, there may be isolated pockets of high ground. To determine whether or not a particular site is subject to flooding, reference should be made to the computed flood levels in conjunction with site-specific surveys where detailed definition is required.
3. Non-riverine and local sources of water have not been considered, and structures such roads, railways or barriers such as levees can restrict water flow and affect local flood levels. Channel obstruction, local stormwater inflow, groundwater seepage or other land drainage can cause flood levels to exceed those indicated on the map. Lands adjacent to a flooded area may be subject to flooding from tributary streams not indicated on the maps.
4. The flood inundation area is shown above the line work for bridges that are below flood levels.

Definitions:

1. **Flood Inundation Mapping** - Delineates flood inundation areas, showing the extent of one or more flood scenarios under existing conditions. Depending on the particular flood scenario, the mapping may be divided into multiple zones. Flood inundation mapping is typically used for near real-time emergency response planning and operations.
2. **Flood Inundation Area** - The area inundated during a particular flood scenario under existing conditions. The flood inundation area may be divided into multiple zones, including isolated areas that may become inundated due to groundwater seepage or other subsurface connections. Flood inundation areas may change as a result of future development or flow obstructions.
3. **Flood Scenario**- Flow conditions that describe a particular flood event. Flood scenarios typically represent a range of flows, based either on flood frequency analysis or set flow intervals. The flood scenarios included with this map set include the 2-year, 5-year, 10-year, 20-year, 35-year, 50-year, 75-year, 100-year, 200-year, 350-year, 500-year, 750-year, and 1000-year flood events.

Data Sources and References:

1. Orthophoto imagery acquired by OGL Engineering for Alberta Environment and Parks: *OGL Engineering (2020). Sangudo aerial imagery acquisition memorandum, project number 2020-501, submitted to Alberta Environment and Parks, 5 pp.*
2. Base data from Natural Resources Canada, Alberta Environment and Parks, and Altalis.
3. Additional base mapping from Esri.

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FLOW DIRECTION
STUDY REACH
MAP SHEET

SCALE - 1:22,000
0 300 600 M
N

Coordinate System: NAD 1983 CSRS 3TM 114; Vertical Datum: CGVD28 HTv2.0; Units: Metres

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SANGUDO FLOOD STUDY
OPEN WATER FLOOD INUNDATION INDEX MAP

INDEX MAP

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_IndexMap_FloodInundation.mxd

2-YEAR OPEN WATER FLOOD INUNDATION MAP

(SHEETS 1 TO 4)

SHEET 2 ↓

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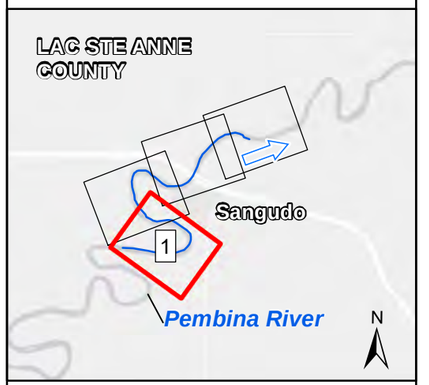

- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 2-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 231 m^3/s

SCALE - 1:5,000
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

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SANGUDO FLOOD STUDY

2-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 1 OF 4

J:\Y_P_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0002YR.mxd

SHEET 1 ⇦

⇨ SHEET 3

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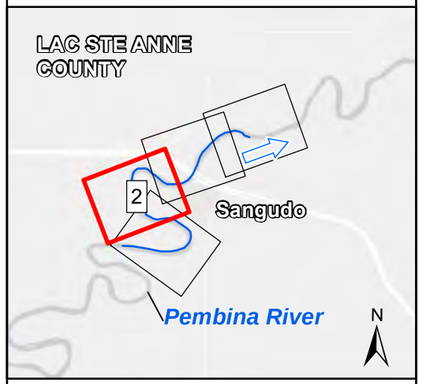

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SANGUDO FLOOD STUDY

2-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 2 OF 4

JY_P:_Projects (Active)\1006073 Sangudo Flood Study\9G GIS\1006073_JY_Map_OWInundation_0002YR.mxd

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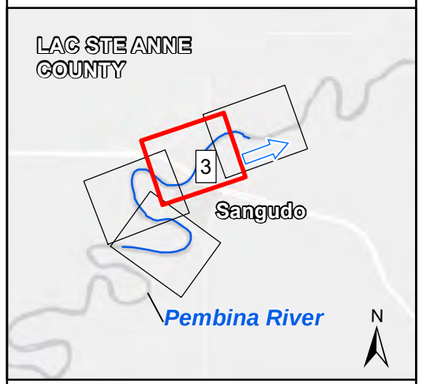

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2-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 3 OF 4

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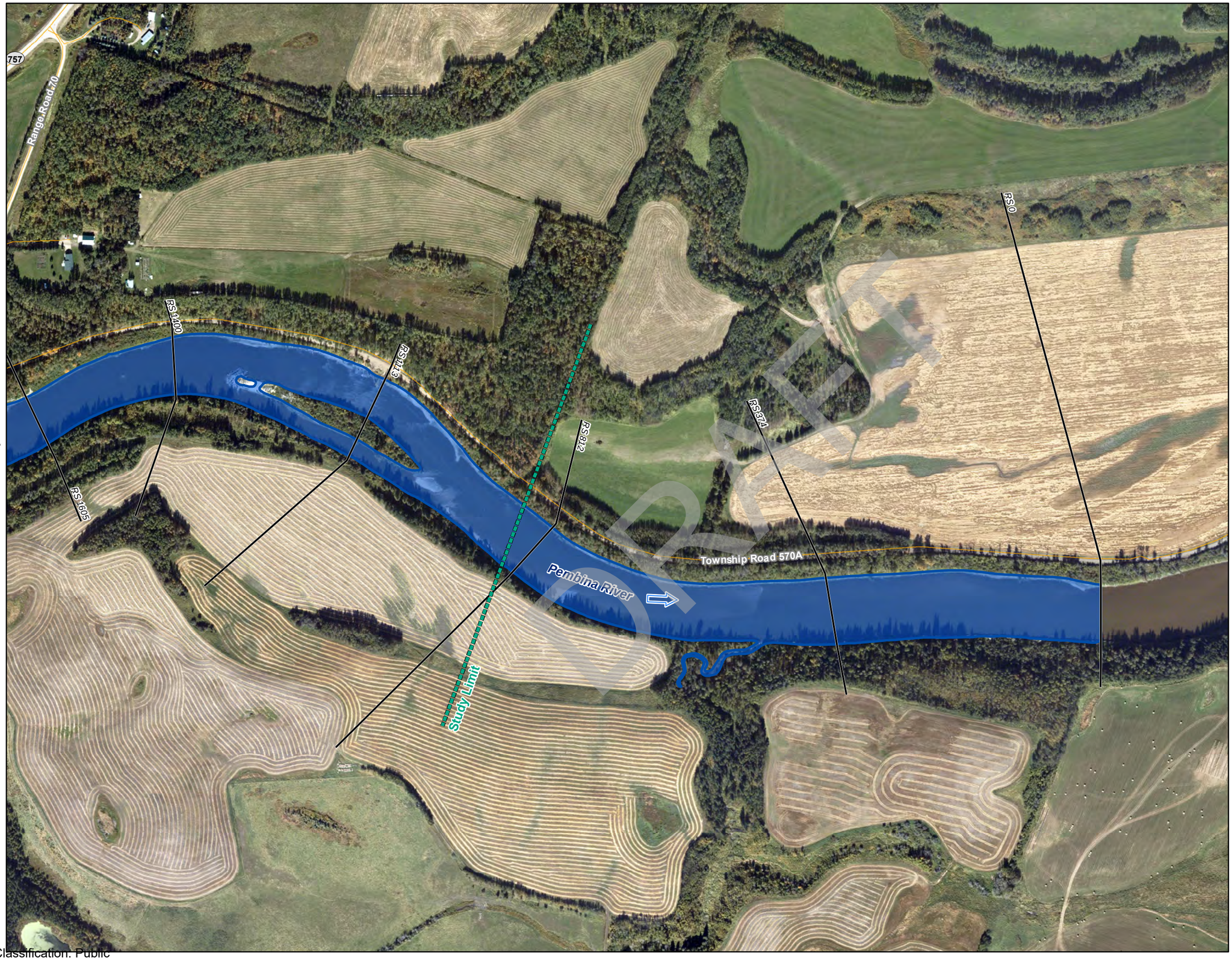

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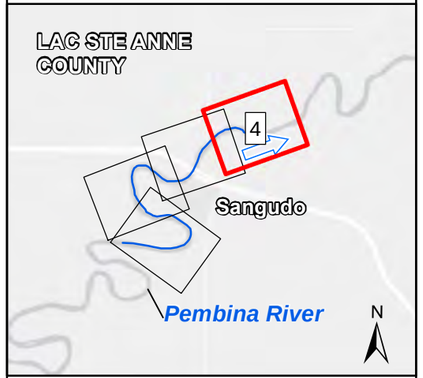

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SANGUDO FLOOD STUDY

2-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 4 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0002YR.mxd

5-YEAR OPEN WATER FLOOD INUNDATION MAP

(SHEETS 1 TO 4)

SHEET 2 ↓

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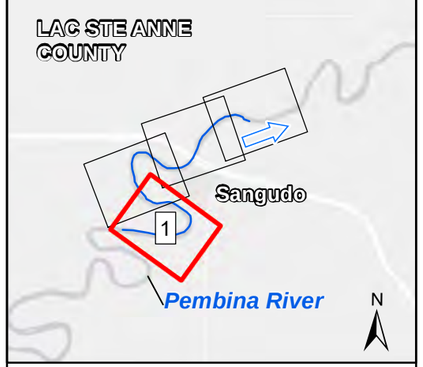

- FLOW DIRECTION
- STUDY LIMIT
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- RAILWAY
- MODEL CROSS SECTION
- 5-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 426 m^3/s

SCALE - 1:5,000
0 100 200 M

N

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

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SANGUDO FLOOD STUDY

5-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 1 OF 4

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Classification: Public

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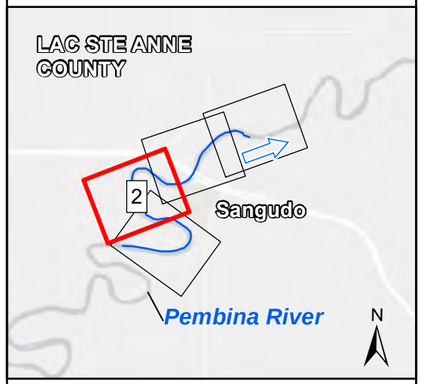

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Coordinate System: NAD 1983 CSRS 3TM 114;
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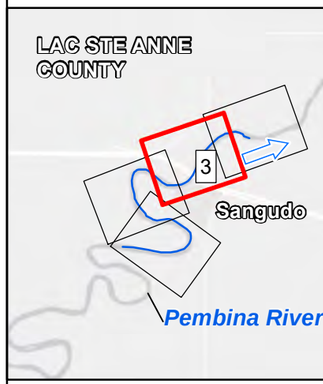
SANGUDO FLOOD STUDY

5-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 2 OF 4

JY_P:_Projects (Active)\1006073 Sangudo Flood Study\9G GIS\1006073_JY_Map_OWInundation_0005YR.mxd

LAC STE ANNE COUNTY



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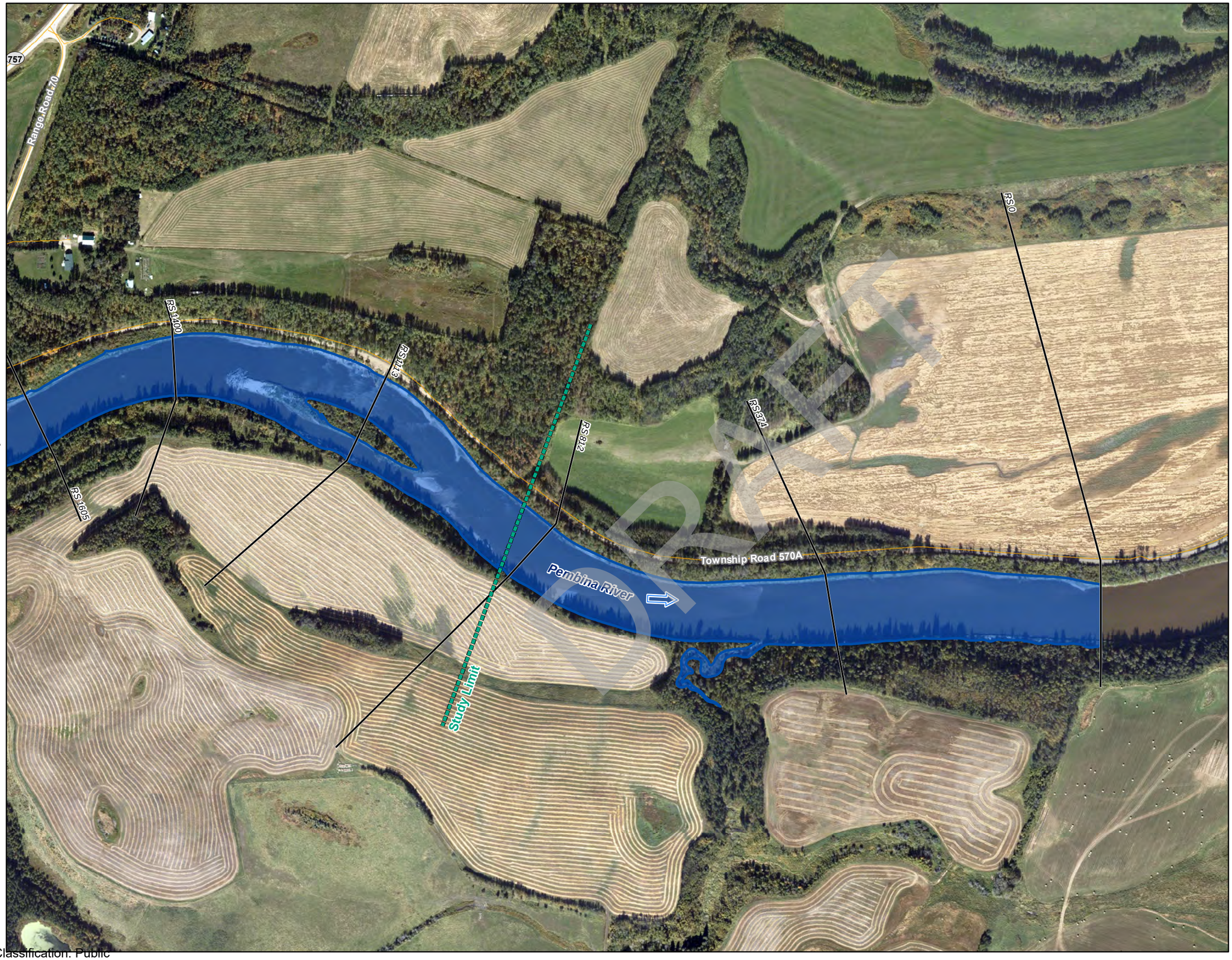
SANGUDO FLOOD STUDY

5-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 3 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0005YR.mxd



SHEET 3 ↑

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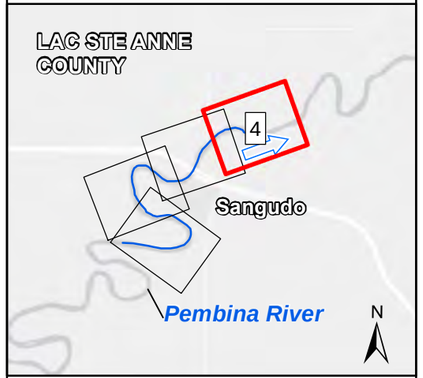

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SANGUDO FLOOD STUDY

5-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 4 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0005YR.mxd

10-YEAR OPEN WATER FLOOD INUNDATION MAP

(SHEETS 1 TO 4)

SHEET 2 ↓

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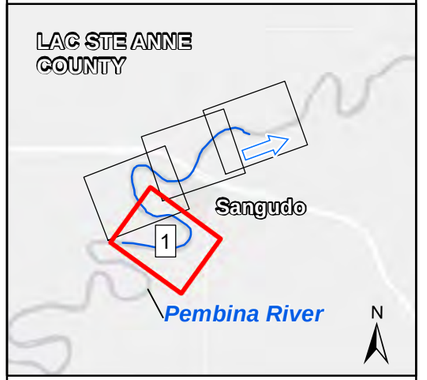

- FLOW DIRECTION
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- RAILWAY
- MODEL CROSS SECTION
- 10-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 597 m^3/s

SCALE - 1:5,000
0 100 200 M

N

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

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SANGUDO FLOOD STUDY

10-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 1 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0010YR.mxd

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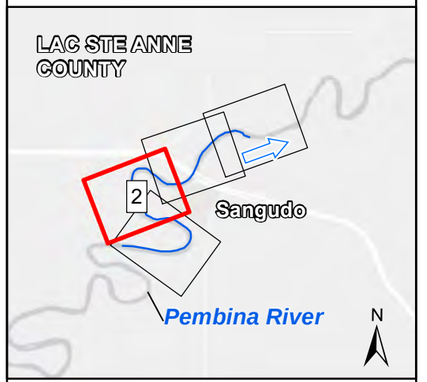

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SANGUDO FLOOD STUDY

10-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 2 OF 4

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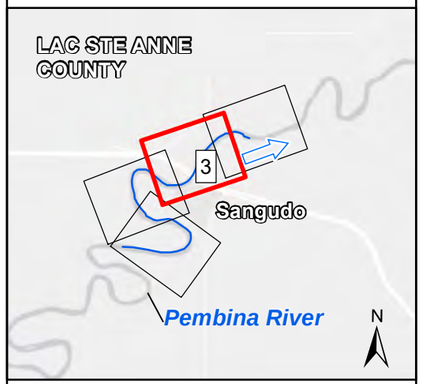

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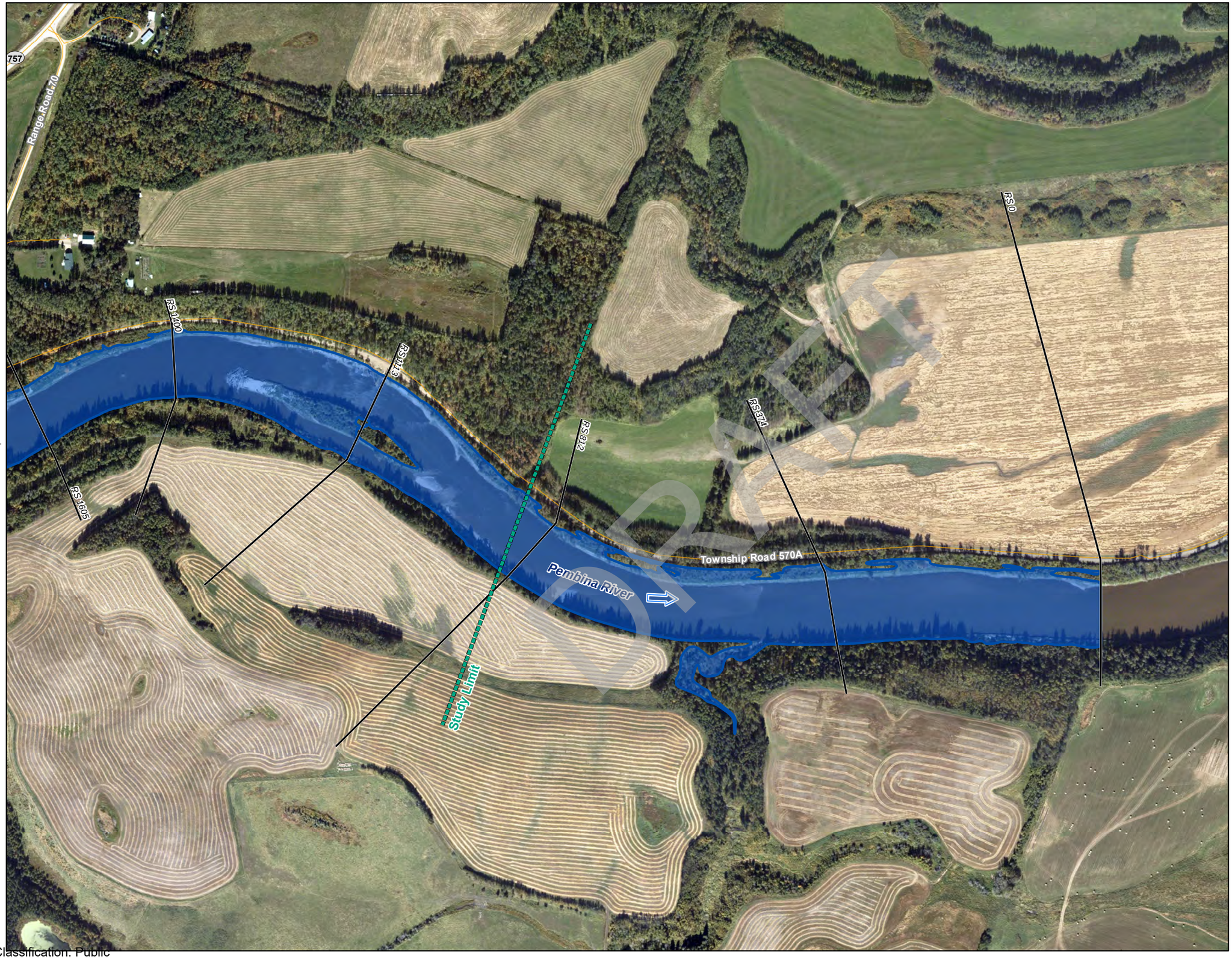
SANGUDO FLOOD STUDY

10-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 3 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0010YR.mxd



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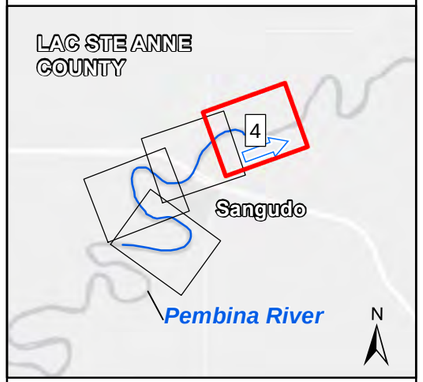

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SANGUDO FLOOD STUDY

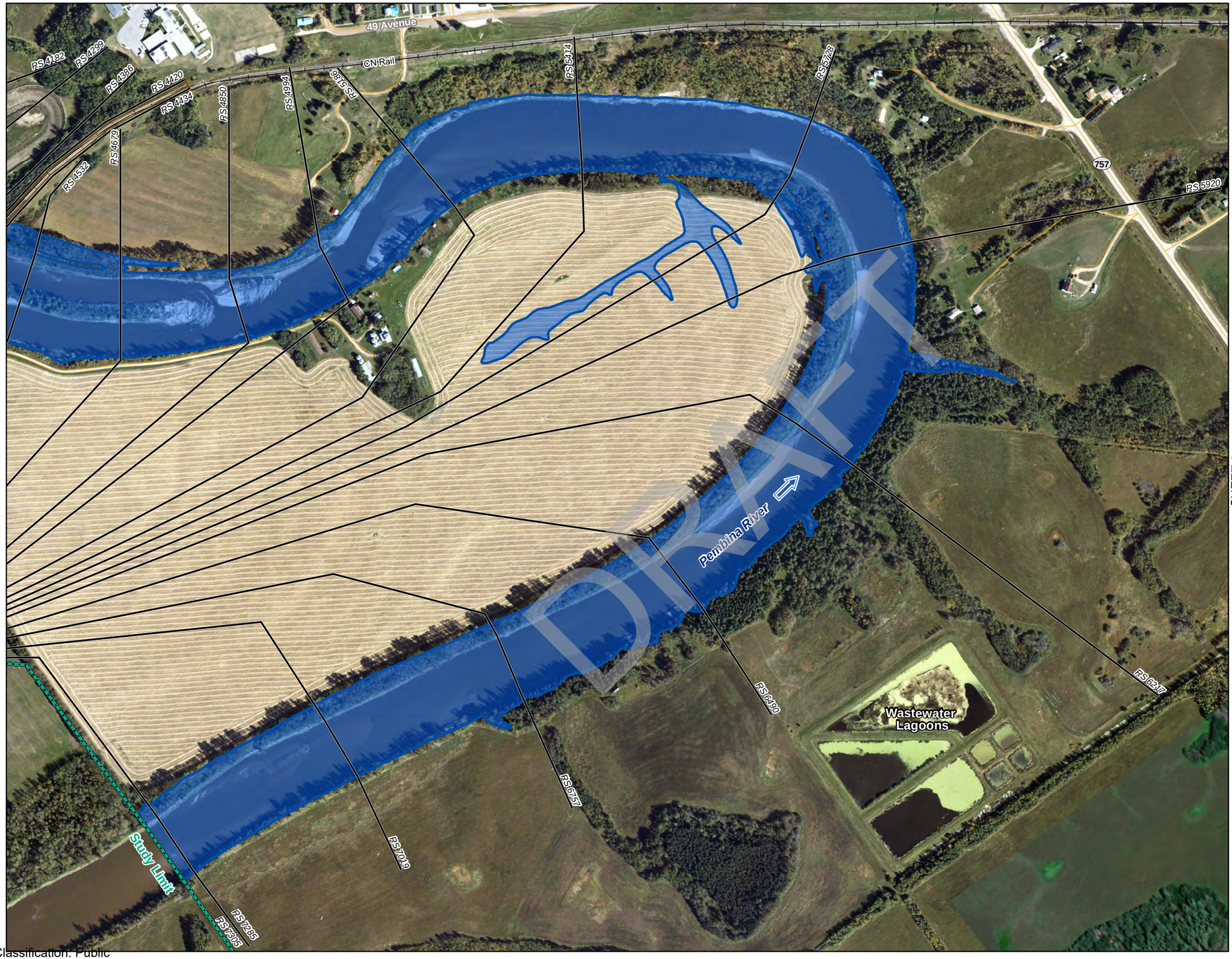
10-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 4 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWInundation_0010YR.mxd

20-YEAR OPEN WATER FLOOD INUNDATION MAP

(SHEETS 1 TO 4)



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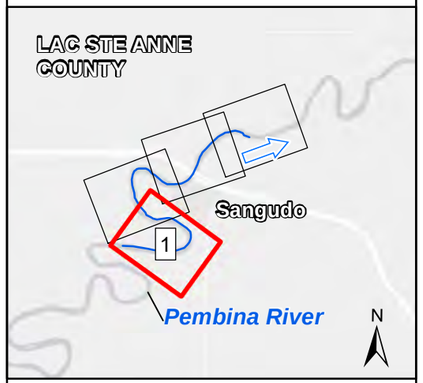

- FLOW DIRECTION
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DISCHARGE
Pembina River = 796 m^3/s

SCALE - 1:5,000
0 100 200 M

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Coordinate System: NAD 1983 CSRS 3TM 114;
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SANGUDO FLOOD STUDY

20-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 1 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0020YR.mxd

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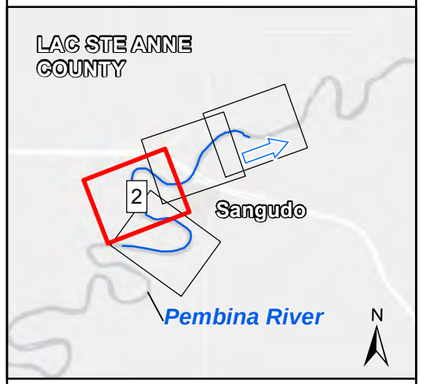

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SANGUDO FLOOD STUDY

20-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 2 OF 4

JY_P:_Projects (Active)\1006073 Sangudo Flood Study\9G GIS\1006073_JY_Map_OWInundation_0020YR.mxd

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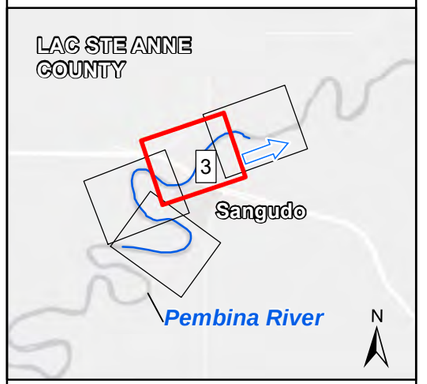

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SANGUDO FLOOD STUDY

20-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 3 OF 4

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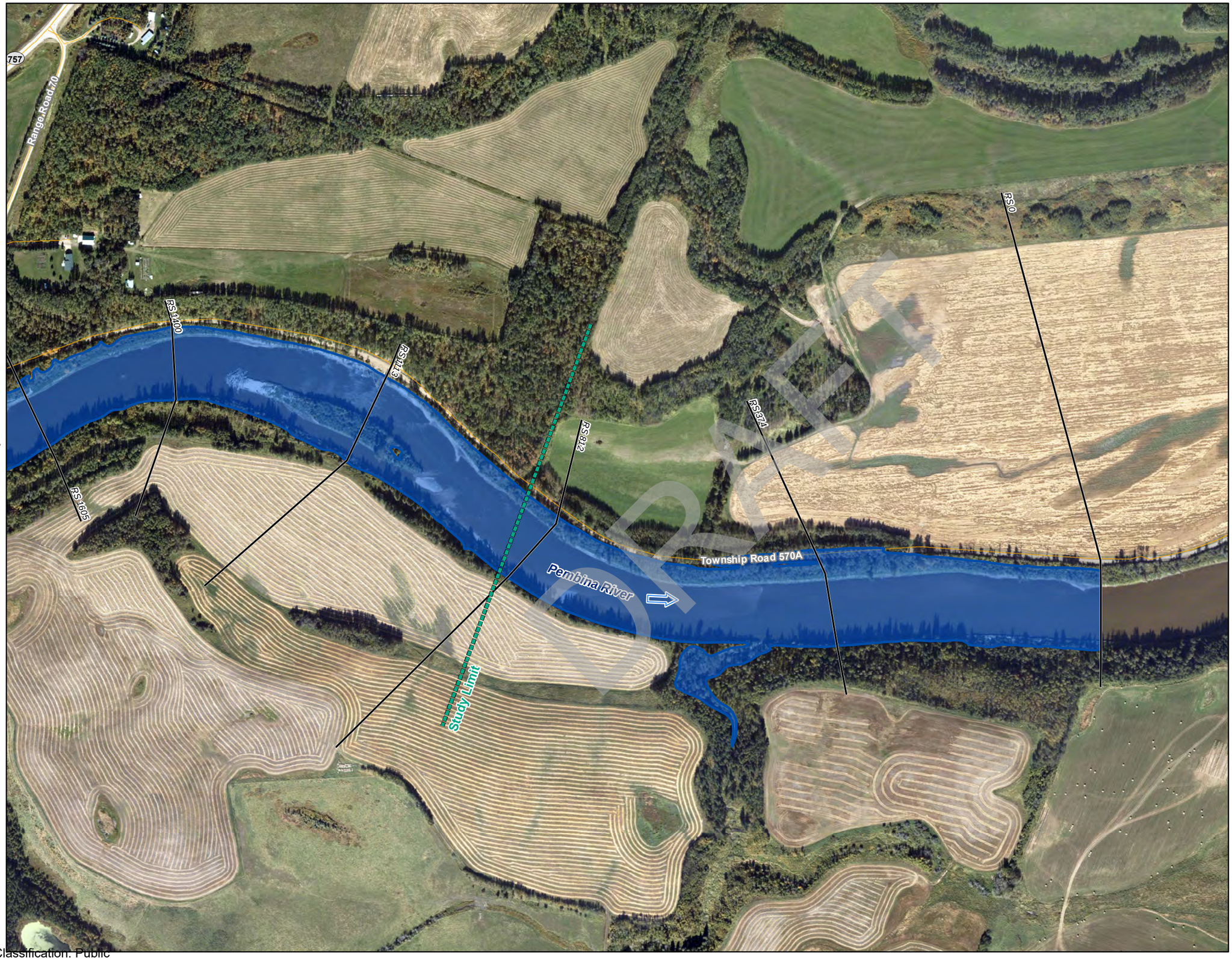

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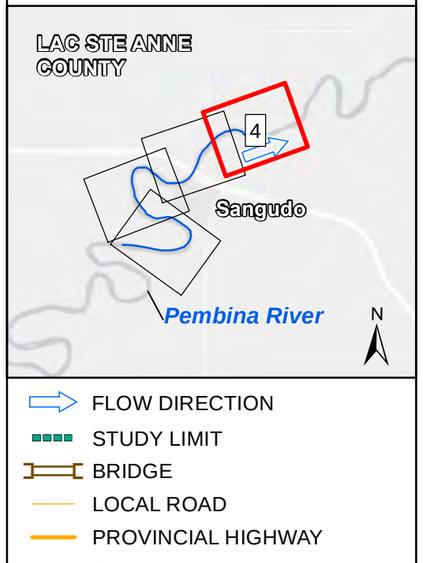

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Engineer	*GIS*	*Reviewer*
MMM	JY	PGV

Job: 1006073 | *Date: 09-MAR-2022*

SANGUDO FLOOD STUDY

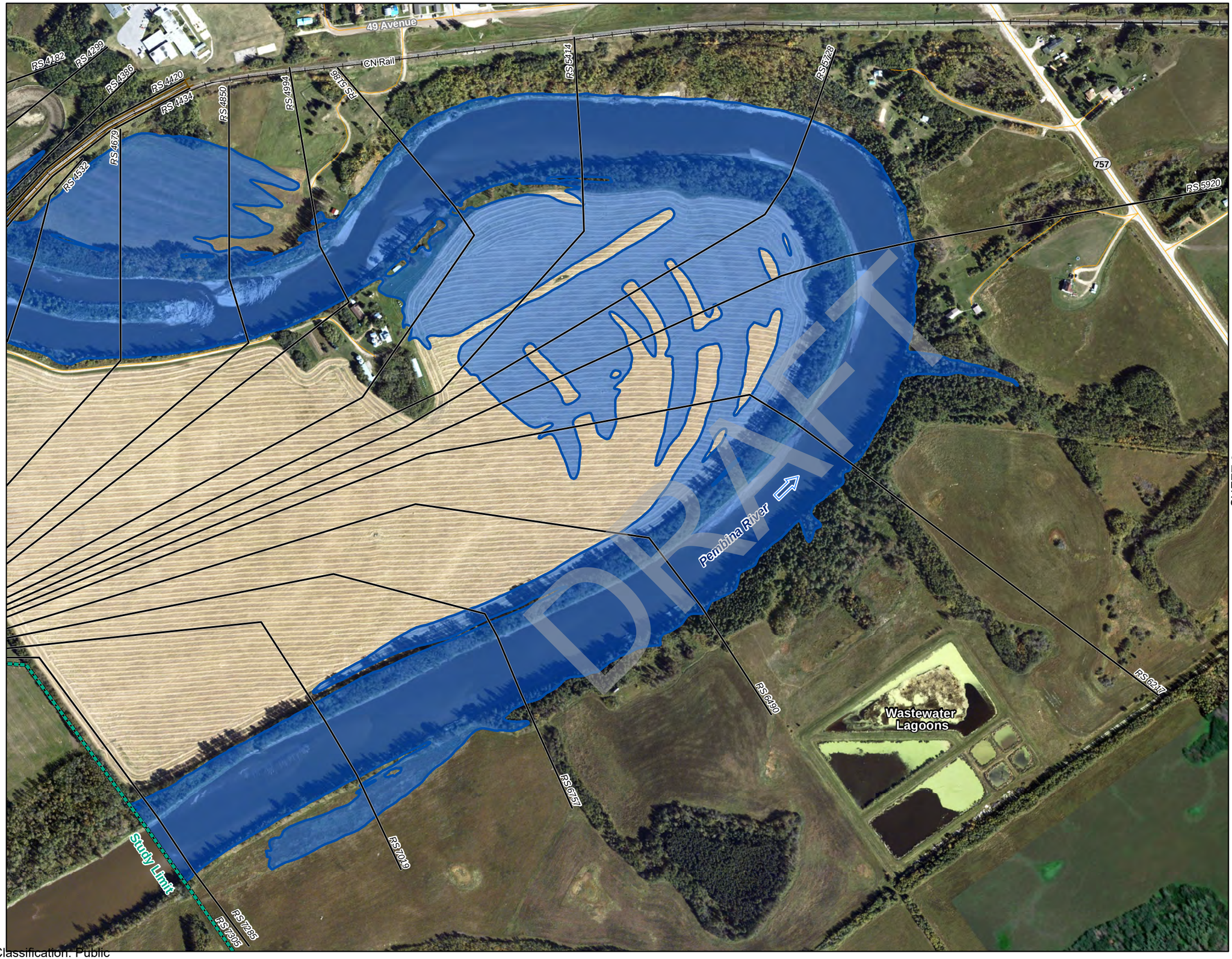
20-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 4 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0020YR.mxd

35-YEAR OPEN WATER FLOOD INUNDATION MAP

(SHEETS 1 TO 4)



SHEET 2 ↓

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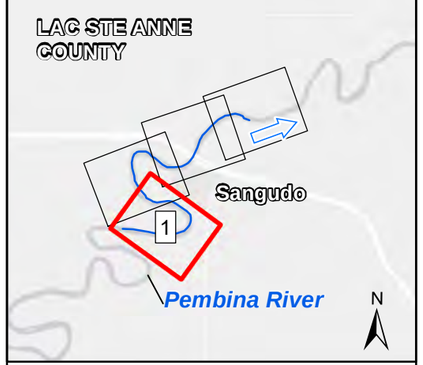

- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 35-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 981 m^3/s

SCALE - 1:5,000
0 100 200 M

N

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

Job: 1006073 | Date: 09-MAR-2022

SANGUDO FLOOD STUDY

35-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 1 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0035YR.mxd

SHEET 1 ⇦

SHEET 3 ⇨

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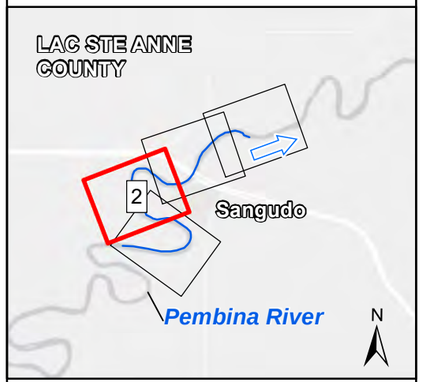


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 35-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 981 m^3/s

SCALE - 1:5,000
0 100 200 M

N

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

Job: 1006073	Date: 09-MAR-2022

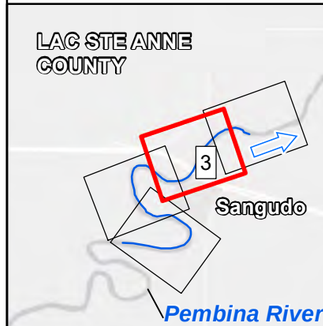
SANGUDO FLOOD STUDY

35-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 2 OF 4

JY_P:_Projects (Active)\1006073 Sangudo Flood Study\9G GIS\1006073_JY_Map_OWInundation_0035YR.mxd

LAC STE ANNE COUNTY



- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 35-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 981 m^3/s

SCALE - 1:5,000
0 100 200 M

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Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

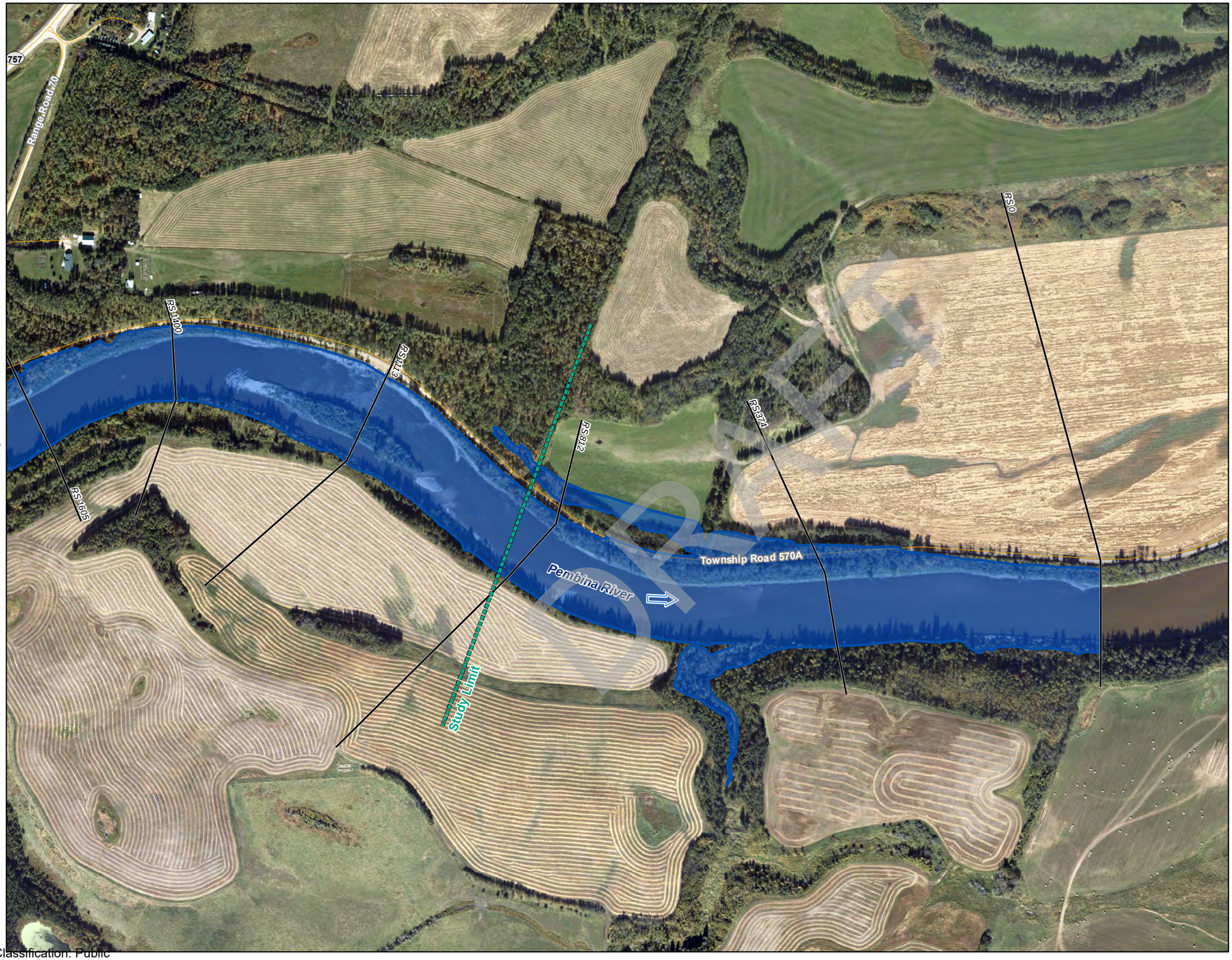
Job: 1006073 | Date: 09-MAR-2022

SANGUDO FLOOD STUDY

35-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 3 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0035YR.mxd



SHEET 3 ↑

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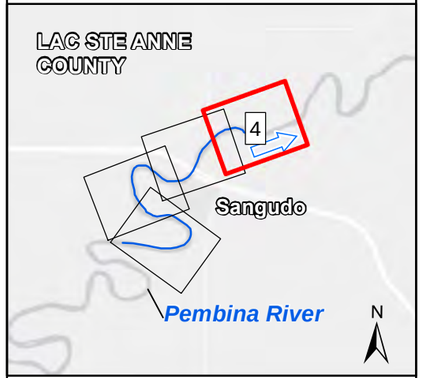


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 35-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 981 m^3/s

SCALE - 1:5,000
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 114; Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	*GIS*	*Reviewer*
MMM	JY	PGV

Job: 1006073 | *Date: 09-MAR-2022*

SANGUDO FLOOD STUDY

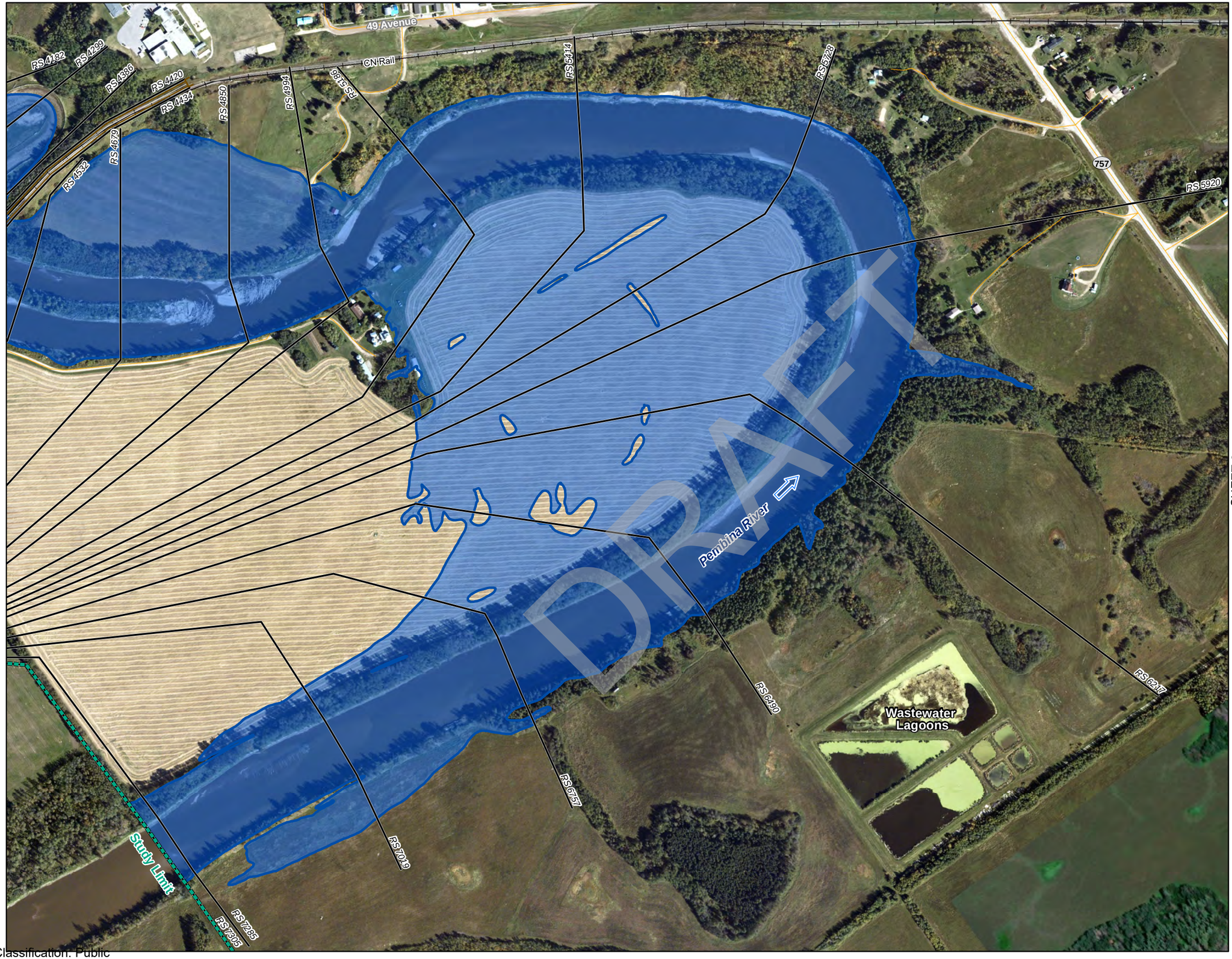
35-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 4 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0035YR.mxd

50-YEAR OPEN WATER FLOOD INUNDATION MAP

(SHEETS 1 TO 4)



SHEET 2 ↓

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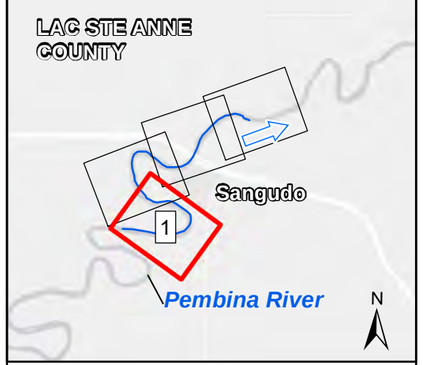

- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 50-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 1110 m^3/s

SCALE - 1:5,000
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

Job: 1006073 | Date: 09-MAR-2022

SANGUDO FLOOD STUDY

50-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 1 OF 4

J:\Y_P_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0050YR.mxd

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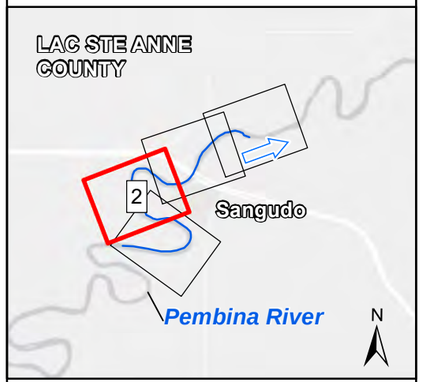


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 50-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 1110 m^3/s

SCALE - 1:5,000
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

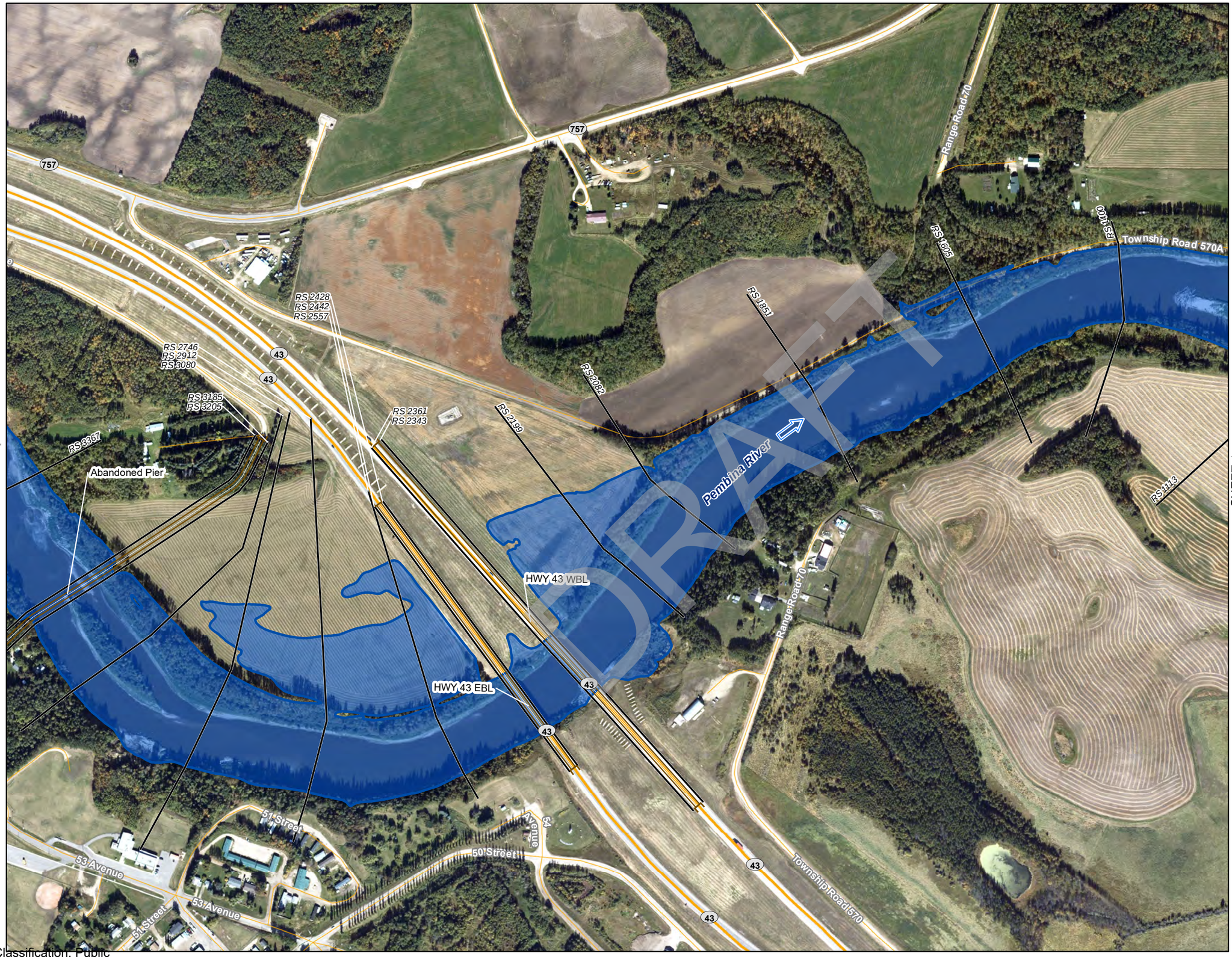
Job: 1006073	Date: 09-MAR-2022

SANGUDO FLOOD STUDY

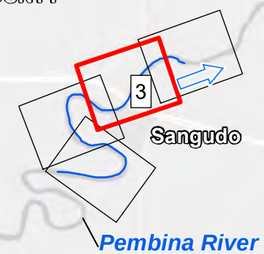
50-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 2 OF 4

JY_P:_Projects (Active)\1006073 Sangudo Flood Study\9D GIS\1006073_JY_Map_OWInundation_0050YR.mxd



LAC STE ANNE COUNTY



- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 50-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 1110 m^3/s

SCALE - 1:5,000
0 100 200 M

N

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

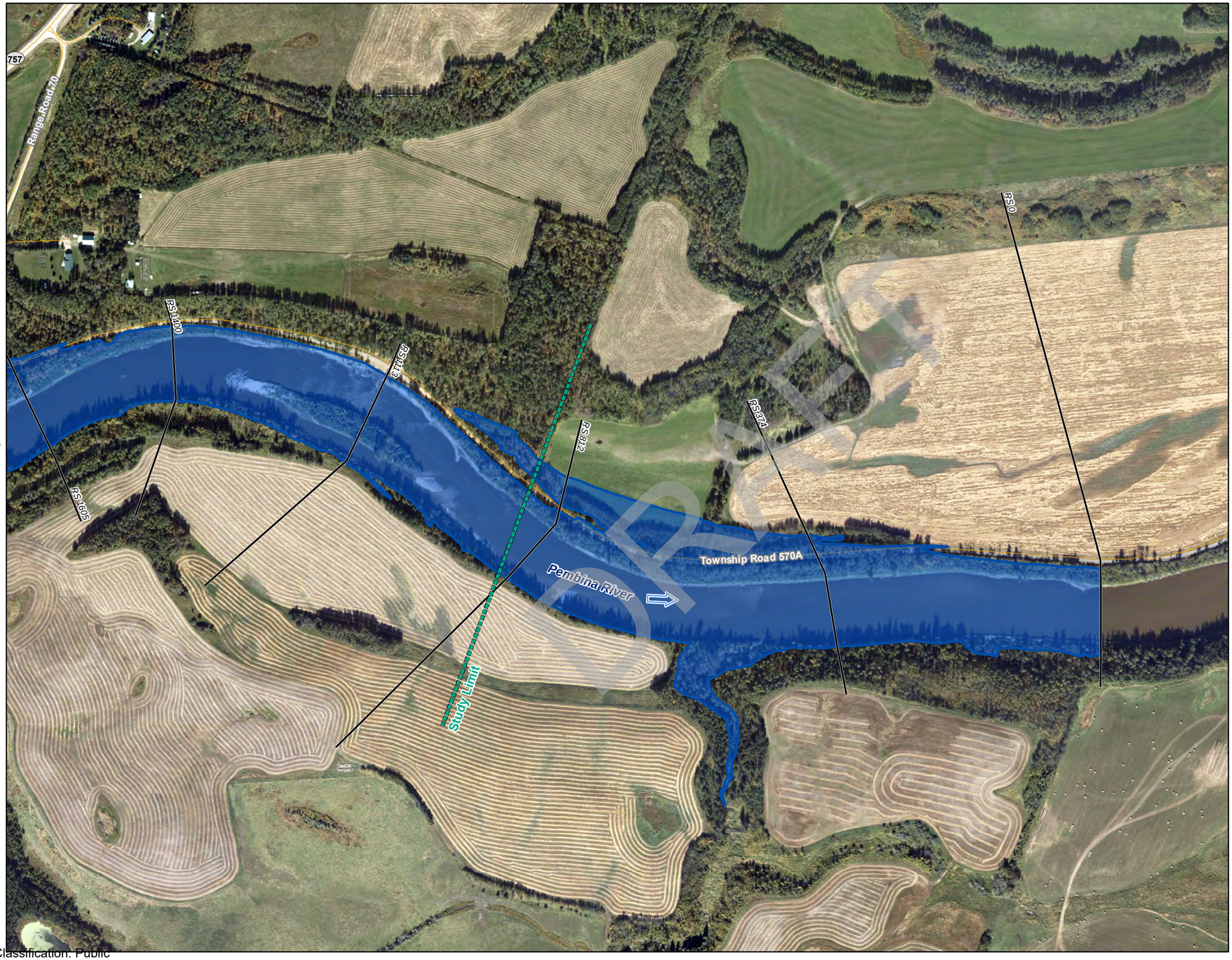
Job: 1006073 | Date: 09-MAR-2022

SANGUDO FLOOD STUDY

50-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 3 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0050YR.mxd



SHEET 3 ↑

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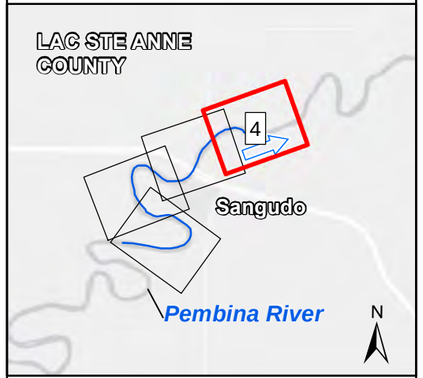


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 50-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 1110 m^3/s

SCALE - 1:5,000
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 114; Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	*GIS*	*Reviewer*
MMM	JY	PGV

Job: 1006073 | *Date: 09-MAR-2022*

SANGUDO FLOOD STUDY

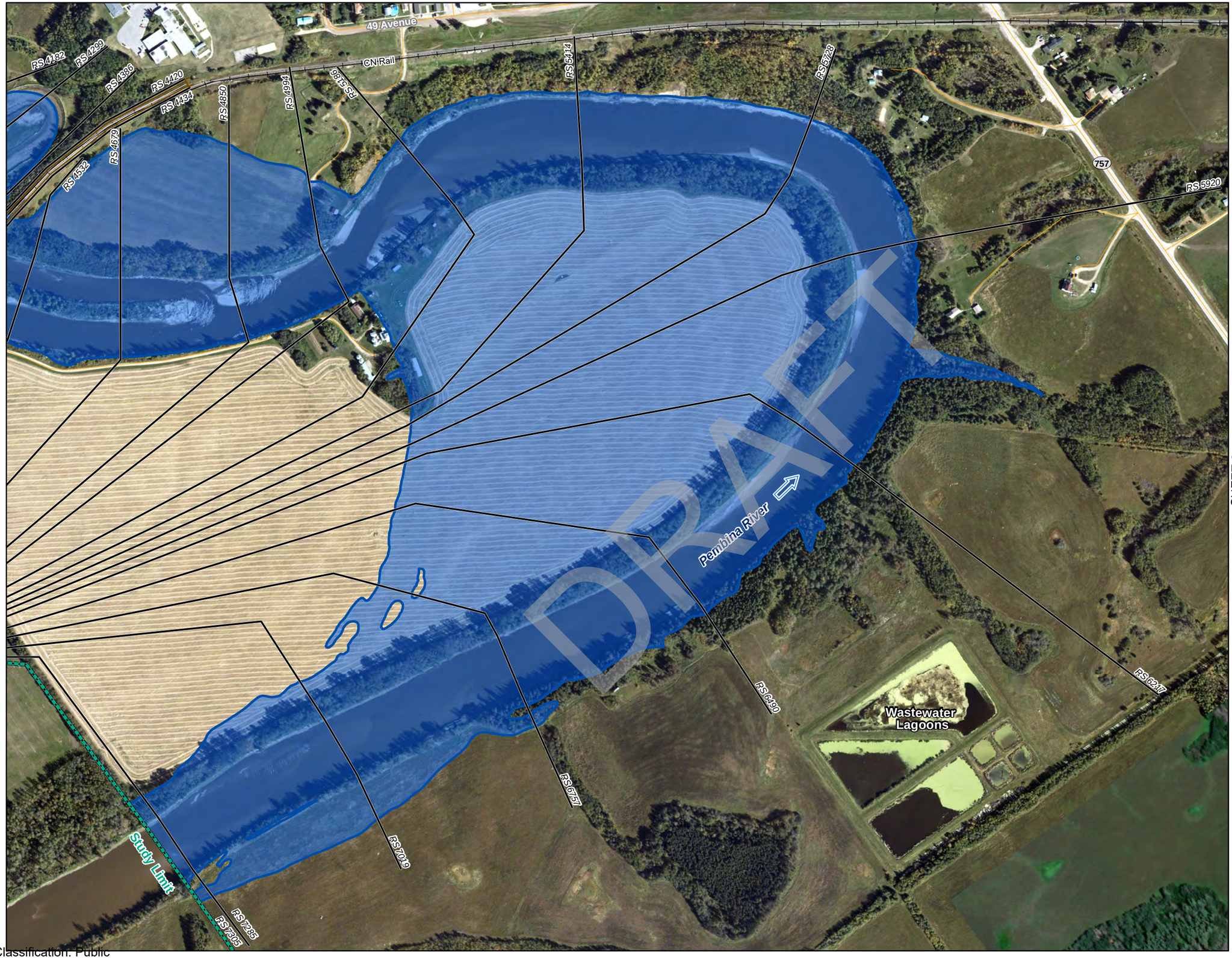
50-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 4 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0050YR.mxd

75-YEAR OPEN WATER FLOOD INUNDATION MAP

(SHEETS 1 TO 4)



SHEET 2 →

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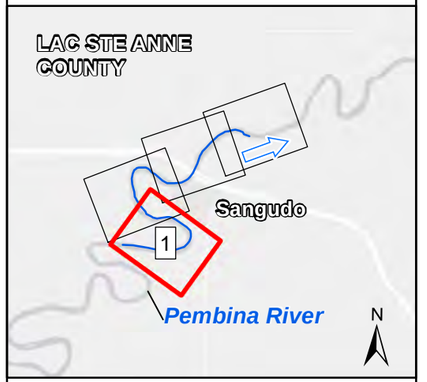

- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 75-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 1270 m^3/s

SCALE - 1:5,000
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

Job: 1006073 | Date: 09-MAR-2022

SANGUDO FLOOD STUDY

75-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 1 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0075YR.mxd

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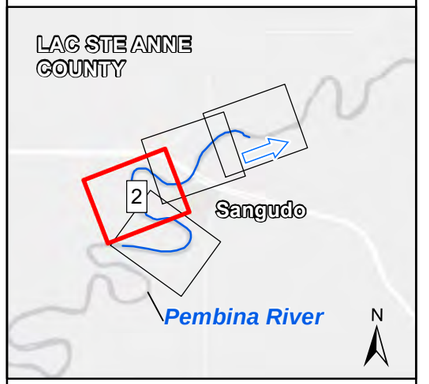


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 75-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 1270 m^3/s

SCALE - 1:5,000
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

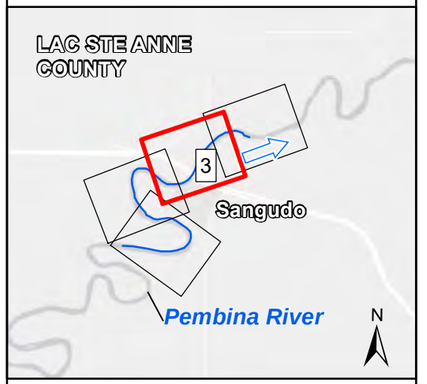
Job: 1006073	Date: 09-MAR-2022

SANGUDO FLOOD STUDY

75-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 2 OF 4

JY_P:_Projects (Active)\1006073 Sangudo Flood Study\9G GIS\1006073_JY_Map_OWinundation_0075YR.mxd



- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 75-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 1270 m^3/s

SCALE - 1:5,000
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

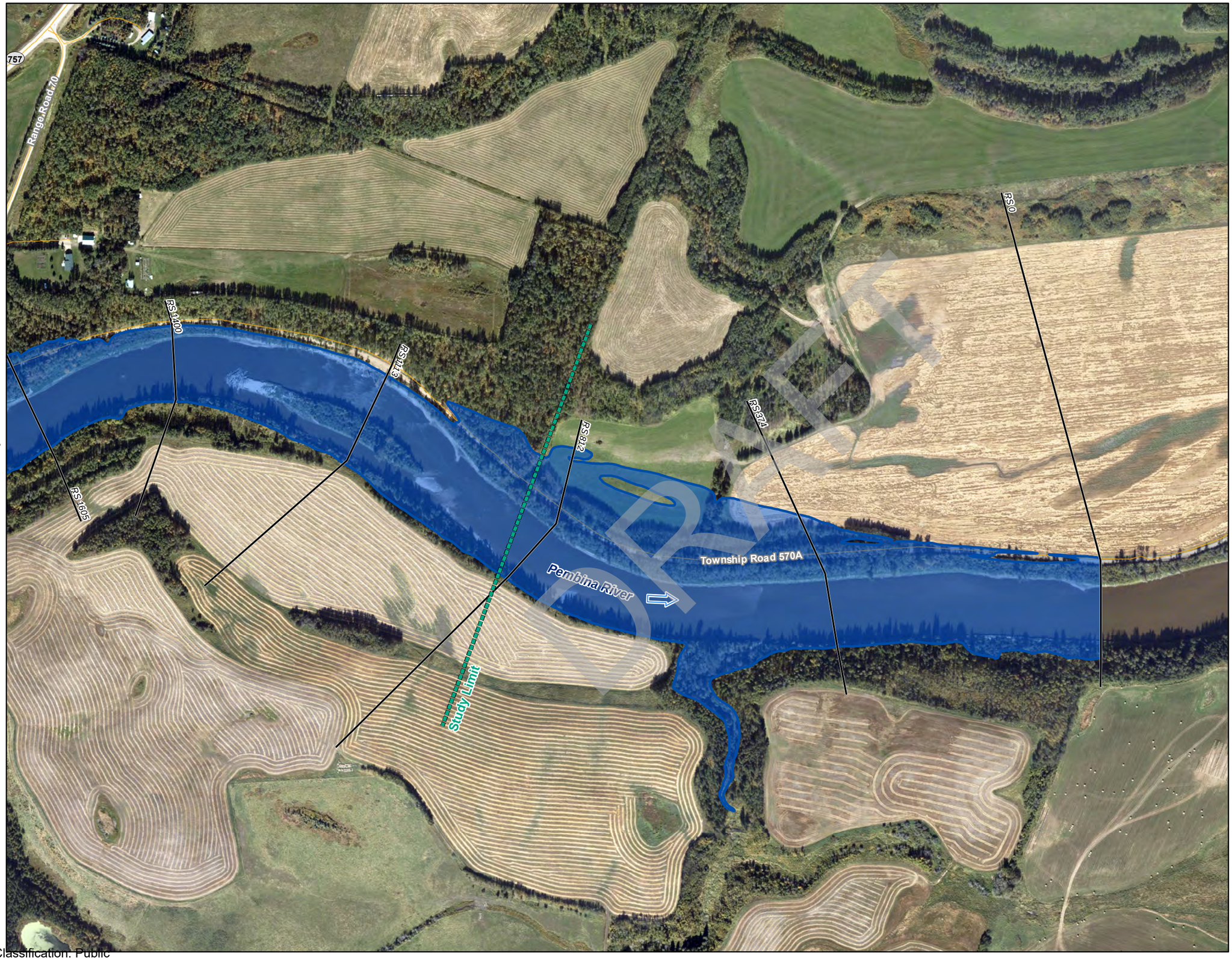
Job: 1006073 | Date: 09-MAR-2022

SANGUDO FLOOD STUDY

75-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 3 OF 4

JY_P:_Projects (Active)\1006073 Sangudo Flood Study\9G GIS\1006073_JY_Map_OWinundation_0075YR.mxd



SHEET 3 ↑

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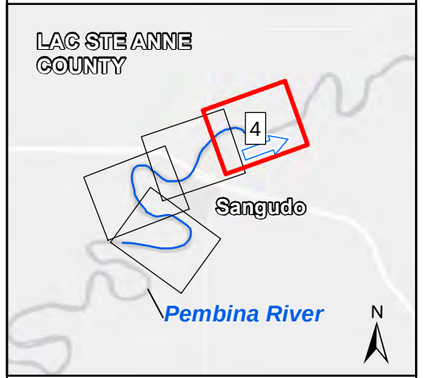


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 75-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 1270 m^3/s

SCALE - 1:5,000
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

Job: 1006073 | Date: 09-MAR-2022

SANGUDO FLOOD STUDY

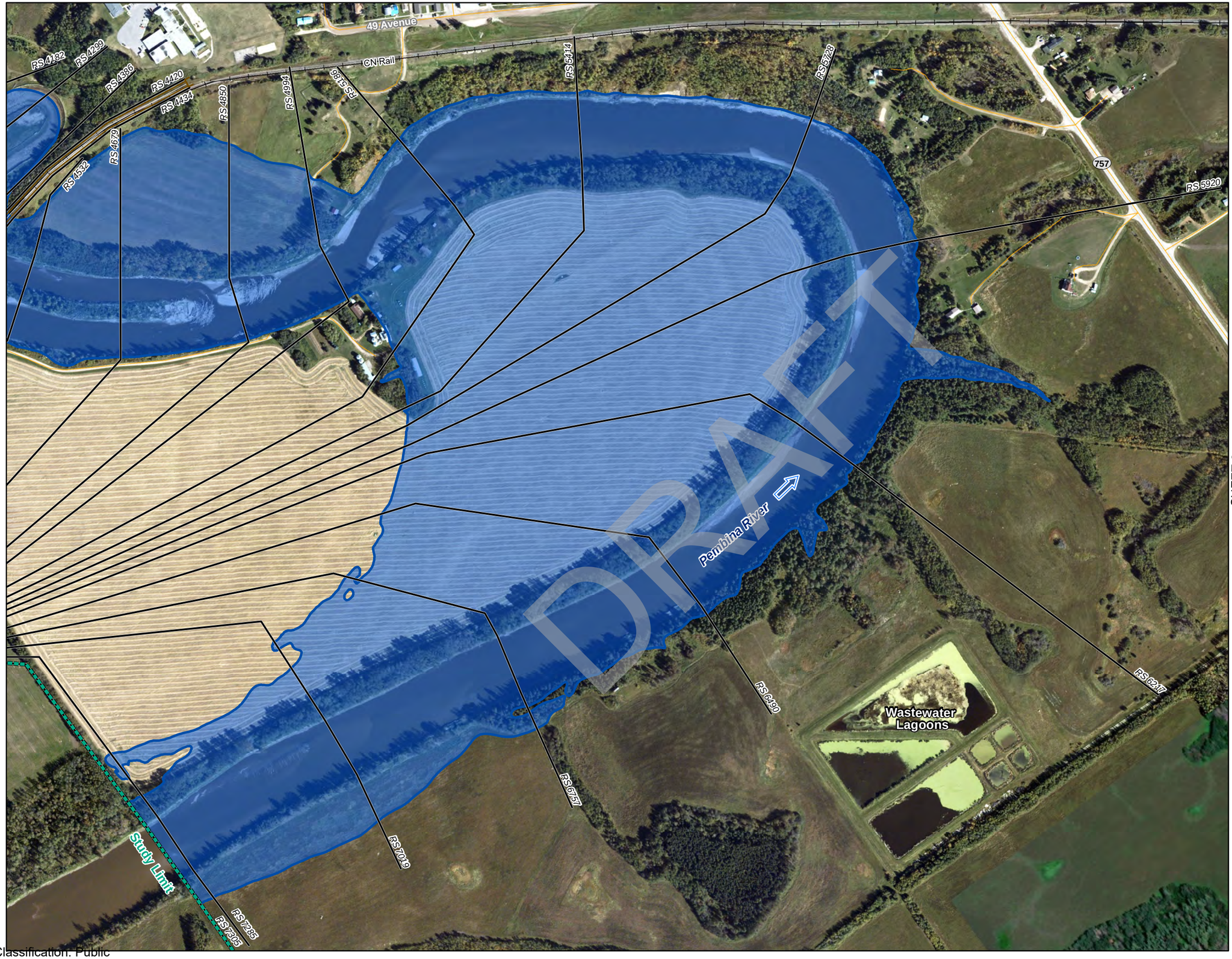
75-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 4 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0075YR.mxd

100-YEAR OPEN WATER FLOOD INUNDATION MAP

(SHEETS 1 TO 4)



SHEET 2 →

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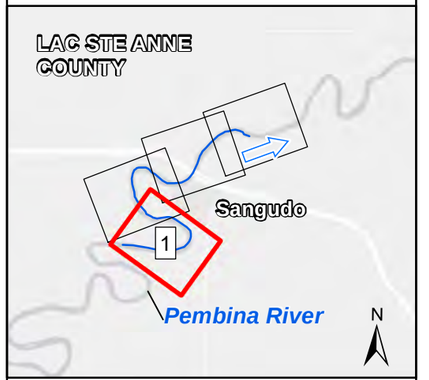


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 100-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 1400 m^3/s

SCALE - 1:5,000
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

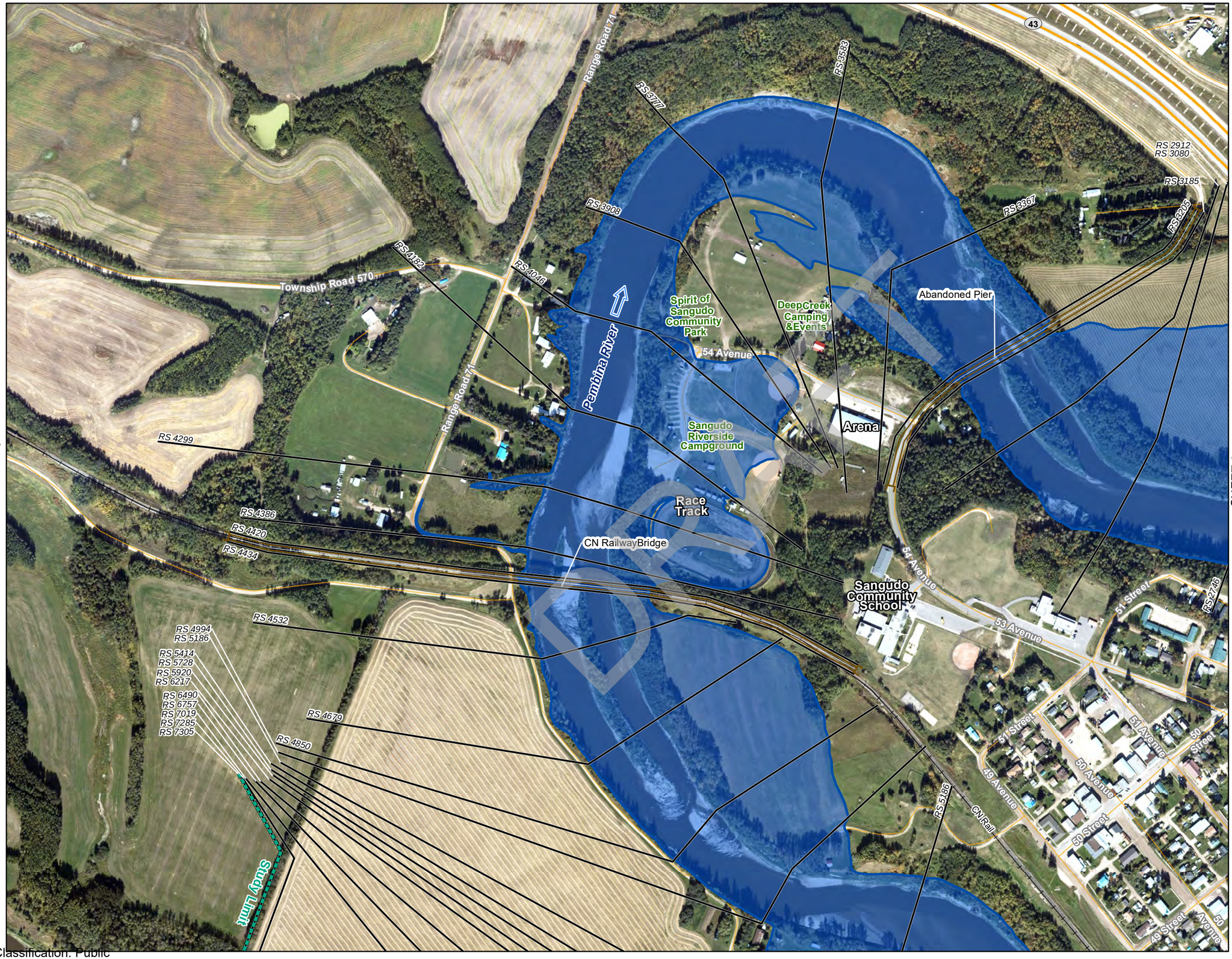
Job: 1006073	Date: 09-MAR-2022

SANGUDO FLOOD STUDY

100-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 1 OF 4

J:\Y_P_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0100YR.mxd



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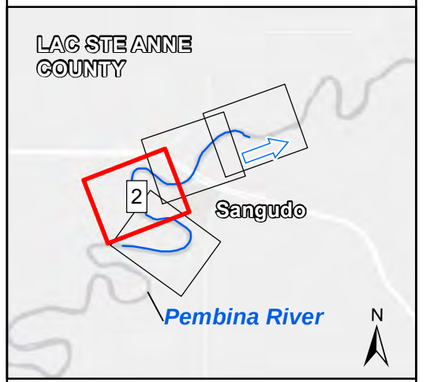

- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 100-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 1400 m^3/s

SCALE - 1:5,000
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

Job: 1006073 | Date: 09-MAR-2022

SANGUDO FLOOD STUDY

100-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 2 OF 4

JY_P:_Projects (Active)\1006073 Sangudo Flood Study\9G GIS\1006073_JY_Map_OWinundation_0100YR.mxd

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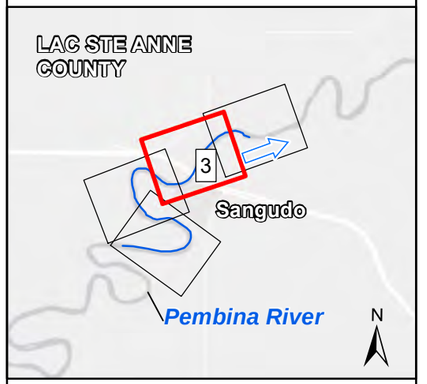


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 100-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 1400 m^3/s

SCALE - 1:5,000
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 114; Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

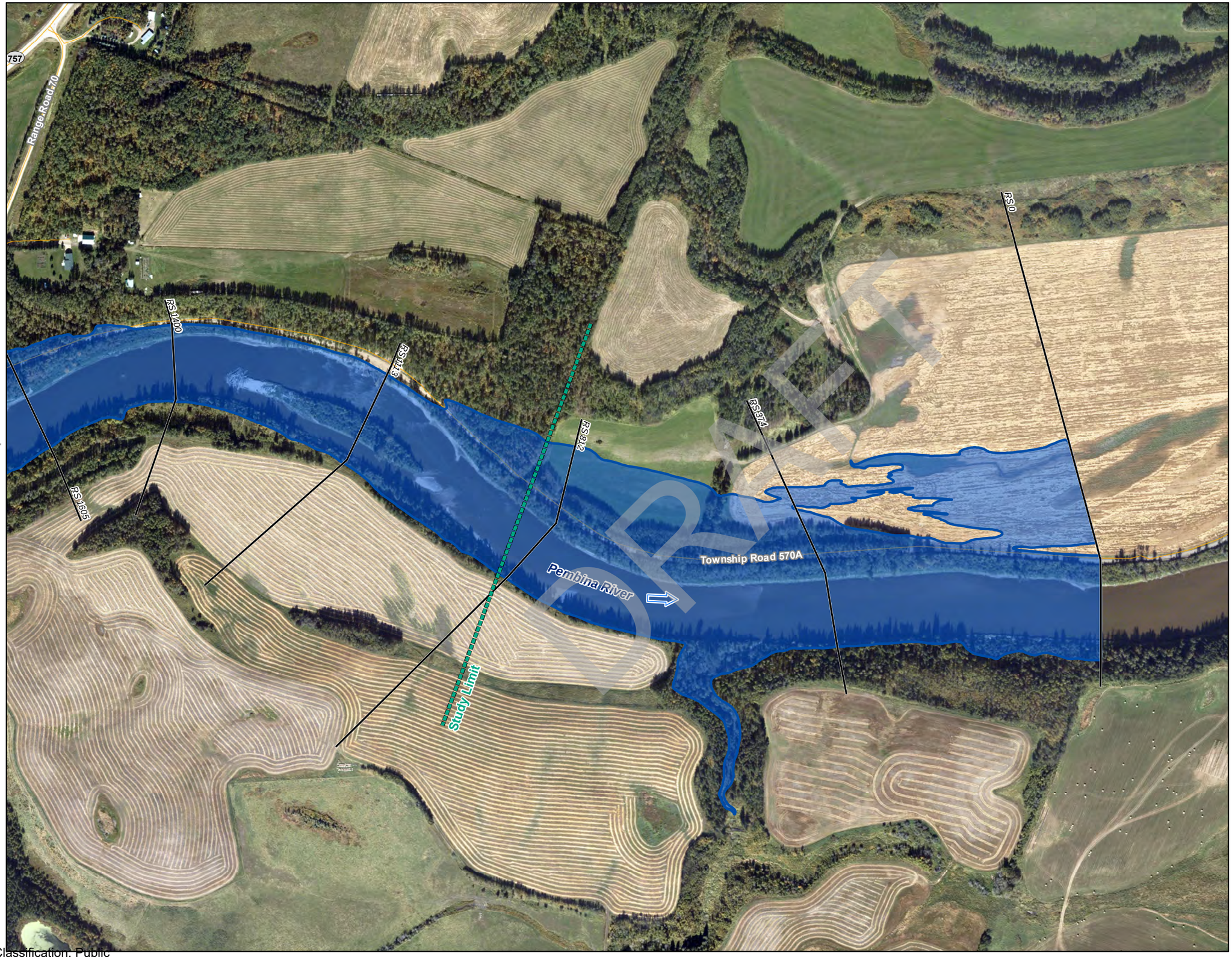
Job: 1006073	Date: 09-MAR-2022

SANGUDO FLOOD STUDY

100-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 3 OF 4

JY_P:_Projects (Active)\1006073 Sangudo Flood Study\9G GIS\1006073_JY_Map_OWinundation_0100YR.mxd



SHEET 3 ↑

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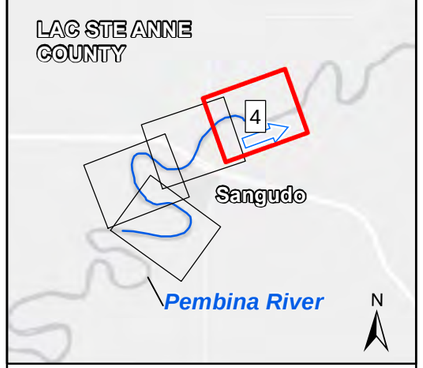


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 100-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 1400 m^3/s

SCALE - 1:5,000
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

Job: 1006073 | Date: 09-MAR-2022

SANGUDO FLOOD STUDY

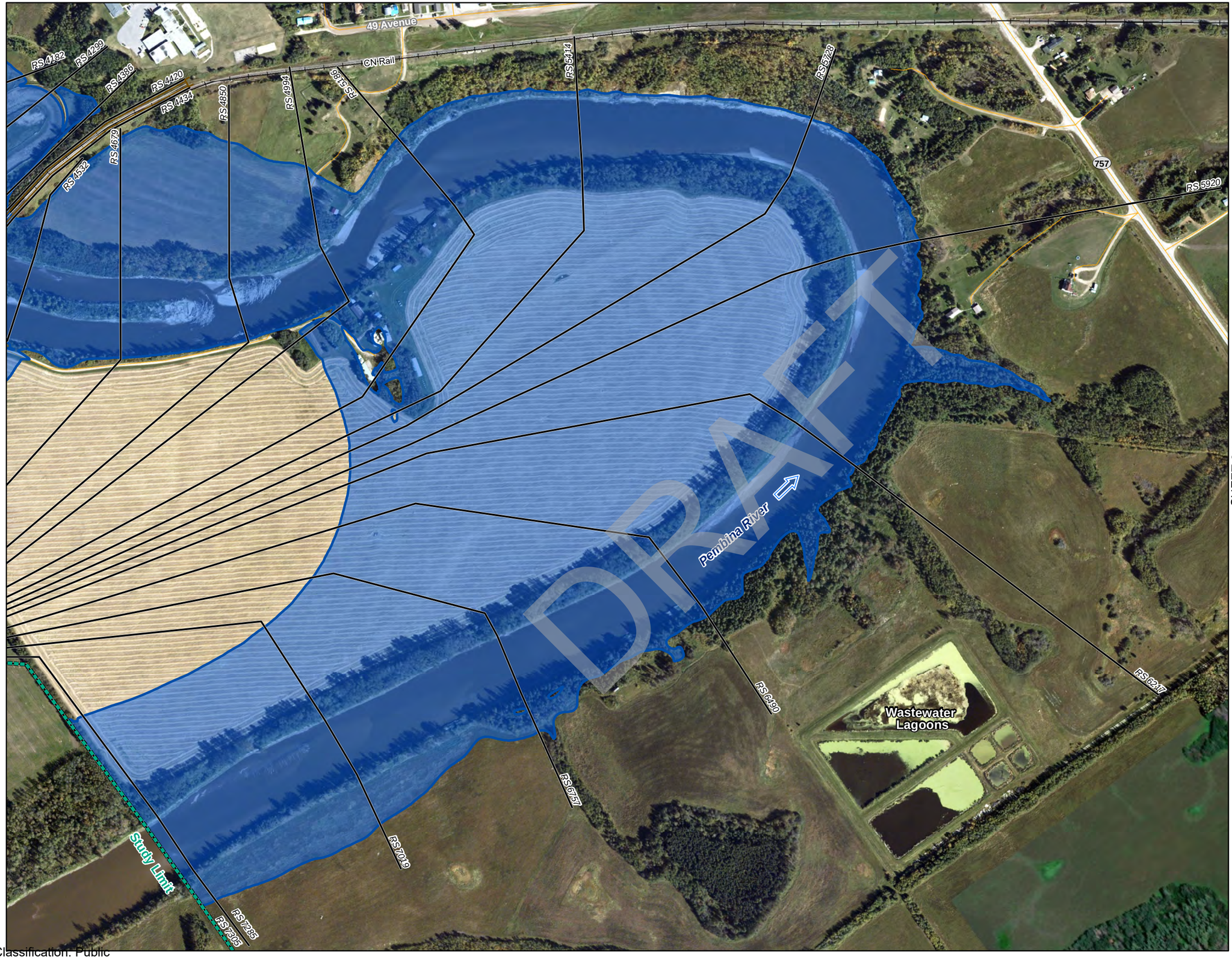
100-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 4 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0100YR.mxd

200-YEAR OPEN WATER FLOOD INUNDATION MAP

(SHEETS 1 TO 4)



SHEET 2 →

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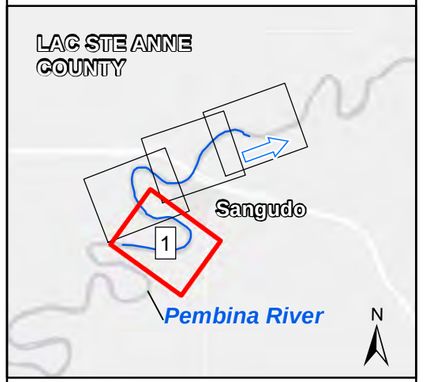


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 200-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 1730 m^3/s

SCALE - 1:5,000
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

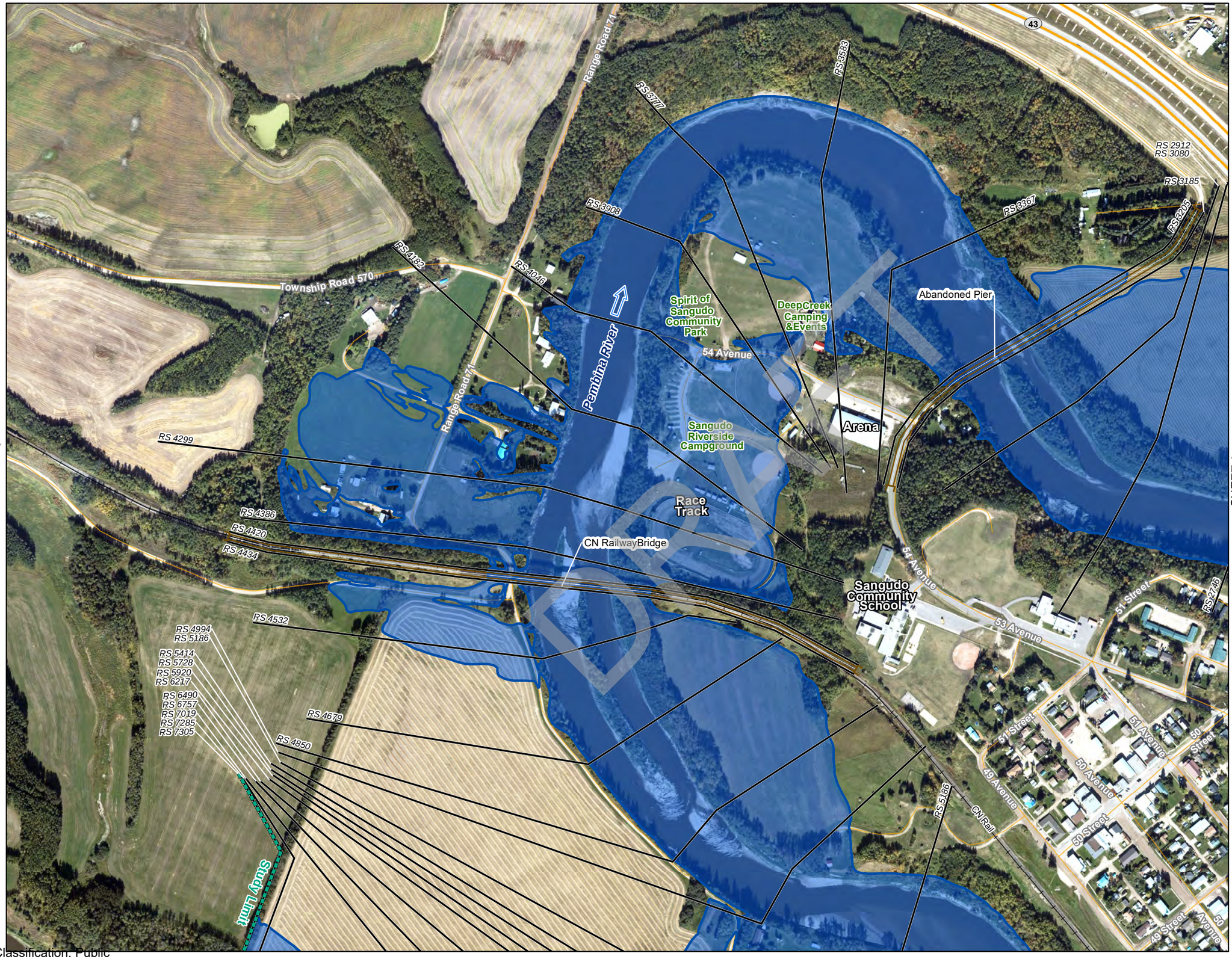
Job: 1006073	Date: 09-MAR-2022

SANGUDO FLOOD STUDY

200-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 1 OF 4

J:\Y_P_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0200YR.mxd



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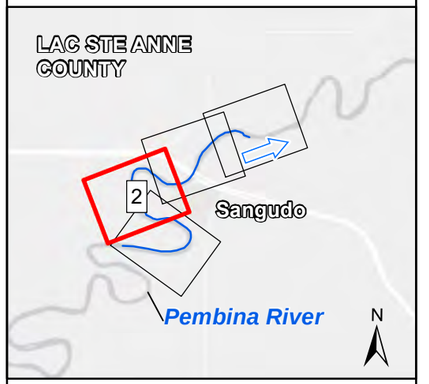


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 200-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 1730 m^3/s

SCALE - 1:5,000
0 100 200 M

N

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

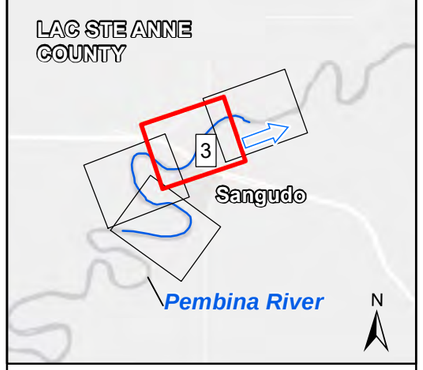
Job: 1006073	Date: 09-MAR-2022

SANGUDO FLOOD STUDY

200-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 2 OF 4

JY_P:_Projects (Active)\1006073 Sangudo Flood Study\9G GIS\1006073_JY_Map_OWInundation_0200YR.mxd



- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 200-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 1730 m^3/s

SCALE - 1:5,000
0 100 200 M

N

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

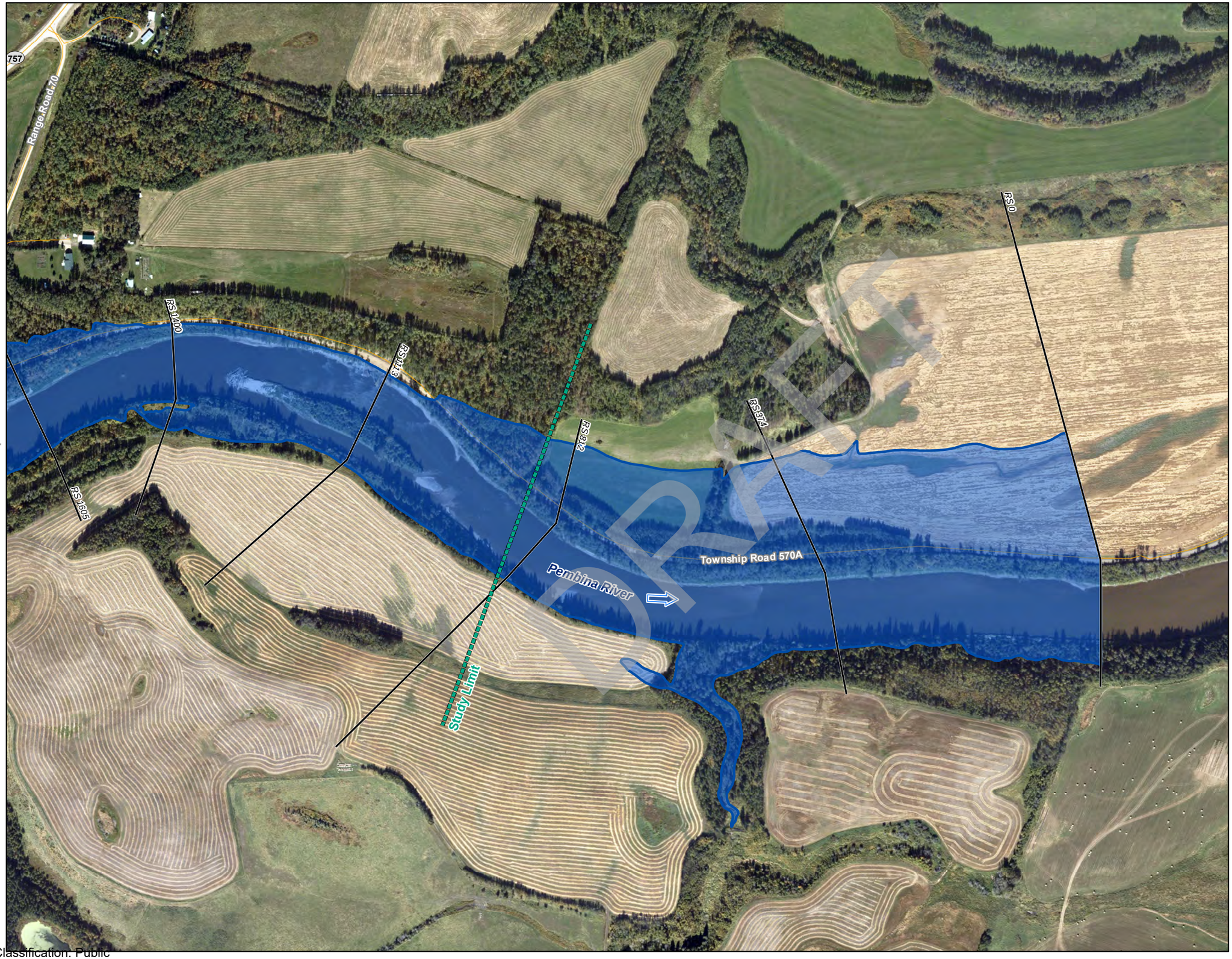
Job: 1006073 | Date: 09-MAR-2022

SANGUDO FLOOD STUDY

200-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 3 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0200YR.mxd



SHEET 3 ↑

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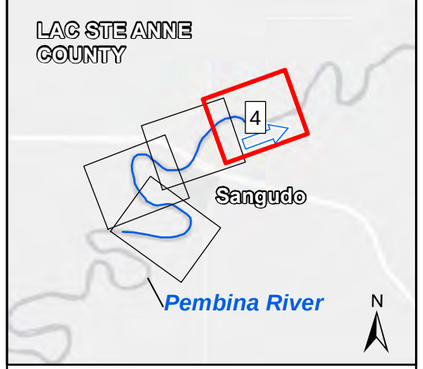


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 200-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 1730 m^3/s

SCALE - 1:5,000
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

Job: 1006073 | Date: 09-MAR-2022

SANGUDO FLOOD STUDY

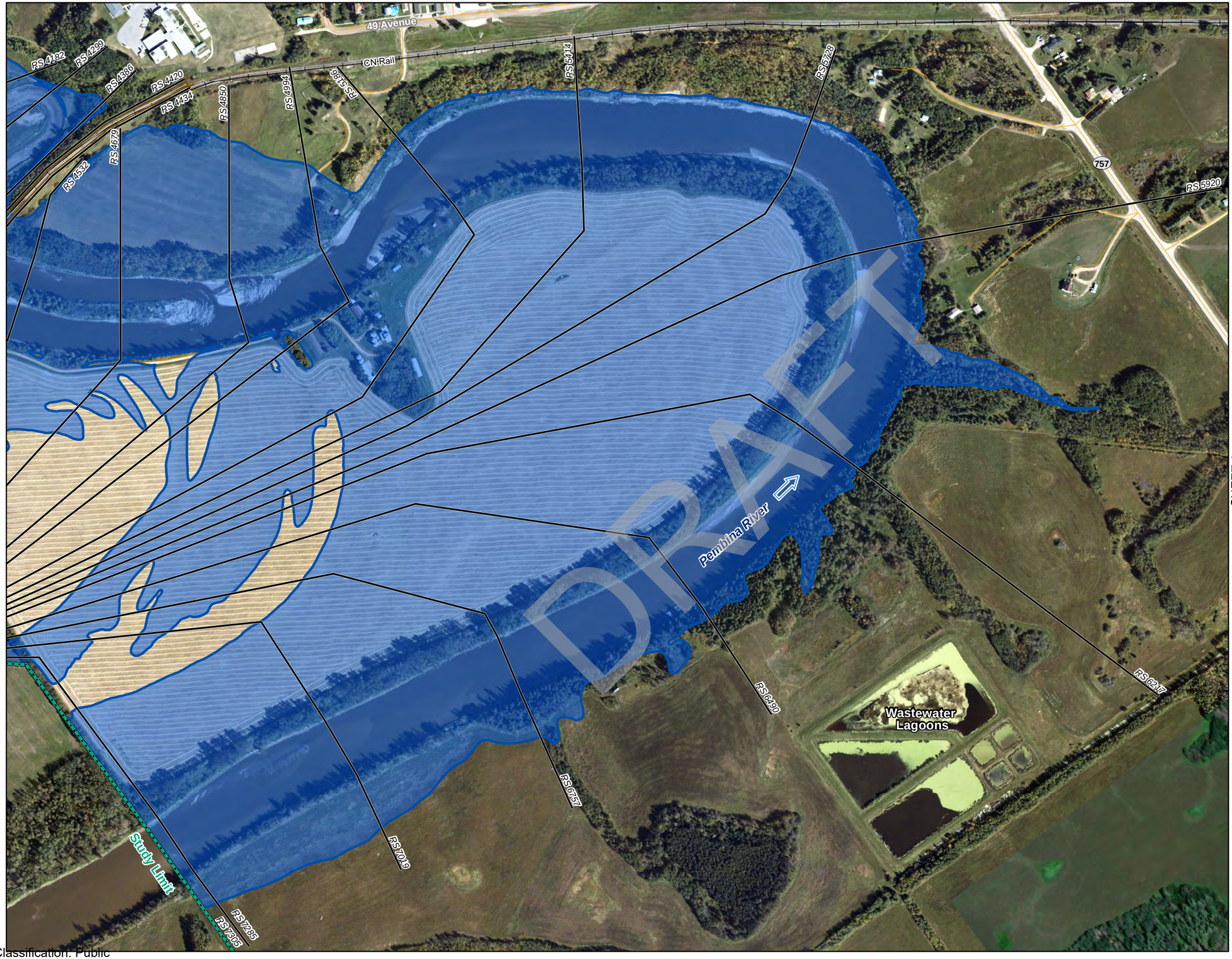
200-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 4 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0200YR.mxd

350-YEAR OPEN WATER FLOOD INUNDATION MAP

(SHEETS 1 TO 4)



SHEET 2 ↓

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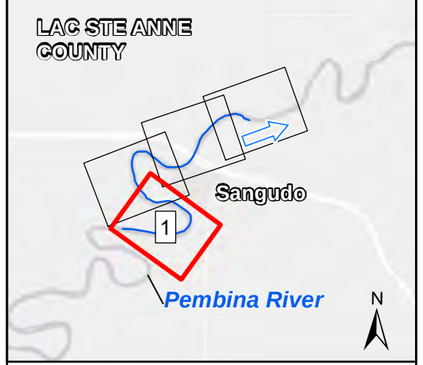


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 350-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 2040 m^3/s

SCALE - 1:5,000
0 100 200 M

N

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

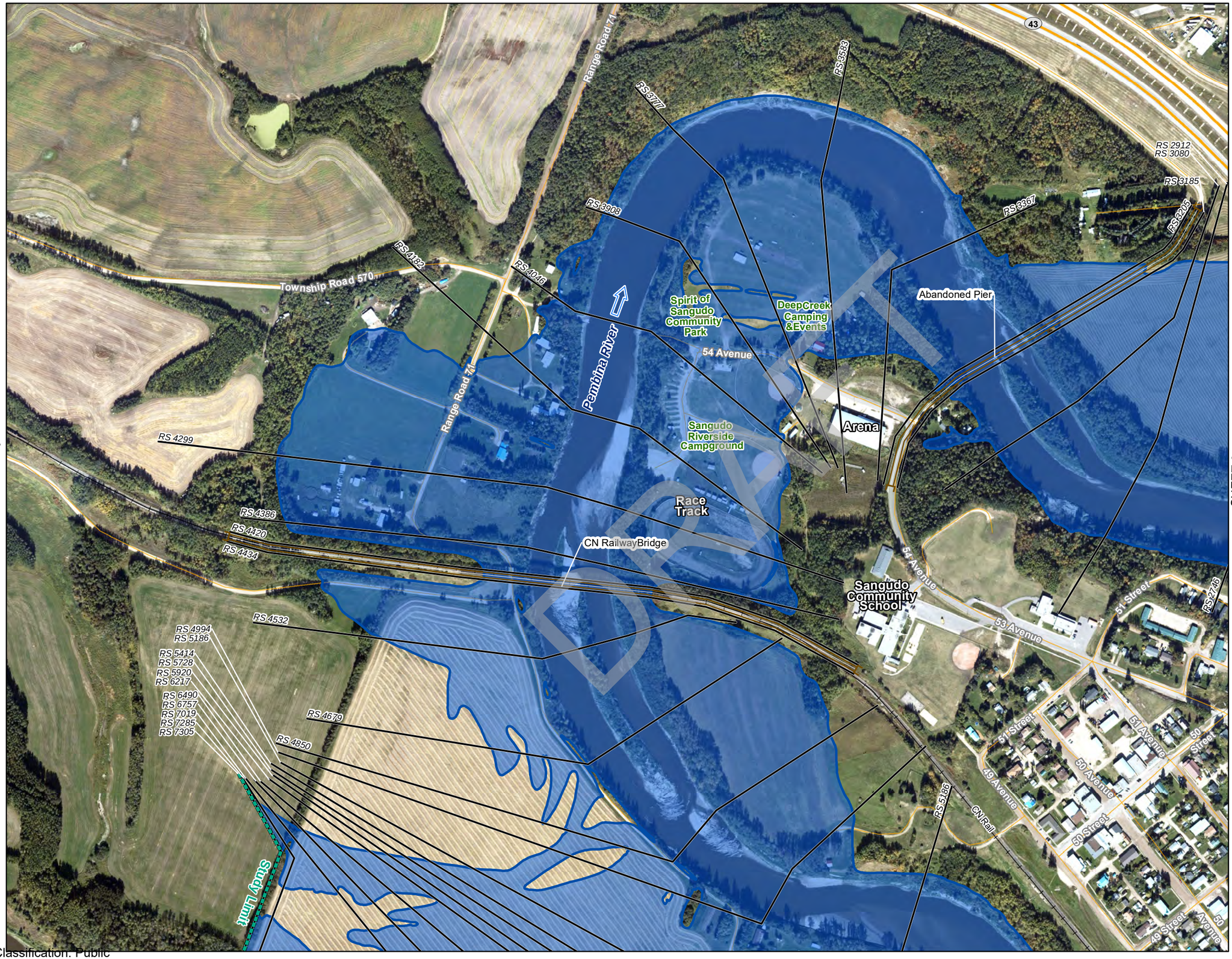
Job: 1006073 | Date: 09-MAR-2022

SANGUDO FLOOD STUDY

350-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 1 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0350YR.mxd



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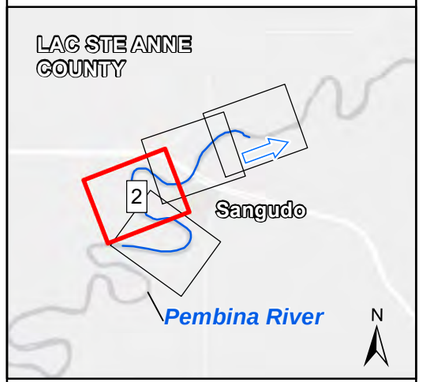

- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 350-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 2040 m^3/s

SCALE - 1:5,000
0 100 200 M

N

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

Job: 1006073	Date: 09-MAR-2022

SANGUDO FLOOD STUDY

350-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 2 OF 4

J:\Y_P_Projects (Active)\1006073 Sangudo Flood Study\9D GIS\1006073_JY_Map_OWInundation_0350YR.mxd

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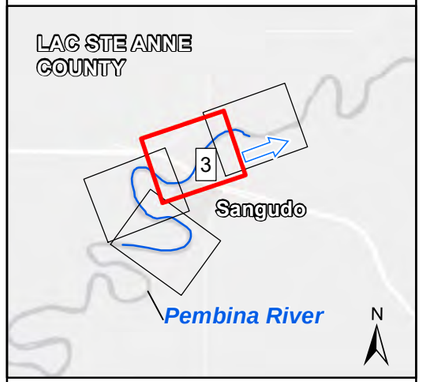


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 350-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 2040 m^3/s

SCALE - 1:5,000
0 100 200 M
N

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

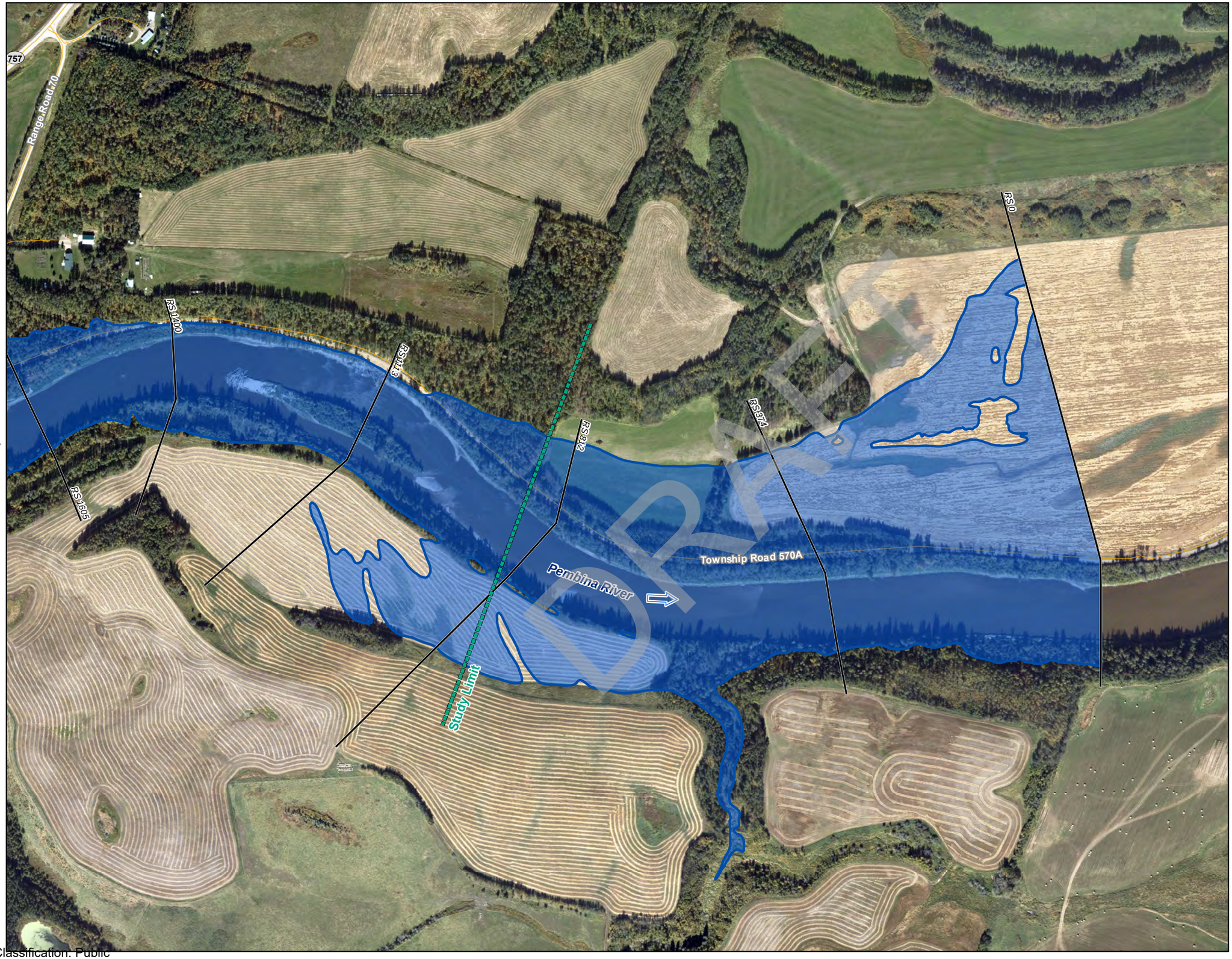
Job: 1006073	Date: 09-MAR-2022

SANGUDO FLOOD STUDY

350-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 3 OF 4

JY_P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0350YR.mxd



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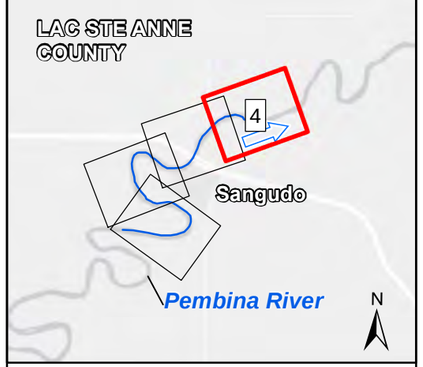


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 350-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 2040 m^3/s

SCALE - 1:5,000
0 100 200 M

N

Coordinate System: NAD 1983 CSRS 3TM 114; Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

Job: 1006073	Date: 09-MAR-2022

SANGUDO FLOOD STUDY

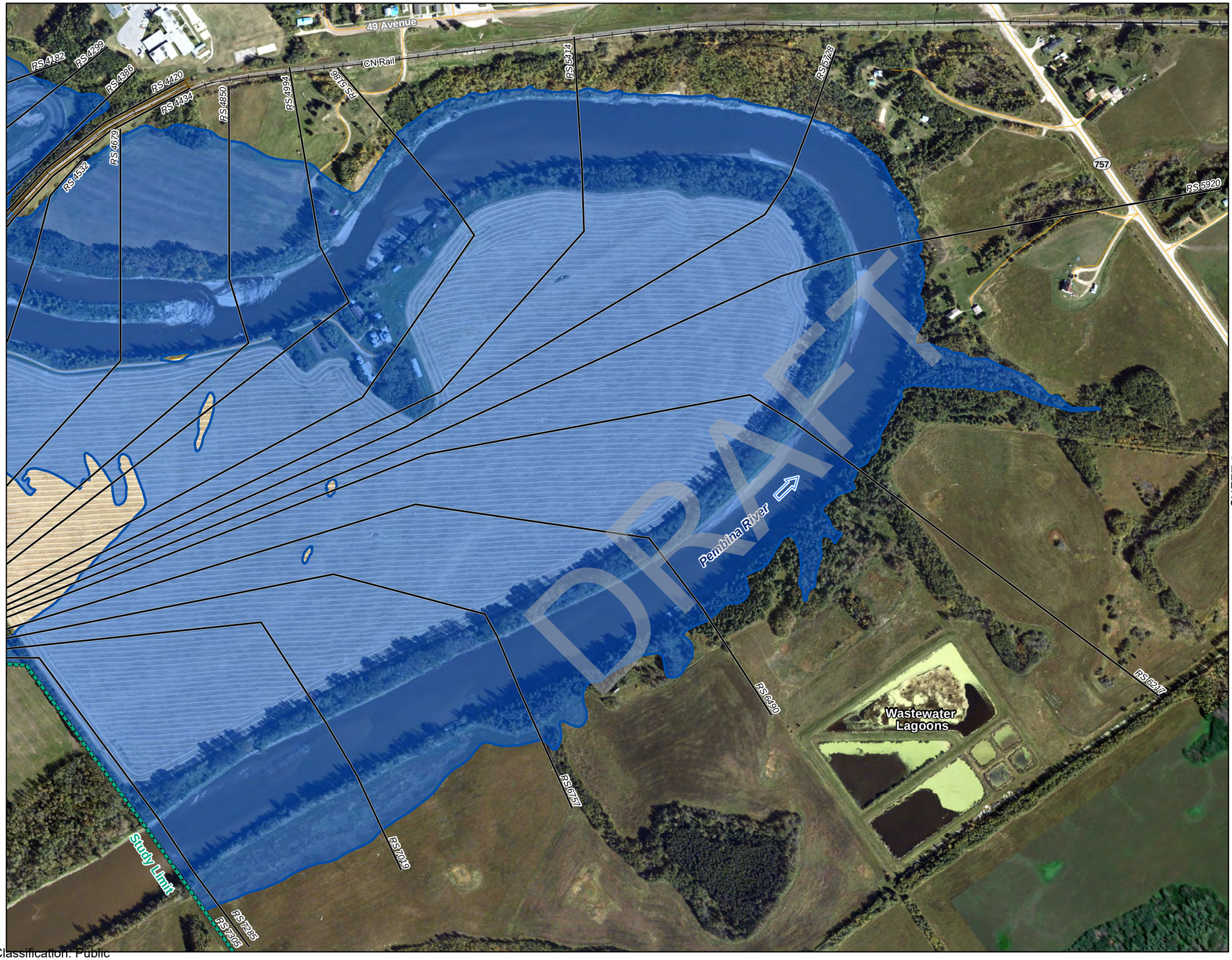
350-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 4 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0350YR.mxd

500-YEAR OPEN WATER FLOOD INUNDATION MAP

(SHEETS 1 TO 4)



SHEET 2 →

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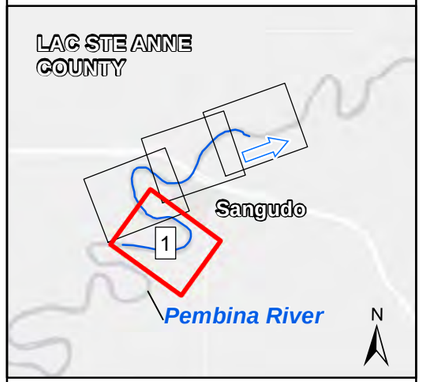


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 500-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 2720 m^3/s

SCALE - 1:5,000
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

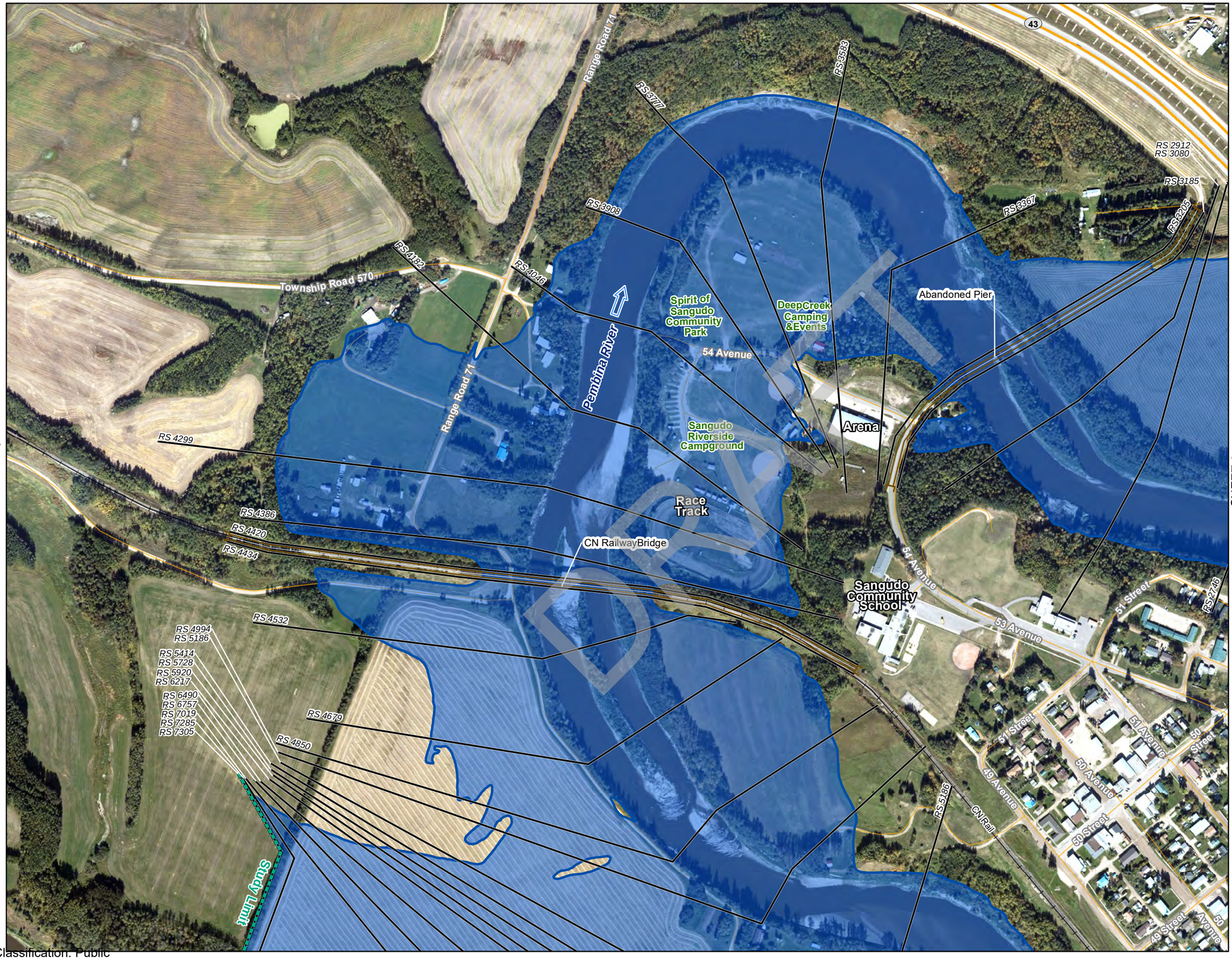
Job: 1006073	Date: 09-MAR-2022

SANGUDO FLOOD STUDY

500-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 1 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0500YR.mxd



SHEET 1 ⇧

SHEET 3 ⇩

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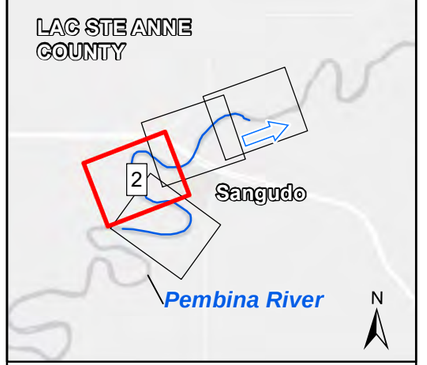


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 500-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 2720 m^3/s

SCALE - 1:5,000
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

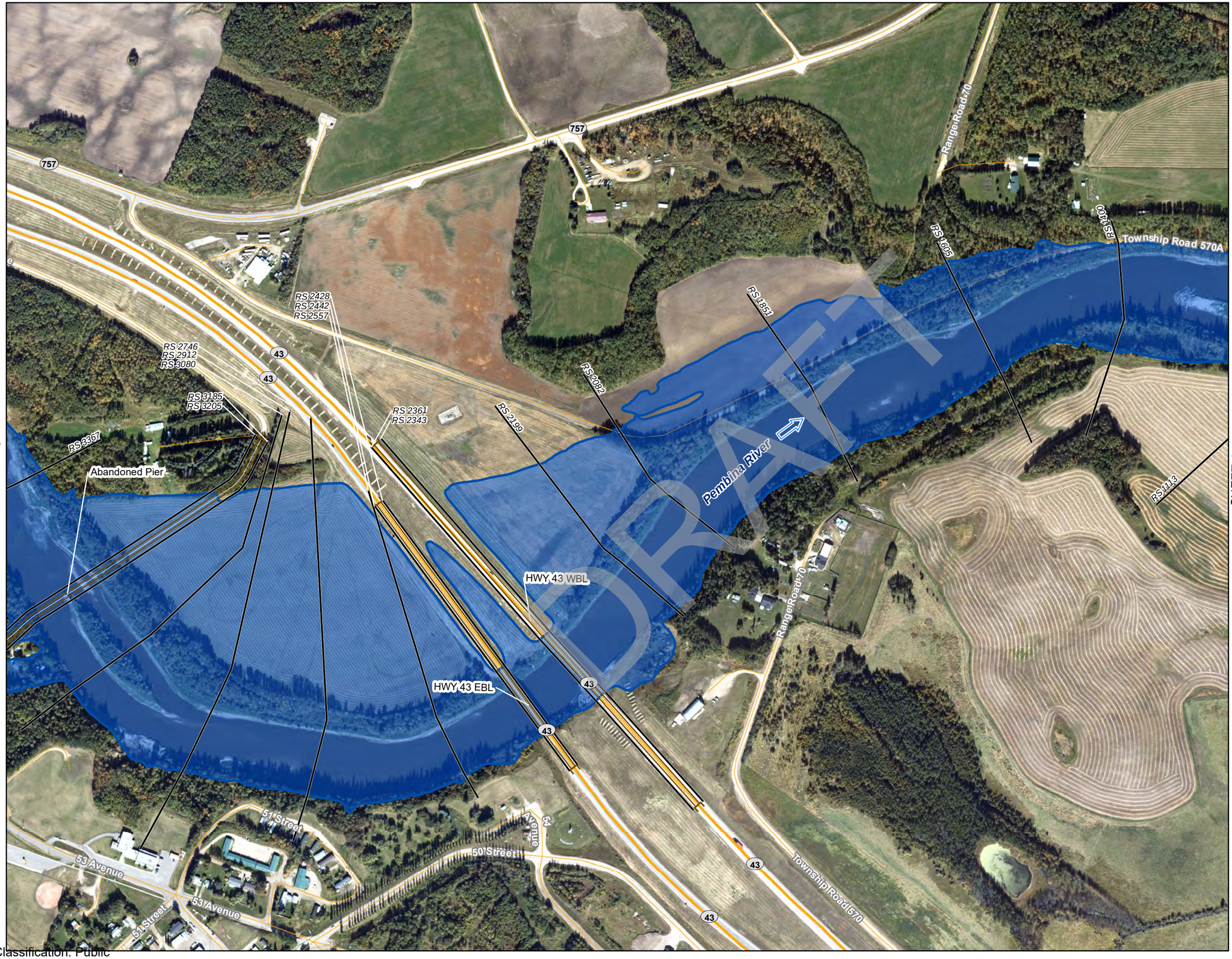
Job: 1006073	Date: 09-MAR-2022

SANGUDO FLOOD STUDY

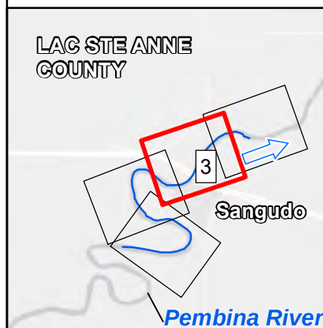
500-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 2 OF 4

JY_P:_Projects (Active)\1006073 Sangudo Flood Study\9G GIS\1006073_JY_Map_OWInundation_0500YR.mxd



LAC STE ANNE COUNTY



- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 500-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 2720 m^3/s

SCALE - 1:5,000
0 100 200 M

N

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

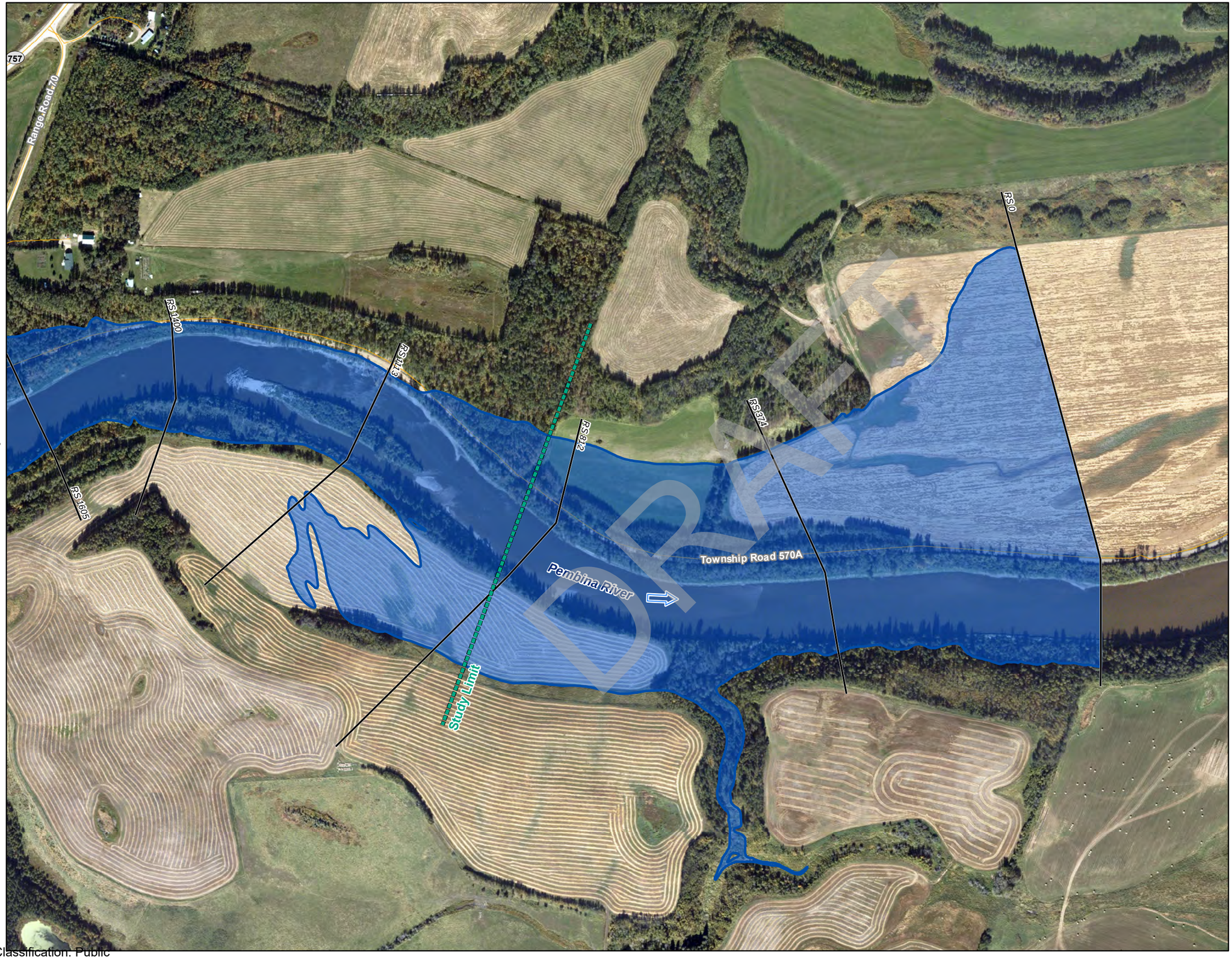
Job: 1006073	Date: 09-MAR-2022

SANGUDO FLOOD STUDY

500-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 3 OF 4

JY_P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0500YR.mxd



SHEET 3 ↑

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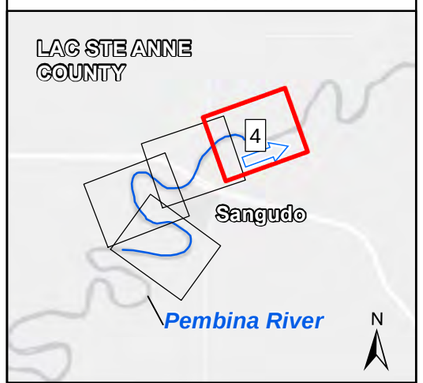


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 500-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 2720 m^3/s

SCALE - 1:5,000
0 100 200 M

N

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

Job: 1006073	Date: 09-MAR-2022

SANGUDO FLOOD STUDY

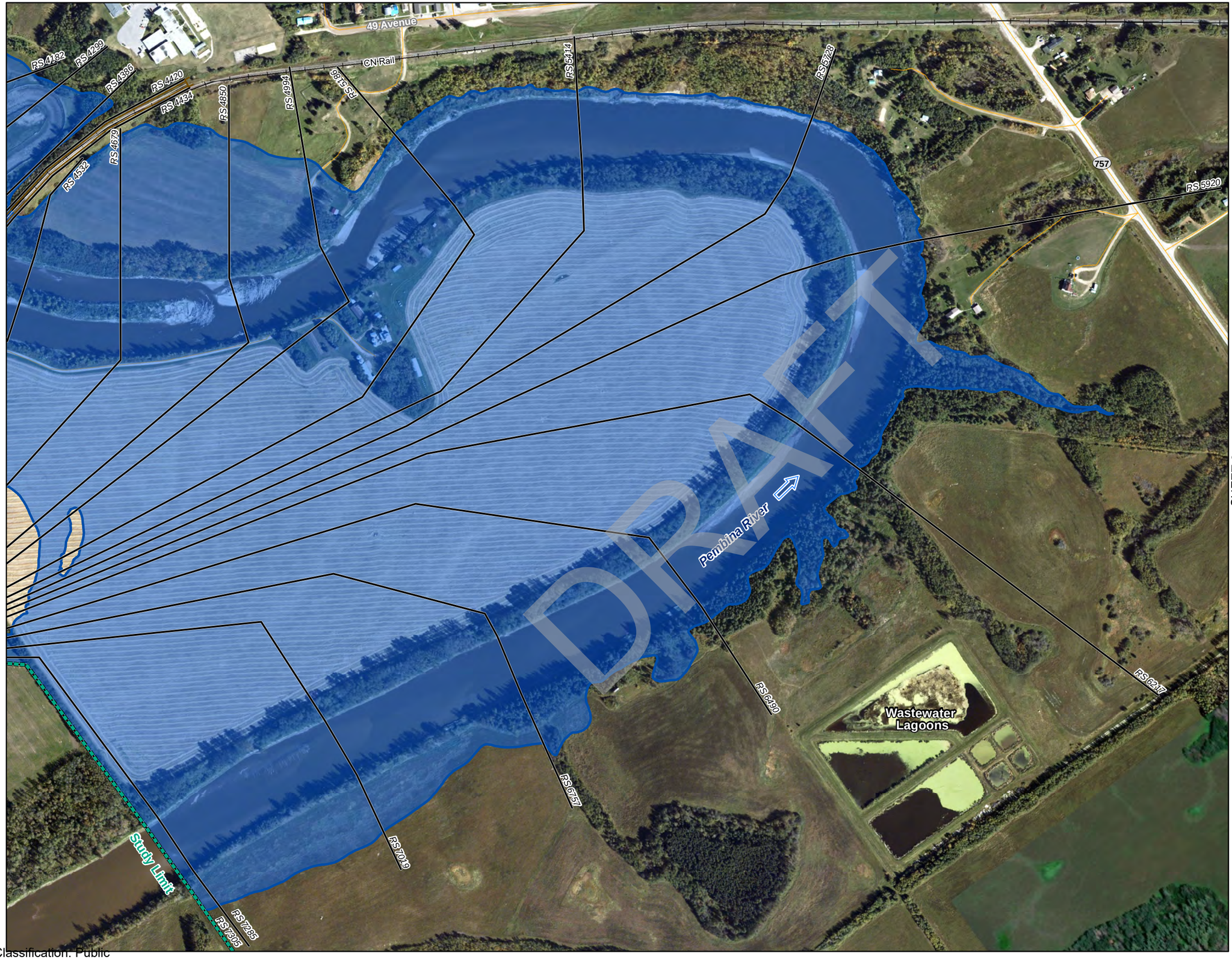
500-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 4 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0500YR.mxd

750-YEAR OPEN WATER FLOOD INUNDATION MAP

(SHEETS 1 TO 4)



SHEET 2 →

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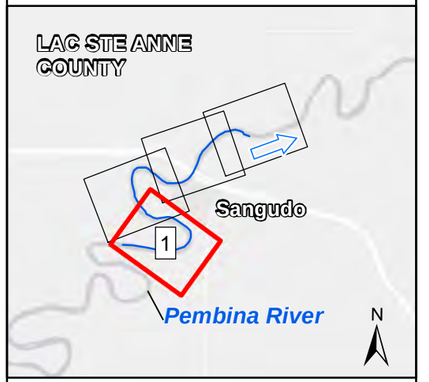


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 750-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 2520 m^3/s

SCALE - 1:5,000
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

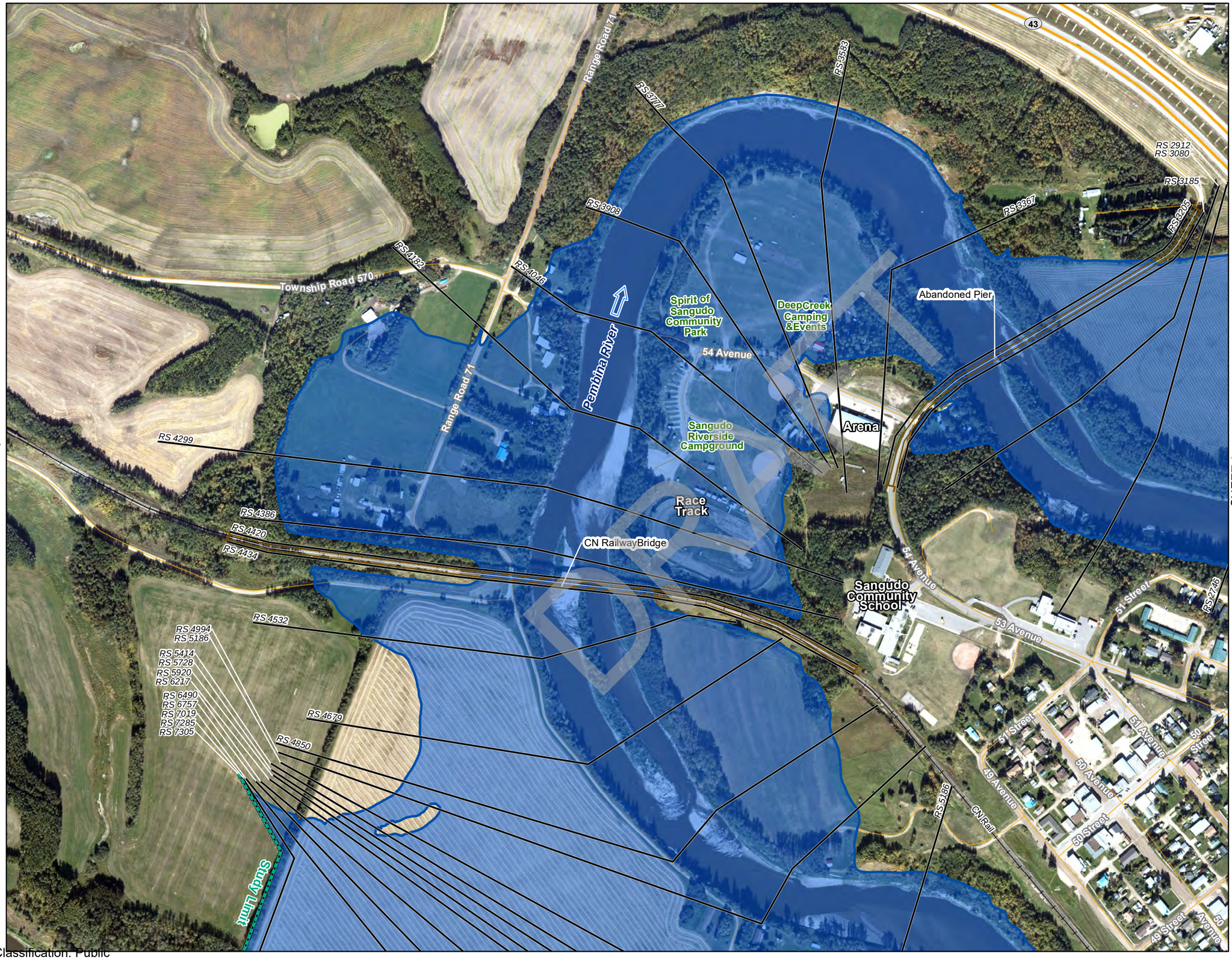
Job: 1006073	Date: 09-MAR-2022

SANGUDO FLOOD STUDY

750-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 1 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0750YR.mxd



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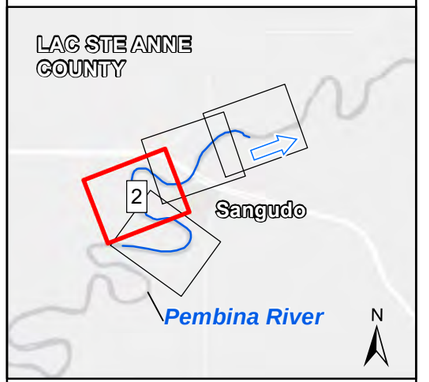


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 750-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 2520 m^3/s

SCALE - 1:5,000
0 100 200 M

N

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

Job: 1006073	Date: 09-MAR-2022

SANGUDO FLOOD STUDY

750-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 2 OF 4

JY P:_Projects (Active)\1006073 Sangudo Flood Study\9G GIS\1006073_JY_Map_OWinundation_0750YR.mxd

LAC STE ANNE COUNTY

- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 750-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 2520 m^3/s

SCALE - 1:5,000
0 100 200 M
N

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

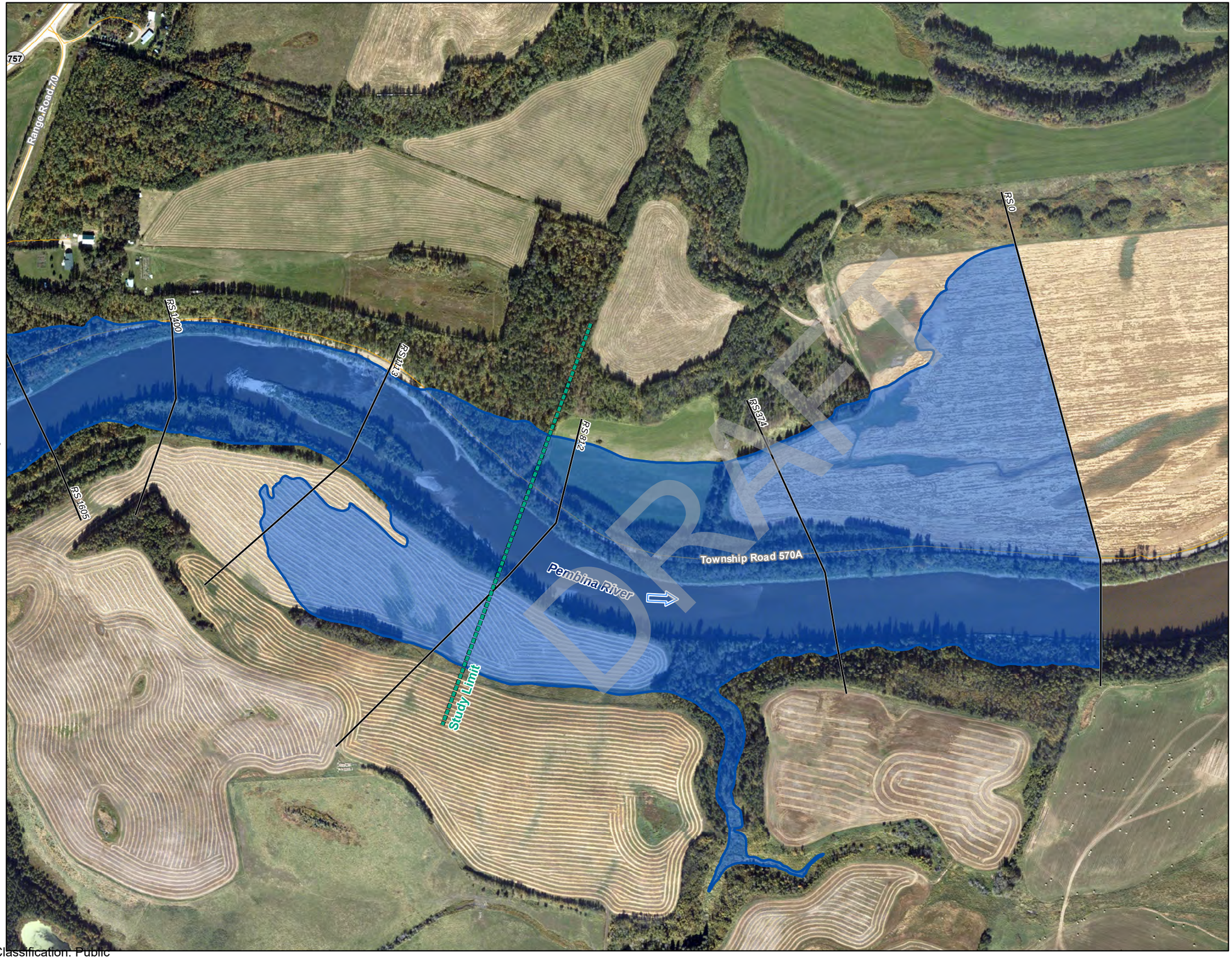
Job: 1006073	Date: 09-MAR-2022

SANGUDO FLOOD STUDY

750-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 3 OF 4

JY_P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_0750YR.mxd



SHEET 3 ⇧

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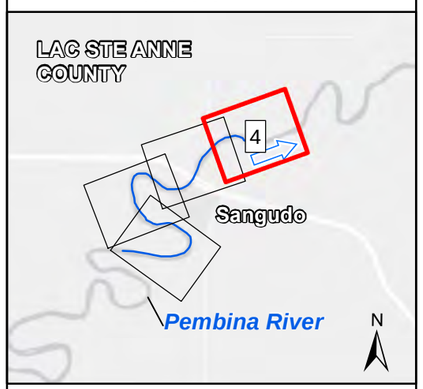
northwest hydraulic consultants



- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 750-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 2520 m^3/s

SCALE - 1:5,000
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

Job: 1006073 | Date: 09-MAR-2022

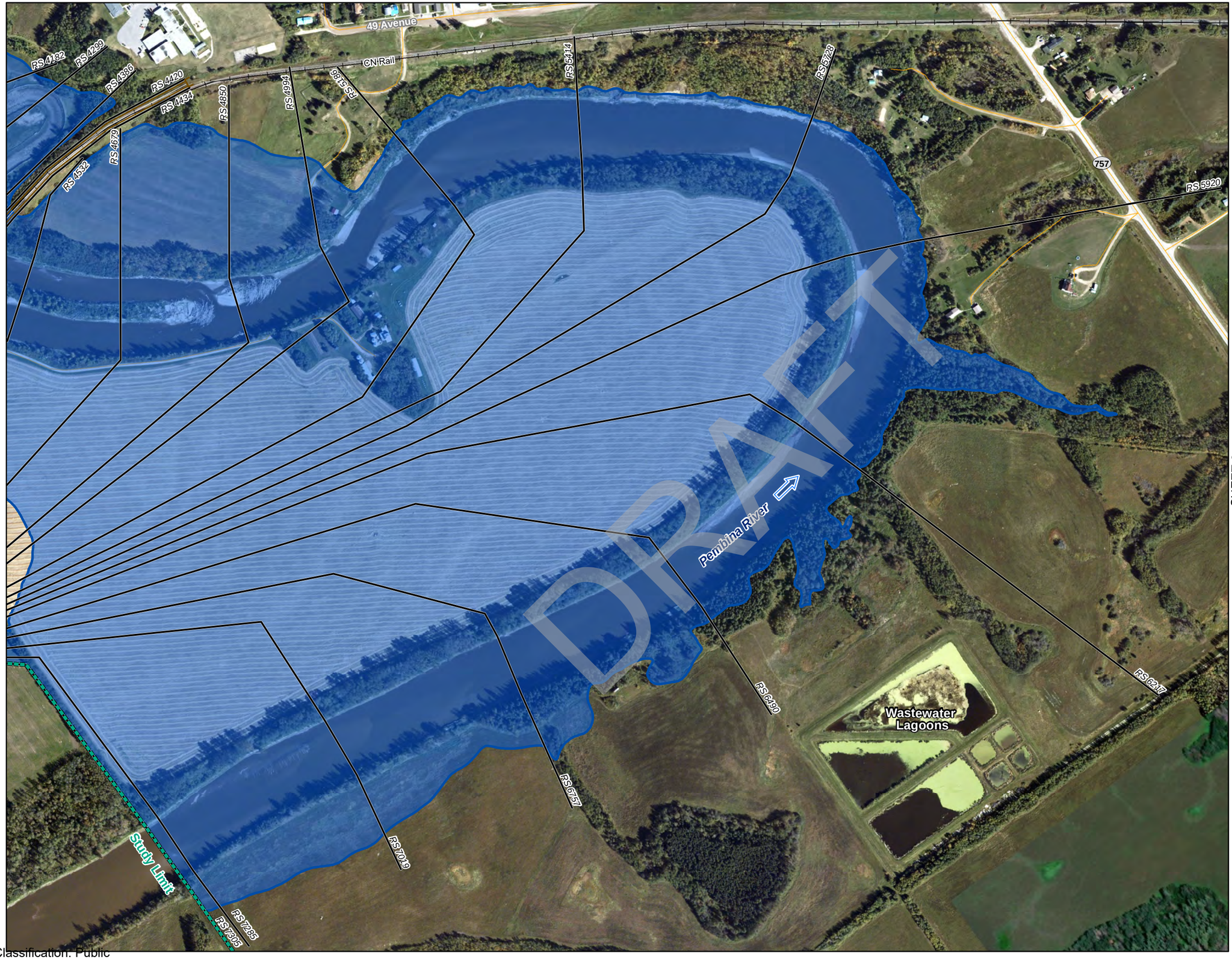
SANGUDO FLOOD STUDY

750-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 4 OF 4

1000-YEAR OPEN WATER FLOOD INUNDATION MAP

(SHEETS 1 TO 4)



SHEET 2 →

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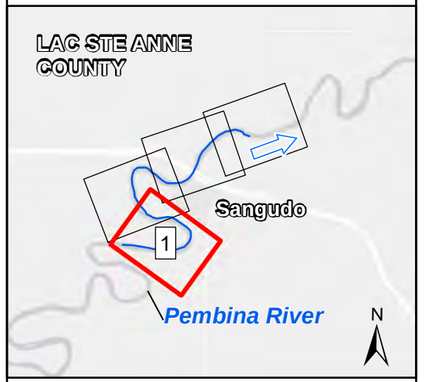


- FLOW DIRECTION
- STUDY LIMIT
- BRIDGE
- LOCAL ROAD
- PROVINCIAL HIGHWAY
- RAILWAY
- MODEL CROSS SECTION
- 1000-YEAR FLOOD INUNDATION EXTENT

DISCHARGE
Pembina River = 2720 m^3/s

SCALE - 1:5,000
0 100 200 M

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

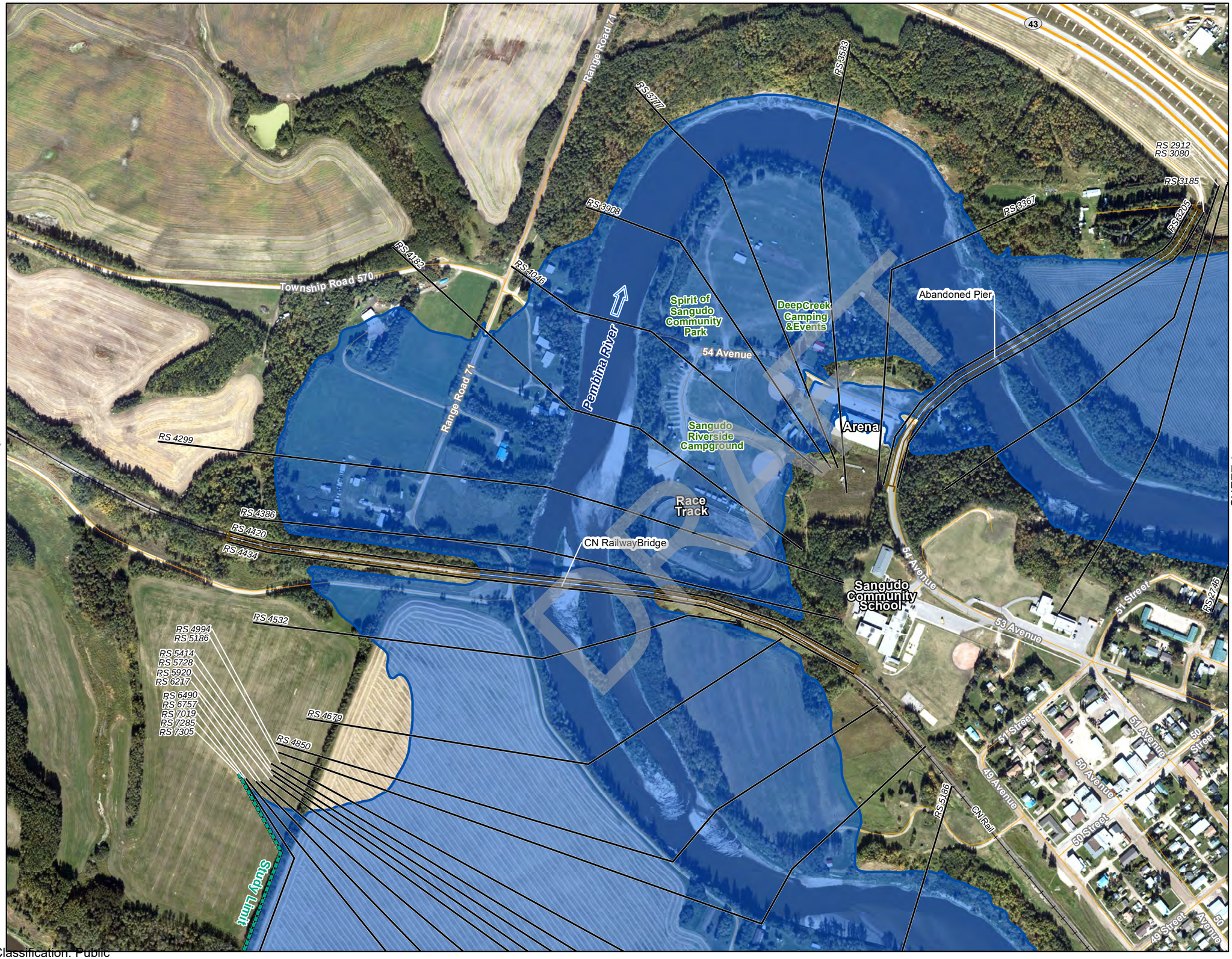
Job: 1006073 | Date: 09-MAR-2022

SANGUDO FLOOD STUDY

1000-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 1 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_1000YR.mxd



SHEET 1 ⇧

SHEET 3 ⇩

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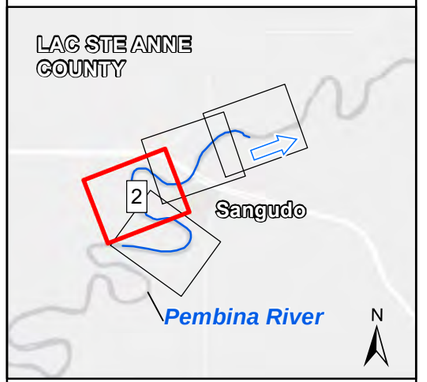

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SCALE - 1:5,000
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N

Coordinate System: NAD 1983 CSRS 3TM 114;
Vertical Datum: CGVD28 HTv2.0; Units: Metres

Engineer	GIS	Reviewer
MMM	JY	PGV

Job: 1006073	Date: 09-MAR-2022

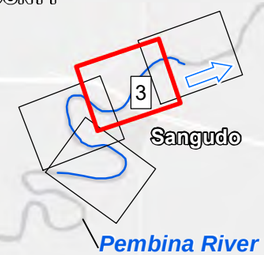
SANGUDO FLOOD STUDY

1000-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 2 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\9G GIS\1006073_JY_Map_OWinundation_1000YR.mxd

LAC STE ANNE COUNTY



- FLOW DIRECTION
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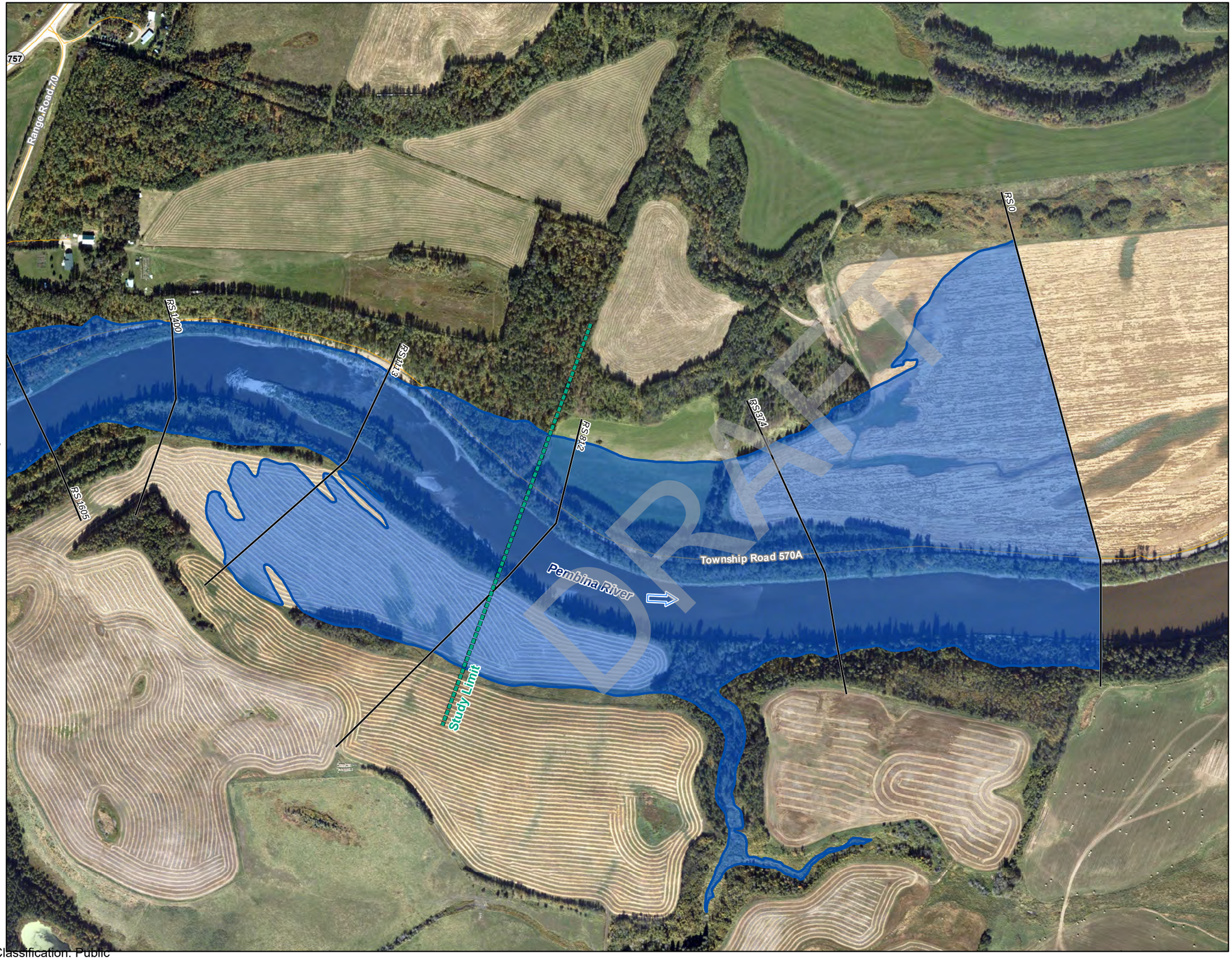
Job: 1006073	Date: 09-MAR-2022

SANGUDO FLOOD STUDY

1000-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 3 OF 4

JY_P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_1000YR.mxd



SHEET 3 ↑

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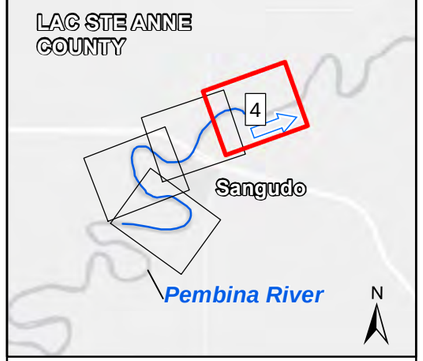

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SANGUDO FLOOD STUDY

1000-YEAR OPEN WATER FLOOD INUNDATION MAP

SHEET 4 OF 4

JY, P:_Projects (Active)\1006073 Sangudo Flood Study\90 GIS\1006073_JY_Map_OWinundation_1000YR.mxd

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