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## Horsefly Regional Emergency Spillway

Impact Assessment Agency of Canada

Detailed Project Description Summary

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February 2022

## **Table of Contents**

<b>ABBREVIATIONS .....</b>	<b>III</b>
<b>PREFACE .....</b>	<b>V</b>
<b>PART A: UPDATED GENERAL INFORMATION .....</b>	<b>1</b>
1.0 THE PROJECT'S NAME, TYPE OR SECTOR AND PROPOSED LOCATION .....	1
2.0 PROPONENTS NAME AND CONTACT INFORMATION .....	4
<b>PART B: PLANNING PHASE RESULTS .....</b>	<b>5</b>
3.0 ENGAGEMENT WITH JURISDICTIONS OR AGENCIES .....	5
3.1 Engagemment With Federal and Provincial Agencies .....	5
3.2 Response to the Summary of Issues .....	6
4.0 ENGAGEMENT WITH INDIGENOUS GROUPS .....	6
5.0 REGIONAL ASSESSMENTS AND RELEVANT ENVIRONMENTAL STUDIES .....	8
6.0 STRATEGIC ASSESSMENTS .....	8
<b>PART C: PROJECT INFORMATION .....</b>	<b>9</b>
7.0 PROJECT PURPOSE AND NEED .....	9
8.0 PHYSICAL ACTIVITIES REGULATION .....	11
9.0 PROJECT ACTIVITIES AND PHYSICAL WORKS .....	11
9.1 Project Phases .....	11
9.2 Description of Project Activities .....	16
10.0 ESTIMATED MAXIMUM PROJECT CAPACITY .....	18
11.0 PROJECT SCHEDULE .....	18
12.0 PROJECT ALTERNATIVES .....	19
12.1 Alternative Means of Carrying out the Project .....	19
12.2 Alternatives to The Project .....	21
<b>PART D: LOCATION INFORMATION AND CONTEXT .....</b>	<b>22</b>
13.0 GEOGRAPHIC INFORMATION .....	22
14.0 PHYSICAL AND BIOLOGICAL ENVIRONMENT .....	24
14.1 Project Environmental Setting .....	24
15.0 HEALTH, SOCIAL AND ECONOMICS OF MD OF TABER .....	27
<b>PART E: FEDERAL, PROVINCIAL, TERRITORIAL, INDIGENOUS, AND MUNICIPAL INVOLVEMENT AND EFFECTS .....</b>	<b>29</b>
16.0 FINANCIAL SUPPORT FROM FEDERAL AUTHORITIES .....	29
17.0 USE OF FEDERAL LANDS FOR PROJECT .....	29
18.0 JURISDICTIONS THAT HAVE POWERS, DUTIES OR FUNCTIONS IN RELATION TO AN ASSESSMENT OF THE PROJECT'S ENVIRONMENTAL EFFECTS .....	29
18.1 Federal Regulatory requirements .....	29
18.2 Provincial Regulatory requirements .....	30
18.3 Municipal Regulatory requirements .....	30
18.4 Regional Plans and Management Frameworks .....	31



**HORSEFLY REGIONAL EMERGENCY SPILLWAY  
IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

<b>PART F: POTENTIAL EFFECTS OF THE PROJECT</b> .....	<b>32</b>
19.0 POTENTIAL EFFECTS ON FISH AND FISH HABITAT, AQUATIC SPECIES AND MIGRATORY BIRDS .....	32
19.1 Overview of Environmental Effects .....	32
19.2 Fish and Fish Habitat .....	41
19.3 Aquatic Species .....	41
19.4 Migratory Birds .....	41
19.5 Summary of Effects.....	41
20.0 POTENTIAL EXTRA-PROVINCIAL AND FEDERAL EFFECTS .....	44
21.0 EFFECTS TO INDIGENOUS GROUPS INCLUDING TRADITIONAL LAND USE, PHYSICAL AND CULTURAL HERITAGE, AND HISTORICAL, ARCHAEOLOGICAL AND PALAEOANTHROPOLOGICAL RESOURCES.....	44
22.0 EFFECTS TO INDIGENOUS HEALTH, SOCIAL, AND ECONOMIC CONDITIONS .....	44
23.0 GREENHOUSE GAS EMISSIONS ASSOCIATED WITH THE PROJECT .....	45
24.0 WASTE AND EMISSIONS GENERATED BY THE PROJECT .....	45
25.0 EFFECTS OF CLIMATE CHANGE ON THE PROJECT .....	45
26.0 FUTURE ACTIVITIES.....	46

**LIST OF TABLES**

Table 3.1 Federal and Provincial Agencies Consulted .....	5
Table 10.1 Capacity of Project Phases .....	18
Table 13.1 Distances from the Project to Reserves.....	22
Table 18.1 Municipal Regulatory Requirements .....	30
Table 18.2 Regional Plans and Management Frameworks Applicable to the MD of Taber .....	31
Table 19.1 Potential Environmental Effects and Mitigation Measures.....	34

**LIST OF FIGURES**

Figure 1.1 Horsefly Regional Emergency Spillway Project – Location .....	2
Figure 1.2 Horsefly Regional Emergency Spillway Project – Project Phases .....	3
Figure 7.1 St. Mary River Irrigation District Main Canal .....	10
Figure 9.1 Phase 1 Site Plan.....	13
Figure 9.2 Phase 2 Site Plan.....	14
Figure 9.3 Phase 3 Site Plan.....	15
Figure 12.1 Southern Regional Stormwater Management Plan Study Area .....	20
Figure 13.1 Location of Indigenous Groups and Nearby Federal Lands .....	23
Figure 14.1 Horsefly Regional Emergency Spillway Project Biophysical Considerations .....	26

**LIST OF APPENDICES**

<b>APPENDIX A PHOTOS</b> .....	<b>A.1</b>
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## Abbreviations

%	percent
AAAQO	Alberta Ambient Air Quality Objectives
ACRP	Alberta Community Resiliency Program
ACSW	Alberta Ministry of Culture and Status of Women
AEP	Alberta Environment and Parks
CO	carbon monoxide
CO <sub>2e</sub>	carbon dioxide emissions
DFO	Fisheries and Oceans Canada
DMAF	Disaster Mitigation and Adaptation Fund
EA	environmental assessment
EPEA	<i>Environmental Protection and Enhancement Act</i>
ha	hectare
HRA	<i>Historical Resources Act</i>
HRIA	Historic Resources Impact Assessment
IA	impact assessment
IAA	<i>Impact Assessment Act</i>
IAAC	Impact Assessment Agency of Canada
ICIP	Investing in Canada Infrastructure Program
IDA	<i>Irrigation Districts Act</i>
IDP	intermunicipal development plans
km	kilometre
m	metre
m <sup>3</sup>	cubic metre



**HORSEFLY REGIONAL EMERGENCY SPILLWAY  
IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

m <sup>3</sup> /s	cubic metre per second
MD	Municipal District
MD of Taber	Municipal District of Taber
NO <sub>2</sub>	nitrogen dioxide
PM <sub>2.5</sub>	particulate matter
RAP	<i>restricted activity period</i>
SMRID	St. Mary River Irrigation District
SO <sub>2</sub>	sulphur dioxide
SRSMP	Southern Regional Stormwater Management Plan
the Agency	Impact Assessment Agency of Canada
the Project	Horsefly Regional Emergency Spillway Project
TID	Taber Irrigation District



## **Preface**

The Horsefly Regional Emergency Spillway (the Project, the Horsefly Spillway or the Spillway) is a flood mitigation project. It will use the existing Taber Irrigation District (TID) irrigation infrastructure to divert floodwaters from the area crossed by the St. Mary River Irrigation District (SMRID) Main Canal to the Oldman River in the vicinity of Taber, Alberta. The SMRID Main Canal runs from southwest of Magrath, Alberta to Medicine Hat, Alberta. During stormwater events, such as have occurred in the springs of 2010 and 2011, the Main Canal could not handle the increased volume of water and the surrounding lands were flooded. The Regional Drainage Committee for communities along the south Oldman River drainage basin commissioned the development of a Regional Stormwater Management Plan, completed in 2014. Following further flooding in the springs of 2013, 2014 and 2018, the decision was made that diversion of floodwaters to the Oldman River at a location approximately halfway along the length of the Main Canal would be the preferred flood mitigation method. The Project was chosen as the most economical and technically feasible alternative to reliably convey stormwater from the SMRID Main Canal to the Oldman River. The Project is being managed by the Municipal District of Taber (MD of Taber).

The TID, established in 1917, operates 138 kilometres (km) of water canals, 213 km of water pipelines and 84 km of water drains. The Project is expanding 14 km of canals and drains of the TID conveyance, a change to 3.2% of the irrigation system.

The Project is being designed to address the volume of water from a 1:100-year flood. Such a flood has a 1% likelihood of occurring any year. In order to divert the desired volume of water, portions of the TID canal system need to be upgraded which involves enlarging the canal and upgrading canal structures and road and railway crossings. It also involves formalizing the last segment of the canal through the coulee that connects to the Oldman River.

Key aspects of the Project include the following:

- The Project is designed for a 1:100-year event, which is equivalent to the 2010 storm event.
- The Project will only be operational during 1:100-year or greater events.
- The Project infrastructure will continue to be used as part of the TID infrastructure, as it currently does, during non-flood events.
- The TID infrastructure is a licensed facility that has been operational since the early 20<sup>th</sup> century.
- Since the TID has to remain operational during the spring and summer months, Project construction will predominantly take place in the fall and winter months after the canals have been drained.
- Project construction will follow standard construction techniques for irrigation systems in southern Alberta. Contractors will be required to have an Environmental Construction Operations (ECO) Plan developed to Alberta Transportation standards and approved by the MD of Taber.



## **PART A: UPDATED GENERAL INFORMATION**

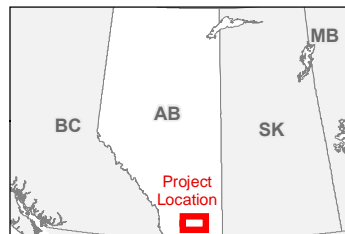
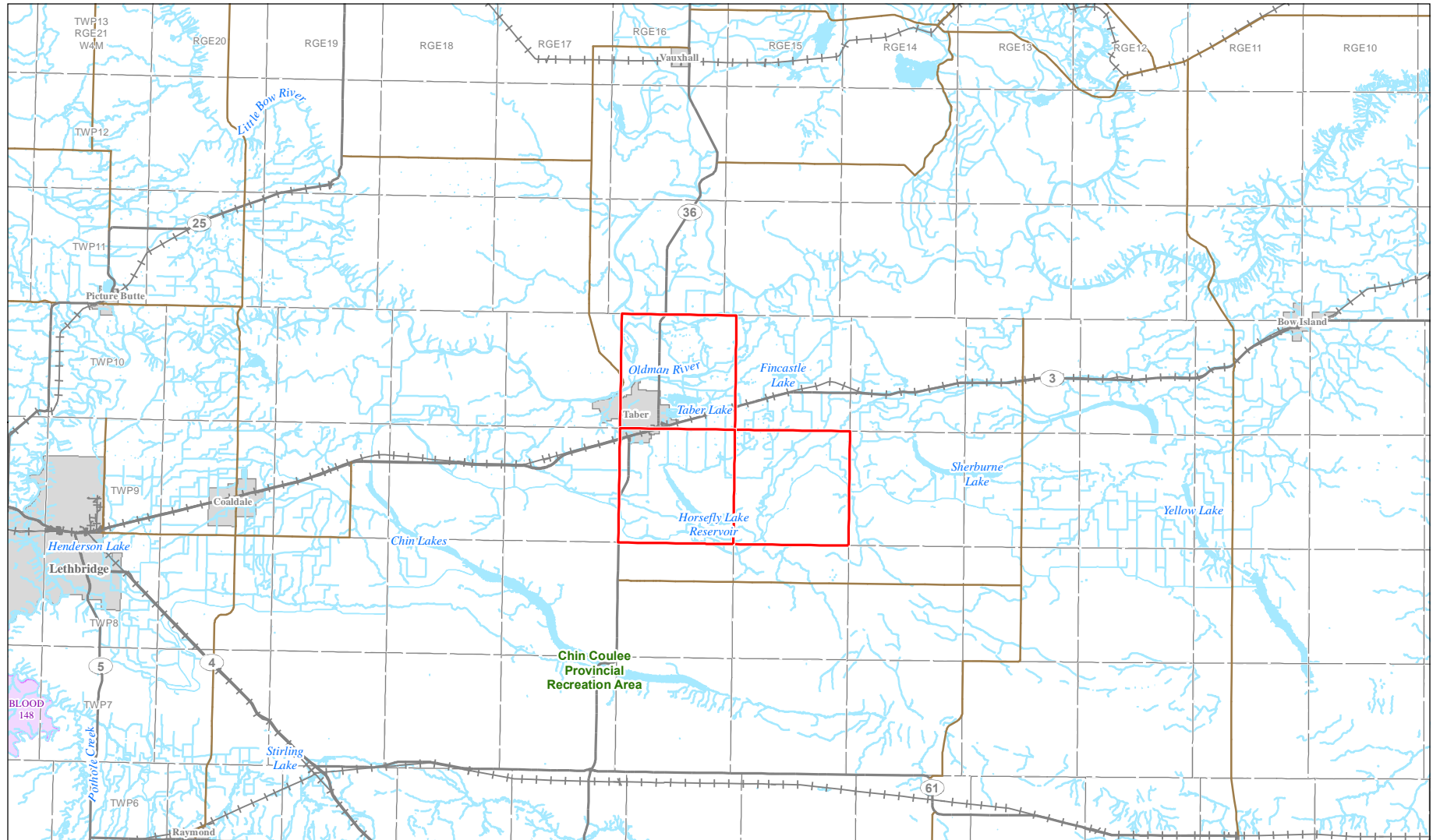
### **1.0 THE PROJECT'S NAME, TYPE OR SECTOR AND PROPOSED LOCATION**

The Horsefly Regional Emergency Spillway Project (the Project) will involve upgrading the existing canal system, owned by the Taber Irrigation District (TID) and St. Mary River Irrigation District (SMRID), to collect flood waters, which would normally flow overland towards the Oldman River. Upgrading the existing canal system would prevent flooding of agricultural lands by diverting the water flow directly to Oldman River. The general location of the Project is shown in Figure 1.1.

The Project is divided into three phases (Figure 1.2): Phase 1, from Taber Lake to the Oldman River; Phase 2, from Horsefly Reservoir to Taber Lake; and Phase 3, from the SMRID Main Canal to Horsefly Reservoir. Photos of all three Phases of the Project are presented in Appendix A.



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- |                   |   |
|-------------------|---|
| Project Area      | Reserve                                     |
| Primary Highway   | Urban Area                                  |
| Secondary Highway | Township                                    |
| Railway           | Waterbody                                   |
| Watercourse       | Provincial Recreation Area/<br>Natural Area |



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Kilometres  
(At original document size of 8.5x11)  
1:500,000

**Notes**

1. Coordinate System: NAD 1983 UTM Zone 12N
2. Data Sources: AltaLIS, NRCAN, Alberta Parks, GeoLogic, NRN, Alberta Government

Project Location  
T9&10N, R15&16W  
Town of Taber

Prepared by SL on 2022-01-25  
TR by TQ on 2022-01-25  
IR Review by JH on 2022-01-25

Client/Project  
Client: M.D. of Taber  
Project: Horsefly Regional Emergency Spillway  
Report: Detailed Project Description

110773806-0001 REVA

Figure No.

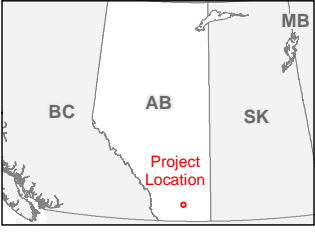
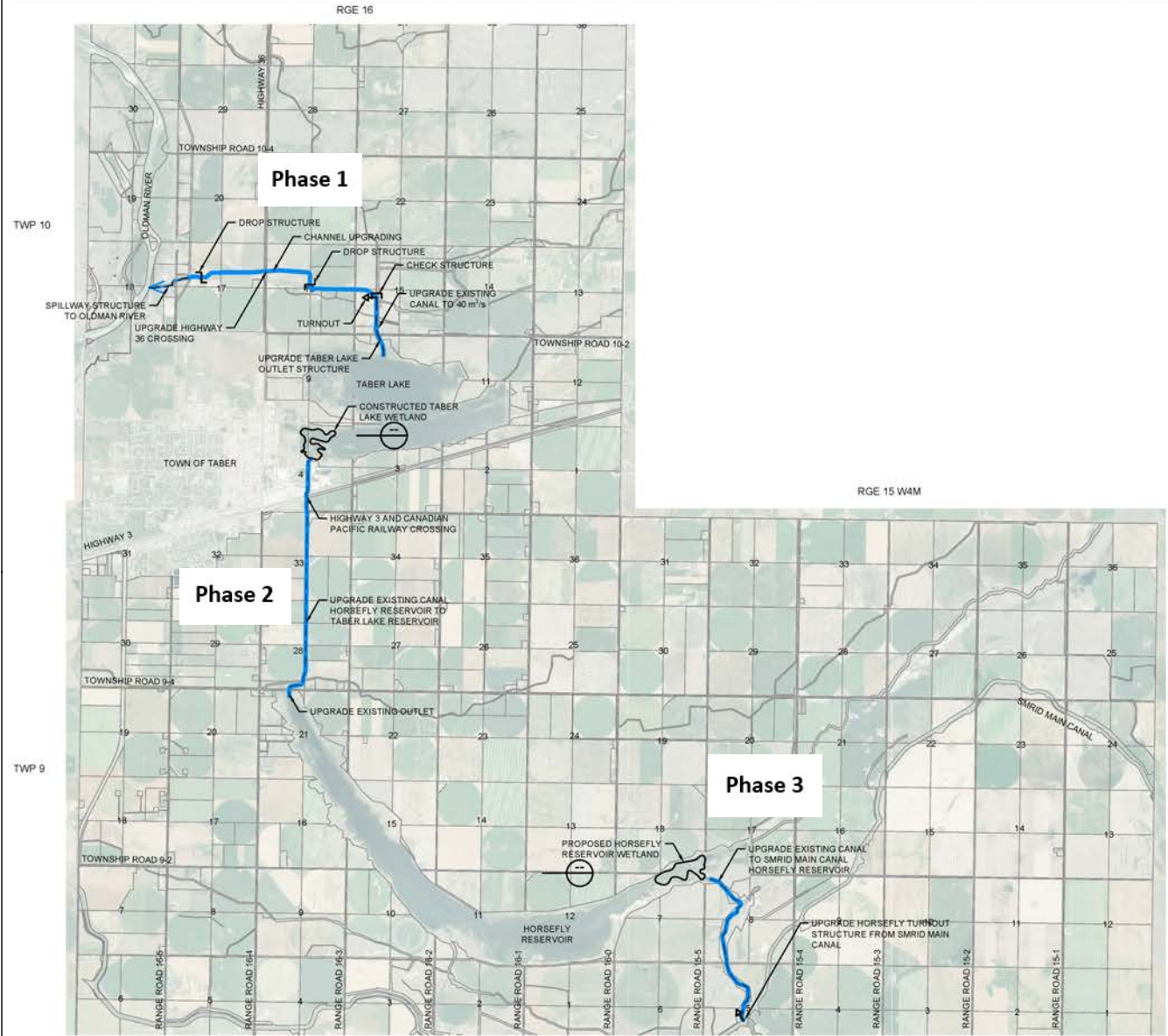
**1.1**


Title  
**Horsefly Regional Emergency  
Spillway Project – Location**



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**LEGEND**  
 HORSEFLY REGIONAL EMERGENCY SPILLWAY CANAL

**Notes**  
 1. Original figure content provided by MPE Engineering Ltd.

**Project Location** Prepared by SL on 2022-01-25  
 T9&10N, R15&16W TR by TQ on 2022-01-25  
 Town of Taber IR Review by JH on 2022-01-25

**Client/Project** 10773806-0003 REVA

**Client:** M.D. of Taber  
**Project:** Horseshy Regional Emergency Spillway  
**Report:** Detailed Project Description

**Figure No.**  
 1.2

**Title**  
 Horseshy Regional Emergency Spillway Project – Project Phases



**HORSEFLY REGIONAL EMERGENCY SPILLWAY  
IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Part A: Updated General Information  
February 2022

## **2.0 PROPONENTS NAME AND CONTACT INFORMATION**

Name of Project: Horsefly Regional Emergency Spillway

Name of Proponent: MD of Taber

Address of Proponent: 4900B 50<sup>th</sup> Street  
Taber, Alberta T1G 1T2

Municipal Administrator: Mr. Arlos Crofts  
(403) 223-3541

Website [www.mdtaber.ab.ca](http://www.mdtaber.ab.ca)

Principal Contact Person: Mr. Arlos Crofts

Environmental Contact Person: Mr. Jim Howell, Stantec Consulting  
(403) 629-3741  
[jim.howell@stantec.com](mailto:jim.howell@stantec.com)



**HORSEFLY REGIONAL EMERGENCY SPILLWAY  
IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Part B: Planning Phase Results  
February 2022

## PART B: PLANNING PHASE RESULTS

### 3.0 ENGAGEMENT WITH JURISDICTIONS OR AGENCIES

#### 3.1 ENGAGEMENT WITH FEDERAL AND PROVINCIAL AGENCIES

Federal and provincial agencies that have been consulted regarding the Project are listed in Table 3.1.

**Table 3.1 Federal and Provincial Agencies Consulted**

Agency	Purpose of Consultation	Outcome/Issues Raised
<b>Federal</b>		
Impact Assessment Agency of Canada	Introduction of Project and clarification of Project classification Ongoing meetings via email and teleconferencing to discuss Project planning	Project was deemed a Designated Project (June 25, 2021)
Fisheries and Oceans Canada	Introduction of Project and DFO requirements	Request for Review by DFO in preparation
Infrastructure Canada	Application to Investing in Canada Infrastructure Program (ICIP)	<ul style="list-style-type: none"> <li>No <i>Impact Assessment Act</i> requirements under Section 82</li> <li>Blood Tribe and Métis Nation of Alberta (Region 3 to be contacted)</li> <li>\$8.8 million grant received for Phase 1 (October 30, 2020)</li> </ul>
	Application to Disaster Mitigation and Adaptation Fund (DMAF)	\$9.8 M grant received for Phases 2 and 3 (November 23, 2020)
<b>Provincial</b>		
Alberta Environment and Parks (AEP)	Submission of Project Summary Table and Disclosure Document	Letter deeming that the Project does not require an environmental impact statement (July 14, 2021)
	Application to Alberta Community Resiliency Program (ACRP) TIER fund	<ul style="list-style-type: none"> <li>\$7.4 M grant for Phase 1 (November 2019).</li> <li>\$12.9 M grant for Phases 2 and 3 (October 2020)</li> </ul>
Alberta Culture and Status of Women (ACSW)	Historical Resources Application for Phase 1, 2 and 3	<ul style="list-style-type: none"> <li>No Historical Resources Act requirements for archaeological resources required.</li> <li>Historical Resource Impact Assessment for palaeontological resources required for coulee on Phase 1 (May 21, 2021)</li> </ul>



# **HORSEFLY REGIONAL EMERGENCY SPILLWAY IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Part B: Planning Phase Results  
February 2022

The MD of Taber, being the proponent, has discussed the Project internally with the members of the Southern Regional Stormwater Drainage Committee since the committee's establishment in 2013. The MD of Taber is the managing partner of the committee, which includes the MD of Taber and Lethbridge, Forty Mile, Cypress and Warner counties; the City of Medicine Hat, the towns of Taber, Coaldale and Bow Island; the TID and SMRID; and the Alberta government agencies of AEP, Alberta Agriculture and Alberta Transportation. All are supportive of the Project.

The MD of Taber held three public open houses on the Southern Regional Stormwater Management Plan, of which the Horsefly Regional Emergency Spillway Project is a component, in Coaldale, Taber and Medicine Hat in the fall of 2014. The attendees were in support of the stormwater management plan with the only concern being water quality if water is pumped into the canals. Given the COVID virus, a virtual open house is planned for Q1 or Q2 2022, focusing on the Horsefly component of the overall stormwater management plan.

## **3.2 RESPONSE TO THE SUMMARY OF ISSUES**

The IPD was posted on the Agency's website on November 8, 2021. The Agency invited public comments on the Summary of the IPD and also solicited comments from federal authorities. Comments were received from eight federal authorities, Alberta Environment and Park, and two Indigenous groups. The Agency hosted two virtual information sessions on the Project on November 16 and 18, 2021. There was only one attendee to the sessions and he enquired about the construction schedule, A Summary of Issues on comments received on the IPD was posted on the Agency's website on December 8, 2021. Responses to the issues raised are incorporated into the DPD.

## **4.0 ENGAGEMENT WITH INDIGENOUS GROUPS**

The following Indigenous groups have been contacted by letter describing the Project:

- Treaty 6
  - Samson Cree Nation
  - Louis Bull Tribe
  - Montana First Nation
  - Ermineskin Cree Nation
- Treaty 7
  - Blood Tribe/Kainai First Nation
  - Stoney Nakoda Nations (Bears paw, Chiniki, Wesley)
  - Tsuut'ina Nation
  - Siksika Nation
  - Piikani Nation



## **HORSEFLY REGIONAL EMERGENCY SPILLWAY IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Part B: Planning Phase Results  
February 2022

- Non-Treaty Nations
  - Foothills Ojibway First Nation
- Métis Groups
  - Métis Nation of Alberta, Region 3

Members of the Project study team met on site with the Blood Tribe/ Kainai First Nation (July 15 and November 4, 2021), Ermineskin Cree Nation (October 15, 2021) and Siksika Nation (November 4, 2021).

As of February 8, 2022, the following comments have been received from Indigenous groups:

- A letter from Métis Nation of Alberta, Region 3 stated that they have no outstanding concerns with Phase 1 of the Project.
- The Blood Tribe/Kainai First Nation expressed no objections to the Project.
- The Samson Cree Nation has expressed concerns about cutthroat trout in the Oldman River but were satisfied that mitigation would address these concerns. The Nation indicated that they have no objections to the Project.
- The Siksika Nation has expressed concerns on the quality of the water entering the Oldman River during Project operation but had no objections to the Project.
- The Ermineskin Cree Nation expressed concerns with the quality of the water entering the Oldman River and effects on fish. They were also concerned with the abandoned landfill on the north side of the coulee. The Nation had no objections to the Project. They expressed an interest in being involved in the wetland design process.
- The Tsuut'ina Nation sent a letter to MPE Engineering and to the Agency with their concerns with the Project. Their concerns included effects on water and fish, archaeological finds, medicinal plants and climate change. The Project team's response to the Nation's concerns is incorporated into the DPD.
- The Piikani Nation submitted a review of the IPD Summary to the Agency. They requested more project design information, information on the storage capacity of Taber Lake, effects on fish, and water quality of the water diverted to the Oldman River. The response to their concerns is incorporated into the DPD.

The Blood Tribe/Kainai First Nation and Siksika Nation have expressed a request to be notified should any artifacts be found during construction. The Project team stated that contract documents for construction will include a notification procedure that the Nations will be informed of any finds.

The Blood Tribe/Kainai First Nation, Siksika Nation, and Ermineskin Cree Nation expressed an interest in bidding on the construction contracts for the Project. All the Indigenous groups will be notified when the bid documents become available.

As of February 7, 2022, the only letter expressing their position on the Project has been the one received from the Métis Nation of Alberta, Region 3. The Louis Bull Tribe has sent an email on February 7, 2022, stating that they are not able to engage in the Project but that they are confident that the Nations of Treaty 7 and the Métis Nation of Alberta, Region 3 will raise concerns similar to theirs.



# HORSEFLY REGIONAL EMERGENCY SPILLWAY IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY

Part B: Planning Phase Results  
February 2022

The MD of Taber will continue to respond to any enquiries from the Indigenous groups.

## 5.0 REGIONAL ASSESSMENTS AND RELEVANT ENVIRONMENTAL STUDIES

There are no known regional assessments of the area under sections 92 or 93 of the *Act* in which the Project is located. Environmental assessments for projects whose study areas overlap those of the Project include Traditional Land Use studies. The assessment for the Montana Alberta Tie Ltd. transmission line, which runs west of Taber, included Traditional Land Use studies for the Piikani First Nation and Blood Tribe/Kainai First Nation.

## 6.0 STRATEGIC ASSESSMENTS

The Strategic Assessment of Climate Change (Government of Canada, 2020) conducted under subsection 95(2) of the *Impact Assessment Act* is applicable to the Project.



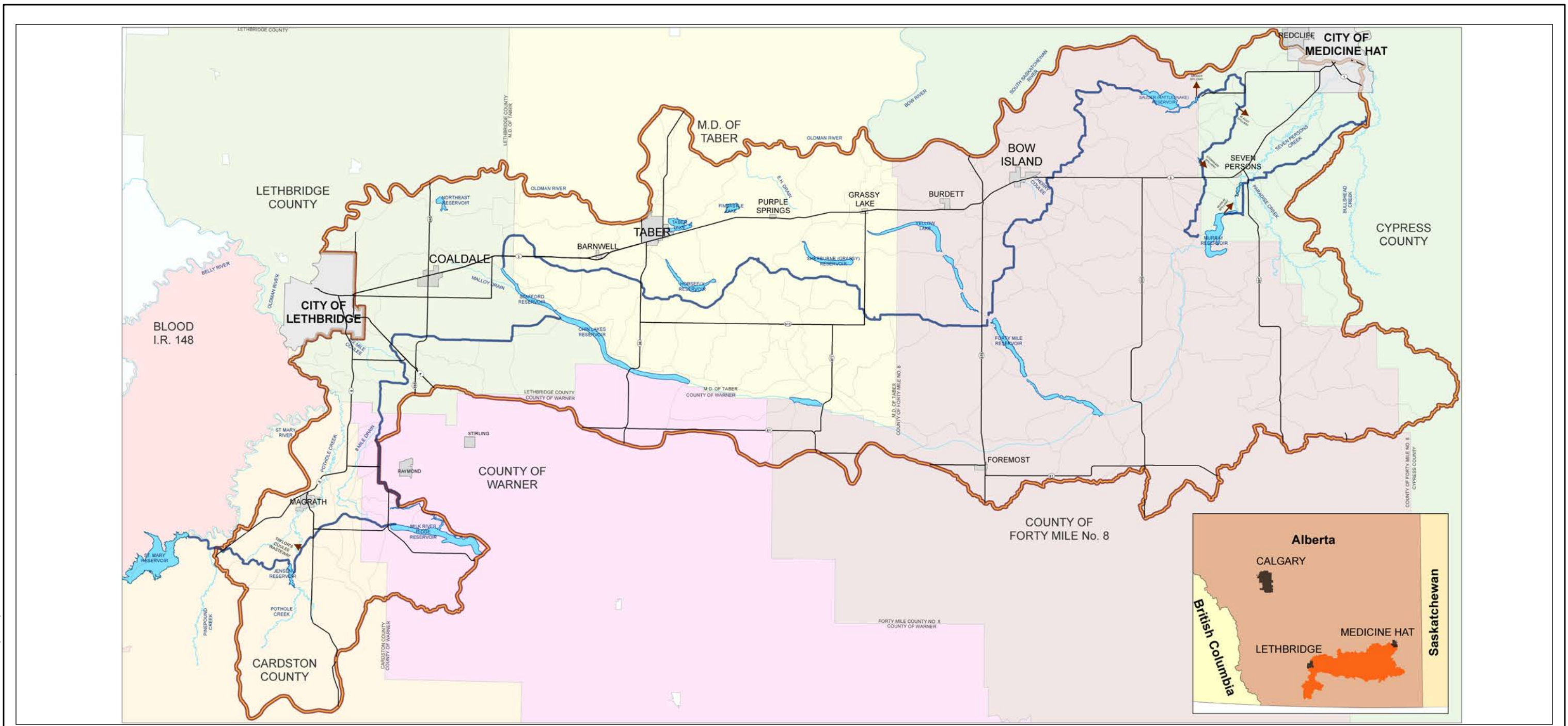
## **PART C: PROJECT INFORMATION**

### **7.0 PROJECT PURPOSE AND NEED**

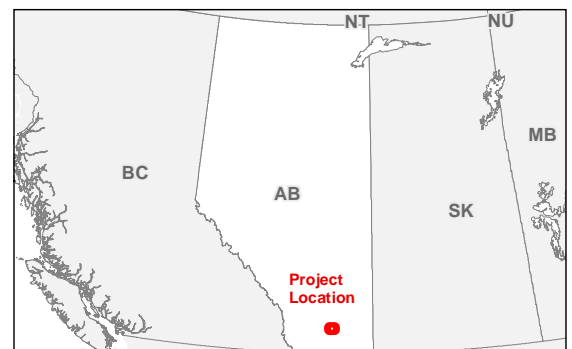
The Horsefly Regional Emergency Spillway Project is proposed by the Southern Regional Stormwater Drainage Committee to address runoff water associated with extreme weather events in Southern Alberta that drain into existing irrigation infrastructure. During spring runoff, frequent storm events, and/or snow melt events, the irrigation system (which was not designed for drainage) does not adequately handle the volume of runoff water as was experienced during flooding events that occurred in 2010, 2011, 2013, 2014 and 2018. The Horsefly Regional Emergency Spillway provides a solution to increase the flood attenuation capacity of the system.

The SMRID Main Canal is the largest single drainage feature in the region, receiving stormwater runoff from approximately 565,000 hectares (ha) of land from Milk River Ridge in the west to Cypress Hills in the east. The location of the Main Canal is shown in Figure 7.1.





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**Notes**  
1. Original figure content provided by MPE Engineering Ltd.

- Legend**
- SMRID Main Canal
  - Lakes & Reservoirs
  - Major Rivers & Creeks
  - Highways
  - Existing Spillways
  - Study Area Boundary - Southern Regional Stormwater Management Plan
  - Cities & Towns



*Project Location*  
T9&10N, R15&16W  
Town of Taber

*Prepared by SL on 2022-01-25*  
*TR by JH on 2022-01-25*  
*IR Review by JH on 2022-01-25*

*Client/Project*  
Client: M.D. of Taber  
Project: Horsefly Regional Emergency Spillway  
Report: Detailed Project Description

110773806 REVA

*Figure No.*  
**7.1**

*Title*  
**St. Mary River Irrigation District Main Canal**



## **8.0 PHYSICAL ACTIVITIES REGULATION**

The Project is subject to Section 61 of the *Physical Activities Regulations*:

*61. The expansion of an existing structure for the diversion of water from a natural water body into another natural water body, if the expansion would result in an increase in diversion capacity of 50% or more and a total diversion capacity of 10,000,000 m<sup>3</sup>/year or more.*

The Impact Assessment Agency (IAAC or the Agency) has determined that because Taber Lake and the Horsefly Reservoir were constructed on former sloughs (as is typical of reservoirs in southern Alberta), they are considered natural water bodies. Although the maximum diversion of water to the Oldman River would be 9,886,882 m<sup>3</sup> during a 1:100-year flood or greater and would only occur during such events, floods greater than a 1:100-year flood could result in over 10,000,000 m<sup>3</sup> of water being diverted to the Oldman River. As a result, the Agency has deemed the Project to be a designated physical activity, potentially subject to an Impact Assessment. An Initial Project Description, followed by a Detailed Project Description is required to be prepared and submitted to the Agency for their review to determine whether an Impact Assessment is required. The Initial Project Description was submitted to the Agency on October 29, 2021. This document is the Detailed Project Description of the Project.

## **9.0 PROJECT ACTIVITIES AND PHYSICAL WORKS**

The Project is divided into three phases: Phase 1, from Taber Lake to the Oldman River; Phase 2, from Horsefly Reservoir to Taber Lake; and Phase 3, from the SMRID Main Canal to Horsefly Reservoir.

### **9.1 PROJECT PHASES**

The Project activities and physical works are described for each phase which are shown in Figure 1.2.

#### **9.1.1 Phase 1**

Phase 1 (Figure 9.1) conveys water from Taber Lake, north and west to the Oldman River. The outlet from Taber Lake will be replaced and the first approximately 800 metres (m) of the existing canal (the Big Bend Lateral) will be enlarged from a capacity of 7.6 m<sup>3</sup>/s to 40 m<sup>3</sup>/s primarily by widening the canal. At this location, a turnout will direct water into the Big Bend Canal north for irrigation. From the west of the turnout on the Spillway the next 3,500 m of the system west of this point is a constructed earthen drain. The existing drain, which normally carries a small volume of runoff from the adjacent fields, tile drain seepage from Big Bend Canal and leakage through old gates, will be enlarged and widened to carry 40 m<sup>3</sup>/s. The final 1,000 m of the canal will consist of enlarging the existing drainage through a natural coulee to the Oldman River. This stretch will include concrete drop structures, a spillway and erosion protection measures.



## **HORSEFLY REGIONAL EMERGENCY SPILLWAY IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Part C: Project Information  
February 2022

Access may be required to the Oldman River for completion of the spillway. The appropriate permits and authorizations from DFO will be obtained prior to work commencing within the river. All conditions to the permits and authorizations will be adhered to. Three MD of Taber road crossings and a crossing for Highway 36 will also require replacement. A wetland is presently being constructed on the west side of Taber Lake by the Town of Taber. This wetland is intended to collect stormwater from the east side of Taber and filter it before it is disposed of into Taber Lake. The Project will include the construction of an additional wetland at the inlet to Taber Lake to provide additional filtration of water from the canal and runoff into Taber Lake, reduce incoming water velocity to the lake, allowing sediment settling, and create wildlife and migratory bird habitat.

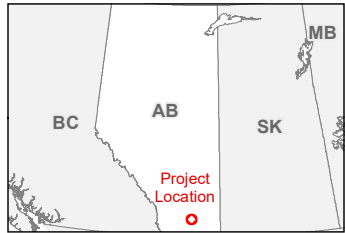
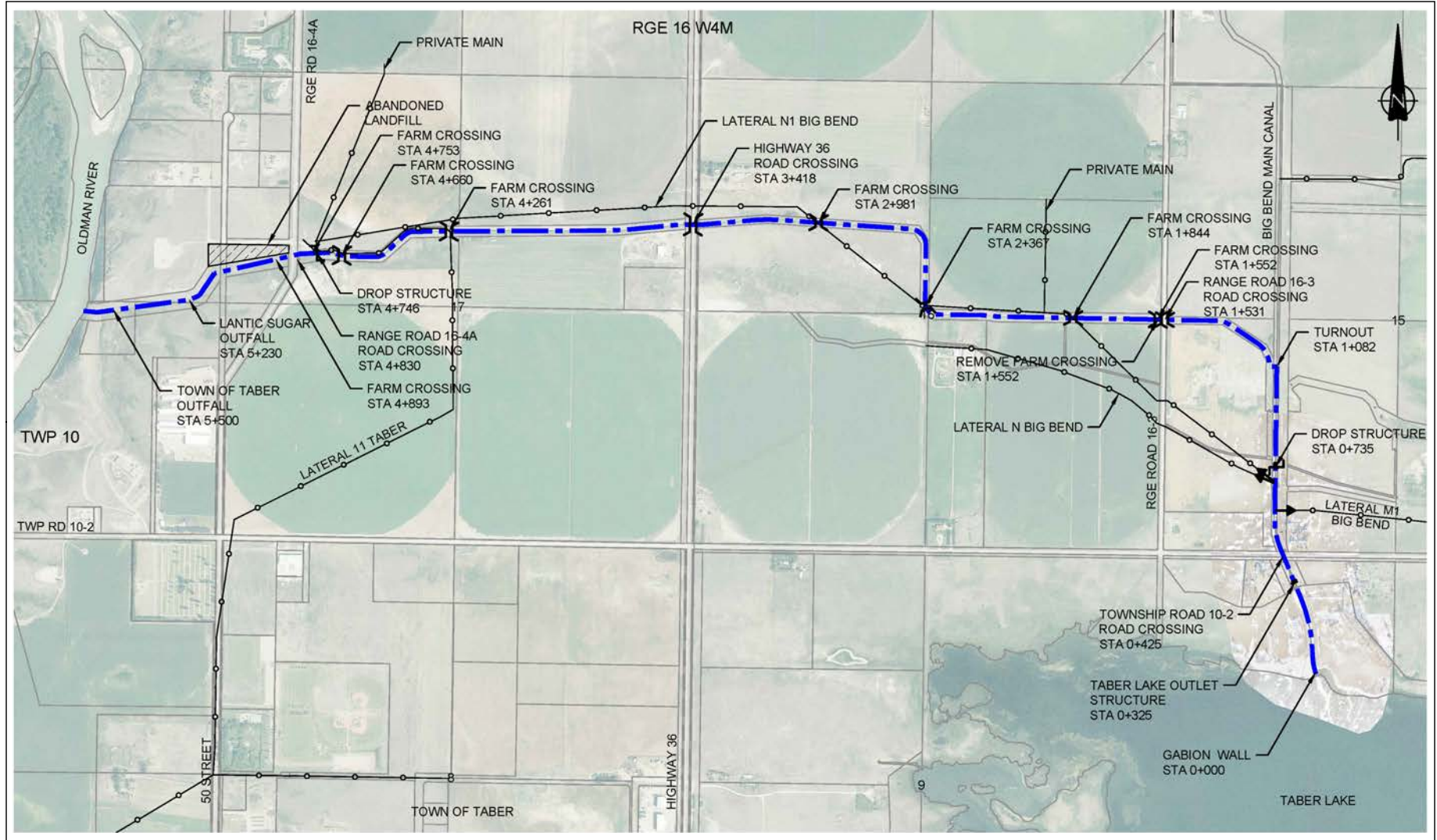
### **9.1.2 Phase 2**

Phase 2 (Figure 9.2) includes enlarging 5,000 m of the existing Lateral 15 canal between Horsefly Reservoir and Taber Lake. The existing canal capacity of 7.1 m<sup>3</sup>/s will be increased to 40 m<sup>3</sup>/s. Concrete drop structures and two MD of Taber road crossings will need to be replaced to convey the additional flows. The outlet structure from Horsefly Reservoir will need to be replaced as will the crossing of Highway 3 and the Canadian Pacific Railway line. There will be no increase in the footprint of Horsefly Reservoir.

### **9.1.3 Phase 3**

Phase 3 (Figure 9.3) includes replacing the turnout structure on the SMRID Main Canal and enlarging 3,500 m of the SMRID-owned canal that delivers water to Horsefly Reservoir. The existing canal capacity of 28.3 m<sup>3</sup>/s will be increased to 40 m<sup>3</sup>/s. Drop structures and an MD of Taber road crossing will need to be replaced to convey the additional flow. The existing wetland at Horsefly Reservoir will be expanded and enhanced to improve water quality through the collection of sediment and reducing incoming water velocity to the Reservoir. The constructed wetland will also result in improved wildlife and migratory bird habitat.





- LEGEND**
- DROP STRUCTURE
  - TURNOUT STRUCTURE
  - ROAD CROSSING
  - HORSELY REGIONAL EMERGENCY SPILLWAY CANAL
  - IRRIGATION PIPELINE

**Notes**  
 1. Original figure content provided by MPE Engineering Ltd.

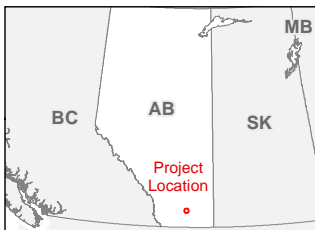
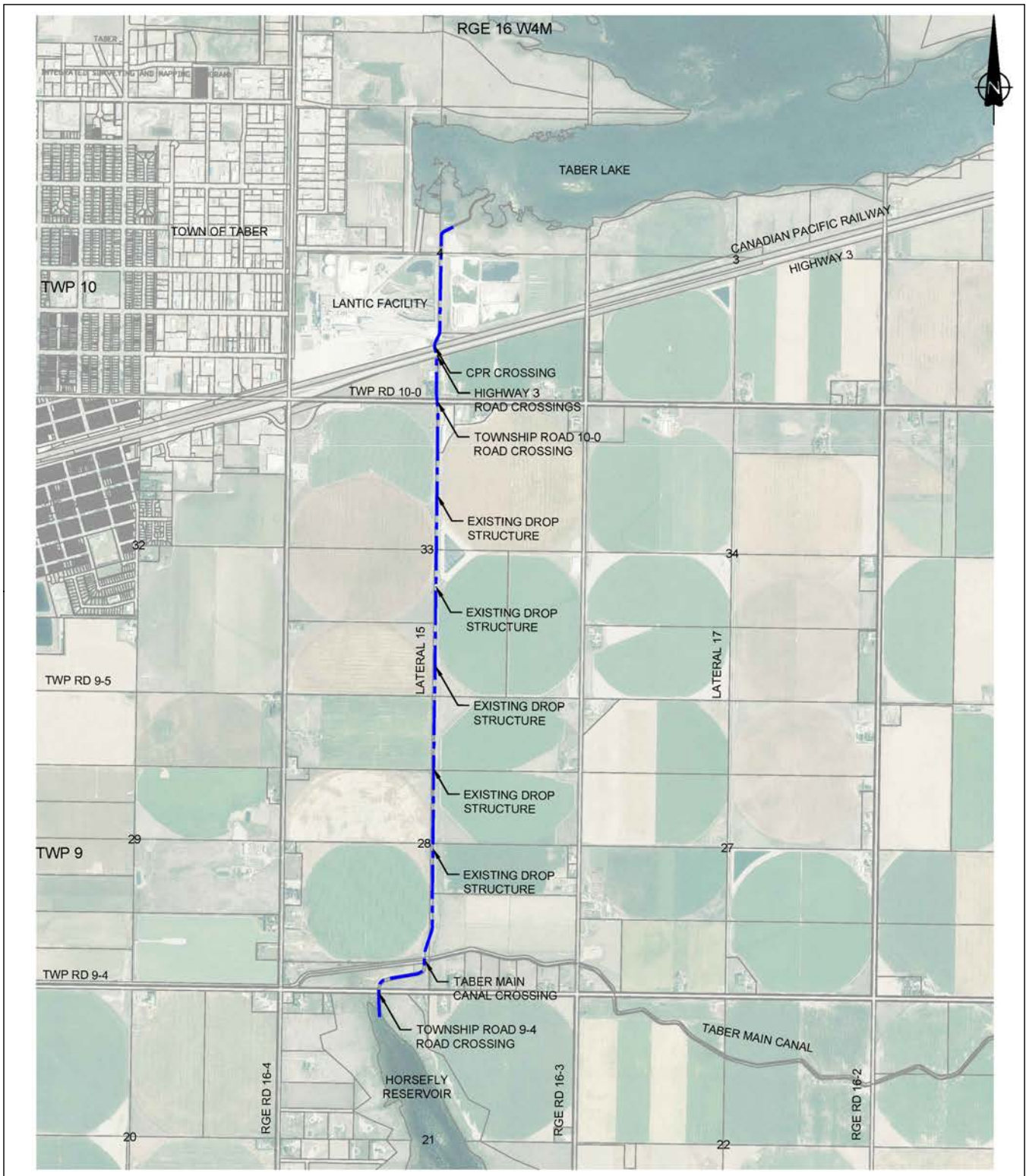
Project Location: T9&10N, R15&16W, Town of Taber  
 Prepared by SL on 2022-01-25, TR by TQ on 2022-01-25, IR Review by JH on 2022-01-25

Client/Project: M.D. of Taber, Project: Horsely Regional Emergency Spillway Report: Detailed Project Description  
 110773806-0002 REVA

Figure No.  
**9.1**

Title  
**Phase 1 Site Plan**





**LEGEND**  
 --- HORSEFLY REGIONAL EMERGENCY SPILLWAY CANAL

**Notes**  
 1. Original figure content provided by MPE Engineering Ltd.

**Project Location**  
 T9&10N, R15&16W  
 Town of Taber

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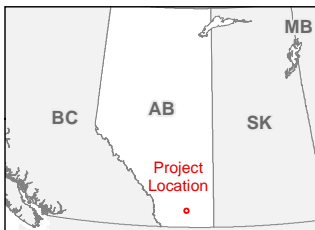
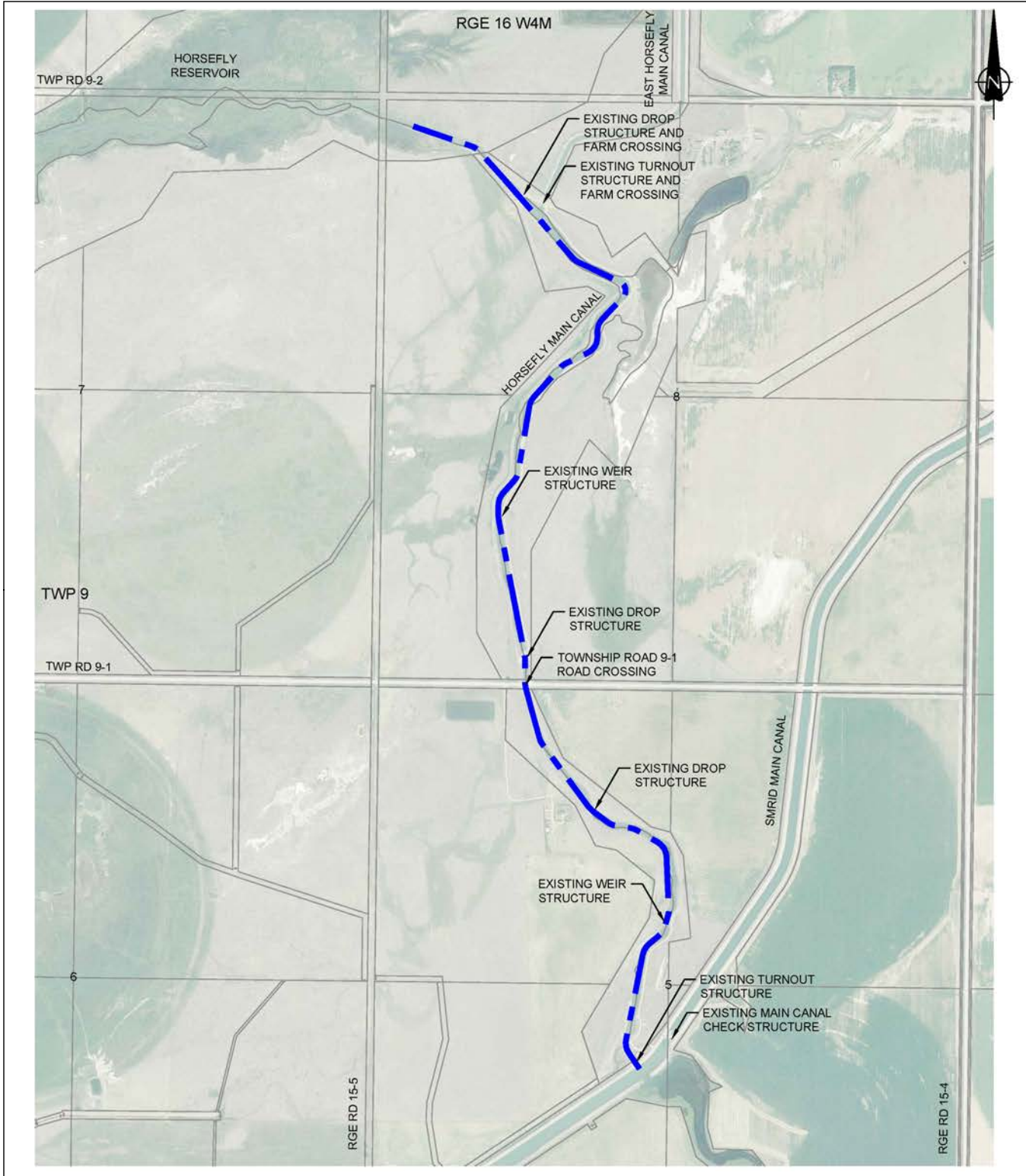
**Client/Project**  
 Client: M.D. of Taber  
 Project: Horsefly Regional Emergency Spillway  
 Report: Detailed Project Description

10773806-0003 REVA

**Figure No.**  
 9.2

**Title**  
 Phase 2 Site Plan





**LEGEND**  
 - - - - HORSEFLY REGIONAL EMERGENCY SPILLWAY CANAL

**Notes**  
 1. Original figure content provided by MPE Engineering Ltd.

**Project Location**  
 T9&10N, R15&16W  
 Town of Taber

Prepared by SL on 2022-01-25  
 TR by TQ on 2022-01-25  
 IR Review by JH on 2022-01-25

**Client/Project**  
 Client: M.D. of Taber  
 Project: Horsefly Regional Emergency Spillway  
 Report: Detailed Project Description

10773806-0003 REVA

**Figure No.**  
 9.3

**Title**  
 Phase 3 Site Plan



## **9.2 DESCRIPTION OF PROJECT ACTIVITIES**

### **9.2.1 Construction**

Project construction incorporates the existing TID and SMRID infrastructure which must remain in operation from April to October. This results in a large portion of the work needing to be constructed in the winter months. Preliminary engineering has been completed for Phase 1 (MPE and Stantec 2021) and engineering for Phases 2 and 3 will follow a similar design.

Project Construction components are as follows:

- Canal enlargement from the SMRID Main Canal to the Oldman River will include stripping, salvage and stockpiling of topsoil, widening the canal to increase capacity, and replacing culverts at local road crossings, Provincial Highways 36 and 3, and a Canadian Pacific Railway crossing for the increased capacity. The channel will be between 4.0 and 6.0 m wide and 2.7 to 3.0 m deep.
- For Phase 1, the spillway will be reconstructed in its present location with minor adjustments.
- As this spillway will only be operated intermittently, there will be no gravel armour erosion protection downstream of the proposed Big Bend Turnout.
- The outside slopes of embankments and other areas within the canal right-of-way will be spread with topsoil, graded and seeded to grass. All haul roads and any disturbed areas will be reclaimed.
- The spillway through the coulee will have a semi natural cross section and riprap will be used to mitigate erosion and stabilize the coulee long term. Using the existing coulee bed is less obtrusive and more economical than other options.
- Outflow from the Lantic Facility will be diverted around the construction site.
- A cofferdam will be constructed at the confluence of the Spillway and the Oldman River; fish salvage will occur behind the cofferdam.
- Control structures in Phases 2 and 3 are still in the preliminary design phase but all inline control structures will need to be replaced for the increased capacity of the spillway.
- Three major crossings: Highway 36, Highway 3, and the Canadian Pacific Railway that all need to be replaced to accommodate the enlarged capacity.
- To control flows into the spillway, the turnout structure at the SMRID Main Canal, will be replaced with a new cast-in-place concrete structure controlled with gates.
- Wetlands are proposed to be constructed where the spillway enters Horsefly Reservoir and Taber Lake to enhance the riparian areas. The wetlands are intended to improve water quality of the reservoirs during normal canal operations. The wetlands will have an area of approximately 20-30 ha.
- Control structures will have chain link fencing and the canals will have barbed wire fencing to control access and for safety purposes.
- Reservoir outlet structures will have safety booms and signage in place warning of potential danger. Where recreational activities occur, controlled access will be provided.



# HORSEFLY REGIONAL EMERGENCY SPILLWAY IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY

Part C: Project Information  
February 2022

Construction traffic will be limited to the rights-of-way and easements obtained for the project. The entire spillway will be fenced along the right-of-way boundaries.

All contractors are required to have an Environmental Construction Operations (ECO) Plan developed to Alberta Transportation standards and approved by the MD of Taber. The ECO Plan provides information on the contractor's understanding of potential impacts of their work and mitigation to avoid and mitigate impacts. It includes an erosion and sediment control plan and emergency prevention and response plans. ECO Plans are common for many infrastructure projects in Alberta.

Post-construction activities will involve clean-up and restoration of the temporary work laydown areas. The stockpiled soil will be used for reclamation. Construction waste will be collected and disposed of at licensed waste facilities.

## 9.2.2 Operation

During non-flood conditions, the Project will operate as it currently does as a component of the TID canal system. Water will be delivered to the Big Bend Canal, with no water flowing west of the turnout structure to the Oldman River. During 1:100-year event or greater floods, water will be diverted through the spillway to the Oldman River. The SMRID Main Canal can handle floods up to the 1:100-year event. For floods greater than the 1:100-year event, water will continue to be diverted with excess water overtopping the canals and flooding the adjacent lands. The design-full supply levels of the Horsefly Reservoir and Taber Lake will not be exceeded during operation of the Horsefly Spillway. Spillway operations will require no storage of materials or solid waste production. All gated control structures in the proposed spillway will be powered by the existing electrical grid system with provisions for portable electrical power in the event of a power outage. All gated control structures will have the capability of being operated remotely.

## 9.2.3 Decommissioning

The Project components will be part of the TID canal system and are not expected to be decommissioned.



## **10.0 ESTIMATED MAXIMUM PROJECT CAPACITY**

The three phases of the Project and their current and planned capacities are shown in Table 10.1.

The Project would divert water to Oldman River only during 1:100-year flood events or greater.

**Table 10.1 Capacity of Project Phases**

<b>Phase</b>	<b>Function</b>	<b>Existing Capacity (m<sup>3</sup>/s)</b>	<b>Proposed Capacity (m<sup>3</sup>/s)</b>
1	Transfer water from Taber Lake to Oldman River	7.6	40
2	Transfer water from Horsefly Reservoir to Taber Lake	7.1	40
3	Transfer water from SMRID Main Canal to Horsefly Reservoir	28.3	47
NOTE: m <sup>3</sup> /s = cubic metres per second			

## **11.0 PROJECT SCHEDULE**

If the Project does not require an Impact Assessment, construction of Phase 1 of the Project is planned to commence in summer 2022 and to be completed by fall 2023. Construction of Phase 2 is scheduled to occur from 2023 to 2025. Construction of Phase 3 is scheduled from 2024 to 2026. Canal enlargement will occur during the non-operational months of the irrigation system, early October to late April. If an Impact Assessment is required, the schedule is expected to be delayed by two years. The Project components are part of the Taber irrigation system, operational since 1919; as such, the Project is expected to operate in perpetuity.





## **12.0 PROJECT ALTERNATIVES**

### **12.1 ALTERNATIVE MEANS OF CARRYING OUT THE PROJECT**

Major flooding occurred in the south Oldman River drainage basin in 2010 and 2011. As a result, the Regional Drainage Committee for municipalities along this drainage basin commissioned the development of a regional stormwater management plan.

#### **12.1.1 Southern Regional Stormwater Management Plan**

The Southern Regional Stormwater Management Plan (SRSMP) examined drainage issues in the south Oldman River drainage basin, focusing on the SMRID main canal (see Figure 12.1). The Plan considered the following six options to accomplish the goal of flood control:

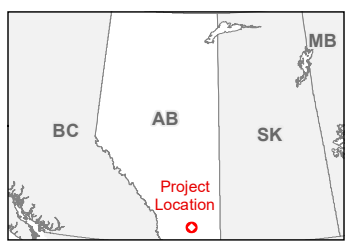
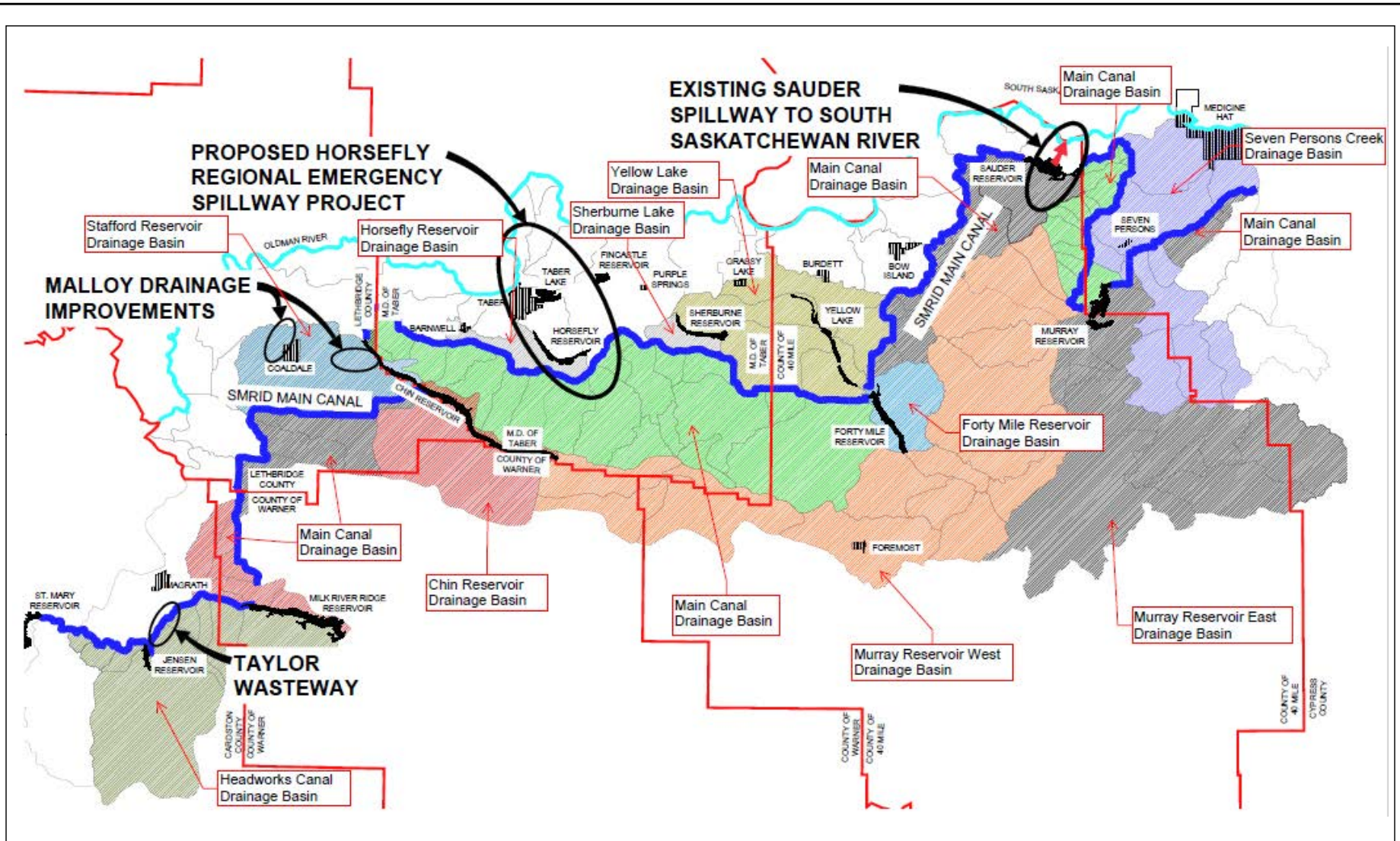
- Construct sufficient additional storage at Chin Reservoir to capture all Main Canal upstream flow.
- Construct a new spillway at Horsefly Reservoir, diverting flow in the Main Canal at that point into the Oldman River.
- Replace the Sauder Spillway.
- Construct a secondary, larger Sauder Spillway.
- Increase the storage at Murray Reservoir
- Construct a dry dam at Paradise Creek capable of capturing all runoff from a 1:100-year flood event.

#### **12.1.2 Preferred Alternative**

Alternative 2, the Horsefly Reservoir Spillway was chosen as the preferred alternative. It would allow diversion of water from the Main Canal, freeing up downstream capacity to accept additional runoff. The Project would therefore benefit not only SMRID and TID, but multiple rural and urban communities. Additional rationale for prioritizing the Horsefly Regional Emergency Spillway is it is the shortest route from the SMRID Main Canal to the Oldman River using existing canals and it is at a significant bottleneck on the SMRID Main Canal, providing a greater amount of flood mitigation than diversions further upstream.



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**Notes**  
 1. Original figure content provided by MPE Engineering Ltd.

Project Location: T9&10N, R15&16W, Town of Taber  
 Prepared by SL on 2022-01-25, TR by TQ on 2022-01-25, IR Review by JH on 2022-01-25

Client/Project: M.D. of Taber, Project: Horsely Regional Emergency Spillway, Report: Detailed Project Description  
 110773806-0002 REVA

Figure No.: **12.1**

Title: **Southern Regional Stormwater Management Plan Study Area**



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# HORSEFLY REGIONAL EMERGENCY SPILLWAY IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY

Part C: Project Information  
February 2022

## 12.1.3 Horsefly Emergency Spillway Alternatives

Alternates to the Project were considered including a spillway channel to the west of the Town of Taber and increasing storage in the Horsefly Reservoir and Taber Lake to store stormwater. Both alternates were eliminated for the following reasons:

- Routing the spillway to the west of the Town of Taber requires routing through a large country residential subdivision and establishing a new corridor for the spillway rather than following an existing canal. Acquiring this land would have been difficult and public opposition was anticipated.
- Increasing the storage in Taber Lake and Horsefly Reservoir is impractical due to their already small size compared to the volume required to be stored. Gaining enough volume was not practicable. The reservoirs are surrounded by urban areas or highly developed agriculture and obtaining land would have been more expensive than the spillway alternative.

Currently the Project is the most economical and technically feasible alternative to reliably convey stormwater from the SMRID Main Canal to the Oldman River.

Alternatives have been considered for the Phase 1 alignment in the coulee and alternatives are being considered for the Phase 2 alignment between Horsefly Reservoir and Taber Lake.

One option of the coulee alignment would be to route the drain to the north of the coulee and use a concrete chute structure to drop the water to the Oldman River. This option was eliminated as the grades to the north of the coulee would require extensive excavation. Ultimately the route through the existing coulee was chosen as it required less excavation and disturbance.

Two options are being considered for the Project alignment between Horsefly Reservoir and Taber Lake. Option 1 retains the existing alignment that crosses the Lantic Facility; Option 2 runs one mile east of Option 1 and avoids the Lantic Facility. However, it would involve the construction of a new canal. Currently, Option 1 is the preferred routing for Phase 2.

## 12.2 ALTERNATIVES TO THE PROJECT

A regional stormwater management plan is the only feasible means to address the issue of flooding in the basin at a regional scale.



## **PART D: LOCATION INFORMATION AND CONTEXT**

### **13.0 GEOGRAPHIC INFORMATION**

The Project's location is shown in Figure 1.2 adjacent to the Town of Taber. Its geographic coordinates are:

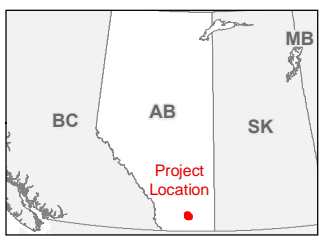
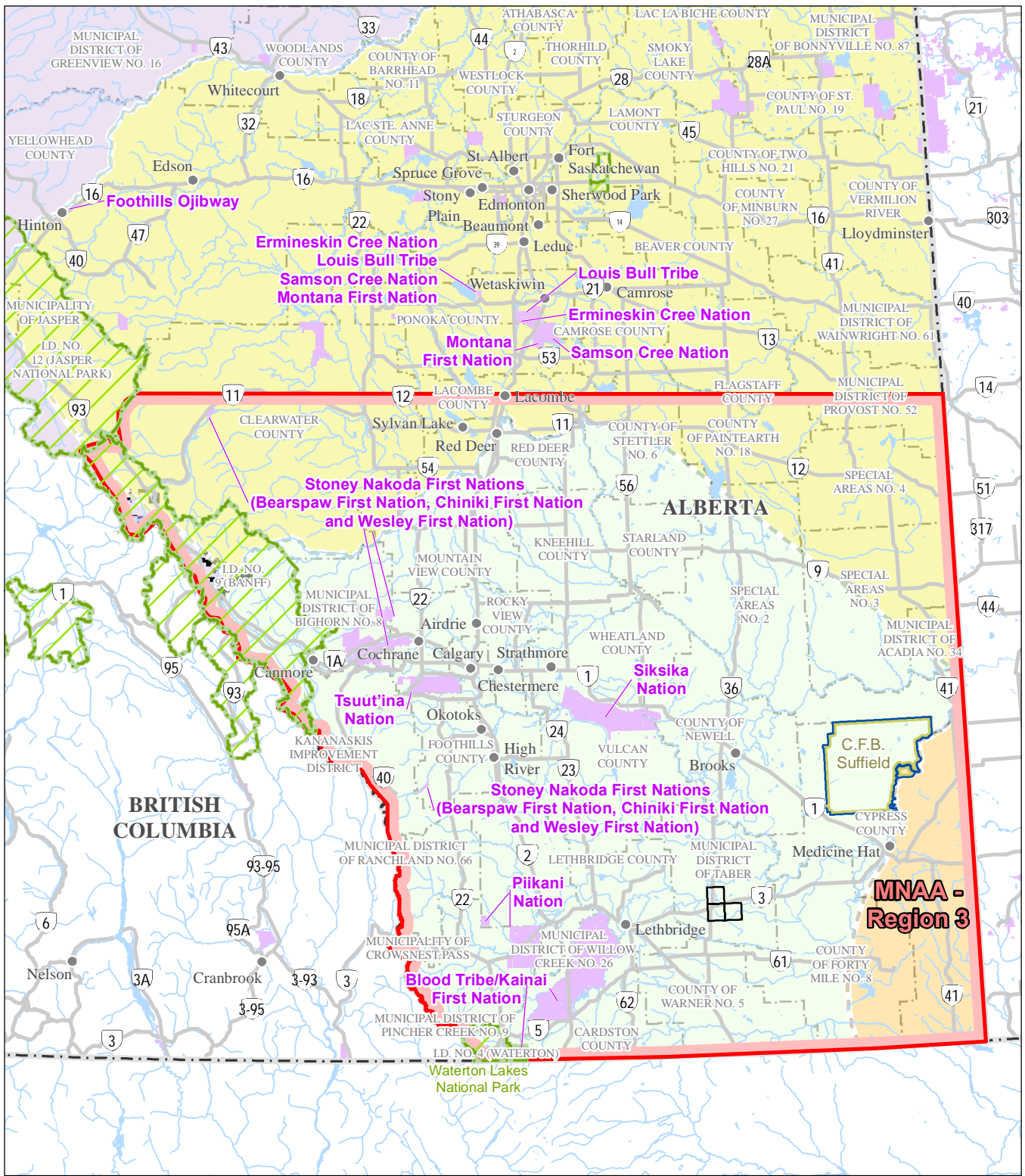
- Phase 1 of the Project is in Sections 10, 15, 16, 17 and 18, Township 10, Range 16, West of the fourth meridian (W4M).
- Phase 2 of the Project is in Sections 21, 28, 33 Township 9, Range 16 and Section 4, Township 10 W4M.
- Phase 3 of the Project is in Sections 5, 7, 8 and 18, Township 9, Range 15 W4M.
- The southern geographic location of the Project and the exit from SMRID Main Canal is Latitude 49° 42' 14.26" N (49.703961) Longitude 112° 00' 14.54" W (-112.004039). The northern geographic location of the Project an outlet to the Oldman River is Latitude 49° 49' 19.25" N (49.822014) Longitude 112° 09' 21.63" W (-112.156008).

The Project is on private land, mainly utilized for agriculture, and on land belonging to the TID, Town of Taber and Lantic Inc. There are 15 residences within 300 m of the existing canal: eight in Phase 1, four in Phase 2 and three in Phase 3. The Project is located within Treaty 7 and Métis Nation of Alberta Region 3. Figure 13.1 shows the Project in relation to Indigenous groups and nearby federal lands. Table 13.1 presents the distances to reserves of Indigenous groups, as identified by the Impact Assessment Agency of Canada (IAAC).

**Table 13.1 Distances from the Project to Reserves**

<b>Indigenous Group or Organization</b>	<b>Distance from Project Centre (km)</b>
Blood Tribe/ Kainai First Nation	57
Piikani Nation	102
Siksika Nation	99
Tsuut'ina Nation	190
Stoney Nakoda Nations (Bears paw, Chiniki, Wesley)	228
Samson Cree Nation	334
Louis Bull Tribe	354
Montana First Nation	334
Ermineskin Cree Nation	346
Foothills Ojibway First Nation	546





Project Area	<b>Treaty Boundary</b>
First Nation Reserve	Treaty 4 (1874)
Métis Nation of Alberta Association (MNAA) Region 3	Treaty 6 (1876)
National Park	Treaty 7 (1877)
Suffield Military Base	Treaty 8 (1899)

0 25 50 Kilometres



**Project Location**  
T9&10N, R15&16W  
Town of Taber

**Client/Project**  
Client: M.D. of Taber  
Project: Horsefly Regional Emergency Spillway  
Report: Detailed Project Description

**Figure No.**  
13.1

**Title**  
**Location of Indigenous Groups and Nearby Federal Lands**

Prepared by SL on 2022-01-25  
TR by JH on 2022-01-25  
IR Review by JH on 2022-01-25

10773806-0008 REVA

# HORSEFLY REGIONAL EMERGENCY SPILLWAY IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY

Part D: Location Information and Context  
February 2022

Based on discussions with Indigenous peoples to date (January 20, 2022) while the Project is within traditional territory of Indigenous groups, it is not specifically on land used for traditional purposes by Indigenous peoples of Canada. The Project is not on land:

- in a reserve as defined in subsection 2(1) of the *Indian Act*
- First Nation land as defined in subsection 2(1) of the *First Nations Land Management Act*
- land that is subject to a comprehensive land claim agreement or a self-government agreement
- land set aside for the use and benefit of Indigenous peoples of Canada

The nearest federal lands to the Project are Waterton Lakes National Park (136 km from the Project) and the Canadian Forces Base, Suffield (83 km from the Project).

## 14.0 PHYSICAL AND BIOLOGICAL ENVIRONMENT

### 14.1 PROJECT ENVIRONMENTAL SETTING

The Project footprint is largely on agricultural land under irrigation. The western-most section of Phase 1 is a coulee leading down to the Oldman River. The area north of the coulee was a former landfill. Some landfill waste is present on the north slopes of the coulee.

The Project area falls within an airshed managed by the Palliser Airshed Society (PAS) that collects air quality data using continuous and passive monitoring stations. Data for the period 2018 to 2020 showed nitrogen dioxide (NO<sub>2</sub>), sulphur dioxide (SO<sub>2</sub>) and carbon monoxide (CO) concentrations less than the Alberta Ambient Air Quality Objectives (AAAQO). Maximum one-hour particulate matter (PM<sub>2.5</sub>) concentrations exceeded the AAAQO of 29 µg/m<sup>3</sup> one time in 2018, five times in 2019, and 18 times in 2020. The Project area in general has good air quality when compared to AAAQO. Any exceedance of air quality objectives is attributed to natural causes such as wildfire or high wind speed conditions.

Existing noise levels along the Project are described in terms of ambient sound levels (ASL). The lowest ASL for receptors closest the Project are assumed to be 45 dBA (decibels at human hearing threshold) and 35 dBA for the daytime and nighttime periods, respectively. The assumed levels are intended to describe typical or representative ambient conditions for receptors in rural areas where agricultural and/or oil and gas activity is also taking place.

Although the coulee has been disturbed by previous land use activities, native grassland vegetation is present along portions of the coulee. Some native vegetation is also present on the north side of Taber Lake near where the canal joins with Taber Lake. A vegetation and rare plant survey found scratchgrass and velvet goldenrod along the Phase 2 and 3 routes. Ten weed species were observed during surveys of the Project footprint, including one prohibited noxious species: Russian knapweed (*Rhaponticum repens*), and nine noxious species.



## HORSEFLY REGIONAL EMERGENCY SPILLWAY IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY

Part D: Location Information and Context  
February 2022

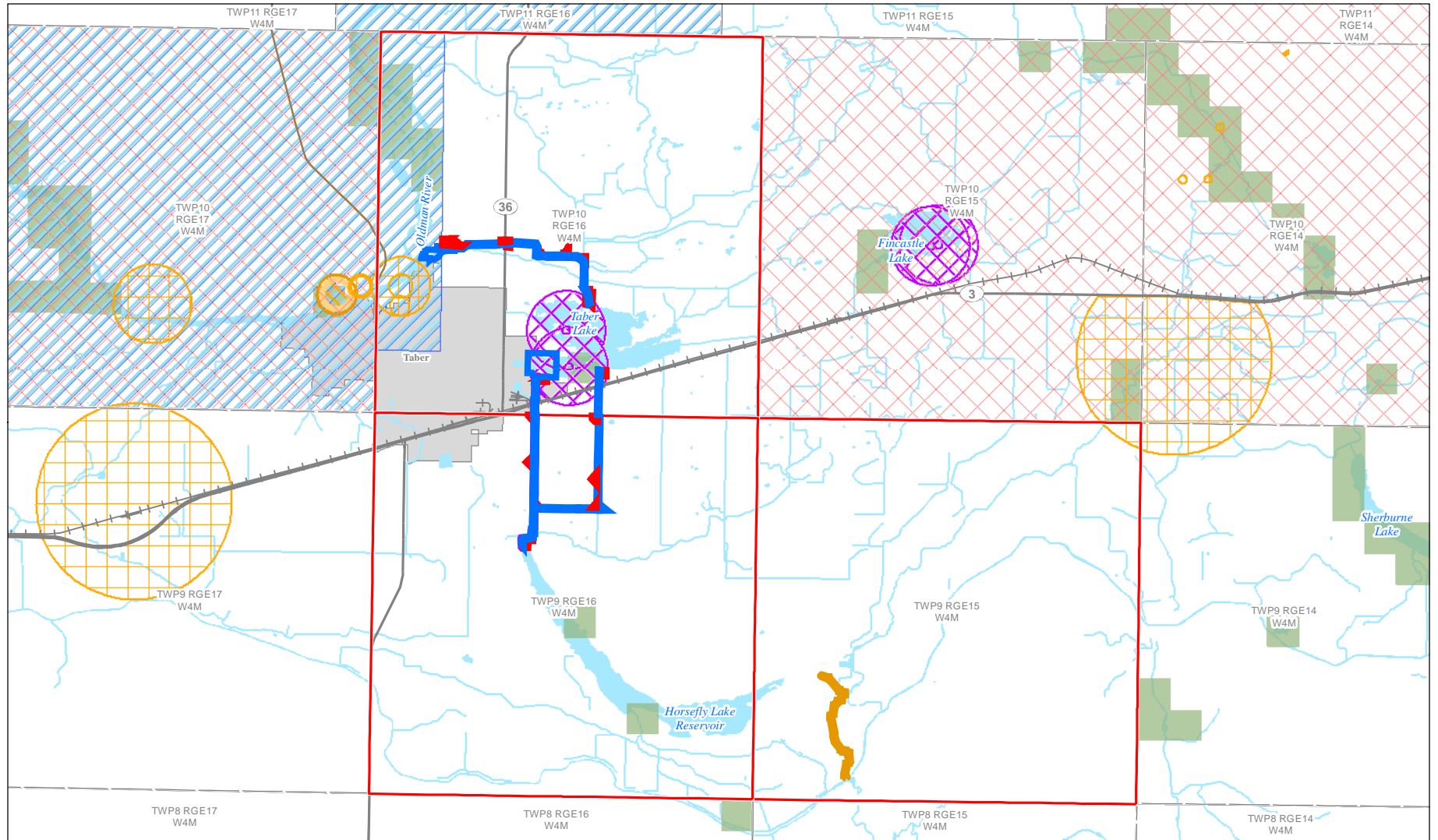
Phase 1 of the Project overlaps provincial sharp-tailed grouse range, burrowing owl range, sensitive raptor range (for ferruginous hawk), sensitive snake habitat, sensitive amphibian range and the setback buffer for colonial nesting bird habitat for American white pelican nesting sites in Taber Lake. Phases 2 and 3 overlap sharp-tailed grouse range, burrowing owl range, sensitive raptor range for ferruginous hawk and sensitive amphibian range. Wildlife surveys of Phase 1 in 2021 found snake hibernacula (bullsnake and prairie rattlesnake), Swainson's hawk and red-tailed hawk nests within 500 m of the Project footprint. Birds observed during the surveys included Swainson's hawk, bald eagle, cliff swallows, bank swallows, barn swallows, black-necked stilt, sora, eastern kingbird and American white pelicans.

A fisheries field program for all three phases was conducted in September 2021. A fish inventory of Taber Lake found species present consistent with Horsefly Reservoir: northern pike, yellow perch, walleye, spottail shiner, and also brook stickleback (*Culaea inconstans*). Both Taber Lake and Horsefly Lake are expected to afford good habitat for all life stages of resident fish species and afford excellent overwintering habitat to resident fish. The Oldman River affords poor to moderate fish habitat which is limited by cover and may affect the quality of rearing and spawning habitat for some species. The coulee gradient likely excludes small-bodied fish or weaker swimmers from swimming up the coulee but is not sufficient to act as a barrier to fish passage and is considered fish habitat. In addition, the coulee provided poor overwintering potential due to shallow depth which is likely to freeze to the bottom. The canals, although not designed for fish habitat, provide good rearing habitat. Migration through the canal system is considered poor due to stepped spillway structures which could impede fish passage.

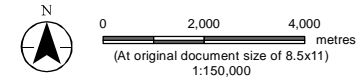
Taber's water supply originates from two sources: from October through April, raw water is pumped from the Chin Reservoir. During May through September raw water is taken from the TID main canal. The Town's wastewater treatment facility was constructed in the early 1980s and is sized for a population of 18,000. The Town also operates an industrial aerated lagoon plant for industrial effluent. Treated effluent can be diverted to the lagoon system to supply the irrigation system for five-quarter sections of farmland. Treated wastewater from the processing of sugar beets at the Lantic Facility runs from a pipeline on the southwest corner of Taber Lake for disposal through the coulee into Oldman River. This is a licensed wastewater disposal site. Water quality data collected throughout Alberta's irrigation districts as part of the Irrigation District Water Quality Project rates the water quality of the Taber Irrigation District and St. Mary River Irrigation District as excellent over the last several years. The water is classified as hard averaging from 139 to 141 mg/L, and alkalinity averaged from 118 to 127 mg/L. Bicarbonate, sulfate, calcium, magnesium and sodium were the ions found in the highest concentrations, followed by smaller amounts of carbonate, chloride and potassium. Chloride concentrations were low, averaging less than 3 mg/L.

Alberta Parks has classified four environmentally significant areas in the Project area based on the presence of potentially containing rare or unique species or habitat, ecological integrity and contributions of water quality and integrity. These areas, shown in Figure 14.1, are: the south side of Taber Lake, a portion of the Oldman River, downstream of the canal outlet, and two areas on Horsefly Reservoir.





- |                               |                             |            |
|-------------------------------|-----------------------------|------------|
| Laydown                       | Non-Sensitive Plant Species | Urban Area |
| Phase 1 Project Footprint     | Sensitive Plant Species     | Waterbody  |
| Phase 2 Project Footprint     | Sensitive Snake Habitat     |            |
| Phase 3 Project Footprint     | Primary Highway             |            |
| Project Area                  | Secondary Highway           |            |
| Colonial Nesting Bird         | Railway                     |            |
| Provincial ESA (Score >0.189) | Watercourse                 |            |
| Hibernacula Buffer            | Township                    |            |



- Notes**
1. Coordinate System: NAD 1983 UTM Zone 12N
  2. Data Sources: AltaLIS, NRCAN, Alberta Parks, GeoLogic, NRN, Alberta Government
  3. Constraints: The project area is completely within: White Zone, M.D. of Taber, Treaty 7 (1877), Bird Nesting Zone B3, Burrowing Owl Range, Sensitive Amphibian Range, Sensitive Raptor Range (Prairie Falcon, Golden Eagle, Ferruginous Hawk), Sharp-tailed Grouse

Project Location: T9&10N, R15&16W, Town of Taber  
 Prepared by SL on 2022-01-25  
 TR by TQ on 2022-01-25  
 IR Review by JH on 2022-01-25

Client/Project: M.D. of Taber, Horsely Regional Emergency Spillway  
 Report: Detailed Project Description  
 110773806-0006 REVA

Figure No.

**14.1**

**Title**  
**Horsely Regional Emergency Spillway Project**  
**Biophysical Considerations**





## **HORSEFLY REGIONAL EMERGENCY SPILLWAY IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Part D: Location Information and Context  
February 2022

Traditional Land Use studies have not been conducted specifically for the Project. Such studies were conducted by the Blood Tribe/Kainai First Nation and Piikani First Nation along the Montana Alberta Tie Ltd. transmission line which runs approximately 20 km west of the Town of Taber. The Alberta Tie reports indicated negligible impacts on traditional plant harvesting and hunting and that construction activities occurring along the proposed transmission line right of way may have indirect adverse effects to the environmental aesthetics in the area, restricted to the construction seasons. The current major economic base of the reserves is agriculture (Blood Tribe/Kainai First Nation) and ranching (Piikani First Nation). Although parts of the regional area continue to be productive for berry picking and the collection of traditional plants, much of the area is disturbed by agricultural cultivation and ranching. Specific sites with stone cairns and rock alignments suggestive of bison jumps continue to be frequented for traditional spiritual practise.

### **15.0 HEALTH, SOCIAL AND ECONOMICS OF MD OF TABER**

The MD of Taber includes the Towns of Taber and Vauxhall, the Village of Barnwell and the Hamlets of Grassy Lake, Hays, Enchant, Johnsons Addition, and Purple Springs. The population of the MD in 2016 (Federal Census) was 7,098, which was an increase of 25% over the preceding two decades (MD of Taber 2019). Most residents (5,762) live in rural areas. The age composition of the MD shows the largest proportion being families with children and youth residing at home. Median household income was \$76,544. In the 2016 census, 64% of the population in the Taber region were employed and the unemployment rate was 4.5 %. Approximately 40% of the region were employed in agriculture.

Farm operations range from large dryland grain farms and grassland leases to productive irrigated farms producing a wide range of valuable crops. Main crops and livestock include sugar beets, corn, potatoes, hogs, beef, sheep and poultry. The agri-food processing industry in the MD include the Lantic sugar beet Facility (located in the Town of Taber), and Lamb Weston (french fries). The energy sector includes oil and gas services, and wind farms. Major employers are health care and education, agriculture and agri-processing; and oil and gas/energy.

For most health-related indicators, the MD of Taber numbers are similar to the provincial numbers; exceptions are:

- population increase in the MD between 1988 and 2018 is less than half the provincial average
- the proportion of First Nations and Inuit people in the MD is 0.6% compared to the provincial figure of 2.8%
- the overall birth rate and teen birth rate per 1000 women is 1.4 times the provincial figures
- emergency department visit rate for mental and behavioral disorders per 100,000 population in 2017 was 51% that of the provincial rate



## **HORSEFLY REGIONAL EMERGENCY SPILLWAY IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Part D: Location Information and Context  
February 2022

Medical services in the MD include the Taber Hospital, and the Taber and Vauxhall Associate Medical Clinics. The MD of Taber offers several tourism and recreational activities including parks, golf courses, swimming pools, fishing in the Oldman River and lakes, Taber Irrigation Impact Museum, MD Gun/Archery Range, and MD Motorcross Track.

The Taber Equality Alliance Society was incorporated in 2016 to create a safe space in the community for sexual and gender identity minorities and their allies,

The Taber and District Community Adult Learning Association has implemented a Temporary Foreign Worker Support Program to help temporary foreign workers in understanding the meaning of regulations and how they will affect them.

The construction work force for the Project is estimated at 30 to 40 persons for each phase. Construction workers are expected to be from the area, working from Taber or surrounding communities; construction camps will not be required. Contractors are expected to follow the Alberta Construction Association Code of Ethics and the Alberta Obligations of Work Site Parties. During operations, the work force is estimated at two or three persons. Project operations are expected to be carried out by the existing TID staff. During flood events, additional staff will be present to observe Project operations.

The MD of Taber and its consultants, through their mission statements are committed to equality, social justice and positive change. The MD of Taber has no barriers to equality with respect to decision-making, participation, access or control over the Horsefly Regional Emergency Spillway Project. Engagement and consultation activities to date have been inclusive of women and diverse groups.



## **PART E: FEDERAL, PROVINCIAL, TERRITORIAL, INDIGENOUS, AND MUNICIPAL INVOLVEMENT AND EFFECTS**

### **16.0 FINANCIAL SUPPORT FROM FEDERAL AUTHORITIES**

Approved funding for the Project includes \$39 million dollars in funding from the provincial and federal governments, including \$8.8 million for Phase 1 through the ICIP by the Government of Canada, and \$9.8 million for Phases 2 and 3 from the federal Ministry of Infrastructure and Communities. Phases 1 and 2 will be owned by TID. Phase 3 will be owned by SMRID.

### **17.0 USE OF FEDERAL LANDS FOR PROJECT**

The Project will not be constructed or operated on federal lands.

### **18.0 JURISDICTIONS THAT HAVE POWERS, DUTIES OR FUNCTIONS IN RELATION TO AN ASSESSMENT OF THE PROJECT'S ENVIRONMENTAL EFFECTS**

#### **18.1 FEDERAL REGULATORY REQUIREMENTS**

In addition to the current IAAC process under the *Impact Assessment Act*, the Project will be subject to:

- the *Fisheries Act*
- the *Canadian Navigable Waters Act*
- the *Migratory Birds Convention Act*
- the *Species at Risk Act*



# HORSEFLY REGIONAL EMERGENCY SPILLWAY IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY

Part E: Federal, Provincial, Territorial, Indigenous, and Municipal Involvement and Effects  
February 2022

## 18.2 PROVINCIAL REGULATORY REQUIREMENTS

Provincial regulatory requirements that may affect the Project are those associated with:

- the *Environmental Protection and Enhancement Act* (EPEA)
- the *Natural Resources Conservation Board Act*
- the *Irrigation Districts Act* (IDA)
- the *Water Act*
- the *Historical Resources Act* (HRA)

The MD received notice on July 13, 2021, that an EA for the Project is not required. Since no EA is required, the *Natural Resources Conservation Board Act* does not apply.

The ACSW concluded that an Historical Resource Impact Assessment (HRIA) for archaeological resources was not required for Phases 1, 2 and 3 although an HRIA for palaeontological resources is required. A palaeontological field survey was conducted in August 2021. A few fossils were found in the coulee. The palaeontological HRIA was accepted by ACSW and the Project approved with the condition that a palaeontologist be present during any excavations in the coulee.

## 18.3 MUNICIPAL REGULATORY REQUIREMENTS

Regulatory requirements from the MD of Taber that may affect the Project are described in Table 18.1.

**Table 18.1 Municipal Regulatory Requirements**

<b>Bylaw or Policy</b>	<b>Description</b>
Bylaw No. 1771 – Irrigation of Roads Bylaw	Prohibits the escape of irrigation water into or on public highways, roads, or road allowances by irrigation installations on adjacent lands.
Drainage Approval Policy	Addresses any work conducted within a Municipal Right of Way for drainage improvement.
Electrical and Pipeline Road Crossing for Irrigation Purposes Policy	Addresses constructing a water pipeline that crosses a municipal road.
Restricting Access of Public Road Allowance Policy	Addresses temporary occupation or use of a road allowance that will require a closure to the public.



**HORSEFLY REGIONAL EMERGENCY SPILLWAY  
IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Part E: Federal, Provincial, Territorial, Indigenous, and Municipal Involvement and Effects  
February 2022

## **18.4 REGIONAL PLANS AND MANAGEMENT FRAMEWORKS**

Table 18.2 lists development plans applicable to the MD of Taber.

There are no constraints to Project development identified in any applicable Regional Plan authorized by the *Alberta Land Stewardship Act* of any Management Frameworks established by AEP. In fact, the 2021 draft IDP for the MD of Taber and Town of Taber includes the Horsefly Regional Emergency Spillway as a land use in the area.

**Table 18.2 Regional Plans and Management Frameworks Applicable to the MD of Taber**

<b>Plan</b>	<b>Description</b>
South Saskatchewan Regional Plan	Uses a cumulative effects management approach to set policy to achieve desired environmental, economic, and social outcomes.
Intermunicipal Development Plans (IDPs)	These plans foster collaboration on planning within municipal jurisdictions. The draft 2021 IDP for the MD of Taber and Town of Taber includes the footprint of the Project. The draft IDP includes the Horsefly Regional Emergency Spillway as a land use.
Municipal Development Plan	The MD of Taber Municipal Development Plan Bylaw No. 1723, adopted in 2004, guides future growth and development in the MD. The plan includes mention of policies to minimize risks to health, public safety, and loss of property from potential hazards such as flooding.
Area Structure Plans	These plans establish the framework for subsequent subdivision and development within the MD and address matters including drainage control.



## **PART F: POTENTIAL EFFECTS OF THE PROJECT**

### **19.0 POTENTIAL EFFECTS ON FISH AND FISH HABITAT, AQUATIC SPECIES AND MIGRATORY BIRDS**

#### **19.1 OVERVIEW OF ENVIRONMENTAL EFFECTS**

The Project is the expansion of an existing irrigation system to provide mitigation for large floods. The expansion consists of enlarging the capacity of the existing canals and drains and associated upgrades to irrigation control structures and road and rail crossings. The Project-environment interactions occur during standard irrigation system upgrades and operations. Construction work on the canal enlargement will take place during the non-operational times which extend from early October to late April. Atmospheric emissions and noise during construction will be relatively short term and effects will be restricted to the immediate Project area.

Project construction will be carried out by third-party contractors hired by the MD of Taber. Contractors are required to meet Alberta Transportation standards for water control projects. An Environmental Construction Operations (ECO) Plan is required prior to commencing construction. The ECO Plan includes a description of potential environmental impacts and controls, hazardous materials and waste management, and environmental emergency procedures specific to the Project. The MPE/Stantec team, as the MD of Taber's representative, will review the ECO Plans and monitor the contractor's implementation of the mitigation measures. The MD of Taber will also hire their own project manager.

The Project will operate as part of the TID system during non-flood conditions. From the west of the turnout to the Big Bend Canal north (see Figure 9.1) the Spillway will be used as a drain and will not divert water to the Oldman River. When the Project is in operation during 1:100-year or greater flood conditions, biophysical effects are associated with the discharge of water into the Oldman River. The increased flow of water has the potential to cause fish habitat alteration or destruction, fish mortality, and water quality degradation in the river. However, the river will be in flood conditions at that time and the additional water from the Project is not expected to cause a substantial effect on the river conditions. Peak discharge of the Oldman River during a 1:100-year flood is 3,900 m<sup>3</sup>/s; the Project will be adding 40 m<sup>3</sup>/s at that time, an increase of 1%. The water quality of discharge from the canal is expected to be better than that of the Oldman River during flood conditions as the river will include sediment and debris from upstream while the discharge from the canal will have been filtered by passing through the Horsefly Reservoir, Taber Lake and the wetlands.



## **HORSEFLY REGIONAL EMERGENCY SPILLWAY IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Part F: Potential Effects of the Project  
February 2022

During a 1:100 year or greater flood, water diverted from the SMRID Main Canal to the Oldman River will take three or four days to pass through the Horsefly Reservoir. Mercury methylation is a chemical process that occurs associated with organic matter decomposition in a waterbody. Stormwater will not be stored in the Horsefly Reservoir and the Project will not be a cause of mercury methylation.

Potential accidents and malfunctions that may occur during Project construction include hazardous material spills, fires and vehicle accidents. The prevention of and response to these events will be discussed in the environmental emergency procedures section of the ECO Plan.

Operations during flood conditions could experience overtopping of the canals. Presently, during large flood conditions water from the SMRID Main Canal can overtop the canal and flood the adjacent lands. The Project will allow water from the Main Canal to be diverted to the Horsefly Reservoir and thus to Taber Lake and then to the Oldman River. This will allow the Main Canal to manage more flood waters from upstream and downstream of the Horsefly Reservoir without overtopping. The volume of water diverted from the Main Canal is controlled at the turnout structure (see Figure 1.2). The turnout structure will be closed when the canal from Taber Lake is at capacity (passing 40 m<sup>3</sup>/s). With floods greater than the 1:100-year event, flood waters from the Main Canal would then flood the adjacent lands as has occurred without the Project. Failure of the control structure to close could result in overtopping of the Project canals and flooding of the adjacent lands. The environmental effects would be similar to a flood without the Project.

Table 19.1 lists Project activities that will interact with the environment, their potential effects and mitigation measures.



**HORSEFLY REGIONAL EMERGENCY SPILLWAY  
IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Part F: Potential Effects of the Project  
February 2022

**Table 19.1 Potential Environmental Effects and Mitigation Measures**

Project Activity (effect pathway)	Potential Effects	Environmental Protection and Mitigation Measures
<p>Construction: Widening of canal, culvert upgrades, road and highway crossings, placement of drop structures and spillway, work and laydown areas</p>	<ul style="list-style-type: none"> <li>• Air emissions from construction equipment consisting of N<sub>2</sub>, CO<sub>2</sub>, H<sub>2</sub>O, NO<sub>x</sub>, SO<sub>2</sub>, CO, PM and VOCs.</li> <li>• Noise</li> <li>• Degradation of water quality from suspended sediment</li> <li>• Soil erosion from exposed surfaces</li> <li>• Loss of vegetation from widening the canal</li> <li>• Fish habitat alteration disruption or destruction from instream activities</li> <li>• Fish mortality from instream activities and loss of habitat</li> <li>• Loss of wildlife habitat</li> <li>• Wildlife mortality</li> <li>• Loss of archaeological or palaeontological sites</li> <li>• Human health effects</li> <li>• Social and economic effects (effects on vulnerable groups, traffic disruption)</li> </ul>	<p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Vehicles and equipment will be required to meet emission control standards.</li> <li>• All work shall be conducted in a manner that minimizes the raising of dust from construction or maintenance operations</li> <li>• Dust control measures such as watering roads to suppress dust distribution and ceasing operations during periods of high winds will mitigate the distribution of particulate matter during construction activities.</li> <li>• Disturbed surfaces will be revegetated promptly following construction to prevent wind erosion and to control dust.</li> <li>• Surfaces of temporary soil and overburden stockpiles will be stabilized during extended periods between usage, by means of vegetating or covering the exposed surfaces.</li> <li>• Use silt fences and other erosion control methods such as mulching and application of tackifiers to prevent soil loss from soil stockpiles due to wind erosion.</li> <li>• The concentration of sulphur in diesel fuel shall not exceed 15 mg/kg to comply with Sulphur in Diesel Fuel Regulations.</li> <li>• Construction vehicle idling times will be reduced to the extent possible in order to reduce emissions, as a best management practice.</li> </ul> <p><b>Noise</b></p> <ul style="list-style-type: none"> <li>• Construction activities will be limited to the daytime period and largely restricted to seasons (e.g., late fall, winter) with fewer outdoor activities.</li> <li>• Construction machinery and factory-supplied noise abatement equipment (i.e., mufflers) will be maintained in good working order.</li> <li>• Residents near to construction noise-generating activities will be notified prior to construction.</li> <li>• Machinery idling will be minimized.</li> <li>• A complaint response procedure will be implemented to address noise complaints should they arise.</li> </ul> <p><b>Water Quality</b></p> <ul style="list-style-type: none"> <li>• Sediment from erosion of the disturbed surface soils during excavations to increase the canal size may be deposited into the canal. Mitigation includes the removal of soil deposited in the canals prior to the irrigation system start up in April.</li> </ul>





**HORSEFLY REGIONAL EMERGENCY SPILLWAY  
IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Part F: Potential Effects of the Project  
February 2022

**Table 19.1 Potential Environmental Effects and Mitigation Measures**

Project Activity (effect pathway)	Potential Effects	Environmental Protection and Mitigation Measures
<p>Construction: Widening of canal, culvert upgrades, road and highway crossings, placement of drop structures and spillway, work and laydown areas (cont'd)</p>	<p>See above</p>	<p>Soils</p> <ul style="list-style-type: none"> <li>• Soils excavated during construction will be stockpiled and the piles will be protected by silt fencing, mulching or the application of tackifiers to prevent erosion into the canal.</li> <li>• Channel banks, berms, dikes and ditches will be seeded and revegetated with an appropriate native seed or erosion control mix to improve stability of these features, unless these features are being stabilized by riprap or gravel armour.</li> <li>• Erosion and sediment control measures include maintenance of vegetation cover, where possible, long-term, temporary or emergency stabilization of soil, revegetation of disturbed areas, and runoff diversion to prevent undesirable soil movement or soil releases and discharges to the canals.</li> </ul> <p>Vegetation and Wetlands</p> <ul style="list-style-type: none"> <li>• Activities will be restricted to the Project footprint to reduce vegetation loss. Construction traffic will be limited to the rights-of-way and easements obtained for the Project</li> <li>• Protective layers such as matting or biodegradable geotextile and clay ramps or other approved materials between wetland root/seed bed and construction equipment will be used if ground conditions have the potential for rutting, admixing or compaction</li> <li>• Where possible, grading/drainage will be directed away from wetlands and ground level cutting/mowing/mulching of wetland vegetation will be conducted instead of grubbing. An appropriate native seed mix that is suitable for wetlands will be used to reclaim Project-disturbed wetland areas</li> <li>• Cross drainage will be maintained where there are permanent or temporary access roads, to allow water to move freely from one side of the road to the other</li> <li>• <i>Water Act</i> approval for disturbance to wetlands will be obtained from Alberta Environment and Parks prior to Project construction.</li> <li>• A native custom seed mix will be used to reclaim Project disturbed native upland areas. An agronomic seed mix composed of plants adapted to the Dry Mixedgrass Natural Subregion will be used to reclaim Project disturbed non-native areas.</li> <li>• Cover crop seed mixtures or riprap will be used to assist in weed and erosion control on exposed soils</li> <li>• Seed or plants of the observed SOCC plant species will be collected and sown/transplanted to reclaimed native grassland areas disturbed by the Project.</li> </ul>



**HORSEFLY REGIONAL EMERGENCY SPILLWAY  
IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Part F: Potential Effects of the Project  
February 2022

**Table 19.1 Potential Environmental Effects and Mitigation Measures**

Project Activity (effect pathway)	Potential Effects	Environmental Protection and Mitigation Measures
<p>Construction: Widening of canal, culvert upgrades, road and highway crossings, placement of drop structures and spillway, work and laydown areas (cont'd)</p>	<p>See above</p>	<ul style="list-style-type: none"> <li>• Project disturbed areas, including topsoil and subsoil piles, will be monitored for weed growth during construction and corrective measures (e.g., spraying, mowing, hand-pulling) implemented to avoid growth and establishment of regulated weeds.</li> <li>• Construction operations shall be carried out in accordance with the Best Management Practices outlined in the Alberta Clubroot Management Plan.</li> <li>• Reclaimed Project disturbed areas will be monitored for weed establishment and growth until vegetation has established. Weed control will be conducted as needed prior to weed maturity and seed set and corrective measures, such as additional seeding, conducted as needed.</li> <li>• Herbicide will not be applied within 30 m of plant SOCC, wetlands or waterbodies. Spot spraying, wicking, mowing, or hand picking are acceptable measures for control of regulated weeds in these areas</li> </ul> <p>Fish</p> <ul style="list-style-type: none"> <li>• Detailed mitigation measures will be developed for each waterbody in which work will be carried out and will be reviewed by DFO.</li> <li>• In-water work will be timed to respect the respective timing windows (i.e., outside the RAP [April 1 to July 31]) to protect fish during sensitive time periods, wherever possible. If work is required during the RAP, approval will be obtained from DFO.</li> <li>• The duration of in-water works will be minimized and any in-water work in the Oldman River will be conducted during periods of low flow, where possible, to further reduce the risk to fish and their habitat and to allow work to be isolated from the waterbody.</li> <li>• Machinery will arrive on site in a clean condition and will be maintained free of fluid leaks, invasive species, and noxious weeds.</li> <li>• All aquatic field gear and equipment working in-water will be disinfected (i.e., rinsed with soapy water, rinsed with QUAT Plus, and allowed to air-dry) before moving to another watershed to prevent the spread of infectious pathogens and invasive species (e.g., whirling disease).</li> <li>• The contractor's ECO Plan will include plans for erosion and sediment control and emergency prevention and response plans for spills to minimize the risk of accidental spills or releases from entering any waterbody.</li> <li>• The ECO Plan also includes a requirement for Turbidity Monitoring Plan for any planned instream construction.</li> </ul>



**HORSEFLY REGIONAL EMERGENCY SPILLWAY  
IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Part F: Potential Effects of the Project  
February 2022

**Table 19.1 Potential Environmental Effects and Mitigation Measures**

Project Activity (effect pathway)	Potential Effects	Environmental Protection and Mitigation Measures
<p>Construction: Widening of canal, culvert upgrades, road and highway crossings, placement of drop structures and spillway, work and laydown areas (cont'd)</p>	<p>See above</p>	<ul style="list-style-type: none"> <li>• Machinery will be washed, refueled, and serviced and fuel and other materials will be stored in such a way as to prevent any deleterious substances from entering the water.</li> <li>• Before any isolation or dewatering works commence, an aquatic biologist will be retained to confirm applicable permits for relocating fish are obtained and will capture any fish trapped within an isolated/enclosed area at the worksite and safely relocate them to an appropriate location. A fisheries research licence will be obtained from Alberta Environment and Parks prior to commencement of construction activities.</li> <li>• Dewatering will be carried gradually to reduce the potential for stranding fish.</li> <li>• Clearing of riparian or aquatic vegetation will be kept to a minimum. Existing trails, roads, and approaches will be used wherever possible to avoid disturbance to the vegetation and prevent soil compaction. Where practicable, vegetation will be pruned or topped.</li> <li>• The bed and banks of the waterbody will be restored to their original contour and gradient; if the original gradient cannot be restored due to instability, a stable gradient that does not obstruct fish passage will be restored.</li> </ul> <p>Wildlife</p> <ul style="list-style-type: none"> <li>• Activities will be confined to the Project footprint.</li> <li>• Prior to the start of construction activities, all sensitive resources (e.g., raptor nests) and their setback buffers, will be marked and setback distances will be followed, where appropriate.</li> <li>• Construction personnel will not be permitted to have dogs on the construction footprint. Firearms are not permitted in Project vehicles or on the Project footprint.</li> <li>• Noise abatement equipment on machinery will be in good working order.</li> <li>• Project personnel are prohibited from hunting or fishing on the construction footprint, and from harassing, feeding, collecting or possessing wildlife species.</li> <li>• The MD of Taber will develop and deliver an environmental orientation to inform the construction workforce of Project- specific environmental requirements, sensitivities and mitigation measures prior to accessing the Project site.</li> <li>• Any previously unidentified listed or sensitive wildlife species or their site-specific habitat (e.g., dens, nests) identified during Project construction will be reported to the Environmental Inspector(s) or designate(s).</li> <li>• As required in the contractor's ECO Plan, all construction debris and other waste materials will be collected and disposed at an approved facility.</li> </ul>



**HORSEFLY REGIONAL EMERGENCY SPILLWAY  
IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Part F: Potential Effects of the Project  
February 2022

**Table 19.1 Potential Environmental Effects and Mitigation Measures**

<b>Project Activity (effect pathway)</b>	<b>Potential Effects</b>	<b>Environmental Protection and Mitigation Measures</b>
<p>Construction: Widening of canal, culvert upgrades, road and highway crossings, placement of drop structures and spillway, work and laydown areas (cont'd)</p>	<p><i>See above</i></p>	<ul style="list-style-type: none"> <li>• Where clearing or construction activities overlap the nesting period for owls and raptors (March 1 to August 31, a nest survey may be undertaken prior to activities if warranted, based on recommendations from a qualified wildlife biologist. In the event an active nest is found, it will be subject to site-specific mitigation measures (i.e., clearly marked protective buffer around the nest and/or non-intrusive monitoring) based on recommendations from a qualified wildlife biologist.</li> <li>• Clearing and construction activities are schedule to occur during frozen conditions or early spring when sensitive amphibians are not active. If physical activities extend beyond April 1, pre-construction surveys may be undertaken for amphibian breeding activity based on recommendations from a Wildlife Resource Specialist.</li> <li>• The two potential hibernacula in the coulee will be removed (upon approval from Alberta Environment and Parks) in early September before snakes enter hibernation. A qualified wildlife biologist will be on site to capture and relocate snakes encountered during removal activities.</li> <li>• Treed habitats which provide nesting and roosting habitat for birds, bats and other mammals, will be retained where safe and technically feasible to do so.</li> <li>• Fencing along the canal will be wildlife friendly with spacing for antelope passage on the bottom wire.</li> <li>• To reduce the possibility of vehicle collisions with wildlife, vehicle speed will not exceed posted speed limits and wildlife warning signs will be installed where appropriate. Where practical and applicable, multi-passenger vehicles will be used for the transport of crews to and from job sites.</li> </ul> <p>Archaeology and Palaeontology</p> <ul style="list-style-type: none"> <li>• Any conditions to approval from ACSW regarding archaeological and palaeontological sites will be adhered to.</li> <li>• Construction activities will be stopped if there is the exposure of a historic resource (e.g., artifact). An archaeologist will examine and catalogue the discovery and it will be reported to the Heritage Division of ACSW.</li> <li>• A palaeontologist will be present to monitor any excavation activities in the coulee bedrock down to the Oldman River. If any significant palaeontological resources are encountered, the Royal Tyrrell Museum of Palaeontology will be contacted.</li> </ul>



**HORSEFLY REGIONAL EMERGENCY SPILLWAY  
IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Part F: Potential Effects of the Project  
February 2022

**Table 19.1 Potential Environmental Effects and Mitigation Measures**

Project Activity (effect pathway)	Potential Effects	Environmental Protection and Mitigation Measures
Construction: Widening of canal, culvert upgrades, road and highway crossings, placement of drop structures and spillway, work and laydown areas (cont'd)	See above	<p>Human Health</p> <ul style="list-style-type: none"> <li>• Mitigation for air emissions and noise will be implemented.</li> <li>• Construction activities will not take place on canals that supply potable water to Taber.</li> </ul> <p>Social Effects</p> <ul style="list-style-type: none"> <li>• The Project will employ a small work force (30 to 40 persons) and will not require a work camp.</li> </ul> <p>Land Use</p> <ul style="list-style-type: none"> <li>• Construction activities and equipment will be managed to avoid damage and disturbance to adjacent properties, structures and operations.</li> <li>• Channel excavation and disturbance will be limited to defined rights-of-way and access routes.</li> <li>• Signs directing traffic to detours will be installed during construction to address public safety.</li> <li>• A traffic management plan will be developed for the construction activities in order to minimize any traffic disruptions.</li> </ul>
Operations: Discharge to Oldman River	<ul style="list-style-type: none"> <li>• Fish habitat alteration or destruction</li> <li>• Fish mortality</li> <li>• Degradation of water quality</li> </ul>	<ul style="list-style-type: none"> <li>• Input to the Oldman River during a 1:100-year flood will add approximately 1% to the river's flow.</li> <li>• The water quality of discharge from the canal is expected to be better than that of the Oldman River during flood conditions as the river will include sediment and debris from upstream while the discharge from the canal will have been filtered by passing through the Horsefly Reservoir, Taber Lake and the wetlands.</li> <li>• DFO will be contacted to discuss any issues that may be associated with discharge to Oldman River.</li> </ul>
Accidents and Malfunctions	<ul style="list-style-type: none"> <li>• Hazardous material spills</li> <li>• Fires</li> <li>• Vehicle accidents</li> </ul>	<p>Hazardous Material Spills</p> <ul style="list-style-type: none"> <li>• Machinery will arrive on site in a clean condition free of fuel, oil or fluid leaks.</li> <li>• Refueling of vehicles and equipment will not take place near waterbodies.</li> <li>• All employees involved in the handling and storage of fuels will have Workplace Hazardous Materials Information System and spill response training.</li> <li>• Materials required for spill containment and cleanup will be available at all work sites and designated areas. All vehicles will carry materials and equipment for emergency spill containment.</li> <li>• All spills will be cleaned up immediately</li> </ul>



**HORSEFLY REGIONAL EMERGENCY SPILLWAY  
IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Part F: Potential Effects of the Project  
February 2022

**Table 19.1 Potential Environmental Effects and Mitigation Measures**

<b>Project Activity (effect pathway)</b>	<b>Potential Effects</b>	<b>Environmental Protection and Mitigation Measures</b>
Accidents and Malfunctions (cont'd)	<i>See above</i>	<ul style="list-style-type: none"> <li>• A spill kit or sufficient supply of materials for clean-up or spill containment will always be available on site and replenished as needed.</li> <li>• The Contractor will designate a qualified supervisor(s) as the onsite emergency response coordinator(s) who will be on site at all times that work is undertaken.</li> </ul> <p>Fires</p> <ul style="list-style-type: none"> <li>• Fires or burning will not be allowed on the construction site.</li> <li>• No activity will be conducted which may cause a fire to spread. Similarly, burning or smoldering matter will not be placed where it may cause a fire to spread.</li> <li>• All reasonable steps will be taken in order to prevent a fire from burning out of control or spreading from land owned or occupied for construction purposes.</li> <li>• In the event that a wildfire is identified where construction activities are taking place, all reasonable attempts will be made in order to extinguish the wildfire. All available equipment, services and labor will be made available for the purposes of wildfire protection operations.</li> <li>• All construction and related activities taking place in the vicinity of a wildfire will cease until it is safe to resume operations.</li> </ul> <p>Vehicle Accidents</p> <ul style="list-style-type: none"> <li>• Workers will follow traffic laws and regulations.</li> <li>• Risk prevention measures will include signage, traffic control flag persons, road surface controls (e.g., dust suppression), maintaining vehicles and reducing traffic to Taber and the Project area during construction.</li> </ul>



# HORSEFLY REGIONAL EMERGENCY SPILLWAY IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY

Part F: Potential Effects of the Project  
February 2022

## 19.2 FISH AND FISH HABITAT

Effects on fish and fish habitat are expected to be minor to negligible. Project construction will occur along the existing canals, which are not fish habitat, and through the coulee, which has fish habitat. The discharge of water to Oldman River will occur during flood conditions. The expected discharge during a 1:100-year flood will be 40 m<sup>3</sup>/s at which time the peak discharge of Oldman River is 3,900 m<sup>3</sup>/s. The increase is 1% of the peak flow at that time.

Upgrades to the outlet from Taber Lake will require dredging to deepen the channel. A coffer dam will be used to mitigate any effects on fish in the lake. Upgrade to the outlet of Horsefly Reservoir will be carried out in the canal; there will be no work in the reservoir.

## 19.3 AQUATIC SPECIES

Effects to aquatic species, as defined in subsection 2(1) of the *Species Risk Act* are not anticipated as marine plants are not found in the Project area.

## 19.4 MIGRATORY BIRDS

Most migratory birds observed during field surveys of the Phase 1 component in 2021 were not on the Project footprint. Mitigation measures for minimizing Project effects on migratory birds include the following:

- Clearing will not occur between April 1 and August 31 to avoid disturbance to nesting birds
- Treed habitats will be retained where safe and technically feasible to do so.
- To reduce the possibility of vehicle collisions with wildlife, vehicle speed will not exceed posted speed limits and wildlife warning signs will be installed where appropriate.
- Project construction will occur largely during the winter and early spring when the irrigation system is not operational. For any activities occurring during the migratory birds RAP, a qualified wildlife biologist will inspect the site for active nests within seven days prior to the start of the proposed work and appropriate mitigation measures will be developed, as required.

The expansion of existing wetlands on Horsefly Reservoir and Taber Lake may provide additional habitat for waterfowl. Project effects on migratory birds are expected to be negligible to low.

## 19.5 SUMMARY OF EFFECTS

The Taber Irrigation District (TID), operational for over a century, includes 435 km of canals, drains and pipelines providing water to over 800 irrigation systems in southern Alberta. The Horsefly Regional Emergency Spillway (the Project), a flood mitigation project, will enlarge four of the TID canals (the Horsefly Main Canal, Lateral 15, a portion of the Big Bend Main Canal and a drain to the Oldman River) to divert water to the Oldman River. Construction will affect 14 km or 3.2% of the TID system. The Project will be operational only during 1:100-year flood or greater. In non-flood times, the system will operate as



## HORSEFLY REGIONAL EMERGENCY SPILLWAY IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY

Part F: Potential Effects of the Project  
February 2022

part of the TID infrastructure providing irrigation water to the area. The drain from the Big Bend Main canal will not be operational during non-flood times and the Project will not divert water to the Oldman River.

The Project is divided into three phases and is planned to be constructed over a four-year period by a work force of 30 to 40 persons. Construction will be carried out primarily in the fall/winter months when the irrigation system is shut down. Construction will be similar to the annual maintenance activities carried out on the infrastructure by the TID. The work will be accomplished by contractors, managed by MPE Engineering and Stantec Consulting who have extensive experience in the development of irrigation and municipal infrastructure in the area. Contractors will develop and implement an Environmental Construction Operations Plan (ECO Plan) which provides information on the contractor's understanding of potential impacts of their work and mitigation to avoid and mitigate impacts. It includes an erosion and sediment control plan and emergency prevention and response plans. Such plans are common for many infrastructure projects in Alberta.

The implementation of mitigation measures, including those listed in the preceding sections will lessen the environmental effects of the Project. Environmental effects will be concentrated on the construction phase of the Project.

Atmospheric emissions will result in temporary air quality effects and noise will increase in the area surrounding construction activities, as occurs with any construction project in the MD of Taber. The effects will be short term and atmospheric emissions are not expected to exceed CAAQS. Noise level exceedances are expected to be short-term and seasonal, primarily during winter months. Residents near to construction noise-generating activities will be notified prior to construction.

Vegetation and soil removal will result in the loss of vegetation communities along the canals, loss of some wetlands and temporary exposure of soil to erosion. *Water Act* approval for disturbance to wetlands will be obtained from Alberta Environment and Parks prior to Project construction. Exposed soil surfaces will be reclaimed. Construction will take place during the non-operating conditions of the irrigation system and any soil deposited in the dry canals will be removed.

Replacement of control structures on the Horsefly Reservoir and Taber Lake and the construction of the outfall to the Oldman River will involve work in the water but using cofferdams and following Alberta Water Codes of Practice.

Wildlife habitat and mortality effects are expected to be minor to negligible, given the extent of new surface disturbance from the Project and small construction crews. Wildlife movement across the enlarged canals will be restricted by the protective fencing installed and some snake hibernacula will be removed. Construction and upgrading of wetlands on Taber Lake and the Horsefly Reservoir may provide new wildlife habitat.

Effects on fish and fish habitat are expected to be negligible. Work in waterbodies is expected to be limited to construction of the spillway outlet to the Oldman River and the inlet and outlets to the Horsefly Reservoir and Taber Lake. Work will follow standard codes of practice and direction from DFO. The Project will not result in a harmful alteration, disruption or destruction of fish or fish habitat.





## **HORSEFLY REGIONAL EMERGENCY SPILLWAY IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Part F: Potential Effects of the Project  
February 2022

Project construction will not take place near any Taber potable water canals. Water discharged to the Oldman River during floods will add approximately 1% to the flow of the flooding river.

The Project construction will have limited effects on human health since the atmospheric emissions and noise will be short term and intermittent. The operation of the Project will have a positive effect on health, social and economic conditions because of its purpose – flood mitigation.

Approval requirements from ACSW, including construction monitoring by a palaeontologist and reporting any finds, will address any potential effects on archaeology and palaeontology.

Effects on land use will be minimized by restricting work to the Project footprint and implementation of a Traffic Management Plan.

The Project will not affect Indigenous peoples' current use of lands and resources for traditional purposes. It will not affect Indigenous peoples' health, social or economic conditions and will not affect their rights. The Project will not affect Indigenous peoples' spiritual, physical or cultural heritage.

The nature of the Project, flood mitigation, will benefit all inhabitants of the SMRID. It is not expected to result in negative effects to vulnerable population groups or result in gender-based violence.

Accidents and malfunctions include hazardous material spills, fire and vehicle accidents. The ECO Plan prepared by construction contractors will include sections on hazardous materials and waste management, and environmental emergency procedures specific to the Project. These sections and a Traffic Management Plan will address accidents and malfunctions.

Flow from the SMRID Main Canal is controlled at the turnout structure at the southern end of the Project. Failure of this structure to close when the Project canals are at capacity or during floods greater than the 1:100-year event may cause the Project canals to be overtopped. The adjacent lands would be flooded similarly to a flood without the Project.

The Project's reduction of losses (including economic, physical and emotional) that are incurred during a flood event will benefit all communities in the Taber area and downstream, regardless of gender, race or social status. Consultation with the public and Indigenous groups have not identified adverse effects of the Project on social, economic or health of inhabitants of the area nor on any diverse or vulnerable groups.

Indigenous groups have not indicated opposition to the Project.

Given the summary of effects described, the Project is expected to not have significant effects on the environment and to benefit residents of the St. Mary River Irrigation District through flood control.



## **20.0 POTENTIAL EXTRA-PROVINCIAL AND FEDERAL EFFECTS**

Environmental changes as a result of the carrying out of the Project are benefits associated with flood control. These will be felt downstream of the Project area to Medicine Hat where the SMRID canal empties into the South Saskatchewan River. Effects will be confined to this area of Alberta and will not occur on federal lands, in a province other than Alberta, or outside Canada.

## **21.0 EFFECTS TO INDIGENOUS GROUPS INCLUDING TRADITIONAL LAND USE, PHYSICAL AND CULTURAL HERITAGE, AND HISTORICAL, ARCHAEOLOGICAL AND PALAEOLOGICAL RESOURCES**

Portions of the Project area have historic resource values of 4 (contains a historic resource that may require avoidance) or 5 (high potential to contain a historic resource). A pre-contact scatter archaeological site has been identified in the Phase 1 Project footprint. Within 100 m of the Project footprint there are two precontact scatter sites and a precontact campsite. The Project area is largely agricultural and there is no record of current use of Project lands for traditional purposes by Indigenous groups. Project-related issues identified by Indigenous groups have been the potential for effects on medicinal plants, undiscovered archaeological sites and water quality effects on the Oldman River. Communication with Indigenous groups has not identified any Project effects on physical or cultural heritage, or structures or sites of historical, archaeological, palaeontological or architectural significance to Indigenous peoples.

## **22.0 EFFECTS TO INDIGENOUS HEALTH, SOCIAL, AND ECONOMIC CONDITIONS**

The Project is not expected to affect the health, social and economic conditions of Indigenous peoples of Canada. The Blood Tribe/ Kainai First Nation expressed no concerns with the Project and requested to be included in the list of bidders for contractor work on the Project. A letter from Métis Nation of Alberta (Region 3) stated that they have no outstanding concerns with Phase 1 of the Project. The MD of Taber will include any Indigenous groups who express interest on the contractor bidding list for the Project. Engagement and consultation activities to date have been inclusive of women and diverse groups. Site visits by the Blood Tribe/Kainai First Nation and Ermineskin Cree Nation included women members of their nation.



## **23.0 GREENHOUSE GAS EMISSIONS ASSOCIATED WITH THE PROJECT**

A Climate Lens assessment of the Project assessed the expected total annual direct and indirect net greenhouse gas emissions for the life of the Project, including emissions to 2030. The report assumed that current operations of the irrigation canal produced zero baseline emissions and that the Project is assumed to exhibit zero emissions during operation and maintenance activities. Cumulative emissions over the 105 years are predicted to be 5,625 tonnes of carbon dioxide emissions (CO<sub>2e</sub>), as a result of the construction phase. The Project is expected to have a positive, yet small effect on carbon sink capacity from the wetland construction at Taber Lake and wetland expansion at the Horsefly Reservoir. Vegetation in the wetlands dies and sinks below the water, depositing carbon while peat acidity slows decomposition, creating layers of stored carbon.

## **24.0 WASTE AND EMISSIONS GENERATED BY THE PROJECT**

The ECO Plan will include a Waste Management Plan. Waste generated during the construction of the Project including metal, wood, plastic and paper and human waste will be collected and disposed of at licensed disposal facilities. Atmospheric emissions during construction will be those associated with the upgrading of the canals and these are discussed in Section 23.0. Noise associated with construction activities will be intermittent and short term. Atmospheric emissions and noise during operation and maintenance of the Project will be minimal.

## **25.0 EFFECTS OF CLIMATE CHANGE ON THE PROJECT**

Climate change may cause an increase in the frequency and intensity of precipitation and the need for the Project to divert water from SMRID Main Canal to Oldman River.

A study of the hydrological regime of the Elbow River watershed which is part of the South Saskatchewan River watershed in Alberta concluded that climate change might cause a decrease in average annual overland flow, baseflow, and streamflow. There may be an increase in evapotranspiration, creating conditions for water scarcity. In addition, an increase in temperature during winter and spring will increase snowmelt and peak river flow, creating an increased flood risk from April to June. Another study found that the probable maximum precipitation values for the Elbow River may increase in the future with a warming climate. Should the probable maximum precipitation increase due to climate change, the probable maximum flood would increase, although it may be offset somewhat from reduced contribution from snowmelt. Both studies predict increased flooding with climate change.



## **HORSEFLY REGIONAL EMERGENCY SPILLWAY IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Part F: Potential Effects of the Project  
February 2022

Modelling of the Elbow River watershed showed climate change projections resulting in an 8% increase in stream flows of a 1:10-year flood and a 12% increase for 1:100 through 1:240-year floods.

Modelled of the headwaters of the Oldman River for future climatic conditions in the 2020s, 2050s and 2080s projected a less than 10% increase in precipitation in winter and a similar amount of precipitation decrease in summer. These changes resulted in up to a 200% increase in winter streamflow in February and up to 63% decrease in summer flow in June. The increase in streamflow is mostly driven by the projected increase in temperature that is predicted to melt winter snow earlier.

The studies presented above suggest that late winter and spring flooding in the Project area will have greater volumes and become more frequent in the future.

### **26.0 FUTURE ACTIVITIES**

Following the submission of the DPD, the MD of Taber has scheduled the following Project activities for 2022:

- Preliminary engineering for Phases 2 and 3 will continue.
- Detailed engineering of Phase 1 will commence.
- Spring wildlife programs for Phases 2 and 3 will be conducted. These will include surveys for sharp-tailed grouse leks, amphibians, raptor nests, burrowing owls, breeding birds, waterbird activity and snake hibernacula.
- Following the decision from the Agency on the requirement of an Impact Assessment is required, a virtual open house will be held in Q1 or Q2.
- If an Impact Assessment is not required, plans for the commencement of construction of Phase 1 will proceed.
  - Construction tendering documents will be prepared, including the mitigation measures developed for the Project.
  - Construction of Phase 1 will commence in fall of 2022.
- A Request for Review of the Project will be submitted to DFO.
- The MD of Taber will continue consultation with Indigenous groups.



# **APPENDIX A**

## **Photos**

**HORSEFLY REGIONAL EMERGENCY SPILLWAY  
IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Appendix A Photos  
February 2022

## Appendix A PHOTOS

**Photo 1 Phase 1- Taber Lake Outlet Structure**



**Photo 2 Phase 1 – Beginning of Channel Drain looking west**



**HORSEFLY REGIONAL EMERGENCY SPILLWAY  
IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Appendix A Photos  
February 2022

**Photo 3      Phase 1- Channel Drain Looking East; Taber Lake in Right Background**



**HORSEFLY REGIONAL EMERGENCY SPILLWAY  
IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Appendix A Photos  
February 2022

**Photo 4      Phase 1 – Drainage Down Coulee to Oldman River**





**HORSEFLY REGIONAL EMERGENCY SPILLWAY  
IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Appendix A Photos  
February 2022

**Photo 5 Phase 2 – Horsefly Outlet Channel Looking North**



**Photo 6 Phase 2 – Horsefly Canal Looking North, Highway 3 Crossing in the Distance**



**HORSEFLY REGIONAL EMERGENCY SPILLWAY  
IMPACT ASSESSMENT AGENCY OF CANADA DETAILED PROJECT DESCRIPTION SUMMARY**

Appendix A Photos  
February 2022

**Photo 7      Phase 3 - Inlet Canal from SMRID Main Canal to Horsefly Reservoir**

