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Horsefly Regional Emergency Spillway

Impact Assessment Agency of Canada

Initial Project Description Summary

November 5, 2021

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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 _{2e}	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 ³	cubic metre



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m ³ /s	cubic metre per second
MD	Municipal District
MD of Taber	Municipal District of Taber
NO ₂	nitrogen dioxide
PM _{2.5}	particulate matter
RAP	<i>restricted activity period</i>
SMRID	St. Mary River Irrigation District
SO ₂	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



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

Part A: General Information
November 5, 2021

PART A: GENERAL INFORMATION

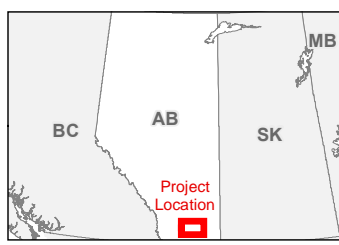
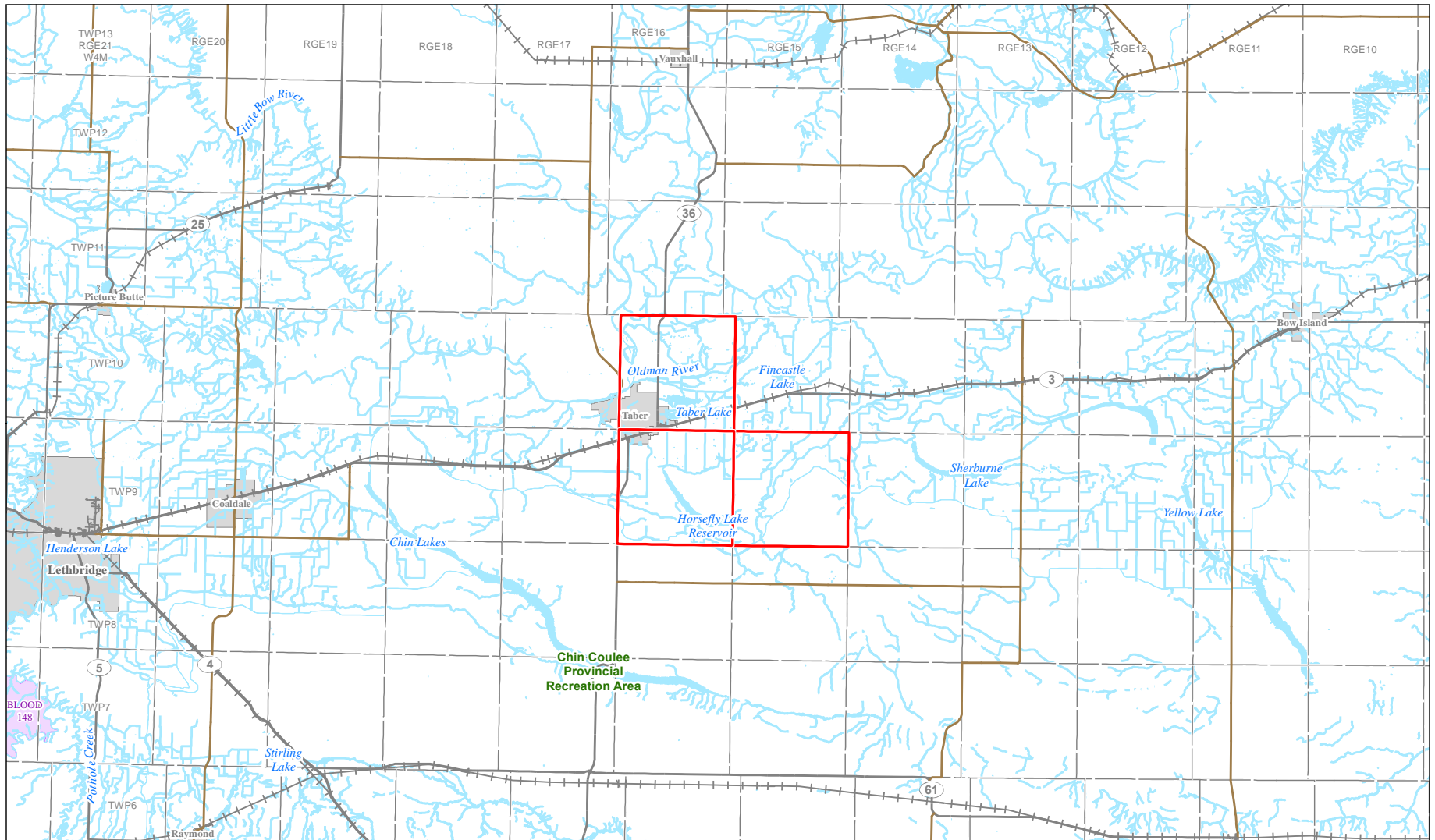
1.0 THE PROJECT'S NAME, TYPE OR SECTOR AND PROPOSED LOCATION

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.

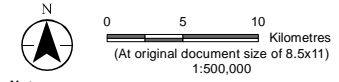
The Project is divided into three phases (Figure 1.2): Phase 1, from Taber Lake to the Oldman River; Phase 2, from Horsefly Reservoir to Taber Lake; and Phase 3, from the SMRID Main Canal to Horsefly Reservoir. Photos of all three Phases of the Project are presented in Appendix A.



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



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 2021-08-16
 TR by TQ on 2021-08-16
 IR Review by JH on 2021-08-16

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

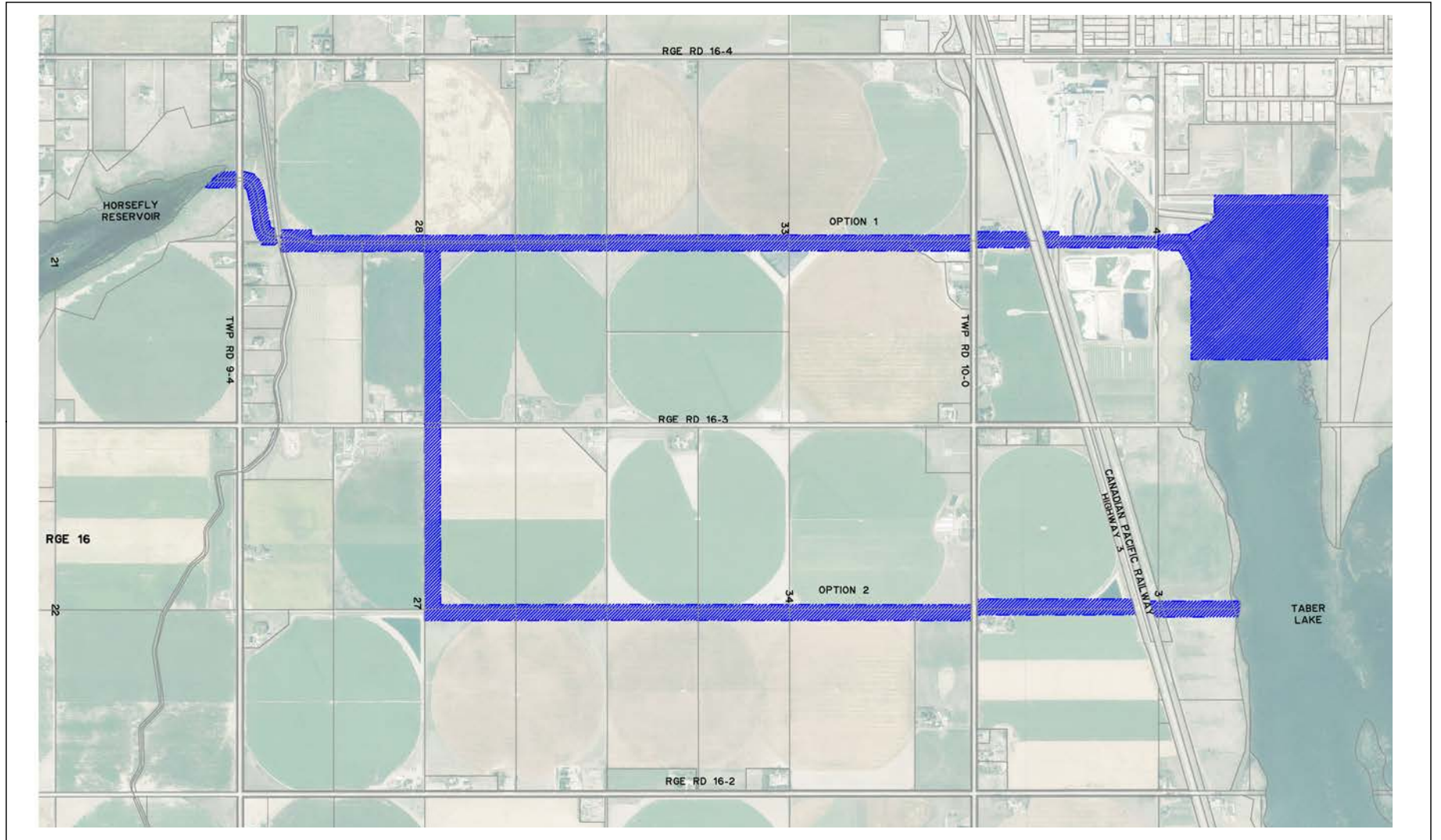
110773806-0001 REVA

Figure No.
1.1

Title
Horsefly Regional Emergency Spillway Project – Location



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 CONSTRUCTION LIMITS

Notes

1. Original figure content provided by MPE Engineering Ltd.

Project Location T9&10N, R15&16W Town of Taber	Prepared by SL on 2021-09-27 TR by CS on 2021-09-27 IR Review by JH on 2021-09-27
Client/Project Client: M.D. of Taber Project: Horsefly Regional Emergency Spillway	110773806-0011 REVA

Figure No.

12.2

Title

Phase 2 Alignment Options



**HORSEFLY REGIONAL EMERGENCY SPILLWAY
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2.0 PROPONENTS NAME AND CONTACT INFORMATION

Name of Project: Horsefly Regional Emergency Spillway

Name of Proponent: MD of Taber

Address of Proponent: 4900B 50th Street
Taber, Alberta T1G 1T2

Municipal Administrator: Mr. Arlos Crofts
<personal information removed>

Website: www.mdtaber.ab.ca

Principal Contact Person: Mr. Arlos Crofts

Environmental Contact Person: Mr. Jim Howell, Stantec Consulting
<personal information removed>
<email address removed>

3.0 ENGAGEMENT WITH JURISDICTIONS OR 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
Federal		
Impact Assessment Agency of Canada	Introduction of Project and clarification of Project classification	Project is deemed a Designated Project (June 25, 2021)
Fisheries and Oceans Canada	Introduction of Project and DFO requirements	To be contacted
Infrastructure Canada	Application to Investing in Canada Infrastructure Program (ICIP)	<ul style="list-style-type: none"> No <i>Impact Assessment Act</i> requirements under Section 82 Blood Tribe and Métis Nation of Alberta (Region 3 to be contacted) \$8.8 million grant received for Phase 1 (October 30, 2020)
	Application to Disaster Mitigation and Adaptation Fund (DMAF)	\$9.8 M grant received for Phases 2 and 3 (November 23, 2020)



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Table 3.1 Federal and Provincial Agencies Consulted

Agency	Purpose of Consultation	Outcome/Issues Raised
Provincial		
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"> • \$7.4 M grant for Phase 1 (November 2019). • \$12.9 M grant for Phases 2 and 3 (October 2020)
Alberta Culture and Status of Women (ACSW)	Historical Resources Application for Phase 1, 2 and 3	<ul style="list-style-type: none"> • No Historical Resources Act requirements for archaeological resources required. • Historical Resource Impact Assessment for palaeontological resources required for coulee on Phase 1 (May 21, 2021)

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. An open house is planned for autumn 2021 in Taber, focusing on the Horsefly component of the overall stormwater management plan.

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)



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

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- Tsuut'ina Nation
- Siksika Nation
- Piikani Nation
- Non-Treaty Nations
 - Foothills Ojibway First Nation
- Métis Groups
 - Métis Nation of Alberta, Region 3

As of October 15, 2021, 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.
- At an on-site meeting on July 15, 2021, the Blood Tribe/Kainai First Nation expressed no concerns with the Project.
- The Samson Cree Nation has expressed no concerns with the Project.
- The Siksika Nation has expressed an interest in viewing the site.
- At an on-site meeting on October 15, 2021, the Ermineskin Cree Nation expressed concerns with the quality of the water entering the Oldman River.

The MD of Taber will 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 conducted under subsection 95(2) of the *Impact Assessment Act* is applicable to the Project.



PART B: PROJECT INFORMATION

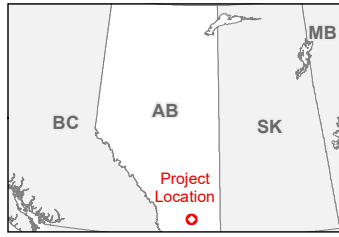
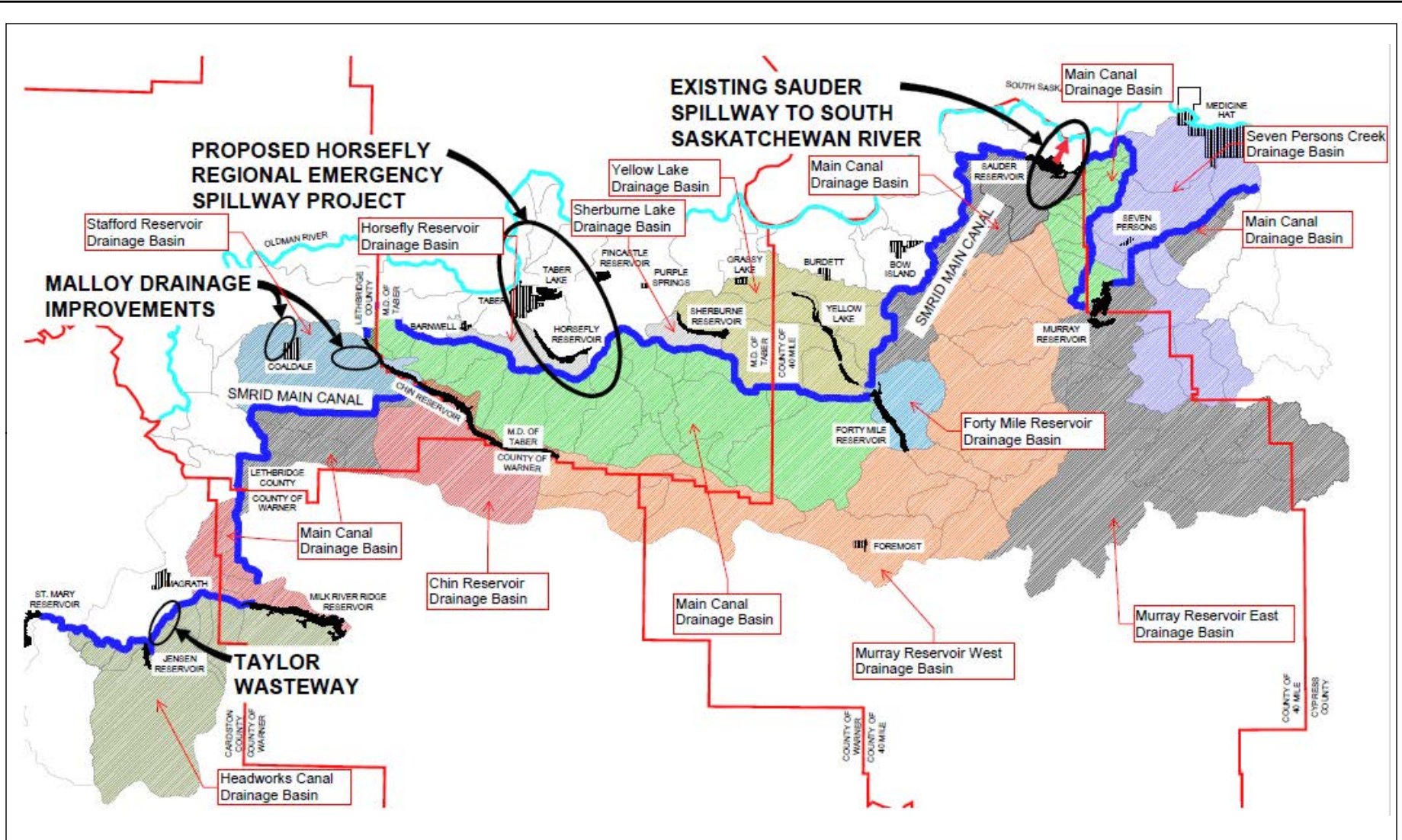
7.0 PROJECT PURPOSE AND NEED

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 and the drainage basins crossed between St. Mary Reservoir and Medicine Hat are shown in Figure 7.1.



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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 2021-08-16, TR by TQ on 2021-08-16, IR Review by JH on 2021-08-16

Client/Project: Client: M.D. of Taber, Project: Horsefly Regional Emergency Spillway
 110773806-0002 REVA

Figure No. **7.1**

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



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

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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 m³/year or more.

The Impact Assessment 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 m³ 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 m³ of water being released 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. This Initial Project Description, followed by a Detailed Project Description has been prepared and submitted to the Agency for their review to determine whether an Impact Assessment is required.

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 conveys water from Taber Lake, north and west to the Oldman River. The outlet from Taber Lake will be replaced and the first approximately 1,000 metres (m) of the existing canal (the Big Bend Lateral) will be enlarged from a capacity of 7.6 m³/s to 40 m³/s primarily by widening the canal. At this location, a check structure will direct water into the Big Bend Canal north for irrigation. From the west of the check structure 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 m³/s. The final 1,000 m of the spillway will install erosion protection measures and enlarge drainage through a natural coulee to the Oldman River. A wetland is presently being constructed on the south side of Taber Lake. Three MD of Taber road crossings and a crossing for Highway 36 will also require enlargement.



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November 5, 2021

9.1.2 Phase 2

Phase 2 includes enlarging 5,000 m of existing canals between Horsefly Reservoir and Taber Lake. Concrete control 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. The wetland currently under construction at Taber Lake will be expanded and enhanced to improve water quality.

9.1.3 Phase 3

Phase 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. Two drop structures and an MD of Taber road crossing will need to be enlarged to convey the additional flow. The existing wetland at Horsefly Reservoir will be expanded and enhanced to improve water quality.

9.2 DESCRIPTION OF PROJECT ACTIVITIES

9.2.1 Construction

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 be 4.0-6.0 m wide and 2.7-3.0 m deep.
- Outlet structures and drop structures will be replaced in Phase 1 to increase capacity.
- 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 Sugar 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.



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

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- 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.

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.

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 released 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. 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.



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Table 10.1 Capacity of Project Phases

Phase	Function	Existing Capacity (m³/s)	Proposed Capacity (m³/s)
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 ³ /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 7.1). 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.



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- 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.

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 proposed 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.



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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. Assessment is ongoing as part of the preliminary design however it is likely both routes have good technical merit and similar environmental effects. The lowest cost option will dictate the design.

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 C: 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).

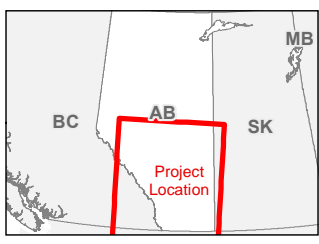
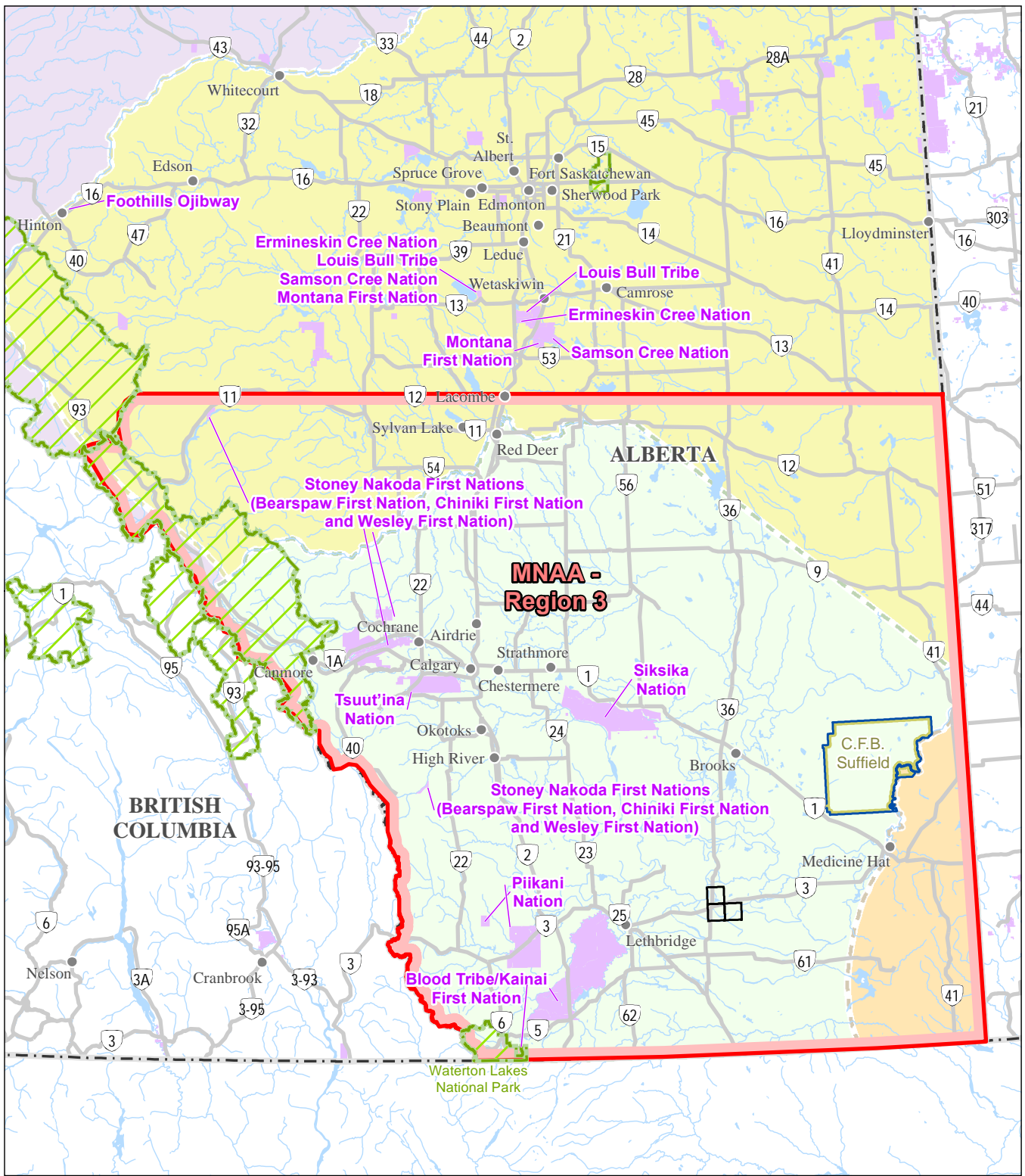
The Project is on private land, mainly utilized for agriculture, and on land belonging to the TID, Town of Taber and Lantic Inc. There are 15 residences within 300 m of the existing canal: eight in Phase 1, four in Phase 2 and three in Phase 3. The Project is located within Treaty 7 and Métis Nation 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

Indigenous Group or Organization	Distance from Project Centre (km)
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



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- | | |
|--|------------------------|
| Project Area | Treaty Boundary |
| First Nation Reserve | Treaty 4 (1874) |
| Métis Nation of Alberta Association (MNA) Region 3 | Treaty 6 (1876) |
| National Park | Treaty 7 (1877) |
| Suffield Military Base | Treaty 8 (1899) |



Project Location: T9&10N, R15&16W, Town of Taber
 Prepared by SL on 2021-08-16
 TR by JH on 2021-08-16
 IR Review by JH on 2021-08-16

Client/Project: M.D. of Taber
 Project: Horsefly Regional Emergency Spillway
 10773806-0008 REVA

Figure No.
13.1

Title
Location of Indigenous Groups and Nearby Federal Lands

Disclaimer: This document has been prepared based on information provided by others as cited in the Notes section. Stantec has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result. Stantec assumes no responsibility for data supplied in electronic format, and the recipient accepts full responsibility for verifying the accuracy and completeness of the data.

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

Part C: Location Information and Context
November 5, 2021

14.0 PHYSICAL 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 (NO₂), sulphur dioxide (SO₂) and carbon monoxide (CO) concentrations less than the Alberta Ambient Air Quality Objectives (AAAQO). Maximum one-hour particulate matter (PM_{2.5}) concentrations exceeded the AAAQO of 29 µg/m³ 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.

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 for Phase 1 found no rare plants or rare communities. A rare plant survey of Phases 2 and 3 found species of scratchgrass and velvet goldenrod.

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 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.



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

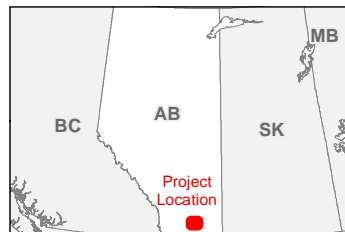
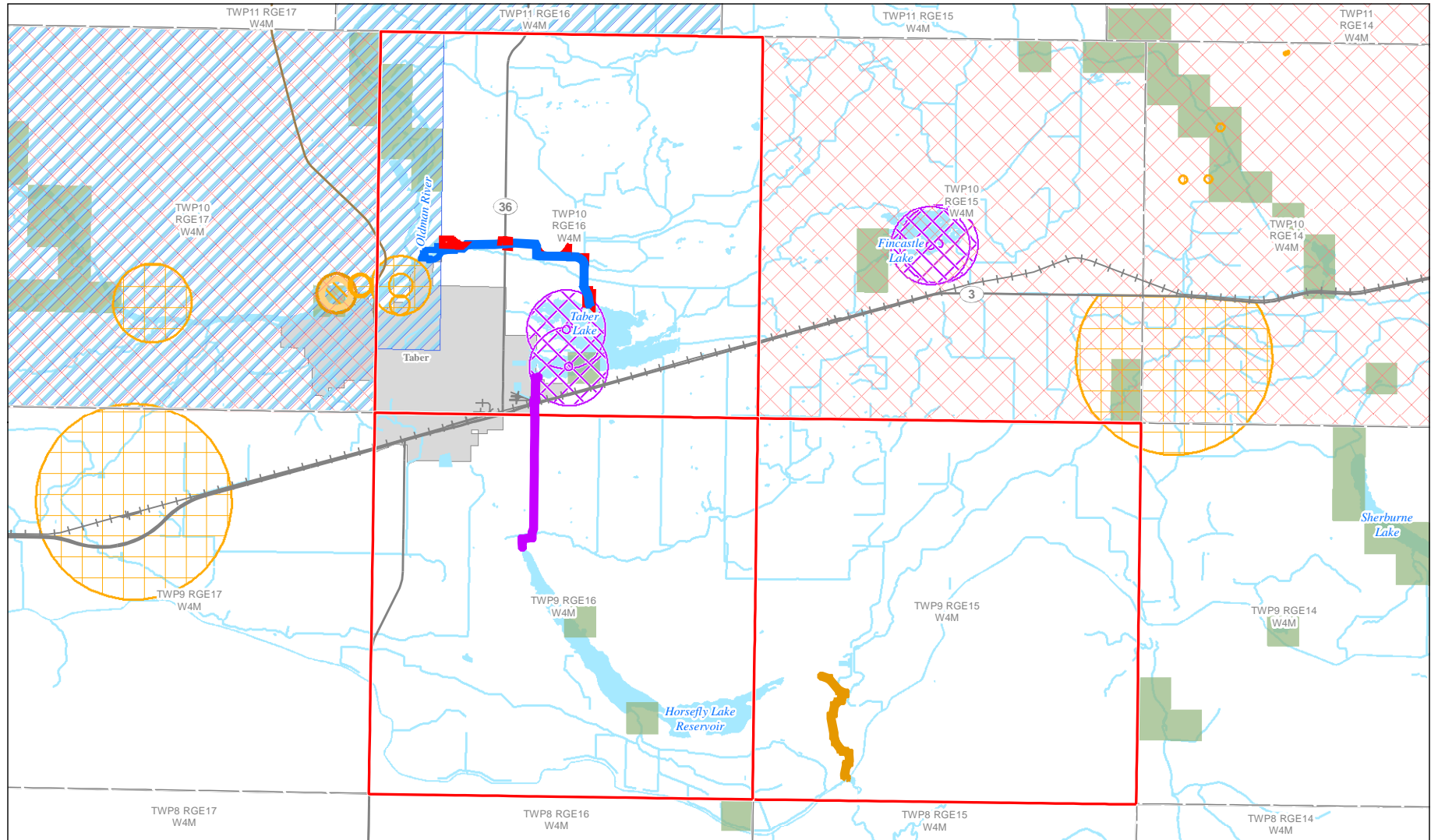
Part C: Location Information and Context
November 5, 2021

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.

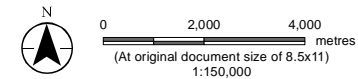
Alberta Parks has classified four environmentally significant areas in the Project area based on the presence of potentially containing rare or unique species or habitat, ecological integrity and contributions of water quality and integrity. These areas, shown in Figure 14.1 are: the south side of Taber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

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 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.





- | | | |
|-------------------------------|-----------------------------|------------|
| 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 2021-08-16
TR by TQ on 2021-08-16
IR Review by JH on 2021-08-16

Client/Project
Client: M.D. of Taber
Project: Horsely Regional Emergency Spillway

110773806-0006 REVA

Figure No.

14.1

Title
Horsely Regional Emergency Spillway Project
Biophysical Considerations



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

Part C: Location Information and Context
November 5, 2021

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. 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 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

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. 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.



PART D: 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 INITIAL PROJECT DESCRIPTION SUMMARY

Part D: Federal, Provincial, Territorial, Indigenous, and Municipal Involvement and Effects
November 5, 2021

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.

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

Bylaw or Policy	Description
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.

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* or 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.



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

Part D: Federal, Provincial, Territorial, Indigenous, and Municipal Involvement and Effects
November 5, 2021

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

Plan	Description
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 E: 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.

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

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 m³/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 INITIAL PROJECT DESCRIPTION SUMMARY**

Part E: Potential Effects of the Project
November 5, 2021

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"> • Air emissions from construction equipment • Noise • Degradation of water quality from suspended sediment • Soil erosion • Loss of vegetation • Fish habitat alteration or destruction • Fish mortality • Loss of wildlife habitat • Wildlife mortality • Loss of archaeological or palaeontological sites • Traffic disruption 	<p>Air Quality</p> <ul style="list-style-type: none"> • Vehicles and equipment will be required to meet emission control standards. • All work shall be conducted in a manner that minimizes the raising of dust from construction or maintenance operations • 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. • The concentration of sulphur in diesel fuel shall not exceed 15 mg/kg to comply with Sulphur in Diesel Fuel Regulations. • Construction vehicle idling times will be reduced to the extent possible in order to reduce emissions, as a best management practice. <p>Acoustic Environment</p> <ul style="list-style-type: none"> • Construction machinery and factory-supplied noise abatement equipment (i.e., mufflers) will be maintained in good working order. • Residents near to construction noise-generating activities will be notified prior to construction. • Machinery idling will be minimized. <p>Water Quality</p> <ul style="list-style-type: none"> • 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. <p>Soils</p> <ul style="list-style-type: none"> • Soils excavated during construction will be stockpiled and the piles will be protected by mulching or the application of tackifiers to prevent erosion into the canal. • 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. • 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.



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

Part E: Potential Effects of the Project
November 5, 2021

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>Vegetation and Wetlands</p> <ul style="list-style-type: none"> • Activities will be restricted to the Project footprint to minimize vegetation loss. • Applicable setbacks will be applied to all known occurrences of provincially listed Species of Conservation Concern. Seed collection or transplanting will be conducted, in consultation with AEP, if occurrences cannot be avoided. <p>Fish</p> <ul style="list-style-type: none"> • Cofferdams will be used for construction activities at the Horsefly Reservoir and Taber Lake outlets. • If work is required at the outlet to the Oldman River, DFO will be notified and any requirements from them will be adhered to. • Instream activities will be scheduled outside Restricted Activity Periods (RAPs) whenever possible. If work is required outside the RAP, an application will be made to AEP. • Instream work will follow Alberta Water Codes of Practice • Re-fueling of machinery and storage of hydrocarbon products within 100 m from the high-water mark of waterbodies and watercourses will be prohibited. <p>Wildlife</p> <ul style="list-style-type: none"> • Activities will be confined to the Project footprint. • Clearing will not occur between April 1 and August 31 in order to avoid disturbance to nesting birds and other wildlife. • 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. • Pre-construction surveys will be conducted to identify wildlife features (e.g., nests, dens) and appropriate site-specific mitigation will be developed <p>Archaeology and Palaeontology</p> <ul style="list-style-type: none"> • Any conditions to approval from ACSW regarding archaeological and palaeontological sites will be adhered to.



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

Part E: Potential Effects of the Project
November 5, 2021

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>Land Use</p> <ul style="list-style-type: none"> • Construction activities and equipment will be managed to avoid damage and disturbance to adjacent properties, structures and operations. • Channel excavation and disturbance will be limited to defined rights-of-way and access routes. • Signs directing traffic to detours will be installed during construction to address public safety. • A traffic management plan will be developed for the construction activities in order to minimize any traffic disruptions.
Operations: Discharge to Oldman River	<ul style="list-style-type: none"> • Fish habitat alteration or destruction • Fish mortality • Degradation of water quality 	<ul style="list-style-type: none"> • DFO will be contacted to discuss any issues that may be associated with discharge to Oldman River.
Accidents and Malfunctions	<ul style="list-style-type: none"> • Hazardous material spills • Fires • Vehicle accidents 	<p>Hazardous Material Spills</p> <ul style="list-style-type: none"> • Machinery will arrive on site in a clean condition free of fuel, oil or fluid leaks. • Refueling of vehicles and equipment will not take place near waterbodies. • All employees involved in the handling and storage of fuels will have Workplace Hazardous Materials Information System and spill response training. • 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. • All spills will be cleaned up immediately • A spill kit or sufficient supply of materials for clean-up or spill containment will always be available on site and replenished as needed. • 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.



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

Part E: Potential Effects of the Project
November 5, 2021

Table 19.1 Potential Environmental Effects and Mitigation Measures

Project Activity (effect pathway)	Potential Effects	Environmental Protection and Mitigation Measures
Accidents and Malfunctions (cont'd)	<i>See above</i>	<p>Fires</p> <ul style="list-style-type: none"> • Fires or burning will not be allowed on the construction site. • 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. • 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. • 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. • All construction and related activities taking place in the vicinity of a wildfire will cease until it is safe to resume operations. <p>Vehicle Accidents</p> <ul style="list-style-type: none"> • Workers will follow traffic laws and regulations. • 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.



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

Part E: Potential Effects of the Project
November 5, 2021

19.2 SUMMARY OF EFFECTS

The Horsefly Regional Emergency Spillway Project will be constructed using standard irrigation system techniques. The implementation of mitigation measures, including those listed in Table 19.1 will minimize 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. Vegetation and soil removal will result in the loss of vegetation communities along the canals and temporary exposure of soil to erosion. 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 Taber Lake will involve work in the lake but the use of cofferdams and following Alberta Water Codes of Practice will minimize effects on fish and fish habitat. Limited wildlife habitat and mortality effects are expected. Approval requirements from ACSW 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.

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 will provide the benefit of flood control; the environmental effects of developing this benefit are not significant.

19.3 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 m³/s at which time the peak discharge of Oldman River is 3,900 m³/s. The increase is 0.01% 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.



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

Part E: Potential Effects of the Project
November 5, 2021

19.4 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.

19.5 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.

20.0 POTENTIAL EXTRA-PROVINCIAL AND FEDERAL IMPACTS

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.



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21.0 IMPACTS 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 and undiscovered archaeological sites. 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 IMPACTS TO INDIGENOUS HEALTH, SOCIAL, AND ECONOMIC CONDITIONS

The Project is expected to have minimal effects on 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.

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_{2e}), as a result of the construction phase.



24.0 WASTE AND EMISSIONS GENERATED BY THE PROJECT

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.

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.



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

Appendix A Photos
November 5, 2021

Appendix A PHOTOS



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

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Photo 1 Phase 1- Taber Lake Outlet Structure



Photo 2 Phase 1 – Beginning of Channel Drain Looking West



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



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

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Photo 4 Phase 1 – Drainage Down Coulee to Oldman River



**HORSEFLY REGIONAL EMERGENCY SPILLWAY
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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
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Photo 7 Phase 3 - Inlet Canal from SMRID Main Canal to Horsefly Reservoir

