

November 5, 2021

Alberta Environment and Parks
2nd Floor, South Petroleum Tower
9815 108 Street
Edmonton, AB T6B 2X3

Environmental Impact Assessment Team

To Whom This May Concern:

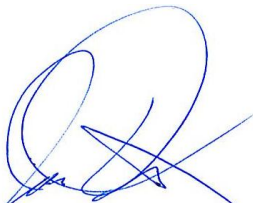
Klohn Crippen Berger Ltd. (KCB) is pleased to provide Alberta Environment and Parks (AEP) with an information package regarding the proposed Chin Reservoir Expansion Project. KCB is providing this information on behalf of the St. Mary River Irrigation District (project owner) and MPE Engineering Ltd (project prime consultant).

The intent of this package to provide AEP's Environmental Impact Assessment Team with the information required to determine if the proposed works will require an Environmental Impact Assessment. Please find attached a Project Summary Table with appended with support figures.

Should you require additional information, please contact the undersigned at 780-733-4586 or jduxbury@klohn.com.

Yours truly,

KLOHN CRIPPEN BERGER LTD.



Jason Duxbury, PhD., P.Biol., R.P. Bio
Senior Terrestrial Ecologist, Regulatory Approvals & Permitting Team Lead

JD:kb

Project Summary Table

Proponent name:	St. Mary River Irrigation District (SMRID)	Date: 2021-11-05	
Project name:	Chin Reservoir Expansion – East Dam	Company contacts names and information:	Jeff Olitch – Engineering (MPE Engineering Ltd.) jolitch@mpe.ca (403) 317-3629 Jason Duxbury – Environmental (Klohn Crippen Berger Ltd). jduxbury@klohn.com 780-733-4586 David Westwood (SMRID) (403) 328-4401 Travis Geremia (SMRID) (403) 328-4401 ext.115
Name of company that will hold approval:	St. Mary River Irrigation District	Company website:	https://www.smrld.com/
Type of project (e.g., water management, hydroelectric, etc.):	Water Management	New project, expansion, additional phase or modification:	Expansion of existing reservoir
Project location (legal land description and municipality):	Western limit is in SE-26-7-16-W4 New dam and eastern limit are within SW 23-7-15 W4 and NW-14-7-15-W4 MD of Taber and County of Lethbridge	Total project area (ha):	Expansion will add 405 ha of reservoir.
Indicate whether the project is on private, federal or provincial land:	Private Land	List any parks/protected areas/conservation areas that may be impacted:	None
Nearest First Nation Reserve(s) and Métis Settlements (name and km):	Blood No 148, approximately 60 km to the west of the Project	Nearest waterway/ water body (name and km):	Oldman River, 22 km to the north
Nearest provincial highway (# and distance):	Hwy 36 Approximately 10 km to the west of the Project	Potential annual water usage and source:	The primary use of the water is for irrigation. Additional usage would be municipal and recreation. The source of the water is the SMRID irrigation canal under an existing water license.
Expected types of air emissions (e.g., SO₂, NO_x, CO₂, etc.):	None	Types of wastes generated and disposal location:	Significant operation waste not expected.

Brief Project Description

Background Information

Chin Reservoir is an off-stream storage reservoir that is located roughly in the middle of the St. Mary River Irrigation District (SMRID) system, approximately 30 east of Lethbridge and 15 km south of Taber (Figure 1). It is the largest off-stream reservoir within the SMRID and has a current storage volume of 154,320 ac-ft (190,350 dam³) at the operating FSL of 861.40 m.

Chin Reservoir is currently located in a major glacial melt coulee known as “Chin Coulee” the reservoir is impounded by two dams on its East and West ends: Chin 1 (West Dam), and Chin 2 (East Dam) (Figure 2). Chin Coulee continues both to the West and East of both dams. West of the West Dam is Stafford Reservoir (Figure 2). East of the East Dam is a series of natural and enhanced low spots that occasionally retain some water which equates to ephemeral wildlife habitat and water for grazing cattle. Water that enters Chin Coulee east of the East Dam eventually reaches Murray Reservoir (Figure 1) when water levels are high and seasonal conditions prevent evaporation.

The two dams were completed in 1955 and no major modifications have been completed since construction. No major storage has been added to the SMRID since Forty Mile Reservoir was completed in 1989 and yet the irrigation acreage has increased dramatically since then.

To meet the need of the increased demand for irrigation, an expansion of the existing Chin Reservoir was chosen as the preferred option. The expansion is planned for privately held land where landowners have been included, and continue to be included in the planning of the project. The chosen option involves moving the existing East Dam 10 km to the east (Figure 1) and raising the reservoir FSL by 2.60 m from the current operating FSL to 864.00 m. The invert of Chin Coulee at the proposed dam location is approximately 827.0 m. Top of dam is required to be 2.20 m above FSL for the required wave containment. Therefore, the top of Dam was conservatively set for 866.50 m. This scenario would require a dam with a total height of approximately 30.0 m. *A key aspect to proposed project is that the project is to increase storage capacity, i.e., an increase in water diversion from naturally occurring watercourses will not be required.*

Site Conditions

The existing dams are built on thick alluvial deposits at the valley bottom, with clay till / till textured colluvium or bedrock at the abutments. The alluvium is generally soft, silty clay of medium plasticity and occasional fine to medium grained silty sand pockets. The alluvium is relatively thick, ranging from 38 m at Chin West Dam and greater than 23 m beneath Chin East Dam (the exact depth is being determined). Based on the available information, it is likely that similar conditions would be encountered for a new dam to the east.

Potential Effects on the Natural Environment

The Chin Reservoir is located in the Grassland Natural Region (NRC 2006). This region of Alberta is dominated by cultivation and contains pockets of native grassland. Summers can be very warm and dry, and winters can be cold with little snow. This region of Alberta includes some of the most productive croplands in the province, with productivity largely dependent upon irrigation. More specifically, the reservoir is in the Dry Mixedgrass Natural Subregion. The warm, dry climate supports grasses, shrubs and herbs that are adapted to summer droughts. This region of the province provides habitat for numerous species of plants and animals adapted to a dry, treeless landscape. Naturally occurring trees are present along waterbodies or in coulees where subsurface water is available. Shrub communities, including buckbrush, silver sagebrush, silverberry and prickly rose, occur in places such as depressions, ravines, and northerly aspects of coulees and river valleys where there is a reliable water supply during the growing

season. Adjacent to rivers, tall shrub and forest communities of willows, thorny buffaloberry and plains cottonwood develop in response to adequate water supplies from groundwater throughout the growing season. Sedges, spikerushes and willows occur with Gleysols in wet, poorly drained areas.

Only about 2% of the Dry Mixedgrass Natural Subregion is water-covered (NRC 2006). Wildlife in the Grassland Natural Area includes numerous species of conservation concern that are tracked provincially and or federally. Potential species at risk include amphibians, reptiles, birds and mammals. The topography of the coulee both reduces the suitability habitat for some species (e.g., Sprague's pipits), while enhancing it for others (e.g., prairie rattlesnakes). Fish species known to occur in the existing reservoir include emerald shiner, lake chub, lake whitefish, longnose and white sucker, northern pike, spoonhead sculpin, spottail shiner, and walleye (FWMIS 2021).

With the proposed expansion of the reservoir, approximately 400 ha of coulee grassland habitat would be inundated. While not quantified at this pre-liminary design stage, the local reduction in grassland habitat is not expected to significantly limit the sustainability of regional populations of grassland dependent wildlife. Intact grassland habitat, both within Chin Coulee and on tablelands surrounding Chin Coulee will not be affected by the expansion and will remain to sustain regional wildlife populations of grassland dependent species (Figure 4).

A few, relatively small waterbodies within Chin Coulee would be inundated. Two waterbodies are remnant reservoirs behind small dykes which were abandoned long ago (Figure 5). The water in these old reservoirs is likely maintained through seepage from the Chin Reservoir. A small ephemeral stream in the coulee is also fed by seepage from the reservoir and groundwater seeps along the coulee. By late-summer, the stream typically becomes disconnected and eventually dries out in the xeric conditions of the region. Federal approvals under the *Fisheries Act* or *Canadian Navigable Waters Act* will not be required for the construction of the new dam.

The stream and some temporary wetlands provide suitable habitat for migratory shorebirds, waterfowl and some passerines. These habitat types are also present downstream of the proposed dam site. Dam seepage conditions similar to what is currently occurring is expected downstream of the proposed East Dam. A large wetland 6.5 km downstream of the proposed dam is a significant staging area for migratory shorebirds and waterfowl (Figure 4). The flat bottom of the coulee provides extensive mud flats suitable for foraging shorebirds and wading species. There are also areas of emergent wetland vegetation, suitable for nesting waterbirds. No changes to this large wetland are expected with the expansion of the Chin Reservoir. Therefore, local habitat availability for habitat suitable for migratory shorebirds and waterfowl is not expected to be significantly reduced.

During pre-liminary baseline studies, numerous rare plant species such as *Bidens vulgate*, *Suckleya suckleyana*, *Epilobium campestre*, *Echinochloa muricata*, *Potentilla supina*, *Heliotropium curassavicum* and *Oenothera flava* were found within the drawdown of the existing Chin Reservoir. With the increase in FSL, so individual plants of these species would be displaced. However, continued operation of the reservoir at the new FSL is expected to eventually recreate the drawdown conditions currently sustaining the species around Chin Reservoir. The conditions would also be expected in the proposed expansion area. With time there would be a potential increase in occurrence of these rare plant species in the area.

The existing reservoir has also created pockets of riparian zones that contain trees and or shrubs. Compared to the agronomic fields and the native grassland habitat, a relatively higher biodiversity was observed in these vegetated riparian zones during the pre-liminary baseline studies. Tree and shrub nesting species, along with species that use trees for roosting were found in these riparian zones. Many of the species were only observed in these habitat patches. These patches also provided protective cover for

ungulates, and small to medium sized mammals. These pockets of riparian habitat would also be created around the expanded reservoir, leading to additional pockets of relatively high biodiversity.

The proposed area of inundation would flood native grassland habitat within Chin Coulee. Pre-liminary baseline studies noted that species which occurred within the inundation zone also occurred in suitable habitat that will not be affected by the expansion of the reservoir. During pre-liminary baseline studies, no species of wildlife were observed only within the proposed inundation zone. Significant adverse effects on the sustainability of wildlife species or communities are not expected in the region with the expansion of the reservoir.

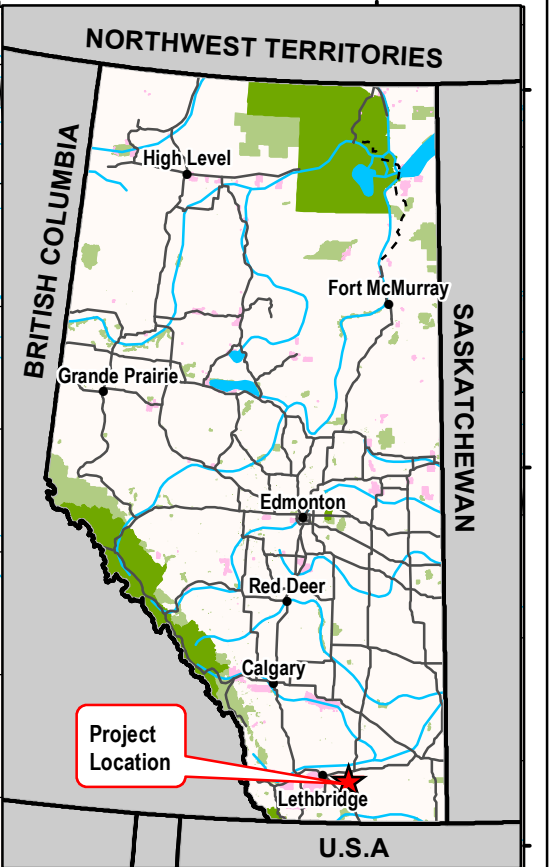
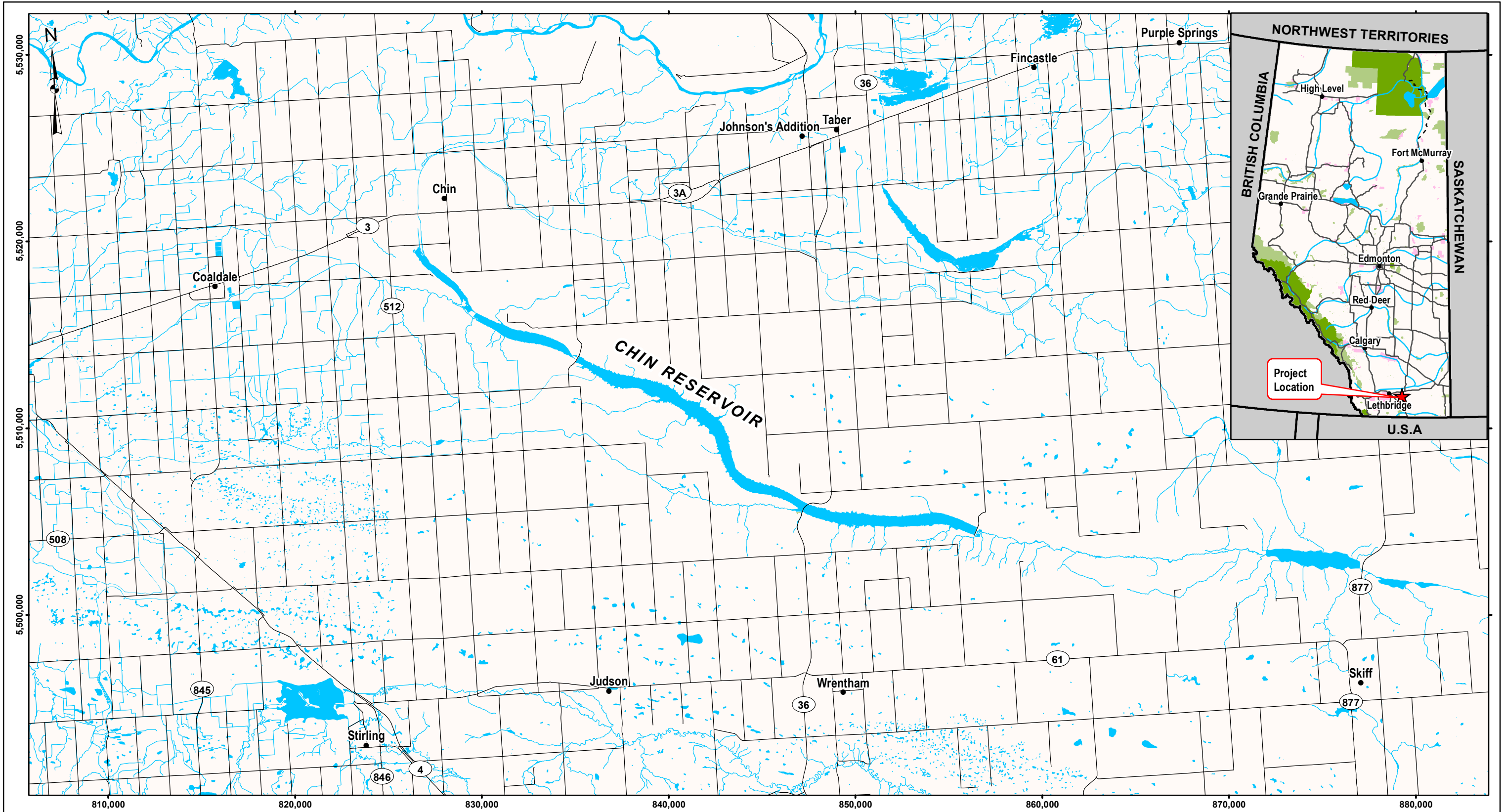
The inundation is not expected to affect public roads, buildings, or infrastructure. There will be an overlap with two power lines and underground energy rights of way. Agreements with the holders of rights of way will be required and potential relocations may be required.

References

Fisheries and Wildlife Management Information System (FWMIS). 2021. Fish and Wildlife Internet Mapping Tool (FWIMT). Accessed online September 2021 at: <https://www.alberta.ca/access-fwmis-data.aspx>

Natural Subregions Committee (NRC). 2006. Natural Subregions of Alberta. D.J. Downing and W.W. Pettapiece. Government of Alberta. Pub. No. T/852.

File: Z:\ACGY\Alberta\A03701E01_MPE_Chin_Res_Environmental\400_Drawings\402_GISMXD\Water_Management\Figure1_ProjectArea_21104.mxd Date: November 04, 2021 Time: 14:11:41 PM Creator: AHarrison



NOTES:
 1. HORIZONTAL DATUM: NAD83
 2. GRID ZONE: UTM Zone 11N

CLIENT







PROJECT	CHIN RESERVOIR EXPANSION	
TITLE	Project Location	
SCALE	PROJECT No.	FIG No.
1:200,000	A03701E01	1

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Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

-  Dam
-  All Weather Road
-  Irrigation Canal



NOTES:
 1. HORIZONTAL DATUM: NAD83
 2. GRID ZONE: UTM Zone 11N
 3. IMAGERY SOURCE: ESRI Basemaps

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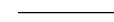


PROJECT	CHIN RESERVOIR EXPANSION	
TITLE	Location of Chin Reservoir West and East Dams	
SCALE	PROJECT No.	FIG No.
1:80,000	A03701E01	2

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Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

-  All Weather Road
-  Estimated Full Supply Level



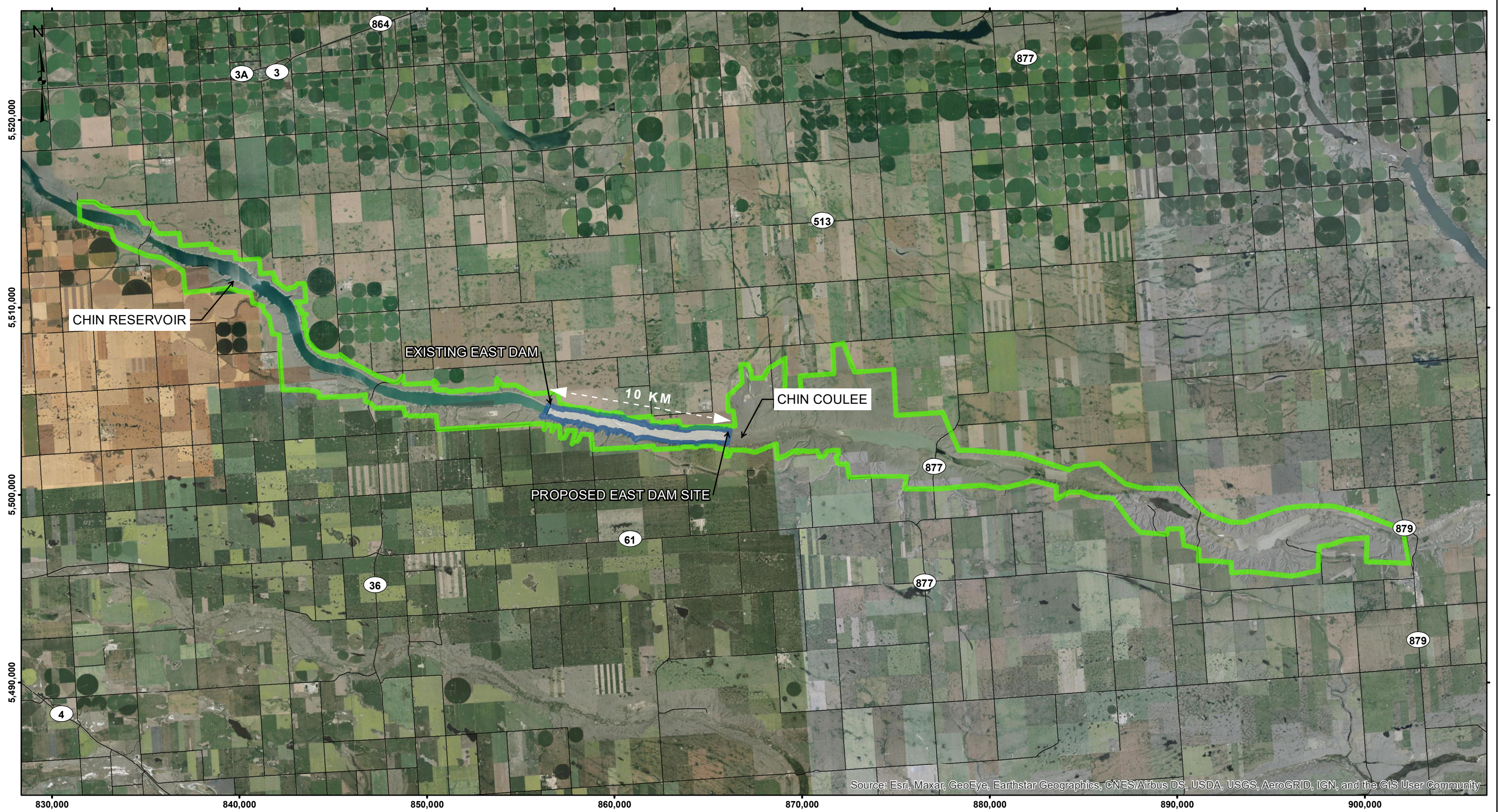
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 2. GRID ZONE: UTM Zone 11N
 3. IMAGERY SOURCE: ESRI Basemaps

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



PROJECT	CHIN RESERVOIR EXPANSION	
TITLE	Proposed Reservoir Expansion	
SCALE	PROJECT No. A03701E01	FIG No. 3

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Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

-  All Weather Road
-  Estimated Full Supply Level
-  Existing Grassland Habitat



NOTES:
 1. HORIZONTAL DATUM: NAD83
 2. GRID ZONE: UTM Zone 11N
 3. IMAGERY SOURCE: ESRI Basemaps

CLIENT







PROJECT	CHIN RESERVOIR EXPANSION	
TITLE	Inundation of Existing Grassland Habitat	
SCALE	PROJECT No.	FIG No.
1:200,000	A03701E01	4

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Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

-  All Weather Road
-  Estimated Full Supply Level
-  Existing Grassland Habitat



NOTES:
 1. HORIZONTAL DATUM: NAD83
 2. GRID ZONE: UTM Zone 11N
 3. IMAGERY SOURCE: ESRI Basemaps

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PROJECT CHIN RESERVOIR EXPANSION		
TITLE Water Bodies Within the Future Inundation Zone		
SCALE 1:6,000	PROJECT No. A03701E01	FIG No. 5