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Memo

To:	Environment and Climate Change Canada (ECCC); Mark Svenson - Alberta Transportation	From:	Eliot Terry and Dave Brescia Stantec Consulting
Project/File:	Springbank Off-Stream Reservoir Project	Date:	December 23, 2021

Reference: Springbank Off-Stream Reservoir Project: IAAC Condition 4.5.2 - Bank Swallow Nesting Structure

INTRODUCTION

The following memo provides a description of the proposed bank swallow (*Riparia riparia*) nesting structure to be installed prior to construction of the Springbank Off-Stream Reservoir Project in accordance with the Impact Assessment Agency of Canada (IAAC) approval condition 4.5.2. Specifically, Environment and Climate Change Canada (ECCC) has required Alberta Transportation to develop and install a nesting structure(s) to compensate for the temporary loss of a bank swallow colony where 12 bank swallows were previously observed in 2016 along the Elbow River at the edge of the Project Development Area (PDA) (Figure 1). The bank swallow colony will not be directly affected during construction or flood operations. However, there is potential for the Project to result in sensory disturbance to nesting and/or foraging habitat during construction of the low-level outlet and associated access, which is approximately 250 m from the identified bank swallow nesting colony (Figure 1). As such, a geotextile sheet will be installed to prevent bank swallow nesting at this location consistent with the direction provided in the IAAC Environmental Assessment Report (IAAC 2021).

BACKGROUND

Although several cavity nesting bird species have been reported to use artificial nest boxes during the breeding season (e.g., bluebird [*Sialia* spp.]), tree swallow, [*Tachycineta bicolor*] (Parrens 1991, Lambrechts et al. 2010, Shutler et al. 2012), there is limited information related to mitigation that includes the design of artificial bank swallow nesting structures. The Port of Québec (2020) has developed a pilot project that includes concrete walls with pre-made holes built into riverbanks to provide nesting habitat for bank swallow, which has proven to be successful. In Ontario, two types of artificial structures have been pilot tested including one concrete structure with sand-filled burrow tubes, and two earthen embankments (OMNR 2017). The concrete structures were not successful, and the earthen embankments have had limited success. In the United Kingdom, artificial nest boxes have been developed as free-standing structures made of various materials including concrete blocks (Hopkins 2001) or wood with pre-made nesting holes and chambers (Tice's Meadow Bird Group 2021). The success of these structures are not known at this time.

Reference: IAAC Approval Condition 4.5.2 - Bank Swallow Nesting Structure

BANK SWALLOW NESTING STRUCTURE DESIGN

The proposed bank swallow nesting structure has been designed primarily based on guidance provided in the Tice's Meadow Bird Group (TMBG) document, Hopkins (2021) and professional judgment.

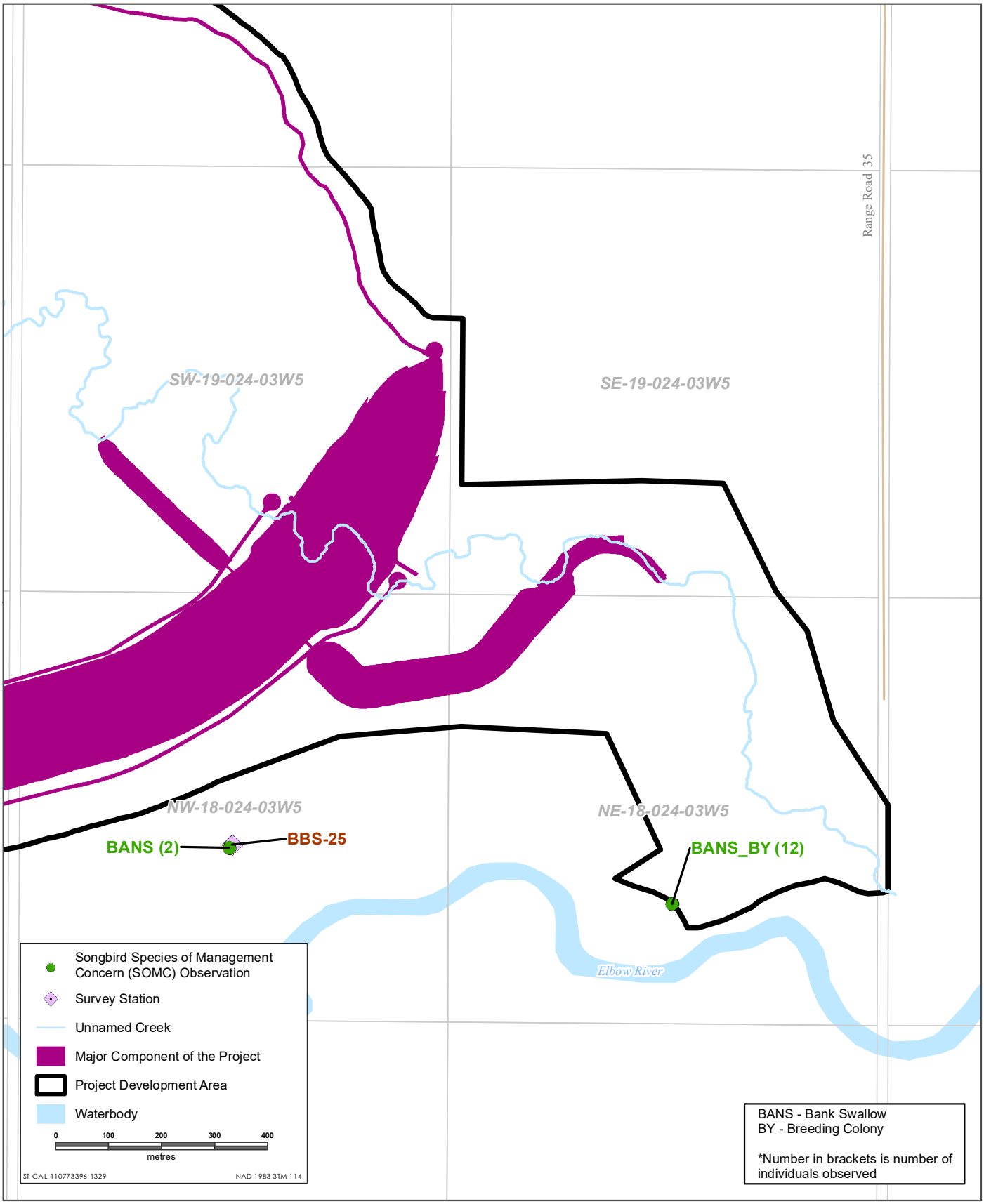
The proposed bank swallow nesting structure design will include two 4-foot long wooden boxes placed side-by-side (8-feet total length) with pre-made holes and burrows (tunnels/chambers) made of PVC piping (Figure 2). The nesting structure will contain a total of 10 holes (4.2 cm diameter) to support a maximum of 10 breeding pairs (20 individuals) to compensate for the reduction in potential nesting habitat for an estimated 12 bank swallows previously observed. The nesting holes will be placed in an array of two rows and spaced 40 cm part. The nesting box will be raised on 4-inch x 4-inch posts. Each nest hole will contain one 71 cm PVC tube angled at a 1/60 slope and will end in a 20 cm x 20 cm x 20 cm nesting box. The top of the structure will be sloped with a slight overhang in front of the nest holes, to prevent water pooling on top of the structure. Each 20 cm x 20 cm x 20 cm nest box will be filled with sand each spring prior to arrival of bank swallows, allowing them to be excavated by each nesting pair upon arrival.

The back of each structure will be equipped with a door to clean the boxes each fall and equipped with a latch that can be locked. A predator guard (e.g., baffle) installed on the front panel or posts will be included to prevent mammalian predators from climbing and accessing the nesting holes (Bailey and Bonter 2017).

BANK SWALLOW NESTING STRUCTURE LOCATION

IAAC approval condition 4.5.2 requires a 500 m foraging area buffer around the nesting structure. Because suitable habitat for bank swallow primarily occurs along the Elbow River, the number of potential locations to install a nesting structure is constrained by the setback distance. As such, there is only one site along the Elbow River that has suitable foraging habitat adjacent to a vertical bank and occurs outside the 500 m setback (Figure 3).

Bank swallow use of the nesting structure will be monitored as discussed in the Bank Swallow Mitigation Plan (see Appendix B of the Wildlife Mitigation and Monitoring Plan). The nesting structure will be evaluated to determine nesting success using the number of breeding pairs and number of nesting holes occupied by bank swallow (i.e., performance indicator). Any potential modifications to the design or location of the nesting structure will be evaluated using an adaptive management approach.



Sources: Thematic Data - Stantec. Base Data - Government of Alberta, Stantec

Location of Bank Swallow Colony and Observations in the LAA

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ALBERTA TRANSPORTATION SPRINGBANK OFF-STREAM RESERVOIR PROJECT

Figure 1

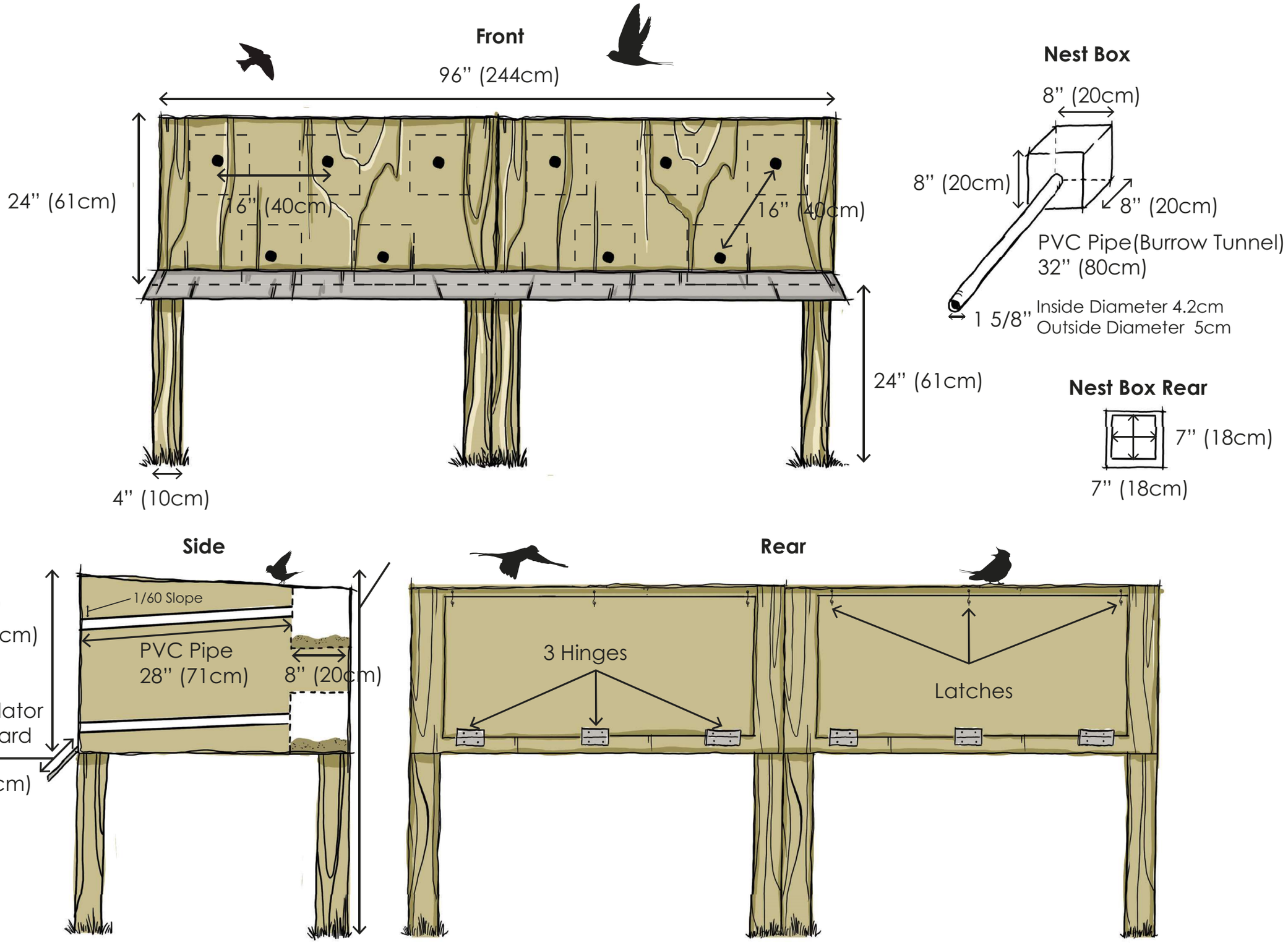
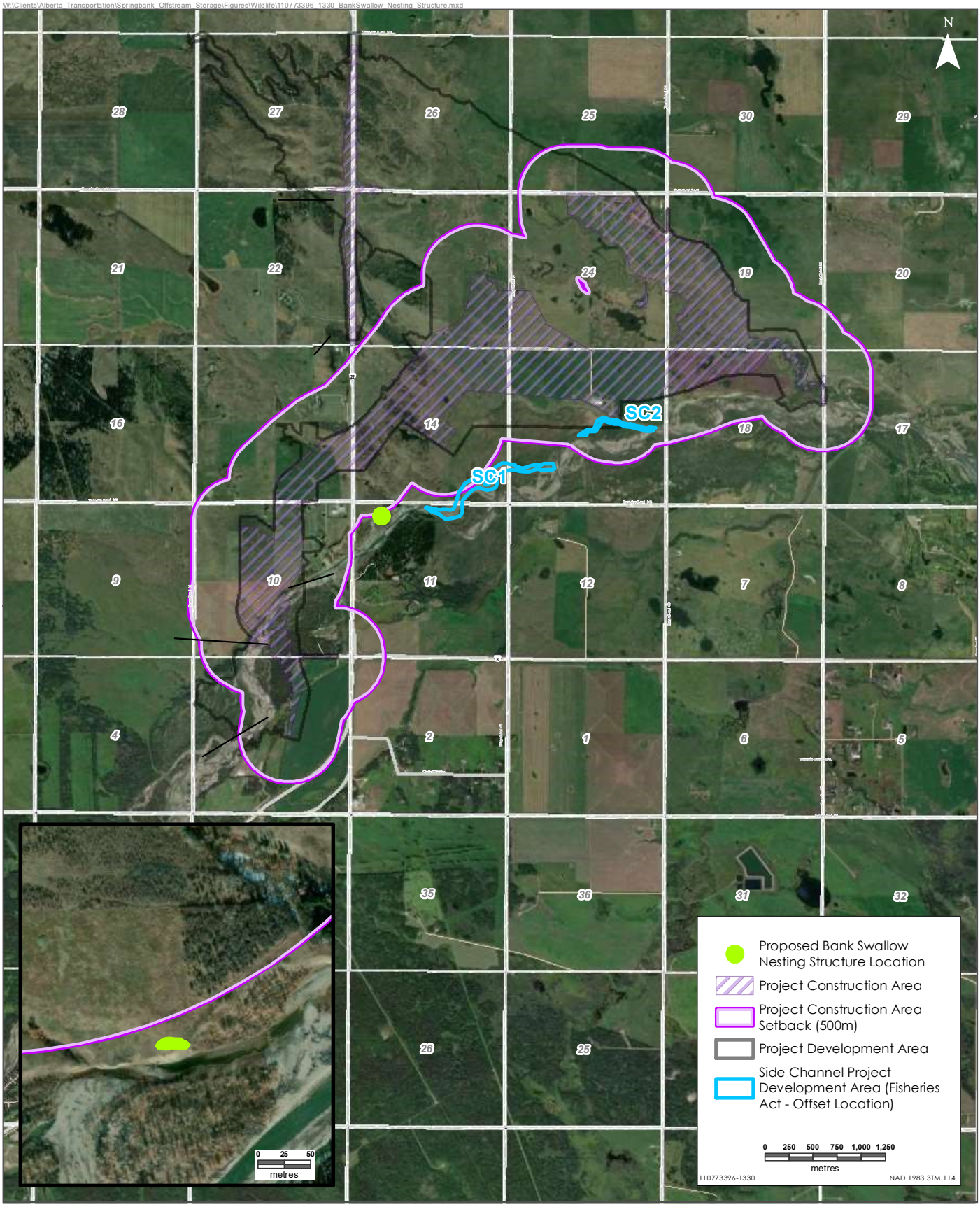


Figure 2. Proposed Bank Swallow Nesting Structure



December 22, 2021

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Bank Swallow Nesting Structure Location

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CLOSURE

We hope this memo provides the necessary detail regarding the proposed bank swallow nesting structure. If there are any questions, please do not hesitate to contact Dave Brescia at Stantec Consulting.

Respectfully,

Stantec Consulting Ltd.

<original signed by>

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Attachment: [NA]

cc. Mark Svenson, Alberta Transportation

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