Herpetofauna in the Steepbank Study Area

May, 1996

Prepared for:

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This report is one of a series of reports prepared for Suncor Inc. Oil Sands Group for the Environmental Impact Assessment for the development and operation of the Steepbank Mine, north of Fort McMurray, Alberta. These reports provided information and analysis in support of Suncor's application to the Alberta Energy Utilities Board and Alberta Environmental Protection to develop and operate the Steepbank Mine, and associated reclamation of the current mine (Lease 86/17) with Consolidated Tailings technology.

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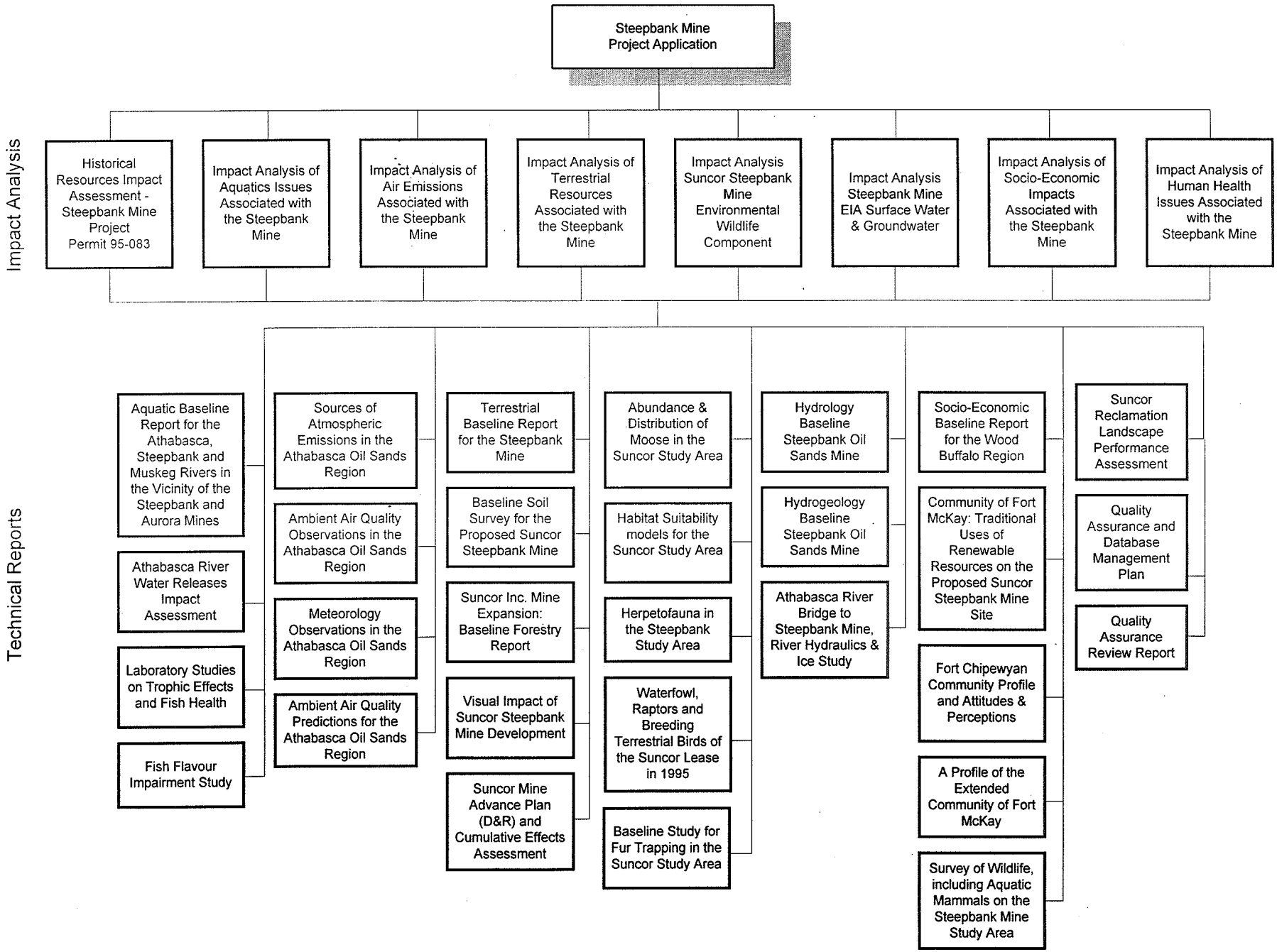

Reports Prepared for the Steepbank Mine Environmental Assessment

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Prepared for:

Suncor Inc., Oil Sands Group
Fort McMurray, Alberta

Prepared by:

Westworth, Brusnyk & Associates Ltd.
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EXECUTIVE SUMMARY

A study, which involved both an auditory census and a search of wetland shorelines, was conducted in the Suncor local study area in May 1995 to determine the abundance and distribution of amphibians and reptiles. Only two amphibian species, the boreal chorus frog and the wood frog, were identified during the study. The boreal chorus frog, which was most common in sedge wetlands with dense emergent and submergent vegetation, was recorded at 46% of 37 sites and was the most abundant and widespread amphibian. However, breeding by this species in the study area could not be confirmed. Wood frogs, which appeared to require less emergent vegetation than boreal chorus frogs, were also abundant and widespread in the study area. Wood frogs were recorded at 38% of the wetlands surveyed and observations of wood frog egg masses and tadpoles confirmed that they breed in the study area. In contrast, although Canadian toads have been reported in the Fort McMurray region in the past, none were recorded during this study. Although this may reflect the lack of suitable terrestrial habitat for the species, there is some concern that the species may be declining across Alberta. Similarly, no red-sided garter snakes were recorded during this study, although they may occur in areas with suitable wintering habitat along the Athabasca and Steepbank Rivers.

ACKNOWLEDGMENTS

This baseline report was prepared for Suncor Inc., Oil Sands Group (Suncor) by Westworth, Brusnyk & Associates Ltd. as part of the Suncor Steepbank Mine Environmental Impact Assessment (EIA). Mr. Don Klym was the Suncor project manager and Ms. Sue Lowell was the Suncor project coordinator. Mr. Steve Tuttle was Suncor's task leader for the wildlife resources component. Mr. Hal Hamilton of Golder was the EIA project manager.

The component leader for the wildlife resources impact assessment was Mr. Lawrence Brusnyk. Mr. C. Fisher served as the principal author of this baseline report. The field work was conducted by Mr. C. Fisher and Mr. D. Albright. Ms. Kari Donnelly and Ms. Carol Brittain were responsible for word processing and report formatting.

Mr. Lawrence Brusnyk, Mr. John Gulley (Suncor), and Ms. Bette Beswick reviewed the draft of the report.

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1.0 INTRODUCTION

The distribution of amphibians and reptiles in northeastern Alberta is not well understood. However, based on information contained in Roberts et al. (1979) and records maintained by the University of Alberta, it is believed that five amphibian species, the wood frog (*Rana sylvatica*), northern leopard frog (*R. pipiens*), boreal chorus frog (*Pseudacris triseriata*), Canadian toad, (*Bufo hemiophrys*) and boreal toad (*B. boreas*), and one reptile, the red-sided garter snake (*Thamnophis sirtalis*), could potentially occur in the Suncor local study area. Because populations of these species in northeastern Alberta are at the extreme northern limit of their North American range, the species diversity of herpetofauna (amphibians and reptiles) in this area is usually low; however, populations may be locally abundant where habitat is favourable.

Because little is known about the status of amphibian and reptile populations in the area that could be affected by the development of the Steepbank Mine, Suncor Inc., Oil Sands Group retained Westworth, Brusnyk & Associates Ltd. to undertake a survey of herpetofauna populations in the Suncor study area.

2.0 METHODS

All frogs and toads (anurans) known to reside in northeastern Alberta reproduce and develop in aquatic communities. Therefore, herpetofauna studies were conducted at 37 wetlands in the Suncor study area with the potential to support breeding populations of anurans. These wetlands were identified from either aerial photographs or during field reconnaissance. Field investigations of these sites were conducted between 18 and 21 May, 1995. Because boreal amphibians congregate in wetlands to breed during spring, this timing allowed an assessment of the species composition and distribution of breeding populations. However, following transformation, adult anurans are primarily terrestrial.

At each study site, an auditory census, which used the distinctive calls of breeding males to identify amphibians to the species level, was conducted for 10 minutes. Following the auditory census, at least 100 m of wetland margin was searched for adult and juvenile amphibians, and egg masses. Wetland type, cloud cover, the area of open water (m^2), surrounding community type, time of day, and geographic location were also recorded for each site.

3.0 RESULTS

Only two species of herpetofauna, the wood frog and the boreal chorus frog, were identified during this study. These two species were widespread and attained high densities in suitable habitats.

3.1 Boreal Chorus Frog

The boreal chorus frog was the most abundant and widespread amphibian recorded during this study (Table 1). This small cryptic frog is rarely seen, but males call continuously into June, well after breeding has ended. The boreal chorus frog was recorded at 46% of the 37 wetlands surveyed, although breeding in the study area could not be confirmed. No egg masses or tadpoles of this species were recorded; however, the egg masses of boreal chorus frogs are difficult to observe because they are small and inconspicuous (<4 cm in diameter), and are often attached to dense vegetation (Wright and Wright 1949).

Sedge (*Carex* spp.) wetlands with dense emergent and submergent vegetation were the most common habitat type used by breeding boreal chorus frogs (Table 1). As many as 100 male chorus frogs were recorded in some of the larger sedge wetlands (>1 ha). However, because only vocalizing males can be enumerated by the auditory count technique, it is believed that the total population in some large sedge wetlands could exceed 400 transformed frogs (i.e., males, females, and juveniles). Wetlands with large expanses of open water, such as large deep marshes, lakes, well-maintained beaver ponds, and reservoirs do not appear to provide suitable habitat for the boreal chorus frog in the Suncor local study area.

3.2 Wood Frog

Although male wood frogs can be easily identified by their characteristic vocalizations, the peak calling period had ended before this study was conducted. As a result, the effectiveness of the auditory census technique was reduced. However, wood frogs are fairly conspicuous as adults and their large egg masses (>5 cm in diameter) are often laid communally near the surface of the water (Russell and Bauer 1993). Thus, the search of wetland margins provided an effective means of determining the distribution of this species in the study area.

Wood frog adults, larvae or egg masses were recorded at 38% of the wetlands included in this study. Wood frogs were often found in conjunction with boreal chorus frogs but were also common in shallow wetlands with sedge margins (Table 2). However, wood frogs, which were sometimes recorded in beaver ponds, reservoirs and ditches in which little aquatic vegetation was present, appeared to be less restricted to sites with emergent vegetation than boreal chorus frogs. The presence of wood frog egg masses, most of which were attached to vegetation or debris, confirmed breeding by this species at 10 sites. The largest groups, which contained as many as 20 egg masses, were found at the top of submerged vegetation. Some egg masses appeared to have been destroyed by a foreign agent, such as fungus or bacteria; however, total egg mortality seldom exceeded 20% in any wetland. Recent wood frog tadpoles were recorded at two sites (H18 and H27).

3.3 Wetlands with Low Anuran Populations

Few amphibians were recorded at some of the wetlands identified as potential herpetofauna habitat in this study (Table 3). No amphibians were recorded in small sedge wetlands, all of which were relatively dry, or in any of the streams included in the survey. Similarly, only one wood frog egg mass was recorded at a total of five sites (H25, H26, H28, H29, H32) located at three large reservoirs in the study area and only one wood frog was located at three sites (H20, H21, H24) in large cattail (*Typha latifolia*) wetlands located within the Athabasca River valley. Active beaver ponds also supported few amphibians.

4.0 DISCUSSION

The Suncor study area has numerous sites that support breeding populations of anurans. Temporary wetlands are common throughout the study area and, in wet years, low-lying area in cutlines, natural clearings and ditches may also provide suitable breeding habitat. Permanent wetlands are also widely distributed, although the larger permanent wetlands and reservoirs do not appear to be productive spawning sites. These wetlands often have shorelines that are steep and sparsely vegetated, and may also support populations of predatory fish, birds, or mammals.

The species composition and habitat utilization of amphibian populations in the Suncor study area as indicated by this study are similar to those reported by Roberts et al. (1979) who conducted studies of herpetofauna in northeastern Alberta in 1977. Those authors reported that three species of amphibians, the wood frog, boreal chorus frog and Canadian toad, occurred in the Alberta Oil Sands Environmental Research Program (AOSERP) study area, which includes the present Suncor study area. Amphibians in the AOSERP area were usually restricted to areas that provided a combination of suitable spawning, larval development, overwintering, and terrestrial habitat (Roberts et al. 1979).

In northeastern Alberta, wood frogs achieve their highest densities in grassy meadows and poplar forests, whereas boreal chorus frogs are frequently associated with sedge-fen and grass meadows (Roberts et al. 1979). Boreal chorus frogs also require spawning sites with emergent and submergent vegetation that will persist into August, and which have a pH that is neutral or slightly alkaline. Both wood frogs and boreal chorus frogs overwinter in terrestrial habitat by burrowing into organic debris or loose substrates in dry sites.

Canadian toads were not recorded during this study, although wetlands that appeared to provide suitable spawning habitat for the species were surveyed. Roberts et al. (1979) indicated that, in the AOSERP area, Canadian toads spawn in natural ponds, borrow pits, streams and lake margins, and utilize grassy meadows for most of the remainder of the year. In 1977, Canadian toads were reported at nine of 18 sites surveyed by Roberts et al. (1979) in the AOSERP study area; however, none were recorded in the present Suncor study area, although two sites in the Suncor study area west of the Athabasca River were included in the 1977 survey. Although the lack of grassy meadows may limit Canadian toad populations in the Suncor study area, there is some concern that the species may be undergoing a widespread

population decline in Alberta. Declining populations have been reported in west-central Alberta (Roberts 1992) and at Elk Island National Park (Russell and Bauer 1993).

Although the Suncor study area lies within the reported range of the red-sided garter snake (Russell and Bauer 1993), this species was not recorded during either this study or the study conducted in the AOSERP area by Roberts et al. (1979). However, small isolated populations of garter snakes may occur near suitable overwintering sites, which, in the study area, are most likely to occur near the Athabasca and Steepbank Rivers. Garter snakes hibernate in communal dens located in areas of fractured sedimentary rock or slumping.

5.0 LITERATURE CITED

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TABLES

6.0 TABLES

Table 1. Sites within the Suncor local study area with boreal chorus frogs.

Site	# of Frogs Heard	Wetland Type	Open Water (m^2)	Community	Location
H1	5	Sedge	3	Black spruce	N 57°00.457' W 111°21.466'
H2	10	Sedge	1	Tamarack	N 57°00.448' W 111°20.001'
H3	5	Sedge	1	Black spruce	N 57°00.285' W 111°20.795'
H4	10	Sedge	1	Tamarack	N 56° W 111°
H7	10	Sedge	3	Tamarack/ Black spruce	N 56°59.721' W 111°19.729'
H8	1	Sedge	3	Willow	N 56°59.724' W 111°19.471'
H10	5	Sedge	1	Willow	N 57°01.061' W 111°20.206'
H13	1	Beaver pond	7500	Tamarack/ Black spruce	N 56°58.293' W 111°24.032'
H16	2	Beaver pond	15000	Mixedwood	N 56°57.214' W 111°24.022'
H22	10	Sedge	1	Tamarack/ Black spruce	N 56°54.418' W 111°26.819'
H23	40	Marsh	10	Black spruce	N 56°54.817' W 111°26.995'
H27	10	Marsh	90	Mixedwood	N 56°57.079' W 111°32.033'
H31	80	Beaver pond	10	Mixedwood	N 56°57.390' W 111°37.595'
H33	40	Beaver pond	2	Willow	N 56°58.008' W 111°35.670'
H35	100+	Sedge	7500	Aspen/Poplar	N 56°55.186' W 111°41.035'
H36	25	Sedge	2500	Aspen/Poplar	N 56°55.520' W 111°42.330'
H38	10	Sedge	15	Mixedwood	N 56°55.815' W 111°38.269'

Table 2. Sites within the Suncor local study area with wood frogs.

Site	# of Frogs	# Egg Masses	Wetland Type	Open Water (m^2)	Community	Location
H2	1	2	Sedge	3	Black spruce	N 57°00.448' W 111°20.221'
H3	1	0	Sedge	1	Black spruce	N 57°00.285' W 111°20.795'
H5	0	20	Sedge	3	Willow	N 57°00.168' W 111°20.017'
H10	0	8	Sedge	1	Willow	N 57°01.061' W 111°20.206'
H11	0	7	Sedge	2	Black spruce	N 57°01.020' W 111°20.586'
H12	0	30	Sedge	5	Black spruce	N 57°00.976' W 111°22.495'
H16	1	1	Beaver pond	15000	Tamarack/ Black spruce	N 56°57.214' W 111°24.022'
H18	0	40	Borrow pit	200	Mixedwood	N 56°59.655' W 111°25.326'
H19	0	11	Sedge	10	Mixedwood	N 56°59.930' W 111°26.586'
H20	1	0	Marsh	20000	Mixedwood	N 57°01.614' W 111°28.873'
H23	2	0	Marsh	10	Black spruce	N 56°54.817' W 111°26.995'
H26	0	1	Reservoir	50000	Mixedwood	N 56°55.587' W 111°30.196'
H27	0	1	Sedge	15	Mixedwood	N 56°57.079' W 111°32.033'
H37	1	0	Ditch	60	Black spruce	N 56°55.519' W 111°38.914'

Table 3. Wetlands in the study area without evidence of amphibian utilization.

Site	Wetland Type	Open Water (m^2)	Community	Location
H6	Sedge	1	Tamarack	N 56°59.759' W 111°20.082'
H9	Beaver pond	100	Mixedwood	N 56°59.626' W 111°19.152'
H14	Sedge	1	Tamarack	N 56°56.330' W 111°22.433'
H15	Sedge	1	Black spruce	N 56°56.664' W 111°23.081'
H21	Cattail marsh	20,000	Mixedwood	N 56°57.883' W 111°26.337'
H24	Cattail marsh	20,000	Mixedwood	N 56°54.716' W 111°26.484'
H25	Reservoir	20,000	Mixedwood	N 56°55.462' W 111°29.749'
H28	Reservoir	50,000+	Mixedwood	N 56°58.530' W 111°35.479'
H29	Reservoir	50,000+	Mixedwood	N 56°59.358' W 111°34.043'
H30	Creek	30	Mixedwood	N 56°56.834' W 111°40.671'
H32	Reservoir	50,000+	Mixedwood	N 56°58.373' W 111°35.967'
H34	Creek	10	Mixedwood	N 56°57.201' W 111°35.350'