McClelland Wetlands:

Mining Our Outstanding Peat Wetlands Should Be Passé

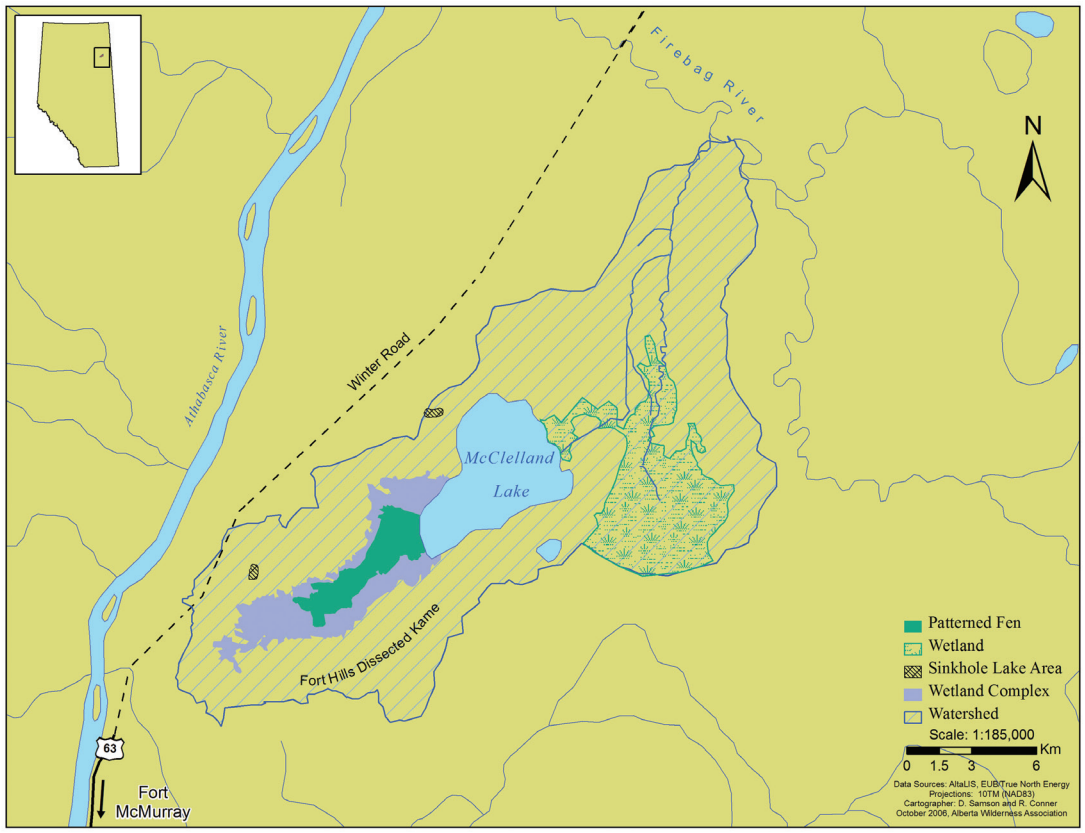
BY CAROLYN CAMPBELL,
AWA CONSERVATION SPECIALIST

"Suncor, Total May Not Proceed with New Oil-Sands Mines" read a late July 2012 Dow Jones newswire article. This was important information to consider for the fate of the ecologically and aesthetically outstanding McClelland Lake wetland complex in northeastern Alberta. In a deeply flawed process in 2002, regulators approved mining of the upper part of the McClelland watershed, including half of its rare "patterned fen," by the Fort Hills tar sands mine project; the caveat regulators added was that there be no damage to the un-mined portion of the complex.

Ten years later, the Fort Hills project has not yet received formal approval from the current leaseholder owner/operator Suncor Energy. Citing greatly increased light oil production in North America, Suncor's CEO stated to investment analysts that Suncor was reviewing the scope and profitability of its new mines. Further bad news came in a mid-August CIBC energy report on North American energy projects, which stated that a glut of light oil production and limited pipeline capacity will mean high-cost oil sands mines will be the first energy investments to be deferred in favour of less capital-intensive alternatives.

Located 85 kilometres north of Fort McMurray on the east side of the Athabasca River in the Fort Hills of northeastern Alberta, the McClelland Lake wetland complex (MLWC) is a Canadian natural heritage treasure. The lake and wetlands are important both for their aesthetic and ecological qualities. The complex consists of two large patterned fens – peat wetlands built up since the last glacial retreat by complex shallow groundwater flows. McClelland Lake fen on the southwest side of McClelland Lake is intricately patterned, with hundreds of narrow treed ridges (strings) separating long, narrow, shallow pools of water (flarks). The watershed also features 12 sinkhole lakes, which are rare in Alberta.

In terms of its ecological importance, McClelland Lake is the largest natural water body between Fort McMurray and the internationally significant wetlands of the Peace-Athabasca delta, which is one of the world's largest inland freshwater deltas. McClelland Lake wetland complex is an important stopover point along a major North American migratory bird route towards the Peace-Athabasca Delta, and is an important breeding area in its own right. Two hundred and five bird species have been recorded within or near MLWC, of which more than 100 stay to breed. The endangered whooping crane has been seen on several occasions in these wetlands. The wetland complex is home to other species of concern, including the Canadian toad, yellow rail, rusty blackbird and short-eared owl. The complex hosts over twenty rare or endangered plant species and a rare vegetation community.



Bad Politics Plunders an Ecological Treasure

The McClelland Lake wetland complex was originally excluded from surface mining in the provincial government's 1996 regional Integrated Resource Plan (IRP). This IRP was developed in a sound process including four years of extensive public consultation. However, due to industry lobbying, the Alberta government suddenly amended the IRP in mid-2002 after a brief, poor public consultation, before the Fort Hills mine

application hearing began. The amended IRP allows mining in half of McClelland Lake fen and the entire upper watershed that feeds the wetland complex. At that time, the Fort Hills project was owned by True North, a subsidiary of the secretive and powerful U.S. private company Koch Industries.

Incredibly, at the 2002 Fort Hills mine application hearing, regulators allowed True North to set aside the negative Environmental Impact Assessment (EIA) that was part of their application. This EIA had stated that water table disruptions from mine dewatering and other lease disturbances would likely kill peat-forming mosses, ending peat production on the fen. Instead, regulators agreed that a company-led Sustainability Committee could devise a plan to sustain the half of the wetland complex that the amended IRP said must remain un-mined. Approval was granted for the mine, about three-quarters of which is outside the McClelland watershed. The Alberta government stipulated that six years before operations began in the McClelland watershed, the government must receive and approve an operating plan to ensure that, in the un-mined portion of the McClelland Lake wetland complex, water flows, water chemistry, and water levels are maintained.

After several ownership changes, Fort Hills is now held by Suncor (which owns just over 40%), French petroleum giant Total (just under 40%) and Teck Resources (20%). According to media reports, Suncor still plans to present a development plan in mid-2013 to its Board of Directors for sanctioning Fort Hills and other projects. Total must also approve the go-ahead of Fort Hills. Teck recently announced it would be slowing down its preproduction spending on the project amidst current weaknesses in global commodity markets.

While the investment community may now be concerned about mine profitability, it would be foolish to be complacent about the fate of this exceptional wetland complex. According to its required annual update on activities in Fort Hills, submitted April 2012, Suncor had notified the Alberta government in late 2011 that the project site was returning to active status after a period of inactivity. Further site clearing was planned for 2012 in watersheds south of McClelland.

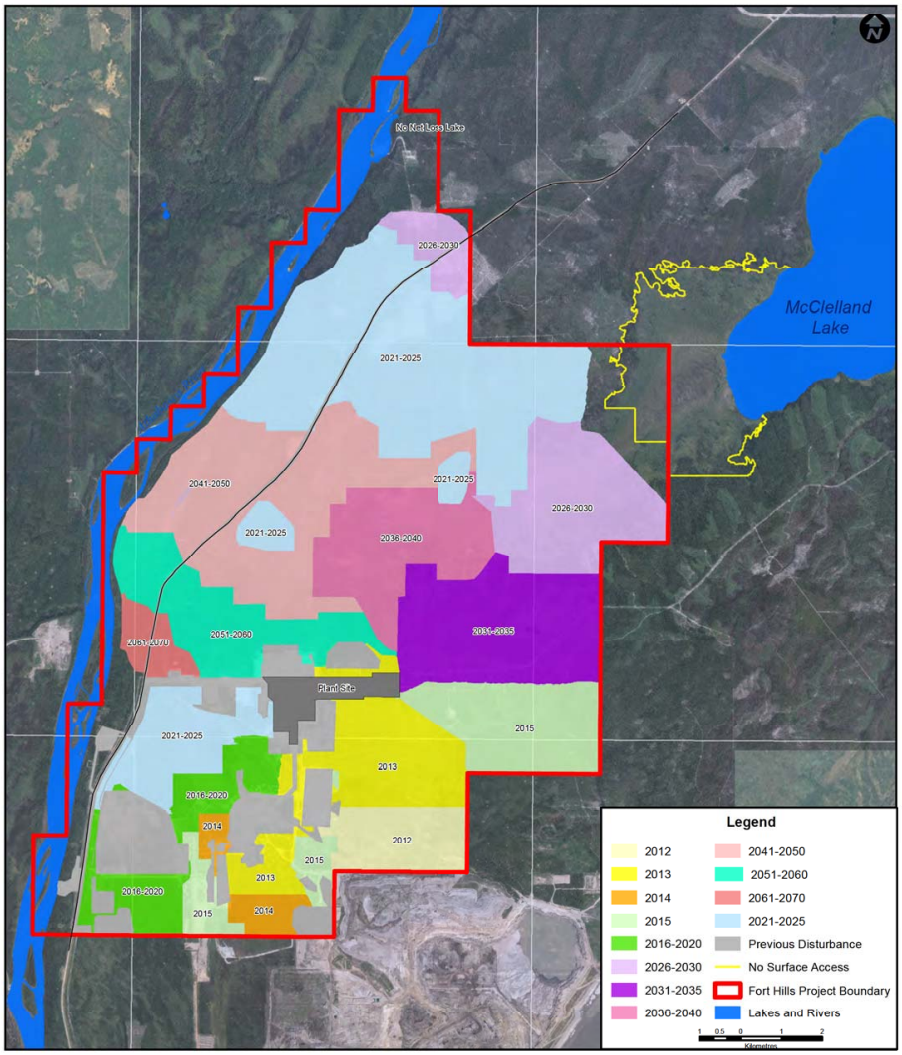


FIGURE 9-1. LIFE OF MINE DISTURBANCE OVERVIEW

NOTES
IMAGERY DATE: AUGUST 2011

Area of Interest

SUNCOR ENERGY OPERATING INC.

FORT HILLS - OIL SANDS PROJECT
LIFE OF MINE DISTURBANCE OVERVIEW
CONSERVATION AND RECLAMATION PLAN

PROJECTION	DATUM	CONTRACTOR NAME	PARAGON MAP NUMBER
UTM 12N	NAD83	PARAGON SOIL	11018-111024-01

DRAWN	CHECK	DESIGN	APPR.	DATE	SCALE	SUNCOR MAP NUMBER	REV.
LP	LW	LW	LW	2011 10 24	1:120,000	NOT ASSIGNED	--

Disturbance schedule from Suncor's as yet unapproved Fort Hills 2011 closure plan. If approved, excavation to destroy the 'upper' half of McClelland watershed (which sustains the downstream or 'lower' half) would begin in 2021. Note the proximity of mining to the yellow 'no surface access' border inside the McClelland Lake wetland complex.

Suncor's April 2012 report also summarized MLWC Sustainability Committee activities. Committee members have decided which monitoring indicators to use to meet regulatory requirements. A network of surface water and groundwater sites in the McClelland fen is now monitoring water quality and flows. Vegetation monitoring plots have been established in the fen, and bird and other wildlife monitoring has been initiated. Suncor stated that it intends to submit in 2012 the required operational plan to mitigate the mine's effects on the un-mined portion of the MLWC. AWA has not yet seen this proposal.

Suncor states that the un-mined wetland complex will be isolated from the mine and will have "sufficient surface and groundwater flows" of the "required water quality." The company doesn't explain how it will do this.

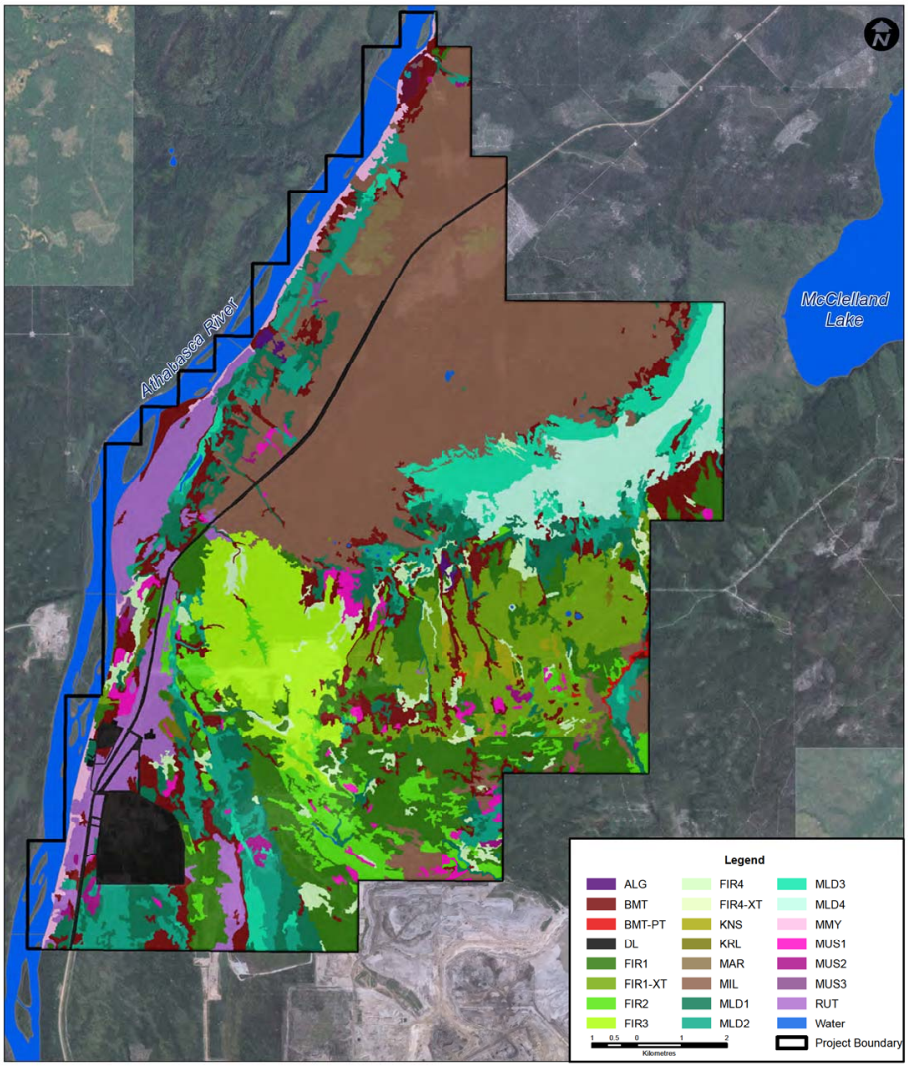


FIGURE 9-16. BASELINE SOIL SERIES DISTRIBUTION

NOTES
IMAGERY DATE: AUGUST 2011

SUNCOR ENERGY OPERATING INC.

FORT HILLS OIL SANDS PROJECT
BASELINE SOIL SERIES DISTRIBUTION
CONSERVATION AND RECLAMATION PLAN

PROJECTION	DATUM	CONTRACTOR NAME	PARAGON MAP NUMBER
UTM 12N	NAD83	PARAGON SOIL	11018-111024-15

DRAWN	CHECK	DESIGN	APPR.	DATE	SCALE	SUNCOR MAP NUMBER	REV.
BD	LW	LW	LW	2011 10 24	1:110,000	NOT ASSIGNED	--

"By law, the post-mine landscape must be 'reclaimed to equivalent land capability.' It's ludicrous to suggest that there will be equivalency in soils, vegetation and species richness in this (Suncor's) proposed closure plan."

A Closure Plan or Closure Experiment?

Some of Suncor's intentions for McClelland's wetlands are evident in the Fort Hills 2011 Reclamation and Closure Plan, which AWA did obtain. This plan was submitted by Suncor to the Alberta government in January 2012 and hasn't been approved yet by the Government of Alberta.

In this 2011 closure plan, Suncor proposes that significant forest clearcutting in the upper McClelland watershed will occur during 2016-2020. Excavating, dewatering, and mining would follow after 2021 (see proposed disturbance map). Half the McClelland Lake wetland complex will be excavated and destroyed. This will include peat layers two to five metres deep (marked as MLD3 and MLD4 on the baseline soil map legend). The topography and soils in the upper half of the watershed that have sustained fresh groundwater flows to allow the wetlands to build their distinctive patterns over 8,000 years would be lost forever. This alone would be an irreplaceable ecological and biophysical loss for this region. Peat wetland vegetation comprises over half the natural landscape of the 4,750 km^2 mineable oil sands region; in other open pit mine leases, no peat wetlands have been successfully recreated. Two fen construction projects are in their infancy, but according to U of A wetland biologists in a March 2012 peer-reviewed paper, at best there will only be a small fraction of the pre-mining area of fens replaced on mine leases. Salt-tolerant marshes with far fewer species are the best prospect currently for wetland replacement.

Suncor states that the un-mined wetland complex will be isolated from the mine and will have "sufficient surface and groundwater flows" of the "required water quality." The company doesn't explain how it will do this. In AWA's view, the massive mine disturbance will very likely destroy the other half of the fen and put the Lake and the rest of the wetland complex at risk. No one has ever tried to save half a patterned fen. A highly experimental engineering and reclamation project on this outstanding peat wetland complex is unacceptable.

The focus in the 2011 closure plan is on how the landscape will be re-contoured and re-vegetated after mining ends. As the two soil maps show, the proposed post-mining lands will lose the incredible variety of soil types laid down by natural processes since the last glaciation. Peat-forming areas will be replaced by far smaller salt marshes and experimental areas that, experimenters hope, will form fens in the distant future.

At one point, the closure plan states: "Given the importance of this habitat for yellow rail, moose, and special status non-vascular plant species, and given the extent of fens in the baseline study area, creating fen wetlands is fundamental to the wetland reclamation plan." But there are major disclaimers elsewhere around prospects for peat-forming wetlands. There is the uncomfortable fact that even current climate conditions in Alberta's boreal forest are drier than when the peat wetlands were forming 8,000 years ago; the added stress of climate change will only dim the prospects of fen creation.

The closure plan states that "with current or cooler climate conditions, peat is expected to accumulate and shrub fens may establish and total fen area would likely increase… Should climate warm, become drier, and/or subsurface flowpaths not establish, upland ecosites – or transition [wet upland] ecosites at best – would likely become established." In other words, do not expect peat wetlands on this landscape. By law, the post-mine landscape must be "reclaimed to equivalent land capability." It's ludicrous to suggest that there will be equivalency in soils, vegetation and species richness in this (Suncor's) proposed closure plan.

There is even significant uncertainty about how well prairie-like marsh wetlands will function. The reclaimed peat-mineral soil mix Suncor proposes for wetlands will have natural hydrocarbon "tarballs" from the churned-up soils. So the company must monitor and mix soils to below-toxic levels of hydrocarbons. The salts present in the region's disturbed layers of marine soils will also limit successful wetland construction: the plan notes that "a critical condition that will be difficult to predict or address is the salinity of the soils and influent water." The plan also notes that little is known about re-vegetation of boreal wetland plant species.

As for the un-mined portion of the McClelland Lake wetland complex, it is scheduled to receive discharge from a constructed East end pit lake filtered through a buffer of constructed treatment wetlands. End pit lakes are far deeper than the region's natural water bodies; their viability to treat mine-affected water and to function as ecosystems has not yet been demonstrated for oil sands mine reclamation. Suncor proposes to drain a post-mining engineered area of 60 km^2, including most of the mines' tailings drying areas and the North and South Dumps, via vegetated waterways into the East end pit lake (the green lines on the reclaimed soils map). But there are disclaimers about the waterways as well: "The success of vegetated waterways is highly dependent on the success of the vegetation cover, which can be compromised by poor runoff water quality (in particular the presence of salts) or frequent flow, which may occur even in very small watersheds if groundwater seepage is present." With constructed wetland success hedged by many disclaimers, this seems a poor, risky solution to count on to provide fresh water in the quantity and quality needed for the un-mined McClelland Lake wetland complex, even assuming it hasn't died from changes in water quantity or quality over decades of upstream mine activity. This closure plan leaves little room for error when huge uncertainties and high ecological loss are at stake.

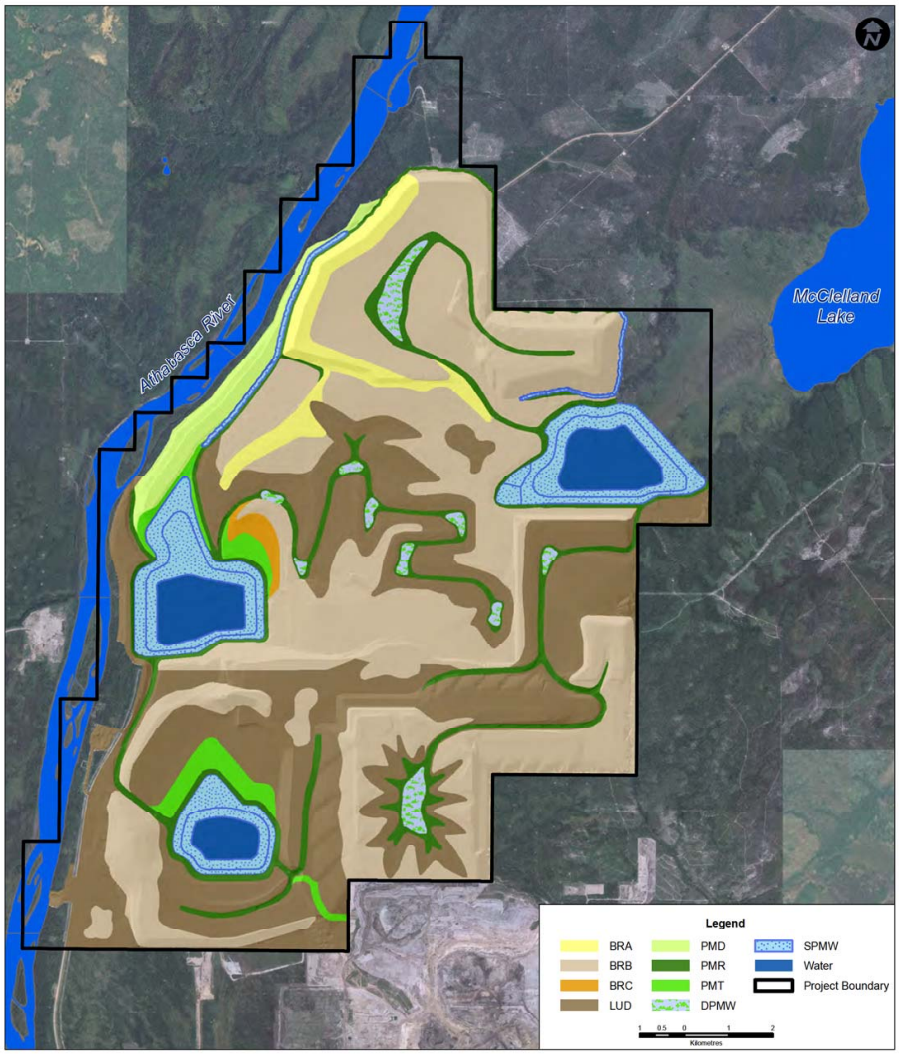


FIGURE 9-15. RECLAIMED SOIL PRESCRIPTION DISTRIBUTION

NOTES
IMAGERY DATE: AUGUST 2011
Soil Prescriptions:

BRA - Brunisolic A
BRB - Brunisolic B
BRC - Brunisolic C
LUD - Luvisolic L
PMD - Peat-Mineral Mix D
PMT - Peat-Mineral Mix Transitional
PMT - Peat-Mineral Mix Transitional
PMR - Peat-Mineral Mix Riparian
DPMW - Deep Peat-Mineral Mix Wetland
SPMW - Shallow Peat-Mineral Mix Wetland

See Table?? for deatiled descriptions.

SUNCOR ENERGY OPERATING INC.
FORT HILLS OIL SANDS PROJECT
RECLAIMED SOIL PRESCRIPTION DISTRIBUTION
CONSERVATION AND RECLAMATION PLAN

PROJECTION	DATUM	CONTRACTOR NAME	PARAGON MAP NUMBER
UTM 12N	NAD83	PARAGON SOIL	11018-111024-16

DRAWN	CHECK	DESIGN	APPR.	DATE	SCALE	SUNCOR MAP NUMBER	REV.
BD	LW	LW	LW	2011 10 24	1:110,000	NOT ASSIGNED	--

Natural soils are far more diverse than reclaimed soils, from Suncor's as yet unapproved Fort Hills 2011 closure plan. In this proposal, after the year 2070, mining process-affected water from the north and southeast mine site will flow in constructed streams (green lines) into the East end pit lake, then through constructed marsh wetlands (dotted blue zones) into the un-mined part of McClelland Lake wetland complex.

Six wildlife species or groups are the focus of closure biodiversity plans: snowshoe hare, beaver, moose, black bear, muskrat, Canadian toad and unspecified waterfowl. For wetland types, the key species types are moose, beaver, muskrat, common loon and two special status species, Canadian toad and yellow rail. The 2011 closure plan states "there is considerable uncertainty as to whether these special status species might colonize these habitats, but the wetland types and designs are being selected to increase the likelihood." In AWA's view, the anticipated drier landscape of young forests, shrubs and salt marshes will very likely support far fewer species than the previous landscape.

Half of the outstanding McClelland Lake patterned fen is slated for certain destruction; the other half is unlikely to survive if the Fort Hills tar sands mine proceeds.
PHOTO: © J. REZAC, WWF-UK

What About a Land Swap?

A pioneering agreement between Environment Canada and French energy company Total may offer a path to a future for McClelland Lake wetland complex. In 2011, Total received regulatory approval for its Joslyn North oil sands mine, but at last the Government of Canada recognized that under the *Species at Risk Act*, it needed to ensure that destroyed habitat for species at risk on the Joslyn Mine lease should be replaced elsewhere. In an October 2011 agreement, Total committed to provide replacement habitat for the common nighthawk and Canada warbler, and "where and when possible," for the olive-sided flycatcher. The location identified as a good candidate for securing the habitat was lands on the east shores of McClelland Lake (Fort Hills is to the west of McClelland Lake). These lands were leased by the Alberta government to energy companies (another poor decision, in AWA's view) and now form part of the Northern Light Partnership tar sands mine leases owned by Total and SinoCanada Petroleum Corporation.

Northern Lights does not currently plan to develop the bitumen resources in that part of the lease and Total is prepared to replace the species at risk habitat affected by the Joslyn Mine with "ecologically equivalent" land on their McClelland lands. Equivalence is defined in the agreement as the ability to support and sustain similar life cycle activities. The parties can reconsider which lands will be replacement habitat if Total decides to develop McClelland lands or if there is a fire. The agreement is in effect until Environment Canada determines replacement habitat is no longer required because there has been sufficient reclamation on the Joslyn Mine lands or because Total provides sufficient alternate replacement habitat. While not perfect, this agreement suggests that, at a bare minimum, the best intact habitat left in the mineable oil sands should remain intact as replacement habitat for species at risk affected by current mines.

If Fort Hills does mine in the McClelland watershed, there will be a decades-long vivisection of the ecological treasure that is the McClelland Lake wetland complex – half will be destroyed forthwith, with a very poor replacement after many decades that will lack the wetlands and species richness. The other half is unlikely to receive adequate clean fresh water in the highly uncertain decades during and after upstream open pit mine excavations. There is very little prospect of re-creating healthy peat wetlands that make up over half the natural pre-mining landscape of the 4,750 km^2 mineable oil sands region, 99 percent of which has already been leased. Clearly, McClelland watershed should be removed from the mining plans of the Suncor-Total-Teck Fort Hills mine. The Alberta government should compensate Suncor for its McClelland lease, perhaps via operating oil sands mining companies collectively bearing the compensation cost as an offset to the irreplaceable peat habitat they are destroying. AWA will continue to work to try to ensure a bright future for this ecological gem in northeastern Alberta.