The colonialism of carbon capture and storage in Alberta’s Tar Sands

Chloe Alexander
University of Guelph, Canada

Anna Stanley
University of Guelph, Canada

Abstract
This essay considers carbon capture and storage (CCS) in relation to struggles over value and territorial jurisdiction in the Alberta Tar Sands. Critical engagements with CCS have pointed to the legitimising function of the technology and highlight its role normalising extraction in the tar sands. We suggest that neither the significance of CCS nor the legitimation function it performs can be fully understood absent an analysis of settler colonialism. CCS we argue is a colonial flanking mechanism directly centred on the governance of harm that construes harm in ways that reproduce settler colonial entitlements to Indigenous lands, bodies and ecosystems and helps to consolidate state jurisdiction and power in the tar sands. This construal of harm also productively intersects other colonial strategies of harm reduction relative to the tar sands, including the criminalisation of Indigenous jurisdiction, and is part of a broader relational context that prioritises settler colonial futurity.

Keywords
Carbon capture and storage, settler colonialism, harm, criminalisation, Indigenous jurisdiction, Alberta Tar Sands

Introduction
““It’s the backbone infrastructure,” said Pearson. “It’s like building the Trans Canada (highway) when you’ve got a few cars running up and down, but you know cars are going to take off.” ... the 240-kilometre pipeline, as its name suggests, is considered a trunk. Now that it’s built, his company
believes it can begin to add lateral pipelines, much shorter in length, that can connect more carbon emitters with oil producers” (Pearson of Wolf Midstream quoted in Friedman, 2020).

In early August 2018, the Canada Pension Plan Investment Board (CPPIB) announced a 305 million dollar investment in the Alberta Carbon Trunk Line (ACTL), a pipeline designed to carry carbon dioxide (CO₂) captured from refining and upgrading facilities in the Alberta Tar Sands to ‘enhanced oil recovery’ (EOR) operations in depleted oil wells in central Alberta. The investment in so called ‘backbone infrastructure’ intended to grow into an interconnected system of carbon pipelines joining ‘carbon emitters with energy producers’ (above) in Alberta was made through Wolf Midstream, a portfolio company of the CPPIB who would construct, own and operate the pipeline (and CO₂ storage facility) and championed as important climate leadership and responsible investing. Tweeting in June 2020 as the system became operational (at only 11% capacity) the Alberta Energy Minister cheered that ‘Once again, Alberta leads the way with game-changing innovation that strengthens our reputation as a responsible energy producer,’ (in Heidenreich, 2020). Now, despite decades of concerns expressed by climate scientists and environmentalists that it will amount to nothing more than a greenwashing of the tar sands – and after years of technological and financial delays and billions of dollars of public finance – carbon capture and storage (CCS) projects have started to become operational, largely thanks to massive new investments from Canadian institutional investors like CPPIB.

2 weeks before CPPIB closed their deal to purchase the ACTL, Kanahus Manuel was arrested for refusing to leave unceded, un-surrendered Secwépemc lands in Clearwater, British Columbia where she and her fellow tiny house warriors had positioned tiny houses occupying and obstructing the proposed route of the Trans Mountain Expansion Pipeline (TMX). The pipeline, slated to expand tar sands production by an estimated 890,000 barrels per day, crosses more than 500 km of unceded, un-surrendered Secwépemc lands (Indigenous Network on Economies and Trade (INET), 2017). Secwépemc (alongside many other land defenders from many other Indigenous nations whose lands the pipeline is proposed to cross) have withheld consent on the grounds that it will cause ecological harm and perpetuate climate crisis (INET, 2017). Manuel was arrested again a year later (October 19, 2019) on Secwépemc lands near a camp at Blue Mountain established to protect a river crossing, again on the route of the TMX pipeline as she (and a fellow land defender) stopped to tell a pipeline construction crew they were trespassing without consent. She was arrested for allegedly ‘bugging’ construction workers and charged with mischief and intimidation. This time she was violently ‘slammed to the ground’ by Royal Canadian Mounted Police (RCMP) officers from the Community Industry Response Group on patrol in the vicinity of the construction camp, restrained (it was eventually discovered she had her wrist broken in the process), transported 200 km south to detention, denied medical treatment for 10 hours, initially denied legal council, and held in custody for two nights before being remanded for bail (Martens, 2019).

This essay considers CCS in relation to struggles over value and territorial jurisdiction in the Alberta Tar Sands. The contrast above reminds us that CCS unfolds within a relational context in which repression of Indigenous jurisdiction and criminalisation of Indigenous land defense are crucial to the reproduction of settler colonial power in the tar sands. Key to this context, we suggest are the ways in which harm is offloaded and construed.

Canada and Alberta are settler states in which the reproduction of capital is premised on access to Indigenous lands and resources and the repression of Indigenous sovereignty and jurisdiction (Coulthard, 2014; Veracini, 2011; Wolfe, 2006). The value of tar sands assets depends on access to Indigenous lands and requires constant delegitimization of Indigenous jurisdiction and political authority – especially when Indigenous communities use this authority to oppose the ecological harms inflicted on their lands and communities (including plant and animal relations), to make
visible the ways in which their lands and bodies have been pressed into service as spaces of toxic storage and containment, to resist overexposure to ecological disruption and to prevent further climate crisis (Cardinal, 2014; Laboucan-Massimo, 2014; Lameman, 2014; Parlee, 2016). While the coloniality of the tar sands and their disproportionate impacts on Indigenous communities are widely acknowledged (just not by government and industry) less apparent are the ways in which harm mitigation strategies like CCS connect with this colonial terrain.

In this essay we suggest that CCS is a mode of governance with distinctly colonial dimensions. Critical engagements with CCS point in particular to the legitimising function of the technology, highlighting the role that it plays both in terms of perpetuating and normalising extraction in the tar sands (e.g. Adkin and Stares, 2016; Le Billion and Carter, 2012). While we agree with these formulations, we suggest that neither the significance of CCS nor the legitimation function it performs can be fully understood absent an analysis of settler colonialism. CCS we argue is a colonial flanking mechanism directly centred on the governance of harm. On the one hand it secures the value of an industry that – in the absence of both indisputable sovereignty and effective territorial control over territories in and necessary to the tar sands and the moral right to waste the people, ecosystems and animals in these territories – is contingent on the violent repression of Indigenous jurisdiction and acts of land defense. On the other, it secures the value of an industry that – especially in a time of Indigenous resurgence focused explicitly on toxic exposure, climate crisis and proliferation of ecological harm – is increasingly contingent on the obfuscation of harm. CCS is a managerial strategy that construes harm relative to the tar sands in such a way as to secure its future as colonial terrain. By design, this construal perpetuates a system of violence rooted in harmful exposure.

Central to our argument is the observation that Indigenous rights, sovereignty and jurisdiction and their assertion through acts of land defense pose a significant threat to investment in the tar sands and to the ability of the settler state to secure the value of tar sands assets. Indigenous sovereignty, Audra Simpson (2011: 211) writes, is ‘nightmarish for the settler state’ since it highlights the precarity of the settler colonial project and the settler states’ authority (see also Benton, 2010: 37–38). Indeed, as Indigenous and allied scholars of settler colonialism have repeatedly pointed out, settler sovereignty (absolute jurisdictional authority of the settler state) is imperfect; such that much of the land within Canada’s territorial borders remains subject to overlapping jurisdiction with Indigenous nations (Mackey, 2016; Manuel, 2015, 2017; Pasternak and Dafnos, 2018; Simpson, 2017). Indigenous jurisdiction creates ‘uncertainty’ with respect to crown title and a return on investments (Manuel, 2015) that undermines Canada’s ability to guarantee profitable access to the tar sands (Pasternak and Dafnos, 2018: 5).

Pasternak (2017: 3) has demonstrated that the state’s assertion of sovereignty over Indigenous peoples is not continuous with the legal authority to exercise territorial jurisdiction over Indigenous peoples and lands (see also Coulthard, 2014; Manuel, 2015; Simpson, 2017). The result, she suggests, is a ‘dynamic of governance’ where ‘state jurisdiction over Indigenous lands is an object of constant struggle to exercise effective sovereign control’ (Pasternak, 2017: 4). This struggle inflects the treatment of harm in the tar sands such that CCS must be read as a site of colonial struggle to secure the colonial terrain of accumulation. Indigenous jurisdiction too, reveals state sovereignty as an ‘effect of practices’ (Blackburn, 2005) that must be continually asserted and produced through a set of complex, intertwined processes that exhaustively inflect the territoriality of the tar sands. The strategies through which Alberta and Canada (and their industry partners) attempt to engage with harm and secure the tar sands are in this sense, exemplary and should be engaged as attempts to manage, circumscribe and extinguish Indigenous sovereignty.

The first part of this paper analyzes the emergence of CCS as a regulatory mechanism concerned with the governance of harm. CCS technologies propose to capture CO2 from industrial processes (including oil refining and upgrading facilities), and transport them via pipeline to suitable deep
geological storage locations for permanent underground storage, often with the intermediate step of using the CO$_2$ to first extract otherwise unrecoverable oil from depleted oilfields (a process known as EOR). Review of the history of CCS (and of the regulatory and policy configurations required to support it) we argue demonstrates how CCS considerably narrows and downplays conceptions of harm to specific and actionable modalities to construe harm as minimal and manageable, and the tar sands as harm-less. The second part of the paper analyzes the ways in which this construal is colonial. While on the one hand it profoundly detracts from the geographies of Indigenous exposure and system of ecological violence that make the tar sands, we argue this construal reproduces settler colonial entitlements to Indigenous lands, bodies and ecosystems and helps to consolidate state jurisdiction and power in the tar sands. This construal of harm also productively intersects other colonial strategies of harm reduction relative to the tar sands. In order to understand CCS as part of a broader relational context that prioritises settler colonial futurity the third part of the paper situates this construal relative to the ways in which Indigenous jurisdiction and land defence in the tar sands have been systematically produced as threats whose immediate neutralisation is paramount (unlike the exposure of Indigenous people to toxic exposure or planetary ecological collapse). Climate governance and security have in other contexts been read as mechanisms concerned with the reproduction of specific forms of power; as strategies for ensuring the continuity of capital and its ability to reproduce and adapt to climate change (see especially Cooper, 2010; Mann and Wainwright, 2018). Here we suggest that CCS – as a technology that interpolates harm reduction in the tar sands – is directly connected to the expansion and reproduction of colonial systems of value (LaDuke and Cowen, 2020) and to ensuring their futurity. To conclude the essay, we return to CPPIB investment in the Trunk Line to reflect on this colonial continuity.

**Protecting the Tar Sands**

CCS is instrumental to the futurity of one of the world’s most ecologically harmful industries. Tar sands bitumen emits more than twice as many greenhouse gas (GHG) emissions as conventional oil (Israel, 2017) and has driven the steady increase in absolute GHG emissions from the oil and gas sector (nationally and for Alberta) since 2000 (Environment and Climate Change Canada (ECCC), 2020b: online). The tar sands play a significant and measurable role in, ‘upending weather systems, killing forests, acidifying the oceans, melting glaciers’ and contributes to the mass extinction of species (Klein, 2014; Robbins, 2015: online). Rather than criminalise or strictly regulate corporate malfeasance, severely restrict emissions or reduce reliance on fossil fuels Canada and Alberta have, for the last two decades, single-mindedly pursued CCS as central to addressing GHG emissions and mitigating climate change (Adkin, 2016; Adkin and Stares, 2016; Zalik, 2016). Pursuit of the technology has from the start been linked to continued exploitation of oil and gas resources in the province – something neither government (throughout 20 years of policy development) has attempted to hide – and as critics have demonstrated, was never actually intended to reduce Alberta’s dependence on hydrocarbons but rather to legitimize, as part of a broader ‘promethean’ discourse of technological innovation and sustainable development, continued exploitation of the tar sands (Adkin and Stares, 2016: 23). To this end both governments have collectively poured billions of dollars of public finance into the promotion and development of CCS (investments regularly justified on the basis that the technology would explicitly contribute to expanded production of tar sands oil) and have directly subsidised tar sands producers and research initiatives aimed at furthering extraction under the guise of harm reduction (Adkin, 2016; Adkin and Stares, 2016: 191).

CCS has also proven to be somewhat of a red herring: pursuit of the technology over the last two decades has, according to analysts, been accompanied by record growth in the tar sands. Absolute annual GHG emissions from Alberta’s oil and gas sector have increased steadily year over year since 2000, driven mainly by the tar sands (Doukas and Scott, 2018: 13; ECCC, 2020b: online).
Between 2000 and 2018 tar sands production grew 376%, reaching an all time high in 2019 (the last date for which figures are available) (Hussey, 2020: 1, 23) and is expected, according to the Canada Energy Regulator, to grow 41% percent over 2018 levels by 2040 accompanied by growth in GHG emissions (Hussey, 2020: 9). Most tar sands producers are forecasting increased production accompanied by planned increases in absolute emissions over the coming decade – despite forecasted intensity reductions due to CCS projects under way (Hussey, 2020). There are currently only 2 operational CCS projects in the tar sands (ACTL and Quest) both operating significantly under capacity\(^2\) and neither contributing to reduction of absolute emissions.\(^3\)

The history of CCS has also involved a dramatic reconfiguration of environmental regulatory and governance frameworks. Over the past 20 years both governments have introduced a slew of regulations, standards, policies and protocols that produced captured carbon as an object of governance – quantifiable and manageable in particular ways through the establishment of new standards and procedures governing all aspects of its capture, transport and storage and according to the logics of the free market. Together with the introduction of new legislation these have created novel terrain and new opportunities for regulatory intervention and have helped to profoundly shape ‘harm’ relative to the tar sands as actionable and manageable. Here we engage these regulatory developments in order to consider the ways in which CCS construes harm.\(^4\)

Canada’s earliest climate strategies envisioned a series of interlinked carbon pipelines adjoining a central ‘backbone’ (initially proposed to run from the tar sands at Fort McMurray) to flow captured carbon throughout the country – and promised strategic investments in centralised CO\(_2\) pipeline infrastructure, funding for CCS demonstration projects, and research into the relationship between CO\(_2\) capture and oil recovery (Government of Canada (GOC), 2000, 2002, 2005; Griffiths et al., 2005). Though CCS was at this time largely theoretical and EOR markets for CO\(_2\) were for the most part nonexistent, the technology became a mainstay of climate strategies with both governments promising significant reductions to GHG emissions (Alberta Environment, 2002a, 2002b; Environment Canada, 1994; GOC, 2000, 2002; Reeve, 2000). CCS was initially proposed as a variation on EOR and drew from many years of collaborative government-industry investigation of the use of industrial gases, including captured carbon to cheaply expand conventional oil and gas production in Alberta and to assess suitability of the Western Canada Sedimentary Basin for post-recovery sequestration (Alberta Environment, 2002a, 2002b; Bachu et al., 2000; Bachu and Stewart, 2002; GOC, 2000: 7, 2002; Reeve, 2000).

Support for CCS in these early strategies was accompanied by significant financial commitments, including to cost share CO\(_2\) pipeline construction with Alberta (GOC, 2002: 35, 2005; see also Griffiths et al., 2005: 58) and (though they were never implemented) by 2007, multiple plans to stimulate a market for captured carbon through regulation of emissions intensity (emission relative to economic output, e.g. a barrel of oil), introduction of market based emissions trading systems (GOC, 2002, 2005, 2007) and (in Alberta) support for EOR markets (Alberta Environment, 2002a, 2002b). It is clear that from the outset CCS was deeply dependent on an incentive structure that linked the viability of the technology to market demand for captured carbon – either for use in EOR or to mitigate the cost of excess emissions. Widespread industry uptake of CCS would require a return on investments incentivised by widespread demand for captured carbon for EOR or demand for carbon transport and storage to avoid penalties. CCS was premised on a regulatory distinction between excess and allowable carbon emissions (per barrel) – and the need to reduce the former; the establishment of a carbon price; market-based exchange systems for excess carbon (in its various forms), and development of sustainable demand for carbon, such as EOR. At pains to establish these conditions, the federal government’s first strategies proposed to complement massive investments in CCS infrastructure with emissions intensity limits, above which emissions could be offset via credits generated through investment in climate and technology funds earmarked to support the eventual construction of a carbon pipeline (GOC,
2002, 2005), a domestic offset trading programme, and tradable credits generated based on proven reductions.

In 2007, with the express intent of creating the ‘robust regulatory system’ that would ‘promote technological investment and innovation in Canada’ (and especially large-scale CCS infrastructure) (GOC, 2007: 2) the federal government proposed a comprehensive trading system (beginning 2010) to support its considerable investments in CCS. The federal Regulatory Framework for Air Emissions promised emissions intensity targets for the oil sector and presented plans for a carbon emissions trading market (similar to a cap-and-trade system) with a federally regulated price for carbon. Compliance was proposed via contribution to a ‘climate change technology fund' (that prioritised investment in CCS infrastructure (GOC, 2007: 12–13)), development of inter-firm emissions trading and domestic offset systems, and one-time credits for early climate actions undertaken between 1992 and 2006 (GOC, 2007: 11–14). Acknowledging the importance of CCS as the only way to achieve long term reductions the plan mandated that initially a minimum of 70% of a firm’s compliance be met by contribution to the fund (GOC, 2007: 12–13). One year later, under the regulations Canada repeated its commitment to CCS and the emissions trading system, mandating that all new tar sands developments (after 2012) be required to implement CCS technologies (GOC, 2008: 3).

Alberta’s first climate plan (Alberta Environment, 2002a, 2002b) was released in 2002 followed by the Climate Change and Emissions Management Act in 2003 and the Specified Gas Emitters Regulations (SGER) in 2007 (see Legislative Assembly of Alberta (LAA), 2003, 2007). Like the federal government’s their plan focused explicitly on technology development to achieve long term reductions in CO2 and promised to reduce the intensity of emissions largely through strategic investment in CCS infrastructure supported by development of an emissions offset trading system (including emissions trading, an offset registry, and offset definition programme). The (2002b) plan also promised to help scaffold EOR markets for captured carbon by pledging to finance EOR demonstration projects using CO2; expand support for analysis of Alberta’s subsurface suitability for CCS; support research to reduce the costs of carbon capture; finance CO2 pipelines; establish a royalty credit programme for early adoption of CO2 and EOR; and develop a policy regime to address geologic pore space (Alberta Environment, 2002b: 26–28). Starting 2008 under the 2007 regulations the plan permitted large industrial emitters comply with emissions intensity standards by paying into a Climate Change and Emissions Management Fund earmarked to fund CCS projects. In 2008 Alberta also introduced measures to ensure new large industrial facilities were designed and built to enable CO2 capture, and retrofit existing facilities (Government of Alberta (GOA), 2008).

Market-based regulation of emissions intensity (including carbon pricing and emissions trading schemes) has continued to underpin federal and provincial commitments to CCS. Canada’s subsequent Pan-Canadian Framework on Clean Growth and Climate Change (2016, effective 2019 and updated in the 2020 climate plan A Healthy Environment and A Healthy Economy and 2021 federal budget), reiterates Canada’s strong commitment to CCUS and outlines a pricing and market-based emissions trading system intended to harmonise carbon pricing across Canada and incentivize ‘net zero’ emission largely through uptake of CCS and other emissions reducing technologies (ECCC, 2016, 2020a). The Framework, sets a minimum price for carbon and outlines the mechanisms of a regulatory trading system (including tradable credits, offset and financial payments) to facilitate compliance and includes parallel supports for CCS. Most recently these include: a commitment to develop a ‘comprehensive CCS strategy’ for Canada (ECCC, 2020a: 38), and as announced in the 2021 federal budget creation of an investment tax credit for CCS, 8 billion dollar strategic investment fund (the net zero accelerator) to finance CCS and other clean technology innovations; and 391 million dollars of funding specifically targeted for CCS development administered by NRCan (GOC, 2021).
Alberta’s 2008 SGER was replaced by the 2018 Carbon Competitive Incentive Regulation (CCIR) which for a brief period set slightly stricter emission reduction targets and parameters around compliance mechanisms and a higher price or carbon (see LAA, 2017). These changes were largely intended to increase demand for government credits and increase the amount of revenue available to fund clean technology including CCS. In 2020, the CCIR was replaced by the Technology Innovation and Emission Reductions regulation (TIER) which rolled back regulatory requirements for industrial emitters to levels similar to the SGER and redoubled Alberta’s focus on CCS. As before, CCS and other emissions reducing technologies were incentivised by provincially regulated emissions reduction requirements using market-based compliance strategies: emitters can reduce emissions themselves, purchase credits from facilities who exceed reductions, purchase Alberta based emissions offsets, or by pay into a TIER fund largely earmarked for CCS and to support the Canadian Energy Centre (LAA, 2019). A minimum of 40% of compliance must be met by payment to the TIER fund (now subject to the minimum federal carbon price) and credits can be generated from investment in both CCS and EOR under the current (2006 and 2015) regulatory protocols (LAA, 2019). In 2020 the TIER fund was used to create an $80 million Industrial Energy Efficiency and Carbon Capture and Storage Grant Program (GOA, 2021).

Besides their concerted attempts to laboriously craft markets for captured carbon and incentivise CCS, both governments devoted significant time and energy to developing policy and regulatory frameworks intended to support CCS and smooth its widespread adoption (e.g. Alberta Environment, 2002b; GOA, 2008; GOC, 2000). This entailed particular attention to the governance of novel regulatory objects, including captured and stored carbon and pore space. Development of CCS regulations was initiated under the leadership of Natural Resources Canada as part of the 2001 Federal Climate Change Innovation and Technology Program – the same initiative that led to the development of Canada’s first carbon capture, utilisation and storage demonstration sites at Weyburn and Middale in 2002. The initiative eventually produced a ‘Roadmap’ (co-authored by NRCan, the Alberta Energy Institute and the Alberta Research Council, for CCS technology in Canada (NRCan, 2006)) that set out the regulatory and policy trajectory needed to support it’s vision for the development of an extensive CCS ‘infrastructure system’ comprised of storage and collection ‘hubs’ linked to a long distance ‘backbone pipeline’ that would be used to transport CO₂ for EOR and sequestration across the Western Canada Sedimentary Basin. The roadmap was followed in early 2008 by the release of the EcoENERGY Carbon Capture and Storage Taskforce report; a similar initiative jointly struck in 2007 by the federal and Alberta governments in collaboration with the oil sector to advise Canada and Alberta on the implementation of CCS.

Like the Roadmap, the Taskforce represented carbon pipelines and storage facilities as urgent, ‘nation building’ infrastructure (estimating that CCS could account for up to 50% of Canada’s emission reductions 2008: 2), and like the Roadmap urged large scale implementation of the technology and immediate financial commitments ($2 billion of up-front capital funding) for pipeline infrastructure. In addition to calling for massive state investment in large scale CCS infrastructure and a renewal of efforts to stimulate CCS and EOR markets through enhanced opportunities for CCS offset and emissions trading, both sets of recommendations focused on the need for regulation and ownership of pore space, and devoted significant attention to the regulation of stored and captured carbon (Alberta Carbon Capture and Storage Development Council (ACCSD), 2009; EcoENERGY Taskforce, 2008). This regulatory focus was echoed in the final report of the Alberta Carbon Capture and Storage Development Council (ACCSDC, 2009), an industry body appointed by the Alberta government in 2008 to ‘accelerate’ the development of CCS in the province. Together these reports called for the review and amendment of all pore space ownership, disposition and surface rights legislation (including of water, oil and gas legislation) to accommodate CO₂ storage rights and clarify subsurface liability for all stages of CCS (EcoENERGY Taskforce, 2008: 22–28). They also recommended the development of regulatory standards and mechanisms
specific to the storage, transport, injection and post-injection management captured carbon (NRCan, 2006: 66) as well as regulatory streamlining of Alberta’s CCS application review process (ACCSDC, 2009: 49).

In response Canada and Alberta invested 1.3 billion dollars in Shell’s Quest project and Enhance Energy’s ACTL (now owned by the CPPIB). Alberta also enacted the Carbon Capture and Storage Funding Act, Carbon Sequestration Tenure Regulation, and Carbon Capture and Storage Amendment Act (2010) to create a stewardship fund to cover costs related to remediation and ongoing monitoring costs for injected CO₂, clarify provincial ownership of pore space, and transfer long-term liability for injected CO₂ (post-closure) to the province (LAA, 2003, 2009, 2010, 2011). These made Alberta the legal owner of all pore space in the province, empowered the province to lease pore space for sequestration and EOR, and made them liable for all post closure injected carbon – a move that transferred all responsibility for any resulting carbon leakage at sequestration sites to the province and absolved corporations of responsibility. This legislation also established regulations for evaluation and permitting of CCS projects, outlined procedures for monitoring and verification of sequestration, and established detailed criteria for granting pore space tenure. The province subsequently initiated a Carbon Capture and Storage Regulatory Framework Assessment to consider all regulations currently applicable to CCS and in 2013 (following 2 years of industry consultations) made over 70 detailed recommendations for the development of regulatory standards and processes relating to: the composition of CO₂ streams, assessment of CO₂ storage capacity, environmental impact assessment guidelines for CCS and EOR, monitoring requirements, and pipeline technical requirements (Regulatory Framework Assessment Steering Committee, 2013). These recommendations inform the ongoing development of regulatory standards and protocols relating to CCS governance, including the current quantification and offset protocols for CCS and EOR operational under TIER. In March of 2021 the federal and Alberta governments announced the formation of the ‘Alberta-Canada Carbon Capture, Utilization and Storage Steering Committee’ to further widespread implementation of CCS in Canada and the tar sands (Newswire, 2021).

The coloniality of CCS

It has been widely acknowledged that the tar sands is an extractive economy structurally reliant on the abandonment of Indigenous people and places to ecological disruption, toxic exposure and premature death (Huseman and Short, 2012; Klein, 2014; Parlee, 2016; Parson and Ray, 2016; Stanley, 2020; Zalik, 2016). As Indigenous scholars have shown, ‘Oil sands mining has significantly altered the [Athabasca] delta and watershed landscape through open-pit mining, deforestation, contamination and de-watering of rivers and lakes, degradation and fragmentation of wildlife habitat,’ and has transformed Indigenous land (the basis of life and livelihood) into a source of ‘significant environmental harm’ (Parlee, 2016: 330–331; see also Awasis, 2014; Coats, 2014; LaDuke, 2014; Thomas-Muller, 2014). Its toxic residues and by-products, including polycyclic aromatic hydrocarbons, heavy metals (like mercury, cadmium and lead) and secondary organic aerosols are present at unsafe levels in the air, groundwater, snow, lake and river sediments, fish and animals, and have been linked to elevated rates of diagnosed cancers (including leukemia and other cancers of the lymph and blood-forming systems), respiratory illnesses, organ damage, genetic defects, and stillbirths in nearby and downstream Indigenous communities as well as to the disappearance of Muskrat nations (Adkin, 2016: 94; Awasis, 2014; Carter, 2016 Chen, 2009; Edwards, 2014; Kelly et al., 2009; Leahy, 2019; Liggio et al., 2019; McLachlan in CBC News, 2014; Natural Resource Defense Council, 2014; Parajulee and Wania, 2014; Parlee, 2016; Simpson et al., 2013). Tar sands have displaced Indigenous communities, destroyed land-based economies and
continue to alienate and disrupt Indigenous peoples’ ability to care for and govern lands and communities (Awasis, 2014; Coats, 2014; LaDuke, 2014; Thomas-Muller, 2014).

The policy trajectory outlined in the paragraphs above describes the ways in which CCS and the regulatory innovations required to support it make harm visible and actionable in specific ways – primarily as excess unmanaged carbon emissions per barrel and according to the right mixture of technology and strategically arranged free market incentives. GHG emissions are here construed as harmful in excess of emissions intensity thresholds and if left un-managed as captured, stored and/or utilised carbon. Excess and un-offset carbon if un-managed may be harmful; captured/stored/utilised/traded/offset/paid for and less-than-intensity threshold emissions (i.e. all managed excess emissions) are not. Especially not harmful (in-visible and not-actionable) are absolute carbon emissions and emissions associated with oil combustion. Even less visible are the distributed geographies of harm associated with the tar sands – those that include more-than-carbon harms, and that are disproportionately and without their consent born by Indigenous people.

This is a construal heavily reliant on market forces to organise and facilitate efficient (and cost effective) circulation of carbon into supposedly harmless novel regulatory forms (as captured, stored and/or utilised emissions), as well as to incentivise uptake of this technology through compliance with emissions intensity thresholds. It is also a managerial strategy in which harm is fungible: exchangeable geographically and temporally for emissions abated elsewhere and against a promise of future reductions. Near constant attempts by both levels of government to engineer markets for captured carbon, through the introduction of carbon offsets, emissions trading, and clean technology funds provide additional ways to make excess emissions manageable: exchangeable (across time and space) against fund payments and emissions abated elsewhere by others.

CCS as a mode of governance (mis) construes (tar sands related) harm as minimal and manageable, and the tar sands more broadly as harm-less. This is a construal that is deeply colonial: not only because of how it detracts from the geographies of Indigenous exposure and land alienation that make the tar sands, but because of how it reproduces state and corporate entitlements to Indigenous bodies, lands and ecosystems. Construction of novel regulatory objects and domains of regulatory jurisdiction, as well as their alignment with re-combinatory narratives about the efficiency of the market and private sector innovation reproduces (and in many cases extends) state and corporate access to Indigenous lands and bodies and consolidates state power in the tar sands. Here we focus on the ways in which the emissions trading systems set up to incentivise CCS and establishment of novel regulatory domains advance colonial entitlements.

The construal of harm as minimal and manageable depends to a large extent on the intersection of market forces (the logic of the market as a spontaneous, self-organising force) and a ‘threshold’ logic of pollution. Emissions intensity thresholds (one version of this logic) are what make CO₂ emissions tradeable in the first place – their establishment creates the excess that constitutes the basis of the trading system and they make it possible to enfold emissions within market logics. Pollution thresholds assume the existence of scientifically or socially defensible quantities of pollution that can (and should) be absorbed into an ecosystem, and according to Liboiron (2021: 55–56) ‘arrange land as a standing reserve’ for settler and colonial aims. GHG emission intensity thresholds relative to CCS reproduce colonial entitlements to Indigenous land (see Liboiron, 2021: 9): in perpetuity as a sink for carbon as ground upon which to transport it long distances and as space within which to otherwise contain the toxic wastes of the tar sands. And they do so with respect to emissions above and below the threshold: emissions captured and stored underground (to comply with thresholds), below-threshold emissions, and all the excess emissions traded (and accumulated) for offsets and against future reductions (e.g. payment to the TIER fund) all operationalise colonial entitlements to use ecosystems, people, atmospheres and subsurface spaces as sinks for carbon. CCS assumes an entitlement for all tar sands emissions to Indigenous lands.

Compliance with these thresholds, the organisation of emissions into harm-less forms (stored carbon, offset carbon and so on), and ultimately the amount of pollution generated for absorption
in Indigenous land is facilitated by market forces via emissions trading schemes. Market logics and market-based emissions trading systems (including when these are orchestrated by governments) anticipate and operationalise colonial entitlements and are instrumental to appropriation of Indigenous land to store waste. Market forces (and the regulators they repeatedly stand in for) determine and administer acceptable quantities of pollution and represent supposedly neutral and objective assumptions about the suitability of atmospheres, climate systems and sub-surface pore spaces as sinks for carbon and about the ability of people and ecosystems to absorb polycyclic aromatic hydrocarbons, heavy metals and other toxicants. The point here is not that markets don’t work, or that regulatory incentives are too lax to make them work (though both are likely true) but that in conjunction with the invention of an emissions threshold they make emissions regulatable: they provide the structures and categories that make GHG’s fungible and contribute to the appearance of manageability. In so doing they organise and administer colonial entitlements to Indigenous lands and bodies; they literally operationalise jurisdictional entitlements by managing (or appearing to manage) GHG emissions. Importantly too: market forces interpolate social relations such that the ways in which they optimise and organise harm reduction appear neutral and objective. The ways in which they work relative to CCS, to align implementations of its infrastructure with predatory economic growth and the objectives of settler and colonial society, are thereby obscured.

Construal of harm as minimal and manageable also relies on construction of new regulatory objects (captured carbon/ excess emissions) and areas of regulatory jurisdiction (for instance pore space, sequestered carbon and carbon streams) as legitimate sites of state action and intervention. Intense regulatory scrutiny – for instance of the purity of carbon streams and attribution of post-closure liability for sequestered carbon – produces emissions as inevitably regulatable and redistributes questions of harm reduction to centre around the manageability of carbon. These in turn create new points of entry from which to provide access to and assert jurisdiction over Indigenous lands relative to the tar sands. Pore space conceived as a regulatory object is also simultaneously an assertion of colonial jurisdiction, and regulation of pore space an assertion of colonial power. Establishment of pore space as a regulatory domain relative to CCS, produces it as state space: as available for sequestration, as something that industry should have access to and that states should manage and control so as to make productive use of. Pore space regulation (including everything from rules about tenure, to assignment of state liability for sequestered carbon and to the establishment of regulatory categories defining purity levels of carbon streams and post closure monitoring and verification of sequestered carbon) are assertions of state power and ways of establishing (novel) control over Indigenous lands and spaces.

Proliferation of regulatory actions relative to CCS can thus be interpreted as a consolidation of state power and access around the manageability of CO2. While on the one hand state assumption of liability for sequestered carbon absolves companies of any and all responsibility for harm that stored or leaking carbon may cause, it also empowers the settler state with new regulatory control over the sub-surface spaces intended to rescue the tar sands – and as such represents not so much a handout to corporations (though it is that too) as a conscious and deliberate alignment of settler state and corporate interests with respect to the tar sands. Likewise, the establishment of registries and protocols for carbon offsets, credits, EOR and sequestration. Corporate access to Indigenous lands quite simply reproduces state entitlements; corporate access enhanced by the transfer of liabilities to the state or establishment of novel regulatory domains reproduces effects of crown sovereignty (Blackburn, 2005).

**Harm and the futurity of settler colonialism**

CCS productively intersects other colonial strategies of harm reduction in the tar sands and is part of a relational context in which repression of Indigenous jurisdiction and land defense are crucial to the
reproduction of settler colonial power. In early 2007, as NRCan and the ecoENERGY Taskforce mapped out their ‘nation-building’ CCS ‘infrastructure system’, the RCMP’s Aboriginal Joint Intelligence Group (AJIG) launched a massive surveillance operation targeting Indigenous communities across the country who refused to consent to expansion of the tar sands. The AJIG was a national security collaboration between the RCMP’s Criminal Intelligence branch and National Security Critical Infrastructure struck at the start of that year to monitor and disseminate information about Indigenous opposition to critical infrastructure and energy sector development (Groves and Lukacs, 2011; see also Boyle and Dafnos, 2019: 98). Classified intelligence documents prepared by the AJIG (2009) reveal exhaustive targeting of Indigenous communities from across Canada opposed on ecological grounds to everything from pipeline construction to permitting processes and document the persistent conflation of Indigenous resistance to the tar sands with illegal, violent and criminal actions harmful to energy infrastructure and the energy sector. Above we suggested that the construal of harm as minimal and manageable, and the tar sands as harm-less consolidates state power and jurisdiction in the tar sands and presumes the jurisdictional authority to harm Indigenous lands and bodies. Here we suggest this construal is part of a broader system involving the criminalisation of Indigenous jurisdiction in which harm is refracted to rescue settler futures.

AJIG Surveillance entries for Fort Chipewyan, the Athabasca Chipewyan First Nation (ACFN) and Prairie Dene First Nation (Alberta) demonstrate that they were monitored by AJIG beginning in 2007 for a ‘dispute with the province of Alberta about oil sands development’ (AJIG, 2009: 58). Fort Chipewyan in particular had documented unusually high rates of diagnosed rare cancers attributable to polycyclic aromatic hydrocarbons and heavy metals from tar sands mining in the Athabasca River (Stanley, 2020) and had expressed concerns to provincial and federal authorities as well as the national media about these effects. ACFN was pressing for an investigation into the health effects of the tar sands. Fort Chipewyan, ACFN and the Prairie Dene were also targeted for taking legal actions against the province of Alberta over oil sand developments: ACFN was suing Alberta for failure to fulfil its duty to consult prior to granting extraction permits to Shell and other tar sands companies in its territories, the Prairie Dene were suing Alberta for failing to consult about a different tar sands development on their territories (AJIG, 2009: 58). In a different entry, the Lubicon Lake Indian Nation was targeted for opposing TransCanada’s North Central Corridor Pipeline project that transports gas to the tar sands. In yet another entry, the Woodland Cree First Nation was targeted for filing a request to intervene at the Alberta Energy Board, in opposition to Shell Canada’s application to massively expand its Carmon Creek tar sands facilities (AJIG, 2009: 62).

And the list goes on: subsequent entries reveal that in Manitoba, the Peguis First Nation, Rosseau River First Nation and other Treaty 1 signatories were targeted by the RCMP for opposing and delaying 3 oil pipelines linked to the tar sands (AJIG, 2009: 42, 46). They were amongst several First Nations who filed an appeal to the federal court alleging failure to consult Treaty 1 Nations with respect to the pipelines and were asking the courts to overturn approval the Keystone XL pipeline (now defunct, but most recently owned by TC Energy and the province of Alberta), and Enbridge’s Alberta Clipper and Southern Access pipelines (the latter of which is now owned by CPPIB). These pipelines transport tar sands bitumen through Alberta, Saskatchewan, and Manitoba, to southern pipeline systems in the US. Of particular concern to the AJIG and national security partners was the delay these court challenges were imposing on the energy sector and the extent to which (peaceful) protest indicated the possibility of ‘future escalation’ (AJIG, 2009: 46). In Saskatchewan the Red Pheasant First Nation (as well as other Treaty 4 and 6 Nations) were targeted for their opposition to the Alberta Clipper pipeline on ecological grounds (AJIG, 2009: 56).

AJIG surveillance was part of a much larger, coordinated effort to criminalise Indigenous resistance undertaken by a range of state actors that criminologists Andrew Crosby and Jeffrey Monaghan have described as a form of settler colonial policing aimed at delegitimizing Indigenous resistance to extractive projects (2019: 6) Relative to the tar sands this effort
(perhaps most acutely demonstrated by (ongoing) efforts to police Indigenous opposition to the expansion of the TMX pipeline and Northern Gateway before it)\(^7\) has served to actively (mis)construe harm: conflating Indigenous land defense with a national security threat and fixing Indigenous jurisdiction and lack of Indigenous consent in the crosshairs of national security policing (Dafnos, 2018: 12, 2019) and tar sands governance.

Nearly two decades of increasingly exhaustive surveillance and prolific sharing of intelligence between police, security agencies, government departments (foremost amongst these NRCan) and the energy sector about the lack of Indigenous consent for tar sands developments (Crosby and Monaghan, 2019: ch 1, 2; Boyle and Dafnos, 2019; Dafnos, 2018; Diabo and Pasternak, 2011; Groves, 2012) has served not just to sideline and dismiss Indigenous knowledges, evidence of ecological destruction and geographies of Indigenous (over) exposure, but to construe Indigenous jurisdiction-and especially the attempts made by Indigenous people and leaders to attempt to protect themselves and their communities against harm as directed threats to pipelines and tar sands mines, the energy sector and national security as well as to conflate assertions of Indigenous jurisdiction with political violence, criminality, militancy and terrorism (Canadian Security Intelligence Service, 2011; Crosby and Monaghan, 2016: 44–50; Diabo and Pasternak, 2011; RCMP, 2010, 2014). Indigenous communities withholding their consent for tar sands related developments were (and still are) harassed, arrested, charged, accused of trespass, surveilled and forcefully removed for speaking out about the health effects of the tar sands, initiating legal proceedings against governments and regulators over lack of consultation, requesting environmental review processes, contesting the legality of expansion and development permits on their lands, participating in regulatory hearings, denying access to sovereign territories, asserting legal jurisdiction over unceded, unsurrendered lands and for occupying their own territories (Barerra, 2019; Laferté, 2020; RCMP, 2014).

Consideration of the ways in which CCS construes the tar sands as harm-less relative to the construal of Indigenous dissent as catastrophically harm-full brings into focus the ways in which harm—and how it is governed—is critical to settler colonial futurity. Without a hint of irony criminal treatment of Indigenous attempts to prevent against ecological harm in the tar sands produces assertions of Indigenous jurisdiction as harms that need to be urgently and aggressively managed (unlike their exposure). Preferential organisation of exposure to, and protection from, harm is fundamental to the value logic that prioritises settler and colonial aims—including the further entrenchment of colonial entitlements to Indigenous lands and bodies and the persistent dismantling of Indigenous relations—over and in exchange for Indigenous life in the tar sands. What counts as harm (and what doesn’t); who and what are considered capable of being harmed; and crucially whose acts are considered dangerous and worthy of accountability are strategically delimited in the strategies described above. Persistent attempts to criminalise enactments of Indigenous jurisdiction construes acts of land defense as harmful but fails to acknowledge the harm that land defenders are trying to bring attention to; frames the tar sands, critical infrastructure, energy security and the profits of oil extraction as capable of being harmed (but not Indigenous people and land); and holds Indigenous people to account through the criminal law for harm against the tar sands.\(^8\) CCS by contrast construes the tar sands’ rising GHG emissions as harmless, neglects to consider the environment, people and non-living beings as capable of being harmed, and fails to hold governments and industry to account for the materially harmful and racialized effects of their extractive practices. Together these strategies construe anything that interferes with or threatens the continued operations of the tar sands as harmful and dismisses harms to which Indigenous people and lands are subject.

**Conclusion: infrastructured colonialism & settler colonial futurity**

CCS secures the value of an industry that—in the absence of indisputable sovereignty and effective territorial control over territories in and necessary to the tar sands, and the moral right to waste the
people, ecosystems and animals in these territories – is increasingly contingent on a specific con-strual of harm. One, that by design delegitimates and violently undermines Indigenous jurisdiction and land defense. At stake in Canada (and Alberta’s) attempts to address ecological harm in the tar sands is thus not only the overexposure of state and institutional capital to climate regimes but to Indigenous sovereignty and the persistence of Indigenous futures. It is in this context that we need to understand the CPPIB’s investment in the ACTL as an attempt to rescue settler futures.

As an asset the value of the Trunk Line is deeply entwined with the colonial futurity of the tar sands. A futurity guaranteed by racialized geographies of toxic exposure and subjection to harm in which ‘robust Indigeneties’ and Indigenous sovereignties are neither profitable nor desirable and must be discouraged at all costs. The mobilisation of pension capital (worker savings) in support of the tar sands (through investment in the infrastructure that protects it) profoundly aligns the income security of (mostly white) working Canadians with dispossession and land alienation, and against Indigenous futurity. But it is also, in large part about rescuing white, settler wealth (see Stanley, 2019). CCS infrastructure is intimately linked to a scenario fixed on recovering (if not growing) the value already invested in climate crisis and dispossession. After years of investment in the exploration and development of oil reserves, companies (and their investors) are increasingly focused on extracting value; a proposition that involves increased production and relies in most cases on the ability to exploit proven reserves (Hussey, 2020; Rowe et al., 2019; Yunker et al., 2018). Counter the current global reallocation of private capital away from the tar sands (due in large part to concerns over the intensity of its carbon emissions) Canadian banks, pension funds, and governments have been increasing their support for the tar sands and exposure to its equity (Rowe et al., 2019). The capital invested in the tar sands, increasingly represents the domestic wealth of the (mostly) white settler state and its workers.

Bank investment in the tar sands is for instance led by the Royal Bank of Canada (RBC), Canadian Imperial Bank of Canada (CIBC), TC, Bank of Montreal (BOM) and Scotiabank (Kirsch et al., 2020: 3) who between 2016 and 2019 provided nearly 70 billion USD (more than 2/3’s of world’s bank total) in financing to the tar sands top 35 extraction and pipeline companies (Kirsch et al., 2020: 5). RBC (lead liability insurer for the ACTL) currently holds the single largest bank stake in the tar sands globally (Rowe et al., 2019: 19); TD bank is one of Enbridge’s leading bankers and backer of the proposed line 3 expansion project slated to carry 760,000 barrels of oil per day through Ojibway territories to Wisconsin (Kirsch et al., 2020: 16); CIBC and the BOM are amongst the top three bankers to TC Energy the company behind the (recently quashed) Keystone XL pipeline that would have expanded production by 830,000 barrels per day (Kirsch et al., 2020: 16); and RBC and TD backed over one billion dollars in loans to support the federal government’s purchase of the TMX pipeline project (Export Development Canada, 2020: online). The same can be said for state treasuries and crediting agencies. Government (tax and non-tax) subsidies collectively flow billions of dollars of public financing per year to tar sands producers and pipeline companies in the form of direct transfers, royalty programmes, fiscal policies, innovation programmes and credits, tax revenues foregone and low interest loans (Corkal et al., 2020: 10; Export Development Canada, 2020: online; Gass, 2019; see also Doukas and Scott, 2018).

In the months before the Trunk Line purchase (and with significantly less public fanfare), CPPIB invested 700 million dollars, again through Wolf Midstream to acquire 100% ownership of Alberta’s Access Pipeline System and Stonefell terminal – a set of oil pipelines anchored by large transportation service agreements with MEG Energy (another tar sands major) to carry diluted bitumen from its tar sands production facilities in the Christina Lake area to distribution points in Edmonton. Despite its claims about climate leadership the fund has billions of dollars invested in some of the tar sands biggest producers and infrastructure operators (including Canadian Natural Resources, Seven Generation, Enbridge; Suncor and Trans Canada Corporation) (Rowe et al., 2019). Indeed, as many oil majors (including Equinor and Shell) sold
their tar sands assets due to concerns over the carbon intensity of these emission CPPIB has been pouring money into them: tripling its investments in CNRL (the tar sands producer who acquired the majority of these assets) to over 1 billion dollars by 2019 (Rowe et al., 2019).

Alberta’s public sector pension investment management company (AIMCO) has over 1 billion dollars of public equity investments in tar sands producers and pipeline companies (Storrie et al., 2020), and owns an 85 per cent direct stake (worth approximately 1.15 B) in Alberta’s Northern Courier Pipeline – a 90 kilometre pipeline that transports tar sands bitumen and diluent between Northern Alberta and Suncor Energy’s terminal north of Fort McMurray. Moving to counter one of the latest rounds of tar sands divestment, the Alberta government forced the transfer of several of its largest public sector pensions (including the Alberta Teachers Retirement Savings Plan) to AIMCO; diverting the holdings of one of Alberta’s largest pension funds to oil and gas companies. Unlike most public service pension fund investors AIMCO takes its direction from the Alberta treasury and is subject to a mandate requiring it to direct a portion of its investments to oil and gas companies. And AIMCO and CPPIB are certainly not alone: public disclosure statements of the majority of Canada’s other largest pension funds10 including Canada Public Service Pension (PSP), Quebec’s Caisse de Dépots et Placements du Quebec (CDPQ), British Columbia’s Investment corporation (BCI) and the Ontario Teachers Pension plan (OTP) divulge billions of dollar (each) of exposure to tar sands assets, especially equity in its top 5 producers and pipeline companies. The OTP own fee simple mineral rights and over-riding royalties to an estimated 19.674 billion barrels/ per day of crude oil production from the tar sands (Heritage Royalty, 2020: online).

Infrastructure (LaDuke and Cowen remind us) has long been ‘critical to settler colonial futurity and to the destruction of Indigenous life’ (2020: 246). CCS offers no exception. CPPIB’s investment in the Trunk Line contributes to a social reality in which settler workers, settler governments and corporate capital are increasingly aligned – and in increasingly material ways – against Indigenous jurisdiction and Indigenous life (Stanley, 2019). CCS is a colonial flanking mechanism; meant to secure the extractive future of the Alberta Tar Sands as well as the colonial terrain through which this future continues to be organised and upon which it depends. CCS offers protection to the needs-to-be-extracted oil that is still in the ground; to the in-development and halfway built pipelines that need to carry it and to the billions of dollars of investments already sunk into securing this extractive future. CCS protects against stranding of these assets; it protects white settler capital and its power to earn interest income and collect dividends from destruction of Indigenous homelands; and it protects Canada’s regime of racial and colonial capitalism in the tar sands.

CCS offers no such protections to Indigenous lands and life. Indeed, the state’s treatment of corporate harm and of Indigenous attempts to prevent it are both consistent with settler colonialism’s drive to circumscribe and eliminate the political threat of Indigenous political and territorial authority. For Indigenous people CCS offers more of the same: it represents the continued exposure of Indigenous bodies, lands and relations to toxic exposure, ecological disruption and climate violence; silencing of lived experiences of toxic exposure; delegitimization of Indigenous knowledge and governance authority; and of course, criminalisation of those who continue to resist. A profoundly colonial infrastructure, CCS plays a crucial role in organising exposure to and protection from harm, including protection from those whose exposure to harm conditions the colonial futurity of the industry (LaDuke and Cowen, 2020).

**Highlights**

- Neither the significance of CCS nor the legitimation function it performs can be fully understood absent an analysis of settler colonialism
• CCS is a colonial flanking mechanism that reproduces settler colonial entitlements to Indigenous lands, bodies and ecosystems
• CCS reproduces these entitlements through the governance of harm
• This construed of harm intersects with other colonial strategies of harm mitigation, including the criminalization of Indigenous jurisdiction

Acknowledgements
Chloe Alexander would like to acknowledge Dr Steven Bittle for supervising her Masters research, of which the carbon capture and storage section of this paper was partially based on. Both authors wish to thank Drs Kate Parizeau and Andrew Baldwin for their support and anonymous reviewers for their constructive feedback.

Declaration of conflicting interests
The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding
The author(s) received no financial support for the research, authorship and/or publication of this article.

Notes
1. Colonial power is multifaceted and the context in which colonial states and industry attempt to manage Indigenous jurisdiction and resistance, foreclose on Indigenous economies and legitimate harm to Indigenous land is of course complex, and it is not our intent to paint an overly simplistic picture. While in this essay we focus on the ways in which 2 particular colonial strategies of harm reduction relative to the tar sands construe harm to undermine Indigenous life, consolidate state power in the tar sands and perpetuate colonial entitlement to Indigenous land, we acknowledge that there are many other ways in which colonial states and their industry partners seek to manage resistance. These include forms of Indigenous participation in resource economies (such as IBAs and equity partnerships) that, while they may be rooted in coercion, might represent opportunities for communities given the alternatives they face.

2. Quest was originally projected to capture 1.8 million tones of CO₂/year, annual technical reports suggest that it nets considerably less (789,994 ton/year in 2018) (Quest, 2018: 7); ACTL current operates at 11% capacity.

3. The Quest project (operated by Shell on behalf of the Athabasca Oil Sands Project – a consortium of CNR, Chevron, and Marathon and Shell) currently captures about one third of carbon emissions associated with its bitumen upgrader facility and transports it via 65 kms of pipeline for injection and permanent storage. The Trunk Line (operational June 2020) is currently contracted to carry CO₂ produced through upgrade and refining of in-kind Crown Royalty Bitumen provided by the Alberta Petroleum Marketing and from CNR to Enhance Energy’s facilities south of Edmonton where it will be used to extract otherwise unrecoverable oil from depleted oil fields. Pembina Pipeline and TC Energy are currently in talks for partnering on a CCS project in the tar sands for 2025 (CBC News, 2021).

4. This effort has been extensively documented by scholars and investigative journalists (See in particular: Barerra, 2014: online; Boyle and Dafnos, 2019; Crosby and Monaghan, 2016, 2019; Dafnos, 2018, 2019; Diabo and Pasternak, 2011; Groves, 2012; Groves and Lukacs, 2011; Lukacs and Groves, 2012; Monaghan and Walby, 2012; Pasternak, 2014: online, 2017: ch 9).
7. See for instance RCMP (2010). For a recent instance see https://sparrowmedia.net/2021/08/tiny-house-warriors-human-rights-letter-to-trudeau/.

8. This construal draws on an important, but arbitrary distinction between criminal and regulatory law. The state legal apparatus frames certain acts as crimes – wrong because they are inherently evil or immoral – subject to the criminal law, and others as regulatory infringements – wrong because they broke a rule – subject to regulatory measures. This distinction, criminologists remind us, is neither objective nor inherent. Rather, it is shaped by power relations; a means ‘by which social control over subordinate, but “resisting” populations is exercised.’ (Box, 2003: 7). To subject Indigenous jurisdiction to criminalisation, and ecological destruction to regulation is to draw on the affective power and foundational weight of this distinction to produce Indigenous resistance as immoral and dangerous and justify the regimes of surveillance, arrest, detainment, and removal that undermine Indigenous futurity.

9. Analysts have shown that the value of the wealth invested in the tar sands is yoked to the viability of proven reserves and to a production and recovery scenario which experts agree is not possible if Canada is to limit warming to 1.5 or 2 degrees above 1990 levels (Corkal et al., 2020; Hussey, 2020; Rowe et al., 2019; Yunker et al., 2018).

10. Retrieved from the US Securities and exchange commission online filing system https://www.sec.gov/edgar/suchiarchedgar/companysearch.html.

References
Aboriginal Joint Intelligence Group (AJIG), RCMP Criminal Investigations (2009) Aboriginal communities, issues, events and concerns 2009/2010. Report for the RCMP. Posted by Tim Groves to the Media Co-op. https://s3.documentcloud.org/documents/271222/aboriginaljigreport2009-10.pdf
Adkin LE (2016) Alberta’s neoliberal environment. In: Adkin LE (ed.) First World Petro-Politics: The Political Ecology and Governance of Alberta. Toronto, Ontario: University of Toronto Press, pp.78–113. Epub.
Adkin LE and Stares BJ (2016) Turning up the heat: Hegemonic politics in a first world petro-state. In: Adkin LE (ed.) First World Petro-Politics: The Political Ecology and Governance of Alberta. Toronto, Ontario: University of Toronto Press, pp.190–240. Epub.
Alberta Carbon Capture and Storage Development Council (ACCSD) (2009) Accelerating carbon capture and storage implementation in Alberta: Final report. Report to Minister of Energy, 9 March. Edmonton, Alberta.
Alberta Environment (2002a) Albertans & climate change: A strategy for managing environmental and economic risks. Report, Edmonton, Alberta.
Alberta Environment (2002b) Albertans & climate change: Taking action. Report, Edmonton, Alberta.
Awasis S (2014) Pipelines and resistance across Turtle Island. In: D’Arcy S, Black T, Weis T, et al. (eds) A Line in The Tar Sands: Struggles for Environmental Justice. Toronto, Ontario: Between the Lines Press, chapter 23. Epub.
Bachu S and Stewart S (2002) Geological sequestration of anthropogenic carbon dioxide in the Western Canada sedimentary basin: Suitability analysis. Journal of Canadian Petroleum Technology 41(2): 32–40.
Bachu S, Brulotte M, Grobe M, et al. (2000) Suitability of the Alberta subsurface for carbon-dioxide sequestration in geological media. Report for Alberta Energy Board and Utilities and Alberta Geological Survey, March. Edmonton, Alberta.
Barerra J (2014) 2014 RCMP tracked movements of Indigenous activist from 'extremist' group: Documents. APTN National News, 17 October.
Barerra J (2019) Trans Mountain monitoring anti-pipeline activists labelling some as ‘persons of interest’. CBC News, 25 November.
Benton L (2010) A Search for Sovereignty: Law and Geography in European Empires, 1400–1900. New York: Cambridge University Press.
Blackburn C (2005) Searching for guarantees in the midst of uncertainty: Negotiating aboriginal rights and title in British Columbia. American Anthropologist 107(4): 586–596.
Box S (2003) *Power, Crime and Mystification*. New York: Taylor & Francis E-Library. E-Pub.
Boyle P and Dafnos T (2019) Infrastructures of pacification: Vital points, critical infrastructure, and police power in Canada. *Canadian Journal of Law & Society/Revue Canadienne Droit et Société* 34(1): 79–98.
Canadian Security Intelligence Service, Integrated Threat Assessment Centre (2011) *Speaking points from a CSIS power point presentation to the Canadian Association of Petroleum Producers*. ATI # CSIS 2016-47. Requested by A Crosby and J Monaghan. https://policingindigenousmovements.ca/introduction/
Cardinal J (2014) *The tar sands healing walk*. In: D’Arcy S, Black T, Weis T, et al. (eds) *A Line in The Tar Sands: Struggles for Environmental Justice*. Toronto, Ontario: Between the Lines Press, chapter 12. Epub.
Carter A (2016) The petro-politics of environmental regulation in the tar sands. In: Adkin LE (ed.) *First World Petro-Politics: The Political Ecology and Governance of Alberta*. Toronto, Ontario: University of Toronto Press, pp.152–189. Epub.
CBC News (2014) *Study suggests link between oilsands and Fort Chip illnesses*. CBC News, 8 July.
CBC News (2021) *Pembina and TC Energy team Up for carbon transportation and sequestration project*. CBC News, 17 June.
Chen Y (2009) *Cancer incidence in Fort Chipewyan, Alberta 1995–2006*. Report for the Alberta Cancer Board Division of Population Health and Information Surveillance, February.
Coats E (2014) What does it mean to be a movement? A proposal for a coherent, powerful indigenous led movement. In: Black T, et al. (eds) *A Line in The Tar Sands: Struggles for Environmental Justice*. Toronto, Ontario: Between the Lines Press, chapter 24. Epub.
Cooper M (2010) *Turbulent worlds: Financial markets and environmental crisis*. *Theory, Culture & Society* 27(2–3): 167–190.
Diabo R and Pasternak S (2011) *Canada has had first nations under surveillance: Harper government has prepared for first nations’ unrest*. *First Nations Strategic Bulletin* 9(1–5): 1–23.
Doukas A and Scott A (2018) *Risking it all: How Export Development Canada’s support for fossil fuels drives climate change*. Report for Oil Change International, International Institute for Sustainable Development, Environmental Defence Canada, Equiterre, Above Ground, and Climate Action Network Canada, 21 November.
ecoENERGY Carbon Capture and Storage Taskforce (2008) *Canada’s fossil energy future: The way forward on carbon capture and storage*. Report to Alberta Energy and Natural Resources Canada, 9 January.
Edward J (2014) Canada’s oil sands residents complain of health effects. *The Lancet* 383(9927): 1450–1451.
Environment and Climate Change Canada (ECCC) (2016) *Pan-Canadian framework on clean growth and climate change*. Report for Oil Change International, International Institute for Sustainable Development, Environmental Defence Canada, Equiterre, Above Ground, and Climate Action Network Canada, 21 November.
Environment and Climate Change Canada (ECCC) (2020a) *A healthy environment and a healthy economy*. Gatineau, Quebec.
Environment and Climate Change Canada (ECCC) (2020b) *Greenhouse gas emissions: Canadian environmental sustainability indicator*. Available at: https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/greenhouse-gas-emissions.html (last accessed 6 January 2021).
Environment Canada (1994) *Canada’s national report on climate change: Actions to meet commitments under the United Nations Framework Convention on Climate Change*. Report for the United Nations Framework Convention on Climate Change.
Export Development Canada (2020) *Transparency and disclosure: Reporting on transactions.* Available at: https://www.edc.ca/en/about-us/corporate/disclosure/reporting-transactions.html (accessed 6 January 2021).

Friedman G (2020) *New CO2 pipeline capable of capturing 20% of oilsands emissions could hold key to Alberta’s energy future.* Financial Post, 4 June.

Gass P (2019) *Doubling down with taxpayer dollars: Fossil fuel subsidies from the Alberta government.* Report for Environmental Defence and International Institute for Sustainable Development, February.

Government of Alberta (GOA) (2008) *Alberta’s 2008 climate change strategy: Responsibility/leadership/ action.* Report, January.

Government of Alberta (GOA) (2021) *Industrial energy efficiency, carbon capture utilization and storage.* Available at: https://www.alberta.ca/industrial-energy-efficiency-carbon-capture-utilization-and-storage.aspx (accessed 1 September 2021).

Government of Canada (GOC) (2000) *Government of Canada action plan 2000 on climate change.* Report. ISBN: 0-662-29444-0.

Government of Canada (GOC) (2002) *Canada’s national climate change: Business plan 2002.* Report, May.

Government of Canada (GOC) (2005) *Project green: Moving forward on climate change- A plan for honouring our Kyoto commitment.* Report, Ottawa, Ontario. ISBN 0-662-68808-2.

Government of Canada (GOC) (2007) *Regulatory framework for air emissions.* Report, Ottawa, Ontario. ISBN 978-0-662-69717-6.

Government of Canada (GOC) (2008) *Turning the corner: Taking action to fight climate change.* Report, March.

Government of Canada (GOC) (2021) *Budget 2021: A recovery plan for jobs, growth and resilience.*

Griffiths M, Cobb P and Marr-Laing T (2005) *Carbon capture and storage: An arrow in the quiver or a silver bullet to combat climate change?* Report for The Pembina Institute, November. Drayton Valley, Alberta.

Groves T (2012) *Canada’s spy groups divulge secret intelligence to energy companies.* The Dominion, 10 October.

Groves T and Lukacs M (2011) *Mounties spied on native protest groups.* The Toronto Star, 4 December.

Hussey I (2020) *The future of Alberta’s oil sands industry: More production, less capital, fewer jobs.* Report for Parkland Institute March and Corporate Mapping Project, 10 March.

Indigenous Network on Economies and Trade (INET) (2017) *Standing Rock of the north: The Kinder Morgan Trans Mountain Pipeline expansion Secwepemc risk assessment.* Report, October.

Israel B (2017) *The real GHG trend: Oilsands among the most carbon intensive in North American.* Blog post for Pembina Institute, 4 October.

Kelly EN, Short JW and Schindler DW, (2009) Oil sands development contributes polycyclic aromatic compounds to the Athabasca river and its tributaries. *Proceedings of the National Academy of Sciences of the United States of America* 106(52): 22346–22351.

Kirsch A, Disterhoft JO, Marr G, et al. (2020) *Banking on climate change: Fossil fuel finance report 2020.* Report for Rainforest Action Network. Banktrack, Indigenous Environmental Network, Oil Change International, Reclaim, and Sierra Club, 18 March.

Klein N (2014) *This Changes Everything: Capitalism vs. The Climate.* New York: Simon & Schuster.

Laboucan-Massimo M (2014) *Awaiting justice: The ceaseless struggle of the Lubicon Cree.* In: D’Arcy S, Black T, Weis T, et al. (eds) *A Line in The Tar Sands: Struggles for Environmental Justice.* Toronto, Ontario: Between the Lines Press, chapter 10. Epub.

LaDuke W (2014) *Ending the age of fossil fuels and building an economics for the seven generations.* In: D’Arcy S, Black T, Weis T, et al. (eds) *A Line in The Tar Sands: Struggles for Environmental Justice.* Toronto, Ontario: Between the Lines Press, chapter 21. Epub.
LaDuke W and Cowen D (2020) Beyond Wiindigo infrastructure. *South Atlantic Quarterly* 119(2): 243–268.
Laferté B (2020) Secwepemc set up new camp in hopes of halting TMX construction, leads to five arrests. Martlet, 23 October.
Lameman C (2014) *ᑭᐦᒋᐱᑭᐢᑫᐧᐃᐧᐣ*: Kihci Pikiskwewin – speaking the truth. In: D’Arcy S, Black T, Weis T, et al. (eds) *A Line in The Tar Sands: Struggles for Environmental Justice*. Toronto, Ontario: Between the Lines Press, chapter 11. Epub.
Leahy S (2019) This is the world’s most destructive oil operation – and it’s growing. National Geographic, 11 April.
Le Billion P and Carter A (2012) Securing Alberta’s Tar Sands: Resistance and criminalization on a new energy frontier. In: Schnurr MA and Swatuk LA (eds) *Natural Resources and Social Conflict*. Macmillan, London: Palgrave, pp. 170–192.
Legislative Assembly of Alberta (2003) *Climate Change and Emissions Management Act*. Bill 37, 3rd session, 25th legislature. Received royal assent 13 December. Edmonton, Alberta.
Legislative Assembly of Alberta (2007) *Specified Gas Emitters Regulation*. Alberta Regulation 139/2007 under the Climate Change and Emissions Management Act. Edmonton, Alberta.
Legislative Assembly of Alberta (2009) *Carbon Capture and Storage Funding Act*. Statutes of Alberta 2009, Chapter C-2.5. Edmonton, Alberta.
Legislative Assembly of Alberta (2010) *Carbon Capture and Storage Statutes Amendment Act*. Bill 24, 3rd session, 27th legislature. Received royal assent 2 December. Edmonton, Alberta.
Legislative Assembly of Alberta (2011) *Carbon Sequestration Tenure Regulation*. Alberta Regulation 68/2011 under the Mines and Minerals Act. Edmonton, Alberta.
Legislative Assembly of Alberta (2017) *Carbon Competitiveness Incentive Regulation*. Alberta Regulation 255/2017 under the Climate Change and Emissions Management Act. Edmonton, Alberta.
Legislative Assembly of Alberta (2019) *Technology Innovation and Emissions Reduction Regulation*. Alberta Regulation 133/2019 under the Emission Management and Climate Resilience Act. Edmonton, Alberta.
Liboiron M (2021) *Pollution is Colonialism*. Durham, North Carolina: Duke University Press.
Liggio J, Li S-M, Staebler RM, et al. (2019) Measured Canadian oil sands CO2 emissions are higher than estimates made using internationally recommended methods. *Nature Communications* 10(1863).
Lukacs M and Groves T (2012) RCMP spied on BC natives protesting pipeline plan, documents show. The Toronto Star, 9 May.
Mackey E (2016) *Unsettled Expectations: Uncertainty, Land and Settler Decolonization*. Black Point, Nova Scotia: Fernwood Publishing.
Manuel A (2015) *Unsettling Canada: A National Wake-Up Call*. Toronto, Ontario: Between the Lines.
Manuel A (2017) *The Reconciliation Manifesto: Recovering the Land, Rebuilding the Economy*. Toronto, Ontario: James Lorimer and Company Ltd
Martens K (2019) Kanahus Manuel arrested, injured during pipeline protest says Tiny House Warriors. APTN National News, 21 October.
Monaghan J and Walby K (2012) Making up ‘Terror Identities’: security intelligence, Canada’s Integrated Threat Assessment Centre and social movement suppression. *Policing and Society* 22(2): 133–151.
Natural Resource Defense Council (2014) *Tar sands crude oil: Health effects of a dirty and destructive fuel*. NRDC Issue Brief, February.
Natural Resources Canada (NRCan) (2006) *Canada’s CO2 capture and storage technology roadmap*. Clean Energy Technologies Report, March.
Newswire (2021) *Canada and Alberta launch steering committee to advance CCUS*. Newswire, 8 March.
Parajulee A and Wania F (2014) Evaluating officially reported polycyclic aromatic hydrocarbon emissions in the Athabasca oil sands region with a multimedia fate model. *Proceedings of the National Academy of Sciences of the United States of America* 111(9): 3344–3349.
Parlee B (2016) Mobilizing to address the impacts of oil sands development: First nations in environmental governance. In: Adkin LE (ed.) First World Petro-Politics: The Political Ecology and Governance of Alberta. Toronto, Ontario: University of Toronto Press, pp.329–355. Epub.

Parson S and Ray E (2016) Sustainable colonialism: Tar sands as resource capitalism. Capitalism Nature Socialism 29(3): 68–86.

Pasternak S (2014) The wars at home: What state surveillance of an Indigenous rights campaigner tells us about real risk in Canada. The Narwhal, 2 November.

Pasternak S (2017) Grounded Authority: The Algonquins of Barriere Lake Against the State. Minneapolis, Minnesota: University of Minnesota Press.

Pasternak S and Dafnos T (2018) How does a settler state secure the circuitry of capital? Environment and Planning D: Society and Space 36(4): 739–757.

Quest (2018) Quest carbon capture and storage (CCS) project: GHG and energy report for 2018. Report.

Reeve DA (2000) The capture and storage of carbon dioxide emissions: A significant opportunity to help Canada meet its Kyoto targets. Report for Natural Resources Canada.

Regulatory Framework Assessment Steering Committee (2013) Carbon capture & storage: Summary report of the regulatory framework assessment. Report for Alberta Energy, Edmonton, Alberta.

Robbins J (2015) The dilbit hits the fan. Places Journal, October.

Rowe J, et al. (2019) Fossil fuels: The Canadian pension plan’s failure to respect the 1.5-degree Celsius limit. Report for Canadian Centre for Policy Alternatives, 19 November. Vancouver, British Columbia.

Royal Canadian Mounted Police (RCMP) (2014) Critical infrastructure intelligence assessment: Criminal threats to the Canadian petroleum industry. RCMP Report, 24 January.

Royal Canadian Mounted Police E Division, Aboriginal Policing (RCMP) (2010) Aboriginal issues bulletin: October 2010. In ATI #RCMP 2013-5745 Requested by Crosby A and Monaghan J. https://policingindigenousmovements.ca/chp-2-northern-gateway-pipelines/

Simpson A (2011) Settlement’s secret. Cultural Anthropology 26(2): 205–217.

Simpson I, Marrero JE, Batterman S, et al. (2013) Air quality in the industrial heartland of Alberta, Canada and potential impacts on human health. Atmospheric Environment 81: 702–709.

Simpson LB (2017) As We Have Always Done: Indigenous Freedom Through Radical Resistance. Minneapolis, Minnesota: University of Minnesota Press.

Sparrow (2020) 40+ human rights lawyers, organizations, authors, and First Nations representatives call on PM Justin Trudeau and RCMP to protect Secwepemc activists from pipeline workers. The Sparrow Project, 30 August

Stanley A (2019) Aligning against indigenous jurisdiction: Worker savings, colonial capital, and the Canada infrastructure bank. Environment and Planning D: Society and Space 37(6): 1138–1156.

Stanley A (2020) Risk management and the logic of elimination. Journal of Cultural Economy 14(1): 1–16.

Storrie J, Kinney D and Boychuk R (2020) Alberta’s failed oil and gas bailout. Report for Progress Alberta.

Thomas-Muller C (2011) Introducing settler colonial studies. Settler Colonial Studies 1: 1–12.

Wolfe P (2006) Settler colonialism and the elimination of the native. Journal of Genocide Research 8(4): 387–409.

Yunker Z, Dempsey J and Rowe J (2018) Canada’s fossil-fueled pensions: The case of the British Columbia Investment Management Corporation. Report for Canadian Centre for Policy Alternatives, 25 June. Vancouver, British Columbia.

Zalik A (2016) Duty to consult or licence to operate? Corporate social practice and industrial conflict in the Alberta Tar Sands and the Nigerian Niger Delta. In: Adkin LE (ed.) First World Petro-Politics: The Political Ecology and Governance of Alberta. Toronto, Ontario: University of Toronto Press, pp.356–384. Epub.