Canadian Institute of Resources Law
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Security Issues Arising from Water Licensing on Private Lands in the Northwest Territories and Nunavut

Prepared for the Mackenzie Valley Land and Water Board

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1.0. Introduction

In settling northern land claims, the Government of Canada has transferred ownership of significant areas of land to Aboriginal organizations and empowered numerous regulatory boards and other agencies in order to promote Aboriginal and local management of territorial lands and natural resources. The evolution of ownership and management spawned by these land claim agreements has been beneficial from numerous standpoints, but has not been seamless. This paper addresses one of the weak points in this evolution – the imperfect integration of different regulatory regimes. This weak point is considered specifically in the context of regulatory requirements that proponents of mining and other intrusive developments provide bonds or other forms of "security" (sometimes termed "financial assurance") to cover the costs of reclaiming the lands and waters affected by their projects, in the event the proponents do not complete the necessary reclamation themselves.

More specifically, this paper addresses a conflict that has arisen with respect to the scope of reclamation costs that water licensing boards in the Northwest Territories and Nunavut can consider in setting the amount of security required by their water licenses. In a nutshell, the conflict is whether those boards can include the "land related," as well as "water related," reclamation costs in the amount of security required by a water licence. The dichotomy of "land related" and "water related" reclamation costs is superficial and misleading, because ecosystems consist of more than simply "land" and "water" and because even those two ecosystem components are not perfectly distinct. However, these two terms will be used throughout the paper, in part, for convenience and also because the terms have been used in the licensing proceedings that will be discussed. (Also for convenience, this paper uses the term "reclamation" broadly to include "restoration," "closure," and "post-closure," unless the specific context calls for a narrower meaning.)

The security conflict has been most acute in contexts where the surface land is owned by a party other than the federal government. This is because the government—through the Minister of Indian and Northern Affairs Canada (INAC)—holds and manages water licence security, in addition to any additional security INAC might require as land owner. Under these circumstances, the federal government can in a sense set its own risks as land owner and coordinate multiple different security instruments to minimize those risks.

This coordination is more problematic where the affected land is owned by a territorial government or Aboriginal organization. (For brevity, these lands will be referred to as "private lands". However, the paper does not address security issues with respect to private lands that are owned in fee simple by individuals.)

The security conflict has arisen in several water licensing proceedings, two of which are: the Mackenzie Valley Land and Water Board's issuance of a water licence for the reclamation phase of the "Con Mine" located on "Commissioner's Lands" in Yellowknife; and the Nunavut Water Board's issuance of a water licence for the "Doris North" mining project on mostly Aboriginal lands in the West Kitikmeot region of Nunavut. Aspects of these two proceedings are discussed in this paper. For additional background, Appendices A and B provide a description of each proceeding as it relates to the security issue. Appendix C provides a third case study—a hypothetical "natural gas gathering" project covering both Aboriginal and federal lands in the Inuvialuit Settlement Region of the Northwest Territories.

The purpose of this paper is to provide background information on the security conflict. The paper was distributed in advance of an April 3, 2008 workshop in Yellowknife where interested parties discussed the issues and explored mutually acceptable solutions. The paper has been revised following the workshop and is intended to accompany and complement the "Summary Report" of the workshop prepared by Terriplan Consultants.[1] As a background- or briefing-type document, this paper does not aim to provide comprehensive or definitive analysis of the security conflict. Nor does it purport to 'take sides' except perhaps for its critique of INAC's methodology for splitting land and water related costs (see part 3.1 below).

The paper starts (part 2) with a summary of the legal framework for water, and to some extent land, management in the Northwest Territories and Nunavut. The overall land and resource management framework is quite complex and extensive so only the essential aspects are discussed here to provide a legal context for the remaining discussion. Part 3 considers the arguments as to *why* water licence security should be limited to water related costs and *how* the licensing boards might divide land and water related costs for that purpose. Part 4 then considers various implications *if* water licence security is limited to water related costs. These parts of the paper provide a useful framework for analysing the numerous issues raised by the security conflict. However, many of these issues are overlapping and interconnecting, so the analytical framework provided by these two parts (and accompanying sub-parts) is hardly neat or perfect.

[1] Terriplan Consultants, *Security Issues Arising from Water Licensing on Private Lands in the NWT and Nunavut – Summary Report* (2008).

2.0. Background - The Overall Framework of Resource Management Legislation in the North

This part provides a basic description of the legal framework for water management, and secondarily of land and resource management, in the North. In order to understand this overall framework, it is useful to view the framework from a historical perspective. This history has been dynamic, in the sense that it has involved Parliament's adoption of several new statutes and authorities to implement those statutes. But the evolution has also been relatively static, in the sense that the new statutes have not fundamentally changed the principal regulatory approaches for managing land and water uses.[2]

2.1.1. Northwest Territories

For purposes of this paper, the legislative evolution in the Northwest Territories consists essentially of three historical phases whose boundaries are defined by Parliament's response to the federal government's settlement of three Aboriginal land claims through the Inuvialuit Final Agreement (1984), the Gwich'in Comprehensive Land Claim Agreement (1992), and the Sahtu Dene and Metis Comprehensive Land Claim Agreement (1993).

Before these Agreements, most land in the NWT outside established communities was owned by the federal government, and managed by the Department of Indian Affairs and Northern Development (DIAND), except national parks and other kinds of protected areas managed by Parks Canada or Environment Canada. (DIAND was recently renamed "Indian and Northern Affairs Canada". The Ministry's new acronym—INAC—will be used for the remainder of this paper.) For lands managed by INAC, surface uses were subject to the *Territorial Lands Act* (*TLA*),[3] and regulations adopted under that statute. That Act, together with accompanying regulations, granted blanket rights for some uses—e.g. hunting, fishing, and trapping—and required permits or leases, both issued by INAC, for other surface uses. In general, permits were granted for short terms and provided non-exclusive use rights, whereas leases provided long term, exclusive rights of use.

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[2] This description is based in considerable part on the historical summary in Michael M. Wenig and Kevin O'Reilly, *The Mining Reclamation Regime in the Northwest Territories* (Canadian Institute of Resources Law and Canadian Arctic Resources Committee, 2005). See also John Donihee, ed., *Resource Development and the Mackenzie Valley Resource Management Act: The New Regime* (Calgary: Canadian Institute of Resources Law, 2000) at 45-57; and Brian Gibson, "Water Management North of 60°N: The Administration of Inland Waters" in T.D. Prowse & C.S.L. Ommaney, eds., *Northern Hydrology: Canadian Perspectives* (Ottawa: Environment Canada, 1990) at 227-239.

[3] R.S.C. 1985, c. T-7.

The *TLA* (and *Canada Mining Regulations* adopted under that Act) also provided a framework for acquiring hard rock mineral rights in the NWT, under which minerals were generally also owned by the federal government and once again managed by INAC.

Another important statute prior to the land claims Agreements was the *Northern Inland Waters Act*[4] (*NIWA*) which governed the use of inland waters and deposits of wastes into inland waters in both the NWT (including the area now within the boundary of Nunavut) and the Yukon Territory.[5] The primary regulatory mechanism under *NIWA* was a water licence, which *NIWA* required for major water uses and deposits of waste into waters. Water licenses were issued by territorial water boards—including the NWT Water Board—subject to the INAC Minister's approval. The Boards issued "Type B" water licenses (for smaller operations) while they recommended "Type A" water licenses to the Minister who either signed them or sent them back for reconsideration.

The 1984 Inuvialuit Final Agreement (IFA) created the 170,000 km^2 "Inuvialuit Settlement Region". Under the Agreement, Canada transferred to the Inuvialuit Regional Corporation federal ownership of roughly 90,650 km^2 of surface lands, and rights to sub-surface minerals under 13,209 km^2.[6] Canada retained ownership of the remaining surface lands and minerals, except for a small percentage of surface lands—known as "Hamlet Lands"—that were transferred to the Government of the Northwest Territories.

The Inuvialuit lands were transferred initially to the Inuvialuit Regional Corporation which transferred them in turn to the Inuvialuit Land Corporation, one of whose divisions, the Inuvialuit Land Administration (ILA) manages the lands.[7] Federal lands (other than those in parks and other protected areas) and minerals in the ISR continued to be managed under the *TLA* and *NIWA* remained in effect for uses of water and deposits of waste in the entire ISR.

Starting before the creation of Nunavut in 1999 and the federal government's devolution of resource management authority to the Yukon Territorial Government in 2003, *NIWA* evolved into separate water management statutes for each of the three territories, including the *NWT Waters Act* (*NWTWA*).[8] Adopted in 1992, this Act

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4 R.S.C. 1985, c. N-25, *repealed* 1992 c. 40, s. 52.

5 All further references to "water(s)" in this paper are intended to mean only inland waters, unless otherwise noted.

6 See John Donihee, "Integrative Mechanisms Emerging from Land Claims," in Monique M. Ross and J. Owen Saunders, *eds.*, *Disposition of Natural Resources: Options and Issues for Northern Lands* (Calgary: Canadian Institute of Resources Law, 1997) at 255; and INAC, *NWT Plain Facts on Land and Self-Government – Inuvialuit Final Agreement* (http://nwt-tno.inac-ainc.gc.ca/pdf/pt/pf/PF_Inuvialuit_e.pdf).

7 See IFA, parag. 6(1)(a); see also Inuvialuit Development Corp., *Inuvialuit Final Agreement* (http://www.idc.inuvialuit.com/about/finalagreement.html).

8 S.C. 1992, c. 39.

essentially followed *NIWA*'s basic licensing approach for water uses and waste disposals in the NWT.

The Gwich'in and Sahtu/Metis land claim Agreements prompted Parliament's addition of a new statute—the *Mackenzie Valley Resource Management Act* (*MVRMA*)[9]—to the legislative regime comprised of the *TLA* and *NWT Waters Act*. Under these Agreements, Ottawa retained ownership of both the surface and subsurface interests in roughly 82% of lands covered by the Agreements.[10] However, in the Agreements Ottawa committed to adopt new legislation establishing integrated land and water management regimes for these federally owned lands and to provide for considerable First Nations involvement in those regimes in large part through their members' participation in several new management boards.

Parliament adopted the *MVRMA* to fulfill this commitment and also to create an integrated land and water management framework for the entire "Mackenzie Valley" region. Section 2 of the *MVRMA* defines this term broadly as essentially all land in the NWT—including all land covered by the two settlement Agreements—except land in the Inuvialuit Settlement Region (ISR) and in the NWT-portion of Wood Buffalo National Park.

In a nutshell, the *MVRMA* establishes several regional "land and water boards" that, collectively, are responsible for: overseeing environmental assessments for various projects in the Mackenzie Valley; conducting land use planning in the lands covered by the land claims Agreements; and issuing licenses for water uses and waste deposits (collectively, "water licenses" unless otherwise noted), and land use permits for all surface interests other than lands in national parks. The Mackenzie Valley Land and Water Board is responsible for issuing land use permits and water licenses for the remaining portions of the Mackenzie Valley that are not covered by land claim settlements and for issuing water licenses in other portions, where the water use or waste deposit has transboundary effects.

While the *MVRMA* was an entirely new statute, it retained three key components of the then-existing legal regime—comprised of the *TLA* and *NWT Waters Act*—for managing land and water uses in the Mackenzie Valley. First, the *NWT Waters Act*'s water licence requirement still applies to uses of, and waste deposits, in waters in the Mackenzie Valley and empowers the regional land and water boards, or the MVLWB (as applicable), to issue water licenses pursuant to the *NWTWA*. (Thus, the NWT Water Board still conducts these licensing functions under the *NWT Waters Act* only for uses of,

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[9] S.C. 1998, c. 25.

[10] Together, the two Agreements cover roughly 337,000 square kilometers, or roughly 29% of all land in the NWT. The Agreements granted the Aboriginal parties both surface and subsurface ownership to roughly 6,000 square kilometers (1.8%) of the settlement lands. The Agreements transferred surface ownership, but not also subsurface rights, to roughly 56,000 square kilometers, or 17%, of these settlement lands.

and waste deposits in, inland waters in the Inuvialuit Settlement Region—i.e. in NWT inland waters that are outside of the Mackenzie Valley region.)

Second, the *MVRMA* usurped the *TLA*'s surface permit function for new surface uses in the Mackenzie Valley, but simply replaced it with a similar surface permitting regulatory approach administered by the Mackenzie Valley land and water boards. Third, the *MVRMA* did not change the *TLA*'s lease program, except to provide that activities leased after April 2000 now required land use permits under the *MVRMA*. Thus, the *TLA* lease program continues to apply to all federal lands in the entire NWT (except in national parks and other protected areas).

For purposes of this paper, another relevant statute is the *Commissioner's Land Act* (*CLA*),[11] which provides a bare bones legislative framework for the management of "Commissioner's lands." The *CLA* defines the scope of these lands essentially as all lands owned or controlled by the Government of the Northwest Territories (GNWT), but excluding "mines or minerals under or within such lands."[12] Commissioner's Lands comprise roughly only .27% of all surface land in the NWT and are generally contained within community boundaries.

The *CLA* has two notable land management components. One allows the NWT Commissioner to adopt regulations "respecting the protection, control and use of Commissioner's land generally" (s. 12(b.4)). The second component is a set of provisions allowing the Government of the Northwest Territories (GNWT) to authorize the disposition of Commissioner's lands and to adopt regulations setting out the parameters of a disposition system other than those few parameters listed in the Act itself (ss. 3, 4, 12, and 13). Pursuant to this broad legislative authority, the *Commissioner's Land Regulations* authorize the Deputy Minister of the Department of Municipal and Community Affairs (MACA) to grant—by sale, lease, or other disposition instrument—any interest in Commissioner's lands (ss. 1-9). Because Commissioner's Lands are located primarily within communities, the vast majority of dispositions issued under the Act are for residential rather than for commercial purposes, and those commercial dispositions are for relatively small-scale activities (e.g. stores, gas bars).

2.1.2. Nunavut

As with the NWT, the legislative framework for resource management in Nunavut has evolved in response to a comprehensive land settlement—the 1993 Nunavut Land Claims Agreement—combined with subsequent legislation to implement the Agreement and creating Nunavut as a distinct Territory in 1999. Under Part 19 the Agreement, roughly 352,000 km^2 (nearly 18 % of Nunavut's 2 million square kilometers) of surface lands were transferred to the Inuit through the transfer of title to Inuit organizations

11 R.S.N.W.T. 1998, c. C-11.

12 *CLA*, ss. 1 and 2. This exclusion is consistent with the mineral reservation in the *TLA* (discussed above), at least, for any "territorial lands" under the *TLA* that the GNWT acquired from the federal government.

designated for each of six specified “Land Use Regions”.[13] The Agreement (parag. 21.2.1) generally prohibits access to and use of these “Inuit Owned Lands” by non-Inuit without the consent of the applicable Designated Inuit Organization (DIO), except pursuant to several exceptions specified in the Agreement for essentially minor uses (e.g. water travel, hunting, research).

As it did with the Mackenzie Valley in the NWT, Parliament adopted new legislation—the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (*NWNSRTA*)—for water management in Nunavut.[14] This Act follows the general pattern set by *NIWA*, by generally requiring licenses—issued by the Nunavut Water Board—for the “uses of water” and “deposit of waste” in Nunavut waters.

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13 Roughly ten percent of the surface lands transferred included accompanying mineral rights.

14 S.C. 2002, c. C-10.

3.0. Should Water Licence Security Cover Only "Water Related Costs" and How are those Costs Calculated?

3.1. Fixing the Amount of Security in Water Licenses

The core issue is a legal one. In its most simple terms, the issue is whether the relevant water management legislation allows the applicable water board to include land related reclamation costs in the total amount of security required by the water licence issued by the board. For purposes of this analysis, the provisions of the water licensing regimes governing the NWT (the Mackenzie Valley and the Inuvialuit Settlement Region) and Nunavut are the same. (Because the *MVRMA* adopts the *NWTWA* water licensing provisions by reference, the following discussion will focus on the relevant provisions of the *NWTWA*—for both the Mackenzie Valley and the ISR—and the *NWNSRTA* for Nunavut.)

As relevant here, the starting point for both statutes are legislative prohibitions against the "use" of water and the "deposit of waste" directly or indirectly into water, except pursuant to a "licence" issued by the applicable water board.[15] The Acts then authorize the water boards to issue such licenses (subject to the Minister's approval for certain categories of licenses) and generally give the boards wide discretion in deciding whether a licence is warranted.[16] Similarly, the Acts give the boards wide discretion in setting the licence terms and conditions,[17] but the Acts also include provisions specifically authorizing the water boards to require a licencee to "furnish and maintain security".[18]

The Acts do not define the term "security," but they state that: the security must be held by the Minister; the "amount" must be that "amount specified in, or determined in accordance with" regulations adopted under the Act; and, likewise, the "form" of the security must be a form prescribed by regulations or otherwise "satisfactory" to the Minister. The Acts further specify that it is up to the Minister to decide when to apply all or part of the security and when to release any unused portion of the security, although the Acts restrict both sets of actions somewhat (discussed below). Finally, the Acts authorize the federal Cabinet to adopt regulations "respecting" or "prescribing" the

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[15] *NWTWA*, ss. 8 and 9; *NWNSRTA*, ss. 11 and 12. The statutes define the terms "use" and "waste" in nearly identical, and very broad terms. See *NWTWA*, s. 2, *NWNSRTA*, s. 4.

[16] *NWTWA*, s. 14; *NWNSRTA*, s. 42(1).

[17] *NWTWA*, s. 5; *NWNSRTA*, s. 70(1).

[18] *NWTWA*, s. 17; *NWNSRTA*, s. 76.

"amount" of required security or, alternatively, essentially authorizing the water boards to determine that amount pursuant to constraints contained in the regulations.[19]

In short, the Acts require that the security amount be determined by or pursuant to implementing regulations, but they do not state expressly whether the implementing regulations can allow the amount of security required under a water licence to include costs for land related reclamation.

Before addressing these regulations, it is worth noting that the Acts' other provisions, and the Acts as a whole, provide mixed clues as to whether the Cabinet can adopt regulations that allow the water boards to include land related reclamation costs in the security required by a water licence. These clues are relevant not only in assessing the legality of Cabinet regulations but in construing the regulations to resolve any ambiguity.

The general legislative argument against including land related costs is that the focus of the water licenses on water suggests that any security required by those licenses should be similarly focused only on water. Assuming for the moment that this argument is valid, the argument still begs several questions as to the scope of project components or activities that are relevant for security purposes.

The threshold question is whether the security must be limited to costs of only those reclamation activities that occur directly within a waterbody. If the answer is no (as all parties seem to agree), several additional questions remain. First, can the security amount include the costs of reclaiming land-based structures whose function was to effectuate the "use of water" or "deposit of waste" for which a licence was required, whether or not the failure to reclaim these structures might harm water?[20]

Second, can the security amount include the costs of reclaiming land-based structures that were expressly required by the water licence, or that were implicitly

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[19] The two Acts differ somewhat in this latter respect. The *NWTWA* states that the Cabinet regulations "may empower" the relevant water board to "fix the amount of the security subject to a maximum specified in, or determined in accordance with" the regulations. The *NWNSRTA* states that the regulations can "prescribe[e]" the "manner of determining" the security amount or "authoriz[e]" the Nunavut Water Board to "fix that amount in accordance with the regulations". *NWTWA*, s. 33(1)(g); *NWNSRTA*, s.82(1). The Acts also differ slightly in that, under the *NWNSRTA*, the Cabinet can adopt regulations only "on the recommendation" of the Minister. *Ibid*. Both Acts also make it clear that the security regulations can "vary according to any criterion or combination of criteria," including according to the various uses of waters and deposits of waste. *NWTWA*, s. 33(2); *NWNSRTA*, s. 82(4).

[20] The term "harm" is used broadly here to include: causing additional, unlicenced "uses of water" or "deposits of waste".

required to meet a performance standard in the licence, whether or not the failure to reclaim these structures might harm water? Third, can the security amount include the costs of reclaiming any other land-based structures if the licencee's failure to reclaim them might harm water? Fourth, to what extent if any should any reclamation costs be reduced, for purposes of including the costs in the security amount, because the licencee's potential failure to reclaim the relevant structure may impact land as well as water? And finally, can the security amount include the costs of restoring environmental components harmed by the licenced "use of water" or "deposit of waste" and, if yes, are such restoration costs limited to water-based components or can they also include land-based ones (e.g. if a waste deposit is released into water but ultimately settles on the bed or shore of the waterbody)?

In short, the basic argument that water licence security should cover only "water related" costs is too simplistic, because the scope of even "water related" costs could be defined in numerous different ways depending on the answers to the questions raised above. Thus, further efforts to find common ground in resolving the security conflict should include addressing and answering each of these specific questions. In doing so, parties should be clear when their answers are driven more by their policy preferences than by the actual legislative mandates.

A primary argument under the *NWTWA in favour of* including land related costs in the required security amount is that the legislative licensing provision refers to the use of waters or deposit of waste "in connection with the operation of the appurtenant undertaking".[21] The *NWNSRTA*'s basic licensing provision does not refer to an "appurtenant undertaking" in this same context, but that Act makes numerous other references to the term in other licensing related provisions.[22] Among these is a provision, mirrored in the *NWTWA*, specifically authorizing the water boards to include conditions in their water licenses "relating to any future closing or abandonment of the appurtenant undertaking."[23] Given these provisions, it seems likely Parliament intended to allow the boards to include costs of reclaiming the "appurtenant undertaking" (as well, perhaps, as other costs related to restoring any affected waters). This position still begs the threshold question: what is the scope of the "appurtenant undertaking"? In particular, does the "appurtenant undertaking" consist of:

- the structures necessary to effectuate the water use or waste deposit;
- any structures expressly or impliedly required by the licence;

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21 *NWTWA*, s. 14(1).

22 See *NWNSRTA*, ss. 39(1) and (2), 44(1), 48(3)(a), 57(a) and (b), 70(1)(d) and (3), 74, 76(5), 77(1)(a), 82(1)(l), and 86(1)(a).

23 *NWNSRTA*, s. 70(1)(d); *NWTWA*, s. 15(1)(e).

- all components of the overall project related to the licenced water use or waste deposit—e.g. mining and processing operation—which, if not reclaimed, might harm water (in the broad sense of "harm" used above);

- or simply all components of the overall project?

Both Acts define "appurtenant undertaking" but only in seemingly circular terms that are arguably unhelpful in answering these questions.[24]

Not surprisingly, the term "undertaking" is the focus of the security provision in the applicable regulations which, for all three regions (Nunavut, and the Inuvialuit Settlement Region and Mackenzie Valley in the NWT) are the *Northwest Territories Waters Regulations* adopted by Cabinet under the *NWTWA*.[25] The operative provision of those regulations is section 12 which states that the Board "may fix the amount" of security "in an amount not exceeding the aggregate of the costs of

- abandonment of the *undertaking*;

- restoration of the site of the *undertaking*; and

- any ongoing measures that may remain to be taken after the abandonment of the *undertaking*. (Emphases added.)"

Similar to the Acts' definitions of "appurtenant undertaking," the regulation (s. 2) defines "undertaking" in circular terms as that "in respect of which water is to be used or waste is to be deposited," but then adds "of a type set out in Schedule II". That Schedule, in turn, refers to seven broadly-worded categories of activities—including "industrial," "mining and milling," and "power" generation. The breadth of these categories implies that the security can cover the cost of reclaiming all components of an overall project regardless of their connection to water uses or waste deposits or whether their reclamation is necessary to protect or restore waters.[26] However, INAC has not accepted this interpretation so the import of the regulation's focus on the underlying "undertaking"

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[24] The *NWTWA* (s. 2) defines "appurtenant undertaking" as the "work described in" a water licence. The *NWNSRTA* (s. 4) defines the term as an "undertaking in relation to which" a water use or waste deposit is "permitted by licence" (*NWNSRTA*, s. 4).

[25] SOR 93/303. Under the *NWNSRTA*'s transitional provisions (s. 173(1)(a)), regulations adopted under the *NWTWA* continue to apply in Nunavut until replaced and repealed by Nunavut-specific regulations which have not yet been adopted. However, by order of the Nunavut Water Board, the licensing exemptions in the *NWT Waters Regulations* are inapplicable in Nunavut. See NWB, *Legislation* (http://www.nunavutwaterboard.org/en/legislation).

[26] The Schedule also includes a "miscellaneous" category described as "[a]ny other undertaking".

remains in dispute.

Other arguments *both* in favour of and against including land related costs in security amounts have relied on legislative provisions regarding: the scope of uses to which the Minister can apply security provided under a water licence; the circumstances in which the Minister can release the security; compensation (both as a condition for, and for harms resulting from the issuance of, a water licence); and, the Acts' overall objectives. However, a complete analysis of all the relevant legislative provisions, and conflicting interpretations, is beyond the scope of this paper. The important point here is that they have been interpreted in conflicting ways with respect to their implications for the land/water security issue.

Still other arguments that have been made, in support of the parties' interpretations of the Acts and the *Waters Regulation*, have been policy based. Chief among these is the policy that all reclamation costs of mines and other projects should be fully secured so that neither governments (and, by extension, the public), nor private landowners, bear the costs of reclamation if it is not completed by the proponent, or bear liability for harm that might result if the reclamation is not completed. Another important policy is that project proponents should not be forced to "double bond" for the same reclamation cost and, more generally, that regulatory requirements should be streamlined and different regulators should work together, to minimize regulatory costs. Underlying these policies are broader or more general public interests in promoting environmental conservation as well as economic development in northern communities.

While these policy-based arguments are a central focus of the debate on the land/water security issue, there are conflicting positions as to the policies' relative importance and their implications (which may vary from one context to another).

The few available 'official' statements of policy—INAC's "Mine Site Reclamation Policy for Nunavut" and nearly identical "Mine Site Reclamation Policy for the Northwest Territories"—have not been especially helpful in resolving this policy debate. These documents contain a smorgasbord of policy statements some of which can be used to support one side of the issue and some the other. As most relevant here, the documents note that there are multiple, different statutory requirements for security and, because security has "become a multi-jurisdictional issue, co-ordination is an important consideration." The documents state further that, to "ensure" that security is "most efficiently and effectively applied," INAC will "facilitate discussion" among different regulators to "promote the co-ordination" and "integration" of security requirements and to avoid double bonding.[27] While recognizing the problem, these policy documents do not take an express or direct stand on whether the water boards can include land related reclamation costs in the amount of security they require in their water licenses.

[27] INAC, *Mine Site Reclamation Policy for Nunavut* (2002) at 9-10; *Mine Site Reclamation Policy for the Northwest Territories* (2002) at 9-10.

3.2. Can Land and Water Liabilities Be Split As a Practical Matter?

As noted in the case studies described in Appendices A and B, INAC's recommended division of land and water liabilities in the Doris North and Con Mine proceedings were based on reclamation cost estimates prepared by Brodie Consulting Inc. (Brodie). The following discussion focuses on Brodie's estimate of the overall security required for the Doris North project which was derived from the RECLAIM model, developed specifically for itemizing mine reclamation costs, as applied to the closure and reclamation plan for the Doris North project.[28] The model's output was a spreadsheet providing dollar entries for total costs, and breakdowns between "land liability" and "water liability" for each of seven reclamation "components" and more detailed spreadsheets listing those three sets of costs for one or more items within each of the seven components.[29] However, the spreadsheet itself does not explain how total costs for each component or sub-component were allocated to one or the other or split between the two.[30]

The narrative discussion accompanying the spreadsheets provides a few additional clues. According to the discussion, total costs for the "monitoring and maintenance" and "mobilization/demobilization" components were split "based upon the ratio of land and water-related costs for the primary reclamation activities." The only explanation as to how that ratio was derived, in turn, was that it was based on Brodie's "judgment".[31]

Brodie's testimony at the hearing and INAC's written Intervention provided

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[28] Brodie Consulting Ltd., *Doris North Mine – Reclamation Cost Estimate* (Prepared for INAC) (July, 2007) at 2.

[29] *Ibid.*, Appendix B. The initial spreadsheet listed an eighth component—"open pit"—but contained $0 values for that component presumably because the Doris North project involves underground mining only and will not use an "open pit".

[30] For all the entries where there was an actual total cost, roughly 51% of the entries allocated that total entirely to the "land liability" column and roughly 39% of the entries allocated the total cost entirely to the "water liability" column, leaving 10% of the entries where the total was divided between the two columns. To be clear, the percentage differences between the actual dollar values of the land/water split in the Brodie estimate—52% land/48% water (for discounted post closure costs)—were much closer than the relative number of instances in which total costs were allocated entirely to the land or the water liability column.

[31] *Ibid.* at 8. See also *Nunavut Water Board Hearing Re: Doris North Project*, Transcript of August 14, 2007 Hearing (hereinafter "Aug. 14 Transcript") at 309 (lines 11-22) (Brodie testimony that the exercise of "deeming" a liability as either land or water related (or both) was "done by myself").

several additional explanations as to how the water and land liabilities were divided. First, the scope of "waters" used for determining water-related liabilities was based on the definition of "waters" in the *NWNSRTA*.[32] Second, the percentage allocations between land and water were made in increments of 25% (*e.g.* 100/0%; 75/25%; 50/50%).[33] Brodie provided no explanation as to why smaller, and thus more accurate, increments were not chosen except to say that "there's not been an attempt to be more refined than those increments".[34]

As for the *logic* of choosing the percentage increments for each item, Brodie explained in his direct testimony that water related liabilities consisted of the costs for "those reclamation activities or portions of activities which are necessary for the protection of or restoration of waters"; whereas land related liabilities were costs for the "balance" of the reclamation activities that are "necessary to leave the site in the condition as required by the applicable regulations and as set out in the reclamation plan."[35]

Read by itself, this explanation would suggest that the costs of certain reclamation activities were assigned to water if Miramar's failure to adequately complete those activities posed a risk to water, *whether or not it also posed a risk to land*. However, in his examples and particularly in response to questioning, Brodie further explained that, for project components whose inadequate reclamation posed risks to *both* water and land, the liabilities were split between the two.

As for how he made this split, Brodie stated (in his discussion of one example) that the proportions were based on his assessment of the relative "potential environmental impact" to land and water.[36] Brodie implied that, in instances where there were "potential environmental impacts" to both water and land, but where he deemed the *relative* impact to water to be less than 25%, he assigned 100% of the relevant reclamation costs to land (and vice versa). Thus, for example, Brodie noted that "re-vegetation would have an element of erosion control, which would be of benefit to waters. So the point here is that this is – there is a small benefit, perhaps, to water, but that activity is normally assigned a hundred percent land."[37] Likewise, Brodie stated that he "typically" assigns costs from the management of chemicals and hazardous materials completely (100%) to water. He conceded that "if these materials or reclamation

32 Aug. 14 Transcript at 279 (lines 8-14).

33 *Ibid.* at 292 (lines 25-26) – 293 (lines 1-6).

34 *Ibid.* at 294 (lines 9-11).

35 *Ibid.* at 279 (lines 14-22).

36 *Ibid.* at 294 (lines 1-3).

37 *Ibid.* at 293 (lines 12-20).

activities were not addressed and there was a spill, one could argue that some of that consequence would arise to the land as opposed to the waters that would be affected." But he explained that the "greater potential environmental impact would in most cases accrue to the waters where the chemicals would drain to," so he assigned 100% of the relevant costs to water.[38]

Brodie's explanation for his methodology raises several basic questions. First, are "water" and "land" reasonable categories of overall environmental risks? Brodie's explanation seems to treat "land"-based risks as any risks other than those to water. Yet, this catch-all category oversimplifies the complexity of ecosystems which include air and wildlife. However, the practical implications of this oversimplified "land" category may be minor because there do not appear to be additional air- or wildlife-specific regulatory regimes that require their own security instruments.

Assuming the land/water dichotomy is reasonable, how does Brodie *determine* the "potential environmental impact" to water and land? More specifically, what common unit or parameter does he use to quantify or otherwise measure the magnitude of "impacts" to land and water so that he can compare them? Is it some dollar value of *damage* resulting from any such "impacts" or the dollar cost of restoring the relevant environmental component if it was damaged by such impact? If not a dollar value, does he use another unit or parameter that can be applied to both water and land so their potential impacts can be compared? Does he also account for the relative probabilities of impacts to water and land and, if so, how does he determine those probabilities?[39]

Assuming that Brodie's methodology for comparing land- and water-based impacts or risks is reasonably accurate, is this comparison at all relevant to the costs needed to finance the reclamation required to actually avoid or mitigate those impacts? The answer would seem to be no, at least in some, if not many or most instances. By way of example, assume a mine has only one physical structure and the estimated cost of reclaiming that structure is $100. Also assume that, under Brodie's analysis, the mining company's failure to reclaim the structure poses a 75% risk to land and 25% risk to water. Under Brodie's approach, the company should be required to provide a $75 security under a land lease and $25 for separate security under a water licence. However, if the company fails to reclaim the structure, what is the likelihood that the risk to water can be averted by spending only the $25 water security and thus completing only 25% of the required reclamation (if the dollar cost is directly proportionate to the extent of reclamation completed) or whatever percent of reclamation could be accomplished with

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[38] *Ibid.* at 293 (lines 22-26) – 294 (lines 1-3).

[39] This approach seems to be implicit in INAC's reference to relative "risks," in its written intervention in the Con Mine hearing. Indian and Northern Affairs Canada, *Intervention for the Miramar Con Mine Ltd. Water Licence Application Closure and Reclamation* (Oct. 15, 2007) at 6.

the $25? If the entire reclamation, at a total cost of $100, is needed to avert that risk, the $25 water security will be insufficient.

In the real world, mines or other large scale developments have multiple structures or components that need to be reclaimed. Thus, to make up the water security shortfall for any one component, the Minister could draw additional funds from the security that might be needed to fund another reclamation component. Under this approach, however, security required by water licenses will never be sufficient to cover the entire cost of the reclamation needed to avert water risks (likewise, land-based security will be insufficient to cover land-based risks).[40]

Brodie's cost estimate report for the Doris North project admits this shortcoming, by "assum[ing] that the land and water securities are pooled in the common interest of reclaiming the site. In the event that the securities are not pooled, then the parties holding the security should be aware that there may be a short-fall in funds if only the land or only the water-related portion of the work were to be conducted."[41] This assumption, in turn, raises additional questions (addressed in part 3 below) of how different securities can be pooled when different securities are actually required. Of course, the assumption fails in instances, like the Con Mine project, where no land-based security is actually required by the land owner.

The practical concerns raised by Brodie's methodology raise the question of what function it actually serves. From INAC's standpoint, the answer is that it addresses what INAC perceives as the water-based limits on the scope of the water board's legal authority in determining security amounts and in the INAC Minister's legal authority to apply any security actually required by a water board. Assuming this legal interpretation is correct, it begs the additional question: If the relevant legislation allows a water board to include in the security amount costs for (in Brodie's words quoted above) only "those reclamation activities or portions of activities which are necessary for the protection of or restoration of waters," do any provisions of the legislation expressly or impliedly require the water board to reduce or eliminate any such cost simply because the relevant reclamation activity may also be "necessary for the protection of or restoration of" land

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40 To use an example from the Doris North project, Brodie lists the total cost of "supplies" needed to "dispose ore concentration equipment" as $50,000 and he split that cost on a 75/25% basis between land and water. If those splits are assigned to two separate, land and water-based security instruments held under different regulatory regimes (and, for private lands, by different agencies), neither instrument will have a sufficient amount to purchase those supplies if ever needed.

41 Doris North Mine Reclamation Cost Estimate, *supra* note 28, at 8.

(or other non-water environmental component)?[42] If the answer to these legal questions is no, then splitting land and water related reclamation costs between security instruments is legally unnecessary except with respect to the costs of reclamation activities that will serve no water protection/restoration purpose whatsoever.

Still another legal question stems specifically from the relevant legal provisions' references to "appurtenant undertakings" or "works" in defining the water boards' and Minister's general water licensing authorities and in the more specific context of the boards' determination of the security amount and/or the scope of uses to which the Minister can apply the security. As noted above, there is disagreement as to whether those terms refer to the *entire* mining project (or, implicitly, to any other natural resource development project or other large-scale activity) for security purposes. But INAC does not appear to question that these terms include, at the very least, the on-land structures whose functions are directly related to the "use of water" or "deposit of waste" for which a water licence is being sought. These structures would include: land-based pumps, pipelines, and other devices to facilitate the removal, from surface or sub-surface water bodies, of water needed for a mining operation; and wastewater treatment facilities that are either expressly required by a water licence or that are implicitly required, as a practical matter, to ensure compliance with any water licence conditions that discharged wastewater meets ambient environmental quality standards expressly referenced in the licenses.

Assuming these land-based structures are relevant "appurtenant undertakings" or "works," then presumably the water boards should be able to add to their security calculations the costs of removing and disposing of the structures, and of restoring the land underneath those structures, *whether or not the licencee's failure to do so would pose risks to water*. Brodie's methodology does not seem to take this connection into account, because Brodie's approach assigns costs between land and water security instruments based on a facility's relative risks to land and water rather than also on the facility's connection to the licenced "use of water" or "deposit of waste".[43]

In sum, Brodie testified that his approach for splitting land and water costs is based on a "significant element of logic".[44] However, the analysis above suggests that the core method for determining relative risks may still be unclear and that the risk-based allocation "logic" raises practical and legal questions.

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[42] Likewise, do the water licensing statutes restrict the INAC Minister's use of any security required by a water licence to the restoration or protection of water only when such use would serve no concomitant benefit to land?

[43] For example, Brodie's cost estimate for the Doris North project assigns the entire cost of removing the sewage plant to land, even though the plant seems "appurtenant" to the licenced discharge of sewage in water. Doris North Mine Reclamation Cost Estimate, *supra* note 28, App. B at 9.

[44] Aug. 14 Hearing Transcript at 279 (lines 6-9).

4.0. What happens if water licence security covers only water related costs?

This part identifies and discusses legal and practical issues that arise if the water security covers only water related costs. The discussion is broken down into issues related to: the INAC Minister's ability to manage security required by water boards and private land managers; the integration of separately held and managed security instruments; land managers' authority to require security; and land owner-managers' liabilities in case project proponents do not complete the necessary reclamation. As noted at the outset, the organization of these issues is not conceptually perfect, but is nevertheless useful for analytical purposes.

4.1. The Minister's Authority With Respect to Managing Security

As noted above, the issues as to the water boards' authority is likely tied to whether the Minister has authority to draw from any security required by a water licence to address land related reclamation costs and liabilities. However, the scope of the Minister's authority is perhaps even more important in considering possible regulatory scenarios if the water licenses require security that covers only water related costs.

This scope issue can be stated generally as whether the Minister can accept and manage security required by a land manager and covering land related costs. This general issue can be broken down into several sub-issues. One is whether the Minister can accept a *single* security instrument for an amount consisting of security required by a water license to cover water related costs as well as any additional security required by the relevant land manager to cover land related costs. If this approach is possible, the water license security might be restricted to water related costs but that security could be integrated with other required security so that there was a single pool of funds to cover all necessary reclamation and other costs.

This sub-issue itself breaks down into at least two further issues, one of which is whether the Minister can accept security in a form that is payable to both the Government of Canada and to the relevant land owner. The Acts' (nearly identical) security provisions could be interpreted to allow this scenario, by leaving the appropriate "form" of security to the Minister's discretion or to Cabinet's discretion through the adoption of security regulations.[45] On the other hand, one might interpret the Acts' instructions that security be "furnish[ed to] and maintained with" the Minister, and that the Minister be responsible for "apply[ing]" the security, as implying that the payee is restricted to the Minister or a federal government source to which the Minister has legal access.

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[45] The security provision in section 12 of the *Northwest Territories Waters Regulation* seems to be silent on the appropriate form of security.

If the Minister can only hold security that is payable to Canada, perhaps a land manager might require that its security be made payable to Canada and that the amount be subsumed in the same instrument furnished under the water licence and applied consistently with the rules governing the Minister's application of the water security. The feasibility of this scenario turns, in part, on the scope of land managers' authority to in effect *delegate* its security functions to the federal Minister and on whether the legal constraints on the manager's exercise of those functions (e.g. permissible applications of security and circumstances in which security can be released) are similar to those on the Minister's management of water security.

The feasibility of a unified security instrument also turns on whether the Minister can accept security that was provided in response to another regulatory regime for which the Minister is not expressly responsible (whether or not the security is made payable to Canada). The *NWTWA* and *NWNSRTA* do not address this issue and further research is needed to assess whether this authority is provided, or expressly or impliedly precluded, under other federal laws.

Short of the land manager's complete abdication of its role in managing the security, any scenario involving the Minister's holding of 'joint' land/water security (for a project on private land) raises practical issues regarding how the Minister and land manager will make joint decisions with respect to the application and release of security for a given project. To date, INAC has stated that any such arrangement would be unworkable, notwithstanding the Nunavut and NWT mining policies' aims to integrate or coordinate different regulators' security requirements.[46]

These problems could be avoided or mitigated for projects on private lands requiring land use permits under the *MVRMA* or *TLA*, if those permits required all necessary land related security, because INAC manages the security required by both land use permits and water licenses.[47] However, further research is necessary to assess whether the scope of activities actually subject to the land use permit requirements is sufficient to cover *all* land related costs of all components of an overall project.[48]

4.2. Integrated Management of Separate Security Instruments

If the Minister cannot receive and manage security required by a land manager, is it still possible for the Minister to coordinate management of the water security with a

46 *Supra* note 27.

47 For a discussion of the geographic scope of these permit requirements and an analysis of the permits' ability to require security, see Wenig and O'Reilly, *supra* note 2 at parts 3.2.2 and 3.2.3.

48 See *ibid*. for a discussion of the limited scope of activities requiring land use permits under the *TLA* and *MVRMA*.

land manager's own handling of land security? The following is a discussion of several issues that would need to be addressed in order to provide a positive answer to this question.

First, the scope of the Minister and land manager's legal authority with respect to the security would likely need to be roughly comparable, so that any mutually agreed management approach would be consistent with both the Minister's and land manager's governing legal regimes. For example, they both must be able to apply the security to the same kinds of circumstances. Then again, the authorities might be overlapping rather than identical, as long as management decisions fell within the areas of overlap in order to be legally valid under both legal regimes and the Minister and land manager could legally commit to avoid the areas that do not overlap.

Second, the Minister and land manager would need to agree on a process for making joint decisions and any such procedural commitment would need to be considered a legally permissible constraint on each decision maker's exercise of discretion.

4.3. Land Managers' Authority to Require Security

As suggested above, a resolution of the overall land/water security issue may depend on land managers' ability to essentially delegate their authority to require and manage security to the INAC Minister. This question of course presumes that land managers have authority to require and manage security in the first place and desire to exercise that authority. If, for a given project, a land manager lacked this authority or the intent to exercise it, and a water board limited its required security to water related liabilities (using the kind of approach provided in the Brodie Consulting cost estimate discussed in part 3.2), then there is a substantial risk that the water board's security will be inadequate to cover all potential costs of reclaiming a project if the proponent fails to do so.

It appears that the four land claims settlement agreements discussed in part 2 above, and accompanying implementing legislation, generally provide managers of settled lands with authority to require and manage security for surface uses. However, further research is necessary to confirm this assumption. It would be worth considering, in particular, whether any such authority is limited with respect to mineral development projects on settled lands for which federal mineral rights were not transferred. To the extent those rights include ancillary rights to access surface lands to extract those minerals, those ancillary rights may limit the kinds of restrictions—including security—that surface land managers can impose on private parties that have acquired rights to federal minerals. Access rights that were 'grand parented' under land claims agreements may pose additional constraints on land owners' ability to require security. As discussed in part 4.2 above, it would also be worth considering the extent to which each land

managers' authority is consistent with the Minister's as necessary for an integrated or coordinated approach.

The picture is more problematic for Commissioner's Lands. As noted in part 2 above, the *CLA* (s. 12(b.4)) allows the NWT Commissioner to adopt regulations "respecting the protection, control and use of Commissioner's land generally". Although brief, this authorization on its face arguably includes implied authority for the Commissioner to adopt regulations establishing a comprehensive reclamation and security program for activities on surface lands. However, to date, the GNWT has not adopted a regulation-based reclamation or security program under this implied authority.

As noted above, the *CLA* also contains a set of provisions allowing the GNWT to authorize the disposition of Commissioner's lands and to adopt regulations setting out the parameters of a disposition system other than those few parameters listed in the Act itself (ss. 3, 4, 12, and 13). Although these provisions are largely silent on the topics of mining reclamation and security,[49] they arguably provide the GNWT considerable implied authority to address those topics in generic disposition regulations and in setting terms and conditions in individual dispositions, subject to the regulations and any constraints provided by the *TLA* reserved mineral rights and water management frameworks, as discussed above.

Pursuant to this broad legislative authority, the *Commissioner's Land Regulations* authorize the Deputy Minister of the Department of Municipal and Community Affairs (hereinafter "MACA") to grant—by sale, lease, or other disposition instrument—any interest in Commissioner's lands (ss. 1-9). With limited exceptions not relevant here, the regulations do not expressly require reclamation or security as a condition for any such disposition.[50] However, several provisions of the regulations require lease applicants to provide information that would be at least minimally useful for reclamation planning purposes.[51]

More importantly, subsection 10(1) of the regulations grants MACA broad authority to determine what other information disposition applicants must provide, which authority arguably includes implied authority to require a reclamation plan and

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49 The exception is s. 3(1.1), which allows the GNWT to grant leases for the establishment, operation and *restoration* of a quarry" on Commissioner's lands (emphasis added)).

50 The exceptions relate primarily to quarrying leases. See *Commissioner's Land Regulations*, ss. 22-26 and 31. See also *ibid.* s. 20 (process for the government's recovery and sale of any structures not removed by the lessee when a lease is cancelled or expired).

51 *Ibid.* ss. 11 (requiring a sketch of any unsurveyed land), 12(1) (requiring a statement of the intended use of the land and a description of the nature of intended improvements to the land), and 12(2) (requiring the submission of plans for fire safety and public health for any buildings or improvements with public access).

information for MACA's calculation of security.[52] In addition, subsection 18(1) of the regulations gives MACA broad authority to determine the "form" of any lease. This authority would appear to include implied authority to adopt reclamation and security requirements as lease conditions.

In sum, the *CLA* is silent on reclamation and security but provides implied authority for the GNWT to address those subjects through each of the components of the Act's overall land management framework. The regulations do not exercise this authority directly but they appear to pass the opportunity to MACA to address reclamation and security through disposition conditions.

Beyond these provisions granting the government discretion to require reclamation, subsection 9(c) of the regulations may impliedly *require* MACA to at least *consider* the prospect for reclamation. That section prohibits the sale or lease of interests in Commissioner's Lands unless MACA is "satisfied" that any such disposition is "fair and equitable and in accordance with the public interest." If a disposition is for purposes of gaining access to and using surface land for a mining or other intensive operation, MACA arguably could not make a proper "public interest" determination without considering whether the applicant has prepared plans for restoration and the likelihood that those plans will be successfully implemented. Thus, this "public interest" determination may provide an implied requirement for MACA to face reclamation and security issues in deciding whether to grant a disposition and in setting disposition terms

As noted in Appendix B, MACA's leases for the Con Mine state that the lessee "shall provide a security bond in an amount and form satisfactory to the Comptroller General of the … [GNWT] conditional upon such terms as the said Comptroller General deems advisable." However, this requirement is expressly conditioned "[u]pon legislation requiring it coming into force in the Northwest Territories".[53] This caveat seems to call for additional legislative consent for MACA to require security *specifically* for the Con Mine, although its intent is somewhat ambiguous. The caveat's purpose is unclear given the above analysis of MACA's existing legislative authority, except that the clause was simply the deal that was struck between MACA and the leasee.

At any rate, to date, no *CLA* dispositions have required security. This said, MACA is in the process of developing a generic or model lease for commercial activities and is considering including a reclamation-related security requirement in that generic disposition. In drafting that requirement, it would be useful to consider how it could be structured to dovetail with water licence security to avoid double bonding while ensuring that both security instruments combined can effectively meet all reclamation needs.

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[52] See also s. 9(a) (prohibiting any disposition unless the DM is "satisfied" that the applicant has "discharged the obligations and performed the covenants and agreements that are required of him or her before the … disposal").

[53] *E.g.*, GNWT, Lease L-18019T, paragraph #29.

4.4. Land Owner-Manager's Liabilities

What legal risks do land owners and managers face if, as INAC has advocated, a water board restricts its security to water related costs and the security turns out to be insufficient to cover needed reclamation? This question is extremely complex and this paper attempts to answer it only by providing an analytical framework for further analysis and research.

First, there is a spectrum of different scenarios in which owners' risks must be considered. At one end of the range of these scenarios is the best case, where water and land security are combined or jointly managed and, collectively, are sufficient to fund the required reclamation work. The worst case scenario at the other end of the spectrum is perhaps the case where land managers had decided to forego requiring land security and land related costs are substantial. There is likely a wide range of scenarios in between these ends of the spectrum which vary according to several factors, including: the nature of non-reclaimed project components and their attendant potential harms; the magnitude of other security instruments; and, the extent to which all security instruments have been coordinated.

Second, a wide range of legal sources may impose legal risks and must all be considered, although their applicability will vary according to the geographic region and status of the land at issue and the nature of the environmental risks posed. These sources include not only the water licensing acts already discussed, but also other applicable federal land management statutes and several federal environmental statutes (e.g. *Fisheries Act*, *Canadian Environmental Protection Act*) and any applicable territorial environmental legislation. The land claims settlement agreements and their implementing legislation should also be considered, as well as any potential liabilities based in common law doctrines (e.g. negligence and nuisance) that may not have been extinguished by these legislative frameworks, or based in Constitutional protections for non-treaty-based Aboriginal rights (or even in Charter-based rights to "life" and "security").

Third, considerations of land owners' legal responsibilities for non-reclaimed projects that pose environmental or public health risks should account for the different parties to whom these responsibilities may be owed. These parties may include people living in or using the non-reclaimed areas, members or shareholders of land management organizations, and federal or territorial agencies empowered to various enforce environmental laws.

Finally, land owners should recognize that there may well be risks even if a water board attempts to account for a project's land and water reclamation costs in setting the security amount required by a water licence. Among other problems, the security amount may not have been adequately calculated, the security-funded reclamation may not be sufficient, or INAC may have released the security before any harm arose. If no scenario is risk free, land owners should consider any risks they face under INAC's preferred approach of splitting land and water security in terms of their potential risks under a more holistic security approach.

5.0. Summary

There is widespread agreement that mines and other large-scale or intrusive developments in the Northwest Territories and Nunavut should be governed by a comprehensive, integrative reclamation regime and that the required security should be sufficient to cover the entire costs of reclamation (including closure, post-closure, and restoration). However, there is disagreement as to whether water boards and INAC should ensure this security objective is met entirely through security required by water licenses or whether the responsibility should be split between water licence and land management functions.

The basic land/water security issue is complex because it requires drawing inferences from numerous legislative provisions that do not touch on the issue directly. Part 3.1 provided an overview of the primary arguments for and against the water boards' inclusion of land related costs in water licence security. In particular, the analysis in that part suggested that these arguments do not have a sufficiently precise focus – *i.e.* they do not actually address each of the several categories of reclamation/restoration costs for mining and other large scale or intrusive developments. The arguments against the water boards' accounting for land related costs also do not seem to explain why the water boards should ignore costs for reclaiming project components that pose risks to water when they also pose risks to land. As noted in part 3.2, INAC's methodology for splitting land and water related costs has similar shortcomings. In addition, the methodology seems to assure that no one security instrument will be sufficient to cover the entire costs of reclaiming and restoring the environment affected by an overall project.

Part 4 provided an analytical framework for considering how the water boards and land managers could coordinate their security requirements, if land and water related liabilities were split among two (or more) security instruments. These considerations are complex and further, context-specific analysis is needed to determine the scope of available options and the risks to land managers under each of them.

Appendix A

Case Study: The Doris North Mine

This case study concerns the "Doris North Project," an underground gold mine proposed by Miramar Hope Bay Ltd. ("Miramar").[54] The overall Project includes an on-site processing facility that will process the ore so that bullion bars can be flown from the site to an off-site refiner.

The overall Project will cover roughly 54 acres of surface land most of which are owned by the Inuit in the West Kitikmeot region of Nunavut. Besides the underground mine adit (i.e. shaft opening) and mill/processing facility, other surface facilities at the mine site include a: crushing plant; tank farm for fuel storage; camp; office complex; workshops; power generation plant; and, sewage treatment plant.

The mine site will be connected by a 4.8 km all-weather road to Roberts Bay where a jetty will be constructed to off-load supplies brought by barges and float planes. Supplies will be stored in a nearby facility before being transported to the mine site. An adjacent quarry will be used for bulk fuel storage. An all-weather airstrip will be constructed adjacent to a section of the all-weather road.

After being treated at the mine site for cyanide and heavy metals removal, mill tailings will be transported 5 km by pipeline (and adjacent all-weather road) for deposit in Tail Lake. Water from the lake will be released annually into Doris Creek which ultimately drains into Hope Bay in Melville Sound (Coronation Gulf). Two "low permeability frozen core" dams will be constructed at the North and South ends of Tail Lake.

The mine is estimated to require one year to construct, two years to operate (with an have an average throughput of 720 tonnes per day), followed by three years of closure and another three years of post-closure monitoring.

Miramar submitted a water licence application to the Nunavut Water Board (NWB) in March, 2002, but the Board did not continue its proceedings until the completion of two rounds of environmental impact assessment proceedings by the Nunavut Impact Review Board (NIRB) in 2006.

The NWB held a public hearing on August 13-14, 2007, following the Board's receipt of written "interventions" from several parties, including INAC and several other

[54] The following background information was obtained from the Nunavut Water Board's Sept. 19, 2007 *Reasons for Decision Including Record of Proceedings* at 5-6. The final Licence was subsequently re-assigned to Hope Bay Mining Ltd., which is a subsidiary of Miramar who was the project applicant. For simplicity, Miramar will be referenced as the project proponent in this discussion.

federal departments and the Kitikmeot Inuit Association (KIA). KIA is the representative of the Inuit in the Kitikmeot region and the "Designated Inuit Organization" under the Nunavut Land Claims Agreement. As such, KIA is the official owner and manager of "Inuit owned land" in the region and the holder of Inuit water rights.[55]

In the hearing, the three primary parties—INAC, KIA, and Miramar—were in agreement as to the general range ($11.5 - $12 million) for the total amount of security required for the overall mine project.[56] However, INAC disagreed with the other two parties as to the portion of that total that should be required under the water licence. In INAC's view, the total amount of security should be split equally between security instruments required by the NWB (and held by the INAC Minister) and by KIA.[57] Miramar and KIA opposed splitting the security. KIA also responded that, if the Board would not require security covering all water and non-water related liabilities, payable to both the Minister and KIA, KIA would require security in the amount of $11.7 million under its own land lease, notwithstanding the potential that this would cause Miramar to be double bonded.[58]

The key parties also appeared to disagree as to the form of security, to the extent that KIA felt that "all risks and liabilities on Inuit-owned land, regardless of whether they're land or water, are secured by KIA," while INAC took the position that the security required by the Board can only be held by the Minister or his delegate.[59]

At the close of the hearing, the NWB invited the parties—particularly INAC, KIA, and Miramar—to file supplemental arguments with respect to security. INAC's nine-page submission starts with the general position that, under the Nunavut Land Claims Agreement and *NWNSRTA*, the NWB's "mandate, responsibilities and powers relate only to water, and do not relate to land."[60] Next, INAC argued that the scope of

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[55] *Ibid*. at 9. See NLCA, parags. 1.1.1, 19.3.1, and 20.2.

[56] INAC estimated total security at $11.535 million and KIA and Miramar estimated the total to be $11.714 million. *Ibid.* at 17.

[57] NWB, *Reasons for Decision* at 10; but see also *ibid.* at 17 (noting INAC's estimate that $5.937 million should be applied to land and $5.562 applied to water related liability, for security purposes).

[58] *Ibid.* at 9. Miramar also argued that, if the security was going to be split, a higher proportion of the total should be held under the land lease than the proportion recommended by INAC. *Ibid.* at 17. Apart from the security requirement, KIA negotiated an Inuit Impact and Benefits Agreement, and a separate agreement with Miramar for compensation for impacts on Inuit water rights. *Ibid.* at 12.

[59] *Ibid.* at 18.

[60] Indian and Northern Affairs Canada, Supplementary Information, Type A Water Licence Application for the Doris North Gold Mine by Miramar Hope Bay Ltd. (Aug. 24, 2007) at 3.

uses to which the Minister can apply the security are all water related, so it would be nonsensical to interpret the legal regime as allowing the NWB to include land related liabilities in its determination of the *amount* of security to be held by the Minister. Finally, INAC stated that, although it is "difficult" to "'isolate' land from water considerations" and that there may be a "few sharp dividing lines between land and water," the Board should adopt the approach of quantifying the "degree" or to which any given proposed reclamation activity relates to land *versus* water or, in other words, the "percentage" of a proposed activity's "relatedness" to land versus water.[61] INAC provided several tips for conducting this analysis:

- "[I]dentify those elements of reclamation activity that are substantially related to water";
- "[O]mi[t] from the security calculation" those elements that have "only a remote connection to water or which are unlikely to affect water"; and,
- "[A]pportio[n] according to a reasonable ratio" security for activities "aimed substantially at both land and water".[62]

Notwithstanding these positions, INAC supported the Board's assumption of a single overall remediation project for costing purposes and likewise agreed with the Board and proponents' approach of developing a single reclamation plan in order to "coordinat[e]" reclamation activities for land and water. Finally, INAC argued that it would be illegal for the Board to order security to be made payable to both the Minister and a third party landowner and impractical for the Minister to have to negotiate with any such third party in deciding how to apply or release any portion of the posted security.[63]

In its post-hearing submission, KIA argued that there was "no clear and principled way to separate out land and water related Security." KIA further implied that, once the NWB calculated water related security under this "highly discretionary and even arbitrary" land/water division, KIA would not be assured that the left over land related portion of the overall total would be sufficient to protect Inuit interests with respect to non-water liabilities.[64] From a legal standpoint, KIA's submission focused on the terms "appurtenant undertaking" and "undertaking," in the *NWNSRTA* and accompanying regulations, respectively, and on the NWB's past practice of refusing to split water and non-water related liabilities for security purposes.[65] KIA's subsequent reply submission

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61 *Ibid*. at 5-6.

62 *Ibid*. at 6.

63 *Ibid*. at 7-8.

64 *Submissions of the Kitikmeot Inuit Association* (Aug. 24, 2007) at 2-3.

65 *Ibid*. at 3-6.

argued that INAC's interpretation of the relevant Acts was unduly narrow given the legislative focus on waste deposits as those occurring both on land and directly in water, and on several other legislative provisions that addressed land- as well as water-based impacts.[66]

Miramar's post-hearing submission focused, first, on the prospect that INAC's approach would result in the company being required to double bond. Miramar's legal arguments focused on the NWB's general breadth of discretion in making security related decisions and on various legislative provisions that allow any of four options suggested by Miramar for INAC/KIA joint roles and entitlements to security that would avoid a double bonding scenario.

On September 19, 2007, the NWB issued a Reasons for Decision indicating its intent to grant the water licence. In its Reasons, the NWB accepted KIA and Miramar's views that the amount of security required in the water licence should cover all water and non-water related liabilities. The Board based its conclusion on the blanket terms of the security provision, and references to the "appurtenant undertaking," in the *NWNSRTA* as supported by the Board's approach in previous licensings. The Board also felt that the Act gave the Minister authority to apply the Board-required security to non-water related liabilities and thus the Board "encouraged" the Minister to reconsider its narrower interpretation of this authority. The Board accepted KIA and Miramar's $11.714 figure for the total security,[67] and recommended that the Minister accept a form of security that could be jointly held by the Minister and KIA, which approach a previous Minister had accepted for a prior Board-licenced mining project.[68]

INAC Minister Chuck Strahl approved the NWB's licence in November, 2007. In a letter accompanying his approval order, Hon. Strahl stated that he had instructed INAC's Nunavut Regional office to consult with Miramar on the "form and posting" of the required amount of security. He also reiterated INAC's position in the NWB proceeding that the Government of Canada could not hold security, and nor could he draw from the security, "for any purpose other than those specifically authorized in" the *NWNSRTA*, but without stating expressly whether these purposes included addressing non-water related liabilities. He acknowledged that KIA might require additional security from Miramar and noted that INAC officials would be "pleased to participate in any discussions of reclamation security and welcome opportunities to work with" interested parties and the NWB on "this issue so critical to sustainable development in Nunavut."[69]

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66 *Reply Submissions of the Kitikmeot Inuit Association* (Sept. 4, 2007).

67 *Ibid.* at 25-26.

68 *Ibid.* at 27 and NWB Water Licence No. 2AM-DOH0713, Part C, parag. 1.

69 Nov. 5, 2007 Letter from Hon. Chuck Strahl/INAC to Thomas Kabloona/NWB

Miramar needs several other approvals for the Doris North project besides the water licence, including: a KIA land lease (issued in March, 2008), a foreshore lease from INAC for the Roberts Bay jetty; an approval from the Department of Fisheries and Oceans under the *Fisheries Act*, an exemption from Environment Canada from federal *Metal Mining and Effluent Regulations* (*MMER*) under the *Fisheries Act*, approval from Natural Resources Canada for explosives storage and use; and approvals from Transport Canada. At the NWB's hearing, DFO stated that it had obtained a $67,000 letter of credit from Miramar as security for the Roberts Bay jetty, and that it would require additional security to cover fish habitat compensation works, and to comply with requirements stemming from application of the mining pollution regulation exemption. However, DFO also stated that it did not intend its security requirements to add to the total amount otherwise determined and that DFO assumed there would be a "'mechanism'" to enable DFO to work with INAC to avoid duplication of securities.[70] Miramar has given KIA a corporate guarantee for roughly $8 million as a short term solution. For the longer term, Miramar, KIA, and INAC have agreed to continue trying to work out the overall security issue following the outcome of the *MMER* approval process and Miramar's further planning as to the overall project scope and its relation to other mining ventures in the same region.

[70] NWB, *Reasons for Decision* at 9-10, and 19.

Appendix B

Case Study - The Con Mine

This case study concerns an application by Miramar Con Mine Ltd. for the MVLWB to renew a water licence for the Con Mine which is located on "Commissioner's Land" in and near Yellowknife, some or all of which land may be subject to current native land claims negotiations.[71] The Con Mine was an underground gold mine which began operating in 1938. Miramar acquired the mine in 1993 and permanently closed it in 2003, at which point Miramar ceased mine dewatering and allowed the underground areas to flood. The associated mill ceased production in 2004 and was closed in 2005.

The renewed Licence is intended to cover a six year period of water uses in connection with Miramar's initial closure and reclamation of the project site, pursuant to a "closure and reclamation plan" approved by the Mackenzie Valley Land and Water Board (MVLWB or Board) in April, 2007. (Unless specifically noted, references below to the "mine" or "mine site" are intended to include the milling and other processing facilities.) More generally, the Licence is associated with Miramar's completion of active reclamation of the mine site and its transition to a "long term post-closure care" of the site.

The license application covers Miramar's removal of roughly 200,000 m^3 per year for 2008 and 2009 from Great Slave Lake, to be used to wash buildings and equipment as part of the site decommissioning process. Following this use, the water is intended to be routed to and stored in one of six "tailing containment areas" on the site, along with surface runoff from the site. Following storage, these waters will be treated in a Water Treatment Plant and then released through a drainage channel into a chain of lakes which drain into Great Slave Lake.

Miramar holds five separate Commissioner's Land leases for the Con Mine. All of the current leases were entered into around 1991-1992; two of the leases—including one that covers the primary mine site—expire in 2021; the other three expire in 2011. The GNWT received the leased land from the federal government in 1970, as part of the creation of the "Yellowknife Block Land Transfer Area". At that time, there were existing federal leases covering the mine site. These leases had been entered into in 1961 and expired in 1991 at which time they were replaced with leases under the *CLA*.

Each of the *CLA* leases has a provision titled "Security Deposit" and which states that, "[u]pon legislation requiring it coming into force in the Northwest Territories, the

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[71] This background information was obtained from: Ron Connell/Miramar Con Mine Ltd. Letter to MVLWB, May 31, 2007, p. 1; Miramar Con Mine Ltd., Application for a Renewal of Water Licence N1L2-0040, and Mining Industry Questionnaire.

Lessee shall provide a security bond in an amount and form satisfactory to the Comptroller General of the … [GNWT] conditional upon such terms as the said Comptroller General deems advisable."[72] MACA seems to view this provision as precluding it from requiring Miramar to provide security until *new* legislation specifically authorizing that requirement was enacted. Further research is necessary to determine whether this provision was carried over from the original federal lease and, thus, whether the *CLA* itself might qualify as the relevant authorizing legislation.

Before applying for its water license renewal, Miramar submitted a "final closure and reclamation plan" (C&R Plan) to the MVLWB, as required by a condition of its then-existing water license. The C&R Plan was comprehensive in the sense that it covered closure and reclamation with respect to *all* components of the overall mining and processing operations. The Board approved the C&R Plan in April, 2007. In its approval letter, the Board noted the upcoming (January, 2008) expiration of Miramar's then-existing water license and the Board's "understanding" that Miramar would soon be submitting an application for a new water license "for the purposes of reclamation and closure".[73]

INAC appears to have been the first party to raise the security issue following Miramar's submission of its water license application. In comments on Miramar's application, INAC recommended that the Board require a security deposit only for "water related liabilities at the Con Mine site" as "[l]and related liabilities" were under the GNWT's "jurisdiction" because the mine was located on Commissioner's Land. Following this approach, INAC provided an estimate of $12,740,879 in "water related liabilities" based on a reclamation cost study conducted by Brodie Consulting Ltd. (Brodie) which sought to "proportion[n] land and water related liability based on reclamation activity." For any mining activity that might impact both land and water—e.g. tailings—Brodie split the total liability for that activity between land and water based on its "professional judgement" as to the "risk to each environmental component."[74]

In response to this recommendation, the Board noted that it raised a "jurisdictional" issue that required clarification before the upcoming public hearing. Toward that end, the Board requested INAC to provide "legal arguments" as to why the Board's jurisdiction should be limited to water related liabilities and then invited the other parties to reply.[75] Much of INAC's response is based on INAC's "past practice"

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[72] *E.g.*, GNWT, Lease L-18019T, paragraph #29.

[73] April 27, 2007 Letter from Willard Hagen/MVLWB to Ron Connell/Miramar.

[74] Indian and Northern Affairs Canada, *Intervention for the Miramar Con Mine Ltd. Water Licence Application Closure and Reclamation* (Oct. 15, 2007) at 6.

[75] Nov. 5, 2007 Letter from Wanda Anderson/MVLWB to Trish Merrithew-Mercredi/INAC.

of seeking security for land-related costs for developments on Crown lands. From this experience, INAC stated its belief that a "responsible and prudent landowner should seek security under a lease or through other agreements with the company" and the landowner would be able to draw against that security for purposes "having no relation whatsoever to water, or the mandate of the [Mackenzie Valley Land and Water] Board."[76]

The gist of the legal position in INAC's response is that "the core of the Board's mandate, while considering a water license, is to identify the potential effects of an appurtenant undertaking on water" and, hence, to consider only those water-related effects in considering the amount of security to require for the abandonment, restoration, and post-abandonment care of the relevant "undertaking".[77]

Several other parties to the licensing proceeding objected to INAC's position. Among these objections, Miramar's response noted that INAC's view was inconsistent with the combined land and water focus of Miramar's C&R Plan as well as "unworkable" because of the "clear interconnection of land and water reclamation liabilities." According to Miramar, it would be "extremely difficult, if not impossible, to separate land and water reclamation liabilities in a clear and principled way, and any attempt to do so would result in a highly arbitrary separation of the two liabilities." From a legal standpoint, Miramar viewed the term "undertaking," in both the *NWT Waters Act* and accompanying regulations, as applying to the entire mining operation. Miramar also indicated its view that the GNWT lacked authority to require security under the *CLA* and accompanying regulations, as well as the actual Leases given the lease term quoted above.[78]

In its response, MACA provided examples to support Miramar's point regarding the practical difficulty of separating land and water liabilities and also referenced the compensation provision in section 17 of the *NWTWA* as enabling the MVLWB to hold security on behalf of another party.[79]

INAC subsequently responded to this point by noting that, while this section allows the DIAND Minister to use security to "compensate … a[n injured] third party in certain circumstances," that section does not allow the Minister to "hold the security on

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[76] INAC's Response to Board's Request (Nov. 28, 2007) at unnumbered pp. 2-3.

[77] *Ibid.* at unnumbered pp. 1-2.

[78] Dec. 12, 2007 Letter from Ron Connell/Miramar to MVLWB. The North Slave Metis Alliance objected to *both* Miramar and INAC's positions, although the nature of the Alliance's objections to Miramar's position is unclear. Dec. 12, 2007 Letter from Sheryl Grieve/NSMA to Peter Lennie-Misgeld/MVLWB.

[79] Dec. 12, 2007 Letter from Beverly Chamberlin/MACA to Peter Lennie-Misgeld/MVLWB.

behalf of or for the benefit of the third party."[80]

In a decision issued January 15, 2008, the MVLWB concluded that it does have authority to "set security for both land and water liability" in the context of requiring a security deposit as a condition for issuing a water license. In support of its decision, the Board referenced its general "land and water" authority in section 102 of the *MVRMA*. The Board also noted that both the *NWTWA* and accompanying regulations provide for security at an amount sufficient to cover the costs of abandonment, restoration, and post-abandonment measures with respect to the "undertaking" which term the Board construed to mean the "entire [mine-related] undertaking".[81]

The Board held a public hearing on Miramar's license application in early 2008 and, following that hearing, forwarded a draft license to the Minister of DIAND. On February 15, 2008, INAC provided comments on the draft license in which INAC "restate[d]" its position that security required by water licenses is held by the Minister for "direct water-related liabilities, and therefore would only be used for direct water-related activities." In INAC's view, the GNWT has "lead responsibility for ensuring appropriate remediation on Commissioner's Land."[82] The Minister's response and the Board's issuance of a final license are still pending.

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[80] INAC's response to reviewer's comments (accompanying Dec. 17, 2007 Letter from Trish Merrithew-Mercredi/DIAND to Wanda Anderson/MVLWB).

[81] *Reasons for Decision of the Mackenzie Valley Land and Water Board*, In Re: Miramar Con Ltd. ('Miramar') – Jurisdictional issue on the authority of the Mackenzie Valley Land and Water Board ('MVLWB or the Board') to set Water License security to cover both land and water liability under Water License application MV2007L8-0025.

[82] February 15, 2008 Letter from David Livingstone/DIAND to Adrian Paradis/ MVLWB at 1.

Appendix C

Case Study (hypothetical) - Natural Gas Gathering Facility in the Inuvialuit Settlement Region

This hypothetical project will occur within the Mackenzie River Delta, which is part of the 65,000 km^2 Inuvialuit Settlement Region (ISR) under the 1984 land claim agreement between Canada and the Inuvialuit, known as the Inuvialuit Final Agreement (IFA).

The overall gas gathering project will cover roughly 2000 hectares and will be located partly on Crown land and partly on land owned by the Inuvialuit and managed by the Inuvialuit Land Administration. The overall gas gathering project will take 2-3 years to construct and will operate for roughly twenty-five years. Cleanup and reclamation would occur primarily in the winter of the final year, with some additional work the following summer. Post-closure monitoring reports will be required for the each of the following five years.

The primary project components are listed below followed by a brief statement of whether the component's construction, operation, and/or reclamation would require the "use of water" or "deposit of waste".

- Several mobile sled camps (supporting 35-75 people) on Inuvialuit and Crown land to support initial construction.

Camp sewage will be treated in a mobile treatment shack towed behind the camp. Treated, tested sewage effluent will be deposited to low lands (and are considered "deposits of waste" subject to water licensing requirements). Solids from sewage treatment will be trucked to the nearest municipality and disposed of in the town lagoon.

- Several temporary infrastructure sites, including a 450 person camp, airstrip, and stockpile site for equipment, materials, and fuel storage, will be located on both Crown and Inuvialuit land.

Water will be used during construction, operation, and reclamation of these sites.

- A barge landing site on Inuvialuit land.

Construction and maintenance will require the deposit of quarried material instream to build up ramps to allow the movement of barged supplies to land.

- Three borrow sites – two on Inuvialuit land, one on Crown land.

- A 40 metre wide pipeline right-of-way, bordered on one side by a 10 metre-wide workspace, both 50 km. in length, half of which length would run on Inuvialuit land and half on Crown land.

The right-of-way will need to be flooded annually so the resulting ice support construction equipment. This hypothetical presumes a small diesel fuel spill (<2500m3 of contaminated soil) within the right-of-way. The spill did not occur in or run into waters but, the licencee's excavation of the contaminated soil and replacement of the excavated soil with quarried material presents a risk that the underlying permafrost will melt impact a water body through the deterioration and potential ponding of water onsite. The licencees' response to the spill will require its own reclamation plan.

- Yearly construction of a 135 km network of winter roads to access all facilities. Roughly half of the entire length will be on Inuvialuit and half on Crown land.

Watercourse crossings will need to be monitored annually and two of the crossings (those over 5 m wide) will have some rutting and erosion problems the remediation of which will be pursuant to reclamation plans developed specifically for these areas.

- Facilities containing equipment for handling natural gas liquids and for pigging (i.e. running instruments inside pipelines to clean them and monitor their condition), located on Crown land.

Water will be used for construction.

- A compressor station and battery facility will be located on Inuvialuit land and accessible by a winter road constructed annually.

Water will be used for construction.

The water uses and deposits of waste from all components of the overall gas gathering project will be considered collectively for licensing purposes. Under this approach, the entire project will require a Type A water licence from the NWT Water Board (under the *NWTWA*) which in turn will require a project-wide spill contingency plan and closure and reclamation plan. All disposable hazardous materials from the project will be collected and shipped for disposal in approved facilities in either British Columbia or Alberta.

This scenario does not include a prediction of the extent to which the failure to reclaim each one of the gas gathering project's components poses a risk to water. In a general sense, however, there is a water related risk from erosion that is common to all components. This risk is typically minimized by stabilizing a site, including covering exposed soil, and contouring the site to match the surrounding contour to avoid ponding which in turn can degrade permafrost and cause the formation of erosion channels and gullies.