

**“When you use the term ‘long term’,
how long is that term” [1, p49];
Risk, Exclusion, and the Politics of Knowledge
Production in Canadian Nuclear Fuel Waste
Management Policy Making.**

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1. Introduction

“I find this a very difficult task to do because within our Indian ways, we are taught that all our decisions should be made by thinking seven generations in advance, that when I’m here to speak for my family, my thoughts should be projected seven generations in advance [...] We talk about this waste that is going to be here for a very long period of time. We know that the period of time I believe they talk in terms of half lives, they talk in terms of tens of thousands of years. There is a lot of time before this stuff becomes neutralized, or this stuff becomes harmless again. Now this process that is going to take place over several thousand generations before this product is harmless again. Is this panel prepared, or are they even capable of making decisions for that length of time?” [1, p 99-105].

“The seven generation teachings, and its inherent consideration of impacts many generations out, has greatly influenced the NWMO study process” [2, p 22].

The subject of both these statements is the “seven generations teaching,” a concept that forms part of many North American Aboriginal cultures’ epistemologies. In the first passage, an Elder of the Serpent River First Nation (SRFN) is using the teaching to question a representative of a uranium mining company’s ability to make judgements about the safety and acceptability over time, of the low level nuclear wastes (tailings) disposed of in the Serpent River Watershed. Both the company and the federal regulator claim in this case that the tailings containment method will be safe because the risks it poses the ecosystem and humans are within regulatory levels. In making reference to the need to consider the future effects of the undertaking, the Elder is contrasting the conceptual limits that the SRFN place on knowledge making (seven generations) with those of the nuclear industry (several thousand generations or more). In so doing, he is challenging the industry’s seemingly unlimited ability to produce knowledge, and hence the quality and content of the claim. In the second passage, the Canadian Nuclear Waste Management Organization (NWMO) is describing the significance of the teaching for decision making about High level nuclear fuel waste (NFW) management. Their use suggests that they have learned from the wisdom of Aboriginal peoples, and, consistent with this particular teaching, are considering the future effects of NFW in their assessments of an approach to managing it. What is interesting about both of these statements is that first, both impart different meanings to the seven generations concept. For the SRFN the teaching communicates not only the need to consider the future ramifications of actions, but the epistemological limits to doing so. For the NWMO, it communicates the need to take into account future effects of decision making, at least seven generations out. Second, both passages apply the concept differently. The SRFN use the teaching to criticise the universality of claims based on risk. The NWMO use it to support their claims, and to show common ground between their study and the knowledge of Aboriginal peoples. Third, despite these dissimilarities, both concern the relationship between knowledge production and time, and fourth, relate the teaching -and by extension Aboriginal epistemology- to knowledge production about the effects of NFW and its management. Most importantly, both of these

statements have everything to do with the challenges of understanding the effects of NFW management under conditions of ignorance and uncertainty- and the appropriateness of 'risk' as an epistemological model for doing so.

Risk is arguably the new commonplace of contemporary policy debates, most especially NFW management. In Canada, as in other places around the world, risk, risk determination, and risk management are ubiquitous in NFW management policy making, where this task has become synonymous with managing risk. For example the NWMO's study of methods for NFW management takes the form of a comparative risk assessment, where objectives such as "safety from harm", "fairness" and "community well being" are understood in terms of risk, and conceptualization of the effects of NFW and its management are translated into 'risks' (eg:[2], [3], [4]). 'Risk' has become a synonym for more extensive terms such as effect, danger, harm, and hazard. Drawing on the insights of sociologist Ulrich Beck [5] and governmentality scholars(eg: [6]) the use of "risk" in Canadian NFW management policy making can be examined in order to assess its implications for social and environmental justice, particularly with respect to Aboriginal Peoples. As indicated in the passages above, the inclusion of Aboriginal peoples, whose territories are likely to be implicated in NFW management policy, has become a politically desirable goal. In particular, the NWMO are concerned with ensuring that Aboriginal peoples are informed participants in decision making, especially with respect to concept assessment and facility siting. Both of these democratic goals necessitate their need to understand, if not participate in the management of, 'risks'. However, as the passages above convey, the use of risk itself in conditions of extreme uncertainty is contested by at least one first Nation, indicating that the debate about risk and democracy need be extended to question the use of risk itself as the exclusive knowledge production technique.

Recent scholarship on risk, and particularly risk management, has focused on its democratization: the incorporation of what are often called "local knowledges", and public values, perception, and acceptance into risk determination and management. The purpose being to make the outcomes of policy making more just. The aim of this paper however is to focus debate and discussion of the concept of risk itself, and to critique its potential for actually producing inclusive and democratic knowledge. Specifically the paper examines the connections between "risk" and the production of knowledge about NFW management in the Canadian context, and asks whose knowledge and whose experiences of the effects of nuclear problems, policies, and practices are best mobilized by the idea of risk, and whose are not. This paper unfolds by first examining the conflict between Aboriginal peoples and the nuclear industry, and then by examining the ways in which the knowledge and experiences of Aboriginal peoples with 'things nuclear' are, through the lens of risk, defined as subsidiary to the fundamental questions of NFW management, and specifically the ways in which they are disconnected from knowledge production about its effects. The paper concludes by raising questions about the nature of risk as a heuristic for producing democratic knowledge, and argues that in the Canadian Context, the industry's use of "risk" was and is instrumental to its success in containing and redirecting challenges to their claims about the effects of NFW management presented by Aboriginal peoples.

2. The Implication of Aboriginal Peoples in NFW Management

Aboriginal peoples in Canada are extensively implicated in the historical and present landscapes of the Canadian nuclear fuel chain. From uranium mining and milling to nuclear power production and waste disposal the lands, livelihoods and labor of Aboriginal peoples are in various ways and for various reasons wound up in the politics and geography of nuclear production. More so than any other group in Canada. Until very recently however, their experiences have not been a consideration in official policy discourses about NFW management; their presence in, and experience of, these landscapes are normally written out. In the late 1990's this was momentarily altered. During the course of a public Federal Environmental Assessment (EA) of Atomic Energy of Canada Limited's (AECL) plans for the deep geologic disposal of NFW in the plutonic rock of the Canadian Shield, extensive public hearings were conducted at which many Aboriginal peoples gave oral and written testimony [7]. These testimonies revealed a history of experience of the nuclear industry very different from, and often at odds with, the one suggested by the concept's proponents (including AECL, nuclear power utilities, the federal nuclear regulator, and various government ministries). This testimony narrated radically different experiences of the effects of

nuclear industries, and promoted different judgements about the implications of NFW than did the proponents. The content of these testimonies challenged plans proposed for NFW management, and most significantly, brought into question the knowledge and authority of the proponents. Drawing in part on the content of these testimonies, the EA panel recommended that the federal government, amongst other things: not adopt the proposal as presented; create a parallel Aboriginal participation process; and remove the responsibility for NFW management from the nuclear industry [8]. In so doing, the panel questioned not only the legitimacy of the nuclear industry's role in NFW management policy making, but also its knowledge, by giving credibility and political legitimacy to an alternative source of knowledge about its effects; the experiences of Aboriginal peoples.

Further, the panel's recovery, treatment and use of these testimonies in their recommendations, re-inscribed the geographies of Aboriginal peoples onto the official politics of NFW management. The ensuing response of government and the nuclear industry, in particular through the work of the newly established NWMO, can, I suggest be read as an attempt to recover from this challenge either by regaining exclusive control over the production of knowledge about NFW or, by democratizing their knowledge production and planning methods. In both cases, Aboriginal peoples are of political significance. In 2002, four years after the release of the EA panel's report, the *Federal Nuclear Waste Act* came into force, giving a mandate to the owners and producers of NFW (in the capacity of board of directors of the newly incorporated NWMO) to study and recommend a method for long term NFW management [9]. This decision followed extensive and exclusive consultations between the federal Ministry of Natural Resources and owners and producers of NFW, and can be seen as a first step in re-establishing industry control over the outcome of nuclear wastes. In the wake of the panel's report, however, the NWMO is required in the legislation to consult with the public and Aboriginal peoples throughout the course of their study [9]. The NWMO appear to be taking their mandate seriously, and appear to be engaging with Aboriginal peoples in order to manage NFW. They have engaged various tools as part of their consultation program, including hosting a two day workshop on the subject of "Aboriginal Traditional Knowledge", and establishing "dialogues" with National Aboriginal organizations such as the Assembly of First Nations (AFN) [2][3] [4].

More important than the presence or success of these activities is the way their results are represented and used in the actual construction of management options and analysis of them. The ways in which Aboriginal knowledge, judgements and experiences are represented in the NWMO's work, both discursively and in terms of content, indicates the extent to which knowledge production is in practice shared and democratic. While the precise contours of democracy are not important here, most ideals point towards a formal inclusion and recognition of difference. In the tradition of critical theorists, in particular Iris Marion Young, [10] [11] democracy refers to the recognition, encouragement, and inclusion of social difference in the practice of social life. The NWMO's study process largely involves the creation of an analytical framework based on "citizen" and Aboriginal "values" with which to develop and analyze methods for managing NFW. Amongst other things, the NWMO's documents, progress reports, and final study highlight the ways in which Aboriginal peoples' "needs, concerns, knowledge, and values" have been incorporated into their work (eg:[2] [3] [4]). A content analysis of the NWMO's work to November 2005, was conducted as part of a larger doctoral research project. This analysis focused amongst other issues on representations of Aboriginal peoples and their knowledge.

2.1 Representations of Aboriginal peoples and knowledge

The dominant representation of Aboriginal peoples, in the NWMO's work is as a "community of interest." This places them amongst a variety of citizen groups, including youth, reactor site communities, and regular Canadians who for various reasons are important to their study. The reasons provide by the NWMO for the relevance of Aboriginal peoples as a group to NFW management provide further insight into their representation. They are significant because they: are a member group of the "Canadian public"; have historically requested to be involved and represented in nuclear issues in Canada; legally must be 'consulted'; and have "special" insights, needs, and values as Aboriginal peoples [4]. The significance and uniqueness of these are always assumed to derive from their aboriginality. They are also presented in NWMO literature as evidence of inclusion of diversity in their work. Their significance and their potential contributions to the study, are overwhelmingly and exclusively connected to three aspects of NFW

management. First, to the identification of “Canadian values” according to which NFW should be managed (though in the final development of their analytical framework, Aboriginal and “Canadian” values were determined by the NWMO to be so similar as to not require distinct representation) [2 ,p 54][12]. Second, to activities related to the future implementation of a management approach, particularly during facility siting and the development of culturally sensitive and needs based protocols. Third, as overwhelmingly connected to procedural matters, including the development of a management approach (as distinct from method). In addition, two dominant representations of the knowledges of Aboriginal peoples are also present in the NWMO’s work. First, the content is represented as a series of spiritual and traditional insights and teachings that are relevant *because* of the values and beliefs that they reveal. This knowledge is generally described as useful for guiding the NWMO’s overall approach, and for identifying the values that need to be met, such as the seven generations teaching described above. Second, the content of this knowledge is represented as a body of process related insights relevant to Aboriginal decision making from which the NWMO can learn, for example. For example, to pray for assistance, and to allow elders to speak first during consultation [4, p 83].

These representations are significant when compared with the content and spirit of claims made by Aboriginal peoples. As exemplified by the passage quoted in the introduction, this knowledge and experiences is often critical, and challenges the content and epistemology of the nuclear industry’s claims about the potential effects of NFW, radioactivity, and the long term safety and acceptability of a management approach. Aboriginal peoples, drawing on their extensive experiences with nuclear industries and different parts of the fuel chain, make judgements and hold knowledge about the long term low level effects of radioactivity in their environments, complex ecosystems, human bodies, and animals [13]. They further have extensive knowledge about the effects of nuclear industries including nuclear waste management on the lands, livelihoods, and rights of Aboriginal peoples [13]. Importantly, this knowledge, in its telling, reveals a history of experiences of the nuclear fuel chain to substantiate these claims. Testimonies about the effects of nuclear industries and judgements about NFW management typically narrate knowledge claims through reference to the experiences and occasions that lead to the judgement (eg:[7]). The NWMO’s representations of the content and purpose of Aboriginal knowledge and the relevance of Aboriginal peoples to their study, contrasts remarkably with the content of the remarks of the statements publicly made by Aboriginal peoples about ‘things nuclear’. In response to the NWMO’s work, the AFN have repeatedly criticized the characterization and use of Aboriginal knowledge for these reasons. On the issue of content, for example, they state:

[the NWMO] treats ATK in a patronizing manner...First Nations have extensive knowledge of their traditional territories and have had considerable experiences with the nuclear industry, placing them in a unique position to guide the discourse on nuclear fuel waste management ...by characterizing Aboriginal knowledge as perspectives and insights rather than knowledge it undermines the validity and importance of Aboriginal involvement. [14, p5]

Further, on the issue of epistemology they state:

“Of particular concern was the inappropriate use of the “seven generations” teachings. Seven generations teachings state that you must try to consider what the impacts of your actions will be seven generations into the future, while recognizing with humility the difficulty in achieving this. Document 2 and accompanying assessment team report states that the first phase of the management approach corresponds approximately with seven generations. The use of seven generations in this manner overlooks that the consequences of disposing used fuel waste will continue for many thousands years. The working group felt that the inappropriate use of seven generations teachings was done simply to appear that the NWMO was incorporating ATK into its work, rather than looking critically at what those teachings truly say about the production and management of used nuclear fuel.[15, p7]

As the AFN, other Aboriginal organizations, and critics have pointed out the NWMO’s representation and use of Aboriginal knowledge and portrayal of the rational for including Aboriginal peoples in their study, is unsatisfactory. Their use of Aboriginal knowledge essentializes, ghettoizes, and diminish it, and in so doing dismisses it’s relevance for understanding, identifying and predicting the social and physical effects of NFW and its management. Determining these effects is the key to NFW management, however, the body of knowledge held by many Aboriginal peoples about the long term, low level effects of radioactivity and its implications for NFW management are not entertained in the NWMO’s discourse. Instead

their knowledge is sidelined as values, concerns, needs, and at best as process related insights and exotic traditional and spiritual teachings. Importantly, the (overwhelmingly negative) experiences of Aboriginal peoples with nuclear industries and their implication in the landscape of the nuclear fuel chain are buried by these representations. Neither Aboriginal peoples, nor their knowledge are ever connected to exposure to, experience of, or the capacity to make judgements about, NFW.

3. Risk

NFW management is in the first instance concerned with the determination and assessment of its effects over the long term. The power to know these effects is coextensive with the power and authority to determine the appropriate management outcome. Official knowledge of the effects of NFW and its management is, in the NWMO's discourse not only concerned with 'risk' but made *through* risk; effects' are presented, understood and identified as 'risks'. Representations which dismiss the knowledge claims of Aboriginal peoples are strongly related to the transformation of all effects into 'risks'. I contend that the use of 'risk' as a heuristic for legitimate knowledge production, contributes significantly to the anti-democraticness of knowledge made about NFW, and protects it from challenge, criticism, and dissent. Most progressive social science scholarship on questions of risk is focused primarily on methods of making risk analysis more inclusive, incorporating social variables into the measurement of risk, and questioning why risks are unevenly produced and distributed (eg [16][17]). Two major developments, I argue, are crucial to the understanding of the functioning of risk in contemporary society: the politics of knowledge production once cast in terms of risk [5] and the discursive operation of the concept of risk itself [18]. Before applying them to the Canadian situation, both of these perspectives will be reviewed.

3.1 Risk and the politics of knowledge

Criticisms notwithstanding (see in particular [19] [20] [21]), Beck's [5] work on the socialization of risk in contemporary society, represents a significant and radical shift in thinking about 'risk'[18]. For Beck, risks and risk determination are intimately connected in contemporary society: "consciousness determines being" [2, p23]. He means that risks 'become' only through experience of them: "[risks] are based on causal interpretations, and thus exist only in terms of the (scientific or anti-scientific) knowledge about them" [2, p23] The epistemological implications of this critique are powerful. First, Beck's analysis complicates and politicises the divide between expert 'determinations of risk', and public 'perceptions of risk.' If experience is everything, then different experiences (and therefore knowledges) of and about risk exist because of the radically different circumstances through which people experience risk. All knowledge of risk is partial, contingent and contested. Second, Beck's analysis scrutinizes the relationships between experience, epistemology and knowledge when trying to identify and determine risks, making all claims about risk historical, limited, and local (located). Third, Beck's analysis suggests that attempts to distinguish between the determination and perception of risk, claims to know *the* risk with certainty and be able to derive acceptable levels, and requirements of proof of causation are cosmetic. Rather, he suggests these are strategic manoeuvres within the politics of knowledge creation to retain or regain control of knowledge about risks and to dismiss competing claims or experiences. His work directs attention to the connection between knowledge, authority, and risk determination and to the role of this community in the legitimization of particular determinations of risk.

3.2 Risk as Discourse

Beck's theory of risk serves to illuminate the political economy of knowledge production once debates are already cast *in terms of risk*. But while Beck assumes that risks *exist*, certain commentators have argued there is no such thing (eg: [18] [6] [22]). While risk can be used to construct accounts of fear, harm and danger, it does not describe an ontological reality: "Nothing is a risk in itself; there is no risk in reality. But on the other hand, anything *can* be a risk; it all depends on how one analyzes the danger, considers the event. As Kant might have put it, the category of risk is a category of understanding; it cannot be given in sensibility or intuition" [23p.199]. Importantly, they question why 'risk' becomes the organizing structure for the production of knowledge about, and the regulation of, danger. This work warns that discourses of risk act to legitimize policy goals and processes, deploy particular fields of social possibility, (re)produce social orders, and socialize actors into certain ways of being and acting. To describe the particular form of risk so ubiquitous in contemporary policy discourses Green coins the term

'modern risk', and defines it as: "an attitude of confidence which optimistically calculates the probability of unfavourable outcomes. It thus acts on the assumption that it knows the odds and can therefore act to objectively reduce hazard...The world is commonly pictured as a system of statistics, an environment where human ingenuity, science and the market can be relied upon to resolve all problems" [18, p79].

Further, Green's examination of risk shows how contemporary discourses of risk sanction a particular kind of social experience and production of knowledge. Both of which conflate knowledge of the future with probability and randomness, knowledge with prediction, and certainty with the calculus of probability [23]. The purchase and powerfulness of this discourse is therefore rooted in the commonplace of modernist ontology and epistemology. Governmentality scholars have used these insights to show connections between discourses of risk and processes of social exclusion, where discourses of risk are examined as active agents in the disqualification of alternative knowledges and experiences (eg: [24] [25]). This work demonstrates that risk is an historical form that arises in processes such as policy making in order to respond to a particular threat or challenge to the *status quo*, and that it functions as a discourse; a sets of relations established between specific bodies of knowledge and practices and forms of social control and social possibility. Both the insights of Beck and the governmentality school can be applied to NFW management, to clarify the position of Aboriginal peoples.

3.3 Risk as a Historical Form in Canadian NFW management

To begin, the emergence of risk, as a historical form in the policy process, should be examined. Risk emerged as a method of knowledge production about the effects and consequences of NFW management in regulatory documents prepared for an expected public licensing hearing for AECL's deep geologic disposal concept. The Atomic Energy Control Board (AECB now CNSC), anticipating a public licensing hearing where it would be necessary to justify the concept to groups outside the nuclear industry, released regulatory policy that both supported the concept and established the safety standards and licensing requirements for such a facility. These documents introduced 'risk' for the first time in a significant way in order to predict, know, and determine the safety and the effects of the repository concept [26] [27]. In these document 'risk' replaces terms such as 'danger', 'harm' and 'hazard' and constitutes and determines 'safety'. Following the 1988 referral of the concept to the public EA panel described above, there is a clear shift from the concept hazard to the concept of 'risk' in support material prepared by AECL, AECB, nuclear power generation companies, and the Federal Ministry of Natural Resources (NRCan) responsible for nuclear policy. In this material, and over the course of the review conducted by the panel during the 1990's, a language of risk within which to evaluate NFW management aggressively emerged. Risk as a means of describing, presenting, and understanding the effects of NFW became ubiquitous with the submission of the AECL's Environmental Impact Statement (EIS) to the panel. AECL's discussion in the EIS of the impacts to human health and safety, represents the seamless transition made from the idea of an 'effect' to the idea of a 'risk' [28]. The ensuing policy debate, including testimony and support by the proponents saw risk, and its related concept 'uncertainty', become the dominant means of articulating the impacts, safety and acceptability of NFW and its management, despite the intervention of the EA panel (see [29]).

The Federal legislation which resulted from the aftermath of the EA, and which incorporates the NWMO, emphasizes the centrality of risk for determining the safety and suitability of a management approach. Risk as *the* exclusive heuristic for knowledge production in this contemporary phase of NFW management policy making is actively perpetuated by the newly formed NWMO's constant emphasis on determining the 'risks', and handling the 'uncertainty' implicit in the task of NFW management (eg:[30] [31] [32]). The entire project has been cast as an exercise in risk management, where the possible effects of nuclear waste, the performance of different methods over time, and concepts such as safety, social acceptability and social justice, are articulated in terms of risk and the distribution of risk. As a result of the challenges brought by the experiences of Aboriginal peoples, first publicised by the EA panel, and now present in the Act's requirements to consult, a discourse of risk, I argue below, is now actively engaged in defining the newly politicised category of 'knowledge' to the industry's advantage. The discourse of risk, authored by the NWMO continually (re)creates and legitimizes the distinction between the expert determination and the public perception of issues involved in NFW management, and provides an epistemological opening through which to universalize the claims of the nuclear

industry about effects. Both, I suggest below, mitigate against the inclusion of Aboriginal knowledge.

4. Risk and Exclusion

Risk, in the NWMO's work, regulates knowledge production in several ways. First it universalizes certain claims about the effects of NFW management by representing it as *inherently* uncertain (especially due to time). The relationship established between time and uncertainty constitutes uncertainty as a property of time, rather than of knowledge about time, and thus permits (uncomplicated) knowledge to be produced (through risk) *about* uncertainty. This serves to establish the superiority of some knowledges over others. Second, it provides a convincing narrative according to which judgements between competing knowledges can be made. Here the discourse enables the NWMO to discriminate between claims according to which best 'rationalizes' 'uncertainty.' The 'scientific and technical knowledge', made by 'experts' (who are usually members of, or are otherwise attached to, the nuclear industry), about the 'technical and scientific' dimensions of NFW is suggested to be more able to handle uncertainty, than are others. Here Beck's critique of the dualisms 'real' versus 'perceived' risk, and 'expert determination' versus 'lay perception' are particularly relevant. Both strategies constitute the claims of Aboriginal peoples as peripheral to the determination of the effects of NFW management and as unable conceptually to handle uncertainty. They constitute the claims of the nuclear industry as able to transcend epistemological constraints such as time, and therefore to determine risk.

4.1 'Universal' knowledge

'Uncertainty' is the reason for risk. Risk is not only the outcome of uncertain conditions, but the mechanism required to rationalize them, restore predictable order, and propose appropriate ways of acting in the face of them [24]. The connection between risk and uncertainty in the NWMO's work is very strong: high levels of uncertainty necessarily require 'risk' techniques to identify, determine, and manage effects. In the NWMO's work, risk is established as the only way to make accurate knowledge about effects. NWMO texts, further, objectify 'uncertainty', constructing it as a property of the different dimensions and general conditions of NFW management rather than a property of the knowledge produced about these things. By repeatedly dissociating the practice of knowledge production from uncertainty, the epistemological limits of knowledge production through space and time are relaxed and effectively obscured. This objectification makes it possible for definitive and universal knowledge (uncomplicated by time) to be made about the future. The concept of risk preserves the epistemological and conceptual credibility of knowledge made through it by obscuring any and all epistemological ties to a context. This has the effect of removing all the borders that contain the claims of whatever group or body of knowledge is aligned with it (in this case the scientific and technical knowledge of experts attached to the nuclear industry), and falsely making it relevant and rational in all contexts and at all levels. The 'scientific and technical knowledge' of the nuclear industry is presented as a universal category of knowing with no limits, and no attachment to place, politics, culture or context. This strategy assures that the knowledge of the nuclear industry is always without limits to its claims, and presents it to the public and to policy makers as the only knowledge whose generation transcends time to adequately rationalize uncertainty and predict risk.

4.2 Discriminating between knowledges

According to Beck, [5] the monopoly on rationality enjoyed by scientific hazard definition stands and falls on the distinction between, and continued separation of, *real* and *perceived* risk. Through the establishment and maintenance of this and similar distinctions such as *lay* versus *expert judgement*, and *values* versus *knowledge*, the category 'Aboriginal knowledge' is constituted as values, concerns traditions, or objects of inquiry. This facilitates representations of it as peripheral to understanding the effects of NFW management, and as inadequate to the task of making valid claims about them. These representations obscure the actual content of Aboriginal claims, and the connection to experience of the nuclear fuel chain that they reveal. The NWMO's literature continually differentiates between competing knowledge claims according to how well they appear to rationalize uncertainty and determine risks. This hierarchically orders competing claims and bodies of knowledge about NFW management. The presence of uncertainty, the pressing need to rationalize it, and the requirement for a knowledge capable of doing so, are all aligned in the NWMO's work to prepare the way for the knowledge of the nuclear industry. This knowledge is

constantly described as ‘technical and scientific knowledge’, and is represented as knowledge appropriate for the handling of uncertainty. All alternative knowledges (including the knowledges of Aboriginal peoples) are represented as unable to rationalize uncertainty and therefore unrelated to it. A strong and distinct separation between ‘technical and scientific knowledge’ and ‘Aboriginal knowledge’ (with the latter always marked as traditional and homogenous), is established, in which the later is associated with ‘traditional’, ‘ethics,’ ‘social issues,’ Aboriginal culture, and risk perception. ‘Scientific and technical knowledge’ is associated with ‘experts’ ‘knowledge’, the claims of the nuclear industry, and risk determination. These conceptual divisions normalize representations of Aboriginal knowledge as values, and societal concerns; and of the knowledge of the nuclear industry as universal and able to rationalize risk

4.3 ‘Peripheral’ and ‘particular’ knowledge

The hierarchical organization of knowledge in this way facilitates the ghettoization and containment of Aboriginal knowledges. It normalizes the separation of Aboriginal peoples from their experiences of the nuclear fuel chain, and thus the epistemological connection of their claims to experience. It romanticizes and essentializes their connection to the task of NFW management, and represents their knowledge as relevant to understanding values and creating a ‘fair’ process. The category “Aboriginal knowledge is therefore seen as coextensive with values, perceptions, and concerns particular to a special cultural constituency which for constitutional (legal) and moral reasons must be entertained. These speak to, and reflect the local concerns and needs of the population, and are based on value judgements integrally related to and marked by cultural (including spiritual and traditional) beliefs. These beliefs are shown to be situated in a moral political and cultural landscape and to reflect priorities which are unique and which therefore must be taken into account- distinctly because of their ties to culture and belief. This type of knowledge is therefore marked, culturally, morally, and epistemologically, and its relevance to NFW management limited and conflated with ‘interests’. In contrast, the Knowledge claims made by the nuclear industry are presented as universal, they are not connected to culture, beliefs, place, moral schemes, value judgements, or even to people. These claims are therefore uncomplicated by anything which would situate or compromise them in the political landscape. Limiting the claims of Aboriginal peoples this way not only diminishes the possible significance of their claims and reinforces the universality and objectivity of the claims of the nuclear industry, but also, objectifies them. Reducing them to data either about values, or local environmental conditions useful to the NWMO in their study, makes them an object of scientific inquiry rather than a system of knowledge based on empirical experience, sound judgement and epistemological rules. This downplays its ability to make claims and its relevance to determining the effects of NFW management.

The discourse of risk also simultaneously facilitates representations of Aboriginal knowledge as peripheral to questions of NFW management. This knowledge is through constant conflation with values, and it’s constitution as essentialized spiritual teachings, manipulated to appear relevant only to matters external to risk, or effects determination. Aboriginal knowledge is therefore resigned to a ‘complementary’ position where it does not compete with the claims of the industry about the nature of effects, or the validity of these claims. Once more, in contradistinction to the (universalized) claims of the nuclear industry, the claims of Aboriginal peoples are cast as broad and intangible statements about values, study guidelines, fairness in decision making, and other procedural (rather than substantive) matters which have absolutely nothing to do with identifying or understanding the potential effects of NFW. They are thus characterized as a set of abstract concerns and principles which do not challenge the claims of the nuclear industry.

5. Conclusion

Risk operates within Canadian NFW management policy making as a heuristic for knowledge production about its effects which reconciles the knowledge of the nuclear industry with the outcomes of the NFW management process. In so doing it marginalizes the present and historical experiences of Aboriginal peoples with the nuclear industry, and removes from view the ways in which they have been implicated in the geography and political economy of the nuclear industry. Risk is a discursive form that protects a particular group’s claims about the effects of NFW by providing it a universalizing epistemological structure with which to obscure its connection to context. Further risk discourse provides the nuclear industry with a conceptual vocabulary that

deliberately casts all competing knowledges as perceptions, values, or as an object of inquiry. The arguments of Aboriginal peoples about the residual effects of radiation in their lands which hosted nuclear activities, such as uranium mining and disposal, have no representation in how the discourse of risk defines and represents knowledge, and thus no purchase in the policy debate. As a result the challenge they present to the nuclear industry's claims are contained. The arrangements which permit the unloading of the negative effects of nuclear power generation onto Aboriginal peoples are thus reproduced (both materially and conceptually), but not shown, by the policy making process and likely, its outcome. In order to raise critical questions about the democratic abilities of risk, this paper has examined the role of 'risk' in Canadian NFW policy making. I have shown how when the politics of knowledge production within the philosophy of risk is analyzed, and the use and role of the notion of risk are interrogated, difficult questions are posed for the democratic potential of risk. I have suggested, through an analysis of the NWMO's representations of Aboriginal content in their process, that in this case risk is an inappropriate heuristic for democratic knowledge production.

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