REASSESSING THE VOLUNTARY FACILITY SITING PROCESS FOR A HAZARDOUS WASTE FACILITY IN ALBERTA, CANADA 15 YEARS LATER

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Abstract

Voluntary siting for hazardous facilities is preferred over traditional siting methods since the former process tends to overcome opposition by encouraging potential host communities to focus more attention on benefits (e.g., jobs) rather than the risk of contamination or other potential impacts. Yet, there are few case studies on the aftermath of voluntary siting to evaluate "success" according to principles from the siting literature e.g., justice, equity, and informed consent. This paper reports results from a study of three communities near the same large-scale hazardous waste facility that was put 15km northeast of Swan Hills Alberta, Canada. This facility represents one of the earliest (1982) and purportedly most successful voluntary siting processes in North America. However, it is deceptive to claim that the process was a success from the point of view of justice, merely because Swan Hills was not in a disadvantaged/vulnerable bargaining position. If the scale of "community" affected is widened, that argument holds less sway. That is, there are serious concerns about justice, informed consent and distributive equity. Based on the perceptions of 453 residents in the region, 15 years after the facility became operational the findings reveal that while Swan Hills residents still favour the facility residents in two towns 70kms away (Kinuso and Fort Assiniboine) do not. In fact, the perceived fairness of the original siting process is the strongest predictor of facility related concern. Implications for the viability of voluntary siting, the appropriate role for informed consent, and the associated role of scale are discussed.

Keywords: voluntary siting, community, scale, justice, fairness, distributive equity, informed consent, Swan Hills, Alberta

1.0 INTRODUCTION

There is a deepening worldwide waste disposal crisis in the sense that several places continue to struggle with finding new places to dispose of wastes that cannot be recycled or reused. Though new approaches to thinking about "waste" are taking hold – e.g., cradle-to-grave product design and responsibility - in the short term at least, we will continue to need such waste sites. [1] A key problem to finding such sites is opposition from local residents, and increasingly, from non-locals. Traditionally, many jurisdictions relied on hierarchical, technically, and professionally driven processes; whereby governments hired experts and together decided on a site which the government would announce to oftentimes unsuspecting communities. At its worst this was the so-called "decide-announce-defend" approach. [2] More recently such processes have been modified to include significantly more community participation, but at the core many have remained hierarchical and technical, prone to the same debilitating community opposition as decide-announce-defend.

It is in this context that voluntary facility siting grew to be one of the preferred approaches for finding sites for particularly contentious point-source technological environmental hazards like hazardous waste and nuclear waste facilities. [2-4] The value of such an approach is that it tends to overcome the problem of "host community" opposition by focusing more attention on benefits (e.g., jobs), rather than just the risk of contamination and other potential negative impacts. Further, there is an element of consent and ostensibly, control, whereby potential host communities vote in a local referendum (plebiscite) to decide their own fate. [5, 6] Yet, because of its relatively newfound status critical attention from academics and practitioners alike has focussed mainly on the degree to which this process overcomes the shortcomings of traditional siting, rather than on the degree to which such a process satisfies broader principles of just/equitable siting. [3, 4, 6] For example there are few studies which assess voluntary siting in philosophical/theoretical terms [5] or from the point of view of locals who have to live with the results of a voluntary siting process.[7]

In particular, useful insights may be gained by looking at: the processes in practice, the communities that "host" an actual facility, and other communities affected by the same facility. As Puschak and Rocha[1] point out, we should be cautious about the long term success of voluntary siting, since there has been a relative, "lack of systematic analysis of voluntary siting outcomes and empirical evidence that voluntary siting outcomes have been more successful than other approaches" (p. 27 see also[3]). Such evaluations require engaging with residents and other stakeholders, or as Gowda and Easterling assert, "This task will not be solved within the minds of policy analysts, but requires a journey into the cultures, belief systems, and

experiences of the various groups that have a stake…" (p.920). This paper addresses these issues by reporting the results from research related to the Swan Hills (hazardous waste) Treatment Center (SHTC)[1] in Alberta, Canada. The next section briefly reviews principles of just/equitable siting in relation to voluntary siting, particularly as they pertain to the ostensibly successful SHTC process. This is followed by a review of the principles in the context of the resident's views of: facility siting, inter-community relations, and the facility itself.

2.0 VOLUNTARY SITING

2.1 The Promise of Voluntary Siting

A key advantage of voluntary siting over traditional approaches relates to consent and equity – yet these are also the areas of most criticisms. It is important to put the voluntary process in the context of how it improves on the decide-announce-defend approach. The voluntary process is meant to address concerns about fairness (equity) raised by non-voluntary approaches, by virtue of allowing host communities to show their (majority) willingness to host a site, through a local plebiscite [3, 7, 8]. The latter is particularly important since it presumably allows a sometimes "silent" majority to approve a facility rather than allow a vocal minority to prevent the facility. [6] Further, that majority decision is supposed to be achieved only after thorough process of information gathering and interpretation related to things like facility need, site suitability and safety. Ideally these assessments happen through experts hired by the community with funds provided to the community by the proponent. The process is based on the Pareto-optimal principle that since the host community is presumably better off (e.g., new jobs) and the rest of society is better off (i.e., they have a new place to put their waste) voluntary siting is better than not building a new facility.[5] This is an important equity consideration in the context of an era of rapidly aging/filling local sites. That is, this acknowledges that current host communities have taken *their* turn dealing with the hazard; and that the status quo is unfair if it is allowed to continue if other communities avoid taking their own turn. In a similar sense, the process allows these other communities to show their altruistic side but offering to host new facilities. In this sense a facility may actually foster community pride.[9, 10]

2.1.1 Canadian example – Hazardous waste treatment facility at Swan Hills

Canadian examples of voluntary siting have often been cited as landmarks of how siting can and should be done successfully. In particular the voluntary process that resulted in the

[1] Because the facility has changed ownership numerous times it has had different names. It is also known in the siting literature and elsewhere as the Alberta Special (hazardous) Waste Treatment Facility (ASWTF) or the Alberta Special Waste Treatment Center (ASWTC) at Swan Hills

1987 construction of the hazardous waste treatment facility 15 km northwest of Swan Hills (pop. 2500) Alberta is heralded as a noteworthy success [3, 4, 6, 8, 11]. For example, Kuhn and Ballard[6] (p.537) proclaim,

> *The Swan Hills integrated hazardous waste facility, located in north central Alberta, stands as a hallmark of siting success. The process began in 1981 and concluded in 1984. The approach used was clearly successful considering what was achieved and at what cost. Where other hazardous waste programs have floundered, the Province of Alberta sited a facility in three years at a relatively low cost of $Can.5 million.*

Nevertheless, cost savings and timely siting should not be the only considerations for declaring siting success. The way the process was carried out has also received considerable praise since it simultaneously addressed: overall facility need, alternatives, facility location, and perhaps above all, community participation and assent through a plebiscite. In fact, in a book on the topic, Rabe carefully argues that the process turned the NIMBY syndrome on its head. That is, rather than individuals/communities espousing the need for waste facilities, but at the same time refusing to host such facilities, i.e., NIMBY; the Alberta's hazardous waste facility was actually fought over by at least two potential hosts. Rabe recounts the dramatic fact that Ryley, a community of 500 and also over 100km nearer than Swan Hills to the provincial capital of Edmonton, publicly protested the decision by the provincial government to "award" the facility to Swan Hills. That it was considered an "award" has a lot do to do with the fact that a hospital, other improved infrastructure, and 100+ local jobs all eventually accrued to Swan Hills alone. The reason provided for choosing Swan Hills over Ryley, besides some likely political manoeuvres by the former's provincial representative[3], is that Ryley was closely located to several other towns and only 80kms from the capital, Edmonton. The choice of Swan Hills helped avoid two equally problematic solutions for following through with a Ryley facility: a) holding a multi-community plebiscite; or b) dealing with opposition from other local communities that would likely not receive any direct benefits if the existing Ryley-only vote in favour of the facility was upheld. This issue of the scale of community plebiscites is a central theme of this manuscript as it also applies to the Swan Hills case.

2.2 Limitations of Voluntary Siting (Philosophy, Experience, and Practice)

2.2.1 Philosophy of justice - Individualist/market worldviews vs egalitarian worldviews

Environmental injustice refers to replication of historical injustices experienced by disadvantaged groups (e.g., racial minorities, low income groups) in current realms of hazardous facility cleanup and facility siting. [12] By distinction, environmental equity tends to

pay less attention to the past and instead focuses on either procedural equity (e.g, public participation in facility siting) or the spatial distribution of hazards relative to disadvantaged groups, regardless of how the pattern emerged - outcome equity. From a philosophical/moral standpoint environmental justice is a multidimensional concept and voluntary siting tends to emphasise certain forms of equity, potentially at the expense of others, and often disregards environmental justice altogether.[12] For example, the typical version of voluntary siting is market driven and according to cultural theory there is a tacit assumption that all involved support an individualistic-competitive worldview. That is, it is assumed that individuals and groups should be free to compete for mutually beneficial gains as long as nobody else (i.e., society at large) is any worse off. Yet, others subscribe to an egalitarian worldview that would ensure that the highest consumers of waste-producing goods – the wealthy – should likewise bear the highest responsibility for the waste, for example hosting a waste facility.[5]

From a justice point of view, among the egalitarians' concerns is the fact that the communities that invariably come forward as potential voluntary siting hosts tend to be challenged with multiple disadvantages including low income, high unemployment, and visible minority status. For instance, Gowda and Easterling describe how Native American communities have tended to be the most prominent groups offering to host monitored retrieval storage facilities for nuclear waste in the US. [7] In the words of one Native American representative, "Just because there are two willing partners to do this tango is no reason to hold the dance" ([5], 127). Though there are various mechanisms for sorting out the actual compensation to ensure something better than the lowest "bid" is actually paid to the "winners", the egalitarian's concern is that the reason for even bidding in the first place is due to a position of vulnerability and reduced bargaining power. [13] For example, there are other cleaner industries that pose lower direct health risks that could likewise benefit disadvantaged communities. These are recurrent themes in the environmental equity and justice literatures. The justice literature in particular is concerned with the *intentional* targeting of these vulnerable groups based as opposed to simply a coincidence of "neutral" market forces. [12, 14] It is for these reasons that egalitarian/justice-oriented writers are among the strongest supporters of increased efforts at waste reduction outright, to avoid the need for large-scale waste disposal facilities in the first place.[5, 15] For example, for some facilities dread of catastrophe may be so high that even financially compromised groups may not be willing to host. [16]

2.2.2 Practice - Informed consent

In terms of the practice of voluntary siting, the manner in which informed consent is carried out is critical. While communities typically vote for or against a facility, who gets to vote in the

first place has not been critically assessed. For example, what counts as a reasonable distance from a facility to warrant participation in the decision process and negotiation for compensation? Is distance even the key consideration? [17] Gowda and Easterling report that though a single community may vote to host a facility, their neighbours may be excluded from such a plebiscite or voluntarily exclude themselves on ethical grounds. One result is strained inter-community relations.[7]

2.2.3 Practice – Distributive equity

As if inter-community conflicts are not discouraging enough, excluding nearby communities also violates principles of distributive/spatial/geographic equity if compensation is localized to only a single community. The distribution of costs and benefits needs to be considered on a scale commensurate with the scale of the facility, whereby a large scale facility should require regional scale (e.g., county, state/province) compensation arrangements.[7] The latter is further necessitated on the grounds that the management of large facilities might better be left to more diffuse oversight than from the operator and a small local community alone. [18]

2.2.4 Subjective experience - Stigma versus pride

Another objection to the market-driven voluntary facility siting approach is that the focus on compensation crowds out altruistic reasons for hosting – particularly by more affluent communities. Wealthier communities typically do not “need” waste facilities, but little attention gets placed on convincing them to host facilities if siting is cast as an economic choice rather than a choice to “do ones’ part for the environment”. Some explain to be a result of the NIMBY phenomenon [3], while others are concerned about compensation being misconstrued as bribery [19] or exploitation [5]. A related concern though, is that the focus on economics and not on altruism creates the by-product that these facilities remain sources of contamination stigma not altruism. Whereas communities should be applauded for being willing hosts, they are, potentially, chided for being environmental dupes. [20]

3.0 SURVEY FINDINGS

This section reports findings from a survey conducted in the communities of Swan Hills, Kinuso and Fort Assiniboine as they pertain to the aspects of voluntary siting discussed above. It is important to realize that the overall project was not meant to study voluntary siting per se, it was a multi-method (interviews, survey) study aimed at understanding the social construction of environmental hazard risk in the everyday lives of residents. The results here are mainly from a telephone survey conducted with a stratified random sample of 453 residents in 2002, with an overall response rate of 69%. The methodology for this study and related studies on the

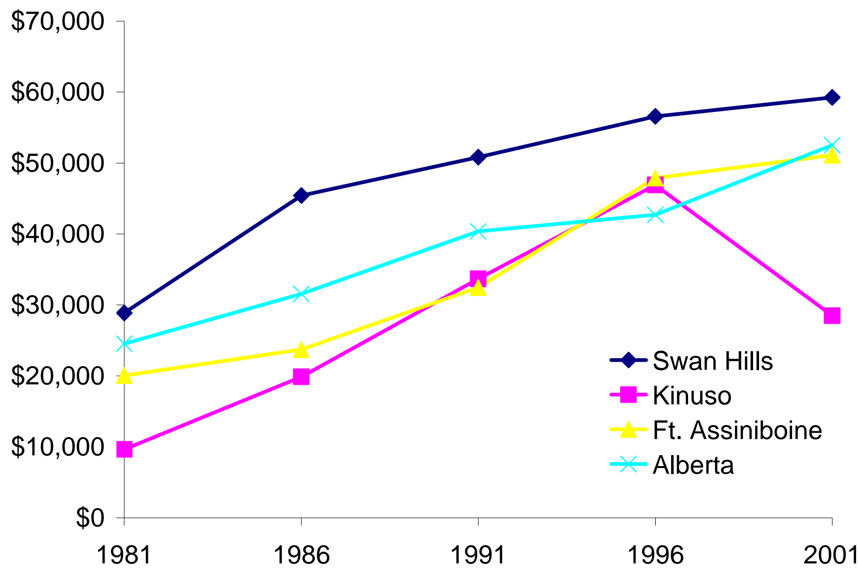
same communities is detailed elsewhere. [10, 17] Likewise the site history and community characteristics are described elsewhere, but for context here, Swan Hills (pop. 2500) is closest to the facility (15km) and can be characterized as a resource town (oil/gas, forestry, waste); Fort Assiniboine is 70km to the south and is predominantly an agricultural community; while Kinuso 70km to the north is: surrounded by First Nations reserves, comprised largely of First Nations people, and sustained largely by tourism, agriculture, and hunting/trapping.

3.1 Philosophy of Justice

By some measures, the SHTC process is a success since; at first glance it appears to satisfy problem of environmental justice. We did not approach the problem by asking residents their philosophy of justice according to cultural theory. Instead, it is potentially useful to look at the initial "bargaining position" of Swan Hills residents in the early 1980s - the time when the siting process began. Graph 1 shows that around the time the facility siting process was happening (1981) the median household income was already above the provincial median ($29,000 vs $24,500). If Swan Hills was at an economic disadvantage, it was not a dramatic one relative to the province. Further, relative to Ft. Assiniboine and Kinuso, Swan Hills has expectedly remained relatively wealthy for the 20 years since the process happened and the 15 years since the facility became operational. From the point of view of environmental justice Swan Hills also had never been the victim of any known historical.

Yet there can be at least two claims made against this facility from an egalitarian point of view. First, though the facility is located near a relatively wealthy community, as it is a small community Swan Hills can hardly be considered a major producer of hazardous waste. This raises questions about sustaining motivations for waste reduction within larger centres in the province that *are* the major waste producers. Second, and more importantly, there has been a legacy of injustices against First Nations communities in Alberta. The siting process did not adequately acknowledge the unique way of life of the First Nations communities along Lesser Slave lake near Kinuso [17, 21] . Not only were the Lesser Slave Bands not allowed to vote in the plebiscite to decide the facility's original fate, they were not beneficiaries any of the initial compensation. For example, though the facility operators did pay for health studies in the area through Provincial Court arranged pollution fines[10]; no First Nations member has worked at the facility and no health care facilities have been built in their area as a direct result of the siting process. That is, no lasting compensation has been felt.

FIGURE 1: Canadian Census: Median Household Income for Selected Alberta Communities 1981-2001



3.2 Informed Consent

Informed consent is potentially divisive, even in sparsely populated areas like rural Alberta. Though the First Nations communities were not actually studied directly by our group [17] (see [21]), the reactions in the towns of Kinuso and Fort Assiniboine provide further insight into the issue of fairness, informed consent and voluntary siting. Given that our research happened between 1998 and 2002, any specifics about perceptions at the time of the voluntary siting process would be subject to recall biases. Thus, we focused on two key questions in our survey "If you had the opportunity to vote today on whether the facility should be exactly where it is today, how would you vote?"; and "How fair do you feel the process was that put the Alberta Special Waste Treatment Facility near Swan Hills". Figure 2 shows that of decided voters, while those in favour in Swan Hills (79%) is exactly the same as the actual result when the facility was first sited [3]; if all three towns were allowed to vote in a plebiscite in 2002, those in favour (49%) and those against (51%) were almost even. Notably, the largely First Nations community of Kinuso opposed (90%) the facility by a large margin, while the predominantly agricultural community of Fort Assiniboine likewise opposed (54%) it.

Perceived fairness shows a similar pattern with the striking difference that the number of undecided residents in Swan Hills is the highest of all the results. Though the large majority of *decided* voters in Swan Hills (90%), and a smaller majority overall (56%) felt the process was fair, a majority in Kinuso (75%) and Fort Assiniboine (52%) did not. What is most interesting is that 36% from Swan Hills would not express their opinion– a statistically significant

difference from the number of undecided voters in the other two towns. Given there is a general reluctance from residents to say anything bad about Swan Hills[10], it may be that these people have concerns about the fairness of the process that they would rather not openly express, despite the anonymity of the survey. Further, this fairness measure is a strong predictor of facility-related safety concern. In fact fairness was typically the most important predictor of facility-related safety concern (all towns, Kinuso, Ft. Assiniboine), moreso than perceived economic or social benefits, and an effect of similar size to various types of "trusted" information sources. [22]

FIGURE 2: Hypothetical vote for existing SHTC "today"

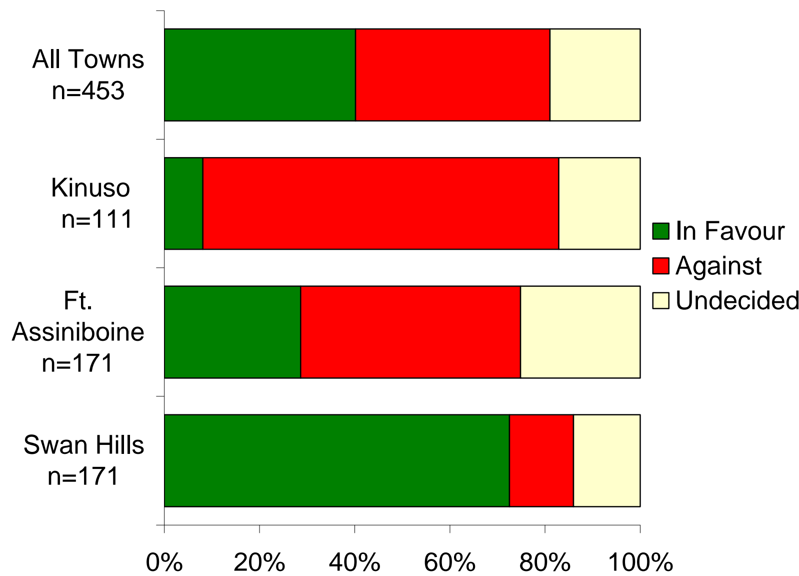
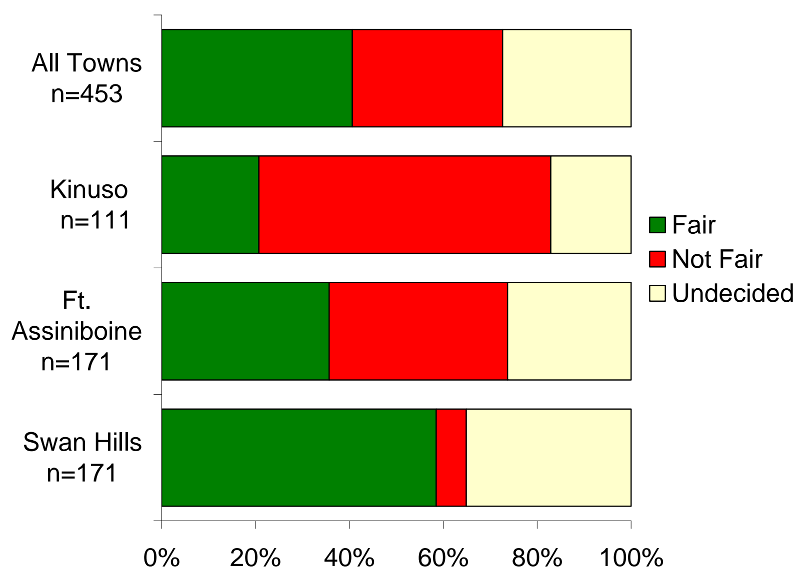


FIGURE 3: Perceived fairness of voluntary facility siting for SHTC



3.3 Distributive Equity

There is a mismatch between (involuntary) risk and benefits on a regional scale. In terms of regional benefits, Figure 1 shows that Swan Hills has retained its higher than provincial median incomes since before the facility was located nearby, and since the over 100 operational jobs came to the town from the facility in 1987. By comparison the towns of Kinuso and Ft. Assiniboine do not seem to be any worse off relative to Swan Hills over the same time period – with the exception of Kinuso in 2001. Thus, on the basis of median income one might dismiss claims of distributive *in*equity, on the basis that the relative gaps have remained fairly constant. Nevertheless, the amenities – including a 24 bed hospital – went to Swan Hills alone as part of the negotiated compensation package.

In terms of negative impacts the First Nations communities surrounding Kinuso have successfully argued that the potential negative impacts from the facility extend far beyond the 15 km radius that encompasses Swan Hills. [21] This idea was reinforced in 1996 when a major leak of PCBs, dioxins and furans set in motion a series of hunting and fishing bans that affected a large the region surrounding the facility that extended to Fort Assiniboine and Kinuso. [23] In effect this was the realization of the fears expressed in at least two major environmental assessment processes related to both facility siting (1984) and the eventual expansion of the facility (1995). It is questionable though whether Kinuso or Fort Assiniboine residents would have accepted compensation for fear that it might be interpreted as a means to keep them quiet about future facility malfeasance.[19] This seems likely given the general sentiment against the facility in Kinuso especially. Compensation, when provided post hoc can also create problems of inter-community conflict as demonstrated in one Swan Hills resident's comments about the legitimacy of First Nations complaints:

> Resentment came in the community when they read media articles saying that the "First Nations or Aboriginal people living near the plant..." well they don't. The closest ones live at Kinuso, the Swan River band, and that's about 70 km from the plant. The other native people involved in this action live 100 and 120 km away from the plant. They do visit occasionally to hunt moose and that's it. (David, does not work at SHTC).

As we argue elsewhere there needs to be mutual respect for different ways of life, whereby hunting moose may be central to one way of life, and merely an indulgence to another.[10]

3.4 Pride vs Stigma

The majority of Swan Hills residents want the facility, and are indeed proud of the part they are playing in dealing with the province's hazardous waste. In the words of one resident, "I feel we

are doing a favour to the rest of the world, like somebody has to look after this and a lot of other places were too afraid to." (Anne, does not work at SHTC). Further, when presented with the following two statements in the survey: "Outsiders are saying bad things about Swan Hills without the facts" and "Swan Hills does not get enough outside credit for hosting the facility." an almost unanimous 98% and 93% of the 171 respondents agreed. Yet, this combination of pride and the stigma from "outsiders" has created a unique situation whereby the facility operators, and indeed the community are motivated to keep negative reports about the facility (and town) secret from outsiders. For example, the leak in 1996 was not reported to the provincial authorities until three days after it was known. Further, in a related paper we argue that this situation continues to have the potential to frustrate appropriate facility monitoring [10]; a situation that might not exist under a more regionalized management scheme [18]. In the words of one resident who has latent concerns[10] about the facility, but who is nevertheless frustrated with the bad press they repeatedly get,

> "The media, I have no respect for [(sic) them]. They come up here with full intentions of taking a perfectly good thing and then they turn around and turn it into something ugly, and I have no respect for them whatsoever. They don't get their facts right, they're all wrong. They don't even get their names right. So I have no faith in them and they're the ones feeding the public the wrong information and if they're going to do it properly, sure you've got your negative side, but don't forget about the positive side, you know. You never, ever see them write about the positive side." (Dagmar, does not work at SHTC).

It is people like Dagmar who are torn between a commitment to their community and a desire to inform "outsiders" about facility-related problems as necessary.

4.0 DISCUSSION AND CONCLUSIONS

The SHTC voluntary siting process may *not* be as successful as some have argued. [3, 4, 6, 8] Certainly it was successful in the sense that a facility has been treating the province's hazardous waste for 20 years and the town of Swan Hills was not financially, racially, or historically disadvantaged when they volunteered to be hosts. Indeed they were and are a relatively wealthy community who are arguably doing their part for the greater good.

Though the people of Swan Hills are generally satisfied with the local hazardous waste treatment facility (SHTC) - the towns of Fort Assiniboine and, especially, Kinuso are much less content. The reason for this situation can be traced back to the voluntary siting process itself since it involved both an inadequate process of informed consent and unfair initial

compensation[2]. It is doubtful though, that *any* compensation would satisfy these latter two communities given their general dislike of the facility. A key predictor of this dislike can be traced to the perceived fairness of the original siting process that excluded all but the residents of Swan Hills despite the fact that a facility of the SHTC's magnitude has the potential for negative impacts on a regional scale.

Thus, the definition of "community" is central to the voluntary siting process. Indeed there may be some useful direction provided in the environmental assessment literature as it relates to directly affected parties [24]. Of paramount importance though is that the scale of "community" affected should be on the same level as the scale of potential negative impacts. There is ample evidence here to question the legitimacy of the single-community-single-facility negotiated settlement model. Though involving multiple communities complicates the process considerably, there are at least two key benefits to such an approach. First, it goes a long way towards satisfying the principles of procedural and distributive equity. Second, it could potentially lead to a greater emphasis on the altruistic roles played by the communities, rather than incite inter-community conflict and put single-town residents in a mindset of being closed to outsiders.

Whether a process involving a scaling up of "community" addresses widespread concerns about justice – vis a vis an initial disadvantaged bargaining position for certain groups – is uncertain. Certainly this will depend on the types of communities involved. Due attention needs to be paid to the historical legacy of any injustices to any group who becomes involved in negotiations. Further, the process should confront head on alternative means for rectifying injustices, beyond just a potentially risky facility.

There is an ongoing urgency to debate issues surrounding voluntary siting, a dialog that has waned in recent years in the environmental management literature. Voluntary siting remains one of the preferred ways to locate sites for disposing waste hazardous and nuclear wastes in Canada. For example, voluntary siting is the means by with Canada's Nuclear Waste Management Organization (www.NWMO.ca) will find a deep geologic repository for Canada's high level nuclear wastes. Whether or not the manner in which the NWMO defines potential community hosts has a bearing on the "success" of the process will be telling.

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[2] Compensation agreements have been reached between the operator and First Nations communities, but these had to won in environmental appeals rather than during the siting process.

REFERENCES

[1] Pushchak R, Rocha C. Failing to site hazardous waste facilities voluntarily: Implications for the production of sustainable goods. Journal of Environmental Planning and Management 1998;41:25.

[2] Kunreuther H, Fitzgerald K, Aarts T. Siting Noxious Facilities: A Test of the Facility Siting Credo. Risk Analysis 1993;13:301.

[3] Rabe B. Beyond NIMBY: Hazardous Waste Siting in Canada and the United States. Washington DC: Brookings Institution, 1994.

[4] Stencel J, Lee K. The voluntary siting process, a case study in New Jersey. Health Physics 2004;86:s57.

[5] Linnerooth-Bayer J, Fitzgerald K. Conflicting views on fair siting processes: Evidence from Austria and the U.S. Risk: Health, Safety and Environment 1996;Spring:119.

[6] Kuhn R, Ballard K. Canadian innovations in siting hazardous waste management facilities. Environmental Management 1998;22:533.

[7] Gowda R, Easterling D. Voluntary siting and equity: The MRS experience in Native America. Risk Analysis 2000;20:917.

[8] Castle G, Munton D. Voluntary Siting of Hazardous Waste Facilities in Western Canada. In: Munton D, editor. Hazardous Waste Siting and Democratic Choice. Washington, DC: Georgetown University Press, 1996.

[9] Petts J. Waste management strategy development: a case study of community involvement
and consensus-building in Hampshire. Journal of EnvironmentalPlanning & Management 1995;38:519.

[10] Baxter J, Lee. D. Explaining the maintenance of low concern near a hazardous waste treatment facility. Journal of Risk Research 2004; 6:705.

[11] Kunreuther H, Slovic P, MacGregor D. Risk Perception and Trust: Challenges for Facility Siting. Risk, Health, Safety and Environment 1996;7:109.

[12] Pulido L. A critical review of the methodology of environmental racism research. Antipode 1996;28:142.

[13] Rawls J. A Theory of Justice. London: Oxford University Press, 1999.

[14] Mohai P, Saha R. Racial inequality in the distribution of hazardous waste: A national-level reassessment. Social Problems 2007;54:343.

[15] Thompson M, Ellis R, Wildavsky A. Cultural Theory. Boulder CO.: Westview Press, 1990.

[16] Hine D, Summers C, Prystupa M, McKenzie-Richer A. Public opposition to a proposed nuclear waste repository in Canada: An investigation of cultural and economic effects. Risk Analysis 1997;17:293.

[17] Baxter J, Greenlaw K. Revisiting cultural theory of risk: Explaining perceptions of technological environmental hazards using comparative analysis. Canadian Geographer 2005;49: 61.

[18] Bradshaw B. Questioning the credibility and capacity of community-based resource management. The Canadian Geographer 2003;47:137.

[19] Kunreuther H. Voluntary Siting of Noxious Facilities: The Role of Compensation In: Renn O, Webler T, Wiedemann P, editors. Fairness and competence in citizen participation: Evaluating models for environmental discourse. Dordrecht, the Netherlands: Kluwer Academic, 1995.

[20] Slovic P, Flynn J, Gregory R. Stigma happens: social problems in the siting of nuclear waste facilities. Risk Analysis 1994;14:773.

[21] Gibson G, Froese K. Hazardous Waste: Disrupted Lives. First Nation Perspectives on the Alberta Special Waste Treatment
Centre, . Edmonton: Environmental Health Sciences, University of Alberta, 2004.
[22] Baxter J. Risk perception: A quantitative investigation of the insider/outsider dimension of cultural theory and place. Journal of Risk Research submitted.
[23] Jardine C. Development of a public participation and communication protocol for establishing fish consumption advisories. Risk Analysis 2003;23:461.
[24] Lawrence D. Impact significance determination—Designing an approach Environmental Impact Assessment Review 2007;27:730.