THE SEARCH FOR A LANDFILL SITE IN AN AGE OF UNCERTAINTY: THE ROLE OF TRUST, RISK, AND THE ENVIRONMENT

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Abstract

This study investigates the explanatory power of the theory of reflexive modernization proposed by Anthony Giddens and the theory of the risk society proposed by Ulrich Beck by empirically examining the interactions and issues raised in the innovative, open, and, inclusive Guelph Landfill Search Process (GLSP). The notions of risk, trust, and the environment are central elements of these theories, both of which propose that social change in the contemporary era has been stimulated by a process of confrontation with modern environmental risks. As such, we have examined the role that these three factors played in the GLSP.

It was observed that despite efforts by the City to inculcate feelings of trust and confidence in the search process, a lack of trust still remained. It is argued that this lack of confidence was not due purely to political factors, but was also due to the lack of trust in the institution of science and technology in general. It was found that the notion of risk was central to accounting for the adoption of such a perspective.

A central factor in the treatment of risk was the lay awareness of the technical uncertainties inherent to environmental impact science. In the context of the GLSP, this lay awareness pertained to issues related to the uncertainty in determining the character of the waste stream, the uncertainty about the hydrogeological features of the potential sites, and the awareness of the limitations of the technical methods and technologies used to detect, monitor, and contain the toxic leachate generated from the proposed landfill.

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The Search For A Landfill Site In An Age of Uncertainty:
The Role of Trust, Risk, and the Environment

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PREFACE

Preface

This work is essentially a sociological examination of the search for a landfill site conducted in Guelph, Ontario from June 1993 to March 1995. The search process adopted by the City of Guelph was reputed to be one of the most innovative, open and inclusive landfill searches that has taken place in the province (to date). The Guelph Landfill Search Process (GLSP)[1], unlike previous landfill searches in Ontario, was based on intensive community participation in the decision-making involved in the siting of a landfill. Notably, such participation included lay involvement in many technical matters that were not traditionally open to non-experts. The rationale for adopting this approach was that it would lead to a greater public acceptance of the identified landfill site (City of Guelph: Position Paper #1, 1994, p.1).

In determining where a landfill should be sited one is fundamentally dealing with the management of *risk* to both the natural environment and to one's health. This is because landfills generate a toxic solution known as leachate. Leachate is formed from the mixing of rainwater with the various discarded wastes (ranging from residues from shampoo and nail polish remover bottles, to residues from soft drink cans and chemicals from batteries). The risk is that leachate may escape from the landfill and contaminate the community's drinking water supply (known as an aquifer or groundwater). Today,

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[1]   A list of abbreviations and acronyms used in this study is given in Appendix 1.

various technological measures are used to contain the leachate generated by a landfill.

Lay participants in the GLSP were provided the opportunity to raise the issue of the effectiveness of such technologies (i.e. the risk of technological failure). They also had the opportunity to become involved with the technical methods used to determine a landfill site, and to question the technical data that was used to identify the potential site. Thus, much of the interactions that took place in the GLSP were between lay participants and technical consultants in what was supposed to be a 'non-confrontational' setting. It is for this reason that one of the key factors that we have investigated in our research were the views that lay participants had towards technology and technical experts. If the GLSP was to be viewed as legitimate, then the public must trust the technical work and the experts involved. We have therefore focused on questions and issues related to the lay individuals' *trust* of technology and technical expertise. In this context we have attempted to identify those factors that influenced the trust relations between lay participants and technical experts in the GLSP. We then investigated the question as to why and how these particular factors arose?

A second factor that we have investigated in this research is the *notion of risk*. The concepts of risk and trust are actually interrelated. For example, if the lay individual trusts a technical expert's assertion that the landfill technologies will not fail, then, he or she will not perceive of a risk. This will in turn affect the type of interactions that result. Therefore, in order to more properly understand the expert-lay interactions that took place in the GLSP, consideration must also be given to the *role of risk* in this process.

As it is often perceived that the siting of a landfill will have an impact on the physical environment, the GLSP naturally included many participants from environmental groups. However, a landfill will also have impacts on the economic, social, and cultural spheres of a community as well. It is for this that reason many other stake-holders became involved in Guelph's innovative search for a landfill. Consequently, many different types of value conflicts and issues arose. As we shall see, the most prominent form of conflict pertained to the trade-offs that needed to be made between economic and environmental factors. This led us to focus on the third area of our research, namely the tension between *ecological and technological/economic values and beliefs* in the GLSP.

By focusing on the factors of trust relations, the treatment of risk, and the role of environmental versus technological values and beliefs, we hope to show how these factors significantly influenced the manner in which the Guelph Landfill Search unfolded. We will then move on to a more general discussion of how the treatment of trust, risk and environmental values/beliefs in the Guelph Search actually revealed an inherent process of *institutional eco-restructuring*. Specifically, we will show how the institutions of science and the local polity involved in the GLSP had been re-structured to deal with: problematic trust relations, environmental risk issues and the tension between ecological and technological values and beliefs.

The main arguments to be developed in our study pertains to the particular manner in which trust, risk, and environmental values/beliefs were treated in the Guelph

Landfill Search Process. It will be argued that the way these three variables were dealt with by participants in the search actually serve as indications of a fundamental change that is occuring at the individual and institutional levels of society. At the level of the individual, it will be shown that a reflexive orientation was adopted by participants in the GLSP. In our context, the term "reflexive orientation" refers to the an orientation that is based on a two-step process. The first step involves a confrontion with an environmental risk issue, and the subsequent step refers to a *revision* of thought or self-identity, that results from confronting the risk issue. At the level of the institution, reflexivity refers to the process of how institutions have become restructured to deal with environmental risk issues (i.e. a process of institutional *eco-restructuring*). In our study we will examine the eco-restructuring of the institutions of environmental impact science and the local polity. Our focus therefore will be to demonstrate how the adoption of a reflexive orientation had influenced the events and interactions that were observed in the GLSP.

Our research adopts a theory-guided (deductive) approach to the analysis of the GLSP. The adoption of such a perspective has meant that we have intentionally limited the scope of our analysis to those issues that are relevent to the investigatation of the theory of reflexive modernization proposed by Beck, Giddens and Lash (1994). Consequently, although we have mentioned other perspectives and conceptual frameworks pertaining to risk, trust, and the environment, we have done so only in passing. To go into the specifics of these other perspectives would take us too far afield and we therefore

had to be quite selective. Although our analysis does take into account the numerous approaches to studying risk, trust and the evironment, it does not do so in a detailed manner. Some of these other perspectives that we have considered, or that have otherwise indirectly influenced the present study, include: cross-cultural approaches to environmental policy formation (Jasonoff, 1987; Harrison and Hoberg, 1994), social construction of social problems research (Stallings, 1995; Spector and Kitsuse, 1973), conflict and Neo-Marxists perspectives on power relations in the treatment of environmental issues (Schnaiberg 1980; Schnaiberg and Gould, 1994, Modavi, 1993), the body of research dealing with risk perceptions and estimations (Slovic,1987; Heimer, 1988), the social and cultural construction of risk perspective (Johnson and Covello,1987; Eyles, Taylor, Johnson and Baxter, 1993), the social construction of nature (Leiss, 1974, Greider and Garkovich, 1994; MacNaghten and Urry, 1995; Dickens, 1992) and the new social (environmental) movement theories (McAdam, McCarthy and Zald, 1988; Szasz, 1994, Aronson, 1993). The wide range of perspectives that may be used in the examination of an environmental issue reflects the inherent complexity of this particular type of issue. Many of the perspectives listed above may legitimately be applied (in their own right) to the analysis of the GLSP, but, as was alluded to previously, they address issues that are indirectly related to the focus of the present study. As we shall see, such perspectives may usefully contribute to the refinement of what may prove to be a broader or more encompassing social theory, namely the theory of reflexive modernization.

An Overview Of This Study

The first chapter of this study will deal with the historical and political backdrop to the Guelph Landfill Search Process. This will include: a brief consideration of the Environmental Assessment Act of Ontario (which all landfill searches must abide by) and a general discussion about the City of Guelph . We will then introduce the specific groups involved in the process, and, give a brief overview of the search.

Chapter 2 will review the theoretical and conceptual framework employed in our study. We will first review the general theoretical orientations that we have employed in our sociological analysis. These include the work of various authors, notably: Giddens (1990,1991,1994) on late modernity, and Beck (1987,1992a,1992b,1992c,1994,1995) on the risk society. After giving an outline of the above theoretical perspectives, we will then give the rationale for our emphasis on empirically investigating the notions of trust, risk and environmental values in our study.

Chapter 3 reviews the methods that were used in our research and includes a discussion of how the concepts were operationalized for this study. The limitations of our data and methods will also be discussed.

Chapter 4 deals with the issue of trust in the Guelph Landfill Search Process. The particular focus will be on the role of trust in expert-lay interactions, including trust in the system of science and technology.

Chapter 5 reviews the sociological conceptions of "risk". From there we will proceed to show how "risk consciousness" (i.e. thinking in terms of risk) may help to

explain not only the character of many of the interactions that took place, but also how and why particular issues arose in the GLSP.

Chapter 6 employs a quantitative analysis of the ecological and technological values and beliefs held by participants in the GLSP. It will be shown that the tension between these two beliefs and values systems resulted in contradictions that were resolved through a process of self-confrontation and revision. We will then discuss how the attempts to reconcile ecological and technological values/beliefs may help to explain some of the interactions and issues that were raised in the GLSP.

Chapter 7 builds on the work of the previous chapter to show that the confrontation between ecological and technological concerns had also influenced events at the institutional level. Specifically, it will be shown that the Guelph Landfill Site Search is a process in which the institutions of science and the poli y underwent a restructuring so as to allow for a more democratic and effective consideration of ecological concerns.

The final chapter summarizes our conclusions and discusses the implications of this research.

CHAPTER ONE

THE GUELPH LANDFILL SITE SEARCH PROCESS

Chapter 1   The Guelph Landfill Site Search Process

The purposes of this chapter are: (i) to describe the environmental planning framework in which the Guelph search took place, (ii) to describe the particular political and historical circumstances behind this search, (iii) to introduce the individuals and groups involved, and, (iv) to briefly describe the sequence of events that took place in the Guelph Landfill Site Search Process (GLSP).[1] Due to the complexity of the process we are studying, the intended purpose of this chapter is largely to provide the reader with an overview, or description, of the GLSP. As such, a more detailed analysis of the issues raised, will begin with the subsequent chapters.

Section I   Background Information

The Environmental Assessment Process in Ontario

The regulation of environmental matters in Canada is quite complex because it involves the co-ordination of federal, provincial and municipal jurisdictions. The federal and provincial governments influence environmental planning and regulations through *legislation*. In the political hierarchy, the municipal government derives its jurisdiction for local environmental policy making from the provincial government. Thus the City

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[1]   A detailed chronology of events that took place in the Guelph Landfill Site Search is given in Appendix 2.

of Guelph's search for a landfill site must obey provincial requirements.

For our purposes we are interested in the Ontario Ministry of Environment and Energy (MOEE)[2] because it is this department that administers the Environmental Protection Act (EP Act) and the Environmental Assessment Act (EA Act)[3]. The requirements of both of these Acts must be followed in the siting of any landfill in the province. The EP Act is of a more technical sort and details the technical requirements of a proposed undertaking and is followed once a site is identified following the guidelines of the EA Act. The EA Act therefore, is more relevant to our study of the GLSP because it is this Act that set out the general conditions that were to be met in the City of Guelph's site search. The following briefly reviews this Act.

The environmental assessment process was designed by the Ontario Ministry of Environment and Energy with the expressed purpose of ensuring that environmental considerations are taken into account in the planning and decisions related to the siting and construction of a proposed project (known as the undertaking). Initially the environmental assessment process was designed to protect the natural environment, but it has since evolved and enlarged its definition of the environment to include a consideration of the social, cultural and economic environments as well. The

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[2]   The MOEE was formed in 1972, at which time it took over the functions of dissolved Ontario Water Resources Commission.

[3]   The EP Act was enacted in 1972, while the EA Act was enacted in 1975.

environmental assessment procedure has now evolved into a preventative process that seeks to prevent problems rather than focusing on remedial actions.

An important component of the environmental assessment process is the emphasis on gaining some input from both the private and public sectors, with the Ministry of Environment and Energy acting as a *referee*. Such a view of the Ministry's role was expressed at several points in the GLSP. For example, a senior MOEE official noted that:

> Environmental assessment is driven by proponents, so it's up to the proponents to decide. It's my job to give them very clear, succinct and consistent advice, but the decisions are entirely theirs. (Kevin Crowley, The Wellington Record, May 7,1993)

In response to a letter from a participant in the GLSP, an MOEE official once again re-asserted the status of the MOEE as a referee:

> The process developed by the City is funded solely by the City and thus the Ministry of Environment and Energy's position is to provide advice on whether the planning process meets the required components of the Environmental Assessment Act (EA Act). The issues you raise regarding the LSG's mandate should be discussed with the City, since they have developed the structure. (Letter of response from MOEE official to a member of a neighbourhood group, November 28, 1994)

It was intended that the environmental assessment process be comprehensive, this in turn necessitated the involvement of experts from a multiplicity of disciplines (social, economic, cultural, environmental). The results and analyses of these consultants were then to be used by the proponent to draft an environmental assessment document. The

EA document is to be submitted to the MOEE, and must contain the following:

-- a clear description and rationale for the undertaking;
-- a list of alternative methods for carrying out the undertaking;
-- a list of alternatives to the undertaking itself;
-- a description of the environment that will be affected;
-- a list of projected effects caused by the undertaking;
-- a list of proposed mitigation measures;
-- an evaluation of the advantages and disadvantages to the environment caused by the proposed undertaking.

The EA document is then forwarded to the Ministry so that a decision can be made as to whether to allow for the construction of the undertaking or to call for an EA hearing (in case there are valid objections to the EA process, as conducted). The decision to have a hearing is made by the Ministry, but the request for the hearing can be made by either the proponent or a member of the public.

During EA hearings, representatives from the Ministry (the EA Board) listen to inputs from the consultants, the public, and the proponent. The EA Board is to act independently of the government and has the role of making decisions, rather than providing recommendations. EA Board decisions are considered as final and can be appealed only to the provincial cabinet. Intervenor funding is available so that the public can support their opposition to the proposed project on a more equal footing with the proponent. The EA Board is to consider all inputs and evidence, consider the "reasonableness" of what is presented, and on that basis, make a decision as to whether the project receives Ministry approval. In the case of the GLSP, EA Board hearings were

not required because all the potential sites identified were ultimately rejected by Guelph City Council.

The EA Act is somewhat flexible, in that, it allows the municipality to adopt any landfill search process it desires, as long is it falls within its' general guidelines. For example, the EA Act proscribes that there be some amount of stake-holder consultation in the environmental assessment process. Significantly, the local polity in Guelph took this consultative requirement one step further by involving the stake-holders (i.e. the general public) in the technical decision-making related to the siting of their proposed landfill.

The municipal polity in Guelph consisted of City Council, their ad hoc committees, and City staff members. The administrative structure of the City staff consisted of the following departments: Planning and Development, Engineering (Public Works and Water Works), Recreation and Parks, and Economic Development. The co-ordination of these departments was overseen by the City Administrator. The municipal polity played a central role in the GLSP, and members from the several municipal departments participated in the search in an official capacity (specifically, members from the Planning and Development, and Engineering Departments, as well as the City Administrator).

General Information about the City of Guelph

Guelph, Ontario was first settled in 1827 and officially obtained the status of a City in 1879 (Johnson, 1977:260). Guelph is located about 100km south-west of Toronto, at the junction of the Eramosa and Speed Rivers and is strategically located in the "technology triangle" region of Cambridge-Kitchener-Waterloo-Guelph. With improved highway and electronic highway access, Guelph is becoming integrated with other major economic centres such as the Hamilton-Niagara and Greater Metropolitan Toronto regions (J.L. Cox Planning Consultants Inc.,1994).

In 1994, Guelph supported a population of 91,000. The city offers a high level of living in terms of employment and business opportunities, while "offering a quality of life associated with small town living." (J.L. Cox Planning Consultants Inc. 1994).

The city has a medium sized university with a campus population of about 14,000. The university is known nationally for its programs in Veterinary Medicine and Agricultural Sciences and is the city's largest employer. The second biggest employer is Imperial Tobacco, followed by various other industrial plants such as Owens-Corning Fibreglass, Consumer Products, Asea Brown Boveri, as well as Sleeman's Brewery, all of which are located in the four main industrial regions of the city. The city also has its own newspapers: the daily Guelph Mercury, which was founded in 1853 (present circulation: 19,000/day), and the weekly Guelph Tribune (present circulation: 31,700/week).

In the spring of 1993 the City of Guelph annexed about 1500 acres of land from Puslinch Township (just south of Guelph) for an amount of $400,000 (Richard Dooley, The Guelph Mercury, May 18, 1994). The rationale for this annexation was that the City required this land for future industrial expansion and the logical direction for the planned industrial development was seen to be southwards towards the Highway 401.

The Puslinch area is a rural region occupied by some farms and numerous estate homes. Although assured by the City of Guelph, many of the residents objected to the annexation fearing that their taxes would increase. Despite the assurances, some residents of the Township paid up to sixty per cent more taxes. The political situation surrounding the annexation of the Puslinch Township land played an important part in the Guelph Landfill Search Process as four of the five potential sites considered by the City turned out to be located in this area. After comparing the sites, the site chosen to be forwarded for further consideration was a site located in the annexed region.

An Overview of Waste Management in Guelph

After nine years of study from 1983 to 1992, and at a cost of $4 million, the County of Wellington and the City of Guelph developed a Waste Management Master Plan (WMMP). The WMMP was developed by a steering committee in conjunction with public input provided by a public advisory committee (PAC). The plan outlined an agenda for the management and disposal of the waste generated by the 22 municipalities

making up the County of Wellington/City of Guelph waste management planning area for the next twenty-five years.

The WMMP included the following components: a waste reduction action plan, a wet/dry recycling and composting program, an inert material disposal site and a landfill for the wet/dry residues and other non-processable wastes (source: Guelph's Green Plan, July 1994:59). The key component of the WMMP was the construction of a $36 million wet/dry recycling facility. This facility, the first of its kind in Canada, was to separate, compost and recycle waste into two streams -- the wet and dry. The wet stream was to consist of materials such as organic food and yard wastes, while the dry stream was to be comprised of such materials as paper, bottles, cans and plastic film. According to the estimates from the WMMP, by the year 2000, the wet/dry recycling program was expected to divert about 60% of the of the collected waste away from the landfill (City of Guelph Landfill Search, Position Paper #1, p.19).

For several months, from January 1993, weekly meetings were held by the Wet/Dry Public Advisory Committee (PAC) to receive public input about the proposed undertaking. Such input is required for the Ontario Ministry of Environment and Energy certificate of approval, a document that had to be issued by the Ministry before construction of the Wet/Dry facility could begin (Hilary Stead, The Guelph Mercury, February 1, 1993). During these meetings much debate and argumentation took place between the proponents and the opponents of the wet/dry facility, in the end however,

the undertaking was given approval by the Ministry, and construction of the facility began in the spring of 1994.

Currently, the thirty year old landfill used by Guelph is located in the north-east quadrant of the city, in an area known as Eastview. However, the Eastview site by 1989, had reached its original certified capacity, but has since then operated under a series of one-year emergency certificates of approval granted by the MOEE. In 1993 the Environmental Assessment Board approved the City of Guelph's request for a five year extension of the Eastview landfill. Residents of this area organized their opposition to the prolonged use of this landfill by forming a group known as the Eastview Residents for Environmental Justice (EREJ).[4] The EREJ actively opposed the continued use of the landfill in their area because of concerns about surface and groundwater contamination by leachate (Discussion Paper #1: Introduction to the City of Guelph's Landfill Site Search Process). As such, a great deal of controversy existed over the closure and post-operational procedures of the Eastview Landfill. Some of this controversy arose from the assertions made by some Eastview residents that they have already made plans, such as household renovations, based on their understanding that the Eastview landfill would be closed, and that remediation would have already taken place by that time (Richard Dooley, The Guelph Mercury, July 7, 1993).

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[4]   Several members of the Eastview Residents for Environmental Justice took a very active role in the Guelph Landfill Search.

In March, 1994 a public liaison committee (PLC) for the Eastview site was formed. The PLC consists of five members from the public (three of whom also belong to the Eastview Residents for Environmental Justice), three councillors (one from the Township of Guelph, where the Eastview Landfill is located), two developers, the Wellington County waste management committee chairman, and an MOEE official. The PLC was to have the power to inspect the site, review the operations documents, and award compensation for any damages caused by the landfill (Andrew Bruce, The Guelph Mercury, March 11, 1994).

Section II   An Overview of The Guelph Landfill Site Search

A Descriptive History of the Guelph Landfill Search Process

To understand the Guelph Landfill Search Process it is necessary to first consider the local-historical circumstances in which the search took place. The GLSP actually began after a problematic joint landfill search conducted by the City of Guelph and the County of Wellington in the previous year.

With the impending closure of the Eastview Landfill, the City and County for ten years screened their territory for a suitable location for a new landfill. The site had to be in operation by late 1998. In 1992 the Joint Steering Committee of the City of Guelph/ County of Wellington Waste Management Master Plan had identified a site that was currently being used for farming in the southeastern corner of Nichol Township, just

north of Guelph. This site came to be known as N-4.

The close proximity of the N-4 site to the Speed River, and to Native burial grounds, immediately raised the ire of residents, members of the Six Nations Iroquois Confederacy, and local environmental groups. Environmental groups such as the Waste Watchers Monitoring the Master Plan, and the Speed River Preservation Group (which included noted Canadian artist Ken Danby in its active membership) immediately organized protests against the N-4 siting.

N-4 residents and local environmentalists charged that the Joint City/County Search was not done in an open or public manner, as required under the EA Act (Richard Dooley, The Guelph Mercury, January 12, 1994). The secretary of the environmental group Waste Watchers Monitoring the Master Plan claimed that the joint-search was dominated by "technocrats", who gave little or no consideration to public input (ibid).

On December 16, 1992, a closed door meeting between the waste management steering committee and the county reeves drew a group of loud protesters who demonstrated in front of the county administration centre (Richard Dooley, The Guelph Mercury, December 17, 1994). The next day the County was to have a vote on whether to recommend the N-4 site to the Ministry of Environment and Energy (MOEE) for the next stage of the environmental assessment process. However, Ken Danby presented County Council with an injunction preventing the vote until December 21, 1992. This delay had little effect, and in January 1993 County Council voted to forward the N-4 site

for the more detailed studies required by the Environmental Protection Act.

Since the N-4 potential landfill site was the result of a joint search, the City Council of Guelph also had to formally approve the site before it could be recommended for further study. On January 11, 1993, again in the midst of vocal protests (one hundred people packed the public gallery in City Hall), Guelph City Council voted 9 to 4 *against* the recommendation of the N-4 site for environmental assessment (Vik Kirsch, The Guelph Mercury, January 12, 1993).

The Landfill Search Group (LSG)

Having just rejected the N-4 site, Guelph City Council decided to embark on their own (sole) landfill site search in May, 1993. The new search was to be limited to the City of Guelph's municipal boundary, but had to deal with the County's waste as well (as required by the joint Waste Management Master Plan). As a contingency, Guelph City Council gave support for the County's position of forwarding the N-4 site for further consideration (City of Guelph, November 1993, Discussion Paper #1).

The intense pubic objections to the manner in which the N-4 site was selected led the City to consider adopting a more open and inclusive process, in which, public input would not be limited to the period after the consultant's work was done (as was traditionally the case). According to the City of Guelph Landfill Search Position Paper #1 (p.9):

As a result of the City and County decisions in January of 1993, the City decided to follow a more public process in considering how to manage the fraction of the waste stream that requires disposal. Although the N-4 site selection process involved a Public Advisory Committee, much criticism has been directed at the City and the County that this type of public participation was not always incorporated into the decision-making process.

City Council hoped to avoid pitting the public against the technical consultants as had occured in the previous (joint) search. To ensure "an open and inclusive community involvement process", Guelph Council decided to form a Landfill Search Group (the LSG) which was to consist of an equal representation from the public and the City. The process was also intended to minimize political influences. Such a sentiment was expressed by the Mayor of Guelph towards the end of the LSG's search:

> I believe that the LSG has done their best. City Council has played no part in the decision-making involved in choosing the preferred site. Council had no input into the decision. We put our faith in the decision made by the LSG. We did not put any politicians [i.e. no members of City Council] on the LSG in order to eliminate [any] political influence. (Fieldnotes, LSG Meeting May 18, 1994)

A general request for applicants willing to serve as the community liaison members of the LSG was sent out by the City. Twenty people responded and four were accepted. In June, 1993 the members of the LSG were officially appointed by City Council. The group consisted of four community liaison representatives, and four city staffers (and two alternatives). The LSG's mandate was to recommend to City Council the preferred location(s) for a landfill within the city limits, that would have a projected

lifetime of twenty years.

A community liaison representative of the LSG was unanimously elected to chair the Landfill Search Group. This individual was a retired professor from the University of Guelph's School of Rural Planning and Development, and the Department of Agricultural Economics and Business. In 1980 he was on the Board of Directors of the provincial agency responsible for siting hazardous waste treatment facilities (the Ontario Waste Management Corporation). The second community representative was a civil engineer, a professor of engineering at the University of Guelph. He was actively involved in local environmental matters such as the two environmental studies of the Hanlon and Mill Creek Watershed areas that were being carried out at the time. The third community member of the LSG was an aquatic ecologist with a specialization in doing environmental assessments of aquatic environments. The last community liaison member was a geological engineer with experience in dealing with groundwater contamination. The four City Officials on the LSG consisted of the Chief Administrative Officer (who served as the LSG vice-chairman), a senior city engineer, the city director of operations (an engineer) and the city director of planning and development. The City's two alternatives included a senior policy planner and the city waste management coordinator (who also served as the LSG project manager). The latter was the only woman on the LSG and held a doctorate in engineering.

The LSG's first task was to interview and recommend technical consultants to City

Council. On October 13, 1993, City Council accepted the LSG recommended firm of Gartner-Lee as the lead technical consultants, in partnership with the LURA Group (public involvement consultants), Braun Consulting Engineers, J.L. Cox Planning Consultants Ltd. and Market Vision (an opinion research firm) (Nov 1993, Discussion Paper #1). Following this, in November 1993, the opinion research firm conducted a 600 person telephone survey to assess the Guelph residents' potential opposition to having a landfill sited in their city.[5] The results of the survey indicated that: 62% of the sample felt that Guelph's garbage should be disposed of in the city, the majority felt that they wanted to be informed about any site selection process in their city, and 55% would support a landfill located two kilometres from their homes (Market Vision Research, December 1993).

To further ascertain the community's views towards a landfill, the public involvement consultant conducted eighteen interviews with stakeholders from November 5 to November 17, 1994. The results of these interviews indicated that: less than half were aware of the City's 50% waste diversion plans; half of those interviewed felt that new landfill technologies should be pursued; less than half expressed outright support for a landfill within the city boundaries and all but two agreed to participate in the landfill search (LURA Group, Interim Report on Stakeholder Interviews, Nov. 1993). There

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[5] The results were projectable to all residents of Guelph, 16 years of age or older within plus/minus 4.1 percentage points, 95 out of 100 times.

were therefore indications that, in general, members of the Guelph community were not averse to the idea of having a landfill in their city. This unexpected result was noted by the LSG chairman: "The so-called NIMBY [Not-In-My-Backyard] syndrome was supposed to be strong. It's a bit of a surprise [that it isn't]." (quoted by J. Wells, The Guelph Tribune, January 19, 1994).

On Friday August 13, 1993 the LSG held it's first meeting. About a dozen members from the public gallery stormed out of this meeting stating that they felt that the new search would be no different from the previous (joint) search (Richard Dooley, The Guelph Mercury, February 28, 1994). In response, the LSG felt that it had to come up with some way of ensuring broad-based public involvement. Their answer was to form a Community Advisory Subcommittee (CASC) that was to allow the broader public to make recommendations and advice the LSG in their search for a landfill site. The organizational structure of the community involvement program developed by the LSG is given on the next page.

Figure 1.1   Organization of Community Involvement in the Guelph Landfill Search
Process

(Source: Update on City of Guelph Landfill Site Search, May 1994)
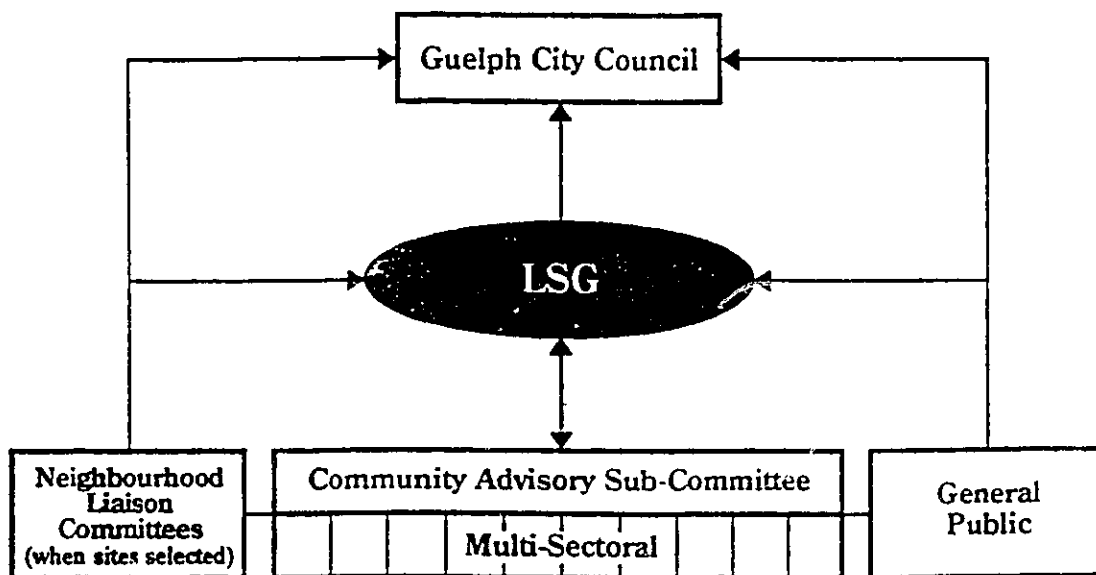
The Community Advisory Subcommittee (CASC)

The LSG proposed that the CASC be established as a multi-stakeholder group consisting of community leaders and interested members of the public (November 1993, City of Guelph: Discussion Paper #1). CASC was to enable the LSG to effectively and efficiently incorporate community values and concerns into the site search process. It was also intended that CASC would act as a networking group to ensure that the community-at-large was kept abreast of the issues that arose in the landfill search process. Specifically, CASC was to assist the LSG in developing:

-- Goals and Objectives for the Siting Process;
-- Public Involvement and Communication Plans;
-- Confirming the need of the proposed site, as related to the overall waste management master plan;
-- Alternative Landfill Technologies;
-- Innovative site selection methods;
-- Compensation policies; and
-- Any other relevant issues which are brought to its attention.
    (source: City of Guelph:Discussion Paper #1 November 1993)

CASC and LSG meetings usually lasted about 3 to 4 hours and sometimes ran late into the night. The meetings were held on weekdays and started at 7pm.[6] Altogether there were 26 CASC meetings and 36 LSG meetings (8 of these were formally joint meetings but it should be noted that many LSG and CASC members attended each other's

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[6]   Initially the LSG meetings started at 4:30pm, but members of the public argued that this is an inappropriate time for many working people and the LSG meetings were then moved to 7pm.

meetings as well). All meetings were advertised in the local newspapers.

The public involvement consultant sent out more than 130 letters to community leaders and groups inviting them to join the CASC (Vik Kirsch, The Guelph Mercury, November 17, 1993). On November 18, 1993 about sixty people attended the CASC orientation session. Participants represented a wide range of sectors: business associations, residents, students, environmental groups (including the Eastview Residents For Environmental Justice and the Speed River Preservation Group), ratepayers associations, public interest groups, agricultural groups, seniors, utility, and service clubs (CASC Meeting Record, Nov 18, 1993).

During this orientation meeting the LSG chairman noted that CASC was to share in the decision-making involved in siting the landfill. He also noted that *sharing the decision-making with the broader community had not been previously attempted in any landfill searches in Ontario*. Commenting about the type of search that Guelph was to undertake through the involvement of CASC and the LSG, the community involvement facilitator (who chaired the vast majority of CASC meetings) stated that:

> This is really unique. There is nothing like this anywhere and Guelph is attracting a lot of attention by using this process.(quoted in The Guelph Mercury, article by Richard Dooley, February 28, 1994)

The CASC orientation meeting participants also discussed the development of the CASC Terms of Reference.[7] It was also agreed at that time that the meetings would follow the Roberts Rules of Order. Other issues that were raised, included: (i) conflict resolution mechanisms (relating to anticipated differences of opinion between LSG and CASC), and, (ii) the need for public access to the CASC's recommendations (specifically the right to publish CASC recommendations in the press and the provision that such recommendations (consensus positions) be provided directly to City Council, in the event of a dispute between CASC and LSG).

The first of twenty-six CASC meetings was held on December 7, 1993. The first item of business for the group was to decide on the format for the meetings. A representative (consultant) from the public involvement agency (LURA) led a discussion suggesting the adoption of a *consensus decision-making process*. The main steps of this process (as described in the CASC Meeting Records #1) were as follows:

1) an issue/problem is brought forward for consideration;
2) the group brainstorms alternative approaches and potential solutions;
3) one approach/solution is put forward;
4) the preferred approach is refined to the extent that all agree with it.[8]

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[7] The CASC and LSG Terms of Reference are given in Appendices 3 and 4, respectively.

[8] For a more detailed account of the consensus decision-making model, see Appendix 5)

In this consensus process, voting was to be used as a last resort.[9]

To encourage a community spirit of working together, one CASC member (a professor of engineering and an environmental activist) composed a site search song that was sung at the beginning of all CASC meetings until the date the potential sites were announced. The title of the song was "Unity From Diversity - The Site Search Song". The verses for this song are given below; it should be noted that MORS is the acronym for Management of Residuals Site, where the term residuals is used because that is what remains after the waste goes through the Guelph Wet/Dry Recycling Facility :

> For MORS we look together, together, together
> For MORs we look together and happier are we.
> For you want a good site, and I want a good site.
> For MORS we look together and happier we are.
>
> The less of it we bury, we bury, we bury,
> the less of it we bury, the happier are we.
> For your waste is still waste, and my waste is still waste.
> The less of it we bury, the happier are we.

Other items discussed in this meeting were: the public opinion survey (conducted by Market Vision in November 1993), and suggestions for the goals and objectives of the site search process.

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[9] Voting was used on some occasions when it seemed that consensus could not be reached. In these cases the CASC position was submitted to LSG as a CASC majority position (the results of the voting would be included in the report) rather than as a CASC consensus position.

An understanding of the wide breadth of CASC's involvement in the Guelph Landfill Search Process can be grasped by considering: (i) the number and types of CASC subcommittees that were formed to deal with particular issues; and, (ii) the types and number of public workshops that CASC (with LSG) helped to develop and implement:

CASC Subcommittees

1. Goals and Objectives Subcommittee
2. Terms of Reference Subcommittee
3. Technologies Workshop Subcommittee
4. Office Space Subcommittee
5. Survey Subcommittee
6. Siting Methodology Workshop Subcommittee
7. Compensation and Impact Management Subcommittee
8. Site Comparison Criteria Workshop Subcommittee
9. Minimum Acceptable Standards Subcommittee
10. Technologies Subcommittee
11. Weights and Ranking of Comparative Evaluation Criteria Subcommittee.

These subcommittees usually consisted of six to eight CASC members who got together and held their own subcommittee meetings and teleconferences. The subcommittee would then report their findings and conclusions to the CASC as a whole. In turn, CASC would offer feedback, modify the report if needed, and finally forward the r(ort as a *CASC consensus position* paper to the LSG for their deliberations. It was then up to the LSG to consider and incorporate the CASC recommendations into their work. For example, the development of the LSG's document on "Landfill Site Search Goals and Objectives"

(February 16, 1994) was firmly based on the CASC statement of its own goals and objectives (see Appendix 4). On the other hand, at another juncture in the process, CASC recommendations were not incorporated (by the LSG) to the degree desired by CASC. This specific situation related to the reluctance of the LSG to accept the "Minimum Acceptability Standards" derived by CASC. But, as was previously mentioned, the provision was made in the CASC's Terms of Reference that, in situations where the LSG disagreed with the recommendations of CASC consensus positions, then CASC would be provided the mechanism to approach City Council directly. In this way City Council was to take the role of an arbitrator in deciding whether the LSG must follow the CASC consensus position recommendations.

Public Workshops

In an attempt to be as inclusive as possible, the public workshops held in the Guelph Landfill Search Process were open to all members of the public and not just the members of CASC or the LSG. Attendance at the public workshops varied from about 25 to 100 people. The workshops were organized in a roundtable format in which a table of six individuals would discuss the issue or problem at hand and make written submissions and comments. The CASC and LSG would then consider the public input obtained from the public workshops. The following is a list of the public workshops that

were held during the period of January to August, 1994:

1. Alternative Waste Disposal Technologies (2 sessions)
2. Alternative Ways to Site a Landfill (2 sessions)
3. Site Comparison Criteria Workshop (2 sessions)
4. Selecting a Method to Compare Potential Sites
5. Site Comparison: Weighting and Ranking Working Session

The list is meant to convey the broad spectrum of issues related to siting a landfill that the CASC considered (and with which the public had the opportunity to become involved). In particular, the *technical nature* of many of the workshops should be noted. A more detailed discussion of some of the workshop activities and exercises listed will be elaborated upon at different points in this work.

The Neighbourhood Liaison Groups

On March 2, 1994 the LSG adopted the CASC recommended landfill site search method of opportunity mapping followed by the application of constraint criteria. A Landfill Search Group Site Identification Subcommittee consisting of LSG members and the technical consultants was then formed. This LSG subcommittee met on four occasions to carry out the necessary work in applying the site search method recommended by the public (the method that the LSG used was recommended to them by the CASC, on the basis of the results from the public workshops). These particular working sessions were the only meetings of the LSG not open to the public. Confidentiality, in regard to the identification of potential sites is a legal requirement

intended to ensure that everyone is notified about the potential landfill sites at the same time, thereby precluding the possibility that particular individuals could use the knowledge about specific potential sites to their advantage (financially or otherwise).

On the day that the LSG announced to City Council the potential sites that they had identified, angry residents questioned the LSG Chairman about the methods that were used to identify the sites. The LSG chairman responded that the method that was used was a purely technical exercise, involving an overlaying of different maps. He claimed that there was little room for subjective judgements in applying the *publicly recommended* site identification method (Fieldnotes, Guelph City Council Meeting, May 10, 1994).

Five potential landfill sites were identified by the LSG. Fo r of these potential sites were located in the southern most part of the city, in an area that was recently annexed from the neighbouring Puslinch Township (as mentioned previously). The fifth site, refered to as the Victoria Road site, was located in area about fifteen minutes walk from downtown. The Ontario Ministry of Agriculture, Food and Rural Affair's Guelph Turfgrass Institute (a research facility that was in turn operated by the University of Guelph) was located on this fifth site. Also situated on this site was the University of Guelph's agri-forestry research project. For a better picture of how the potential sites were situated in the Guelph area, please see the map on the next page.

Figure 1.2 Location of the Potential Landfill Sites in Guelph
(Source: Update on the City of Guelph Landfill
Site Search, May 1994)
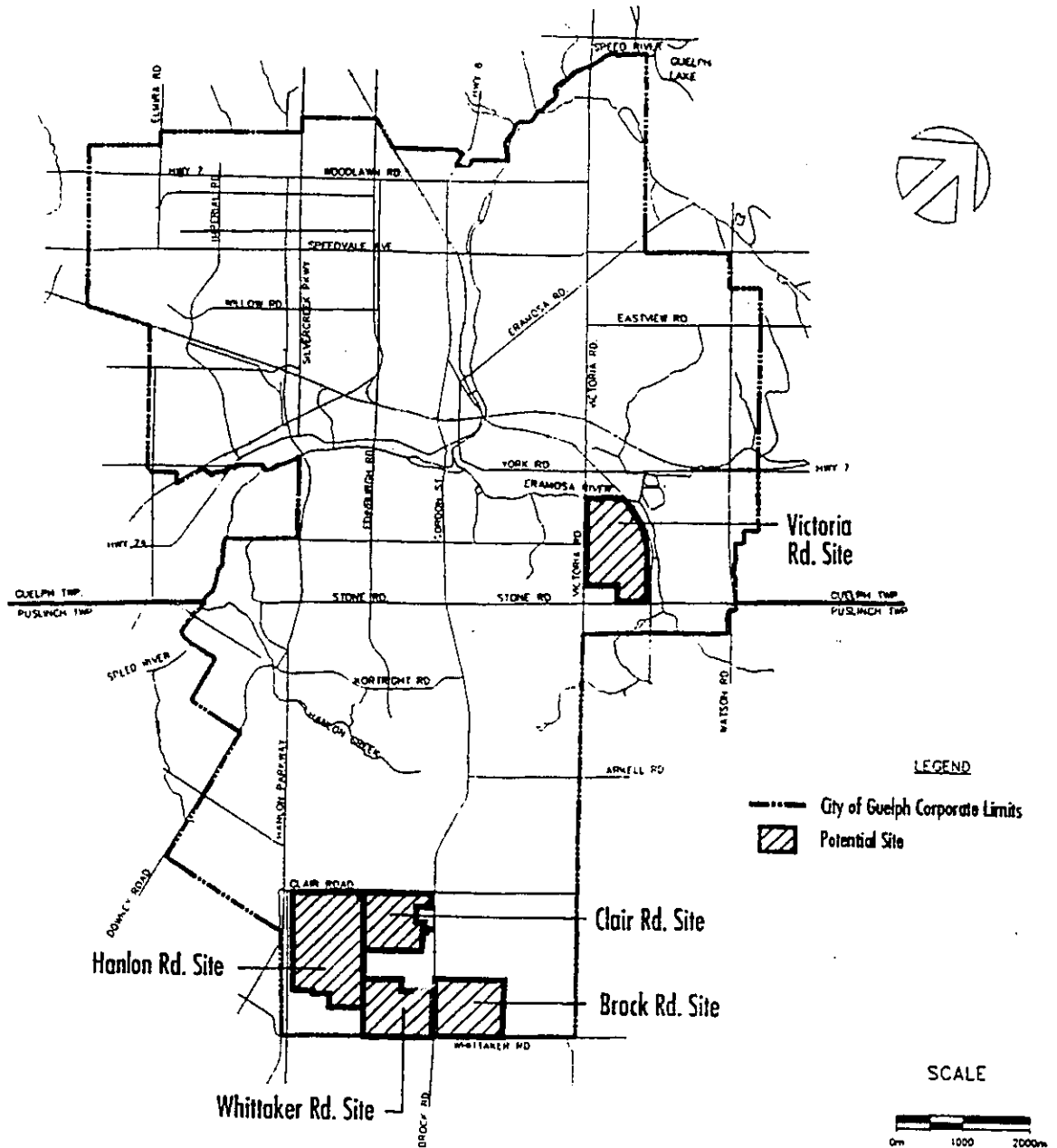
LEGEND

City of Guelph Corporate Limits

Potential Site

Victoria Rd. Site

Clair Rd. Site

Hanlon Rd. Site

Brock Rd. Site

Whittaker Rd. Site

SCALE

0m   1000   2000m

Coalition of Residents Against Landfill Sites in the Hanlon and Mill Creek Watersheds (CORALS)

As might be expected, neighbourhood liaison groups were organized to represent the interests of the potentially affected residents (i.e. those living in or near the potential landfill sites). Two such groups were formed. The first group to be organized was called CORALS (the Coalition of Residents Against Landfill Sites in the Hanlon and Mill Creek Watersheds) and represented about one hundered residents of the annexed area. The three executive members of CORALS (including its chairman) were members of CASC since its conception. CORALS became organized extremely quickly and, within a week after the announcement of potential sites, the group had picket and billboard signs made, and were quickly informing themselves of the process to date.[10]

Although the LSG considered the four sites in the annexed (Puslinch) area as separate sites, CORALS insisted that the four sites were so close together that there was effectively only one site, at least as far as the CORALS membership was concerned. For this reason only one neighbourhood group was formed to oppose all four of the landfill sites in the annexed region.

In regard to the only site located outside of the annexed area, the leader of CORALS had the following to say (at the CASC Meeting held the same day as the

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[10]   Photographs of the potential site areas, and the protest signs that were erected are given in Appendix 6.

potential site annoucement): "The Victoria Road site was just thrown in as a sham to show that sites in the city were [also] considered" (Fieldnotes, CASC Meeting, May 10, 1994). The LSG chairman stated he was offended by that remark, and explained that the Victoria Road site was the only site in the city which met the required criteria. To this the CORALS leader sarcastically responded, "Excuse me for being suspicious!" (Fieldnotes, ibid).

Members of CORALS were infuriated that their area was chosen to host a potential landfill site. These residents felt that they had already been betrayed by the City of Guelph in terms of their increased tax burden. Further, it was their understanding that the annexed area was earmarked for industrial development. From the viewpoint of CORALS members, the potential siting of a landfill in their area seemed to have been a deliberately orchestrated political manoeuvre that victimized the residents of the annexed area; as one member of CORALS stated, he and the residents of Puslinch felt "cheated by the LSG and the Mayor of Guelph" (Fieldnotes, CASC Meeting #14, May 10, 1994).

As evidence of this alleged political manoeuvring by the City of Guelph, members of CORALS on several occasions mentioned that they did not know about the Guelph Landfill Search Process until receiving a notice in the mailbox stating that their property was being considered for a landfill on May 10, 1994 (the day the potential sites were announced to City Council and the public). Efforts to inform the public about CASC and LSG meetings were made by the community involvement consultant through the

placement of advertisements in the Guelph Mercury and the Guelph Tribune newspapers. However, many residents of the annexed area mentioned that they did not receive either of these two newspapers. One resident noted that the Puslinch Pioneer was their community paper, and that no information regarding the public meetings of the LSG and CASC was placed in this community newspaper (Fieldnotes, LSG Meeting, May 18, 1994). She went on to say that she felt that the Guelph Mercury was purposely used by the LSG to keep people in the annexed area in the dark about the landfill search process. However, this was probably not the case, rather, the lack of information about the landfill search in the Puslinch Pioneer was probably the result of an honest oversight.[11]

Some members of CORALS subsequently joined CASC not only to keep themselves informed of the process, but to influence the process to whatever extent they could. However, the majority of CORALS members refused to join the CASC because they believed that it was part of the process that led to the selection of their area as a site for a potential landfill in the first place. Others in CORALS refused to participate in CASC because they felt that such participation would work against them in the future,

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[11]   The executive members of CORALS were all members of the CASC since its formation (long before the potential site announcements) and they had the opportunity to inform the public involvement consultant about this newspaper, but for whatever reason they did not, though it is unlikely that this was deliberate.

if an Environmental Assessment Hearing were called.[12]

The Victoria Road Neighbourhood Liaison Group (VRNLG)

The second neighbourhood group consisted of residents from the Victoria Road potential site. Unlike CORALS which had organized themselves immediately after the announcement of potential sites, the Victoria Road group did not formally organize until several weeks had elapsed. On June 13, 1994 the community involvement facilitator helped organize a meeting in which residents from the Victoria Road site could get together. The residents met and agreed to form the Victoria Road Neighbourhood Liaison Group (VRNLG).

The residents living near the Victoria Road site appeared to form two distinct groups of neighbours, one located at the east side of the site and the other on the west side. The residents from both neighbourhoods consisted of a mix of senior citizens, young families and university students (Joint VRNLG/LSG Meeting Record, July 19, 1994). It also appeared that the residents living near the Victoria Road site were of a lower economic class, relative to their counterparts in the annexed area. Unlike the

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[12]   As mentioned previously, the EA Act requires some public input into the landfill search process must be made in order for that process to be considered as legitimate and legal in the eyes of the Ministry of Environment and Energy. If the amount of public input is considered inadequate, then the selected landfill site may be rejected in a subsequent Environmental Assessment Board hearing.

annexed area, there were no large estate homes in the Victoria Road neighbourhoods.

Part of the Victoria Road site was actually situated on Crown land, in which four ministries were involved -- the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), Government Services, Correctional Services and Natural Resources (AT Guelph, the University of Guelph newspaper, July 27, 1994). The site itself was very close to a public park, the Eramosa River (and escarpment), a walking trail (consisting of a natural wildlife corridor), and, even though it was located within walking distance to the downtown, the area still was able to maintain a "semi-country" atmosphere. This latter feature was quite valued by many residents in the area; a sentiment that was pointed out on several occasions by the VRNLG residents (Fieldnotes at VRNLG meetings, June 22/94, July 19/94, August 23/94, Sept. 19/94). The site was also very close to the University of Guelph campus and university researchers were utilizing part of the land on the Victoria Road potential site for a ninety-year agri-forestry study.

Two main arguments were put forth by the VRNLG. The first had to do with the potential for contamination of the Eramosa-Arkell Springs; springs which provide for 65% of Guelph's total drinking water supply. The second had to do with the *issue of social equity*. The residents of the Victoria Road site felt that their neighbourhoods have been neglected and managed poorly by the City. For example one resident stated that:

> We [i.e. residents in the Victoria Road area] have done our share. We
> have contributed our fair share to the industrial process -- the Owens
> Corning plant is in our viewscape, the Eastview dump is only 3 km away,

the abandoned IMICO plant[13] is here, as are four known abandoned landfill areas, the Better Beef slaughter house, and Huntsman Chemical. Yet, the natural preserve in the neighbourhood has been maintained. We've done our fair share of being dumped on, and we want LSG to recognize this. (Fieldnotes, LSG meeting with VRNLG, July 19, 1994)

The same speaker went on to note that their neighbourhood seemed to have become a "depot" for the "bads" of the city, and that shopping malls and industry seemed to be moving out of their area. He asked if it was the plan of the City to close their area down through attrition? And if so, was it part of the City's plan to site a landfill in their area, so that their neighbourhood was further isolated and marginalized?

The social equity issue raised by the VRNLG can be summed up by the following citation from a VRNLG document submitted to the LSG:

> The residents of the St. Patrick's ward[14] strongly believe that we have shouldered more than our share of the responsibility for Guelph's waste and that in the interests of fairness, the landfill should be sited in another area of the city. (VRNLG Document: Equity Issues, August 23, 1994)

Up until July 19, 1994 the University of Guelph was surprisingly silent about the possibility of a landfill being located on their property. Frustration about the lack of the U of G's involvement was publicly expressed during a VRNLG meeting. This provoked

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[13] IMICO -- the International Malleable Iron Company property is an abandoned industrial site containing contaminated soil, requiring extensive environmental remediation. The MOEE had brought charges against the company to clean up the site, but the property was sold to a religious cult.

[14] The St. Patrick's Ward constitutes one of the neighbourhoods near the Victoria Road potential site.

a response by a University representative, who responded that the University had in fact established a committee to study the landfill matter, and that they had already started gathering information about the site. He further stated that since the information collected was from non-expert undergraduate studies, the University would not share that information with the VRNLG. The University from this point on became a key player in the Guelph Landfill Search.

Members of the University of Guelph Landfill Committee met with the LSG on August 23, 1994. Representatives from the University included: the Vice President (Administration), a Professor of Land Resource Science, Legal Counsel for the University, Director of the Real Estate Department, Director of Physical Resources, Dean of the Ontario Agriculture College, a representative from the Ontario Ministry of Agriculture, Food and Rural Affairs, and the Vice-President Research. The University Committee presented the results of their own technical (hydrogeological) studies of the Victoria Road site area, and concluded that the site was not suitable for a landfill because of the exposed bedrock present on the site.[15]

In their summations, the University declared that they would recommend that the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) and, the Ontario

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[15] Leachate can easily travel through the crevices in the exposed bedrock and reach the underlying water supply with little resistance.

Management Board Secretariat (MBS)[16] not permit a landfill to be sited there. This was a significant development because the City of Guelph, as a municipality, cannot appropriate land owned by the Province. The formal request by the MBS that the LSG drop the Victoria Road site from the landfill selection process was received by the LSG on September 27, 1994. The Victoria Road site was dropped from consideration that evening (during the LSG's publicly held potential site comparison working session).

The Comparison of Potential Sites

The process of comparing the five sites commenced immediately after the potential sites were announced on May 10, 1994. On this date the lead consultants (Gartner-Lee) announced the sub-consultants hired to do work in comparing the sites with regard to: hydrogeology, surface water, air quality, visual impact, land use planning, economic impact, heritage, and archaeology. The social environment input was to be provided through the completion of community involvement workbooks designed and distributed by the LURA group (public involvement consultants sub-contracted by Gartner-Lee). It

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[16] The Province of Ontario Management Board Secretariat (MBS) is a branch of cabinet that deals with all land owned by the province. Only the premier or the cabinet can overrule a decision made by the MBS. In this case the OMAFRA leases the land from the MBS. In turn, the University of Guelph runs the Guelph Turfgrass Institute for OMAFRA.

should be noted that Gartner-Lee did not subcontract a consultant to do the social impact assessment work because the LSG wanted the community to provide them directly with information (with no involvement of an intermediary). The LSG Chair noted that the LSG did not want a consultant from outside the community to tell them about the local community; they wanted to hear this information directly from the community members themselves, that is, from the actual people who live in the community. (Fieldnotes, LSG/CORALS Meeting, July 25, 1994)

The community involvement workbooks were distributed to the neighbourhood liaison group members in late June, 1994. The purpose of these workbooks was: to obtain information about local environmental and community knowledge, to determine the sense of community the residents had, and to ask residents for their input on the potential effects that the proposed landfill would have on their community. The workbooks also asked for residents' input on an impact management and compensation policy. Twenty-two VRNLG members completed the workbooks, but the CORALS group members refused to complete the workbooks on the basis that they objected to the nature and type of questions that were asked. Two main objections were raised, first, some felt that the questions were far too technical, and secondly, some felt offended by personal questions such as those pertaining to how long the residents had lived in the area, or where they worked, and went to church. (Fieldnotes, LSG meeting with CORALS, July 25, 1994). As such the CORALS group decided to come up with their

own report on what their community meant to them. In early August, 1994 twenty-nine

members of CORALS gathered together and determined by themselves, the manner in

which to provide local knowledge about their community to the LSG. The LSG accepted

the CORALS community input document in mid-August.

On August 9, 1994 the LSG held a public workshop to allow the public to select

and recommend a method to compare the potential sites. The methods that were

considered were based on the comparison of certain criteria from site to site. By doing

the comparison the best of the four potential sites could be identified. The criteria were

determined by the public at another open workshop held previously on June 8, 1994.

The June workshop resulted in the identification of 48 criteria such as: traffic safety,

potential for leachate contamination, potential impact due to the inhalation of landfill

gases, potential for disease transmission via-vermin, potential disruption to aquatic and

terrestrial ecosystems, displacement of residences, visual impact of the landfill,

compatibility with existing and/or future land use, disturbance of cultural heritage

features, capital and operating costs of the landfill, displacement of business, property

value loss and so on. All these criteria were then grouped into six criteria groupings.

These six groupings were then ranked by the public on June 18, 1994 in the following

order of importance:

Table 1.1 Criteria Groupings Used To Compare Potential Sites

Criteria Group	Rank
Public Health & Safety	1
Natural Environment	1
Social Environment (including land use)	2
Economic Environment	3
Cultural Environment	4
Public Services	5

(Source: Meeting Record of Site Comparison Criteria Workshop, June 18, 1994)

What was now required was a way of applying the comparative criteria in order to compare the four potential sites. In order to illustrate the type of technical work done in the public workshops, let us briefly (without going into unnecessary detail) describe some of the site comparison methods considered by GLSP participants (from LSG Document-- Workshop Participants' Guide: Site Comparison Methodology Workshop, August 9, 1994):

1. Ad Hoc Methods

Written information about the predicted impacts of constructing a landfill on the site are given in descriptive form. Through the discussion of these impacts a decision is made.

2. Checklist Methods

The predicted impacts are compared against a list of criteria. If a site meets a criterion

it is give a check mark. The site with the most check marks is the best.

3. Matrix Methods

A table (i.e. a matrix) with the potential sites listed down one side and the criteria across the top is made. The predicted impact of each site for each criterion is summarized in the boxes in the table. Each box can contain either a "high", "medium" or "low" designation, alternatively, each box may be given a mathematical scoring from 1 to 10.

4. Pair-wise Comparison Methods

Essentially the sites are compared in pairs until the best one is determined through elimination.

5. Mathematical Programming Methods

These methods are based on sophisticated statistical techniques and equations. They allow testing to see how sensitive the results are to small changes in the predicted impacts.

After much discussion at the workshop, numerous preferences were expressed as to which method should be adopted, consequently there was no unanimity. The results of the Public Workshop were then forwarded to CASC for their August 16, 1994 meeting. During this meeting, the CASC voted to formally recommend that the Matrix method be used by the LSG. The CASC felt that this method was the best because it incorporated both the qualitative and quantitative aspects into the comparative analysis (Fieldnotes, CASC Meeting, August 16, 1994).

It should be noted that *it is not normally the case that the public is involved in the*

selection of the method to be used to compare potential landfill sites. The following is

cited from the Workshop Participant's Guide (August 9, 1994):

> In other landfill site searches, it is common for the consultant to choose
> and apply the evaluation method and then present the results to the public.
> However, because the Guelph process emphasizes community involvement
> in the process, the comparative evaluation of the potential site will happen
> in a public workshop. The method chosen for the Guelph Landfill Search
> should fit with the type of discussion process that the NLGs, CASC and
> LSG have developed.

The matrix method was applied by the LSG during an open working session in

which the members of the public could watch as observers. The result was that one of

the sites in the annexed region, known as the Hanlon Road site, was ranked the highest.

The ranking of the Hanlon Road site as the best of the potential sites was formally

announced to City Council the following week (on October 12, 1994). The LSG then

had to determine if this particular site was *suitable* via the completion of further

confirmatory investigations.

The Determination of Site Suitability

The confirmatory investigations[17] involved in determining suitability required a

more detailed hydrogeological examination of the area via the drilling of boreholes. These

confirmatory investigations were necessary under the requirements of the Environmental

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[17]   These investigations were taken to confirm that the hydrogeological data
that was used to identify the preferred site were accurate.

Protection Act (LSG Report to Council, October 12, 1994).

The LSG and their technical consultants divided the confirmatory work into two parts -- groundwater protection (hydrogeology) and impact management issues (land use planning and economics). During the two months following, the hydrogeological work was done by Gartner-Lee, while the land use and economic impact studies were done by their subconsultants. It should be noted that during this period, the Township of Puslinch hired their own hydrogeologist to confirm the technical findings of the LSG and their consultants. This counter-expert critiqued many of the hydrogeological methods and findings used by the LSG. As we shall see, such a critique led to an increased lay awareness of the uncertainties associated with environmental impact science.

On December 14, 1994 the LSG voted 5 to 3 that the Hanlon Road site be recommended to City Council as a "suitable" site, as based on the LSG's assessments of the detailed technical confirmatory work reports. The Hanlon Road site was located just south of the Hanlon Business Park and straddled one of the major entrance ways into the City. As of yet, the area on which the site was located was not serviced, but plans for infrastructural development were inevitable because of the logical southward expansion of industry into this vicinity (i.e. expansion towards a major highway). According to the LSG's planning consultant, the Hanlon Road site was one of four areas that comprised the City's vacant industrial land supply. The planning consultant also noted that the site was situated on "the most marketable land within the long term industrial/business land

supply portfolio" (J.L. Cox Planning Consultants Inc.: South Guelph Land Use- Long Term Scenario, 1994).

Just before, and during the determination of site suitability, the specific occupants of the Hanlon Road site began to verbalize their concerns to the LSG and to City Council during their respective meetings. Close to a dozen businesses in the area had threatened to leave the city if the landfill was located on the Hanlon Road site (Richard Dooley, The Guelph Mercury, October 13, 1994). Prominent among these businesses was the Sleeman Brewing and Malting Co. Ltd.. This company was located across the road from the Hanlon Road site and the company president argued that a landfill in the area would have an extremely detrimental effect on his business:

> When we sell beer we also sell Guelph; we sell an image. It is advertised on our box that the beer is made from deep water wells in Guelph. The landfill will have a negative image on the product we are selling as being made in an environment of clean air and clean water. If our competitors get air about the idea that our brewery is beside a landfill they will have a heyday. There will be a decline in business, the loss of sales will put us out of business. (Fieldnotes, President of Sleeman Brewing and Malt Co. Ltd., LSG Meeting, September 27, 1994).

The treatment of the landfill issue from this point onwards became a matter of discussing the trade-off between economic growth versus environmental protection.

The LSG had completed their mandate once they had determined that the Hanlon Road potential site was suitable for further consideration. It was then up to Guelph City Council to decide between the Hanlon Road and N-4 sites. On the Guelph City Council

meeting of February 27, 1995 the decision was made to *reject* the Hanlon Road site as a preferred location for a landfill. The N-4 site was therefore forwarded for further consideration under the requirements of the Environmental Protection Act but after a series of Environmental Assessment Board hearings, this site was also rejected in the following year.

Summary

The City of Guelph's landfill search was somewhat innovative because of the higher than usual degree of openness and the increased opportunity for community involvement. The intention of the City was to avoid the type of distrust which was evident in their previous, controversial search. As such, the City had adopted a process in which lay members from the community could involve themselves with the *technical* matters related to the siting of a landfill.

In order to facilitate public participation in their community-based landfill search, the City of Guelph developed two public groups. The first group was the Landfill Search Group (LSG) which was comprised of four members from the community and four members from the City Staff. To further increase the opportunity for public participation, the Community Advisory Subcommittee (CASC) was formed to aid the LSG and their technical consultants in their task of finding a landfill. Membership in CASC was open to anyone in the community who wanted to participate (providing that he or she accepted the CASC's Terms of Reference). The CASC was a multi-stakeholder

group consisting of individuals from a wide range of affiliations, including environmental groups (such as the Eastview Resider. for Environmental Justice and the Speed River Preservation Group), members from industry (including representatives from the Guelph Chamber of Commerce), community service groups (for example, the Ontario Public Interest Group, Kiwanas and the Optimist Club), students (from both high school and university), senior citizens, and individuals from rate-payers associations.

In addition to the open LSG and CASC meetings, public workshops were also held in order to pursue the more technical matters. The workshops were not only open to members of CASC and the LSG, but members of the general public who wished to participate could do so as well. The CASC and members of the public were able to participate in those technical activities not usually open to the broader public. For example, they were able to participate and have input in: the selection of the method which should be used to identify the potential sites, the criteria that should be used in comparing the potential sites (once identified), how this criteria should be prioritized, the development of an equitable compensation policy, and the factors that should be considered in selecting the landfill technologies.

After the potential sites were announced by the LSG, the residents that could be affected by the sites became organized into two neighbourhood groups -- the Coalition of Residents Against Landfill Sites in the Hanlon and Mill Creek Wastershed (CORALS) and the Victoria Road Neighbourhood Liaison Group (VRNLG). Some members from

both of these groups also participated in the CASC. These two neighbourhood groups organized their protest over the potential landfill sites by erecting billboards and signs at the site locations. Members of the neighbourhood groups also voiced their concerns during the question period portion of City Council meetings (i.e. at those meetings in which the LSG gave their progress reports to Council).

It should be noted that the final recommendations of the LSG had to be approved by City Council. As it turned out, the LSG's recommended site was in fact rejected by City Council because of concerns over the negative impact the proposed landfill would have on the industries located there.

As we shall see in the following chapters, the adoption of this inclusive community-based approach led to the development of new problems. Notably, problems arose in relation to how environmental risks should be managed, and to the issue of trusting technical experts and expertise to contain such risks. Further, we shall investigate how these new types of problems may in turn be affected by changing value and belief orientations in regard to technology and the environment. The following chapter will review the theoretical framework we will employ in examining the issues of trust, risk and the environment in the Guelph Landfill Search Process. That is, we will discuss why issues related to the trust in technical expertise and technical systems is particularly problematic under the social conditions existent today. As we shall see, these forms of trust are related to the nature of the risks we now face and the changing public

conceptualizations of the role they feel that technology and the environment should play in contemporary times. To aid us in this discussion we will consider the theoretical work of Anthony Giddens (1990, 1991, 1994a, 1994b) on reflexive modernization, Ulrich Beck (1987, 1992a, 1992b, 1992c, 1994a, 1994b, 1995a, 1995b) on the "risk society", Olsen, Dunlap and Lodwick (1992) on the role of ecological versus technological beliefs and values in modern society, and finally, the work of Mol and Spaargaren (1993) (also Spaargaren and Mol, 1992, as well as Mol, 1994) on the institutional eco-restructuring embodied in the development strategy of ecological modernization.

CHAPTER TWO

INVESTIGATING THE THEORY OF REFLEXIVE MODERNIZATION

Chapter 2   Investigating the Theory of Reflexive Modernization

The purposes of this chapter are threefold: (i) to briefly outline the theoretical and conceptual framework that will be used, (ii) to provide the rationale for applying this particular theoretical approach to the Guelph Landfill Search Process, and, (iii) to formally expound the major thesis arguments (that are to be based on the theoretical formulations just introduced).

Although the newly developing body of social theory to be used in this research is intuitively appealing, it will be argued that, in general, it lacks to this point an empirical referent necessary to affirm, refute or fully draw out the important sociological implications involved therein. Our research will attempt to address this deficiency by considering the situation of the Guelph Landfill Search Process in this theoretical light. The consideration of such an empirical case will not only allow for the testing of the validity of the theoretical claims made, but, it will also allow for the refinement of the theory as a whole. As such, this research may be considered, in a general sense, as a confirmatory study, of which, one purpose is to refute or affirm the claims made by the theory of reflexive modernization.

Section I: Theoretical Perspectives on Risk

The Theory of Reflexive Modernization

The theory of reflexive modernization was originally proposed by Anthony Giddens (1990,1991) to characterize the institutions and social relations of contemporary society. Giddens (1990,1991) asserts that the major institutions of society (such as the family, the polity, religion, work, and science) have undergone fundamental changes which have made the structural framework of contemporary society different from that of the recent past. He refers to the period of industrial society (i.e. before the emergence and development of the welfare state) as the epoch of *simple modernity*. He contrasts this with the present epoch which he refers to as a period of *reflexive modernity* (also referred to as late modernity, and post-traditional society). In The Consequences of Modernity, Giddens (1990) has conceptually outlined a portrait of contemporary society under the conditions of reflexive modernity.

In trying to locate the cause of the dynamism of modern society, Giddens (1990:16) focuses on three processes -- the collapsing of time and place (i.e. globalizing tendencies), the disembedding of social systems (which acts in conjunction with globalization), and the reflexive ordering and reordering of social relations. Each of these three processes will now be briefly discussed.

In pre-modern society (i.e. in simple modernity) Giddens (1990:18-20) argues that space and place coincided, this in turn had the effect of localizing social activities to specific spatial dimensions. Today however, social activities and people can be

influenced by societal factors that are quite distant from them. It is this development that is referred to as the "separation of time and place". The main social ramification of this separation of time and place is that institutions are now able to break free from the restraints of local habits and practices. Thus, modern organizations can now link local and global ways of thinking and doing things in ways inconceivable in past societies. This "lifting out" of social relations from local contexts of interaction and their restructuring across indefinite spans of time and space is referred to by Giddens (1990:21) as the process of "disembedding".

There are two main mechanisms for disembedding, namely, symbolic tokens and expert systems (collectively known as "abstract systems"). An example of the former is money, here the symbolic tokens can be circulated regardless of the individual or group handling them. Thus, in reflexive modernity, the disembeddness provided by money has allowed for the development of an interdependent or globalized economy. The second mechanism of disembedding refers to how professional and *technical expertise* contribute to the organization of modern material and social environments. The main sociological implication of this is that, today the individual must put more and more of his or her *trust in experts* (and in their work), as many aspects of modern life (including even the most mundane) are now wholly dependent on expert knowledge.

The third master process observed by Giddens (1990) is the *reflexive ordering and reordering of social relations*. Reflexivity can occur on the individual and institutional levels of society. Reflexivity occurring at the individual level is termed "self-reflexivity",

while at the institutional level it is known as "institutional reflexivity". The former refers to how the self (or self-identity) *reassesses* itself in light of the continual exposure to new types of *knowledge*. This type of self-monitoring has of course always existed, but Giddens (1991,1992) argues that in contemporary times, the lightening fast rate at which knowledge is being disseminated, and the sources from which this knowledge originates (i.e. from all around the globe) makes the active reconstruction of the self, a chronic (and problematic) process. Institutional reflexivity, on the other hand, refers to how the *collective actions of groups* changes in the light of the chronic revision of *knowledge*.

The social psychological repercussion of the conditions of reflexivity is that, in order for there to be any sort of ontological security, the individual must implicitly put his or her trust in experts. This is problematic today, because the individual is now likely to have greater *awareness* of a multitude of contradictory knowledge claims emanating from multiple and diverse expert sources (especially if lay individuals are given the opportunity to directly participate in technical issues, as they were in the GLSP). As a result, it is argued that expert knowledge is now publicly recognized as being both fleeting and uncertain, which in turn leads to the constant questioning of the validity and reliability of such knowledge. Consequently, the reconstruction of the self and social action is always in a state of flux in reflexive modernization.[1] In essence, *trust* in modern institutions rests upon an ever-changing "knowledge base" which make the social

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[1]   In a more recent work, Giddens (1994a) delineates how the chronic reconstruction of the self makes the perpetuation of tradition in the contemporary era problematic.

relations occurring within modern institutions both problematic and difficult. It is from this argument that I take the cue to formally investigate the *sociology of trust relations* within the Guelph Landfill Search Process (where trust relations refers to trust in experts and expert knowledge systems).

In a later work, <u>Modernity and Self-Identity: Self and Society in the Late Modern Age</u>, Giddens (1991) focuses on how the three master processes affect the individual in terms of their influences on the individual perception of risk: the adoption of much more reflexively processed activities; the rise of doubt; mistrust; and the loss of ontological security. The result is that, in dealing with life chances and situations in reflexive modernity, the self is confronted with certain "dilemmas". Four such dilemmas are discussed by Giddens (1991:187-200).

The *first dilemma* stems from the observation that the conditions of late modernity lead to *concurrent processes of unification and fragmentation*. Personal experience may become fragmented as the individual is now exposed to an indefinite range of possibilities and lifestyles (particularly in light of the globalizing tendencies).[2] At the same time, these alternate avenues may promote unification as distant events become as familiar (or more so) than proximate influences. These distant events may in fact become part of one's framework of practical experience. For example, one may now know more about the politics and personality of a world leader than one knows about one's next-door

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[2]   In terms of symbolic interactionist theory this idea of the fragmentation of the self seems to be similar to the notion of the role set (and the derivative implications of a role set, such as role strain and role conflict).

neighbour.

The *second dilemma* faced by individuals in late modernity involves the *dialectical interaction between powerlessness and appropriation*. In this situation, one may effectively lack power because he or she has no choice in the matter. This is a consequence of the fact that, in late modernity one may have little choice except to put his or her trust in pervasive and very complex abstract systems (such as the global economy, or mega-risk technologies). The immediate implication of this is that one is necessarily subject to certain much larger social forces beyond one's direct control and sphere of knowledge.[3] At the same time however, one can develop new capacities as new opportunities that would otherwise not be available open up. For example, in the GLSP, members of the lay community had access to technical data and information that were not usually available to them in the past (such as data concerning the technologies involved in the design of an engineered landfill, as well as the methods and hydrogeological criteria used in identifying and comparing potential landfill sites) . These lay members could then use this newly acquired knowledge to pursue their environmental goals in the GLSP more effectively.

Institutionalized channels for such alternate lines of action were not available in the past, but under the conditions of late modernity, they have started to appear in various

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[3]   As was discussed, the direct implication of this is that individuals must either learn to trust the expert knowledge system, or, take the appropriate actions to deal with their lack of trust (for example, self-education and political mobilization). As we shall see, the second action is more likely in reflexive modernity.

social institutions (particularly in the polity). For example, the awareness of high consequence environmental risks may lead to feelings of powerlessness, but they may also produce a motivation to 'survive' through new channels. It will be argued that the increased ability for the public to become involved in the Guelph Landfill Search Process is an example of just such a newly opened channel (i.e. an opening for greater public participation in the institutions of science and the polity). Furthermore, the research will endeavour to identify any new capacities or lines of actions that have emerged.

The *third dilemma* for the self concerns *the tension between authority versus uncertainty*. Unlike earlier societies in which members of the lay community placed their confidence and trust in what were traditional and over-arching (monolithic) authorities (usually religious authorities, and later scientific authorities), in the epoch of late modernity members of society are present.. with a *plurality* of expert-authorities from which to choose. The problem is that there can no longer be any over-arching authority, as every field of expertise plays host to a plethora of *publicly recognized* competing authority claims.[4] In such circumstances, authority can no longer serve as an alternative to *doubt*. This rejection of absolute authority also applies to scientific authority. The consequence of this rejection is that, much of the technology used, and the technical

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[4]   Public recognition of competing claims is one of the crucial distinctions between the social climate of late modernity and earlier periods. In early modernity the awareness of competing authority claims was usually limited to the community of experts. Hence the competing claims within the scientific paradigms described by Kuhn (1962) was limited to the community of experts. Today however, the public at large is cognizant of such competing claims.

approaches recommended by the experts, is no longer trusted to the degree it once was in the past. The dilemma between authority versus uncertainty will be investigated in our research by examining the attitudes GLSP participants had towards technical experts as well as feelings of trust and uncertainty they expressed towards the proposed landfill and recycling technologies.

The *fourth dilemma* refers to the *strain between personalized versus standardized experience*. According to Giddens (1991:196) the project of the self is opened up by the conditions of late modernity, but at the same time these conditions are strongly influenced by the standardizing effects of commodity capitalism which seeks to standardize consumption and production. Therefore, one can attempt to express his or her individuality by buying certain products, but these products themselves are produced and sold in a standardized way. In this sense, Giddens' observation is similar to Herbert Marcuse's (1964) "one-dimensional man" thesis. One way this standardized consumption effect may enter into an environmental sociological analysis involves an examination of the manner in which the "environmental friendly" packaging of a wide range of consumer items, ranging from consumer products (for example, diapers, detergents, food packaging, etc.), to vacation tours, to television programs, have influenced social behaviour.[5] This perspective is relevant to our study of the Guelph Landfill Search because it directs our attention to the analysis of how the Search may be *an attempt to*

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[5]   For a detailed analysis of the connection between sustainable lifestyles and consumer culture, see Spaargaren, 1994.

"environmentally package" a political process. This point was actually recognized by one

CASC member (and concurrent member of the Eastview Residents for Environmental

Justice) who remarked that:

> The idea of considering the environment was just given by the LSG to
> appease the environmentalists. It's all a game. (Fieldnotes, CASC
> Technologies Subcommittee Meeting, August 8, 1994)

We will examine such claims in more detail in our analysis of the process.

One important feature of late modernity that seems to have been neglected in

Giddens work, but nevertheless should be noted, relates to the social climate or setting

in which these modern dilemmas occur. Specifically, those dilemmas relating to the lay

individuals' need to address questions of powerlessness and authority, were perhaps

promoted by the increase in number of those members of society belonging to the

educated middle classes who may, to some extent, be less reluctant to pursuing avenues

of self-empowerment and may be more confident in their abilities to actively question

technical and political authorities (Gouldner, 1979; Konrad and Szelenyi, 1979; Boggs,

1993; Levitt, 1984; see also Inglehart's (1990) thesis concerning the role of "post-

materialist" values in the mobilization of the educated middle class). The active

participation and involvement in the technical matters related to the siting of a landfill,

therefore is likely to have been influenced by a social context in which the rise of the

educated middle class and the subsequent formation of "new" social movements

established a climate conducive to the pursuit of such activities.

In his summation, Giddens (1990:139) asserts that the dynamics of late

modernity can best be described by comparison to a juggernaut (i.e. an uncontrolled runaway train that barely retains enough stability to stay on the rails). Using this "juggernaut" model of society, Giddens (1990) argues that the institutions of modernity exist in such a way that the individual is never able to sufficiently control either the path or the pace of personal and social development. To characterize the tug-and-pull nature of late modernity, Giddens (1990:140) proposes the following dialectical relations as descriptive of the institutional tensions present in high modernity: displacement and re-embedding (the interaction of estrangement and familiarity), intimacy and impersonality (the intersection of personal trust and impersonal ties), expertise and reappropriation (the intersection of abstract systems and day-to-day knowledgability), privatism and engagement (the intersection of pragmatic acceptance and activism). As will be discussed later on, many of these tensions (especially those related to trust and expert systems) are clearly observable in the Guelph Landfill Search Process.

At this point it will be useful to review the important features of the theory of reflexive modernization because this theory will play a central role in our analysis of trust and risk (to be discussed next). Reflexivity refers to the susceptibility of most aspects of social life, and material relations with nature, to chronic *revision* (Giddens,1991:20). One must bear in mind that there are two interrelated types of reflexivity involved, namely, self reflexivity and structural reflexivity. That is, the individual may *revise* his or her self-identity (self-reflexivity) while institutions may *restructure* themselves (structural reflexivity). In our research we will investigate the extent to which both

individuals and the institutions of science and the local polity have revised/restructured themselves to deal with environmental risk issues. Because the process of reflexivity is based on knowledge, both the individual and the collective must put their *trust* in the knowledge they attain before they can proceed with a decision on how to act (for example, to choose a certain lifestyle at the individual level, or to implement a particular political policy at the collective level). By investing trust in a particular knowledge claim, both the individual and the collective expose themselves to the chance that their decisions may have been in error. In other words, there is always some *risk* involved because there is always an awareness of the associated uncertainty. It is in fact this awareness of uncertainty (which, I contend, manifests itself at the social psychological level as *risk consciousness*) that makes it necessary to put some faith (to whatever degree) in expert knowledge systems. Hence, there is an implicit connection between risk and trust.

According to Giddens (1990:124-125), risk plays a central role in the political, social and economic dynamics of society for several reasons. First of all, the scope of the risk environment has changed, as modern environmental risks may now directly affect very large numbers in the population. Secondly, the type of risks we now face are different from the risks of the past because they stem from the created environment. That is, modern environmental risks are the product of the infusion of human knowledge into the material environment. In other words, ecological dangers may now be the result of the transformation of nature by human knowledge systems (Giddens, 1990:127). For

example, the risks from an engineered landfill may stem from the failure of technologies to control the generation and subsequent leakage of leachate into the groundwater. Third, the awareness of risk has increased in contemporary times as many collective dangers become known to the wide public (particularly because of the role of the media). Related to this general awareness of risk is the idea that risks are now *known* to be risks, as it becomes realized by the lay public that the technical "knowledge gaps" involved in controlling risks cannot be converted into "certainties". That is, there is now an increased awareness of the limitations of expertise. As we shall see in our analysis, lay participants in the GLSP became very aware of such limitations in regard to environmental impact science.

From the above discussion it can be seen that risk and trust are two important factors involved in reflexive modernization at both the individual and institutional level. It is for this reason that we have chosen to focus particular attention on researching these two concepts. Although Giddens deals with the concepts of trust and risk in expounding his theory of reflexive modernization, the latter concept is more fully developed in Ulrich Beck's (1992) theory of *risk society*.

The Theory of Risk Society

Although Beck (1992) developed his theory of risk society independently of Giddens, both works show a remarkable convergence (a point recognized by both authors; see Beck, Giddens, Lash,1994). As such, the risk society may be considered to be a type

of society that could have only emerged under the conditions made possible by increased structural and individual reflexivity. That is, because agency (i.e. the freedom to act) increases in reflexive modernity (due to the lessening influence of the structures of tradition, family, social class, religion, etc.), individuals must now personally deal with the possible consequences (i.e. the risks) that their (relatively) freely made decisions bring about. This refers to both the risks that the individual faces personally, as well as to the risk that the collectivity faces.[6]

For Beck (1992:26) one of the major features of the risk society is that it deals with the distribution of negatives. Unlike the earlier period of industrial society (i.e. simple modernity) which dealt with the distribution of "goods" in society (such as wealth, consumer goods, incomes, educational opportunities, property, etc.), our present period of reflexive modernity deals with the distribution of dangers or risks, hence, we live in a "risk society". In other words, according to Beck (1995:3), in the industrial conflicts of simple modernity it was positives that were at stake -- profits, prosperity and consumer goods, whereas, in the ecological conflicts of today's risk society, it is largely the negatives that are at stake -- losses, devastation, threats. For example, the issue of risk distribution was essentially the core of the social equity problem we have discussed in the preceding chapter. That is, residents in the Victoria Road neighbourhood felt that the they were already shouldering more than their fair share of the industrially produced risks

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[6] As in the case of siting a landfill, issues related to the risks the collectivity face are usually very emotional and politically charged issues.

faced by the Guelph community. They therefore argued that the risks of the proposed landfill should be shared by another neighbourhood.

For Beck (1994a:5), the risk society represents a phase that western industrial society is presently going through. It is a phase in which the social, political, and economic risks increasingly tend to escape the existing institutions responsible for monitoring and protection. In the earlier phase of simple modernity, the threats produced by industry and technology did not become political or public issues. In simple modernity the risks that were produced by decision-making were legitimated, as they were seen to be the "price that must be paid for progress". In the risk society, the Enlightenment notion of "progress" becomes challenged as the consequences of such "progress" must now be confronted. Thus, Beck (1994a:29) asserts that:

> In risk society, new expressways, rubbish incinerator plants, chemical, nuclear or biotechnical factories and research institutes encounter the resistance of the immediately affected population groups. That, and not (as in early industrialization) rejoicing at this progress, is what has come to be predictable.

In the risk society, the legitimating role of the industrial and technological experts starts to be questioned by other groups (including lay activists) as their exposure to modern risks increase. Consequently, risk issues come to dominate political/public debate in the contemporary era (relative to the past).

The reflexive social change that is behind the transition from simple modernity to the risk society (or late modernity), is in essence based on the process of confronting modern risks. This process of confrontation does not only involve the actual physical

exposure to the risks, but, it also involves the lay realization that the justifications given by the political and industrial actors to tolerate the particular risks are no longer acceptable, because there is too much at stake. As such, Beck (1994a:6) notes:

> '[R]eflexive modernization' means self-confrontation with the effects of risk society that cannot be dealt with and assimilated in the system of industrial society - as measured by the latter's institutionalized standards.

For several reasons, the nuclear, chemical, biological and environmental risks produced in the risk society are of a different type than those faced in earlier industrial times. First of all, as Beck (1992:21-22) notes, the risks we now face may no longer be limited socially (they can potentially affect all social classes), physically, or temporally (they can affect future generations). In this connection the argument could be made that the human-made risks that existed in the past were limited to only certain, particularly vulnerable sectors or social classes in society, but, in contemporary times they have become generalized (i.e. environmental risks can now affect a larger proportion of society, particularly across social class lines). Second, modern risks may not necessarily be detectable by our natural senses and, as a result, we are essentially obliged to place a greater reliance on the scientific and technological means of detecting such dangers. For example, in the case of the potential landfill leachate contamination of the drinking water in Guelph, the concentration of this toxic substance may be so small that it may not be tasted or smelled in the drinking water, yet the danger to human life will still remain. To detect such a risk necessitates the need to rely on the sophisticated methods of analytical chemistry. This again raises the issue of individual and collective *trust* in science and

technology. For example, a lack of trust in technologies used to detect or monitor leachate contamination in landfills may lead to greater risk consciousness in individuals.

Environmental risks in particular may involve long chains of causal interactions involving chemical and natural agents before an effect is made manifest (and then the effects may only be seen in the future). The complexity of such risks means that the types of risks that are dealt with today are not *accountable* by the usual rules of causality, guilt and liability. As a result, they are neither compensable nor insurable (Beck,1995:2). Thus Beck (1992:22) notes that:

> The normative bases of the calculation of accident insurance, medical precautions, and so on, do not fit the basic dimension of modern threats. Atomic plants, for example, are not privately insured on insurable. Atomic accidents outlast generations. This means that the calculation of risk is it has been established so far by science and legal institutions *collapses*.

It should be noted that under such conditions of uninsurability, the types of risks we now face are nevertheless caused by our own *decisions*. Modern risks such as chemical pollution, global warming, the hole in the ozone layer, nuclear accidents, and so on, occur as a result of human intervention in nature (which is in turn based on decision-making) and are therefore not like the "natural" risks of yesteryear (such as droughts, hurricanes, etc.). The fact that modern risks are the results of human decision-making is of crucial importance in reflexive modernity because under these social conditions, *decisions pertaining to risk management and risk assessment become open to public criticism* (i.e. issues related to risk are treated reflexively in the political sphere).

But what exactly are these social conditions that allow for the reflexive treatment of risk-related issues? To answer this question one must consider the nature of social institutions in reflexive modernity, and especially those that deal with the production, management and distribution of risks. The production (and to some extent the management) of risks occurs through the involvement of industry and science, while the distribution of risks has increasingly become a political issue.[7] Beck (1991,1994) therefore focuses particular attention on the institutional roles of science and the polity in reflexive modernity.

Environmental risk issues raise many types of concerns. This in turn leads to the development of public pressures demanding that the institutions of science and the polity restructure themselves to allow for the legitimate treatment of the wide range of associated concerns. Thus Beck (1994) notes that the environmental movement was the key social force responsible for bringing risk management issues into the public arena, thereby provoking changes in the institutional structures that deal with environmental matters. Beck's analysis of institutions on this count seems to be very similar to Giddens observations about "institutional reflexivity" (i.e. structural reflexivity). To better understand this point let us now consider in more detail the nature of the institutions of science and the polity in reflexive modernity.

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[7] The decision making involved in the siting of a landfill in a particular area is one such example involving the politically based distribution of risk. It is in fact this decision making process that brings to fore the issue of *social equity*. For example, the siting of a landfill near working class or African-American neighbourhoods (see Bullard, 1990). As was mentioned in the last chapter, the social equity question was raised by residents living near the Victoria Road potential site.

The Institution of Science in the Risk Society

As was alluded to previously, the role of the institution of science in general, and the technical expert in particular, is important in issues related to risk because more of risks we now face are invisible, thereby leading to a *greater reliance* on science to detect and inform us about such risks. Secondly, such risks are *produced* on the basis of decisions grounded in scientific knowledge. Consequently, the knowledge claims of the various experts involved play an important role in the interactions between members of the lay and expert communities involved with environmental risk issues. Under such circumstances, the *trust* that each actor invests in technical information also becomes an important intervening variable in expert-lay interactions. This important factor will be examined in our analysis of the Guelph Landfill Search Process.

As Beck (1992:29) notes, in defining risks, the sciences' institutional monopoly on rationality is now broken. There now are always competing and conflicting claims, interests and viewpoints implicated in the process of defining the risks involved in a particular situation, or associated with a particular technology. The establishment of a framework for competing claims means that the treatment of environmental risk issues is likely to always involve some consideration of value-based trade-offs. For example, the acceptability of environmental risks versus economic development, social benefits versus "acceptable risk" to personal health, and so on, all must be addressed within the context of a reflexive treatment of risk at the interactional level. The forum for this interaction takes place in newly formed *sub*-political channels in which lay actors in social

movements and counter-experts can influence environmental policy and decision making. It will be argued that an example of such a newly opened sub-political channel was the CASC/LSG structures found in the Guelph Landfill Search Process. As we shall see, these structures allowed members of the lay public to make decisions about environmental risk along side the technical experts (an avenue not previously available in Ontario since the innovative GLSP was the first of its kind to employ such a high degree of community involvement in the decision making).

Beck (1992:154) notes that the institution of science actually plays a dual role in dealing with risk issues. First of all, as has been mentioned, science defines the risks, but it must offer solutions to these risks as well. In turn, the offered solutions must be *trusted* by the community if they are to legitimately accept the proposed undertaking (such as the construction of an engineered landfill near their community). The problem of establishing trust relations between members of the lay public and the technical experts is compounded in reflexive modernity because of the presence and awareness of competing claims to technical knowledge. The public question becomes "whom do we trust?". Whereas in previous times there existed an unbroken faith in science and progress, today, in reflexive modernity, the awareness of the competing claims to scientific knowledge makes such unquestioned faith unrealistic. As the chief technical consultant in the Guelph Landfill Search noted, twenty-five years ago no one used to question on technical grounds the landfill site found by the engineer, but today they do (Fieldnotes, City Council Meeting, February 27, 1995). This research will determine if

participants in the Guelph situation do indeed hold such a sceptical view of science and technological progress in general. Or, in Beck's (1992:154) terminology, has science as the great demystifier of nature, itself become demystified in the public eye? Following from this is the question of whether scientific knowledge has indeed become demonopolized as Beck (1992:154) claims:

> This situation arises as a consequence of the triumph and differentiation of scientific validity claims; it is a *product of reflexivity* of techno-scientific development under the conditions of risk society.

For Beck (1992:30) the major change in the institution of science in risk society is that it no longer largely deals with the liberation of humankind from nature. Rather, science now addresses "the definition and distribution of errors and risks which are *produced by itself*". That is, unlike the era of simple modernity, in which science was applied to the "given" world of nature[8], in the reflexive phase, the sciences must now confront their own products, defects and secondary problems (Beck, 1992:154). In other words, science must pay more attention to dealing with problems in the "created environment". As such,

> We are no longer concerned exclusively with making nature useful, or releasing mankind from traditional constraints, but also and essentially with problems resulting from techno-economic development itself. (Beck, 1992:19)

As a result of the fact that the risks stemming from the created environment may

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[8]   This mode of applying science is based on an ideology that seeks to "dominate" and subjugate nature (see Leiss, 1974). Such an approach starts to be questioned in the risk society, when individuals are forced to deal with the environmental consequences of subscribing to this ideology.

now affect the public at large, the reflexive citizenry demands the opportunity to become involved in such issues (with the environmental movement spearheading this initiative). So what was once purely defined as a technical matter now becomes transformed into a political matter. As was mentioned previously, this has resulted in the opening of a new political space; a space which is filled by citizens' initiative groups, social movement actors, and "advocacy" science, and is referred to by Beck (1994:23) as the realm of *sub-politics*. This opening up of the political sphere will be dealt with in the following section.

The Polity in Risk Society

Beck (1994:5) notes that in simple modernity (i.e. classical industrial society), the threats produced by industry and technology did not become political issues. Such risks were conceived of as "residual risks", and actions were routinely taken by industrial actors to legitimize such threats without raising the general public's ire (although such risks were probably not perceived as being legitimate by the blue collar workers employed in the factors of early industrial society). However, in reflexive modernity (and therefore, in risk society) the legitimating role of industrial actors starts to be questioned by non-industrial actors (such as members of citizens groups and social movements), and the threats to the public well-being comes to dominate public/political debates and conflicts. This raised public awareness of risk leads to the introduction of

new issues into political activity and decision-making, such as the issues of the self-limitation of development, and the redetermination of standards of responsibility, of safety, and damage.

For Beck (1995:2), the "risk society" is one in which the dark sides of progress increasingly come to dominate public debate. Under the realization that industrial threats can now annihilate the entire world, new social and political pressures arise. From such pressures there emerges new opportunities for the re-structuring of society.

According to Beck (1995:3), this new mobilization and the process of restructuring has already begun. As individuals realize that the threats to their lives occur "in the milieu of *bureaucratically administered security*" individuals will form new alliances based on the common threat. This realization is the natural outcome of the "political reflexivity" of threat:

> Once citizens realize that the guardians of rationality and order also legalize threats to survival, then all hell breaks loose politically. (Beck,1995:3)

Political reflexivity at the individual level is part and parcel of what Giddens (1991) refers to as the "reflexive project of the self" in late modernity. Thus, the individual citizen's decision to become politically involved with particular issues may be understood with reference to Giddens' (1991) notion of the "reflexive biography" or what Beck (1994:15) refers to as individualization -- the "do-it-yourself biography". Such decisions

to become politically active lead to the development of a sub-politics -- the shaping of society *from below* (i.e. from the "grass-roots", particularly from the educated middle classes). For Beck (1994:23), sub-politics deals with how groups not traditionally involved in politics, such as those from social movements, expert groups, on site workers and so on, who now deal with, and demand, opportunities to influence the arrangement and development of society and culture. One major implication of sub-politics is that it "involves the self-opening of the monopoly on truth" (Beck,1994:25). In particular, sub-politics is one medium through which competing claims to technical knowledge can be reflexively treated. As was alluded to previously, it will be argued that the inclusive round-table model, and the extensive citizen involvement program used in the Guelph Landfill Search, are examples of such a medium of sub-politics.

Section II   Placing the Environmental Risk Issue into Theoretical Perspective
The Environmental Issue and Reflexive Modernization

Beck (1995:8) asserts that what is at the heart of the ecological issue is the focus on a "systematic, legalized violation of fundamental human rights -- the citizen's right to life and freedom from bodily harm." In more prosperous times these rights were cushioned and disguised, but now, because of the degree of damage that can be caused, mega-risk technologies have become much more politicized as lay actors become more aware and affected by the consequences of environmental problems. Today, ecological conflicts have a deep structure based on the violation of *survival norms* (an idea which

seems to be related to Giddens's (1991) notion of the loss of ontological security).

Because environmental issues (such as the siting of a landfill) do involve decision-making and politics, the sociological analysis of such issues cannot be confined to a consideration of only the human-physical environment relation. That is, environmental issues are inherently social issues dealing with human-to-human relations. This is akin to arguing that science is not a purely physical activity that deals only with matter and energy (i.e. the physical environment), rather, it is also a social activity involving such factors as status, professionalization, claims-making and competing paradigms (a point well established by many sociologists of science; see for example, Knorr-Cetina, 1981 and Latour, 1987). It is precisely for this reason that the factors of *trust, consciousness of risk, and environmental values* become central points of focus in our analysis of the Guelph Landfill Search Process. All of these identified factors pertain to the actual social activities and interactions involved in the *social construction of an environmental issue*.

For several reasons the environmental issue is perhaps the exemplary issue of reflexive modernization. First of all, if reflexive modernization is based on the reflexive re-ordering of social relations, then, the newly institutionalized sub-political channels (such as the LSG\CASC structures) would be expected to allow for the reflexive treatment of expert knowledge. These sub-political channels, therefore, can be considered to exemplify just such a reordering of social relations to deal with issues of environmental risk. In effect, such restructuring allows environmental values to penetrate the institutions of science and the polity.

As was mentioned previously, reflexive modernization is to some degree based on the influences of globalization. It is particularly relevant to mega-risk technologies that may potentially affect the environment on a global scale. In our case the risk is not really global in magnitude, nevertheless, the risk of the leachate contamination of the City's water supply is definitely a *collectively faced risk* (i.e. the risk affects many people *en masse*). For our purposes therefore, the important fact is that technologically produced environmental risks have consequences for a large number of people. As such, in this study it will be shown that much of the work of Giddens and Beck concerning the large scale consequences of environmental risks may be applied in the analysis of the Guelph Landfill Search Process.

Beck (1992b:111) notes that it is *not* that modern risk threaten *only* the physical well-being and health of a community of individuals that makes risk a central concern in society. That is, the effects of environmental risk are not simply limited to issues of public health. Rather, environmental risks may also threaten property, capital, jobs, trade union powers, and the economic foundation of whole sectors and regions. This is because as Beck (1992:37) observes, environmental risks exhibit a *"boomerang effect"* in that the impacts of such risks cannot be limited to others exclusively. That is, such impacts may also "come back" to haunt those who produced and benefited from creating those risks in the first place:

> The basic insight lying behind all this is as simple as possible: everything which threatens life on this Earth also threatens the property and commercial interests of those who live *from* the commodification of life

> and its requisites. In this way a genuine and systematically intensifying *contradiction* arises between the profit and property interests that advance the industrialization process and its frequently threatening consequences, which endanger and expropriate possessions and profits (not to mention the possession and profit of life). (Beck, 1992:87)

The boomerang effect is therefore an *equalizing* effect because environmental risks may affect everyone without exception. It is in this context that Beck (1992:36) notes that the boomerang effect may be illustrated by a simple formula: "poverty is hierarchic, smog is democratic". Consequently, the conflicts that arise in the risk society are unlike the conflicts of the earlier industrial era because they are not, by any means, limited to only the relations between capital and labour. The widespread consequences of modern environmental risks mean that ecological threats lead to new alliances that will reformulate the traditional split between the business and labour camps. An example of such splits is evident in regions dealing with the "jobs versus the environment" debate taking place across the Western world. In such debates, capital and labour form unexpected *alliances* against the state and the environmental lobby (as a topical example, consider the disputes surrounding the clear cutting of trees in British Columbia). In any case, it is this societal-wide impact of ecological risks that makes the study of risk central to the analysis of modern society (both at the structural and individual levels).

Beck (1992b:116) notes that the importance of the environment as an impetus for social change largely came about by the environmental movement. According to him it is not an exaggeration to say that citizens' groups have taken the thematic initiative in this regard, because it was they who put the themes of the endangered world on the social

agenda against the resistance of the established parties. In Beck's (1992b:116-117) words:

> The themes of the future, which are now on everyone's lips (i.e. the compulsion to perform ecological lipservice is universal, it unites ideologically divergent political parties, the chemical industry with its Green critics and so on), have not originated from the leaders in business, science or the state. They have been put on the social agenda against the concentrated resistance of this institutionalized ignorance by the entangled, moralizing groups and splinter groups fighting over the proper way, split and plagued by doubts. Democratic subversion has won a quite improbable thematic victory.

The thematic insertion of environmental concern into the public consciousness has important sociological consequences. One such consequence is noted by Beck, Giddens and Lash (1994:vii) in their assertion that the environment should no longer be considered only as an external context of human action:

> [T]he environment is in fact no longer external to human social life but thoroughly penetrated and reordered by it. If human beings once knew what 'nature' was, they do so no longer. What is 'natural' is now so thoroughly entangled with what is 'social' that there can be nothing taken for granted about it any more. (ibid,vii)

In other words, environmental concerns have permeated many aspects of social life previously removed from such concerns (for example, the environment now enters into discussions about social equity and economic decline). The verification of the above assertion will involve a consideration of individual values towards nature, technology and politics (all of which are of course intimately related to the notions of trust and risk consciousness as well). It is to these interrelations, and the issues which arise thereof, that will be the focus, in our analysis of the GLSP. The following section will introduce

the reader to the manner in which we will analytically deal with such interrelations.

The Notion of Ecological Modernization

As the search for a landfill site may be considered to be a planning or development process, it will be useful to consider the Guelph Landfill Search Process as a particular strategy for modernization in our epoch of reflexive modernization. In fact, *one of the major arguments to be made in this thesis will be that the Guelph Landfill Search is an example of how an environmental issue is reflexively treated.* It is further argued that the reflexive treatment of an environmental issue may be best explained in terms of the modernization strategy known as *ecological modernization.*

Based on the work of Huber (1982, 1988, 1991), Spaargaren and Mol (1992:333) introduce the concept of ecological modernization as a more sociologically informed alternative to the essentially political concept of sustainable development. Although the concept of ecological modernization is consonant with the idea of sustainable development, the former provides a more analytical impetus. According to these authors, the notion of ecological modernization conceptually highlights the relationship between the modernization process and the environment, within the context of reflexive modernity. The main differences between the two concepts is that, first of all, sustainable development pretends to be applicable to developing nations, and secondly, it presents itself as a scheme to promote the ideas of equal development and peace.

For Mol (1994:11) ecological modernization is conceptualized as a historical stage

in the process of industrialization where the object is to overcome environmental problems without leaving the path of modernization. That is, ecological modernization involves the continued use of modern institutions, but in modified form. As such, it involves the development, inauguration and diffusion of new technologies (Spaargaren and Mol,1992:335). These new technologies are integral to the notion of ecological modernization because such technologies promise to take into account the need to maintain the sustenance base without leaving the path of modernization. In other words, according to ecological modernization, new technologies are considered as a means to lead society out of the ecological crisis. In this sense, ecological modernization may be considered as one of the means individuals and institutions may gain control over the "juggernaut".

Spaargaren and Mol (1992:335) assert that there are two central projects at the heart of the *ecological switchover* involved in the strategy of ecological modernization. The first is the restructuring of production and consumption practices towards ecological goals. In this sense, environmental concerns (and nature) are to be reflexively "re-embedded" into the institutions of society. Such practices include the rejection of end-of-pipe technologies in favour of more intelligent technologies, and the adoption of more sophisticated processes to minimize the effects of technology on the environment. Secondly, the ecological modernization strategy seeks to economize nature by placing *economic* value on it (hence the interrelationship between the environment and the economy alluded to in the previous section). As noted by Mol (1994:13) this does not

mean that economic rationality retains its prominence over other values and rationalities, rather, it means that *ecological rationality* is utilized in a manner parallel to economic rationality in development planning. As such, ecological modernization theory focuses in on how the reflexive (re)design of central institutions of modernity have occurred on the basis of environmental criteria (Mol, 1994:15).

In elaborating on the concept of ecological modernization Spaargaren and Mol (1992:334) distinguish between two levels in which the concept can be applied. On one level, ecological modernization can be used as a theoretical concept to analyze the necessary development of central institutions in modern society to address the fundamental problem of the ecological crisis (i.e. the overburdening of the natural environment). On a more practical level, ecological modernization can be used as a political program to direct environmental policy. As such, the distinction should be noted between ecological modernization as a theory of social change, versus ecological modernization as a political program for change (Mol,1994:17). Our emphasis will be on the first approach, although some consideration will indirectly be given to the second approach as well (particularly in Chapter 7).

Ecological Modernization as a Theory of Social Change

As was previously mentioned, Mol and Spaargaren (1992) argue that ecological modernization is a more sociologically relevant perspective than the related notion of sustainable development. The latter term, according to these authors serves a political

agenda which makes it less useful for sociological analysis. Nevertheless, in many respects there are numerous commonalities and points of convergence between the two perspectives. First of all, both perspectives are concerned with *social change* via the adoption of environmentally sensitized approaches to industrial development. Related to this, both the ecological modernization and the sustainable development approaches give somewhat equal importance to the role of *technological and ecological factors* (i.e. one factor is not given precedence over the other). A third similarity involves the fact that both approaches emphasize the importance of *institutional change*, rather than change at the individual level. This third similarity points to a deficiency common to both perspectives -- the neglect of the individual (social-psychological) basis of social change. In order to address this deficiency we will focus on such factors as trust relations, risk consciousness and ecological and technological values and beliefs in the Guelph Landfill Search Process. As we shall see in Chapter 6, the particular configuration of ecological and technological values and beliefs that individuals hold is an important indicator of the hypothesized social change (i.e. the "ecological switch-over" referred to by Spaargaren and Mol,1992:335). For example, if individuals in a particular community are found to exclusively hold technological values and beliefs there is no basis to assert that an ecological switch-over has occurred at the individual level. On the other hand, if all technological values and beliefs are rejected while only ecological values and beliefs are accepted, then this will indicate the occurrence of a complete ecological switch-over. A somewhat balanced (hybrid) configuration of ecological *and* technological values and

beliefs would indicate that individuals give a somewhat equal amount of importance to technological and ecological factors with respect to development. The latter situation would therefore lend support to the ecological modernization theory's proposition that people support technological developments only if they do not jeopardize the natural environment. In order to investigate such matters we turn to the work of Olsen, Lodwick and Dunlap (1992) on environmental versus technological values and beliefs.

Olsen et al. (1992) argue that the previously held system of beliefs and values which strongly supported socio-economic development on the basis of the unfettered use of science and technology (described by them as the *Technological Social Paradigm* -- TSP) is increasingly becoming replaced by a system of beliefs and values that express a stronger environmental concern (described by them as the *Ecological Social Paradigm* -- ESP). However, they hold that the ESP may not necessarily gain complete ascendancy over the TSP. Rather, the two paradigms may interact in a dialectical fashion resulting in the adoption of a synthesis, namely the *Sustainable Development Social Paradigm* (Olsen et al.,1992:153).

To investigate the extent to which GLSP participants accept the Sustainable Development Social Paradigm, a modified version of the Olsen et al. (1992) method will be used. This will allow us to measure one aspect of the sustainable development dimension of ecological modernization -- the degree to which the individual (or the

aggregate of individuals) support the sustainable development perspective.[9] The rationale behind this approach is that if the ecological modernization is indeed based on a view that advocates the overcoming of the environmental crisis without leaving the path of modernization, then, the scales developed by Olsen et al. (1992) should reveal the co-existence of pro-environmental values and beliefs with pro-technology values and beliefs (as found by Olsen et al., 1992:165).

Further, I will argue that the decreased influence of the Technological Social Paradigm is not completely explained by the ascendancy of the Ecological Social Paradigm per se. Rather, the lessening influence of the Technological Social Paradigm may also be explained by the reflexive treatment of technical knowledge in modern society. That is, the awareness of competing claims to knowledge, the distrust of technical knowledge (and technology in general), and risk consciousness, may also help to explain the alleged decrease in the popularity of the Technological Social Paradigm. Ethnographic evidence of competing claims to technical knowledge is given in our chapter on risk, while the distrust of technical knowledge and systems is discussed in our chapter on trust.

According to the theory of social change proposed by Olsen et al. (1992), the co-existence of ecological with technological values and beliefs is indicative of a social change. That is, a change from a technologically based social paradigm to an ecological

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[9] The other dimension of the ecological modernization approach involves a consideration of how the institutions of science and the polity have changed to accommodate a sustainable development approach.

one. We will extend this theory by considering the theoretical work on reflexive modernization. For example, it will be shown that the *anomalies* that arise from the co-existence of ecological and technological beliefs/values indicate that a process of confrontation with environmental risks has occurred. It will be further argued that this confrontation at the individual and collective levels has led to changes in the institutions of science and the local polity. In other words, it will be shown that the Guelph Landfill Site Search exemplifies a process of institutional restructuring that allows for a greater consideration of environmental risk issues. In the empirical context of the present study, indicators include such factors as the presence of problematic expert-lay trust relations, risk consciousness, and the co-existence of environmental and technological values/beliefs. These factors would not exist in the siting of a landfill in simple modernity. That is, in the past, those affected by a potential landfill would not and could not question the technical elites (as technical expertise and technologies would be trusted or else no channels would be open for them to question the experts), risk consciousness would not exist among those lay community members affected, and lastly, environmental concerns would not likely be raised.

Summary

Reflexivity refers to the process of social change that occurs as a result of a questioning or requestioning of knowledge (Beck, Giddens, and Lasch, 1994:vii). Such a form of social change has, of course, always existed. But, what is unique to the

contemporary period is that the stimulus for this change is now based on the process of confronting the risks produced by the application of technical knowledge. These types of risks are different from the risks of yesteryear because of the magnitude and the nature of the human made threats that are now produced. For example, the risks arising from an engineered landfill, or a nuclear reactor, may affect relatively large proportions of the population. Secondly, these risks may not be detected by our physical senses (for instance, lethal doses of radiation, or trace concentrations of toxic contaminants). As a result, the detection of certain types of modern environmental risks rely on the methods of science to a much greater degree than in the past. Therefore, the environmental risks we now face present new social, political and technical problems that need to be addressed. Our analysis of the Guelph Landfill Search Process is meant to help identify and discuss examples of these new types of problems from a sociological perspective.

The general argument to be made in our study is that the manner in which an environmental risk issue was dealt with in the GLSP is illustrative of a social change that has occurred at both the individual and institutional levels of society. Specifically, it will be argued that the GLSP represented an environmentally-informed process of reflexive change since it will be shown that those issues related to the risk of leachate contamination served as the impetus for the individual and institutional changes observed. This reflexive social change will be analyzed by considering three factors that we believe are central elements in the theory of reflexive modernization.

The first factor we will consider is the notion of trust. Specifically, we will

attempt to show how lay trust in technical experts and expertise has changed from an unchallenged faith in science to a somewhat more critical view. The second factor that we will consider is risk. In considering this factor we will analyze how environmental risks were dealt with by participants in the Guelph Landfill Search Process. As such, we will pay particular attention to which risk issues were raised and why they were raised in the context of the GLSP. The last factor we will consider are the technological and ecological values and beliefs of GLSP participants. The focus here will be to show how the observed tension between ecological versus technological beliefs/values was the result of the adoption of a reflexive orientation.

In the following chapter we will discuss the types of methods and data we have used to develop our analysis. Further, we will examine how the data that we have collected may be used to test some of the theoretical claims made (included in this will be a discussion of validity issues as pertaining to our study). As such, the Guelph Landfill Search Process will be treated as an empirical case to test some of the tenets of the theory of reflexive modernization. Finally, we will discuss the specific ways in which we have empirically investigated the concepts of trust and risk, as well as how we had operationalized the variables of ecological and technological beliefs and values.

CHAPTER THREE

METHODOLOGICAL OVERVIEW

Chapter 3   **Methodological Overview**

In this chapter we will briefly discuss the methods of data collection and types of data that were used in this study. Further, we will also discuss the limitations of such methods and data in relation to the theoretical issues we wish to investigate. Particular attention will be given to the issues of validity. Before examining the particular details of the methods and data used it will be helpful to consider the general approach that was adopted, as this has influenced the choice of the particular types of methods and data utilized in the present study.

General Methodological Orientation

Stallings (1995:217) notes that frequently, discussions of methods in *quantitative* studies describe such matters as research designs, sampling procedures, variables, and analytic procedures, in a rather cryptic fashion. This manner of presenting the methodological discussion occurs because the use of a few code words such as "cross-sectional design", "secondary data", and "multiple regression", succinctly describe what has been done. Consequently, only minimal elaboration is usually required. In the case of *qualitative* research however, Stallings (1995:217) notes that the convention is to describe in some detail various components of the fieldwork that have influenced the conclusions that were reached. These components may include such things as the general approach used (e.g. participant observation), the setting in which the observation took

place, how entry into the setting was managed, and the role that the researcher had adopted in the field. Stallings (1995:217) notes that in relation to his study of the promotion of risks associated with earthquakes, it was more difficult to write a discussion of methods because a variety of analyses were performed to construct what was basically a theoretical argument and to see where it led. In the present study we essentially face the same type of problem, in that, we wish to theoretically examine the *types* of issues raised in the GLSP. We therefore were selective in regard to the substantive issues that we have chosen to discuss in this study. That is, many more issues were raised in the GLSP, but we did not focus on all of these because they did not fall into our theoretical focus. Specifically, we focused on those issues that were directly or indirectly related to the concepts of trust, risk, and the environment, as these were central elements in the theory of reflexive modernization. In a general sense therefore, our research objective was to investigate the explanatory power of the social theories proposed by Giddens, Beck and Mol and Spaargaren. As such, we have regarded the social interactions and issues raised in the Guelph Landfill Search Process as a source of data which we could examine to either confirm or disconfirm some of the tenets of the theoretical framework. In this connection, the concepts we have used to investigate the theory of reflexive modernization are what Blumer (1969:148) calls "sensitizing concepts". That is, concepts that give the researcher a general sense of reference and guidance in approaching empirical instances. Sensitizing concepts therefore simply suggest directions to look.

In adopting this approach we are in complete agreement with Silverman's (1993:ix) assertion that social theory is not an "add-on" extra, but that it should be regarded as the animating basis of social research.

My general research approach has been greatly influenced by the work of C. Wright Mills (1959), particularly his methodological emphasis on the adoption of the "sociological imagination". For Mills (1959:5) the sociological imagination involves the analytical approach of attempting to explain the connection between the individual's personal biography and the historical setting in which he or she is situated. Mills (1959:57) argues that by adopting such an approach the sociologist may be better equipped to deal with the problem of "methodological inhibition" in which the methodology seems to determine the problem. According to Mills (1959:71) therefore, social research of any kind is advanced by ideas, but at the same time it is to be disciplined by fact.

In using the sociological imagination as an analytical tool, Mills (1959:8) notes that the researchers' attention should be directed toward the relationship between " the personal troubles of milieu" and "the public issues of social structure". For Mills troubles in the private life of the individual arise when the individual feels that the values that he or she cherishes are threatened. On the other hand, public issues deal with matters that transcend the local environments of the individual and the range of his or her inner life. According to Mills therefore, the methodological task in sociological

explanation is to investigate the relationship between the public and the private. This

approach to sociological analysis is directly relevant in our study of the Guelph Landfill

Search Process because the landfill issue has obvious implications for the personal life of

the individual affected (for example, he or she may have to relocate, or have to deal with

the potential risks of the nearby landfill). At the same time, the landfill issue is a public

issue because it potentially affects the community at large, and as we have seen in our

description of the GLSP, participants in the GLSP came from a wide range of societal

sectors. In our study we have tried to link the public and private aspects of social life

by following Mills (1959:128) proscription that:

> To practice such a policy is to take up substantive problems on the
> historical level of reality, to state these problems in terms appropriate to
> them, and then, no matter how high the flight of theory, no matter how
> painstaking the crawl among detail, in the end of each completed study,
> to state the macroscopic terms of the problem.

Mills (1959:124) notes that the difficulty in adopting such an approach is that if

the idea or concept the researcher is using is too large for the content, then the researcher

tends toward the trap of grand theory which results in the development of a static and

abstract view of the components of the social structure at a very high level of generality.

On the other hand, if the content swallows the idea, then the tendency is to fall toward

the pitfall of abstracted empiricism in which there is an overemphasis on the empirical

with little regard to explanatory social theory. I have made an attempt to stay between

these two extremes, but, this attempt was at times difficult because of the tendency to

focus on the public issue aspects of the GLSP. Such a tendency was the result of the fact that I had adopted an observation-based approach to my study. To pursue a detailed examination of the private aspects of the GLSP issue would require intensive interviewing (which at this stage, could not be pursued because of a lack of resources -- time and money). However, I have attempted to gather some data on the private aspects of the landfill issue by using secondary sources (such as newspaper articles) and a survey designed to obtain the GLSP participants' personal views of technology and the environment.

Paying attention to the notion of validity is central to maintaining the balance between the tendency to grand theorize and the tendency for abstracted empiricism (based on methodological inhibition). It is for this reason that I now turn to a consideration of validity issues as pertaining to the limits and types of evidence used in the present study.

The qualitative methods employed in this study included *fieldnotes* from: 26 CASC meetings; 36 LSG meetings (8 of these were joint meetings); 5 public workshops; 4 neighbourhood group meetings (2 CORALS, 2 VRNLG); 1 press conference; and 4 meetings of Guelph City Council. Silverman (1993:37) citing Wolcott (1990) notes that one of the greatest dangers in taking fieldnotes is that the researcher will often seek to report "everything" in his or her notes. This has the disadvantage that the theory-driven nature of field research may be overlooked. Secondly, it leads to difficulties in the development of a more systematic analysis at a later stage:

> The critical task in qualitative research is not to accumulate all the data you can, but to "can" (get rid of) most of the data you accumulate. This requires constant winnowing. (Wolcott, 1990:35 cited by Silverman, 1993:37)

In our theory-guided study, the problem of taking too many fieldnotes was dealt with by focusing in on those aspects of the process which directly or indirectly dealt with issues associated with risk, trust, and the environment. The GLSP was a long and somewhat complex process which meant that I had to deliberately neglect certain aspects of the process which were not relevant to the testing to the theoretical propositions I was investigating. However, I was aware that such aspects may have influenced my findings in some indirect ways. For example, in investigating the trust GLSP participants had towards technical experts, I found that some individuals did not trust the experts because they considered them as agents of the elected politicians. Thus, the issue for these individuals may not have been the distrust of technical experts per se, but the distrust of politicians. In other words, an indirect relationship existed in that the political distrust was an intervening variable in the relationship between the GLSP participant and the technical expert. In cases such as this, we therefore had to take into account other factors and use other ways to measure the direct relationship between individuals and their distrust of technical experts. For instance, in relation to the notion of expert distrust, the ethnographic evidence related to this issue was supplemented by quantitative survey questions intended to measure the direct relationship between individual distrust of experts

by controlling for political distrust. The drawback to this was that the questions were not based on the specific circumstances of the Guelph Landfill Search Process because I was interested in the more general views that participants had towards technology and technical experts. Despite this drawback however, one advantage of adopting a more general approach was the I was then able to directly compare the results I had obtained to those found in another study (namely, the study of Olsen, Dunlap and Lodwick, 1992). Such a comparison may lead to greater insights, particularly in regard to the generalisability of our findings.[1]

Our investigation of the Guelph Landfill Search Process was an observational study in which the aim was to gather first-hand information about social processes in a "naturally occurring" context (Silverman, 1993:11). Robertson (1987:40) defines an observational study as:

> [A]n intensive examination of a particular group, event, or social process. The researcher does not attempt to influence what happens in any way, but aims instead at an accurate description and analysis of what takes place. The analysis usually traces cause-and-effect relationships, but some sociologists are content merely to give a precise account of their observations. This information often provides rich insights into social behavior and for that reason alone adds to the sum of sociological knowledge.

The focus therefore was upon what participants actually did in the GLSP rather than upon

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[1]   The issue of generalisability is dealt with in our discussion of the quantitative methods used in this study.

what they thought they did. The drawback to relying on fieldnotes and not interviews was that each participant may not have the same views as those expressed during the GLSP meetings. However, such a problem was overcome in that we were not as much interested in each individual participants' views as we were in the types of issues that were raised and discussed. The adoption of this approach meant that we did not have the benefit of what appears to be cumulative evidence on the basis of asking the same question to numerous individuals and obtaining a series of quotes that support a common position or theme (as many readers may be accustomed to). In our observational study, we were interested in the exchange of ideas and the treatment of issues raised, rather than on the views of each and every participant, or the detailed specifics of the issues raised (the latter may be more interest to those involved with policy formation than to sociologists). However, the problem with this approach is that:

> There is a tendency towards an anecdotal approach to the use of "data" in relation to conclusions or explanations in qualitative research. Brief conversations, snippets from unstructured interviews, or examples of a particular activity are used to provide evidence for a particular contention. There are grounds for disquiet in that the representativeness or generality of these fragments is rarely addressed. (Bryman, 1988:77 cited by Silverman, 1993:153)

Field research studies are particularly vulnerable to problems of representativeness because such studies are based on one or more cases, and, as Silverman (1993:160) notes, it is unlikely that these cases will have been selected on a random basis. It is more likely

the case will be chosen because it allows access.[2] The problem then arises as to how representative our case study findings are of all members of the population from which the case was selected? To address the issue of representativeness (the "perennial worry of case-study researchers"), Silverman (1993:160) suggests two means. The first is infer from one case to a larger population. This can be done in several ways: by obtaining information about relevant aspects of the population of cases and comparing our specific case to them; by using survey research on a random sample of cases; and, by co-ordinating several ethnographic studies.

The second strategy suggested by Silverman (1993:160) to deal with the issue of representativeness involves the method of generalising in terms of theories. Unlike the logic in statistical analysis, which seeks to generalise from cases to populations, qualitative research according to Silverman should follow a logic in which generalisability refers to the generalisability of cases to *theoretical* propositions. We have adopted this approach in our research. Specifically, in our case we have attempted to do this with reference to the theoretical works of Giddens, Beck and Mol and Spaargaren (discussed in the preceding chapter).

In addressing the need to overcome the anecdotal quality of much of field

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[2] For example, I had chosen to study the GLSP because the "open" character of this particular landfill search process made it quite easy for me to attend the meetings as a member of the general public. In this sense, I had no privileged access (to individuals or information) relative to the actual participants in the GLSP.

research, Silverman (1993:162) notes that the search for deviant (i.e. non-confirmatory) cases may help to alleviate such a problem. This is because the consideration of the deviant case makes it necessary to refine or reformulate the existing theory to better account for the observed reality. In this study we will show how the certain particular social and political circumstances in the Guelph context may need to be addressed by the more general theory of reflexive modernization. For example, as we shall discuss in more detail later on in this study, the theory of reflexive modernization asserts that the opening of sub-political channels has led to the sharing of decision-making power. We have found in our study of the GLSP, that although this may be true to some extent, this sharing of power refers primarily to the power of the technical elites and not of the political elites. Specifically, in the case of the GLSP, the *final* decision was to be made by City Council, who therefore retained their decision-making power. The theory of reflexive modernization therefore may be reformulated to take into account this point.

Aside from fieldnote observations we have also used various *documents* in our research including: LSG, CASC and public workshop meeting records, environmental assessment documents prepared by the technical consultants (with input from CASC and LSG); various forms of *correspondence* between LSG, CASC and neighbourhood group members; *government documents* prepared by the City of Guelph and the MOEE; as well as *newspaper articles* (from the Guelph Mercury, the Guelph Tribune, At Guelph -- the University of Guelph paper). In utilizing these textual forms of data it should be noted

that each type of document will usually contain biases (which may or may not necessarily be hidden). For example, as would be expected, letters from the members of the neighbourhood group quite often contained reasons as to why the landfill should not be sited in their area. In the case of the government document the bias may be expressed in terms of why the City feels that the adopted landfill search process is fair and legitimate. Finally, in the case of the newspaper article, the article may be written to draw out the "dramatic" character of the issues and interactions involved in the GLSP. Although we sometimes refer to excerpts from these documents for the substantive positions expressed, most of the time we are more interested in the *type* of issue that was raised because it is these elements that have implications for our theoretical analysis. For instance, towards the end of the process in which N-4 was to be compared to the Hanlon Road site (i.e. the site selected in the GLSP), the former LSG Chair wrote an open letter to City Council which stated the following:

> Guelph City Council faces a difficult political decision, just as the Landfill Search Group faced a difficult technical and social decision. The main difficulty stems from two facts: (1) Guelph will have a wet-dry waste processing facility in operation which means that the landfill will receive a very different stream of wastes with much less danger of operational effects on surrounding areas; (2) LSG, with Council's direction, conducted an extremely open community-based process to try to find an urban location for a landfill, which brought forth unprecedented expectations for standards of waste management and landfill operation to protect natural systems and surrounding neighbours. (Letter to City Council, January 28, 1995)

In our study, we are not interested in the substantive question of whether the wet-dry

recycling facility will be effective. That question is more relevant to the work of technical experts and policy makers. From a sociological point of view, we are interested in the question of why this particular type of issue were raised in the first place (i.e. the issue of environmental technologies), and how they were subsequently treated, and what implications these have for the nature of society (or sector of society) we now live in. In the example we are dealing with, the former LSG Chair, in the letter cited above, implicitly espouses a trust in the technology of the wet-dry facility. As such the issue of trust in technology was examined in our study. We have focused on this particular issue because of its sociological implications in testing the theory of reflexive modernization.

In the case of documents produced by the local government, consider the following excerpt:

> The City of Guelph is a special community, with a talented and abundant volunteer force which is known for its vigourous participation in community projects. Environmental issues have been embraced with a positive attitude that has moved this City into a leadership position in "green community" issues. LSG intends to build this special knowledge into its search for suitable site(s). (City of Guelph, Discussion Paper #1: Introduction to the City of Guelph's Landfill Site Search Process, November, 1993:4)

The reasons the City gives for the adoption of their innovative landfill search therefore seems to be based on their awareness that ecological concerns are becoming an important social issue. Such an assertion cannot be taken at face value and must be investigated (as will be done in our analysis). That is, we need to determine if there is a bias in such an

assertion.

Finally, as an example of the bias in newspaper articles consider the front page headline in the Guelph Daily Mercury (December 13, 1994) which stated: "Landfill consultant fired". During the LSG meeting held the following evening, members of the LSG, CASC and the neighbourhood groups all took the reporter to task about this dramatic headline. The following day a retraction was published in which the reporter clarified the fact that the community involvement facilitator was not "fired", rather the contract was terminated because the phase of the search that CASC and LSG were involved in no longer required this consultants' involvement. This example has meant to illustrate that frequently, newspaper articles may display a dramatic flair in what may have been, in actuality, not so dramatic. Therefore, once again the researcher must be sensitive to such bias. As I have been able to attend all the meetings involved in the GLSP, I was in a position to identify such biases. We will now move on to a discussion of the actual concepts and variables that were investigated in this study.

The Variables of Ecological and Technological Values and Beliefs

Quantitative data were collected through a survey distributed to participants at CASC and LSG meetings[3]. This survey was in fact a shortened version of the instrument

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[3] The LSG Chairman and the CASC facilitator kindly mentioned my study to participants and encouraged them to complete my survey. Additionally, an article

designed by Olsen, Dunlap and Lodwick (1992) to measure technological and ecological values and beliefs (given in Appendix 8).[4] The survey was intended to discover if there existed a *co-presence of conflicting values and beliefs* among participants in the GLSP. It will be argued that, if a contradictory configuration of values and beliefs exists, then, this will indicate the existence of a reflexive orientation in which the unquestioned beliefs and values in technology and science start to be replaced by ecological beliefs and values. For example, the sharing of both ecological and technological values/beliefs may suggest that some re-thinking on environmental issues has occurred as individuals were forced to directly confront an environmental risk issue. This would not be expected in simple modernity because in that period, there existed an unquestioned faith in technology, in which the environment was only considered as an externality (Beck, 1992). In summary, it will be argued that those individuals who hold *contradictory* beliefs and values with regard to technology and ecology actually exhibit a reflexive orientation.[5] If this occurred then attempts to reconcile these contradictions should be in evidence in the

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about my study appearing in the <u>Guelph Mercury</u> (circulation 19,000/day) urged participants to complete the survey (see Appendix 7).

[4]   The statistical analysis of ecological versus technological beliefs and values in the GLSP is discussed in Chapter 6.

[5]   In an environmental policy context this has important implications because the strategy of *sustainable development* depends on reconciling contradictions between pro-technological (and economic) values and beliefs with pro-environmental values and beliefs.

GLSP. These attempts at reconciliation, in turn, should have an impact on the nature of the expert-lay interactions that took place. Such impacts should be particularly evident in the types of trust relations that were observed (regarding trust in technical experts and expertise) and in the particular way in which environmental risk issues were treated in the site search. It is for this reason that we have considered two other factors in our study of an alleged *ecologically based reflexivity*[6], namely, trust and risk. Before turning towards a methodological discussion of the way in which these factors have been operationalized let us first define the sample we have used in our study to gather data on ecological and technological values and beliefs.

The Sample

Our study was limited to investigating the influence and impacts of reflexivity on those involved in the GLSP. In this sense, our sample refers to what is known as a "communicative community". Olsen et al. (1992:18) define a "communicative community" as a set of members who sustain an ongoing pattern of communication. Those involved in CASC, LSG, and the neighbourhood groups collectively exemplified just such a community type.

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[6] We use the term "ecologically based reflexivity" to denote confrontations with *environmental risk issues* that lead to revisions and restructuring along more positive and *pro-ecological* lines.

It is difficult to determine exactly what sample size one requires to be representative of the communicative community involved in the GLSP because the number of participants fluctuated with time. The size of the LSG of course remained constant at 8 in number (because no new members were added or dropped). However, although about 100 individuals attended the CASC orientation meeting, towards the end of this process this number had dwindled to about 30 in number. Furthermore, once the Victoria Road potential site was dropped from consideration, members of VRNLG stopped attending CASC and LSG meetings. To deal with this problem we calculated an overall average of the number of individuals who attended CASC meetings by using the attendance records (attendance records for LSG meetings were not available). On average, therefore, 39 individuals from CASC, LSG and the neighbourhood groups participated in CASC meetings. Our sample of 40 returned surveys (200 were distributed) is therefore likely to be representative of the communicative community we are studying. The breakdown of the sample was as follows (on next page)[7]:

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[7]   We did not receive any completed surveys from the VRNLG.

Table 3.1: Sample Breakdown (N=40)

Group Affiliation in the Guelph Landfill Site Search	Number of Respondents
Community Advisory Subcommittee (CASC)	19
Landfill Search Group (LSG) & Technical Consultants	7
Coalition of Residents Against Landfill Sites in the Hanlon and Mill Creek Watersheds (CORALS)	10
Other participants from the general public (no affiliation)	4

The Concept of Trust

The notion of trust is a central concept in the theory of reflexive modernization because trust represents stability in a world that is constantly being revised or restructured. Trust, therefore, becomes problematic in situations of uncertainty and reflexivity. One repercussion of this is that trust in both technical experts and in science and technology, become particularly problematic in reflexively dealing with environmental risk issues. If lay members of the communicative community involved in the GLSP were confronting the landfill issue in a reflexive manner, not only will they be expected to hold contradictory views towards ecology and technology, but they will also *doubt* the effectiveness of the actual technologies and technical expertise being considered. In other words, there will be a lack of trust in technical experts and expertise

as lay members reconsider their views of science and technology in actively confronting the landfill issue.

In order to identify instances of a lack of trust in technical experts in the GLSP we have utilized the work of Shapiro (1987) on the general forms of impersonal trust that can occur in principle-agent relations. Shapiro (1987) notes that if a *lack of trust* exists, then certain actions will be taken by the principle to ensure that the agent is doing his or her job. These actions may include: (i) attempts to personalize the formal relationship, (ii) attempts by the principal to become a jack-of-all trades, (iii) insistence by the principal that his/her requests are formalized in a contract, (iv) refusal by the principal to deal with the agent altogether, and finally, (v) by investment in several agents at the same time. In the context of the GLSP, lay members of the community may be considered to be the principals while the technical consultants were the agents who presumably represented the interests of the lay public. On this basis, we have used the above indicators to determine if there existed a lack of trust in technical experts in the GLSP.

Aside from the alleged distrust in technical experts, trust in the *system* of science and technology was also measured. The first four questions of our survey (see Appendix 8) have been designed to do this. The first two of these questions indicated the extent to which individuals believed that science and technology have: (i) improved or worsened the quality of life, and, (ii) increased or reduced freedom and independence. Questions

3 and 4 are more directly related to the issue of trust in the system of science and technology. Question 3 measured the extent to which individuals believed that science and technology can be made risk-free, on the assumption that, if one unconditionally trusts the system of science and technology, then one will believe that technologies can be made to be risk-free. Question 4 asked if science and technology create more problems then they solve, on the assumption that, if one trusts science, then one will not likely agree with this statement. Underlying our arguments about trust in science and technical experts is the notion that, in reflexive modernity, individuals are aware of the flaws associated with technical knowledge and methods. This brings us to a consideration of the associated issue of risk.

The Concept of Risk

A major argument to be made in this work is that the collective confrontation with environmental risks has provoked a change in the way that such issues are dealt with in late modernity. But, what exactly is this alleged change? Further, what are the indicators of this alleged change? To investigate these matters we have focused on the manner in which risk and uncertainty were dealt with in the GLSP. In particular we wished to determine if participants were thinking in terms of the relative likelihood of different risk scenarios. We have termed such a mode of thinking as risk consciousness.

Risk consciousness indicates the presence of a reflexive orientation because it

emphasizes a mode of thinking that is used to deal with issues of uncertainty. For example, in dealing with the risk of ground water contamination, individuals must *confront* the uncertainties involved with various technical matters. This follows from the fact that the failure of landfill technologies will result in the actual threats to the environment. In reflexively dealing with these sorts of situations, individuals will therefore be expected to exhibit risk consciousness.

Qualitative evidence of the existence of risk consciousness in the communicative community may be gained by examining the manner in which risk was dealt by participants in the GLSP. The following elements will indicate the reflexive treatment of risk: (i) the presence and awareness of competing claims to technical knowledge among lay participants; (ii) discussions about the knowledge gaps in the technical knowledge base; (iii) discussions about the uncertainties involved in determining and monitoring the environmental risks involved; (iv) lay questioning of the reliability of the technical methods used; and, (v) the awareness of high consequence (global) risk situations. The presence of such indicators will suggest the existence of a reflexive orientation based on risk consciousness because it is in dealing with anomalies or contradictions in the system of science and technologies that there will exist a stimulus for the revision of one's views towards the relationship between environment and technology.

Summary

This study employs both quantitative and qualitative methods to investigate the theory of reflexive modernization. Our general methodological approach is to show how the events, interactions and issues that arose in the Guelph Landfill Search Process may or may not be explained in terms of the social conditions described by the theory of reflexive modernization. In our study of the GLSP we have focused on three factors that play a key role in this theory: (i) trust relations between lay persons and experts, as well as trust in the system of science; (ii) the treatment of risk including the notion of risk consciousness; and (iii) the influence of environmental and technological beliefs and values. In the following chapter we will consider the first of these three factors.

CHAPTER FOUR

THE SOCIOLOGICAL EXAMINATION OF TRUST IN THE GUELPH LANDFILL SEARCH

Chapter 4   The Sociological Examination of Trust in the Guelph Landfill Search

The first factor that we will consider in our investigation of ecological reflexivity in the Guelph Landfill Search Process pertains to the issue of trust. It would be expected that a confrontation with an environmental risk would lead to a re-thinking of the amount of trust that the lay individual gives to technology and science, because it is the very failure of science and technology that results in the actual risk. As such, it would be expected that such a re-examination would have an impact on the expert-lay interactions that took place in the GLSP. We will examine these issues in this chapter.

The first part of this chapter will provide a brief introduction to how the concept of trust may be sociologically conceptualized. As we shall see, although there have been few attempts at developing a formal sociology of trust (Barber, 1983, being the noted exception), many sociologists have used the concept implicitly and indirectly in their works.

In the second section we will outline the rationale behind the City of Guelph's Landfill Search Process. Evidence will be presented to show that one of the main reasons that the City had adopted this innovative and open process was to address the issue of (dis)trust. The second part of this section will show how a lack of trust, nevertheless, prevailed.

The third section explores the reasons why trust did not develop in the observed expert-lay interactions. An attempt will be made to theoretically explain this situation on

a social-psychological level. The last part of this section will show that although trust did not develop in regard to expert-lay interactions, it did develop with respect to the relations between CORALS members. In fact, it will be shown that involvement in CORALS had the effect of bolstering the sense of community experienced by some of those participating in the process.

The final section will switch the focus of analysis from trust in expert-lay interactions, to an analysis of trust in the abstract system of science and technology. This examination will be largely quantitative, as attitudes towards science and technology were measured through a survey.

Section I The Sociological Conception of Trust

The concept of trust is an inherently sociological notion. Unlike animals, human beings do not exclusively rely on instinctually informed methods of interaction. Human beings, as social animals, must learn through socialization and subjective experiences to either trust or not trust their fellow human beings. As such, to one degree or another, trust implicitly mediates all forms of social interaction -- both at the interpersonal and institutional levels. It is for this reason that trust has been implicitly (and rather indirectly) dealt with by all the major sociological perspectives ranging from the subjectivist traditions of phenomenology, ethnomethodology and symbolic interaction (for example, Garfinkle 1963), to the structuralist traditions (both Marxist and Functionalists

such as Luhmann, 1973 and Barber, 1983 respectively).

Trust, in essence, is related to the stability of both interpersonal interactions and institutions. As an example of the former, consider Garfinkle's (1963) work with breaching experiments. This work dramatically illustrates the large degree to which trust is taken for granted in everyday interactions. In terms of institutional analysis, functionalists such as Luhmann (1973:5) show how trust is essential to the "stability of action systems" and how it serves to "reduce the complexity" of our modern world. Likewise, conflict theorists (such as Schnaiberg and Gould, 1994) demonstrate how a loss of trust in the existing political-capitalist system in general, and political leaders in particular, can stimulate social change via the development of protest movements. Conflict theorists emphasize this lack of trust in social relations when they argue that different groups in society (capital and labour) have fundamentally opposed interests. For example, Schnaiberg (1980) argues that, due to the dominance of the profit-making incentive in our society, the capitalist becomes inevitably bound to the dictates of the environmentally destructive "treadmill of production", and as a result can not be trusted to care for the environment because the latter will presumably be sacrificed for the sake of increasing profit. In this chapter, I will attempt to show that the various approaches to trust are not by any means mutually exclusive, and that a consideration of the multiple perspectives on trust is essential for a more complete and informed understanding of the Guelph Landfill Search Process.

Section II   Trust and the City of Guelph's Landfill Search Process

The issue of trust is central to many of the interactions that took place in the

Guelph Landfill Search Process.   In fact, the City of Guelph adopted this particular

innovative type of landfill search process in order to deal with anticipated problems with

public trust:

> Unlike traditional siting processes, this landfill site search process focuses
> on community-based siting approaches which provide an integration of
> social-political features with a rigorous environmental-technical
> examination of alternatives. This innovative approach ensures that local
> environmental knowledge, principles and values are incorporated into the
> technical aspects of the work. *The underlying premise of this approach is
> that an open, collaborative and flexible process will inspire trust and
> confidence in the City's site search.* (City of Guelph Position Paper
> #1,1994:1; emphasis mine)

The City of Guelph was well aware of the controversy and the problems plaguing their

previous landfill search (conducted in partnership with Wellington County), and it seems

that they did indeed specifically identify a lack of trust as one of the major problems

associated with the previous joint search:

> Although the N-4 site selection process involved a Public Advisory
> Committee, much criticism has been directed at the City and the County
> that this type of public participation was not always incorporated into the
> decision-making process.(City of Guelph Landfill Search: Position Paper
> #1,1994:9)

> There was some discussion regarding *the lack of trust in the process*
> because of past experiences. PAC [i.e. the Public Advisory Committee
> involved in the joint search] had found that their recommendations and
> advice had been ignored on many occasions. While this point was well
> taken, it is recognized that *there needs to be some element of trust*, but
> that measures need to be taken to ensure that CASC recommendations are
> considered and understood by the LSG public liaison representatives. In

the event that LSG as a whole does not support CASC recommendations, LSG must commit to attempt to resolve the differences with CASC. However, CASC must be provided with mechanisms to access Council and/or the media to ensure that if a conflict cannot be resolved, CASC's consensus opinion is heard. (Stated by the community involvement consultant hired by the City, Meeting Record of CASC Orientation Session, November 18, 1993; emphasis mine)

Thus, it can be seen that the innovative community-based landfill search process was adopted by the City of Guelph in order to avoid the type of mistrust and distrust that had occurred previously in the controversial search that led to the selection of the N-4 site. It was in this spirit that the LSG was committed to the idea that all meetings be open to the public:

The holding of private, closed-door meetings can frequently raise suspicions and concern. This is why the LSG has committed to holding all of its meetings in a public format. (Letter from LSG Chair to CORALS member, August 31, 1994)

Not only was the Guelph Landfill Search Process to be an open process, it was also supposed to be a purely technical process that would not involve the "interference" of politicians (i.e. City Council). This exact intention was expressed by the Mayor of Guelph:

We did not put any politicians [i.e. members elected to City Council] on the LSG in order to eliminate [any] political influence. (Fieldnotes, Major of Guelph, LSG Meeting May 18, 1994)

This sentiment was also expressed by a city councillor towards the end of the process:

We were to do an academic search process without any political interference. Thank goodness it was without political interference because we would screw it up. (Fieldnotes, Guelph City Councillor, Guelph City Council Meeting, October 12, 1994)

Although the potential political influences may have been minimized in the Guelph
Landfill Search Process, the final decision was to be made by City Council. In any case,
Guelph's innovative approach to siting a landfill attempted to promote and emphasize the
working relationship between the LSG (and its technical consultants) with the lay
community at large. In fact, one of the stated objectives of the LSG was that:

> The process should be inclusive of all interests in the community and
> should attempt to consider and incorporate the viewpoints of as wide a
> community as possible by encouraging and facilitating wide public
> information availability and involvement in decision-making. (From the
> document entitled LSG Landfill Site Search Goals and Objectives,
> February 16, 1994)

> The search will be community-based -- in that the *public and citizen
> leaders will take on the responsibility of developing* the planning process
> and identifying solutions. (City of Guelph, untitled document distributed
> at the first CASC meeting, December 7, 1993; emphasis mine)

By allowing the public to take responsibility, the City hoped that confidence and trust in
the process would be built. The intention of the City therefore was to build trust through
inclusiveness. The adoption of a strategy based on such a perspective resulted in the fact
that much of the interaction that took place in the GLSP occurred between lay members
of the community and technical consultants (instead of between politicians and technical
consultants). Accordingly, our analysis of trust will primarily focus on expert-lay
interactions. Since the process was designed to facilitate collaborative interaction between
the technical experts and lay persons involved, it is important to understand the role that
trust played in either facilitating or disrupting these lay-expert relations.

In discussing the search with participants, overwhelmingly those involved with

the previous joint search commented that the Guelph search was indeed much more open.

For example, one public member involved in the joint search made the following comment:

> As far as public input in the process [which led to] N-4 compared to the Guelph process, the difference is like night and day. If the N-4 process were open like Guelph we would not be here, we would have a site. On top of things, the public input into the N-4 process cost more than in the Guelph process. (Fieldnotes, Public Open House, February 21, 1995)

A City staff member of the LSG (who was also the Waste Management Co-ordinator for the City of Guelph) went as far as saying:

> I can state categorically that Guelph's landfill process is the most public landfill process that has ever taken place. (Fieldnotes, LSG Meeting for the announcement of potential sites, May 18, 1994)

Upon being questioned, the lead consulting engineer in the process commented that he felt that the Guelph Landfill Search had not been adversarial at all, especially in comparison to the numerous other landfill searches he had been involved with (Fieldnotes, February 21, 1995).

In the following, we shall see that despite the conscious attempt to instill community trust in the GLSP, the fact remained that some lack of trust was still evident.

Distrust in the Guelph Landfill Search Process

The relationship between a technical expert and the client is based on what Shapiro (1987:625) calls *impersonal trust*. Impersonal trust relates to all agent-principal relationships where the agents (individuals or organizations) act on behalf of others

(called the principals). Principals invest resources, authority or responsibility in the agent, with the understanding that the return may be uncertain. If principals are unavailable to specify, scrutinize, evaluate, or contain their agent's performance, then the situation arises where impersonal trust is required.

As we have mentioned, the Guelph Landfill Search Process was supposed to be an open process in which the principals (i.e. the public) had direct access to the work of their agents (i.e. the technical consultants and the Landfill Search Group).[1] According to Hadden (1991), an open process, that incorporates direct community involvement in risk decisions, and takes place over a longer period of time in a non-crisis setting, should provide a basis for the development of trust. The trust that develops under these conditions will not be of a wholly impersonal sort because impersonal trust is only necessary in situations where direct accountability is not possible. Therefore, the type of trust that was to be cultivated in an open and accountable process such as the Guelph Landfill Search would be expected to have some personal characteristics associated with it. However, the trust involved still largely remained as an impersonal sort because of the persistence of the formal principal-client relationship (i.e. it was publicly realized that in the final instance the technical consultants' fee was to be paid by the City).

Shapiro (1987:627) notes that certain problems are necessarily associated with

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[1] The only exception to this involved that phase of the process which had to do with *potential* site selection. This technical work had to remain confidential by Ontario law (see Chapter 1 for details). Although some CASC members requested the minutes to these technical LSG working sessions (none were taken).

situations involving impersonal trust. For example, the impersonal trust relationship between the agent and the principal may be open to abuse by the agent because the agent may control property he or she does not own, thus having the capacity to illicitly create wealth. The agent may also have discretion over the distribution of opportunity. Additionally, agents can create or disseminate information that cannot be verified by principals because of their lack of expertise or access to data sources. As mentioned in Chapter 3, Shapiro (1987) notes that in dealing with the above types of problems, certain courses of action may be undertaken by the principal in order to minimize the risks involved. We have attempted to discover if such courses of action were taken by the principals (i.e. the lay members of CASC and the neighbourhood groups) with respect to their agents (i.e. the LSG and their technical consultants). The existence of such problems and actions will therefore give some indication of the degree to which there was a lack of trust in the Guelph Landfill Search Process.

One mechanism the principal may use to deal with his/her lack of trust is to attempt to *personalize* the agency relationship by embedding it in structures of personal social relations. Here, as was alluded to previously, the goal was to transform impersonal trust into a more personal type of trust. For example, the principals may deal only with known agents -- members of their social networks, kinship, ethnic group, or neighbourhoods. Such relationships are based .^n familiarity, interdependence and continuity, which in turn allows for informal social control options to punish abuse.

The public, in the form of CASC, LSG and their consultants, had been

working together, face-to-face, for about one and a half years, including the participation in 24 CASC meetings and 35 LSG meetings (not to mention attendance at numerous city council meetings, public workshops and neighbourhood meetings). As a result, many of those involved in the process ostensibly had ample opportunity to develop more of a personalized trust relationship, but, this did not happen because of the divergent interests involved, as well as because of the persistence of the formal agent-client contract, where the City (and not the public per se) was technically the client. In line with this reasoning, one participant, a member of the environmental group component of CASC, noted that the four public members of the Landfill Search Group were themselves technical people. He further commented that he felt that these four public members and the four City staff members of the LSG shared a sort of "technocratic alliance" based on a shared pro-technology ideology. According to this CASC member, this "technocratic alliance" had the effect of implicitly biasing members of the LSG from seriously considering the input from the lay-public (Fieldnotes, CASC Meeting June 29, 1994).

A second way in which problems associated with informal trust may be dealt with is that the principal can forgo the benefits of the division of labour by becoming a jack-of-all-trades. This is directly evidenced by the involvement of numerous "lay-experts" in the Guelph process. Many of the environmental and citizen activists, as well as ordinary residents affected by the potential landfill, educated themselves about the technical aspects of a landfill. This occurred to such an extent that terminology such as hydraulic conductivity, depth of overburden, aquifers, ground water discharge areas,

bedrock, poly-vinyl chloride liners, leachate, bedrock, silty-till and so on, were used in an almost casual manner by the lay participants in the Guelph Landfill Search Process.

However, the learning process involved in acquiring the technical knowledge pertaining to the siting of a landfill may be quite difficult in terms of both time and effort. First of all, the complexity of environmental risk matters makes it necessary for the "lay-expert" to devote a great deal of his/her time in the self-education process. For example, one prominent CASC member, a former choreographer trained in video production and graphic arts, attended up to eight public meetings a week, pored over many engineering documents, and networked with dozens of people across the city and abroad (Richard Dooley, The Guelph Mercury, July 17, 1994). During one meeting, in a state of exasperation, this CASC member made the following plea to the LSG:

> We're trying to review the materials, files and files, about hydraulic traps, liners, monitors, and sensors. We need help in deciphering this information. (Fieldnotes, LSG Meeting, August 17, 1994)

Furthermore, even though information was supposed to be fully accessible to the public, some CASC members still found that access was indeed a problem. A CASC member even suggested that City Council should intervene and try to force the consultants to cooperate with CASC because, according to her, CASC members who had directly requested technical documents were treated as "foreign animals" and denied the information with various excuses such as "the documents are only in draft form or incomplete at the time" (Fieldnotes, CASC Meeting, June 23, 1994).

The use of technical information by the citizens involved in the process may be

of two kinds. Field observations indicate that those involved in the *neighbourhood groups* (i.e. CORALS, VRNLG) had learned about the technical aspects of the landfill in order to effectively present and understand arguments as to why the landfill should not be sited in their area. On the other hand, others, such as members of the *environmental group* component of CASC had educated themselves in order to ensure that the technical consultants were "doing their job" with respect to environmental protection.[2] It is for this reason that some members of CASC often questioned the technical consultants on what exact technologies were to be used in the proposed landfill. For example, one CASC member stated the following:

> We want to know about contingency plans. We need to have some discussion about the type of technologies you [i.e. the LSG] are going to recommend... How much input will CASC have. Will we have any say in the type of technology going into the landfill? There are too many questions left unanswered and that leaves us sceptical. (Fieldnotes, CASC Technologies Subcommittee Meeting, August 24, 1994)

Much of the technical information used by lay individuals was directed towards questions of environmental risk, as such we will defer our more detailed discussion of technical information and self-education to the next chapter (which deals with the treatment of risk in the Guelph Landfill Search Process). For now, we can observe that the thrust of the above discussion on lay self-education indicates that some CASC and neighbourhood group members had rejected the benefits of the division of labour because they did not

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[2]   Both treatments of technical data illustrate the centrality of information in the claims-making process. In fact, information is one of the "resources" referred to in resource mobilization theory's sociological conceptualization of social movements.

trust the work of the technical experts to represent their interests.

The contract is a third strategy that can be used to ensure that the principal can potentially exert at least some control over the agent. The following discussion examines how a contract, as a way of dealing with situations of uncertainty and a lack of trust, entered into the Guelph Landfill Search Process.

In dealing with their distrust of technical expertise CASC members developed a document outlining what they considered to be a series of Minimum Acceptability Standards (MAS) relating to the proposed landfill. The introduction of the MAS document into the Guelph Landfill Search Process was perhaps one of the most contentious and controversial aspects of the process because the CASC wanted the LSG to accept, and be bound, by these specified standards, but the LSG refused.[3] The need for these standards was based on the CASC's assertion that:

> ...Sites had been identified based on the application of "desk top" data rather than field studies, and as such, it is not known if any of the sites are suitable for a landfill site. (CASC Report to the Landfill Search Group, July 21, 1994)

The CASC Minimum Acceptability Standards Subcommittee report consisted of two sections, the first dealt with technical criteria and the second with planning principles. The technical criteria section included requirements for: the minimum hydraulic conductivity of soils around the landfill, the minimum distance that the landfill should be from built-up areas and wells, the requirement that the maximum height of the landfill

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[3] The Minimum Acceptability Standards document was drafted by CASC in June, 1994.

not exceed 11 metres, and the requirement that the LSG exclude sites that would not be of an adequate size to accommodate a potential leachate treatment system. The second section exhorted the LSG to evaluate each potential site in terms of planning principles based on such criteria as, (i) "compatibility/ acceptability" (with consideration given to: use, zoning, current and future land use, impact on adjacent uses, form, natural environment), and, (ii) "desirability" (with consideration given to opportunity, availability of alternatives, economic hardship).

The controversy surrounding this issue stemmed from the fact that the Minimum Acceptability Standards drafted and endorsed by CASC were not accepted by the Landfill Search Group because they were viewed by the latter as being too restrictive (in regard to the technical requirements demanded). That is, it was felt that if the proposed Minimum Acceptability Standards were applied, they would "hand-cuff" the work of the technical consultants.

The situation regarding Minimum Acceptability Standards has been brought forth to illustrate the contractual form of a trust relationship in the Guelph Landfill Search Process. In the words of one member who helped draft the Minimum Acceptability Standards document:

> It [i.e. Minimum Acceptability Standards] is intended to provide a basic measuring point to make sure that, with all the trade-offs we are making, we don't get stuck with something that is bad for the community. (quoted in The Guelph Mercury July 28, 1994)

In other words, the MAS document was drafted as a form of contract intended to ensure

that the wishes of the community be incorporated (with regard to particular technical details). The need for such measures indicates a lack of trust in the technical consultant's fiduciary responsibility (and perhaps technical competence). This was realized by a community liaison member of the LSG:

> Why do people want MAS [Minimum Acceptability Standards]? Because people want some objective measure, rather than the reliance on LSG's "gut feelings". (Statement by a community liaison member of the LSG, Fieldnotes, LSG/CASC Meeting, August 24, 1994).

The "gut feelings" referred to above indicates the recognition by the community, of the subjective aspects existing in what was supposed to be an apolitical, technical process. It is these subjective aspects which in fact define the *discretionary* space of all professionals. If one does not have trust in the agent, then, one will take measures to eliminate or limit the agent's discretionary powers. This was the tacit and implicit sentiment underlying the MAS document. The reaction by the LSG and their technical consultants to this reduction in discretionary power was to assert that the imposition of the standards would "hand-cuff" and hinder their ability to do the technical work required in siting and designing a landfill. In this connection the LSG Chair noted:

> I, as do the engineers, have trouble understanding in theory the idea of "minimum standards". Rigid rules for all the indicators is not feasible. (Fieldnotes, CASC Meeting, June 14, 1994)

> We did not use Minimum Acceptability Standards as CASC had requested us to do because rigid, fixed standards should not be considered alone, but with many other considerations. (Fieldnotes, City Council Meeting, October 12, 1994)

The importance of trust in relation to resolving the dispute concerning minimum

acceptability standards was in fact made quite explicit by the community involvement facilitator. During one of several meetings aimed at resolving the impasse between the LSG and CASC, the facilitator (who was the acting chairperson at the meeting) made the following plea to the two parties in her introductory remarks:

> *We need to address the issue of trust*, we need to have trust in one another, we have to stay away from personality conflicts and concentrate on the substantive. (Fieldnotes, September 14, 1994 Joint LSG/CASC Meeting)

The several meetings between CASC and the LSG that were held to specifically resolve the issue of Minimum Acceptability Standards all ended in a stalemate, as both parties maintained entrenched positions. CASC then went directly to City Council, and their representative pleaded their case. As it turned out, City Council voted against forcing the LSG to apply the CASC recommended standards.

The circumstances surrounding the request by CASC to City Council also contributed to the sense of distrust in the process. The evening that City Council was to consider the CASC request that LSG adopt the Minimum Acceptability Standards, the LSG presented to Council their own document outlining their rationale for rejecting the standards. The problem was that the CASC was not informed that such a document was being prepared by the LSG and they therefore were not granted the opportunity to respond to the document. Further, CASC and the neighbourhood groups felt that the LSG report was wrongly interpreted by City Council as being a joint LSG/CASC report. In other words, it was felt that City Council was deliberately misled by the LSG. In a subsequent

CORALS meeting one member made the following remarks about that turn of events:

> Quite frankly, all our recommendations fall on deaf ears. But, when LSG's report on MAS [i.e. Minimum Acceptability Standards] was submitted at 7 p.m. the same night, City Council said, "Oh, the LSG has submitted a report." They voted on it, the vote was ten to one in favour of LSG's report, and that was it. What this is telling us is that we have to pull out the troops and all of us have to demonstrate on October 11 [i.e. the date of the preferred site announcement]. All of us are discouraged by Council's actions. Council was not impartial. (Fieldnotes, CORALS Meeting, September 20, 1994)

Similar comments were made by members of CASC:

> This confirms my suspicions that this site search is not as open as the LSG has led us to believe. Public members of the LSG and CASC have made it clear that their number one priority is the protection of ground water. The LSG has failed to do this by not accepting the minimum acceptability standards. (Fieldnotes, City Council Meeting, October 12, 1994)

> I have a bit of scepticism of what the government will do, whether municipal or otherwise. This is why I wanted MAS [Minimum Acceptability Standards] in place. It's some form of guarantee that the public's input is being considered. (CASC member, Fieldnotes LSG/CASC Meeting, August 24, 1994)

The actions taken by CASC to circumvent the LSG and go directly to City Council highlights the fourth way principles can deal with their lack of trust in their agents: refusal to deal with agents altogether. For example, one may decide to keep his or her money at home instead of in a bank. In the case of the Guelph Landfill Search, some members of the neighbourhood liaison groups refused to participate in the process because they felt that such participation may jeopardize their position in a future

Environmental Assessment Act hearing.[4] However, they could not fully disengage themselves from the situation because the fact always remained that their land could be appropriated by the City against their will.

A final strategy that principals may use to avoid the problems of informal trust is that they may spread their risk by investing in several agents at the same time. In the case of the neighbourhood groups (i.e. CORALS and VRNLG) this spreading of risk was done through the hiring of private technical consultants (i.e. counter-experts).[5]

From the discussion to this point, it can be clearly seen that many aspects of the relationship between lay members of the community (i.e. the environmentalists and stakeholders) and the experts was based on the principal-client model of impersonal trust, where the principals engaged in various strategies to deal with their lack of trust. We will now consider some factors that may account for the fact that this lack of trust persisted despite the fact that the Guelph Landfill Search Process was intended "to inspire confidence and trust".

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[4] The EA Act requires that there be adequate public consultation at some point in the landfill siting procedure. The newly elected Conservative government however relaxed this requirement in 1996.

[5] The role of counter-experts in the Guelph Landfill Search Process will be discussed in the next chapter in dealing with the issue of how competing claims to technical knowledge contributed to risk consciousness.

Section III Towards a Sociology of Trust

Following Barber (1983:5), we will begin our analysis of trust by considering a factor that is common to all definitions of trust, namely, the notion of *expectation*. For Barber (1983:9) expectations are built into social structures, and in this light, roles and institutions are to be understood as short-hand ways of referring to complex patterns of expectations among actors. There may be three kinds of expectation: (i) the expectation of the persistence and fulfilment of the natural and the moral social orders; (ii) the expectation that partners in the interaction will carry out their fiduciary obligations and responsibilities, that is, that they will fulfil their duties to place the others' interests before their own (in certain situations); and, (iii) the expectation of technically competent role performance from those involved with us in social relationships and systems. Since the expectation of technical competence and fiduciary responsibility are particularly relevant to expert-lay trust relations we will concentrate on these two types.

Trust, Motive and Expectations

Luhmann (1973:41) notes that the decision to confer trust to the other will be founded on the *motivation* attributed to the other's behaviour. That is, in order for trust to be conferred, the conduct of the other must be viewed as reaffirming the other's identity. In this sense, conduct must fulfil *expectations*, and, as was noted by Barber

(1983), expectation is an important aspect common to all forms of trust relations.[6]

However, Luhmann (1973) notes that, before the individual puts his or her trust in the other, the individual must also be assured that the action of the other is not coerced. That is, the other must be seen as acting on the basis of his or her own freedom. Only if there is freedom of action, can the other be held legitimately responsible for his or her actions.

The freedom of action is a particularly contentious issue in the case of technical professionals. Starr (1982:15) defines a profession as that occupation which: (i) regulates itself through systematic, required training, and collegial discipline; (ii) that has a base in specialized technical knowledge; and, (iii) has a service rather than profit orientation, enshrined in its codes of ethics. The professional engineer has the above characteristics, but engineering is different from the other professions in that engineers are usually *employees*, consequently, they lack the greater degree of autonomy afforded to other professionals. This is a consequential factor in the Guelph Landfill Search Process because the technical consultants involved were retained by the City of Guelph. This meant that the client for the consulting engineering firm was technically the City of Guelph, and not the citizens of the municipality (although it should be remembered that it was the LSG's decision (made with the assistance of CASC) to retain the particular

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[6]   In fact, if the fulfilment of expectation is felt to be certain by the individual it will constitute part of his or her "taken-for-granted reality" (in the sense developed by ethnomethodologists). The breaching experiments carried out by Garfinkle and his students essentially describe situations in which such taken-for-granted expectations are not met.

engineering firm used in the process). Although this was formally the case, the City of Guelph had adopted their innovative public involvement process in order that the public could effectively interact with the technical staff on a face-to-face basis. In this sense the City seemed to have hoped that the citizens would regard themselves as the "employer" of the professional experts rather than regarding the City bureaucrats or elected officials as the experts' employer. As was discussed previously, the overall intention was to eliminate any political influences in the search. However, this approach did not seem to be adopted by some lay-participants. The perception of some members of the public was that the technical consultants either: did not have the required freedom of action from the City bureaucrats, or that they had too much freedom of action and would use this to pursue pecuniary interests. Let us consider both of these perceptions in turn.

Some participants in the Guelph Landfill Search Process (particularly those in CORALS) felt that the technical consultants gave primary allegiance to the City of Guelph rather than to the public *per se*. As such the expectation of fiduciary responsibility on the part of the technical consultant was questioned by some lay participants. In light of their past experiences with the tax increase imposed by the City of Guelph shortly after annexation (despite assurances to the contrary from the City), some of the citizens of Puslinch Township participated in the Guelph Landfill Search Process with a lack of trust and a cynical eye. The following comments made by CORALS members indicated such a viewpoint:

It seems that Puslinch was railroaded into becoming part of Guelph through annexation. I am suspicious that our area is now being considered for landfills. (CORALS Member, Fieldnotes, LSG Meeting for the announcement of potential sites, May 18, 1994)

[The Mayor of Guelph] and [a City Councillor] pleaded for the City of Guelph that annexation was required for industrial development. We feel betrayed because in our wildest dreams we did not expect we would host a landfill..I and the members of Puslinch feel cheated by LSG and [the Mayor of Guelph]. (Fieldnotes, LSG Meeting for the announcement of potential sites, May 18, 1994)

We assumed that the tax increase was the first and last change that annexation would have on our operations. We were wrong. In 1994, your Landfill Search Group, LSG, selected five possible sites, four of which are almost adjacent to our facility. (Letter from the manager of a senior citizen retirement home to Mayor of Guelph, June 16, 1994)

I find it overwhelming that the ink is barely dry on annexation before we get dumped on with a doubling of taxes and now, the City is literally dumping garbage in our back yards...This latest move convinces me that the residents and businesses were totally misled and lulled into a false sense of security during the annexation process... While the City was busy selling annexation as being needed to meet the growing industrial, commercial and residential needs of the city, it's now looking more and more like the real issues are taxes and garbage. (Letter from the President and General Manager of a golf and country club to Guelph City Council, June 2, 1994)

The above evidence indicates that some CORALS members felt that annexation had occurred specifically for the purpose of locating a landfill within the area. Consequently, the motives of the City of Guelph's LSG (and their consultants) were indeed questioned.

The possibility of the pursuit of pecuniary interest was raised in a meeting in which the LSG was to determine the suitability of Hanlon Road site (i.e. the site that was selected for detailed examination). A member from the public pointed out that a conflict

of interest may be present in the relationship between the LSG and their technical consultant. He pointed out the possibility that the LSG's consulting firm may be surreptitiously promoting the site in order that it may receive the contract for the actual construction of the proposed landfill. However, the issue of fiduciary responsibility is a sensitive one and some felt it was not appropriate to discuss such matters in an open forum. It was with this sentiment that one of the community liaison members of the LSG responded to the accusation as follows:

> Here the issue of professional duty and trust come up, and I wish we wouldn't talk about it. (Fieldnotes, LSG Meeting, October 5, 1995)

A similar concern was implied in a statement by a CASC member:

> The public has been let down by their elected representatives who have only given lip service to public input and have tried to solve the problem of where to locate a landfill by throwing good money after bad on overpriced consultants who have not identified any viable sites and have left the situation in a state of confusion. (Presentation excerpt, Special Landfill Meeting, February 26, 1995)

Fiduciary responsibility was also raised by one Guelph City Council member, who made the following comments:

> For almost everybody a landfill is just a dump, but for the consultants it is a gold mine!" (Fieldnotes, City Council Meeting, October 12, 1994).

Underlying such an assertion is the conviction that there are differences in approach between the public (which is concerned with the public good) and the technical consultant (who in this case was seen as concerned with making profit). The same councillor made

the following comment in relation to an LSG request for a budget increase[7]:

> I want to make sure this process is not consultant driven. I don't see why we should be spending money to see if we can put a dump on top of our aquifer. It's just not acceptable. (Fieldnotes, October 12, 1994, Guelph City Council Meeting)

To this, the chair of the LSG replied that he felt that it was necessary to consider the trade-off between saving money versus the risk of endangering the environment and the City's drinking water. He noted that:

> We [the LSG] have to do it the right way and protect the environment. We have to meet the requirements of the Ministry. It would be a waste of money if we didn't do things in an acceptable fashion. (Fieldnotes, October 12, 1994, Guelph City Council Meeting)

In other words, the LSG chairman was defending his actions by noting that things must be done in a manner that ensures public safety and prevents environmental damage and was therefore justifying his actions in terms of fiduciary duty.

Thus, we can see that lack of trust in the fiduciary responsibility of the technical consultant, as well as the attendant issue of the questioning of motive, arose at several points in the Guelph Landfill Search Process. Such a questioning of motive and identity gave rise to a situation known as a *suspicion awareness context* (Glaser and Strauss, 1964).[8] In a suspicion context each actor in the dyad suspects that one another's

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[7]   This particular member of Guelph City Council was a past president of the Association of Professional Engineers of Ontario.

[8]   Glaser and Strauss (1964) identify three other forms of awareness contexts: *open awareness context* -- each actor knows the other's true identity, and, his/her own identity in the eyes of the other; *closed awareness context* -- one actor is ignorant of the other's identity, or, the actor is unsure of his/her identity in the eyes of the other;

identities are not what they appear to be. In the case of the expert-lay interactions in the Guelph process, the lay-member had to determine if the "true" role-identity of the technical expert is that of a "neutral technical consultant", a "partisan political actor", or a "concerned environmentalist". The technical consultant, on the other hand, had to determine if the lay-member's true identity was based on a "NIMBY" sentiment, or actual environmental concerns and altruistic concerns for public health. The presence of the suspicion awareness context therefore is another indication of the problematic expert-lay trust relations that were present in the Guelph Landfill Search Process. The suspicion context also meant that some of the actual work of the technical experts was eyed with suspicion:

> Some suggestions are accepted, but others seem to be reworded. I feel that the public input is being reworded and manipulated so that it turns out to be less strong. (Fieldnotes, CORALS Meeting, September 20, 1994)

In a similar vein, a CASC member made the following comment:

> I am suspicious that, what is given back to CASC from the engineer's work is not complete. (Fieldnotes, CASC Meeting, June 23, 1994)

The development of a suspicion awareness context and the search for the other's motives compounds the problems that enter into expert-lay trust relations. In line with this, Giddens (1994) observes that, because trust is at issue at access points, the *demeanour* of the expert becomes very important in the interaction between the technical expert and the lay-person. The demeanour of professionals has of course always been important, as

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Pretence awareness context -- each actor is aware of the other's true identity, but, both pretend they are not aware.

for example in the solemnness of the doctor, the grave deliberations of the judge, or the cheerfulness of the steward. In all such cases the professional's demeanour is meant to help reassure the lay person. In this sense the expert-lay interaction has always been characterized (i.e. the situation has been defined) by a need to establish trust of the expert by the lay person. Thus, one CASC member noted that:

> Experts may be very good in their own field, and *are usually very persuasive. They can be intimidating, due to their expertise.* It is very rare, however that they have the broad perspective needed to draw appropriate conclusions to most problems. (Emphasis mine) (Letter to Guelph City Council, January 29, 1995)

It is in regard to this that Lee and Jones-Lee (1993:4) observe that, frequently, layperson regulatory agencies are not knowledgeable enough to discern the partial truths or clever wordings in technical documentation. Consequently, it is the "*relative demeanour of the experts*" that often times decides the issue involved in landfill controversies. Today, however, this public-relations situation has become even more crucial because of the sheer magnitude of the collective risk faced. In the Guelph case, the risk is grave: the contamination of drinking water would affect the whole community. In other words, the public realizes that there is much to lose, or to pay the price for, if they wrongly place their trust in the expert.

The development of a suspicion awareness context, the search for motives, and the employment of strategies of impression management may occur in any situation in which "strangers" come to together. But, what is unique about the occurence of these factors in the GLSP is that their presence is symptomatic of an underlying quality of the

risk society. Namely, they are the result of a lack of trust in the system of technical expertise. In this connection, Giddens (1994a:89) observes that:

> Trust based purely on the assumption of technical competence is *revisable* for much the same reasons as knowledge purchased through methodological scepticism is revisable; it can in principle be withdrawn at a moment's notice. Hence, it is not surprising that the purveyors of expertise often feel led to place a special premium on the services they have to offer, or to make particular efforts to reassure patrons at the point of contact with them.

As such, the lack of lay trust in expertise (to be discussed in more detail at a later point in this chapter) creates problems of legitimacy for experts who may then employ impression management techniques in response. Such a situation is exacerbated in the risk society because the types of human-made risks we now face have grave consequences for large numbers of people, and secondly, because such risks are inextricably linked to uncertainties that are becoming increasingly known by the lay population (particularly if the lay members of the community are provided the opportunity to directly deal with environmental risk issues, as they were in the GLSP). It is in this light that Giddens (1990:130) notes that:

> Widespread lay knowledge of modern risk environments leads to awareness of the limits of expertise and forms one of the "public relations" problems that has to be faced by those who seek to sustain lay trust in expert systems.

The likelihood of conferring trust therefore is also related to the nature of the risks we now face. We will return to this trust-risk relationship in the next chapter.

Clearly the lack of trust conferred to the technical consultants in the GLSP

involved the socio-historical particularities of that situation (such as the problems related to both the annexation of Puslinch Township and the previous joint search that led to the selection of the controversial N-4 site), as well as their lack of trust in the system of science noted above. However, the existent lack of trust may also involve some more general features of late modernity such as the decline in deference to professionals in general.

Barber (1983:131-132) notes that professionals are expected by society to "represent the height of trustworthiness with respect to technically competent performance and fiduciary obligation and responsibility." However, he also notes (along with Beck,1992; Fischer,1990; Giddens,1990; Hadden,1991; Kenreuther and Patrick,1984; Lasch,1984; van der Daele,1992; Waller, 1994; Walsh,1987) that there has been a *decline in deference* to professionals in modern society. According to Barber (1983), the reasons for this decline in deference and trust include the following: (i) the ever more powerful knowledge that professions now have to influence the individual and public welfare; (ii) the increasing strength of the value of equality in society, with the drive for the less powerful (of all kinds) to have more control over the issues which vitally affect them; and, (iii) the increased knowledge and competence that a better educated public brings to bear on its relations with professionals, experts and leaders. An additional reason given by Van der Daele (1992:324) is that public controversies surrounding nuclear energy, chemical plants, waste management and genetic engineering are extensively covered by the media, and such widespread coverage can only add to the

general public's scepticism.

As we have seen from the discussion thus far, these factors accounting for the decline in deference were largely present in the GLSP. The type of technical knowledge that experts utilize is "powerful" for the reason that the utilization of such knowledge leads to the construction of projects which may have serious consequences for a large number of people (such as ground water contamination from an engineered landfill). In the Guelph Landfill Search Process members of the community were given the opportunity to work *with* the technical consultants in managing this risk. Secondly, the Guelph Landfill Search Process represented a form of "participatory" democracy in which members of the public were able to deal with the environmental issues that had the potential to directly affect them. In this light, the LSG, CASC and the neighbourhood groups all represent the organizations that facilitated the "democratic process".[9] This form of "participatory" democracy should be contrasted to "representative" democracy in which political and technical elites are *entrusted* by the public to represent their views. Third, as we have discussed briefly (and will be elaborated upon further in the next section), members of the lay public have engaged in a process of self-education to apprise themselves of technical matters so as to more effectively work with the technical consultants. As we shall now discuss, such a process of (lay) self-education in technical

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[9]   Actually, some members of CORALS felt that the process was not democratic at all because the recently annexed residents of Puslinch County did not have elected representatives on Guelph City Council.

matters was uncommon in simple modernity, but in the risk society it has become relatively more common.

"Lay-Experts", Lay Individuals, and, Technical Experts in the Guelph Landfill Search Process

As was discussed above, the innovative process of having direct public input into techno-environmental decision making was designed to encourage the development of a more personalized form of trust. As Waller (1994:3) notes:

> Bridging the gulf of perception and understanding between experts and the lay public through the cooperative work of task forces might help to restore the *trust* necessary to the effective exercise of power. (emphasis mine)

In dealing with technical matters, Waller (1994:2) notes that in modern society the amount and complexity of scientific knowledge makes it difficult for the ordinary citizen to evaluate complex environmental issues, engage in public debate, or challenge the expertise of professionals. In this sense, ordinary citizens have become more reliant upon professionals. At the same time however, Rip (1992:363) points out that the degree of trust people have for experts depends on their overall confidence in science. Therefore, the need to rely on professionals does not necessarily lead to the citizen becoming more trusting of technical professionals. In line with this reasoning Fischer (1990:49) notes that:

> The expertise problem clearly poses a dilemma. We live in a world utterly dependent on expert knowledge but find ourselves unable to comfortably put our trust in professional experts. Among the various manifestations of this dilemma is a remarkable loss of confidence in expertise per se.

As was alluded to previously, some individuals in the lay community were able to deal with this dilemma by educating themselves so that they could challenge or question some of the work of the technical experts. The acquisition of knowledge and skills by the layperson, in fact, changes the power differential existing in the expert-lay relation. In line with this, Giddens (1994:84) defines an expert as that individual who can lay a claim to knowledge or skills which the layperson does not have. Consequently, the concepts of 'expert' and 'layperson' should be understood to be contextually relative terms. There are many levels of expertise, and what counts in the encounter between the layperson and the expert is the imbalance in skills or information which "for a given field of action, [that] makes one an 'authority' in relation to the other" (Giddens, 1994:84). In this light, a "lay-expert" is a non-professional lay individual who empowers him or herself through self-learning.

In a world filled with professional experts and "lay-experts", and the decline of deference, the issue of legitimacy becomes crucial. Thus, Waller (1994:4) notes that the central questions in dealing with environmental issues in a public forum is how experts can be held publicly accountable, and how they are able to shape public perceptions, involvement, and compe ence, in such a way as to maintain an oligarchy in the midst of democratic institutions.

The Guelph Landfill Search Process attempted to address such issues by adopting an open, inclusive, and accountable process whereby "lay-experts" and concerned citizens could work collaboratively with the technical consultants. Yet, this did not seem to be enough. Towards the end of the process, at the point in which the Hanlon Road site was to be compared to the N-4 site by Guelph City Council, a special meeting was held on February 26, 1995 and the CASC resurrected itself. In this meeting the CASC decided that both sites were unsuitable, and that arrangements should be made to encourage City Council to embark on a new joint landfill search comprised of *only* members from the community. The following quote is from this meeting:

> We at CASC tried our damnest to get LSG to consider Minimum Acceptability Standards; they didn't. Therefore the LSG did not fulfil their mandate. The LSG didn't do their job, they let the technical consultant lead them up the garden path. I think there should be no consultants involved. It should be all volunteers from the public. I would not sit on any search committee which had a consultant sitting on it. (Fieldnotes, CASC member, Special CASC Meeting, February 26, 1995)

Two prominent members of CASC drew up a plan of action which also indicated a lack of trust in technical experts:

> The solution I see to this mess is for members of the public who are dissatisfied with the status quo to *empower* themselves and shape the future the way they think it should unfold...[I] suggest that the public can find their own landfill with the expertise available from the members of the public present here. There is no need to spend on consultants or legal advisors. *We can use specialists to answer specific questions but do not put them in charge.* (Document distributed at Special CASC Meeting February 26, 1995)

This illustrates the extent to which lay persons in late modernity are willing to empower

themselves because of their lack of trust in technical experts. However, others involved in the Guelph Landfill Search Process (particularly those associated with CORALS and VRNLG) felt that they could not competently undergo a process of self- learning (as the "lay-experts" had), and as such, these individuals supported the hiring of counter-experts. In other words, they were resigned to taking the role of the layperson and not the hybrid role of the "lay-expert".

An example of such a perspective is expressed in a letter written by a CORALS (a neighbourhood group) member to the Guelph Mercury (July 28, 1994). In this letter the author expresses a concern regarding a request by the LSG for her personal input into a community information workbook that was distributed to residents by the Landfill Search Group. The objective of this workbook was to obtain information about the community directly from the potentially affected residents, as it was assumed that they would have a more intimate knowledge of their area. These data were then to be used by the CASC and the LSG in the technical exercise of comparing the five potential sites being considered. In a letter to the editor entitled "We're not the experts", a Puslinch resident wrote that:

> The first part of the workbook asks that I list and/or describe wildlife, endangered species, rare aquatic life and so forth. *I am no ecological expert*. Should I have listed the hawk we saw the other day as big - or perhaps the rabbits (genus bunny) and the ground hog that lives by the roadway or the big turtle some trucker killed up by the goose pond - or how about the Canada goose flock which has a breeding area in the wetland. (emphasis mine) (The Guelph Mercury July 28, 1994)

This issue, concerning the direct input of information from residents, was raised

at a LSG meeting (July 21, 1994) held before the letter cited above was printed. In this meeting the public involvement facilitator (who chaired many of the CASC meetings) noted the following (addressing members of the neighbourhood group CORALS):

> It is you, the community which provides information about the history, cohesiveness, networks etc., and how this will be affected by a landfill. What we're looking for is a community-based understanding or description of the community in which you live. We are not looking for technical expertise, just environmental concerns the member of the community has directly experienced. For example, in Peel [County], in an IWA search, a community member identified a heronry, which led to the disqualification of the site for further consideration.

The main consulting engineer added that, in the Guelph search to date, a unique habitat, namely a wetland, had been identified in one site by a community member. This wetland was not in the public records. This led to the modification of the potential landfill footprint (and later, the rejection of it on the basis of insufficient capacity).

A similar statement regarding the inappropriateness of lay-members to participate in technical meetings was given in a presentation by another CORALS members just before the start of a public workshop on site comparison criteria:

> LSG cannot assume that members of the general public not experienced in environmental, geological and municipal affairs to adequately and expertly analyze and judge the criteria necessary to select the best possible landfill site. Therefore, CORALS will request a full environmental assessment hearing should any of the potential sites be chosen as the preferred site. Furthermore, CORALS' executive requests LSG to initiate on behalf of the CORALS group pre-intervenor funding so that CORALS can receive advice from independent experts in the fields of hydrology, geology, engineering, planning and ecology.. (Draft Workshop Record, June 8, 1994)

To this statement, the Chair of the LSG responded that the Landfill Search Group recognized that members of the public may not be "experts" in the given areas, but he stressed that this should not be taken as a point of concern. He asserted that the LSG was looking to the public for their common sense and intuition regarding how best to compare sites (i.e. their knowledge about local environmental conditions).

Trust and the Strengthening of Community Ties

So far we have discussed and emphasized the lack of trust that informed the relations between lay individuals and technical experts, however, the trust between members of the community may have, in fact, been consolidated by the landfill search process. Upon becoming involved in the landfill search process, members of the neighbourhood groups formed a community identity which did not exist previous to their involvement. For example, the leader of CORALS expresses just such a sentiment during the final CASC meeting:

> The only good thing that has come out of this landfill search is CORALS, and the development of a sense of community I now have. The good friendships I have formed with my neighbours is something I haven't felt since my experiences in the war. (Fieldnotes, CASC Meeting, September 22, 1994)

This community identity may have been forged on the basis of the collective risk the participants faced with an impending landfill site. According to Edelstein (1988:139) community identity is based on:

> Feelings of similarity, interdependence maintained by mutual support, and

the sense that they are part of a structure that is larger and more stable than the individual can ever have in isolation.

For example, when the five potential sites were announced, the citizens of Puslinch decided to form one neighbourhood group (i.e. CORALS), instead of four such groups, to represent the residents living on or near any of the four potential sites in the annexed region. The residents of Puslinch felt that they had been similarly victimized, not only in regard to the taxation issue (i.e. the rise in taxes after annexation), but, also because of the fact that four of the five potential sites were located in their region.[10] Throughout the whole process CORALS insisted that the four sites collectively represented one shared community. This outlook had important implications for the willingness of CORALS members to participate in the Guelph Landfill Search Process. For example, when a public workshop was held to select a method to compare potential sites, some CORALS members felt that it would be unethical for them to participate for the following reasons:

> This is going to sound religious, but, I believe that participating in this workshop is un-Christian because it pits neighbour against neighbour. CORALS has made it clear that it considers the three sites [at the time] in Puslinch as one site, so we are not going to force one Puslinch site to be ranked against the other.(Fieldnotes, LSG Public Workshop, August 9, 1994)

Such problems also existed with regard to the subsequent public workshop in the process, the site comparison weighting and ranking of criteria working session. The quandary that CORALS members were put in was recognized by the LSG Chair who noted the

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[10]   The CORALS leader felt that the only potential site that was not in the annexed area (i.e. the Victoria Road site) was "thrown in as a sham -- a red herring" (Fieldnotes, LSG Meeting, May 18, 1994)

following in a letter of response to the CORALS leader:

> I understand the genuine nature of the concern. On the one hand, members of CORALS do not want to be put in the position of choosing among the three potential sites in the annexed area, pitting neighbour against neighbour. On the other hand, you do not want to stack meetings with a large number of CORALS members so as to force the landfill into the Victoria Road neighbourhood. I sympathise with the ethical and human problem which exists. I understood you to take the position that you would prefer that LSG take upon itself the responsibility of making the final choices which will identify the preferred site rather than of leaving it to the open community process which may have the potential of being stacked toward one site or another. (Letter from LSG Chair, August 28, 1994)

Thus, members of the neighbourhood groups felt united on the basis of their common opponent (i.e. "the City") which in turn increased their feelings of community solidarity.

From the above discussion, the conclusion can be drawn that community involvement seems to have led to a greater distrust of political actors and technical experts while at the same time strengthening the lay individual's trust of his or her neighbours (who share a common situation).

Section IV   Trust in the Institution of Science and Technology

To this point we have primarily discussed the trust pertaining to the relations between the technical experts and lay individuals involved in the Guelph Landfill Search Process. This sort of trust relation is based on what Giddens (1990:88) calls "facework commitments":

> Trust in persons involves facework commitments, in which indicators of
> the integrity of others (within given arenas of action) are sought.

However, in the case of expert-lay interactions, the conceptualization of an environmental

issue may also be influenced by the trust that the actors have in the *system* or *institution*

of science and technology itself. Thus, Gartner-Lee (1993:20) notes:

> Generally, the greater one's belief in science and technology, the more
> likely one will believe that a waste facility can be constructed and operated
> safely.

This trust in the abstract technical expertise system is referred to by Giddens (1990:88)

as "faceless commitments":

> Trust in systems takes the form of faceless commitments, in which faith
> is sustained in the workings of knowledge of which the lay person is
> largely ignorant.

One of the key insights that Giddens (1990:83) makes is that the nature of (late) modern

institutions is deeply bound with the mechanisms of trust in *abstract systems* (especially

expert systems). In dealing with expert systems, the individual must place faith in the

system of science just to simply live one's day-to-day life. That is, faith is not in the

technical expert per se, but, in the abstract quality of the technical knowledge system.

In other words, although the individual must have faith in the technical competence of

the expert, he or she must also trust or invest faith in the *authenticity of the expert*

knowledge system that is applied by the expert (and "backs" the given technological

product or service; such as a landfill and the attendant monitoring technologies).

According to Giddens (1990), faceless and facework commitments interact in a complex

manner in situations in which lay individuals are forced to deal with experts ... at access points) and abstract systems. Because of this, problems in trust arise as lay individuals are exposed to, and must deal with, the flaws present in the abstract system of technical expertise. Such exposure will be expected to ultimately result in a weakening of lay trust in the institution of science and technology. The following quantitative analysis will investigate the degree to which this had happened with regard to those involved in the Guelph Landfill Search Process.

A Quantitative Analysis of Trust in the Institution of Science and Technology

Aside from the ethnographic evidence presented thus far, other indications of the lack of trust that participants had in the system, or institution of science, may be inferred from the results of the Technological Beliefs Index component of our survey. The Technological Beliefs Index was based on the responses to the following four questions (the corresponding counter-statement follows):

- Science and technology have improved our quality of life
- Science and technology have worsened our quality of life.

- Modern technology has increased our freedom and independence.
- Modern technology has reduced our freedom and independence.

- Complex technologies can be made virtually risk-free through continual improvements.
- Complex technologies will always be risky because of the chance of human error.

- Science and technology will always be able to find solutions to our problems.
- Science and technology often create more problems than they solve.

Following Olsen et al. (1992), a composite index was constructed by aggregating and weighting the responses to the above four questions. The respondents were then classified into three categories: strong, weak, or non-technological believers (for details of this procedure please see Appendix 9). The results of this procedure (see Table 4.1 below) indicates that only 10% of our sample of those involved in the Guelph Landfill Search Process (GLSP), had a strong trust or confidence in the ability of science and technology to solve humanity's problems, while 13% had a very low confidence. The overwhelming proportion of respondents (77%) indicated that they had only a *weak* trust in the institution of science.

Table 4.1 Belief in Science and Technology

Category	Percentage of Participants in the GLSP Sample N=40	Percentage of Olsen et al. (1992:40) Sample N=667
Strong Science & Tech Believers	10%	15%
Weak Science & Tech Believers	77%	62%
Non Science & Tech Believers	13%	23%

The percentage of those involved in the GLSP who had a weak trust in science is higher than the corresponding findings of Olsen et al.'s (1992) study of the general population (of Washington State) which rendered a result of 62%. This 15% difference (which is statistically significant $p < .05$, $t = 1.90$) may be accounted for by considering the fact that

those involved in the innovative GLSP had first-hand exposure to scientific and technical activities, and, as a result, were more aware of the problematic and imprecise character of science.

This awareness of the pitfalls of science, and the lack of trust thereby incurred, is indicated by responses to survey question Q3: "Complex technologies will always be risky because of the chance of human error." versus the counter-statement "Complex technologies can be made virtually risk-free through continued improvements.". The latter statement implies an implicit trust and confidence in the ability of science to furnish absolute knowledge, because it is only through the obtaining of absolute and complete technical knowledge that the expert can design and produce an entirely risk-free technology. Therefore, agreement with the first statement indicates agreement with the view that the expert will never be able to obtain the absolutely reliable knowledge required to produce risk-free technologies. As we shall see later, such a belief is to be expected in late modernity because the awareness of the revisability of technical knowledge precludes the ability to obtain absolute knowledge (and therefore risk-free technologies as well). The results obtained indicate that 18% more of those involved in the GLSP than those in Olsen et al.'s (1992) study (80% compared to 62% respectively) felt that technologies will always be risky (see Table 4.2, below).[11] This result is not unexpected because much of the discussion in the GLSP dealt with issues of the

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[11]   This percentage difference is statistically significant (p<.01, t=2.31).

environmental risk associated with landfills and landfill technologies (to be dealt with in more detail in Chapter 5). Experiences of dealing with risk-related issues at the access point (i.e. at the GLSP meetings) is likely to lead to a raised risk consciousness. This heightened awareness of risk will, in turn, commensurately decrease the amount of trust members of the GLSP confer to science and technology in general.

A lack of trust in technology was also indicated by responses to Q19 (see Table 4.2, next page), which asked GLSP participants whether they felt that simple (as opposed to sophisticated) technologies should be used whenever possible. The rationale is that, if the individual has a large degree of trust in technology (and the scientific knowledge which is behind this technology), then such a person is more likely to support sophisticated technologies. On the other hand, supporters of simple technologies may feel that complex technologies have a greater potential for failure (and therefore endangerment), as more things can go wrong with such technologies.[12] In other words, they may simply feel that complex technologies are riskier. In line with this reasoning, only 16% of the respondents in our survey supported that widespread use of sophisticated technologies (30% were undecided and 55% supported simple technologies). Whereas 55% of the respondents in our GLSP survey supported simple technologies, Olsen et al (1992) found that 64% supported the same. The 9% difference is statistically significant $(p < .01, t=2.31)$ and therefore must be examined. The fact that 9% less of the GLSP

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[12]   For an excellent sociological discussion of what and how things can go wrong with complex technologies, see Charles Perrow (1984): *Normal Accidents: Living With High-Risk Technologies.*

Table 4.2   Distribution of Responses to the Science & Technology
Belief Indicators

Survey Statement	Percentage of GLSP Sample Who Agreed (Strongly or Mildly) N=40	Percentage of Olsen et al.(1992:39) Sample Who Agreed (Strongly or Mildly) N=672
Q1. Science & technology have improved our quality of life.	83%	85%
Q2. Modern technology has increased our freedom and independence.	75%	62%
Q3. Complex Technologies will always be risky because of the chance of human error.	80%	62%
Q4. Science & technology will always be able to find solutions to our problems.	23%	29%
Q16. Citizens should have the major say in deciding technical issues.	33%	26%
Q19. Simple technologies should be used whenever possible.	55%	64%

members supported simple technologies compared to the general population at first sight seems contradictory. One would expect that since the GLSP members had a heightened awareness of risk, and trusted science and technology to a much lesser degree (as described throughout this chapter), that they would prefer simple technologies to a much higher degree than the general population. One factor to consider as to why the expected result was not forthcoming was the large proportion of undecided respondents. 30% of

the respondents were unsure of whether to support either sophisticated or simple technologies. These people may have supported sophisticated technologies before participating in the GLSP but, as they gained experience with the workings of technical experts and technical knowledge through their participation, they may have started to reconsider the possibility that such technologies may fail. As such, at the time our survey was administered, they may have been undergoing a transition from supporting complex technologies to simple technologies, thereby resulting in the large proportion of undecided responses.

A further indication of a lack of impersonal trust in science as a system is given by the responses to Q4 (see Table 4.2, above): "Science and technology will always be able to find solutions to our problems." versus "Science and technology often create more problems than they solve.". The results show that the majority of those sampled (48%) believed that science creates more problems than it solves (30% undecided, only 22% disagreed). These results are comparable to Olsen et al's (1992) study: 46% agree, 24% undecided, 29% disagreed. The fact that the majority disagreed with the proposition that science *will always* find solutions implies that many respondents may have realized that scientific knowledge is always revisable and never absolute.

From the above quantitative evidence it can be generally concluded that the majority of participants in the Guelph Landfill Search Process had, at best, only a *weak trust* in the system of science and technology. This weak trust in the technical expert system will in turn influence the interactions that were observed between lay individuals

and technical consultants. It is with respect to this point that Luhmann (1973:53) notes that a sort of *diffuse trust* is involved in matters that pertain to technology and risk management. This diffuse trust is based on the assumption that sufficient *controls* regarding the reliability of expert knowledge are built into the technical knowledge systems themselves (i.e. in the institution of science itself). If this is thought to be the case then, the personal motive of the expert becomes irrelevant, as the system controls are expected to function independently of the personal motives implicated in the given situation, thus ensuring the reliability of the technical system. In other words, the motives of the technical experts are never questioned because the lay individual's overall trust in the institution of science will automatically ensure trust in the agents and products of science (i.e. experts and technologies, respectively).

Such a unquestioned faith in science and technology may have existed in simple (industrial) modernity. But, as we have seen from the above analysis, the development of a suspicion awareness context, and the weak trust in science and technology indicated by the quantitative data, suggests that both the motives of the technical expert, and trust in the institution of science is questioned in contemporary times (at least in the Guelph Landfill Search Process). In line with this observation, the lead technical consultant in the GLSP noted that twenty-five years ago, the work of the engineers was never questioned as the public was not consulted in determining where a landfill should be site (Fieldnotes, February 27, 1995). Similarly, Hadden (1991) notes that, in the past, the reasons for protesting a landfill site were not based on environmental concerns, but,

primarily on concerns over decreased property values. This latter concerns exists today of course, however, the key point is that, unlike the situation in the past, the protest rhetoric today is not framed in terms of economics but in terms of environmentalism.

Conclusion

The discussion in this chapter indicates that a lack of trust existed in the Guelph Landfill Search Process despite efforts by the City to address this very problem. As we have seen, it does not seem possible to fully divorce the political aspects of finding a landfill site from the technical ones. Consequently, the distrust that lay members had in dealing with the technical experts may be partially attributed to historical circumstances, such as the previously unsuccessful joint search and the issue of annexation. Such "historical baggage" had an inertial impact on the expert-lay interactions that were observed by influencing the *expectations* that lay members had of the technical consultants (i.e. "facework commitments"). In other words, political (dis)trust of elected officials (i.e. City Council) may have exerted an intervening influence in the lay participants' views of the technical expert, and such influence may have been accentuated because of both the historical circumstances of the GLSP, as well as because of the public awareness of the fact that all final decisions had to be approved by City Council. Consequently, even though the City of Guelph had tried to implement a purely neutral and technical process, political influences remained. This in turn indirectly affected the character of

the expert-lay trust relationships observed in the GLSP.

The distrust of technical experts in the GLSP may have involved another dimension as well, namely the general systems distrust in the institution of science and technology (i.e. "faceless commitments"). Our quantitative evidence has suggested that this type of distrust was also present. In actuality, facework and faceless forms of (dis)trust converge in the treatment of an environmental risk issue. This is because, in dealing with an environmental risk issue, lay individuals may become cognizant of the notion that the inexact quality of environmental impact science can make such science particularly susceptible to political manipulation. Consequently, lay interaction with experts on a face-to-face basis may be influenced by problems in faceless commitments. As we have seen in this chapter, both forms of distrust had an influence on the expert-lay interactions that were observed. To understand the connection between this lack of trust in technology/experts and reflexivity we need to consider in more detail the actual handling of the technical issues involved in dealing with the environmental risks of a landfill. This brings us to the subject of the next chapter -- the treatment of risk in the Guelph Landfill Search Process.

In the following chapter we will examine the particular issues that were raised in the GLSP pertaining to the risk and uncertainty involved in environmental impact science. Specifically, we will discuss the risks and uncertainties involved in the methods used to determine leachate contamination, and the risks associated with contingency planning. We will attempt to show how the lay awareness of such risk and uncertainties contributed

to the adoption of a reflexive orientation in which views towards science and technology may have been revised as a result of the lay involvement with an environmental risk issue.

CHAPTER FIVE

THE TREATMENT OF RISK IN THE GUELPH LANDFILL SEARCH PROCESS

Chapter 5   The Treatment of Risk in the Guelph Landfill Search Process

The term "environmental risk" refers to those risks to human beings that arise in, or are transmitted through the air, water, soil or the biological food chains (Whyte and Burton, 1980:1).   As such, in confronting the risk of groundwater contamination, participants in the Guelph Landfill Search Process were essentially dealing with an environmental risk issue. However as we shall see in this chapter, this particular type of environmental risk was to be addressed through the use of technological measures associated with a modern engineered landfill (which includes technologies for leachate monitoring and containment).   As such, the environmental risk that the Guelph community faced was very much related to the making of not only political but technological decisions as well. It is in relation to this that Niklas Luhmann (1993) notes that risk may be conceived of as the potentiality of facing unexpected and detrimental consequences that are *attributable* to a decision maker.

The type of technical matters associated with environmental risks are often thought to be very complex. As a result, the opportunities for lay members of the public to become involved in such matters are usually very limited. To a large degree the situation was different in the GLSP because participants were able to deal with many technical matters that were not usually open to public involvement. In other words, lay *access* to the technical decision-making process in the GLSP was not as limited as is usually the case. According to Filyk and Cote (1992:62), the ability to communicate

directly with decision-makers is the principle advantage that *advisory groups* (such as CASC) have over *interest groups* in influencing policy formation. We can therefore say that the structure of the Guelph Landfill Search Process encouraged *advisory input* into the technical decision-making process involved in the handling of an environmental risk issue. As we shall see, the formation of CASC as an advisory group in the GLSP illustrates one way in which environmental risks are now dealt with in late modernity.

In this chapter we will investigate how lay participation in specific technical matters actually contributed to the *distrust* of technology and expertise identified in the preceding chapter. Specifically, we will discuss how lay participation in environmental impact science had contributed to the adoption of a reflexive orientation. We are therefore attempting to go beyond the traditional emphasis on risk perceptions and risk estimations[1] by adopting an approach that emphasizes the *interactions* between lay actors and those entrusted with the management of risk. Our approach is therefore consistent with Freudenberg and Pastor's (1992:389) view that:

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[1]   The traditional emphasis on "subjective" risk perceptions versus "objective" risk assessments was inspired by Chauncey Starr's (1969) seminal article about how voluntary risks did not inspire opposition, relative to equivalent risks that were imposed. Building on this work, Slovic (1987) and his associates developed the psychometric paradigm which emphasized the differences in risk perceptions and risk estimations between experts and lay individuals. The critiques of this approach led to the development of the cultural construction of risk perspective developed by Douglas and Wildavsky (1982).

> Particular promise [for sociologists] is evident in studies that go beyond
> a focus on individuals' risk perceptions, dealing with the behaviours and
> interests of societal institutions entrusted with the management of risks.

We hope that, by adopting such an approach, we may be able to go beyond the questions that are of interest only to technologists and policy makers, to the point of testing sociologically relevant questions. For example, in this chapter we will investigate the question of whether a reflexive orientation was adopted by participants in their treatment of the risks associated with a modern landfill. That is, in confronting the landfill issue, did participants in the GLSP revise their views of scientific and technological progress, while at the same time adopting a more environmentally sensitive view?

The first section of this chapter will briefly discuss the social dimensions of risk. This will be followed by a discussion of how certain characteristic features of late modernity, such as globalization, and the insidious nature of modern environmental risks, have influenced the interactions that took place in the GLSP. We will further examine these expert-lay interactions by focusing on how the scientific uncertainties associated with the risks of a landfill were treated. In this discussion we will examine the uncertainties related to: the character of the waste stream, the detection of contaminants, and contingency planning.

In the second section we will continue our discussion of how risk was reflexively treated in the GLSP, by examining the specific technical claims that were made with regard to hydrogeology. As we shall see, hydrogeological factors played a key role in Guelph's search for a landfill site.

In the final section of this chapter we will discuss how the reflexive treatment of risk was not limited to purely technical matters but was also involved in the treatment of other issues such as the development of a compensation policy in the Guelph Landfill Search Process.

Section I   Risk and Reflexivity

Risk is a central feature of reflexive modernization because it is in confronting risks that the individual and the collective are forced to re-evaluate their assumptions about: survival, the ability of science to solve our problems, trust in technical agents and expertise, unfettered economic development, and so on.   Such concerns were not addressed in the residual risk society of the past (Beck, 1992), because in that period, environmental risks were merely seen as the "price that had to be paid for progress". Today however, the situation is different because many are now aware of risk *as* risk. In this connection, Giddens (1990:129) notes that:

> The fact that risks -- including in this regard many different forms of activity -- are generally accepted by the lay population to be risks is a major aspect of the disjuncture between the pre-modern and modern worlds.

That is, in the residual risk society of the past, environmental risks were not even conceived of as risks, but today they are.   For example, this awareness of risk *as* risk was noted by a Guelph City Councillor who asserted that:

> When you engineer this [landfill] you are really managing risk. Any engineer who denies this is really stretching his code of ethics. (Fieldnotes, Guelph City Council Meeting, October 12, 1994)

For Beck (1992) it is only under the present conditions of the risk society that those dangers which remained latent in the past, now surface and must therefore be confronted in the present. Thus, it was noted in <u>Guelph's Green Plan</u> (City of Guelph, July,1994:58) that:

> [T]he philosophy of "out of sight, out of mind" which prevailed for years, has finally caught up with us. Landfills which were once thought of as harmless are now sources of pollution, and processes for siting new landfills are being met with great opposition.

As more and more environmental problems are identified, the more likely it will be that individuals at some point must confront them. The confrontation of issues such as the risk of leachate contamination from a landfill leads to what is referred to by Giddens (1991:112) as a *fateful moment*. Fateful moments are defined as "those moments at which consequential decisions have to be taken or courses of action initiated" (Giddens, 1991:243). In the epoch of the risk society, it can therefore be expected that fateful moments will become increasingly more frequent, as a wider sector of society will be forced to deal with newly identified environmental risks.[2] In our case, we are dealing with the confrontation of the risks associated with a landfill. In dealing with their fateful

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[2]   It is only in the contemporary era, because of increasingly advanced technologies, that we can detect environmental risks that would otherwise remain latent (as was the case in the past). For example, problems such as the hole in the ozone layer, or chemical contaminations in concentrations of parts per billion, would not have been detected twenty years ago.

moment, participants in the GLSP were compelled to reconsider their views of "progress", safety, survival, and faith in technology. As we shall see in the next sections, such a reflexive process was initiated by their involvement with the abstract system of technical expertise involved in the assessment and management of the risk of leachate contamination.

In confronting the risk of technological failure and the potential for leachate contamination, participants in the GLSP were especially forced to deal with the issues of technical uncertainty and unpredictability. This leads to an emphasis on the adoption of a mode of thought that is based on an "as-if" type of thinking:

> The notion of 'risk' is central to modern culture today precisely because so much of our thinking has to be of an 'as-if' kind. (Beck, Giddens and Lash, 1994:vii)

In this chapter we will show how this 'as-if' type of thinking was present in the Guelph Landfill Search Process. The existence of such an orientation will be revealed by considering how the risk of leachate contamination was actually dealt with by the participants involved. For example, one indication of this form of thinking in the GLSP is related to the fact that frequent references were made to different risk scenarios, especially in regard to contingency planning. In fact, as we shall see, many of the technical claims made in the GLSP were based on the assessment, evaluation and discussion of various risk scenarios. For Giddens (1994b:184), such forms of "scenario thinking" is a core feature of late modernity:

> Many aspects of our lives have suddenly become organized only in terms
> of 'scenario thinking', the as-if construction of possible future outcomes.
> (Giddens, 1994b:184).

The presence of scenario thinking will therefore be another indication of the adoption of a reflexive orientation based on an "as-if" mode of thinking in the GLSP.

In investigating the relationship between risk and reflexivity we are actually examining the process in which the confrontation with risks leads to individual and social change. In this chapter we are specifically interested in what types of issues were confronted in dealing with the environmental risks of a landfill, and, on the impact these had on the manner in which the GLSP unfolded. In what follows we will detail how confrontations with issues related to: (i) collectively faced risks, (ii) endangerment of the future, and, (iii) uncertainty in environmental impact science and technology, have all contributed to the adoption of a reflexive orientation in the treatment of an environmental risk issue.

The Social Character of Risk

The term *risk* is used in many disciplines ranging from actuarial science to meteorology to toxicology. Consequently, the meanings of the term risk are quite varied. In our work we shall focus on the two main conceptualizations of risk used in the process of environmental risk assessment (Dwivedi with Kyba,1991:199). The first perspective conceives of risk as a *hazard*. In this sense, risk is viewed as an exposure to mischance or peril. The second view conceives of risk as a *probability*. In this second sense, risk

is conceived of as the probability or chance of suffering an adverse consequence. The two interpretations of risk can be combined to form a more broad based definition. Thus, in our work we will define risk as, "the probability multiplied by the consequences of an adverse or hazardous event" (Whyte and Burton,1980:1).

Risk should not be considered as simply a technically defined matter. The treatment of risk necessarily takes place in a social context. Hence, even the assessment of risk is not a purely technical exercise because it inevitably involves such social factors as power, values, perceptions and communication. It is in this sense that risk may be said to have a social basis. According to Freudenberg and Pastor (1992:391) technological risks, relative to other types of risk, such as financial or recreational, are more directly subject to such social factors as power, social control and the trustworthiness of specialized experts. At the same time, they observe that environmental risk controversies involve a *discursive dimension*. This dimension refers to such issues as how the concepts or terms used in the discourse were defined. For example, the implicit meanings behind such terms such as "benefit" or "progress" can very much influence the basis on which development decisions are made.[3]   In this light, Freudenberg and Pastor (1992:391) contend that:

The political/discursive struggles, however, have more often than not been

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[3]   For example, in simple modernity, the term "progress" would refer to economic and technological growth without consideration of the environment. In the risk society, on the other hand, the view of "progress" starts to change so that the environment is not treated as a mere "externality". This in turn will influence subsequent development plans.

hidden by the way in which questions about technological risk conflicts have been framed to date.

For these authors the key investigative focus should be on the "framing" of risk debates by the institutional actors. In this chapter we will examine how the framing of the risk debate in the GLSP led to the adoption of a reflexive orientation in which views towards science and technology became revised. In other words, we will detail how the *social basis* of the risk management process contributed to the adoption of a reflexive orientation. We will begin our analysis of the social basis of the treatment of risk in the GLSP through a brief consideration of the cultural construction of risk perspective.

This 'cultural construction of risk' perspective leads us to a consideration of how social factors enter into the definition and treatment of risk. For example, Douglas and Wildavsky (1982) investigated how each society highlights particular risks while downplaying others. They also examined the associated question of why a society *institutionalizes* certain means for controlling some risks and not others. A focus on the social construction of risk, therefore, directs us to the view that people do not select out certain risks based on a need for protection or safety *per se*. Rather, the selection of which risks the public focuses on, is also very much based on beliefs about social institutions, values, and moral behaviour (Johnson and Covello,1987:vii). That is, what societies label as risky is largely determined by social and cultural factors. We will attempt to expand this 'cultural construction of risk' perspective in a different direction by considering how the conditions of reflexive modernization have informed many of the

interactions that took place in the Guelph Landfill Site Search. One such condition of reflexive modernization pertains to the process of globalization.

Globalized Risks In Late Modernity

The process of globalization has been identified by Giddens (1990, 1991, 1994a) as a central feature of late modernity. This process has had several effects on the manner in which risk was treated in the Guelph Landfill Search Process. The first effect has to do with the language used by actors in dealing with the landfill issue.

According to Mary Douglas (1992:15), globalization has brought about the need for a universal language that can help facilitate newly emerging forms of inter-community discourse. She argues that risk related terminology is frequently adopted in these situations because it admirably serves the forensic (i.e. universal) needs of a new global culture. It is for this reason that the treatment of environmental issues often utilize a terminology based on risk analysis. In the context of the Guelph Landfill Search Process we shall see that this is evidenced by the fact that much of the interaction that took place between the lay individuals and experts was expressed in the language of risk. That is, expert-lay interactions in the GLSP were framed in such a way that the attention of the participants was focused on issues related to the possibility of leachate contamination. As we shall discuss later, the language of risk was also used in issues not directly related to technical matters, such as in dealing with the issue of compensation in the GLSP.

A second impact of the globalization process on interactions in the Guelph Landfill

Search Process involves the *nature of the risks* we now face in late modernity. That is, high consequence risks that are global in impact. Harvey (1989) notes that the contemporary media serves to widely publicize many of these collective risks. As such, environmental risk catastrophes are frequently presented as spectacles for the public gaze. The effect of such media coverage of mega environmental catastrophes is that they become well known to the public, as was the case with recent incidents such as: Chernobyl, Bhopal, Love Canal, Three Mile Island, and the Exxon Valdez.

There is evidence that a heightened awareness of globalized risk was indeed present in the Guelph Landfill Search Process. This awareness, in turn, did have some influence on the manner in which participants in the GLSP conceived of environmental risks. For example, the following allusions were made to globalized risk scenarios by lay members involved with the Guelph landfill issue:

> Our community realizes that a break-down of an engineered landfill site will not be a spectacular event such as the tragedies of Chernobyl and Bhopal. It will be a slow, low-level, insidious leak which will contaminate our water. (From CORALS member presentation entitled "Environmental Implications of Engineered Landfill Sites.", Joint CORALS/LSG Meeting, July 25, 1994)

> To suggest adverse effects would be minimized through engineered leachate management -- well, tell that one to the people of Chernobal (*sic*)! (Letter to Guelph City Council from the owner of a golf and country club, June 2, 1994)

The global dimension of the waste management problem in general was also referred to at several points in the process. For example an elder from the Six Nations Iroquois Confederacy of the Grand River made the following comments:

> I realize that garbage is a problem. *It is a world wide problem.* But, we as human beings must realize that this affects the natural environment. As Natives, we have a responsibility to the environment. This is where I come from. (Fieldnotes, CASC Meeting, September 22, 1994)

The linkage between the global and local dimensions of the landfill issue was also stated in a public workshop guide:

> Residents and business in Guelph have indicated through a variety of public forums that they wish to strive towards sustainable development, by achieving a "cleaner and greener" way of living. This concept is as broad as *"Thinking Globally, Acting Locally"*, to ensuring that new developments, including ensuring that new landfill sites, are built in an environmentally and economically sustainable manner. (City of Guelph, Landfill Search Group's Workshop Participants' Guide: Alternative Waste Disposal Technologies. January 19, 1994)

Thus, commonalities between local and global environmental risks were realized by at least some of those involved in the GLSP.

One important (implicit) commonality between local and global types of risks relates to the issue of *survival*. In this connection Beck (1995a:8) notes that environmental risks involve the violation of strongly held survival norms. It is precisely because environmental issues deal with issue of survival that the state is involved in the regulation of environmental risks because as Mary Douglas (1992:15) observes:

> The political pressure is not explicitly against taking risks, but *against exposing others to risk.* (emphasis mine)

In the following section we will examine how participants in the GLSP were compelled to confront the issue of survival in dealing with the landfill issue.

Confrontation With Future Endangerment

In dealing with environmental risk issues in late modernity, one of the concerns

that is frequently raised pertains to concerns about the future (i.e. future *survival*).

Concerns about the future were frequently expressed by participants in the Guelph

Landfill Search Process:

> It is our obligation to leave the world in the best possible condition for our
> children. We hope that our children will never have to quote Dr. Albert
> Schweitzer who said: "Man has lost the capacity to foresee and to
> forestall. He will end by destroying the earth." (from CORALS member
> presentation entitled "Environmental Implications of Engineered Landfill
> Sites, Joint CORALS/LSG Meeting, July 25, 1994)

> We must not jeopardize our most precious, non-renewable resource. Even
> a fully engineered landfill site will only guarantee groundwater protection
> for a few years. Our community's concern for our water safety is by no
> means "grossly exaggerated and most irrational" as one of the City's
> engineers recently stated. A fully engineered site in the annexed area will
> only postpone the inevitable. It is our children who will have to deal with
> it. (CORALS member presentation at Joint CORALS/LSG Meeting July
> 25, 1994)

> A fully engineered landfill site with today's technology might remain
> trouble-free for about thirty years. That certainly will take care of the
> problem in our lifetime, but again, as so many times in the past, we leave
> the clean-up to the next generation. (from CORALS member presentation
> entitled "Environmental Implications of Engineered Landfill Sites, Joint
> CORALS/LSG Meeting, July 25, 1994)

Concerns about the environmental risks that the future generations will be forced

to deal with is a common concern in reflexive modernization. This is because as Beck

(1992) notes, it is now realized by an increasing proportion of the lay public that, modern

environmental risks are not limited temporally (or spatially). For example, in the specific

case of the GLSP, it was realized that the effects of chemical-leachate contamination may

only be realized in the future. Alternatively, it is sometimes realized that, although the

risk may indeed exist in the future, it may not necessarily be detected. In other words,

it is the realization of the uncertainties associated with environmental risks that leads to

the adoption of a future orientation. Thus, the treatment of environmental risk today, is

actually an exercise that is directed towards the future:

> [T]he actual social impetus of many risks lies in the *projected dangers of the future...* The centre of risk consciousness lies not in the present, but *in the future.* In the risk society, the past loses the power to determine the present. Its place is taken by the future, thus something non-existent, invented, fictive is the 'cause' of current experience and action. We become active today in order to prevent, alleviate or take precautions against the crises of tomorrow and the day after - on not to do so. (Beck,1992:34)

We will now consider some other uncertainties involved in the assessment and

management of the risks associated with a modern landfill.

The Lay Awareness of Technical Uncertainty

In this section we will develop the argument that a key factor that promoted a

rethinking of the GLSP participant's views towards science and technology involved a

raised awareness of the uncertainty existent in the science used to address environmental

risk issues. As we shall see, this heightened awareness of uncertainty can be attributed

to the fact that participants in the GLSP had the opportunity to directly deal with the

technical matters related to the siting of a landfill. The confrontation with issues related to the uncertainty of environmental impact science was therefore experienced first-hand by lay-participants at several points in the Guelph Landfill Search Process. The following discussion reviews such instances.

Uncertainty in the Character of the Waste Stream

One of the major uncertainties that was repeatedly raised for discussion by the lay participants in the GLSP involved the nature of the waste that was to enter the proposed landfill site. Claims were being made by both the City's technical staff component of the LSG as well as some LSG community liaison members, that, the processing of waste through the newly built wet/dry recycling facility would result in a residual waste stream that would be less harmful to the environment. For example, the LSG Chair in response to a letter from a CASC member, asserted that:

> The City of Guelph Landfill will be significantly different from other municipal landfills in Ontario. The "wet-dry" source separation and treatment plant which is currently under construction will remove the vast majority of organic materials from the waste stream so that only residuals and non-processable wastes will be landfilled. Thus the principle cause of leachate and gas problems normally associated with municipal landfills will be eliminated. It is therefore expected that this landfill will create far less environmental impact than previous waste disposal facilities. (Letter by LSG Chair, June 30, 1994)

However, such claims did not go uncontested because the wet-dry recycling facility was the first of its kind in Canada. As a result, it was noted that:

Gueiph is in a unique situation because no other landfill in North America is built in association with a wet-dry facility. (LSG Chair, Joint CASC/LSG Meeting November 9, 1994)

The fact that the facility was the only one of its kind in Canada was not very reassuring to many of those involved in the Guelph Landfill Search Process because, for them, the facility simply introduced more *unknown factors* with which they had to contend:

There is no other case city to compare the Guelph's situation with a wet-dry recycling facility as a form of a reality check. This presents a methodological problem. (LSG's planning consultant, LSG Meeting, December 14, 1994)

I do not know enough about the residue from the wet-dry plant, especially about the uncertainty of the waste going to the plant, because users may not know how to source separate. Overall the principle weakness is that we are too focused on the idea of a landfill and not on the idea of an integrated waste management plan. (Fieldnotes, former LSG member, February 27,1995)

Regardless of all the rhetoric, there are many unknown factors in the landfill equation. The LSG in one of its recommendations to City Council has included the provision for a **CONVENTIONAL** landfill site, which clearly demonstrates that the LSG is groping in the dark and has no exact idea of the eventual composition of the waste going into the landfill! (Letter to the Editor from CORALS, October 31, 1994)

There existed a pervasive doubt amongst many participants in the GLSP in regard to the nature of the waste that was to enter the new landfill. Consequently, many felt that the proposed landfill would be as unsafe as existing landfills. This doubt remained despite the fact that CASC members and participants from the general public were involved with the LSG's review and assessment of the character and quality of the waste that was to

enter the proposed landfill.

The uncertainty associated with innovative technologies was frequently raised by both the CASC and the neighbourhood groups. These lay individuals insisted that the CASC and LSG deal with the potentiality that the wet/dry recycling facility would be a total failure, or that it would break down for some indefinite period of time, thereby making it necessary for unprocessed waste to enter the proposed landfill. For example, the following exchange was observed during a CASC Technologies Subcommittee Meeting (August 8, 1994):

> CASC Member A: [Another technical consultant's] waste quantity estimate in the McDougal site was off by fifty percent, and it was thrown out. How do we know they [i.e. the experts] won't err again?

> CASC Member B: Of course it will be off, it's all a game. Each site is too small.

> CASC Member A: It's not a new type of landfill, other than the search process.

> CASC Member B: It is new. Batteries, paint, aerosol cans will not end up in the ground. The volume of the heavy metals will be less.

> CASC Member A: CASC members realize that the wet-dry [recycling facility] will break down, but when we ask the LSG about the contingency plans they circumvent our questions. The whole wet-dry facility may be scrapped in several years. Nobody knows. Third World countries are much more efficient in separating waste. Why are we spending 3.4 million dollars on this?

> CASC Member B: They have a much bigger underclass than we have, who will do the separation.

CASC Member A, who was also a member of the environmental group Eastview

Residents for Environmental Justice, implicitly expressed a distrust in the use of expensive and sophisticated technologies, and questioned the need for it. Reservations regarding the technologies associated with the wet-dry recycling facility were also expressed by members of CORALS:

> During LSG and CASC discussions it became apparent that there are many unanswered questions regarding the exact composition and quantities of materials entering the landfill. How can we be satisfied hearing that this will be a new and innovative landfill when we do not know if the wet/dry facility will be able to handle all the industrial waste currently diverted. What happens if the wet/dry facility breaks down? (from CORALS member presentation entitled "Environmental Implications of Engineered Landfill Sites, Joint CORALS/LSG Meeting, July 25, 1994)

> This process is based on the misplaced assumption that technology will solve the all the problems we have. Technological systems will break down. Therefore the wet/dry facility will inevitably break down and at some point and [unprocessed] waste will end up in the landfill. Nothing should be done to the environment that is irreversible. (from CORALS member presentation, Joint CORALS/LSG Meeting, July 25, 1994)

Members of the Victoria Road Neighbourhood Liaison Group also voiced similar concerns:

> VRNLG Member: I am concerned regarding the reliance on unproven technologies to be used for both the Wet/Dry facility and the proposed landfill. How can anyone be certain the site will be safe?

This statement of concern was met with the following response:

> LSG Member: The City's intent is to study the Wet/Dry facility to prove its ability. The Ministry of Environment and Energy (MOEE) does not rely exclusively on the proponent and the consultants to ensure the site is safe. The MOEE requires extensive monitoring and reporting of the site's effects and performance. These requirements are outlined in a Conditions of Approval (C of A), should a site be approved. Community Liaison Groups will also assist with monitoring and contingency planning.

> Community members need to become involved to ensure the proponent does its job. The Landfill Search Group (LSG) has sought community involvement thus far in its search through the formation of the Community Advisory Sub-Committee (CASC) and the Neighbourhood Liaison Groups (NLGs). (VRNLG Draft Meeting Record, June 22, 1994)

From the above citations it can be seen that the attribution of risk was very closely related to the lack of trust that the individual had in technology. Conversely, if the individual does trust the technologies to a relatively greater extent, he or she will down-play the risks involved. As such, the LSG Chair made the following comments to City Council:

> Guelph City Council faces a difficult political decision, just as the Landfill Search Group faced a difficult technical and social decision. The main difficulty stems from two facts: (1) Guelph will have a wet-dry waste processing facility in operation which means that the landfill will receive a very different stream of wastes *with much less danger* of operation effects on surrounding areas; (2) LSG, with Council's direction, conducted an extremely open community-based process to try to find an urban location for a landfill, which brought forth unprecedented expectations for standards of waste management and landfill operation to protect natural systems and surrounding neighbours. (Letter from former LSG Chair to Guelph City Council, January 20, 1995; emphasis mine)

In the following we will discuss this relationship between trust and risk as it relates to other types of technologies, such as those related to mitigation.

In situations where there are varying degrees of risk and trust, different individuals will perceive of different risk scenarios. Some will want to plan for the worst case, while others will want to plan for the best case. As we have discussed in the preceding chapter, many lay participants in the GLSP wanted to deal with the worst case risk scenario because they did not have a trust in science and technology to be used in designing the proposed landfill. This will in turn heighten their perceptions of risk. For

example, one participant noted that:

> The cost and the danger of a mistaken decision in the landfill issue is so high we would prefer that the maximum values [i.e. the worst case scenarios] remain the judging point. (CORALS member letter to City Council, January 26, 1995)

The important point to realize however, is that the consideration of multiple scenarios in dealing with risk issues in the GLSP illustrates a fundamental feature of a reflexive orientation because it reveals the "as-if" type of thinking which forms the basis of risk consciousness.

As was alluded to previously, the uncertainty associated with landfill technologies is particularly problematic in dealing with *innovative technologies* (such as the wet/dry facility). The need to consider innovative technologies in designing the proposed landfill was at times encouraged because it was well known by most participants involved in the GLSP that all presently existing landfill technologies would fail. At the same time however, it was also realized that the consideration of new and innovative technologies would itself lead to the introduction of new uncertainties. Thus, as Roberts and Weale (1991:xiii) note, "uncertainty is a perennial condition in the face of innovation." This results in a paradox since innovative technologies need to be considered in dealing with environmental risks (because of the known inadequacies of existing technologies), but at the same time, the use of innovative technologies may lead to the development of new and unforeseen problems. Such a paradox was expressed in the following exchange:

LSG Chair: We don't have proven technology that is proven to be absolutely safe.

CASC Member: I'm afraid this |view| will preclude consideration of innovative technology.

LSG Chair: Yes, but innovative technologies may have consequences we are not yet aware of.

The remarks made by the LSG Chair indicated that he was indeed aware that the use of innovative technologies does not guarantee that new risks will not crop up and that technological risks remain unpredictable. The development and lay awareness of this paradox was a direct consequence of the adoption of a reflexive orientation in the risk society. In dealing with environmental risk in a reflexive manner, views towards technologies become revised as the limitations of science and technologies become known. Consequently, innovative technological solutions can no longer be unquestionably subscribed to in reflexive modernization. In this context, Beck, Giddens and Lash (1994:vii) observe that:

New areas of unpredictability are created quite often by the very attempts that seek to control them.

Other indications that lay participants in the GLSP were well aware of the limits of environmental impact science and technologies to deal with environmental risks were revealed in their discussions pertaining to the issue of contaminant detection.

Uncertainty in the Detection of Contaminants

The limits to technical knowledge and methods are especially critical in situations

involving environmental risk because, frequently, the uncertainty associated with such

knowledge and methods is what is at issue. For example, at several points throughout

the Guelph Landfill Search Process, CASC members pointed out that the actual chemical

composition of leachate is variable and that the chemical constituents could not be known

with any certainty. Hence, how does the expert know he or she is testing for the "right"

chemical? As one CASC member put it: "How can you test for what you don't know?"

(Fieldnotes, CASC Technologies Subcommittee Meeting, August 8, 1994). The

awareness of this uncertainty was also expressed by other members of CASC:

> We know that as long as unsorted wastes go to the landfill that our water
> will be contaminated. The LSG has stated that "no hazardous waste will
> go into the landfill." There are currently 60,000 chemicals in use. Only
> approximately 2,000 of these are considered priority pollutants that must
> go to specified hazardous landfills. Every few years a new highly
> hazardous chemical from this group of 60,000 is identified. The potential
> hazard to public health and environmental quality associated with many of
> these 60,000 chemicals is unknown. If unsorted waste enters the landfill,
> it will take only one gallon of paint thinner to pollute the entire aquifer.

> Some of us in Guelph already suspect that our aquifer and groundwater are
> polluted and that it is merely a matter of testing for the right chemicals to
> provide the proper proof. (Letter from CASC member (also member of
> Eastview Residents For Environmental Justice) to Guelph City Council,
> February 21, 1995)

A similar response was made by a member from a neighbourhood group:

> It is frightening to realize that there are thousands of different chemicals
> for which no tests are performed, and we have no understanding of the
> chemical reactions occurring in a landfill environment and their ultimate

impact on people. (from CORALS member presentation entitled "Environmental Implications of Engineered Landfill Sites", Joint CORALS/LSG Meeting, July 25, 1994)

The awareness of the limits associated with the means to detect the environmental risk were also expressed:

Current analytical techniques to monitor our landfills are described as crude and the City's record of monitoring the Eastview landfill site does not inspire confidence. At Eastview, chloride ion content is measured because it is easy to measure, but is it really indicative of what is actually escaping from the site? We have no idea nor do we know how to go about fishing out what trace elements could be present. We do not have the complete picture. *Our present techniques are like trying to do brain surgery with carpenters' tools -- hammer, chisel and axe.* (from CORALS member presentation entitled "Environmental Implications of Engineered Landfill Sites, Joint CORALS/LSG Meeting, July 25, 1994; emphasis mine)

The above discussion points to one of the characteristic features of living in reflexive modernization, namely the adoption of a somewhat paradoxical and ambivalent view of science. This paradox stems from the fact that, although we grow more aware of science's inability to solve all our problems, at the same time, we are forced to rely on science to a degree much greater than in the past because the types of risk we now face are not readily detectable by our physical senses (Beck, 1987). For example, in the case of the Guelph Landfill Search Process, one CORALS member noted that concentrations of leachate as low as parts per billion may have serious health consequences, and such a concentration cannot be detected by our senses:

Some chemicals are extremely toxic in trace or almost immeasurable quantities. We cannot afford to put our water supply in jeopardy. Our neighbours in Elmira and Cambridge have serious groundwater

contamination problems. The chemical NDMA which is contaminating Elmira's water is measured in parts per billion. Even at that low concentration it is toxic. We must strive to protect our water for the future. (from CORALS member presentation entitled "Environmental Implications of Engineered Landfill Sites", Joint CORALS/LSG Meeting, July 25, 1994)

Yet, at the same time it was realized that technical measures must be implemented in the detection and monitoring the risk of leachate contamination. However, because of the lay awareness of the uncertainty involved in environmental impact science and technology in late modernity, "security degenerates into mere technical safety" (Beck,1995:25), and, as we shall discuss in the next chapter, this results in certain psycho-social impacts. In the following section we will discuss how the issues associated with technical safety were dealt with by the participants in the GLSP.

Dealing with Environmental Risk via Contingency Planning

The inevitability of leachate generation and leakage was considered as a given by the vast majority of those involved in the Search:

City Councillor: I question the protection of our groundwater resource because the Hanlon Road site sits right on top of our water resource aquifer.

LSG Chair: All of Guelph sits on top of our water resource.

City Councilior: You have said the landfill cannot be engineered to guarantee that it will not eventually leak.

LSG Chair: No one factor can give complete protection, therefore we

have considered various other factors -- depth of overburden, low conductivity, mitigation measures. There were two boreholes drilled on the site as part of the Hanlon Creek Watershed study showing ten to fifteen meters of Port Stanley Till, whose hydraulic conductivity gives protection... We admit that all landfill technology will fail within thirty years, this means we need to treat the waste within the time frame. Guelph is unique in North America in approaching the construction of the landfill. This is an approach that in fact all of Canada should use. (Fieldnotes, Guelph City Council Meeting, October 12,1994)

It is understood that reliance on a fully engineered site is required, and although Ministry guidelines indicate that a site should be engineered to prevent leaking in perpetuity, but all landfill sites leak! Council should be aware that the U.S. EPA/89 states "even with good quality assurance, the permeation of an intact flexible membrane through water vapour, pin holes or tears will allow leakage of up to 300 gal/per day per acre. (CASC's subcommittee on Minimum Acceptability Standards Delegation Speech to City Council, September 6, 1994)

It is well documented in scientific literature that **ALL LINERS LEAK** (both natural clay and INTACT engineered flexible membrane liners.) THEREFORE, THERE IS NO LINER IN EXISTENCE TODAY WHICH WILL MEET THE PERFORMANCE STANDARDS OF PROTECTING GROUNDWATER RESOURCES IN PERPETUITY (sic).
So who are we fooling here? Certainly not the public. [The LSG Chair] stated at an LSG Meeting that our landfill "would produce no leachate". He hastily retracted this statement when questioned by the public because he knew that there would be unsorted wastes going into the landfill. Unsorted wastes produce leachate. All liners leak. The polluting lifespan of a leaking landfill is at least three hundred years. (Letter from CASC member (also member of Eastview Residents For Environmental Justice) to Guelph City Council, February 21, 1995)

The best engineered site is fallible. All you need is a guy in a bulldozer to cause a little rip in the liner. This must be held out in front of you [i.e. the LSG], otherwise this realization will be lost in the two thousand details. (VRNLG member, VRNLG Meeting with LSG, September 19, 1994)

The general awareness of the claim that all landfill liners will breakdown, and that leachate will therefore escape, led the CASC to emphasize the need to plan in the event of just such a failure. As such, their attention focused on mitigation technologies. The need to consider mitigation is to be expected in reflexive modernization because of the public awareness that all technologies will eventually fail. Under such conditions, science cannot give any guarantees about public safety or environmental protection (hence the emergence of pervasive sense of "radical doubt" noted by Giddens, 1994b:190). This awareness that there can be no guarantees with regard to technologies used in environmental protection is revealed in the following citation:

> It is doubtful if anyone could successfully argue that a landfill would not have some impact on the natural environment, and many people would argue that all the impacts would be of the negative variety. Mitigation measures should not have to guarantee protection of the environment, but rather meet provincial reasonable use guidelines.[4]
> *Why not guarantee protection?* Can rural estate developments guarantee that on-site septic systems will not leach into groundwater, that road salt will not have adverse impacts on vegetation and groundwater? -- No more so than a landfill can guarantee total environmental protection. (Letter from CASC member, July 14, 1994)

As a result of this realization, much of the attention of the neighbourhood groups and the CASC, was focused on the need for, and the limits of, contingency planning:

> Generally, the public will be told: "Well there is a contingency plan". This pacifies the public. What is needed is that the public should be informed of exactly what the contingency plans are, so that the public is

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[4] The legal concept of "reasonableness" used in environmental policy guidelines refers to the notion of "what is appropriate or suitable to the particular circumstances". (Quoted from the Ontario Pesticide Act, Statutes of Ontario,1973, Ch.25,S.14; cited in Dwivedi and Kyba,1991:204)

educated about the fact that contingency plans are very few and very limited. (CASC member, CASC Technologies Subcommittee Meeting, August 24, 1994)

It is not sufficient to say that increased mitigation efforts will be considered to off-set the increased likelihood of water contamination. (Letter from CORALS to LSG, August 8, 1994)

Question From VRNLG Member: Much of the discussion to alleviate the concerns of residents that would be affected by potential problems of the landfill sites has been based on faith in available (yet much of it unproven), technology and human ingenuity. What contingency plans and precautions will be in place to minimize the risks, detect problems and compensate injured parties in the event of unforeseen problems? For example, will a bond be posted by the engineering, operating or consulting firms to demonstrate their confidence in their technologies and abilities and ensure that they are also stakeholders in this challenging project? In not, why? What GUARANTEES do citizens have that the site will operate according to its design?

Answer From LSG: The City has committed to work with the technology subcommittee of CASC and the neighbourhood groups to put in place appropriate technologies and contingency plans for both the landfill and the wet/dry facility. As well, the City has also committed to develop the details of a compensation policy for this facility with public input. Beyond this, the MOEE will require the development of a comprehensive contingency plan for any landfill site. Also, the City has indicated a willingness to involve the community in a monitoring committee similar to the Eastview landfill.
(Written questions from the Victoria Road Neighbourhood Liaison Group to the LSG, July 11, 1994)

In regard to leachate infiltrating the groundwater; are the engineered mitigation measures failsafe systems, or is there a recognition by LSG that some "acceptable" levels of leachate will enter the groundwater? (Letter from President of the Guelph Development Association, August 3, 1994)

Because it was recognized by members of CASC and the neighbourhood groups that there

could be no guarantees regarding the effectiveness of mitigatory techniques and

technologies, the best that the individual could do was to deal with the *probability* (or likelihood) of failure. For this reason, the lay participants emphasized the need to consider the worst case scenario in planning for contingency.

This rejection of absolute guarantees and the subsequent adoption of a probabilistic approach gives rise to another paradox. The individual may put his or her faith in probabilistically based risk assessments, but this will not guarantee results either. By its very nature, the treatment of risk involves uncertainty, hence there can be no guarantees by definition. This paradox was revealed in a statement made by a CORALS member:

> There has been no "Silent Spring" written about leachate and landfills. *We need epidemiological and risk analysis guarantees from toxicologists, not engineering guarantees of no failure.* (from CORALS member presentation entitled "Environmental Implications of Engineered Landfill Sites, Joint CORALS/LSG Meeting, July 25, 1994)

The CORALS member asserts his *distrust* of engineering guarantees, but at the same time (ironically) expresses his *trust* of epidemiological and risk analyses. The emergence of this new confidence in risk analysis coupled with an awareness of risk in general, was also expressed by a CASC member in the following exchange:

> CASC Member: Contingency and monitoring must be considered now; then at least the public will know these are they types of risk they face. What are examples of technology used in performance monitoring?

> Technical Consultant: Piezometers or Transducers which detect pressure changes, head gradient devices which pump water out and test the quality, artificial gradients are constructed so that any leakage from the landfill will flow back into it.

> CASC Member: Any sort of risk analysis done to test the effectiveness of any of these gadgets?

Technical Consultant: Not that I am aware of.
(Fieldnotes, CASC Technologies Subcommittee Meeting, August 24, 1994)

Contingency planning embodies the "as-if" type thinking associated with risk consciousness. As discussed previously, this cognitive approach to dealing with environmental risks is based on the identification and consideration of possible future scenarios. Such an approach is illustrated by the response of the technical consultant in the following exchange:

CASC Member: How will we identify water quality failures?

Technical Consultant: Regulation treats this issue very seriously. Everything is done to deal with every probability. Contingency plans are developed to account for any unexpected or unanticipated problems. Hydrogeology/geology looks at sites from this point of view. (CASC Meeting Record, June 29, 1994)

As such, in reflexive modernization the very notion of expectation becomes problematic because of the constant awareness of the uncertainty involved in environmental impact science and technology. This is further illustrated by the following exchange:

CASC Member: You use the word "expected" when referring to contingency planning. Before you said you "didn't know what could be expected". How can you put in effective control measures when you're not sure what will happen?

Technical Consultant: Regulation ensures that you deal with all problems on site. (CASC Meeting Record, June 29, 1994)

The problematic relationship between uncertainty and expectation makes contingency planning very difficult because such plans must essentially grapple with a contradiction. This contradiction stems from the fact that contingency planning is meant to address the

unexpected. But, how can you plan for something which you cannot anticipate?

The emphasis on contingency planning by members of CASC is one of the best examples of how risk was reflexively treated in the Guelph Landfill Search Process. The fact that the participants in the GLSP realized that there can be no guarantees, even in regard to mitigation and monitoring technologies, meant that there was a recognition that there are indeed inherent limits to dealing with risk related issues. In this light, Scott Lash (1993:4) notes that:

> If reflexivity means self-monitoring, then contingency of the non-insurable society presumes the failure of self-monitoring, the limits of reflexivity.

The emphasis on contingency planning is fundamentally a reflexive approach to dealing with risk. According to Beck (1995), dealing with risk during simple modernity meant dealing with risk under the conditions prescribed by the insurance principle -- foreseeability, compensatability, and limitations of the hazard (both locally and temporally):

> If a fire breaks out, the fire brigade comes; if a traffic accident occurs, the insurance pays. This interplay between before and after, between security in the here-and-now and security in the future because one took precautions even for the worst imaginable case, has been revoked in the age of nuclear, chemical, and genetic technology. (Beck, 1995:23)

Thus, it is the case that, in dealing with the risk of leachate contamination, the conditions of the insurance principle become violated because one cannot predict when the leachate will leak, where it will leak, who it will affect, and so on. Particularly important in this context is that the risk of leachate contamination may not be known with absolute

certainty once it has occurred because there can be no certainty that the expert is testing for the "right" chemical contaminant, as the toxic effects of many chemicals (and their combinations) may as of yet not be known. That is, there will always exist some "residual risk" (Beck, 1995:23).

A central tenet of the scientific method is the unyielding insistence for the strict proof of causality. Likewise, in order for the insurance principle to be applicable, the cause-effect relationship must be well established. Frequently, insurance companies will only pay compensation in those cases where the cause of the damage is clearly established. In the case of environmental risks, the establishment of this cause-effect relationship is often problematic because there are usually a number of possible "causes" of the health ailment. It is therefore difficult to confirm or attribute the effect to a single cause in an unambiguous manner (Harrison and Hoberg, 1994:17). According to Beck (1992:63-64) therefore, the application of this strict (mono) cause-effect approach to dealing with risk is fundamentally inappropriate in dealing with the risks of late modernity. Such a realization Beck (1992:63) notes has led policy makers in some nations (such as Japan) to recognize statistical *correlations* as proof of causal links between pollution levels and certain diseases (for example).

The lay awareness of the above points to the underlying realization that:

> [P]rotection by insurance promise[s] the impossible: events that have not yet occurred can be addressed now - through prevention, compensation, or provisions for after-care. (Beck, 1995:22)

It is under such conditions of realization that Lash (1993:6) notes that, risks in late

modernity are monitored by the rational critique of science.

In the following section we will examine how the rational critique of science in the Guelph Landfill Search Process took place through the medium of competing technical claims. Additionally, we shall discuss how the public awareness of the uncertainty inherent to environmental impact science was further compounded by the emergence of these competing technical claims.

Section II   Reflexivity and Competing Technical Claims

In this section we will examine how the GLSP participants' confrontation with the risks of leachate contamination led to the active questioning of science. This questioning of science was made manifest in the form of competing technical claims made by the lay and technical actors involved in the GLSP. That is, the inherent uncertainties associated with modern environmental risks effectively invited technical claims and counter-claims concerning the methods and data of the science used. As we shall see, the direct involvement of lay participants in the technical decision-making involved in the siting of a landfill, led to a raised lay awareness of the multiplicity of technical claims under the conditions of uncertainty. This raised awareness of the inexact nature of science and technology will further stimulate the actor to re-examine his or her views towards science and technology. In this sense, we will argue that the awareness of competing claims to technical knowledge contributed to the adoption of a reflexive orientation. In what

follows, we will discuss some of the actual technical claims that participants in the GLSP dealt with.

Competing Technical Claims: Dealing with Hydrogeology

In order to examine the types of competing technical claims made in the GLSP it will be necessary to briefly review some of the technical considerations involved in the siting of a landfill.

There are essentially two main approaches to the problem of preventing the escape of leachate generated from a landfill. The first relies on technologies such as plastic and composite liners that are spread out at the bottom of the landfill so as to contain the leachate within it. A system of pipes are located at the bottom of the landfill in order to collect the leachate and pump it out of the landfill site so that it can be treated at some off site location (usually at a waste water treatment centre).[5]

Aside from a reliance on technological measures to contain leachate, consideration may also be given to the type of soil found below and surrounding the landfill. It is for this reason that a consideration of hydrogeology becomes important in the siting of a landfill. The hydrogeology of an area is based on the type of soil found

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[5]   Other technical approaches to leachate containment that were considered by both expert and lay members included the use of what is known as the hydraulic trap. The hydraulic trap essentially consists of the construction of an artificial gradient sloped in such a way that any leachate that escapes through the landfill liner will be forced back into the landfill through the force of gravity. Additionally, an artificial pressure gradient is established by pumping water into the landfill at certain locations thereby forcing the leachate to stay within the landfill.

in the region. Soil type is an important consideration because leachate can travel much faster and easier through soil that consists of larger particles. Therefore, the soil best suited to prevent the leachate contamination of groundwater is clay. The fine particle size of clay makes it difficult (if not impossible) for leachate to travel through it. This approach to leachate containment is known as *natural attenuation*. Unlike the first approach (i.e. a purely engineered landfill), natural attenuation does not rely on technological means to contain leachate.

In order to educate the lay members of CORALS about the technical issues discussed above, one member of this group produced and distributed a hand-out that defined the various technical terms and considerations involved in the process of finding a landfill location. The document explained in lay terms the various hydrogeological principles related to soil texture, recharge and discharge areas, and sensitive hydrological features. The reason for preparing the document was described as follows by the CORALS member:

> These notes are provided by a non-expert to help other non-experts understand the hydrogeological questions related to the proposed Guelph landfills. (From the handout entitled "Understanding Hydrogeology, distributed at the Joint LSG/CORALS Meeting, June 16, 1994)

As an example of how technical information can be effectively conveyed to lay members of the community as part of the process of self-education characteristic to life in reflexive modernization, consider the following excerpts from this document:

> Picture three pails sitting on a table, one filled with sand and gravel, one with silt and clay, and one a complete mixture of soil types. All three

buckets have a hole in the bottom. Pour a pitcher of water in the top of each. As you can guess, the water will go straight through the sand and gravel quickly, because they are coarse particles. The water will probably sit on top of the silt and clay bucket, because they are tiny, fine particles that pack close together. And the water will go slowly but steadily through the complete mixture, because there is enough sand and gravel to create air spaces.

All the land across the south end of Guelph, between Clair Road and Sideroad 15 is part of the **Paris Moraine**, a glacial feature that is made up of a complete mixture of soil textures, with lots of sand, gravel, silt, and some clay. Beneath this is limestone bedrock. Although you might not expect it, limestone is also very porous, and water moves through it very easily.

This means that any eventual leak from a landfill can probably sink down into the ground until it reaches the groundwater (about 100 feet), and contaminate it. This is the most important argument against the landfill in this area.
(From the handout entitled "Understanding Hydrogeology, distributed at the Joint LSG/CORALS Meeting, June 16, 1994)

The process of self-education carried out by some of the lay participants involved in the GLSP represents another aspect of reflexive modernization - the process of *re-skilling*. For Giddens (1991:7), re-skilling refers to the process of re-acquiring certain specialized types of knowledge and skills. It represents a means through which lay individuals deal with the expropriating character of abstract systems of technical expertise. According to Giddens (1991:7), re-skilling becomes especially prevalent at times of consequential transitions, or when fateful decisions need to be made. For example, it was in dealing with the potential risks from a landfill that some members of the lay community engaged in the process of re-skilling by educating themselves about the hydrogeological factors related to the siting of a landfill.

To identify possible locations for a landfill in Guelph, the LSG and CASC

proposed that groundwater protection criteria (i.e. soil types) be given the highest

priority, followed by land use criteria. It is important to note a unique aspect of this

process was that these two criteria groupings (i.e. groundwater protection and land use

compatibility) were given priority by the LSG and CASC on recommendation from the

public (based on the results of the Public Workshop on Alternative Ways to Site a

Landfill held on March 1, 1994).[6]

The groundwater protection and land use criteria sets were combined by the LSG

and CASC to produce a *priority decision matrix*. This matrix (see Table 5.1, below)

outlined the ranking sequence used by the LSG to identify the potential sites that were

subsequently compared and ranked. For example, as indicated in the matrix below, the

first choice for locating a landfill would be on a site in a non-urban area with 10 meters

depth of clay (which would offer the greatest degree of groundwater protection), while

the least preferred choice would be a site located on built urban land which contained

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[6]   The criteria in the groundwater protection grouping related to the publicly
stated goals of:

> ...minimizing impacts on public health and safety and the
> natural aspect of minimizing impact on the natural and
> social environment. (From document entitled Guelph
> Landfill Site Search, Proposed Site Selection Process: Site
> Identification Criteria. March 28, 1994).

While the land use compatibility grouping was to "relate to the social
aspect of the goal: minimize the impact on the natural and social
environment" (ibid).

exposed bedrock, sand and gravel (such soil type gives very little protection from leachate contamination of groundwater).

Table 5.1: Site Identification Decision Matrix

Land Use Compatibility ------------------------------------ Groundwater Protection	Non-Urban Land	Future Urban Land	Built Urban Land
Clay at least 10m deep	1	2	7
Silt & Silty Till greater than 30m deep	3	4	8
Silt & Silty Till from 10m to 30m deep	5	6	9
Exposed Bedrock & Sands & Gravel	10	11	12

(Source: City of Guelph, Guelph Landfill Site Search, Position Paper #2, May 1994)

Once the five potential sites were identified by the LSG using the decision matrix[7], the next task for the CASC and LSG was to verify that the sites did indeed contain the expected soil types. This needed to be done so that comparisons could be made between the identified potential sites. It was at this site comparison stage of the landfill site search that differences of opinions and competing technical claims began to appear with regard to both criteria sets used in the site identification process. At first, claims were being made about the soil types present in the site. Later on in the process

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[7]   It should be recalled that, because of legal requirements, this phase of the GLSP was done by the LSG in a closed working session.

however, the emphasis switched to the land use criteria set (to be discussed in Chapter 7). The actual types of competing technical claims made in the GLSP, and the issues related to this, will now be discussed.

Awareness of the Uncertainty of Technical Knowledge

In order to deal with the uncertainty of the data used by the LSG, the CASC proposed a set of Minimum Acceptability Standards:

> At the Site Comparison Criteria Workshop held on June 8, 1994, members of the public were requested to provide input on minimum acceptability standards. Among the suggestions put forward by participants, was a request to form a committee to explore the issue of minimum acceptability standards. *This suggestion was made in recognition that sites had been identified based on the application of "desk top" data rather than field studies, and as such, it is not known if any of the sites are suitable for a landfill site.* (CASC Report on Minimum Acceptability Standards, July 21, 1994, (emphasis mine))

The rationale given above directs our attention to the lay public's awareness of one of the problems of environmental impact science, namely, the use of different sources of data. The *lay* awareness that different sources of data existed meant that it was realized that even in science, there can be no single absolutely correct and reliable data source. That is, it becomes known that there is always some uncertainty associated with the data used in the management of environmental risks.

The CASC noted that it was "desk top" data, as opposed to field data that was used by the LSG in identifying the potential sites. The specific type of "desk top" data that was used by the LSG was particularly open to dispute. The LSG's hydrogeologist

used the soil records provided by water well drillers. In his presentation to the LSG the hydrogeologist noted that although water well records were used, he did so cautiously, because such geological data is provided by the well drillers only because the Ministry of Environment and Energy requires them to do so (Fieldnotes, LSG Meeting, July 21, 1994). He admitted therefore, that, from a consulting engineer's point of view, such data are not totally reliable as the well driller is not as much interested in geological data as he is in finding water. As a result, the data provided by well drillers are not usually well presented or accurate. However, upon analysis, he concluded that the hydrogeological criteria was not very useful in comparing the potential sites in Guelph, because all of the sites were basically the same (with regard to soil composition). Therefore, it was his professional opinion that there was no need for the drilling of boreholes in each of the potential sites because enough data already existed.[8]

The LSG Chair noted that the public seemed to favour drilling (in fact, the drilling of boreholes in the potential sites was one of the requirements listed in the CASC Minimum Acceptability Standards document). He therefore asked the hydrogeological expert if drilling would add any significant information at all. The hydrogeologist answered:

> My experience in interpreting such non-expert well driller information makes me feel confident in my characterization of the hydrogeology. I feel that there should be some *trust* in my experience in analyzing such

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[8]   The drilling of boreholes provides information about the soil composition (specifically, a data profile of the stratified layers of soil present) and the depth of soil to the aquifer.

data. Although I realize that the confidence amongst the public groups may increase, I still feel that there is no need to drill. (Fieldnotes, LSG Meeting, July 21, 1994)

The lay realization that scientific knowledge is never absolute becomes widespread in the context of such competing technical claims. In support of the CASC and the neighbourhood groups' position, a community liaison member of the LSG asserted that:

I feel that there is no adequate public confidence in the data. I therefore make the motion that [the LSG's consulting engineering firm] drill on all the [potential] sites for the sake of public perception. (Fieldnotes, LSG Meeting, July 21, 1994)

After much discussion and debate between members of the LSG, a vote took place, and it was decided that the information provided by the hydrogeological expert would be accepted. On that basis, the LSG decided that there would be no need for drilling boreholes on each of the potential sites for the sake of comparing them. The LSG's decision was greatly opposed by the neighbourhood groups and CASC. The objections were based upon the public's claim that the data obtained from the well drillers logs were not accurate with respect to both the types of soil present at the sites, and in regard to the determined depth of overburden (i.e. distance to the bedrock aquifer). For example, the following excerpts are from a letter from CORALS:

We are very disturbed by the fact that hydrogeology will not be given the importance it merits in this landfill search. If LSG is truly serious about protecting groundwater and recharge areas then the hydrogeology of all potential sites must be evaluated at this stage.(Letter from CORALS to LSG Chair, August 9, 1994)

To help illustrate the type of hydrogeological claims made by the "lay-experts" in CORALS consider the following excerpts from the same letter:

> The generalization of soil descriptions from their original readings of "stony, sandy silt till with some clay" or "stony, silty sand till with some clay" to "silt or silty till" is misleading and unacceptable. The simplified description gives the impression that this soil composition is less permeable than what it really is. (Letter from CORALS to LSG Chair, August 9, 1994)

Later in the process the LSG Chair responded to the public opposition by reasserting and justifying the decision of the LSG not to drill boreholes:

> It is well recognized that well-log information can be interpreted with care by professionals to make judgments of the variations in soil composition down to bedrock. (LSG Chair's response to CASC members letter, September 13, 1994)

The dispute concerning the type of technical data used in identifying and comparing the potential landfill sites indicated that the public was well aware of the uncertain character of the science used in the management of environmental risks. We will now examine other competing technical claims that were raised in the GLSP. As we shall see, the existence of these competing claims further contributed to raising the lay participants' awareness of the uncertainties associated with environmental risk management and assessment.

Counter Experts and the Awareness of Uncertainty

The lay public's awareness of the competing technical claims with regard to the issue of hydrogeology and the drilling of boreholes was not only made known through the exhortations of the "inside" experts in the CASC (including many self-educated lay-experts), but also through the claims raised by the counter expert hired by Puslinch Township (this expert worked closely with the CORALS neighbourhood liaison group), as well as the experts from the University of Guelph who worked with the Victoria Road Neighbourhood Liaison Group. At the outset, the Puslinch expert noted that he was hired by Puslinch Township to satisfy the residents of the annexed area that the LSG's work was scientifically reliable and replicable (Fieldnotes, LSG Meeting, August 4, 1994). He asserted that his conclusion was that there was "no scientific evidence" that supported the findings of the LSG. He then went on to build his case by examining why there existed such a contradiction.

The Puslinch hired hydrogeologist asserted that one of the maps used by the LSG to identify the potential sites was simply the wrong map to use for that purpose. The LSG had used a surficial geology map in their work, but, according to the counter expert, this map only gave a description of the veneer of the land, and therefore did not give a reliable description of the soil types below four meters in depth. Using maps from three alternate geologists, and data from boreholes drilled for the recent Hanlon Creek Watershed Study, he noted that the soils below four meters of depth were comprised of sand and gravel, and were therefore very dissimilar to the composition in the first four

meters of depth (which the surficial maps used by the LSG identified as being silty till). He concluded therefore, that the soil in all the sites at depths greater than four meters offered very little resistance to leachate travel, hence the risk of groundwater contamination was much greater than had been ascertained by the LSG and their technical consultants. According to the counter expert's analysis, the potential sites in the annexed area were not comprised of a thin veneer of gravel below which there was silty till, as the LSG's consultant had claimed. On this basis, the Puslinch counter expert concluded that:

> In my opinion the site is not what LSG expected or wanted, nor does it provide the groundwater protection the community wanted. I just have to reiterate how wrong the process is, and how flawed it is right from the start. (Fieldnotes, CORALS hired hydrogeologist, LSG Meeting, December 14, 1994)

The LSG's hydrogeological expert was then asked to respond to the claims made by the Puslinch expert. The LSG consultant questioned the validity of the academic sources used by the counter expert. He also noted that the academic hydrogeological research cited by the Puslinch engineer pertained to the *regional* geology of a widely encompassing area, whereas as he had used *local* evidence about the specific potential sites being considered in the annexed area. He argued therefore, that his site specific data would depict a more accurate account of the local geology than the more regional data analyzed by the Puslinch counter expert. This claim was later countered by members of CORALS:

> The data collected on the Paris-Galt Moraine by [a university hydrogeological researcher] is much more extensive and recent than the data apparently used by [LSG's technical consultant]. We want to know what exact field work was undertaken by [LSG's technical consultant]. Desktop information and well log records from areas surrounding the sites are unacceptable as they do not give an accurate picture. Furthermore, the actual drillings performed by [a university hydrogeological researcher] along the northern side of the moraine contradict the data presented by [LSG's technical consultants] regarding the depth of different soil layers. (Letter from CORALS to LSG, August 9, 1994)

It was later agreed that the two hydrogeologists would have a meeting together to discuss the differences in their technical findings.

The Puslinch and LSG hydrogeologist met to discuss the discrepancies in their findings on August 12, 1994. It was noted by the LSG's consultant that the meeting was held behind closed doors at the request of the Puslinch hired engineer. The minutes to these meetings were typed by the Puslinch hydrogeologist's employer (an environmental services firm), and were reviewed by the LSG hydrogeologist on two occasions. The results of the discussions occurring at this meeting were presented to the LSG on August 30, 1994.

According to the minutes of the meeting between the two engineers, the purpose of the meeting was:

> ... for the two hydrogeologists to exchange perspectives of the process to-date and to try to reach some common ground upon which hydrogeological decisions could be made. (August 12, 1994, Minutes of Meeting between Puslinch and LSG Hydrogeologists at Township of Puslinch Council Chambers)

It was noted by the LSG's consultant that he had initially suggested to the LSG and

CASC that, since natural attenuation was limited in the Guelph area, a fully engineered site would be required. Consequently, he recommended that hydrogeological criteria not be used at all in identifying the potential sites as reliance on natural attenuation was not feasible (i.e. all areas in Guelph were equally poor in terms of soil type, so there would be no point in comparing soil types across different potential sites) . He then went on to note that LSG and CASC had discussed this issue at length and had decided to consider the possibility of *limited* natural attenuation, as opposed to none at all. In order to consider whatever limited natural attenuation there was, the LSG and CASC used a procedure of overlaying maps of surficial geology and overburden thickness (the combined mapping of the two was referred to as the Groundwater Protection Criteria Map). It was the adoption of this particular procedure to which the Puslinch engineer objected. For him, the surficial geology map neither reflected the true geology of the sites to any great depth, nor did it accurately describe the lateral variations in overburden soil types. As a result, the Puslinch engineer claimed that the procedure used by the LSG led to a *misrepresentation* of the actual geological conditions:

> I believe that there was a false representation of the geology. And I feel that [the LSG's technical consultants], as educators of CASC and LSG, should have emphasized that the depth of overburden is not the same as soil composition. (Fieldnotes, LSG Meeting, August 30, 1994)

> I feel worried and frustrated that despite the serious errors in hydrogeology identified by myself, and subsequently verified by the U of G, that the process still goes on. (Fieldnotes, LSG Meeting, August 30, 1994)

The LSG's consultant reminded the Puslinch engineer that the selection of a

landfill site is considered as a *planning process* under the Environmental Assessment Act of Ontario. As such, considerations other than hydrogeology would and should be considered:

> There is a concern that having too much detailed hydrogeological data, relative to other disciplines, can distract people from the "big picture" issues as has been the experience in other siting studies. (Comment of LSG's consultant hydrogeologist to Puslinch consultant, Meeting Minutes, August 12, 1994)

He went on to note that the final decision regarding the preferred site may hinge on other types of criteria (i.e. the best hydrogeological site may not necessarily be chosen).

From the evidence presented above, one of the conclusions that we can draw is that the public scrutiny of the technical work done by the consultants in the open Guelph Landfill Search Process led to an increased public awareness of the uncertainties involved in environmental impact science. That is, because of the open character of the GLSP, such counter claims became known to the public. In the past, such counter technical claims were usually known only to members of the technical community, and not to the general public. However, in reflexive modernization, because of the opening of a sub-political space by social movement actors and advocate experts, the flaws that exist in "doing science" increasingly become revealed to sections of the lay public. Knowledge about such flaws will often times lead to a lack of trust amongst the professional and lay actors involved with environmental risk matters. This is illustrated by the following extract from a CORALS letter to the LSG:

> The public trust has been seriously undermined when it became apparent

> that [LSG's technical consultant] used the surficial geological maps to draw conclusions on soil composition down to bedrock. (Letter from CORALS to LSG, August 9, 1994)

The effect of this awareness of the flaws involved in environmental impact science is that it promoted the adoption of a reflexive orientation, in which views towards science and technology in general, are re-assessed in a new light (a point that will be more fully developed in the next chapter). This lay awareness of the inherent uncertainties in environmental impact science was therefore also promoted by the fact that lay individuals in the GLSP became aware of the competing hydrogeological claims that were being made. This awareness, in turn, will create certain problems in the process of re-skilling, particularly in relation to the self-education process of the "lay-experts":

> Reskilling, however, is always partial and liable to be affected by the 'revisable' nature of expert knowledge and by internal dissentions between experts. Attitudes of trust, as well as more pragmatic acceptance, scepticism, rejection and withdrawal, uneasily coexist in the social space linking individual activities and expert systems. (Giddens, 1991:7)

Therefore, although measures can be taken (as they were in the GLSP) to ensure lay access and involvement in the technical matters related to the management of environmental risks (particularly lay access to technical information), it seems that there will always be at least some problems related to trust. As we have seen, although efforts were taken by the City of Guelph to ensure an open and accountable process, it remains unlikely that, under the conditions of reflexive modernization, the adoption of the City's approach would realistically result in the elimination of all problems related to trust and the management of environmental risks. However, as we have discussed previously, the

process did increase the level of perceived legitimacy (especially when compared to the previous controversy-ridden search).

Section III   The Pervasiveness of Risk Consciousness

Dealing with risk was not limited to those matters that exclusively pertained to the natural environment. The issue of risk was also considered in matters related to the social and economic impacts of the proposed landfill as well. The "as-if" type thinking involved in the reflexive treatment of risk was therefore also applied to other issues. This is evidenced by the fact that the criteria and criteria groupings developed by lay-participants in the Guelph Landfill Search Process were themselves based on the awareness of risk. The actual criteria that were identified by GLSP participants to deal with the overall risks of a landfill are presented below:

I PUBLIC HEALTH AND SAFETY:

Transportation: Traffic safety; pedestrian and cyclist safety; potential impact on aviation safety as a result of bird interference.

Ground & Surface Water: Potential impacts on humans due to contact with leachate-impacted ground water and surface water; effects on ground water availability from aquifers; potential for increased risk of flooding; potential for increased risk of erosion.

Air: Potential for effects due to the inhalation of landfill gases; off-site mitigation of combustible gases.

Waste: Potential for disease transmission via vermin and vectors (i.e. gulls); potential for human contact with waste.

II NATURAL ENVIRONMENT

Terrestrial Ecosystem: Potential disruption to and/or actual loss of terrestrial habitat and important terrestrial features; potential disruption to and/or loss of terrestrial ecosystem function; potential disruption to and/or loss of wildlife movement corridors.

Aquatic Ecosystem: Potential disruption to and/or loss of aquatic habitat and other important aquatic features; potential disruption to and/or loss of aquatic ecosystem function; potential disruption to and/or loss of fish migratory routes.

III SOCIAL ENVIRONMENT:

Social Displacement: Displacement of residents and public facilities.

Social Disruption: Potential disruption to the use and enjoyment of residences; public institutions and any other sensitive land uses (i.e. noise, dust, odour); visual impact of the landfill; potential nuisance associated with vermin and vector; potential changes to community character and cohesion; potential displacement and/or disruption to use and enjoyment of open space; effects on recreational resources; effects on the availability of surface water resources; potential changes to community character; potential changes to community cohesion and satisfaction with the community.

Land Use: Compatibility with existing and\or future provincial or federal special land use; compatibility with existing and\or future Municipal and County planned land use; compatibility of completed landfill with existing and\or future surrounding land uses within the City of Guelph and the adjacent Township.

IV CULTURAL ENVIRONMENT:

Displacement: Displacement of on-site cultural heritage and cultural landscapes.

Disturbance: Potential disruption or disturbance to cultural heritage features off-site and due to nuisance impacts; displacement of archaeological resources; settlement sites and unmarked burials.

V ECONOMIC ENVIRONMENT:

Capital and operating costs of landfill; roadway improvement costs; sewage treatment and water supply; displacement of businesses; disruption of businesses; business opportunities related to the landfill; effects on the municipal tax base; direct employment in landfill operations and indirect employment in related services; property value loss; waste haulage cost; tipping fees; sterilization of industrial and mineral resources (loss of use); displacement of forestry resources; effects on availability of surface water resources.

VI PUBLIC SERVICES:

Operational impacts of landfill on public services (e.g. roads, utilities); level of service provided by the landfill; potential disruption to local traffic networks.

(Source:City of Guelph Landfill Site Search --Site Comparison Technical Working Paper, Gartner-Lee Limited, August, 1994 and Addendum of September 20, 1994)

The range of criteria identified by the public is illustrative of the *extensive range of risks*

that the Guelph lay community confronted in their involvement with the landfill issue.

In fact, one may consider the subsequent ranking of the criteria groupings by the public

to be indicative of a hierarchical ranking of perceived risks, or at least the public's

relative toleration of the various types of risks associated with the landfill. The public

ranked (i.e. prioritized) the criteria groupings in the following order: Public Health and

Safety equally ranked first with the Natural Environment, followed by the Social

Environment, the Cultural Environment, the Economic Environment, and finally the

Public Services grouping. The fact that public health and the natural environment were

both given the highest priority once again highlights the centrality of the issue of *survival*

in dealing with the risks of late modernity. As we shall see in the next chapter, it was

in confronting the issue of survival that a space was created for the serious consideration

of environmental concerns.

We will now consider how the reflexive treatment of environmental risk by lay-participants was also in evidence in the treatment of issues that are usually not thought of as "environmental".

Risk and the Issue of Compensation in the Guelph Landfill Search Process

The idea of risk is intimately connected to the issue of compensation in much the same way the notion of risk is related to the issue of insurance -- they both deal with future events under conditions of uncertainty. In the CASC meeting held on August 16, 1994, members of CASC and the LSG began to deal with the issue of compensation. The development of a compensation policy was technically outside the LSG's mandate, and therefore outside the mandate of CASC as well. However, because of the insistence of CASC, in the end it was resolved that the City Administrator and the City's environmental lawyer would draft a compensation policy document that would be brought to CASC for their input. The intention was to incorporate public input into the compensation document before it was to be presented to City Council for final approval. The compensation policy that resulted from this innovative process was itself innovative:

> The [compensation] policy that resulted is perhaps the most comprehensive in the province - it certainly seems to be the most generous - identifying those residents who may require compensation as early as the pre-planning and pre-operational stages of the site search, something not done in other site searches in the province. (University of Guelph, Annual Newsletter of the University School of Rural Planning and Development, September, 1994:10)

In dealing with the compensation policy document, many members of CASC felt

that the size of the zone that was to be considered for compensation was too small, and

they wanted the radius enlarged so as to include anyone who could possibly be affected

by leachate contamination in the future. As one CASC member noted:

> What it comes down to is risk assessment. Therefore, the point is to
> consider the *maximum risk scenario*, to capture all the risk. (Fieldnotes,
> CASC Meeting, August 16, 1994)

Similarly, a member of CORALS noted that:

> [T]he total figures in the report [of the LSG's technical consultants] deal
> only with businesses and residences within the present 500 metre impact
> zone. CASC unanimously recommended that during the preferred site
> stage and the operational phase the impact zone be a minimum of 1,000
> metres from the landfill footprint. If this were the case a far larger
> number of businesses and residences would be affected and the economic
> impact would be proportionately higher. (Letter from CORALS member
> to City Council, January 28, 1995)

Such concerns over the size of the area for which compensation should be

considered is a common but controversial element of many cases dealing with

contamination of the environment. For example, Fowlkes and Miller (1987) note that

residents involved in the chemical contamination incident at Love Canal, New York,

could be classified as being one of two types, corresponding to their respective positions

on what they believe the size of the compensation zone should be. *"Maximalists"* were

those that felt that the area that the state authorities designated as dangerous was not

sufficiently encompassing. As a result, the maximalists felt that a greater number of

people needed to be relocated. *"Minimalists"*, on the other hand, felt that the area

considered for compensation and relocation should not be enlarged. Fowlkes and Miller (1987) outline how the decision to support either a maximalist or minimalist position varied with such factors as economic investment in one's home, age of the individuals, whether the individuals were parents of young children, and whether the individuals worked for the chemical company which had contaminated the site.[9]

CASC clearly consisted of individuals supporting the maximalist position. This would be expected because, as Fowlkes and Miller (1987:65) observed in the case of Love Canal, it was the maximalists who became vigorously involved. It was they who actively attended the meetings and persistently questioned the state authorities. The minimalists, in contrast, did not invest their efforts in gathering evidence to support their position; rather their strategy was to discredit the maximalists, of whom they accused of trying to "get something for nothing".

In the Guelph Landfill Search situation, the consensus position of the CASC was that the compensation zone should be enlarged. This is an example of how the public and the environmentalists usually support the possibility of the worst case risk scenario while public authorities feel otherwise. It should be noted that in the case of the Guelph Landfill Search Process, the issue of compensation was addressed *before* any

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[9]   Specifically, the minimalists overwhelmingly consisted of retired people whose major concern was their personal economic well-being. Such individuals had paid off their mortgages, invested in home improvements, and wanted to live comfortably on their small, fixed income in a respectable neighbourhood. And, it was on this basis that the minimalists did not want to relocate. In contrast, the maximalist group consisted of largely younger parents who feared for their children's health. They were unwilling to tolerate any sort of risk and wished to be relocated to avoid any possibility of harm.

contamination had occurred, nor had any sites been identified at that point. This again is a unique feature of this particular process. The drafting of a compensation policy before a site was even found, was in essence an anticipatory action directed toward the future.

In the case of the GLSP, the issue of compensation dealt with future impacts. But what was meant by "impacts" in these circumstances? During one of the two public workshops held to deal with the development of the criteria that the public felt should be used to compare the potential sites, the technical consultant defined impacts in terms of "net impacts". Net impacts refer to those impacts that are *expected* after mitigation actions have been taken (i.e. Net Impact = Impact - Mitigation Actions). These mitigation actions are largely technological and, thus, the issue of the risk of technology failure (and uncertainty) implicitly entered into the discussion of compensation.

Risk, as it relates to compensation, can be understood by considering the two extremes that are possible. The first extreme is that the technology is trusted to be failsafe, so that it is believed that there is no risk of leachate contamination. In this situation, compensation will not be an issue at all (except for perhaps the stigma involved with living by a landfill, and the decreased property values that may bring). On the other hand, if the water supply of the City is contaminated, then all the citizens could quite justifiably require compensation. Thus, the size of the area to be compensated is dependent on the perceived reliability of the technology used, and the technical means used to identify the danger (i.e. on the lay perceptions of the risk associated with the

monitoring technologies and with the effectiveness of the analytical techniques used for the detection of leachate leakage).

The relationship between risk and compensation was explicitly recognized by the CASC. The CASC subcommittee on compensation was aided by a group of graduate students from the University of Guelph School of Rural Planning and Development, who had researched the issue of compensation as part of a project undertaken for course credit in their academic program. This group, known as the Student Research Group (SRG), made a presentation to CASC which included a discussion of risk. They noted that, in drafting a compensation policy, the issue of real versus perceived impacts and risks should be addressed by the CASC. The following is from a document distributed by the SRG during their presentation:

> Impacts -- Real/Perceived: What will be the *real* impacts? What are the *perceived* impacts?
> Risk -- Real/Perceived: What will be the real risks of the Guelph Landfill? -- The perceived risks? This will be unique because the waste stream will be different owing to the wet/dry facility. (Student Research Group, School of Rural Planning and Development, Handout distributed at CASC Meeting April 6, 1994)

The CASC however, maintained their emphasis on the inevitability of leachate escape. In other words, they stressed the need to consider what Beck (1995:23) refers to as the "maximum credible accident" in the development of their compensation policy.

The connection between risk and compensation was also recognized by members of the Victoria Road Neighbourhood Liaison Group (VRNLG):

> People need to understand risk to provide constructive input. This must
> be communicated before the City implements the Compensation Policy.
> (VRNLG member, VRNLG Draft Meeting Record, June 22, 1994)

It was further recognized by participants in the Guelph Landfill Search Process that the

issue of compensation related to a myriad of risk related issues, and not just to the idea

of financial loss to residents. For example the LSG Chair, in a progress report to City

Council observed that:

> One thing which we have noted is that the usual policies on
> "compensation" extend to matters which do not involve financial
> obligations but which are important to reassuring the nearby community
> that they will be protected as much as possible from harmful effects and
> will have a voice in identifying harmful effects.
>
> In addition to the central financial matters such as property value
> protection within some surrounding area, there are several other general
> policy components. These customarily deal with (a) mitigation measures
> by the facility to reduce impacts, (b) contingency plans to look after
> unexpected occurrences, and (c) community involvement in monitoring the
> facility's impacts on the surrounding area. These latter matters are
> important to have in place before sites are announced to help give comfort
> to those landowners and residents potentially affected. (Letter from LSG
> Chair to Guelph City Council, March 23, 1994)

The second paragraph from the above citation is telling, in that it deals with mitigation

measures, contingency plans, and community involvement in monitoring, all of which

highlight the importance of addressing the issue of public distrust in expertise. All of

these factors are usually considered in the technical management of environmental risk,

and as a result, they are not usually associated with economic issues such as

compensation. In the risk society of late modernity, the adoption of a reflexive

orientation leads to the active questioning of the scientific basis of assessing the

environmental impact of the particular risk being considered. This in turn will influence the matter of compensation. For example, if a worst-case risk scenario is considered, then the required compensation will be much greater than would be the situation if the compensation policy were based on the best-case risk scenario. Thus, a resident of Puslinch noted that:

> Given the permeability of the soil at the base of the landfill and the fact that all the experts agree that the liners will fail, it is only a matter of time until the City will find itself having to fulfil this obligation [i.e. in regard to compensation] to a large number of people. (Letter from Puslinch resident to City Council, January 28, 1995)

It should also be noted that it is because of the issue of risk that lay members of the public were able to participate in the development of a compensation policy. This represents one form of eco-restructuring in which greater public involvement is promoted in those matters related to environmental risk. As we shall see in Chapter 7, such forms of eco-restructuring are characteristic to life in reflexive modernization. From the above discussion we can see that the ramifications in dealing with the issues associated with environmental risks are quite extensive in late modernity. This is one reason why risk has become a central feature of contemporary political, economic and social life.

Conclusion

In this chapter we have examined how the risk of leachate contamination of the community's drinking water was dealt with in the Guelph Landfill Search Process. As we have seen, many of the expert-lay interactions that took place in the GLSP both

directly and indirectly dealt with issues related to environmental risk.

In dealing with risk, GLSP participants were forced to confront certain problems, and raise certain issues with which lay individuals would not normally have to contend. Specifically, it was claimed that in dealing with problems such as: the uncertainties involved in the character of the waste stream as well as the methods of contaminant detection, and the limits to contingency planning, that, lay participants became aware of the flaws in environmental impact science. This awareness was further re-enforced by the lay participants' first-hand experience in dealing with competing hydrogeological claims.

The technical issues dealt with by the participants in the Guelph Landfill Search Process were likely to have very important implications for the participants' taken-for-granted reality. This is because the awareness of uncertainty and risk promoted by their involvement could only lead to a re-questioning of the amount of faith they placed in technological projects. The issue of the limits of science and technology becomes increasingly important as it was realized that physical survival (or at least one's accustomed way of living) was what was at stake.

In summary, we have attempted to show that it was in confronting environmental risks that the climate was set for the adoption of a reflexive orientation in which views towards science were reconsidered. This revision of views towards the technical world represents just one aspect of the process of reflexivity. A second aspect pertains to the raised awareness of environmental concerns. In fact, this chapter's discussion of the

technical issues raised by GLSP participants indicates that such issues were not purely academic, but that they also involved considerations of environmental protection.

In the following chapter we will examine how a lay re-thinking of views towards technology and the environment may have resulted from the involvement with an environmental risk issue. Specifically, we will attempt to show how the results of a survey we had administered indicated that the co-existence of positive technological and ecological beliefs and values. It would be expected that if the conditions of simple modernity had persisted, then, such a co-existence of values and beliefs would not be in evidence as lay participants in the GLSP would likely indicate a much greater support for technological beliefs and values. As we shall discuss, the co-existence of both types of values and beliefs may indicate a process of reflexive change in which technological values and beliefs start to be questioned, while ecological values and beliefs are given a commensurately greater prominence.

CHAPTER SIX

THE REFLEXIVE TREATMENT OF ECOLOGICAL AND TECHNOLOGICAL
VALUES AND BELIEFS IN THE GUELPH LANDFILL SEARCH PROCESS

Chapter 6   The Reflexive Treatment of Ecological and Technological Values and Beliefs in the Guelph Landfill Search Process

For Beck (1994:5) the concept of reflexive modernization "does not imply (as the adjective 'reflexive' might suggest) *reflection*, but (first) *self-confrontation*". The self-confrontation that occurs in late modernity is in a way 'forced' because the cumulative threats produced in the risk society compel us to deal with, or at least question, the very foundation of our technologically based society. That is, the assumptions which underlie our technologically based society, such as the unquestioned belief in progress, the unfettered trust in science and technology, the emphasis on rationality and so on, all must be re-examined in late modernity because of the nature and types of risks we now face in the risk society (i.e. risks that are: global in consequence, not detectable to our senses, uninsurable, unforeseeable, and incompensatable). Such a *re-examination* of fundamental values and beliefs is therefore the essence of reflexivity. The societal manifestation of the collective process of self-examination is seen in the fact that in risk society the threats produced by industrial society dominate much of social and political discourse that ensues (as the Guelph Landfill Search Process attest to). It is within this context that Beck (1994:6) defines 'reflexive modernization' as:

> [S]elf-confrontation with the effects of risk society that cannot be dealt with and assimilated in the system of industrial society - as measured by the latter's institutionalized standards.

Giddens' (1990) understanding of reflexivity is slightly different from that of

Beck's, but as we shall see, both variants do conceptually converge at some points. For Giddens (1990) reflexivity refers to the process whereby the individual or the institution constantly reassesses itself because of continual exposure to new types of knowledge. *Self*-reflexivity therefore occurs when the agent reflects on his or her *values* and *beliefs* systems.

Lash (1994:116) notes that what is common to Beck's and Giddens's conceptualization of structural and self reflexivity is that both forms deal with efforts to *minimize insecurity*. For Beck, individuals in risk society minimize insecurity by involving themselves in activities that *critique* the expert systems which back the techno-environmental risks of late modernity. Giddens (1990) however, feels that the minimization of insecurity (or what he calls ontological insecurity) is based on *entrusting* expert-systems.

Lash (1994:117) asserts that these two approaches to minimizing insecurity are divergent since Beck's approach seems to emphasize the distrust of expert systems (which leads to *social change* via the emergence of the sub-politics and new social movements), while Giddens seems to emphasize the need to trust expert systems to gain a sense of security (which leads to the establishment of *social order*). Although I do concur with Lash (1994) on this point, I do not see both perspectives on reflexivity as being completely irreconcilable. Rather, I believe that the *self-confrontational* aspects of reflexivity can act as an important conceptual bridge between the two perspectives. That is, in confronting environmental risks the individual has to *decide* who and what to trust,

and the values and beliefs to which to subscribe. That is, whether to trust science (and its agent -- the technical expert) or not, or whether one should reject old ecological and technological values and beliefs and accept new ones. The fact that a decision has to be made suggests that there must be some *a priori* tension between trust and distrust, as well as between risk and non-risk perceptions, as they relate to technological and environmental issues. If this were not the case then one would not feel the need to reconsider issues of trust and risk since such matters would then be part of his or her unquestioned "taken-for-granted reality".[1] For example, in confronting the possiblity of a landfill in their area, lay participants in the GLSP (particularly those in the CORALS and VRNLG), began to confront many of the technical and environmental issues involved in the siting and construction of an engineered landfill. As we have discussed, this included exposure and involvement with issues related to the uncertainty involved in environmental impact science (such as the uncertainties and risks associated with the reliability of the wet-dry facility, and in the methods used to detect leachate contamination). These sorts of concerns would not arise prior to the lay individuals' (forced) involvement with the landfill issue. It is only upon becoming involved that some

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[1] It is therefore not surprising that a suspicion awareness context develops under such conditions (as discussed in Chapter 4). In an open awareness context there is no need for reflexivity because social conditions within such a context will sustain or preserve the taken-for-granted aspects of the interactional situation. In an open awareness context, roles, identities, values, and beliefs are all non-problematic in the interactions, hence, the individual feels no need to re-examine such issues. It is only when the taken-for-granted reality is threatened or disrupted that insecurity comes to play a role. In dealing with this insecurity, issues of risk and trust arise (especially at access points).

lay participants in the GLSP realized the limits of science and technology (as they relate to an environmental issue).

In this chapter we will use the work of Olsen, Dunlap and Lodwick (1992) on ecological versus technological values and beliefs to further investigate the issue of reflexivity. The direct confrontation and involvement with an environmental risk issue would be expected to lead to a re-evaluation, or at least to a questioning of the actor's values and beliefs about the environment and technology. In this context, the holding of *inconsistent* values and beliefs in regard to *technological progress* and *environmental protection* will be indicative of a reflexive orientation. For example, in the preceding chapters we have focused on how the process of confronting the risk of technological failure, and the awareness of the inherent uncertainties and flaws of science, may have contributed to the lack of trust in technology and technical expertise expressed by GLSP members. Therefore, it would be expected that positive technological values and beliefs would not be as strongly held in the risk society relative to the past. Such a weakened view of science and technology would not exist in simple (industrial) modernity because belief in technological progress was seen as essential for economic development. It is only now, in confronting the side-effects of simple modernity, that the impetus arises for re-thinking or re-evaluation of technological value and belief systems. It should be noted that although technological values and beliefs may become questioned in the reflexive process, it is unlikely that they will be rejected altogether because of the common realization that material prosperity is very much dependent on technology.

The re-evaluation of *technological* value/beliefs is only one part of the reflexive process that is promoted by the process of confronting environmental risks. The other part of the reflexive process involves a re-evaluation of the actor's *environmental* values and beliefs. Thus, reflexivity in the risk society should be expected to involve a *weakening* of the faith given to technology and technical expertise with a commensurately greater amount of attention given to environmental concerns. We would expect, therefore, that a reflexive orientation would consist of a mindset that includes both a relatively weak support of technology and science and a relatively strong support of ecological values and beliefs. We will investigate this hypothesis in this chapter.

In the first section of this chapter we will outline the concept of the social paradigm and discuss how the Technological and Ecological Social Paradigms were quantitatively assessed in our study.

In the second section we will discuss how social change may be described in terms of shifting paradigms. As we shall see, central to this conceptualization of social change are the notions of inconsistencies and incongruencies related to the adherence of somewhat contradictory sets of values and beliefs.

In the last section we will expand on the paradigm model of social change by considering the theory of reflexive modernization. In this section we will discuss how the inconsistencies and incongruencies indicated by our quantitative analysis were associated with the anxieties and insecurities characteristic to the risk society. We will then discuss how this has led to an adoption of a reflexive orientation.

Section I   The Concept of Social Paradigm

Olsen et al. (1992:8-9) essentially propose a dialectical model of social change based on the proposition that a prevailing Technological Social Paradigm (TSP) is being influenced by a newly emerging Ecological Social Paradigm (ESP). In this context, a social paradigm refers to:

> [T]he perceptual and cognitive orientation that a "communicative community" uses to interpret and explain particular aspects of social life that are important to it. (Olsen, Dunlap, and Lodwick,1992:18)

The constituent parts of a social paradigm are *beliefs* and *values* (Olsen et al., 1992:16). In this framework, *social beliefs* are defined as those specific ideas about some aspect of social life that are held to be true by individuals (regardless of the supporting or contradictory evidence). For example, the view that technological developments will always provide solutions to social and economic problems is a social belief. *Social values*, on the other hand, refer to what individuals conceive of as good and bad, or desirable and undesirable. Social values therefore refer to how individuals think things *should be*. Olsen et al. (1992:16) note there is usually some consistency between social values and beliefs. For example, if an individual *believes* that the benefits one receives are a result of individual efforts, then, such a person will likely *value* competition for jobs and income. Conversely, if the person *believes* that poverty is due to discrimination and exploitation, such an individual will likely *value* those social policies aimed at eliminating such practices.

Social Paradigms and Social Change

Olsen et al. (1992) have used the concept of social paradigm to investigate social change pertaining to environmental matters in a more quantifiable manner. They have built on an existing body of literature that dealt with this theme in more theoretical terms. We will now briefly consider this literature as it will help situate our understanding of social change in terms of shifting social paradigms.

O'Riordan (1976:1) observed that the two competing ideological themes of ecocentrism and technocentrism have existed together for about a century, although among different sectors of the population. Ecocentrism is based on the assumption that there exists an equilibrium in nature and, that human beings are simply part of this all-encompassing balance. Ecocentrists feel that human beings should not upset this delicate balance through drastic intervention (as would occur with the continued use of high impact industrial technologies). Technocentrists, on the other hand, assume that human beings are superior to all other forms of life on earth and should therefore try to control and dominate nature. For O'Riordan (1976) the growing awareness of scarcity and the increasing influence of the "limits to growth" perspective spurred the environmental movement of the early 1970s to raise the general public's awareness of the inherent contradiction between ecocentrism and technocentrism. According to O'Riordan (1976) this led to the growing public awareness of an ecocentric ideology, but that this soon became displaced as attention became directed towards economic concerns related to the recession.

According to Szasz (1994:42), however, environmental awareness (particularly in the United States) was once again activated in the late 1970s due to the tremendous amount of media coverage of the Love Canal and Three Mile Island catastrophes. After such dramatic incidents, the public character of environmental awareness changed from the debate over more abstract principles such as ecocentrism versus technocentrism to a more practical orientation. Such a practical orientation is outlined by Cotgrove's (1982:7) distinction between catastrophists and cornucopians. Catastrophists are those who dramatize the dangers of environmental destruction and have a limited faith in the capacity of science and technology to address this problem. Cornucopians, on the other hand, are those who place a much greater *trust* in the capacity of advanced industrial societies to tackle environmental problems and to produce an abundance of material goods.

Mol and Spaargaren (1993:437) note that despite the existence of such orientations, the environment still played only a peripheral role in the institutional structures of society. Consequently, the environmental movement was relegated to the postion of a counter-movement because the environment was still largely seen as being "external" to social reproduction. However, the continued influence of the environmental movement forced the environmental issue onto the political agenda from that time (i.e. 1970s) onwards (Mol and Spaargaren, 1993:437). In the 1980s the influential United Nations World Commission Report on Environment and Development (the Brundtland Report) provided a positive scope for action by introducing the concept of sustainable

development as a focal point for environmental debate (Mol and Spaargaren, 1993:436).

This led to an upsurge of environmental concern which brought to an end the conception

of the environment as a factor external to the institutional organization of production and

consumption (Mol and Spaargaren, 1993:437). The adoption of such a perspective has

persisted into the 1990s whereupon efforts became directed towards the restructuring of

institutions along more environmentally relevent lines.

In order to investigate the alleged increase in environmental awareness, Olsen et

al. (1992) employ the notion of shifting social paradigms. Borrowing from Thomas

Kuhn's (1970) work on how paradigm shifts occur in the scientific community, Olsen et

al. (1992) focused on the notion of *anomalies*. For Kuhn (1970) anomalies are those

logical inconsistencies or discrepancies that arise from the fact that new scientific findings

or knowledge may *contradict* some tenets of the prevailing paradigm. The prevailing

paradigm is therefore realized as being incomplete (with regard to explanatory power) by

those in the scientific community. This in turn invites new theoretical thinking and

empirical findings and research that begin to violate or further challenge the expectations

and beliefs contained in the prevailing paradigm. With time, if the anomalies cannot be

explained by further refinement of the prevailing paradigm, then new ways of thinking

about scientific problems will start to emerge. Ultimately there will arise a competing

paradigm which will attempt to deal with the anomalies by using new approaches. These

new approaches may eventually become consolidated in a new paradigm. If this new

paradigm becomes accepted by more and more members of the scientific community, it

will then replace the old paradigm and the end result will be a *paradigm shift*.

Olsen et al. (1992:25) note that differences between *scientific* and *social* paradigms should be borne in mind. First of all, scientific paradigms are established by an intentional and rational process. Scientific paradigms are often debated and publicly discussed in conferences, technical journals and academic circles. On the other hand, new *social* paradigms often emerge *unintentionally*, and are often incompletely and vaguely expressed. However, the new social paradigm, like the new scientific paradigm, gradually gains adherents as more and more people become aware of the *anomalies* within the old social paradigm.

Second, Olsen et al. (1992:26) note that Kuhn (1970) often referred to anomalies in two different ways (which he did not explicitly differentiate between). The first views anomalies as caused by *internal logical contradictions* within the paradigm itself. In such a situation some components of the paradigm will be inconsistent with other components. For example, in terms of the *social* paradigm, these internal logical contradictions may refer to the situation where some of the *values* shared among adherents to a paradigm do not fit with the *beliefs* that are central to it. For example, if one holds the traditional *belief* that a women's proper place is in the home, but also *values* the right of the women to choose her own life course, then *the conflict between values and beliefs* will result in an internal inconsistency.

In a different manner, anomalies may be the result of *external discrepancies* between the beliefs and values of the paradigm and existing (external) social conditions.

Consequently some paradigm components are *incongruent* with the reality outside the communicative community. This second type of anomaly is known as an *experiential incongruency* (Olsen et al., 1992:27).

For example, an internal contradiction *within* the Technological Social Paradigm (i.e. the configuration of values/beliefs pertaining to technology) may occur if there is a continued acceptance of the *belief* that technological innovation will eventually solve all of our resource and energy problems, that is coupled with the acceptance of those *values* which stress the importance of protecting the natural environment against unnecessary exploitation and desecration. That is, the *uncritical* faith in technology to solve the energy and resource problems may potentially be in conflict with environmental protection values. As Olsen et al. (1992:27) note:

> Increasing awareness of this possible logical inconsistency within the Technological Social Paradigm could cause many people to begin *questioning* that paradigm and consider adopting a new paradigm that directly supports their environmental values.(emphasis mine)

An example of the type of *external* discrepancy that may result from the relationship between the TSP and life outside that communicative community may arise in a situation in which there exists a traditional faith in the benefits of technology that is inconsistently coupled to the growing awareness of the numerous *risks* posed by modern technological development. The existence of such an external incongruity highlights the tension between risk and trust in late modernity. According to Olsen et al. (1992:27):

> Most people have been taught throughout their lives that modern technology is quite safe and trustworthy. In recent years, however,

numerous events have occurred that have cast serious doubts on that trust. These have ranged from "normal accidents" (Perrow,1984) such as airplane crashes and oil spills to entirely unexpected technological failures such as the Chernobyl nuclear plant in the Soviet Union and the release of lethal fumes from a chemical plant at Bhopal in India.

As individuals begin to feel fearful about exposure to serious technological risks, that very *fear* "might cause them to reject their faith [or *trust*] in modern technology and adopt a new Ecological Social Paradigm" (Olsen et al., 1992:28).

The existence of anomalies provides one indication of the existence of social change as individuals must attempt (either consciously or unconsciously) to reconcile old ways of thinking with new ways. In the context of our analysis, the concept of anomaly is of crucial importance because of its critical role in the reflexive process. Specifically, in confronting the environmental risks of late modernity, anomalies should arise as individuals become compelled to deal with issues that up until then, were taken for granted. This in turn may stimulate a re-thinking of ecological and technological values. Such conflicts between concerns about technology and ecology are even more likely to occur in situations in which environmental risk issues are encountered first-hand. It is precisely for this reason we have used Olsen et al.'s (1992) quantitative approach for measuring technological and ecological values and beliefs in our analysis of reflexivity in the Guelph Landfill Search Process.

The Technological Social Paradigm

The Technological Social Paradigm (TSP) consists of the combination of technological values and beliefs that influence the communicative community members' cognitive orientations towards a social issue. A description of the TSP can be obtained by combining the communicative community's technological beliefs *and* values into an index via a series of steps to be described below.

The technological belief statements were presented in the survey with their respective counter statements as follows (respondents were asked whether they strongly or mildly agreed with either the first or second statement, or whether they were undecided):

Q1. Science and technology have improved our quality of life.
Science and technology have worsened our quality of life.

Q2. Modern technology has increased our freedom and independence.
Modern technology has reduced our freedom and independence.

Q3. Complex technologies will always be risky because of the chance of human error.
Complex technologies can be made virtually risk-free through continual improvements.

Q4. Science and technology will always be able to find solutions to our problems.
Science and technology often create more problems than they solve.

The percentages presented in Table 6.1 (next page) refer to positive beliefs about technology. The responses to the first two indicators clearly show that the majority of individuals in both the Guelph Landfill Search Process and in Olsen et al.'s (1992) study sample of residents of the State of Washington, felt that science and technology have given us many benefits with regard to our quality of life, freedom and independence.

Table 6.1   Distribution of Responses to the Technological Belief Indicators

Survey Statement	Percentage of GLSP Sample Who Agree (Strongly or Mildly) N=40	Percentage of Olsen et al.(1992:39) Sample Who Agree (Strongly or Mildly) N=672
Q1. Science & technology have improved our quality of life.	83%	85%
Q2. Modern technology has increased our freedom and independence.	75%	62%
Q3. Complex Technologies can be made virtually risk-free through continual improvements.	18%	37%
Q4. Science & technology will always be able to find solutions to our problems.	23%	29%

The material prosperity resulting from technologies is not easily disputed and the results of the survey are indicative of the adoption of such a viewpoint. However, when we consider the degree of trust that respondents' have in science and technology with regard to the possibility for risk-free technologies (Q3), and the idea that science and technology will be able to solve all our problems (Q4),we see that the percentages are low (18% and 23% respectively with regard to our Guelph study).

The Enlightenment mind-set of having an unquestioned faith in science and technology as *the* means for emancipation and progress is certainly not indicated by both our and Olsen et al.'s (1992) respective findings. In order to present these results more succinctly we followed Olsen et al.'s (1992:40) procedure of producing a Technological

Beliefs Index. To produce this index the responses to Q1 to Q4 were aggregated and weighted following the sequence of steps outlines by Olsen et al. (1992:40).[2] The results of this indexing procedure are presented in Table 6.2 (below).

Table 6.2 Construction of the Technological Beliefs Index

	Percentage of Believers in the GLSP Sample (N=40)	Percentage of Believers in Olsen et al. (1992:440) Sample (N=667)
Strong Tech Believers	10%	15%
Weak Tech Believers	78%	62%
Non Tech Believers	12%	23%

The results indicate that the vast majority (78%) of participants in the Guelph Landfill Search Process were Weak Believers in Science and Technology. Only 10% had strong beliefs in science and technology and 12% rejected science and technology altogether. We have already discussed in some detail the role of technological beliefs, in our chapter on trust, for this reason we will move on to consider the role of *technological values*.

Unlike the case with beliefs, values are *"either-or"* ideas which require a *choice* to be made between alternative preferences. Therefore, the pair of value statements presented in the survey do *not* refer to positive and negative expressions of the same idea (as was the case with the pair of belief statements). Rather, the pair of value statements is meant to make the respondent choose one preference over the other. The choice

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[2]   The development of this (and other) belief and value indexes is summarized in Appendix 9.

therefore is whether one supports the position that society "should be" based on ecological principles or on technological principles. These value pairings are given below (the technological value statement is given first, the corresponding ecological value statement follows):

Q5. Nature should be used to produce goods for people.
Nature should be preserved for its own sake.

Q6. Economic growth should be given priority over environmental protection.
Environmental protection should be given priority over economic growth.

Q7. The environment should be changed to meet people's needs.
People should adopt to the environment whenever possible.

Q8. Natural resources should be used primarily for the benefit of the present generation.
Natural resources should be saved for the benefit of future generations.

Choosing one statement over the other indicates a value preference. For this reason the above four pairs of value statements serve as indicators for *both* ecological and technological values, depending on how the responses are scored. As such, in this section the values are scored as indicators of technological values, but in a subsequent section they will be scored as ecological values (by reversing the ranking). The results of applying the procedure for technological values are given below.

Since values indicate what people feel society should be like, we can see from Table 6.3 (next page) that many individuals in the Guelph Landfill Search Process do not feel that society should be exclusively based on technological principles.[3]

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[3] The percentages from Q5 and Q6 are significantly different from the findings of Olsen et al's (1992:43) study. That is, 26% *less* of those involved in the GLSP than those in the Washington State study, felt that nature should be used to produce

Table 6.3   Distribution of Responses to the Technological Values Indicators

Survey Statement	Percentage of GLSP Sample Who Agree (Strongly or Mildly) N=40	Percentage of Olsen et al. (1992:43) Sample Who Agree (Strongly or Mildly) N=672
Q5. Nature should be used to produce goods for people.	5%	31%
Q6. Economic growth should be given priority over environmental protection.	13%	26%
Q7. The environment should be changed to meet people's needs.	5%	8%
Q8. Natural resources should be used primarily for the benefit of the present generation.	8%	6%

The percentages pertaining to the technological value notion that the environment should be changed to meet people's needs are very similar (5% in our study, 8% in Olsen et al.'s (1992) study). A similar situation arises with respect to the technological value viewpoint that natural resources should be used primarily for the benefit of the present

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goods for people (rather than nature being preserved for its own sake). The percentage difference is very significant (t=3.29, p < 0.0005). Secondly, 13% *less* of those involved in the GLSP than those in Olsen et al's (1992) study, felt that economic growth should be given priority over environmental protection. This percentage difference is also statistically significant (t=1.83, p < 0.05). Such differences between those actively involved in an environmental issue (i.e. in the siting of a landfill) and the general public should be expected because the activists would be more sensitized to environmental issues.

generation (8% in our study, 6% in Olsen et al.'s (1992) study). In both studies the

percentage of individuals supporting pro-technological values was very low (both below

10%). Therefore, it can be concluded that technological values are not very widely held

in both the communicative community and in general society. Our findings therefore

agree with Olsen et al.'s (1992:44):

> The most striking feature of all these technological values is the very low
> extent to which most people agree with them. Quite obviously, the public
> does not accept technological values to anywhere near the extent that they
> accept technological beliefs.

We then developed in a Technological Values Index in the same manner as in the

case of the Technological Beliefs Index.[4] The results of this procedure are given in

Table 6.4 (below).

Table 6.4 Construction of the Technological Values Index

	Percentage of Valuers in the GLSP Sample (N=40)	Percentage of Valuers in the Olsen et al. (1992:45) Sample (N=668)
Strong Tech Valuers	2%	2%
Weak Tech Valuers	8%	23%
Non Tech Valuers	90%	76%

As we can see, the vast majority (90%) of those involved in the GLSP are Non-

Technological *Valuers*. On the other hand, Non-Technological *Believers* comprised only

12% of the those involved in the GLSP. The vast majority (78%) were Weak

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[4]   Please see Appendix 9.

Technological Believers. Therefore, we have situation where most people (90%) involved in the GLSP did not *value* technology, but at the same time, many (78%) still maintained a *weak belief* in the efficaciousness and benefits of science and technology. Once again we have reached a conclusion in agreement with Olsen et al. (1992::45), namely:

> This finding that technological values receive relatively little support from most people in this study suggests that there may be a considerable amount of inconsistency in the public at the present time. Many people are continuing to hold at least some technological beliefs, but most of them reject the values that logically should be associated with those beliefs.

As mentioned previously, a social paradigm consists of *both* social beliefs and social values. Following Olsen et al. (1992:46-47) we therefore combined the technological values and beliefs indexes to create a Technological Social Paradigm Index. The TSP Index will indicate the extent to which the TSP is held by the communicative community at that point in time. The first step in this process is to cross-classify the three categories of technological believers with the three categories of technological valuers, as done below in Table 6.5.

Table 6.5 <u>Technological Social Paradigm</u> (N=40)

	Strong Technological Valuers	Weak Technological Valuers	Non Technological Valuers
Strong Technological Believers	A. 0%	B. 5.0% (2)	C. 5.0% (2)
Weak Technological Believers	D. 2.5% (1)	E. 2.5% (1)	F. 72.5% (29)
Non Technological Believers	G. 0%	H. 0%	I. 12.5% (5)

The percentage in each of the cells represent the proportion of all respondents (N=40) falling within it.[5]

The TSP Index was then constructed from the above matrix by combining the cells in a logically consistent manner. This led to the six types or categories of Technological Social Paradigm Holders given below (the capital letters in the parentheses indicate which matrix cells from Table 6.5 were combined to produce the category). Complete Paradigm Holders held both beliefs *and* values that were strongly supportive of science and technology. Moderate Paradigm Holders (in cells B and D) include those who were strong believers and weak valuers, or were weak believers and strong valuers. Weak

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[5]   The relationship between the Technological Values and the Technological Belief Indexes was significant (p < 0.05; Chi-square = 11.86, d.f.=4). The resultant Somers'd (symmetric) value of .32 indicates that although a relation between technological values and technological beliefs does exist, it is relatively weak. This supports the earlier finding that holding technological beliefs does not necessarily lead to holding technological values. In other words, it indicates the presence of one form of anomaly.

Paradigm Holders (those in cell E) were weak technological believers and weak valuers. The Partial Paradigm Holders (those in cells C and G) were either strong believers but non-valuers or non-believers and weak valuers. Marginal Paradigm Holders (cells F and H) were either weak believers and non-valuers or non-believers and weak valuers of science and technology. While Non-Paradigm Holders (those in cell I) held no technological beliefs or values at all.

Table 6.6 <u>Technological Social Paradigm Index</u>

	Percentage of GLSP Sample (N=40)	Percentage of Olsen et al. (1992:48) Sample (N=663)
Complete Paradigm Holder (A)	0%	1%
Moderate Paradigm Holder (B,D)	7.5%	6%
Weak Paradigm Holder (E)	2.5%	13%
Partial Paradigm Holder (C,G)	5%	8%
Marginal Paradigm Holder (F,H)	72.5%	53%
Non-Paradigm Holder (I)	12.5%	19%

As we can see from Table 6.6, the vast majority (72.5%) of those involved in the GLSP were *Marginal TSP Holders*. That is, about 73% of participants in the GLSP were either weak believers and non-valuers or are non-believers and weak valuers of science and technology. Therefore, the indications are that the majority of those who participated in the GLSP did not hold the Technological Social Paradigm as their dominant perspective (there were no Complete TSP Holders, and only 7.5% Moderate TSP Holders). In fact,

Marginal and Non TSP Holders combined to make up 85% of those involved in the GLSP (compared to 72% of those in Olsen et al.'s (1992:48) study). In the next section we will do a parallel analysis with regard to ecological values and beliefs.

The Ecological Social Paradigm

The analysis of the Ecological Social Paradigm (ESP) will be done using the same format as our analysis of the TSP. For the sake of brevity therefore, we will simply introduce the relevant tables with the understanding that the methods used to construct the tables are already understood (for a review of the procedures used, see Appendix 9). We start with a consideration of ecological beliefs.

The four sets of paired indicators used to measure ecological beliefs were as follows (the positive expression is presented first, followed by the contrasting negative expression):

Q9. People must learn to live in harmony with nature to survive.
People must learn to control nature in order to survive.

Q10. The earth is like a spaceship, with limited room and resources.
The earth is vast, with almost unlimited room and resources.

Q11. Modern industrial countries are very seriously disturbing the balance of nature.
The balance of nature is strong enough to cope with the impacts of modern industrial countries.

Q12. Despite our special abilities, humans are subject to the laws of nature like other species.
Because we are human, we are not subject to the laws of nature as are other species.

The responses to these ecological belief indicators are summarized in Table 6.7.

Table 6.7   Distribution of Responses to the Ecological Belief Indicators

Survey Statement	Percentage of GLSP Sample Who Agree (Strongly or Mildly) N=40	Percentage of Olsen et al. (1992:63) Sample Who Agree (Strongly or Mildly) N=672
Q9. People must learn to live in harmony with nature to survive.	85%	86%
Q10. The earth is like a spaceship, with limited room and resources.	93%	78%
Q11. Modern industrial countries are very seriously disturbing the balance of nature.	90%	78%
Q12. Despite our special abilities, humans are subject to the laws of nature like other species.	98%	62%

A cursory look at the percentages in Table 6.7 clearly indicates the very high degree to which ecological beliefs were subscribed to by those involved in the GLSP -- all percentages are at least 85% or above.[6]

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[6]   The percentage differences between our distribution and Olsen et al's (1992:63) for th. .e of the indicators are statistically significant. Specifically, 15% *more* of those involved in the GLSP than those in Olsen et al's (1992) study felt that the earth is like a spaceship, with limited room and resources (t=.18, p < .005); 12% more felt that modern industrial countries are very seriously disturbing the balance of nature (t=2.44, p < .01); 36% more felt that despite our special abilities, humans are subject to the laws of nature like other species (t=4.6, p < .0005). Again, such results would be expected because participants involved in the GLSP were directly involved in an *environmental* risk issue.

Table 6.8 Construction of the Ecological Beliefs Index

	Percentage of Believers in the GLSP Sample (N=40)	Percentage of Olsen et al. (1992:64) Sample (N=671)
Strong Eco Believers	87%	57%
Weak Eco Believers	10%	35%
Non Eco Believers	3%	8%

As the Table 6.8 shows, an overwhelming majority (87%) of those involved in the GLSP were strong ecological believers (the procedure used to construct the Ecological Beliefs Index is given in Appendix 9).

As previously discussed with regard to technological values, reversing the scores obtained from our indicators of technological values will allow those very same indicators to act as indicators of ecological values. When this is done, we obtain the distribution shown in Table 6.9 (following page).

Table 6.9 Distribution of Responses to the Ecological Values Indicators

Survey Statement	Percentage of GLSP Sample Who Agree (Strongly or Mildly) N=40	Percentage of Olsen et al. (1992:66) Sample Who Agree (Strongly or Mildly) N=672
Q5. Nature should be preserved for its own sake.	85%	55%
Q6. Environmental protection should be given priority over economic growth.	80%	51%
Q7. People should adapt to the environment whenever possible.	92%	82%
Q8. Natural resources should be saved for the benefit of future generations.	83%	75%

Table 6.9 indicates the large extent to which ecological values were subscribed to by participants in the GLSP. At least 80% of the participants chose the pro-environmental values over the pro-technological values in each category. This suggests that at least four-fifths of the GLSP communicative community valued the environment more than technology.[7] Once again we can construct an index to show the distribution of ecological

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[7]   The first two percentage differences from Table 6.9 are statistically significant. That is, 30% more of those involved in the GLSP than those in Olsen et al's (1992) study held the ecological value that nature should be preserved for its own sake (t=3.75, p < .005); and 29% more held the ecological value that environmental protection should be given priority over economic growth (t=3.54, p < .005). But, once we consider Ecological Valuers versus Non-Ecological Valuers as a whole (as indicated below in Table 6.10), the percentage difference diminishes as only 8% more of those involved in the GLSP compared to those involved in Olsen et al's (1992) are

valuers in the GLSP (details of this procedure are given in Appendix 9).

Table 6.10 Construction of the Ecological Values Index

	Percentage of Valuers in the GLSP Sample (N=40)	Percentage of Valuers in the Olsen et al.(1992:68) Sample (N=688)
Strong Eco Valuers	75%	25%
Weak Eco Valuers	15%	57%
Non Eco Valuers	10%	18%

In order to obtain the Ecological Social Paradigm we once again cross-classify the

beliefs and values indexes to obtain the matrix shown in Table 6.11.

Table 6.11 Ecological Social Paradigm

	Strong Ecological Valuers	Weak Ecological Valuers	Non Ecological Valuers
Strong Ecological Believers	A. 75.0% (30)	B. 7.5% (3)	C. 5.0% (2)
Weak Ecological Believers	D.	E. 5.0% (2)	F. 5.0% (2)
Non Ecological Believers	G.	H. 2.5% (1)	I.

The correlation between ecological beliefs index and the ecological values index used to

create the above matrix is highly significant with Chi-square = 20.47, d.f.=4, and

p < .0005. The correlation is quite strong as indicated by the Somers' d (symmetric)

Ecological Valuers. This suggests that the main difference is that more of those i! volved
in the GLSP value the environment more strongly (i.e. to a greater degree).

value of .59. In order to examine the degree to whi ;h participants in the GLSP subscribed to the ESP we constructed an ESP index in a manner parallel to that of the TSP Index. The results of this construction are given in Table 6.12 below.

As Table 6.12 indicates, 75% (30/40) of those involved in the GLSP were Complete Ecological Social Paradigm Holders. In other words, 75% of those involved in the GLSP were both strong believers in, and valuers of, ecological proclivities (compared to 22% of those in Olsen et al.'s (1992:71) study of a more general public population). There were no participants involved in the GLSP who rejected both ecological values and beliefs altogether (only 4% of such individuals existed in Olsen et al.'s, 1992 study).

Table 6.12 <u>Ecological Social Paradigm Index</u>

	Percentage of GLSP Sample (N=40)	Percentage of Olsen et al. (1992:71) Sample (N=688)
Complete Paradigm Holder (A)	75%	22%
Moderate Paradigm Holder (B,D)	7.5%	34%
Weak Paradigm Holder (E)	5%	23%
Partial Paradigm Holder (C,G)	5%	4%
Marginal Paradigm Holder (F,H)	7.5%	13%
Non-Paradigm Holder (I)	0%	4%

Further examination of our results shows that just over four-fifths (82.5%) of those involved in the GLSP have adopted the Ecological Social Paradigm, either completely or moderately (compared to over half (56%) of Olsen et al.'s (1992) sample). Olsen et al. (1992:71) conclude that the Ecological Social Paradigm is evidently held by the American public at the present time. As our sample is biased in favour of environmentally activated individuals we cannot extrapolate to the general public, but it is perhaps safe for us to conclude the Ecological Social Paradigm is clearly held by the vast majority of those involved in the GLSP.

Section II   Conceptualizing Social Change In Terms of Shifting Paradigms

The technological and ecological social paradigms are to some extent antithetical. This stems from the fact that in simple modernity (i.e. classical industrial society), the environment was usually considered as an "externality" in relation to technical and industrial development. That is, industry considered any outputs (i.e. waste products) that were flushed into the environment outside their factory or firm as being "someone else's problem". Hence the pollution of the commons was considered by industry to be a problem that should be addressed by the state.[8] The state (under pressure from the

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[8]   The above argument is essentially a variant of the "free-rider problem" associated with the "tragedy of the commons" conceptualization noted by Hardin (1968). O'Riordan (1976:36) notes that the "commons" tragedy lies at the heart of environmentalism because it deals with the moral relationship between short-term selfishness and enlightened longer-term community interest.

environmental lobby) may enforce environmental regulations to protect the commons, but as Schnaiberg and Gould (1994:55) note, such regulations are often considered by industry to be a cost:

> For firms, the presence of environmental regulations is regarded as a transaction cost, that is the cost of doing business. Thus the managers want to undertake activities that produce the minimum level of compliance that will suffice to let the economic actors carry on their desired business. (Schnaiberg and Gould,1994:55)

As such, environmental values and industrial values (and the technological values which support the latter) are often at odds. However, in contemporary times, Beck (1992b:111) notes that modern environmental risks inescapably have an impact on a wide variety of economic sectors because they threaten property, capital, resources, jobs, and so on. That is, because of the "boomerang effect" (Beck, 1992:23), in which the consequences of risk come back to impact even on those who produced (and to that point benefited) from the risk, which implies that environmental problems can no longer be simply minimized or externalized. As a result of the necessity of confronting modern environmental risks, individuals (and institutions) are forced to reconcile their views of technology with their raised environmental awareness. This will likely result in the coexistence of technological and ecological beliefs/values with the latter becoming more prominent.

The results of our analysis generally confirm the conclusions of Olsen et al. (1992:136) that there has been a shift from adherence to the Technological Social Paradigm to the Ecological Social Paradigm (at least in regard to the communicative

community involved in the GLSP). This is indicated by our findings that the *overwhelming majority (85%) of GLSP members were Marginal or Non-Technological Social Paradigm Holders*. On the other hand, the *overwhelming majority (82.5%) of those involved in the GLSP were also Complete or Moderate Ecological Social Paradigm Holders*. This generally suggests that participants in the Guelph Landfill Search Process (i.e. members of CASC, LSG and the neighbourhood groups) largely rejected technological beliefs and values but accept ecological beliefs and values.

Our quantitative analysis has thus far directed us to the fact that ecological beliefs and values were considerably important to participants in the GLSP, while technological beliefs and values were de-emphasized. To account for this we will first discuss how Olsen et al. (1992) have explained the shift from the Technological to the Ecological Social Paradigm. We will then examine how such an explanation may be enhanced by considering the theory of reflexive modernization.

Technological Inconsistency in the Guelph Landfill Search Process

According to Olsen et al. (1992:107), there are three types of *internal* paradigm inconsistencies . The first refers to the case where individuals *believe* that technology is highly beneficial for society, but at the *same time* feel that fundamental ecological principles are also important. That is, they accept ecological *values* as desirable objectives, or they support anti-technological *values*, but, they concurrently maintain positive *beliefs* about science and technology. Such individuals are referred to as

"*technological inconsistents*". To find the extent to which individuals involved in the GLSP were technological inconsistents, following Olsen et al. (1992:107), we have constructed an Index of Technological Beliefs/Ecological Beliefs Inconsistency based on the cross tabulation of: (i) the Technological Beliefs Index with the Ecological Beliefs Index, and, (ii) the Technological Beliefs Index with the Ecological Values Index.

The following matrix reveals the proportion of the involved in the GLSP who were inconsistent in that *they held both technological and ecological beliefs at the same time*.

Table 6.13 <u>Matrix of Technological Beliefs Index Categories and Ecological Beliefs Index Categories (N=40)</u>

	Strong Eco Believers	Weak Eco Believers	Non-Eco Believers
Strong Tech Believers	A. 7.5%	B. 0%	C. 2.5%
Weak Tech Believers	D. 67.5%	E. 10%	F. 0%
Non-Tech Believers	G. 12.5%	H. 0%	I. 0%

Cells from the above matrix were then grouped together in a logically consistent manner to create the Index of Technological Beliefs/Ecological Beliefs Index (Table 6.14; next page).

By combining the highly and somewhat inconsistent categories we can see that 75% of those involved in the GLSP held *contradictory beliefs* with regard to technology and ecology (compared to 49% of the general public in Olsen et al. (1992) study). This

Table 6.14 Frequency Distribution for the Index of Technological
Beliefs/Ecological Beliefs Index

	Percentage of Participants in the GLSP Sample (N=40)	Percentage of Participants in Olsen et al.(1992:193) Sample (N=685)
Highly inconsistent (Cell A)	7.5%	7%
Somewhat inconsistent (Cells B,D)	67.5%	42%
Slightly inconsistent (Cell E)	10%	24%
Not inconsistent (Cells C,F,G,H,I)	15%	27%

suggests that this type of belief-belief anomaly was quite prevalent amongst those involved. It also indicates that involvement with an environmental risk issue may increase the likelihood that an anomaly between ecological and technological beliefs will arise, if it did not already exist previous to the individual's involvement (as seen by comparing to Olsen et al.'s (1992) finding in relation to the general public).

Table 6.14 shows that 75% (30/40) of those in the GLSP sample were somewhat to highly inconsistent in regard to holding both ecological and technological beliefs at the same time. Specifically, 7.5% held *strong* ecological beliefs at the same time as they held *strong* technological beliefs, thus indicating a high amount of inconsistency. The vast majority, about 68%, were somewhat inconsistent because they were *weak technological believers, but at the same time held strong ecological beliefs* (see Cell D in Table 6.13).

A second form of internal inconsistency arises when individuals *support*

technological beliefs but at the same time espouse ecologically oriented values. To study

this relation the Technological Beliefs Index was cross-classified with the Ecological

V∙lues Index to give the following matrix.

Table 6.15 <u>Matrix of Technological Beliefs Index Categories and</u>
<u>Ecological Values Categories</u> (N=40)

Ecological Values ----------- Technological Beliefs	Strong Ecological Valuers	Weak Ecological Valuers	Non- Ecological Valuers
Strong Tech Believers	A. 5%	B. 2.5%	C. 2.5%
Weak Tech Believers	D. 57.5%	E. 12.5%	F. 7.5%
Non-Tech Believers	G. 12.5%	H. 0%	I. 0%

From Table 6.15, cells were grouped together on the basis of the indicated level of

inconsistency. This procedure resulted in Table 6.16 (on the following page).

Table 6.16 Frequency Distribution of the Index of Technological
Beliefs and Ecological Values

	Participants in the GLSP (N=40)	Literature Value Olsen et al.(1992: 109) (N=685)
Highly inconsistent (Cell A)	5%	3%
Somewhat inconsistent (Cells B,D)	60%	22%
Slightly inconsistent (Cell E)	12.5%	39%
Not inconsistent (Cells C,F,G,H,I)	22.5%	36%

As we can see, *the majority of GLSP participants (65%) were somewhat or highly inconsistent in regard to holding technological beliefs and ecological values.* Specifically, 5% were highly inconsistent because they held *strong ecologi al values*, but at the same time, they also held *strong technological beliefs*. The majority (60% of the GLSP sample) were weak technological believers at the same time as they were strong ecological valuers (see Cell D of Table 6.15), or they were strong technological believers who held weak ecological values (see Cell B of Table 6.15).

The above quantitative analysis suggests that the majority of GLSP participants held ecological and technological beliefs and values that were inconsistent or contradictory. As we shall discuss, the presence of such inconsistencies suggests the presence of a reflexive orientation amongst the members of the communicative community in our study. That is, it is our contention that the weakening of technological views and the concurrent strengthening of ecological views is indicative of the adoption of a reflexive orientation in the risk society.

Technological Incongruency

If individuals subscribe to the TSP, but at the same time their social environment tends to emphasize an ecological rather than a technological orientation, then such individuals can be described as "*technological incongruents*" (Olsen et al., 1992:116). To analyze the impact of the social (i.e. external) environment on the individual, Olsen et al. (1992:116) focused on three such impacts: exposure to the environmental movement cohort[9], awareness of environmental problems, and concern about environmental risk. Their results showed that very few of those exposed to the environmental movement were technological incongruents because it was argued that such individuals would not hold the technological paradigm to any extent (i.e. those exposed to the environmental movement had already fully accepted the ecological paradigm and therefore would not be technological incongruents). Similarly, they found that the awareness of environmental resource scarcity was only moderately related to acceptance of the ecological paradigm. Olsen et al. (1992:124) concluded that these two type of external incongruencies did not strongly influence the process of paradigm change.

The third external incongruence they investigated is of special interest to us, namely, the possible incongruence between awareness of environmental risk and faith in the ability of modern technology to solve our problems. The argument is that the

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[9]   Olsen et.al (1992:116) indirectly measure this by determining if the respondent is younger and better educated, since according to previous studies (Morrison,1986; Morrison and Dunlap, 1986; Van Liere and Dunlap, 1980), such individuals are more likely to hold a pro-environmental orientation.

exposure to environmental risks creates a potential anomaly for those who hold the TSP. Olsen et al. (1992:129) found that concern about environmental risks was strongly related to holding the ecological paradigm.

In their conclusions Olsen et al. (1992:130) note that *external incongruencies* better account for the shift from the Technological Social Paradigm to the Ecological Social Paradigm, than do *internal inconsistencies*. They note that concern about environmental risk gives the most support for the argument that externally based anomalies have in the past influenced individuals to shift paradigms:

> From the perspective of paradigm shift theory, this suggests that past external incongruencies may indeed have created anomalies for many people that led to a paradigm shift which they have now completed. *This is especially true in regard to concern about environmental risks*, somewhat less so for awareness of environmental scarcities, and only slightly so for membership in the environmental movement cohort. (emphasis mine, Olsen et al., 1992:130)

Such a conclusion reaffirms the importance and centrality of risk and risk consciousness to our era of reflexive modernity (as discussed in the preceding chapter).

The Partial Shift from the Technological to the Ecological Social Paradigm

As can be seen from Table 6.17 (on the following page), 75% (30/40) of our GLSP sample completely subscribed to the Ecological Social Paradigm. This suggests that a shift from the TSP to the ESP has occurred.

Table 5.17 Distribution of Respondents on the Technological and Ecological Paradigm Indexes

Index Level	Technological Paradigm (N = 40)	Ecological Paradigm (N = 40)
Complete Paradigm Holders	0%	75%
Moderate Paradigm Holders	7.5%	7.5%
Weak Paradigm Holders	2.5%	5%
Partial Paradigm Holders	5%	5%
Marginal Paradigm Holders	72.5%	7.5%
Non-Paradigm Holders	12.5%	0%

To explore the linear paradigm shift model's prediction that individuals may hold *either* the technological or the ecological paradigm, but not both simultaneously, can be accomplished through the crosstabulation of the TSP Index with the ESP Index. The results of this procedure indicate that 85% (34/40) of our sample were partial, moderate or non-TSP holders at the same time as they were complete, moderate, or weak ESP holders. However, it should be noted that, although the vast majority (85%) seem to support the Ecological Social Paradigm, of this majority, more than half (58% or 20/34) still retained a marginal support for technological beliefs and values. That is, technological beliefs and values were still held by many ESP holders (albeit the indications are that these pro-technology views were not strong, the point is that they were not rejected altogether). In order to explain this coexistence of a strongly held ESP with a weakly held TSP, Olsen et al. (1992) proposed a dialectical model of social change.

The dialectic model is a three-stage model of continuous change in which there is an ongoing interaction between the two paradigms that leads to the development of a third (synthesis) paradigm. That is, the prevailing TSP (the thesis paradigm) will interact with the ESP (the anti-thesis paradigm) to produce a synthesis paradigm. This model thererore proposes that social change results from efforts taken to resolve fundamental contradictions through creative integration (Olsen et al.,1992:103). The synthesis paradigm therefore can be expected to be one in which there is *an integration of pro-technological development views with ecological awareness*. This proposed synthesis paradigm was referred to by Olsen et al. (1992:153) as the *Sustainable Development Social Paradigm*. In this context, the sustainable development perspective is based on a view that does not conceive of economic growth as being dependent on constantly rising industrial production. Rather, it proposes that industrial production must occur within the context of maintaining the environment. The Sustainable Development Social Paradigm therefore reflects the hybrid quality of bringing together ecological and technological values and beliefs:

> People who hold some aspects of the ecological paradigm or of both the technological and ecological paradigms may give evidence of adopting a Sustainable Development Social Paradigm that integrates technological and other forms of social development with ecological sustainability. (Olsen et al.,1992:153)

In other words, the new synthesis represents an integration of ideas of development (from the technological paradigm) and sustainability (from the ecological paradigm).

To further establish the existence of the Sustainable Development Paradigm,

Olsen et al.(1992:154) developed an index consisting of two technological beliefs and two

ecological beliefs that were consistent with the idea of sustainable development, as well

as four values that were likewise consistent.[10] The four survey statements that were used

in our research are given below (sustainable beliefs are given first followed by the

nonsustainable beliefs):

Science and technology have improved the quality of life.
Science and technology have worsened our quality of life.

The earth is like a spaceship, with limited room and resources.
The earth is vast, with almost unlimited room and resources.

Modern industrial countries are very seriously disturbing the balance of nature.
The balance of nature is strong enough to cope with the impacts of modern industrial
    countries.

Modern technology has increased our freedom and independence.
Modern technology has reduced our freedom and independence.

To create the Sustainable Paradigm Index, the number of pro-sustainable responses were

added together. The respondents were then classified as follows:

Strong holders = acceptance of 4 statements = 55%   (22 of 40)
Moderate holders = acceptance of 3 statements = 30% (12 of 40)
Weak holders = acceptance of 2 statements = 15%   (6 of 40)
Non-holders = acceptance of 1 or 0 statements = 0% (0 of 40)

The results show that a considerable proportion of those involved in the Guelph Landfill

Search scored high on the Sustainable Paradigm Index (85% are either moderate or strong

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[10]   In our study we did not include the value indicators because it was felt this
would make the survey too long. Second, indications of accepting the Sustainable
Development Paradigm could already be garnished by the data gathered on Technological
and Ecological Paradigms.

holders of the Sustainable Development Social Paradigm). This suggests the existence of an emerging Sustainable Development Paradigm within the GLSP.

The acceptance of the Sustainable Development Paradigm indicates that an attempt was made by the members of the GLSP communicative community to *reflexively integrate or reconcile* technological and ecological views. This reflexive orientation, in turn, establishes the social-psychological basis for a social change that supports a more environmentally sensitive perspective. The acceptance of such a perspective will therefore promote, or at least allow for, the endorsement of development strategies that are sensitive to environmental concerns. In other words, the configuration of values and beliefs supporting the Sustainable Development Paradigm may serve as the basis for 'environment-informed' *institutional* transformations (what Spaargaren and Mol, 1992 refer to as *ecological modernization*).[11] At this point we will investigate how the connection between reflexivity and environmental risk has helped to establish the conditions conducive to ecological modernization.

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[11] The institutional restructuring underlying the ecological modernization strategy is discussed in Chapter 7.

Section III Reflexivity and the Tension Between Ecological Versus Technological Values and Beliefs

The importance of reflexive "self-confrontation" or "self-analysis"[2] to contemporary times has already been recognized by social movement theorists. Although not writing from a self-identity perspective, Papadakis (1993:33) notes that:

> Identity-oriented accounts address the ways in which participants in social movements create their own objectives and meanings for collective action; their capacity for 'self-analysis' involving not only themselves but their relationship to specific institutions; the alterability of social relations; and the importance of individual initiative in bringing about social change.

For example, one member of CORALS implicitly referred to the reflexive process that he underwent in confronting an environmental risk issue:

> Although I joined the process on May 10 [i.e. the day the five potential sites were publicly announced by the LSG] because it affected me, I've learned a whole lot about the environment, about the process, and politics. *Since I have joined the process, my interests and concerns have enlarged to areas outside my previous views, and to issues about the environment in Guelph.* (Fieldnotes, CASC Meeting, September 22, 1994)

Although neither Beck nor Giddens explicitly use the empirical concepts of Technological and Ecological Social Paradigms, they do nevertheless frequently refer to the implicit tension that exists between technological and ecological views throughout their respective works. For example, as was discussed in earlier chapters, much of Giddens' work refers to problems of trust and risks associated with *technical* experts and *technological* systems. The lay awareness of such problems could only contribute to

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[2]   Self-analysis is an integral element of what Giddens (1992) refers to as a process that is pervasive in late modernity, namely the "reflexive project of the self".

weakening the hold of the Technological Social Paradigm. For Beck (1994:6) the technical and environmental issues raised in the context of risk society; including such issues as: the issue of self-limitation of development, and the redetermination of standards of responsibility, safety, monitoring, and damage limitation, all serve to undermine the foundations of contemporary society and its institutions. In this context, the reflexive treatment of such risk issues encourages or promotes a reconsideration of what the actor's value and belief systems are (i.e. technological versus ecological). The reflexive process will therefore be expected to lead to inconsistencies that must be reconciled in both thought and action. As we have seen in our quantitative analysis, such inconsistencies did indeed exist in the GLSP. We will now discuss how these inconsistencies influenced the interactions that took place in the GLSP.

Survivalism and Reflexivity

The connection between reflexivity and values conflict, although not emphasized, is in fact noted by Beck (1994:178):

> Reflexivity of modernity is tantamount then to the prognosis of difficult-to-resolve value conflicts on the foundations of the future.

When we discuss the "future" in this context what we are actually referring to is the idea of future *survival*. The notion of survival is a central element of many environmental issues (such as the search for a landfill). This is why protection of the environment is often associated with the idea of public health, and helps to explain why participants in

the Guelph Landfill Search Process had ranked the protection of the natural environment

and public health as their number one concern and insisted that these two criteria be given

the highest priority in finding a landfill site.[3] For example, it was noted by the LSG

Chair that:

> Protection of the natural environment and protection of human health and
> safety have consistently been given priority among all of the other
> considerations by the members of the Community Advisory Sub-
> Committee and people attending the workshops. (Letter from LSG Chair,
> July 19, 1994)

A CASC member noted the following:

> Groundwater protection was one of the most important of public concerns.
> The Minimum Acceptability Standards were to protect this. (Fieldnotes,
> Guelph City Council Meeting, February 27, 1995)

Similarly, a CORALS member commented that:

> One thing we have learned from this exercise is that the public has
> identified groundwater protection as *the* criteria and not just one of several
> criteria. (Fieldnotes, Guelph City Council Meeting, February 27,1995)

Hence, as we have seen in the preceding chapters, much of the activities in the GLSP

were addressed to the issue of environmental risk.

The emotional intensity associated with *environmental risk issues* is li.ked to the

notion of survival because the violation of the survival norm understandably calls forth

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[3]   Further evidence of the importance of survival is provided by the responses
to our survey question about whether: "Risks to public health should be minimized even
if economic progress is slowed down", versus the view that, "Some risk to public health
should be accepted in order to ensure economic progress." Of the 39 individuals who
responded to this question 82% strongly agreed or mildly agreed with the first statement,
5% were undecided and 13% disagreed (mildly or strongly).

strong emotions. One emotion that is very commonly associated with environmental risk issues is fear. It is in relation to this that Giddens (1990:100) notes:

> In its most profound sense, the antithesis of trust is thus a state of mind which could best be summed up as existential *angst* or *dread*.[4]

As we have seen in our analysis of trust, the lack of trust is a key element in the expert-lay interactions that took place in the Guelph Landfill Search Process. However, dread may have more to do with the process of confronting environmental risks than with the issue of trust in technology and technical expertise *per se*. This is because it is in confronting environmental risks that the actor implicitly confronts the issue of survival. This will in turn force a re-examination of the ecological and technological values and beliefs systems that must be considered in dealing with the attendant environmental risk and survival issues.

Christopher Lasch (1984) asserts that the survival mentality is a general feature of contemporary Western society. In refining his "culture of narcissism" thesis, Lasch (1984:16) contends that, "the concern with the self, which seems so characteristic of our time, takes the form of a concern with psychic survival". Although not specifically focusing on environmental values and beliefs in modern society, Lasch (1984:16) notes that:

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[4] As a point of clarification, it is perhaps not completely accurate to refer to dread as the opposite or antithesis of basic trust as Giddens (1990) has. Rather, I think that dread is the result or *consequence* of a *lack of trust*, not the opposite of trust *per se*.

Even opposition movements - the peace movement, the environmental movement - take survival as their slogan. Of course they refer to the survival of humanity as a whole, not to the everyday psychic survival of individuals; but they still reflect and reinforce a survival mentality.

However, Lasch (1984) emphasizes the possible debilitating reactions of the survival mentality, one which emphasizes retreat into the actor's own world as opposed to the taking of pro-active actions. This perspective can be expressed in terms of the empowerment-appropriation dilemma identified by Giddens (1991), and discussed in Chapter 2. Lasch stresses the latter (i.e. the appropriation) aspects of the dilemma, while lamenting the lack of "constructive political actions" that need to be taken to address risk issues. Lasch (1984:62) contends that there exists a lack of political action today because there has occurred a "trivialization of crisis" which he argues not only contributes to a pervasive sense of danger in contemporary times, but which also serves the function of being a survival strategy in its own right:

> When the grim rhetoric of survivalism invades everyday life, it simultaneously intensifies and relieves the fear of disaster. The victim of circumstances copes with crisis by preparing for the worst and by reassuring himself that the worst has a way of falling short of expectations. (Lasch,1984:62)

In this light Lasch (1984:64) feels that the voluminous psychiatric and sociological literature on both "victims" and "survivors", reflects the paradoxical nature of modern society. Victims succumb to the psychic frustrations (or what Giddens (1991) calls problems of ontological security) while survivors react. Lasch (1984) argues that the two currents may run together in the same individuals and in that case will lead to a "minimal

self" in which the self retreats to deal with the manageable or predictable problems of

everyday life, instead of dealing with larger issues (such as high-consequence risk issues).

He feels that when survivalism is the overriding issue, individuals will take more interest

in their personal safety than in the survival of humanity as a whole.[5] This is the reason

given for the lack of self-empowerment and political activism that Lasch believes to exist

in Western society:

> One reply to these claims insists that questions of genuine survival -
> energy policy, environmental policy, the nuclear arms race - ought to be
> decided politically, collaboratively, and democratically, instead of being
> treated as technical subjects understood only by a handful of specialists.
> It is more characteristic of the contemporary survival mentality, however,
> that it turns away from public questions and concerns itself with the
> predictable crises of everyday life, where individual actions still seem to
> have some minimal impact of the course of events. (Lasch,1984:64)

The treatment of "genuine survival" issues through collaboration and democratic means,

and not just by technical specialists is essentially describing a core feature of reflexive

modernization (i.e. the demonopolization of technical knowledge identified by Beck,

1992). This situation according to Lasch was uncommon (at least at the time of that

particular writing), but as we have argued throughout our preceding chapters, the Guelph

Landfill Search does seem to exemplify those very same aspects (particularly self-

empowerment). Second, Lasch's (1984:64) view that the "minimal self" retreats into his

or her own world in order to deal exclusively with manageable stresses, is also

questionable. For example, the increased activism of the general public in regard to

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[5]   Such a view is in accord with Lasch's (1980) narcissism thesis.

environmental issues in recent times was noted by the LSG Chair:

> As a social scientist, I have noticed that there has been a public change from the passive to the active pursuit of dealing with environmental problems. (LSG Chair, a retired professor of rural economics, Fieldnotes, CASC Meeting March 10, 1994)

In fact, the whole Guelph Landfill Search Process may be thought of as a sub-political channel that was designed to allow individuals in late modernity to become involved in risk management issues (to be discussed in greater detail in the next chapter).

The above discussion of the works of Giddens, Beck and Lasch, all point towards the importance of the theme of survival in contemporary times. Survival issues provoke anxieties in individuals as noted by Giddens (1991) with regard to feelings of dread resulting from the individual's self-confrontation with existential questions, and anxieties such as the "anthropological shock" noted by Beck (1987:156).[6]   M o l   a n d Spaargaren (1993:433) refer to those anxieties associated with environmental problems as *eco-anxieties*. In agreement with Beck and Giddens, we will discuss eco-anxieties in the context of survivalism. As we shall see, it is in confrontations with the anxieties related to survival that has encouraged a rethinking of ecological and technological views in order to deal with emerging internal and external anomalies. That is, it is through the

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[6]   Anthropological shock refers to the apprehension or shock people feel when they realize that their senses have been expropriated as they cannot detect many of the risks of modernity with their physical senses. Such a realization leads people to recognize the fact that they cannot have full "self-determination" because they will now have to rely on others (such as technical experts) to detect the risks of late modernity (for example, food that has been irradiated by a nuclear accident, or toxic chemical contamination involving a concentration measured in parts per billion).

reflexive treatment of such anomalies that a change has occurred in dealing with modern environmental risks.

Mol and Spaargaren (1993:454) argue that much of Beck's work dealing with survivalism is relevant only to situations involving high-consequence risks because it is these risks in particular that evoke "apocalyptic" and pessimistic views. Mol and Spaargaren (1993:443) critique Beck's (1992) equation of 'reflexive modernity' to the apocalyptic risk-society because they feel that:

> His [i.e. Beck's] projective theory of society evokes an image of a society dominated and guided at all levels by fear. Once the logic of risk distribution becomes the dominant logic, anxiety becomes permanent, oppressive and omnipresent, not only at the level of individuals but also at the level of social movements and politics.

For Mol and Spaargaren (1993) problems such as ground and surface water pollution, chemical and household waste, regional problems like acid rain, are quite different from high consequence risks and,

> [F]or that reason should not be connected directly to eco-alarmists prospects emphasizing the impossibility, under the conditions of (late) modernity, to control these problems by making use of modern institutions such as science and technology and state intervention. (Mol and Spaargaren, 1993:454)[7]

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[7]   Mol and Spaargaren (1993:455) also note that high-consequence risk theory can contribute to studying other (less-consequence) environmental risk issues in several ways. The first is that high-consequence risk theory has directed the research focus onto how lay actors and perceptions influence the relation between the environment and the conditions of late modernity. The second contribution that high-consequence risk theory has made is that it highlights the differences between global and local environmental risks as they apply to the relationship between the environment and society. Third, the risk society thesis has directed the researcher's attention onto issues concerning the reflexive character of science and technology under the conditions of late modernity. We have

At the same time however, the presence of anomalies (as manifestations of reflexivity) indicates that there is some commonality between local and high-consequence risk situations. First of all, following Beck, the term "high-consequence" for Mol and Spaargaren refer to situations in which the whole globe (or large parts of it) may suffer. In our case, the contamination of groundwater may not affect the whole globe, but it certainly does affect a whole community (potentially 81,000 individuals), therefore it can in some sense be considered as "high-consequence". Secondly, the search for a landfill is very much part of a larger environmental problem, namely the global waste management problem. This relation becomes especially significant under conditions of reflexive modernization (particularly the local-global dialectic discussed in the previous chapter).

Third, the type of risks involved in our study is similar to Beck's (1992) view of high-consequence risks such as nuclear radiation because the detection of the contamination of ground water is dependent on technical means and not on our physical senses.

Although such commonalities exist between the two types of risk (i.e. high versus low consequence risks), we do agree with Mol and Spaargaren (1993) that the degree of response to the violation of survival norms (which does nevertheless exist in both cases) may not be as emotional in the case of the Guelph Landfill Search Process as it would

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tried to follow many of these suggestions in our work so far.

be, for example, in the siting of a nuclear reactor. The point we want to make however, is that commonalities do exist, in actuality and in consequence. This is especially true in regard to feelings of insecurity.[8]

Anomalies, Insecurities, and Reflexivity

The insecurities felt in the case of a lower-risk situation will be different in degree but not in kind relative to mega-risk situations. In this connection we will briefly review the type of anxieties and insecurities that arise in the case of siting a landfill.

A survey administered for the LSG through a consulting firm (Market Vision Research of Toronto) was done just prior to the formation of CASC in December 1993. The objective of this survey was:

> To determine in an objective fashion, the attitudes, opinions and views of the citizens of the City of Guelph as they pertain to the siting of a new landfill facility to handle waste from the City of Guelph. (Market Vision Research,1993a:1)[9]

The results of that survey indicated that 64% of those sampled felt that "managing the City's waste or garbage" was a very or somewhat serious concern (subjects were asked

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[8]   In this sense the term insecurity may be better than the term anxiety in reference to lower consequence risk situations.

[9]   This survey consisted of a sample size of 600 residents of Guelph (sixteen years of age and older) chosen through random proportionate sampling techniques. Fifteen minute phone interviews were conducted on the evenings of November 30 to December 6,1993. The results of the survey are projectable to all residents of Guelph (sixteen years of age and older) with plus/minus 4.1 percentage points, 95 out of 100 times (Market Vision Research, 1993:2).

to choose between the following categories: very serious, somewhat serious, not too serious, and not at all serious). Half of the respondents felt that the quality of the environment was a very or somewhat serious concern (Market Vision Research,1993a:5). Insecurity, however is more likely linked to the notion of safety in regard to the siting of a landfill. The following question was asked with regard to the issue of safety:

> Based on your impression and knowledge, are garbage landfills usually very safe, somewhat safe, or very unsafe from an environmental point of view? (Market Vision Research,1993b:4)

The results are presented in the frequency distribution given below:

Figure 6.1 Frequency Distribution Regarding the Perceived Safety of Garbage Landfills

Very safe	6%
Somewhat safe	37%
Somewhat unsafe	37%
Very unsafe	14%
Don't know	6%

Thus, 43% of the respondents felt that a modern landfill is very or somewhat safe, while *just over half (51%) felt that it is very or somewhat unsafe.*[10] When asked why they felt that way, the following reasons were given:

Of the 43% who felt that a landfill was safe:

City does good job with garbage management	(20%)
Causing no harm	(15%)
Safe if rules/regulations followed	(14%)
Garbage is being always monitored	(12%)

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[10]   It should be noted however that the previous, controversial joint search was well documented by the Guelph newspapers. Consequently, some of the Guelph citizenry may have been 'sensitized' to landfill issues.

Of the 51% who felt that a landfill was unsafe:

Affects water/soil/wildlife	(24%)
Toxins - concerns regarding their proper disposal	(20%)
Harmful to ozone/gases being released	(14%)

From the above results we can see that of those who perceive a landfill as being unsafe, the reasons given all involved concerns about the natural environment and public health. This again gives a first indication that some amount of apprehension or concern about the risk involved with siting a landfill existed in the general Guelph population. That is, the expressed concerns about water, toxins and gases all indicated a knowledge of environmental and health risks.

In their study investigating the worries of members of three Southern Ontario communities who lived close to solid waste disposal facilities, Eyles, Taylor, Johnson and Baxter (1993:811) found that concerns about water quality, future health, and expertise[1] all induced anxiety. They attributed these worries to the fact that such factors as water quality, health and expertise were all beyond the control of individual residents:

> *[W]here there is little control, there will be anxiety,* even in an objectively low risk situation of non-toxic municipal waste disposal. (Eyles et al.,1993:811; emphasis mine)

These sorts of anxieties, although not apocalyptic in degree, do nevertheless induce stresses that will challenge the actor's taken-for-granted experiential reality. Such anxieties also point to the insidious nature of modern environmental risks. This is

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[1] Concerns about water quality, health and expertise have been discussed in our chapters on trust and risk.

particularly true because the limited control that lay actors have over modern risks is often due to the fact that such risks are not detectable to their physical senses.

Using depth interviews, Eyles et al.'s (1993) study also revealed that community members living near a waste facility in Milton, Ontario, experienced a lack of trust in technical experts. As would be expected, problematic trust relations further compounds the felt anxiety:

> Fears were expressed about increased health risks as a result of problems with leaching and/or run-off. *These fears were often exacerbated by the knowledge that some harmful substances will unavoidably enter the site and a lack of trust in the opinions of experts or authorities who have assured them that there is nothing to worry about.* This lack of trust seems to stem primarily from the perception that experts have been proven wrong in the past and that strict monitoring procedures will be relaxed over time. (Eyles et al.,1993; emphasis mine)

Hence, the problematic trust relations characteristic to risk society also may contribute to feelings of insecurity and anxiety.

The anxieties associated with living near a landfill site were actually addressed directly by CASC in regard to the issue of how residents living near the potential sites should be notified. For example, one CASC member noted the following:

> We should hone in on those things which will cause *distress* to those people affected by the potential landfill. The letter [of notification] should be couched in terms of these concerns. This will help to placate people and allay their worries. (Fieldnotes, Joint LSG/CASC Meeting, April 6, 1994)

Another member of CASC noted that:

> In order to deal with the *mental anguish* that people may experience
> following the announcement, a team of *crisis councillors* should be
> available on a short-term basis. (Fieldnotes, CASC Meeting, April 13,
> 1994)

This "mental anguish" did not only refer to issues of physical survival. For example, a

CASC member noted that mental anguish may be felt by landowners who have greatly

invested in valuable properties and will be worried about their possible investment loss.

As such, a resident in the annexed area commented that:

> *This landfill issue potentially represents a shattered dream for us*; having
> spent the past 6 years saving for this, our final move, and over 1 year of
> intensive searching to find the perfect place to raise our children. (Letter
> to LSG, July 28, 1994)

Members of CORALS also wanted to make sure that the LSG was aware of the anxiety

they felt over the landfill issue:

> How long can this search process be dragged out? Does City Council and
> the LSG realize the *emotional impact* it is having on the people involved?
> (Letter from CORALS to the LSG, September 7, 1994)

A CASC member noted that stress may also be experienced by senior citizens who may

have their retirement plans disrupted by the potential landfill. He noted that such

concerns "cause a tremendous sense of worry and anxiety" (Fieldnotes, CASC Meeting,

April 28, 1994). This CASC member actually wanted such considerations to be

incorporated into the City's compensation policy. To this the City's environmental

lawyer replied that, "You will never be able to sell mental anguish as a compensation

issue with regard to the potential sites". However, such anticipated anxieties are real and

they will impact on other aspects of an individual's life because as W.I. Thomas (1966) noted, what an individual believes is real is very often real in its consequences. Therefore, the perception of the risk of leachate contamination will have a direct impact on subsequenct actions and experiences. Thus, one GLSP participant commented that:

It [i.e. the landfill site search] causes a lot of stress in the community. There have been marriage break-ups in the community and at least one heart attack I know of related to the stress of the landfill search. (Quoted from the Guelph Mercury, Richard Dooley, July 17, 1994)

According to Edelstein (1988:11) such concerns and anxieties (i.e. anxieties which are not apocalyptic in degree) disrupt our normal understandings about what to expect from the world around us. Such a complex of normal understandings is referred to by Edelstein as the "lifescape". As Edelstein observes, even relatively moderate environmental and health concerns lead to a self-questioning of the beliefs and values that necessarily constitute part of our lifescape. In our study we have focused on just such a reflexive process in regard to the changes in ecological and technological values/beliefs.

In order to analyze such processes of reflexivity via a cross-sectional study (admittedly a longitudinal study would be more appropriate in some respects) we measured the values and beliefs that people had in order to determine if there were inconsistencies. The presence of such inconsistencies gave some indication that a self-questioning had occurred (otherwise the subjects would probably hold values and beliefs completely consistent with the technological world view which would indicate a non-questioning of their taken-for-granted reality). It is in fact this type of reflexive self-

questioning that prompted the change in the "lifescape" described above, which in turn

established the foundation for a paradigm change at the collective level in late modernity.

The insecurities that are associated with the landfill issue are characteristic to life

in the risk society. As Beck (1992) notes, the risks or threats in simple modernity of the

past went unrecognized because they were often viewed as simply being the negative

effects of the apparently responsible and calculable actions and decisions made by trusted

technical and political elites. The decision makers were trusted (at least trusted to a

greater degree relative to our present era characterized by the decline in deference), and

the risks that were produced by their decisions were just considered to be the "price that

must be paid for progress". In other words, in simple industrial modernity, the

environment was simply considered, and quite quickly dismissed, as a mere "externality".

Risks were therefore not recognized in the past because they were essentially part of that

period's "taken-for-granted" reality. Thus, Szasz (1994:57) writes:

> At some earlier time, the process or technology in question had not been
> organized as a "risk" in people's perceptions but was tacitly accepted by
> the public; later it came to be perceived as threatening, possibly
> catastrophic. This process of transformation has been documented most
> extensively for the important case of nuclear power; change in mass
> perception of industrial hazardous waste followed a strikingly similar
> trajectory.

However, today actors are forced to confront the environmental risks that were once

latent. In doing so they must re-consider their views of technology and the environment

as their taken-for-granted reality (i.e. their lifescape) becomes threatened.

Conclusion

In this chapter we have examined how the shift from technological to ecological values and beliefs may be explained in terms of the adoption of a reflexive orientation. This reflexive orientation was promoted by the need to deal with the anxieties and insecurities associated with modern environmental risks. That is, in directly confronting the issues related to the risks of leachate contamination, participants in the Guelph Landfill Search Process may have reconsidered their views on technology and the environment.

The existence of this reflexive orientation was indicated by the fact that there were inconsistencies in regard to participant's environmental and technological values and beliefs. The presence of such inconsistencies indicated that a process of change has occurred in which the pro-technological views of simple modernity were weakened (but not rejected altogether), while at the same time, pro-ecological views were strengthened.

The coexistence of inconsistent technological and ecological values and beliefs may also indicate the emergence of a new paradigm based on the attempted reconciliation of the two types of beliefs and values. That is, a sustainable development orientation may have resulted from dealing with an environmental risk issue.

In the following chapter we will discuss the influences of this reflexive orientation on what we contend has been an eco-restructuring of the institutions of the local polity and science in the Guelph Landfill Search Process. As we shall see, the beginnings of the eco-restructuring of the local polity may be seen by considering how the GLSP was

based on sub-political channels in which lay participants' environmental concerns could at least be voiced in the community's search for a landfill site. Further, we will discuss how such an institutional eco-restructuring was promoted in the City of Guelph's Green Plan. Secondly, we will try to show how the eco-restructuring of environmental impact science had occurred by examining the changes in expert-lay relationships involved in the treatment of technical knowledge. Specifically, we will discuss how the demonopolization of technical knowledge, as a condition of reflexive modernization, had the effect of promoting the development of environmental consciousness and eco-rationality to deal with the potential risks associated with a modern landfill.

CHAPTER SEVEN

INSTITUTIONAL ECO-RESTRUCTURING AND THE GUELPH LANDFILL SEARCH PROCESS

Chapter 7   Institutional Eco-Restructuring and the Guelph Landfill Search Process

In the last chapter we have discussed how the *coexistence* of ecological with technological values and beliefs amongst participants in the Guelph Landfill Search Process was indicative of a reflexive orientation. We have further argued that this reflexive orientation had the effect of leading to the adoption of a perspective which emphasized *both* industrial/technological *and* ecological concerns in the Guelph Landfill Search Process. Such a perspective essentially emphasized the need for technological development which at the same time was sensitive to the maintenance of the sustenance base. This type of perspective was termed the "Sustainable Development Social Paradigm" by Olsen et al. (1992:153). As was argued in the preceding chapter, the adoption of the particular configuration of values and beliefs comprising the Sustainable Development Social Paradigm actually may represent an eco-restructuring of self-identity. In this chapter we will show how such an eco-restructuring at the individual level mirrors a similar restructuring process that is starting to take place at the institutional level. Specifically, we will outline how the eco-restructuring of the institutions of the polity and science served to "frame" or promote the reflexive character of the interactions that took place in the Guelph Landfill Search Process.

The eco-restructuring of the central institutions of late modernity is referred to by Mol and Spaargaren (1993) as *ecological modernization*. On a theoretical level, the ecological modernization approach investigates the questions of how and why an

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ecological switch-over has occured, or is occurring, at the *institutional* level. In this context, we will discuss how the GLSP actually represented a form of ecological modernization, in which *confrontation with environmental risk issues led to institutional changes that allowed for a greater consideration of environmental values*.

The first section of this chapter will focus on the eco-restructuring of the local polity as illustrated by the recommendations in Guelph's Green Plan. The Green Plan represents a first step the City has taken to move its community towards environmental sustainability. The Plan outlines concerns that should be addressed by the various departments of City Council as well as by the various municipal departments. As we shall see, the philosophical orientation behind many of the recommendations made in the Green Plan typify a reflexive process. That is, the Guelph Green Plan illustrates how the eco-restructuring of the polity is based on the newly realized need to confront environmental risks in late modernity. We will then move on to consider how the restructuring of the polity has influenced the character of the decision-making activities carried out in the Guelph Landfill Search Process. Specifically, we will examine how the opening up of the decision-making process has led to the emergence of different types of values conflict. We will particularly focus on the conflict between economic versus environmental values as this issue came to be a central concern towards the end of the GLSP.

The second section will deal with the eco-restructuring of the institution of science. As most of the empirical findings concerning expert-lay interactions in the

GLSP have already been discussed in preceding chapters, we will now focus on how science as an institution, has restructured itself to allow for, or promote, such interactions. As we shall see, the restructuring of science in the Guelph Landfill Search Process was illustrated by: (i) the demonopolization of technical knowledge, (ii) changes in expert-lay interactions, (iii) the newly emerging connection between risk consciousness and environmental consciousness, and finally, (iv) the rise of eco-rationality (i.e. a rationality which is based on environmental values and not on the domination of nature per se).

Section I   The Eco-restructuring of the Local Polity

Having a public forum to discuss land use issues has a long history dating back to the eighteenth and nineteenth century England. According to Kemp (1985:179), historically, local public inquiries in the past were intended to deal with concerns over the enclosure of open fields and common land. Such inquiries attempted to give the appearance of openness, impartiality and justice (Kemp,1985:180). In actuality, openness and impartiality were lacking because such public inquiries were essentially limited to enfranchised property-owners who were in a position to influence the government's decision-making. Writing from a critical theory perspective, Kemp (1985:179) argues that the ultimate effect of these hearings was that they gave a *justificatory* force to government decisions and policies. In a sense, this was true of the GLSP. Although the process was largely supposed to be apolitical (i.e. a purely neutral technical matter), the

final decision was made by City Council.

As we have discussed in our chapter on risk, Beck (1994:6) notes that the raised awareness of risk in contemporary times means that new issues are brought to the fore in public hearings -- the issue of self-limitation of development, and the redetermination of standards related to responsibility, safety, monitoring, damage limitation, as well issues related to the distribution of risks. The question then arises as to what kind of decision-making structure is required to allow discussion of such issues in late modernity? To address this question let us examine in more detail: (i) the general approach to dealing with environmental concerns evident in the City of Guelph, and, (ii) the structure of the GLSP itself.

The Reflexive Orientation of the Polity in Guelph

As the innovative Guelph Landfill Search Process was initially adopted by the City, it is important to first consider how the search process fitted within the philosophical orientation of the City of Guelph. A first indication of such an orientation may be obtained by considering the City of Guelph's Mission Statement:

> Guelph is an innovative, caring community:
> * Proud of its history
> * *Committed to its natural environment*
> * Excited about its future
>
> We will:
> * Be responsive to the needs of our citizens
> * Build upon our diversified economic base and *promote new technologies*
> * Ensure controlled quality growth

* Maintain strong municipal practices

* *Respect and protect our environment* by preserving our natural, cultural and architectural heritage.

(emphasis mine; posted at Victoria Road Recreation Centre, Guelph, Ont.)

Shrivastava (1995:131) notes that mission statements provide a shared vision for those involved in the organization (in our case, community). Citing Campbell and Young (1991), Shrivastava observes that *ecocentric organizations* often have their commitments to nature clearly articulated in mission statements. In the City of Guelph Mission Statement, we see two explicit references to *environmental concerns* and one explicit reference to a commitment to using *new (i.e. innovative) technologies*. In other words, a *coexistence* of technological and ecological values and beliefs are expressed in the mission statement. Such a configuration of environmental and technological/industrial values and beliefs allows for the socio-political conditions to at least be *receptive* to a reflexive orientation based on a sustainable development social paradigm.

Another aspect of reflexive modernization involves the opening of sub-political channels. Indications of an orientation that is receptive to the opening of sub-political channels were also expressed in the documents produced by the City of Guelph to inform the citizenry about the landfill issue:

> The City of Guelph is a special community, with a talented and abundant volunteer force which is known for its vigorous participation in community projects. Environmental issues have been embraced with a positive attitude that has moved this City into a leadership position in "green community" issues. LSG intends to build this special knowledge into its search for suitable site(s). (Discussion Paper #1: Introduction to the City of Guelph's Landfill Site Search Process, November 1993)

By becoming involved in the LSG's landfill search project, Guelph residents have an opportunity to change the way waste is disposed of in the future, in the City of Guelph. This community-based search process is innovative and unique - and if it succeeds, will be a model for all of Ontario. (Discussion Paper #1: Introduction to the City of Guelph's Landfill Site Search Process, November 1993)

Recognizing that broad-based and extensive community participation is essential to solving Guelph's waste disposal problems, the LSG formed the Community Advisory Subcommittee to provide advice on key matters related to the site search and to *encourage widespread public participation*. (Update on Potential Waste Disposal Sites Identified in Guelph, May 1994; emphasis mine)

Key observations [made by the City of Guelph]:
(i) Residents of Guelph will only participate in a landfill siting process which is inclusive and responsive and takes the views and opinions of the public seriously;

(ii) a multi-stakeholder advisory group has substantial support as a method for LSG to obtain public input on a consistent basis;

(iii) continual and regular communications with stakeholder groups, and the general public must be undertaken to ensure that the "silent majority" are informed and provided with the opportunity to participate;

(iv) conducting this landfill site search in community-based fashion appears to have substantial support; and

(v) regular opportunities for the involvement of the general public to feed into the LSG/CASC process, need to be continuously provided.
(City of Guelph Landfill Search Position Paper #1, pp. 14-15, environmental assessment document submitted to the provincial ministry)

It should be noted that this strategy of allowing direct public/community input into environmental decision-making was not unique to only the landfill issue in the City of Guelph. Rather, it was part of a much larger philosophy that was expressed not only in

the City's Mission Statement but in the City's newly developed Green Plan.

The Eco-Restructuring of the Local Polity via Guelph's Green Plan

In April 1993 a survey was conducted through the weekly newspaper the Guelph Tribune (which has a circulation of 31,700/week) to determine what the community's views were towards a proposed Green Plan. The responses (N=313) indicated that many in the community felt that a more comprehensive community involvement program was needed (City of Guelph Green Plan,1994:83). In order to facilitate such a program the City (at the request of City Council) recruited a non-government organization known as the Guelph Round Table on Environment and Economy (GRTEE) to develop, co-ordinate and implement an effective community involvement program. The program was to determine which environmental issues should be addressed in the proposed Green Plan. The rationale for recruiting an environmental group instead of relying exclusively on City staff was that:

> It was felt that if the public involvement program was developed by a community group such as the GRTEE, rather than the City, the results would provide a better foundation for consensus-building and public ownership of the process and the outcome. (City of Guelph's Green Plan, July 1994:85)

The direction taken by City Council in involving an environmental group was therefore premised on their prior assumption that *trust* (and therefore legitimacy) needed to be built, and that opening a channel for sub-political actors (such as the GRTEE) would help

in this respect. City Council's view of stressing the involvement of environmental groups in environmental policy and decision-making therefore gives some credence to Beck's (1992b:116) claim that it was the citizen activists of late modernity who spearheaded the movement to place environmental issues near the top of the political agenda, and that it was they who demanded that a sub-political channel be opened to allow lay individuals to actively participate in the management of environmental risks.

The environmental group, the Guelph Round Table on Environment and Economy was specifically entrusted with the role of developing the community involvement program because it was felt that its membership represented a wide spectrum of interests and that it provided a multi-sectoral starting point (City of Guelph Green Plan, July 1994:83).

The stated purposes of the Guelph Green Plan was as follows:

> The Green Plan is the first step in a strategic planning process that is committed to moving the Guelph community towards environmental sustainability, while ensuring that we maintain our economic viability and meet our social commitments.... The Green Plan is not intended to regulate business or individual action, or to create a new layer of bureaucracy in addition to existing federal, provincial and municipal requirements. Rather, it is the first step in a dynamic, evolving process that will stimulate discussion and bring about change, ensuring that we give greater attention to the environmental implications of our everyday activities. (From the Foreword to City of Guelph Green Plan, July 1994)

The above citation points to the fact (made throughout this research) that environmental issues in late modernity are simply not just matters involving the natural environment, but, that they also involve issues of "economic viability", "social commitments",

"planning" and decision-making in general.

The initiatives of the Green Plan were not only intended to bring about change at the individual level, but also at the institutional level of the municipal polity. For this reason it was stated that:

> City Council and City departments need to consider the environmental effects of all actions and activities, from day-to-day activities through to major project proposals, before decisions are made. The potential environmental effects should be listed and described, including both the damages and the benefits (City of Guelph Green Plan, July, 1994:3)

In this sense, the Green Plan implicitly intended to develop a strategy for the reflexive *eco-restructuring* of the various departments within the municipal polity. The Guelph Green Plan reveals a *reflexive orientation* in that it involves outlines a strategy based on the deliberate and conscious effort to *confront* environmental risk issues at the collective level. It then proceeds to give an initial outline of how the various departments in the municipal polity should be restructured to deal with environmental problems that they collectively confront. In this sense it can be seen that the Guelph Green Plan is very much based on a reflexive orientation.[1]

The City's process of self-confrontation with the environmental risk issues of late modernity (and the associated issue of survival) was actually revealed on the first page of the Green Plan document:

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[1]   The Green Plan was originally initiated by the City of Guelph's Engineering Department. Their proposal to City Council was approved in November 1990 (City of Guelph's Green Plan, July 1994:83)

> This Green Plan was not created because the environment is fashionable, or because a green city is nicer than a grey one. Ensuring an environmentally sustainable future in Guelph is vital; the water supply depends on it, jobs depend on it, and *life itself* depends on maintaining the cleansing, productive and life supporting nature of the environment. (City of Guelph Green Plan, July,1994:1, emphasis mine)

The fact that self-confrontation with environmental risks served as the basis of the eco-restructuring of the polity was also indicated by the following:

> City Council has *recognized* that the time has come to devote an equal amount of effort and attention to promoting the sustainability of the natural environment that is affected by all community activities in the City. (City of Guelph Green Plan, July,1994:3,; emphasis mine)

The recognition, orientation and sentiment expressed above once again direct us to the issue of survival and its connection to environmental risk.[2]

The eco-restructuring of the polity in Guelph was intended to be implemented at the local level only (i.e. within the City's jurisdiction):

> The Guelph Green Plan, as a municipal (local) policy document, was not mandated or supervised by the provincial system. The Green Plan is a local initiative which will be implemented by the Guelph community through adopted policy, programs and initiatives; as a guide in decision-making; and through municipal budget directions. (City of Guelph Green Plan, July 1994:91)

It is for this reason that most of the proposed eco-restructuring outlined in Guelph's Green Plan refers to changes to the municipal polity's administrative and departmental structures. Such structures include the committees on which the mayor and councillors sit: the administrative services committee, community services committee, finance

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[2]   A connection which was discussed in a more detailed fashion in the preceding chapter.

committee, planning and development committee and ad hoc committees. Recommendations for the eco-restructuring of the following municipal departments were also given: Planning and Development, Engineering (Public Works and Water Works), Recreation and Parks, and Economic Development.

Based on extensive community involvement, the Guelph Green Plan outlined five "Challenges" statements that were to be addressed by the City in dealing with the main environmental issues they faced. The "Challenges" referred to the following areas -- land use and development, water, energy, transportation and waste. For example, the following are the challenge statements for land use/development, waste management and water, respectively:

> The Guelph community must maintain an ongoing commitment to environmentally responsible development, through an integrated approach that balances economic and cultural needs with environmental and social responsibilities. (City of Guelph Green Plan, July 1994:13)

> The Guelph community must work towards an efficient waste management system that strives for the elimination of waste, based on a hierarchy of reduce, reuse and recycle. The system must be economically sustainable, recognize the need for shared responsibility between residential and business community, and minimize the negative impacts on the environment. (City of Guelph Green Plan, July 1994:61)

> The Guelph community must work together to enhance the water resource (in terms of both quantity and quality) through wise and efficient use, while supporting a healthy and sustainable ecosystem. (City of Guelph Green Plan, July 1994:29)

The Challenge statements are indicative of the types of environmental risks that must be confronted in late modernity. That is, they represent the newly realized need to

incorporate the "environment" in development planning in today's risk society (i.e. reflexive modernity). In order to pursue these environmental challenges, it was recognized that various City departments and committees had to be restructured. To facilitate this eco-restructuring of the municipal polity the Guelph Green Plan proposed the formation of: (i) the Green Strategy Steering Committee (GSSC) and, (ii) an Environmental Advisory Committee (EAC). The proposed GSSC was to consist of an equal number of: citizens at large, representatives from environmental interest groups, representatives of the industrial, commercial and institutional sectors, and City officials (elected and staff). The members of this committee were to be appointed by City Council. The stated purpose of the Green Strategy Steering Committee was as follows:

> The purpose of GSSC is to ensure that there is an orderly, managed and coordinated approach to integrating the Goals and Objectives of the Green Plan into all municipal and community activities, so that as a community, we can work towards meeting the Challenges identified in each environmental issue section, and ultimately move towards environmental sustainability. (City of Guelph Green Plan, July 1994:78)

The Green Strategy Steering Committee was to frequently report to City Council with regard to its accomplishments, work plans, and provide an annual report on the "state of sustainability".[3] The report was to be prepared *with the inclusive involvement of the community*. Secondly, the GSSC was to develop clearly defined environmental goals for

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[3]   This report was intended to go beyond the "State of the Environment Reports" done by other municipalities. Rather, the intention was to integrate the examination of the natural environment with an analysis of its relationship to the economic and social sustainability of Guelph as a whole (City of Guelph Green Plan, July 1994:79).

all City departments (as related to the Green Plan). This task included the co-ordination of departments to help implement environmental initiatives. Third, it was intended that the GSSC establish a community-based system to assemble information on the natural systems existing in Guelph. Lastly, the GSSC was to help facilitate the gathering of multi-sectoral information and advice needed to formulate Guelph's development policies.

The second type of eco-restructuring of the municipal polity outlined in the Guelph Green Plan involved the formation of an Environmental Advisory Committee (EAC). The form that this proposed committee should take had not been formalized at the time of this research.[4]

The eco-structuring of the institution of the local polity described above allowed for, and promoted, the development of a sub-political channel in which lay participants could become involved with an environmental risk issue. Although the Guelph Green Plan started to be drafted in September 1992, about a year before the GLSP, the latter clearly followed the spirit and philosophy of the Green Plan with regard to community involvement in environmental decision-making, and the adoption of a consensus model.

Given the participatory thrust of environmental policy making in the City of Guelph, and the fact that the GLSP was designed to be open and inclusive with shared decision-making; participants in the Search should be expected to hold positive views towards the notion of grass-roots involvement of lay participants in sub-political channels

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[4]   It was expected that the EAC would function as a complement to the GSSC, with the EAC involving itself with technically-oriented tasks related to land use issues. This was in contrast to the GSSC which was to have a much broader scope.

such as CASC. This was in fact indicated by the results of our survey. In response to the question of whether "Citizens should have the major say in deciding important political issues", versus the counter-statement of, "Elected officials should have the major say in deciding important political issues", 85% (33/40) strongly or mildly agreed with citizen involvement in making important political decisions, while 7.5% (3/40) were undecided on this issue and the same percentage mildly disagreed. Surprisingly however, in response to the question of whether "Citizens should have the most influence in deciding local community issues", versus the counter-statement of "Citizens should have some influence in local community issues, but final decision should be made by public officials", only 64.1% (25/39) agreed with the first statement, while a sizeable minority of 25.6% (10/39) were undecided on this issue and one person disagreed. These results may indicate that although about two-thirds of those in the sample did agree that involvement in sub-political channels was beneficial, about twenty five percent also realized that such decisions were necessarily political (i.e. that in the final instance, they thought that decisions should be made by elected officials). In other words, they did support some community involvement, but realized that a political decision was necessary in the end.

The Guelph Landfill Search Process as a Form of Sub-Politics

The drive for an "ecologically sensible politics" is essentially based on efforts to

open up a sub-political space for social movement actors to deal with environmental

issues. Thus one CASC member (and concurrent member of Eastview Residents for

Environmental Justice) suggested that the CASC's Terms of Reference be enlarged to deal

with the wide range of environmental issues associated with a landfill:

> If the consensus process we are following in CASC already sets a
> precedent, then let's request that CASC throughout the summer and
> beyond, look at all aspects of the WET/DRY, SEWAGE/BIOSOLIDS as
> well as ENVIRONMENTAL consequences of playing host to a
> RESIDUAL MATERIALS FACILITY site. In order to properly review
> the many facets of the waste management scenario; the public will require
> information, reports, and draft documents for discussion etc. from the
> consultants and various City departments. [The LSG's technical consulting
> firm] appears to support the fact that people in CASC can be responsible
> with such information. [The LSG's lead technical consultant] creates his
> working documents in tandem with our progress in CASC. This example
> would be helpful for Engineering, and Planning Departments (as well as
> any hired consultants within and without the process unfolding) to extend
> to us the missing pier-s of the garbage crisis picture....In doing so,
> members of CASC will have a unique opportunity to help our City as we
> develop our way the 1990's and beyond. (Letter to CASC, June 7, 1994)

This CASC member implicitly noted that in order for public interest actors to effectively

contribute to the management of environmental issues, the polity and science must be

restructured so as to allow such actors to have access to technical information. We shall

now examine other forms of restructuring that are required in the establishment of sub-

political channels.

In order to demonstrate that the GLSP represented a sub-political channel that was

opened up to deal publicly with an environmental risk issue, we will consider Beck's

(1994a) characterization of such channels. First of all, Beck (1994:29) notes that the

norms of the participatory process should be self-legislated. This refers to the mode of

discussions, protocols, debates, and forms of voting, all of which should be self-agreed

upon and sanctioned by everyone involved. In the GLSP, the first order of business for

the CASC was to look into exactly these matters. During the CASC orientation meeting

it was decided that a *consensus decision-making approach* be adopted.[5] The rationale

behind the consensus decision-making process was given as follows:

> [I]t is fundamental that the group as a whole agrees to work together to solve problems, rather than one or two people trying to solicit others' support for their position... [A]rriving at a consensus position may take longer than "traditional" ways of making decisions, but the decision is ultimately better because it is generated and owned by the group. (CASC Meeting Records, December 7, 1993)

In addition to the consensus decision-making approach, the procedures of the meetings

were to follow the Roberts Rules of Order. It was also decided that there was no need

for the CASC to have a chairperson as this person may advertently or inadvertently

misrepresent the views of CASC. For this reason it was decided that all CASC consensus

positions would be documented by the (neutral) community involvement facilitator and

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[5] As was described in Chapter 1, this model is based on four steps:
(i) an issue/problem is brought forward for consideration,
(ii) the group brainstorms alternative approaches and potential
solutions,
(iii) one approach/solution is put forward, and,
(iv) the preferred approach is refined to the extent that all agree with it. In the consensus decision-making process, voting is only used as a last report (as it goes against the spirit of consensus-building).

forwarded directly to the LSG for their deliberations.

The CASC even made recommendations to the LSG regarding *their* decision-making process. A CASC member noted that if one or more of the community liaison members of the LSG were absent during a LSG meeting, the City staff members (who had alternatives in case the primary members were absent) could "stack the vote" in their favour (CASC Meeting Records, December 7, 1993). A CASC recommendation was proposed (and subsequently accepted by the LSG) that quorum rules for LSG voting procedures be developed so as to ensure that City staff members be limited to casting one less vote than the number of community liaison representatives voting.

Secondly, Beck (1994:29) notes that sub-political channels in reflexive modernization should ensure that the structure of decision-making be opened. That is, participants should not feel that the decisions have already been made and need only be "sold" to the public. Related to this, Beck (1994:29) notes that in building consensus, negotiation between experts and decision-makers should not be done behind closed doors, but should be open for inclusive public dialogue. In adapting the consensus-decision making process, the Guelph Landfill Search Process was indeed attempting to open-up the decision-making process. As we have discussed previously, this was felt by the City to be essential in avoiding the problems of the previous, controversial joint-search in which meetings took place behind closed doors.

In describing the consensus decision-making model, the community involvement facilitator noted that each participant's opinion is valuable, and that all options should be

considered, discussed and understood by all participants. Further, the rejection or narrowing of opinions too quickly was to be avoided (CASC Meeting Records, December 7, 1993). Such a philosophy was also meant to open-up the decision making process to all who wanted to participate.

The problem of how to allow all those who wish to participate to do so effectively was even addressed during a CASC meeting in which members were deciding on the format for the Public Workshop (Working Session) on Site Comparison Weighting and Ranking of Site Evaluation Criteria (Fieldnotes, CASC Meeting, August 16, 1994). The public workshops to that date all involved participation in round table discussions where *each* round table would arrive at a consensus position which would then be reported to the facilitator. The results from each round table would then be tallied up and presented to the LSG for their consideration. However, it was noted by some CASC members that sometimes the round table discussions resulted in the more boisterous participants intimidating other participants at the table. To avoid this problem the Site Comparison Weighting and Ranking of Evaluation Criteria exercise used a method in which *each* *individual* could separately fill out a workshop sheet (after discussion at the round table) and then personally submit it to the facilitator. In other words, individual inputs would be tallied instead of group inputs. Thus, the lead technical consultant of the LSG, reminiscent of a social scientist, noted that:

> This method was chosen to be "user friendly" so that small group pressures don't bias individual input. (Fieldnotes, Site Comparison Weighting and Ranking CASC/Public Working Session, August 29, 1994)

Beck (1994:29) identified two other factors that should be adopted in pursuing a consensus-based approach: the demonopolization of technical expertise and, the "informalization of jurisdiction". This second factor refers to the situation in which the items to be considered by participants should not be limited to only those "considerations internal to specialists" (Beck,1994:29). Instead, such consideration should be opened up according to the *social standards of relevance*. Both of these factors will be considered in a subsequent discussion related to the restructuring of the institution of science.

Private or Public Interests in the Guelph Landfill Search Process

Papadakis (1993:104) observes that one of the major differences between the past twenty years and earlier times is the emergence (on a large scale) of agencies designed to specifically address environmental issues. The goal of many of these agencies is to incorporate concerns about the environment into the entire policy-making process. The Green Strategy Steering Committee (GSSC) and the Environmental Advisory Committee (EAC), discussed above, represented two such agencies in Guelph. The Guelph Landfill Search Process, which emphasized community involvement in the policy decisions related to siting a landfill site also illustrates this. In our study, community-based agencies such as LSG, CASC and the neighbourhood groups were formally involved in the decision-making process. However, the question arose as to which "public" was being represented by the various groups involved. This particular issue was raised and discussed at the last formal CASC meeting (September 22,1994):

CASC Member: Do we [i.e. CASC] really represent the public? I have concerns about what CASC is. The question is how many parts of the public are represented at this point? I really don't feel we represent the mass of the public. (Fieldnotes, CASC Meeting September 22,1994)

Some individuals who were joint members of CASC (i.e. prior to the formation of the neighbourhood groups) and CORALS objected to the accusation that CASC had become a group which did not represent the interests of the broader public:

We strongly object to the insinuation, on several occasions, that CASC does not reflect the"real" public and is dominated by interest groups such as CORALS. CASC has consisted of representatives of various interest groups, individuals, and businesses from all segments of the City of Guelph. (Letter from Joint CORALS/CASC Members to LSG, October 7, 1995)

The LSG Chair noted that obviously those who live closer to a potential site will have a greater interest in the landfill issue. He further noted that:

CASC [at that point in time] represents a much narrower range of views than it started off with. This is perhaps understandable. I have professional experience with this and know of no other, better way of doing this. We really have two kinds of public. You have interest groups and the general public. But, it is essential that the landfill process be a public process. I don't know how better to do this. (Fieldnotes, CASC Meeting, September 22,1994)

To this the community involvement facilitator added that the Guelph Landfill Search, unlike other searches in Ontario, was consciously designed to be *inclusive*, that is, open to *anyone* who wished to participate. Thus, differences in opinion and approach should be expected to emerge in such circumstances. This realization was made by the LSG Chair who, in a letter of response to a CORALS member, noted that:

I personally feel that CORALS has participated publicly in a responsible way, being opponents rather than enemies. CORALS has raised questions and asked for information, and has provided information. This is constructive and I hope that CORALS will continue to be part of the process to locate an acceptable landfill. We recognize that your role is different from CASC's. Both groups have concerns for the community and for the natural environment and both groups are important and valuable in this process. (Letter from LSG Chair to CORALS Member, June 30, 1994)

However, the tension between CORALS and CASC did exist from the time that

the potential sites were announced. For example, some members of CASC objected to

the fact that some CORALS members (who were not joint members of CASC) were

given an opportunity to speak at CASC meetings:

There should be no privileged presentation(s) of special interest or protest. Contributions to the meeting should be fact, evidence or argument. Protest or demonstration statements should be ruled out of order and made public elsewhere e.g. the protestor's public meetings, press, and in due course City Council - NOT CASC/LSG. (Letter from CASC Member to CASC,LSG and the community involvement facilitator, June 4, 1994)

In no way can the filibustering which took place at the meeting last night by a special interest group [i.e. CORALS] be construed as constructive input. It was no more than a small group of NIMBY motivated disgruntled residents of Puslinch Township. Their action was disruptive and time wasting and an insult to genuinely concerned and involved members of the public who were forced to sit and endure a pointless and almost endless stream of irrelevant questions. Mindless NIMBYISM was allowed to control the meeting and sway the decision of the LSG. This is an insult to the dedicated members of the public who have diligently followed the process. (Letter from CASC Member to the LSG, June 20, 1994)

The relationship between CASC and CORALS was then clarified by the community

involvement facilitator who referred to the LSG Program for the Organization of

Community Involvement developed early on in the process (below). From the diagram it can be seen that the neighbourhood liaison groups have the same access to LSG and City Council as the CASC does. That is, the neighbourhood groups (and the general public) could approach Council and the LSG directly to voice their concerns. However, the LSG and City Coucil were not obliged to work with the neighbourhood groups. On the other hand, the LSG was obliged to report back to, and to work with, the CASC as part of the on-going reciprocal process (indicated in the diagram by the

Figure 7.1 Organization of Community Involvement in the Guelph Landfill Search Process
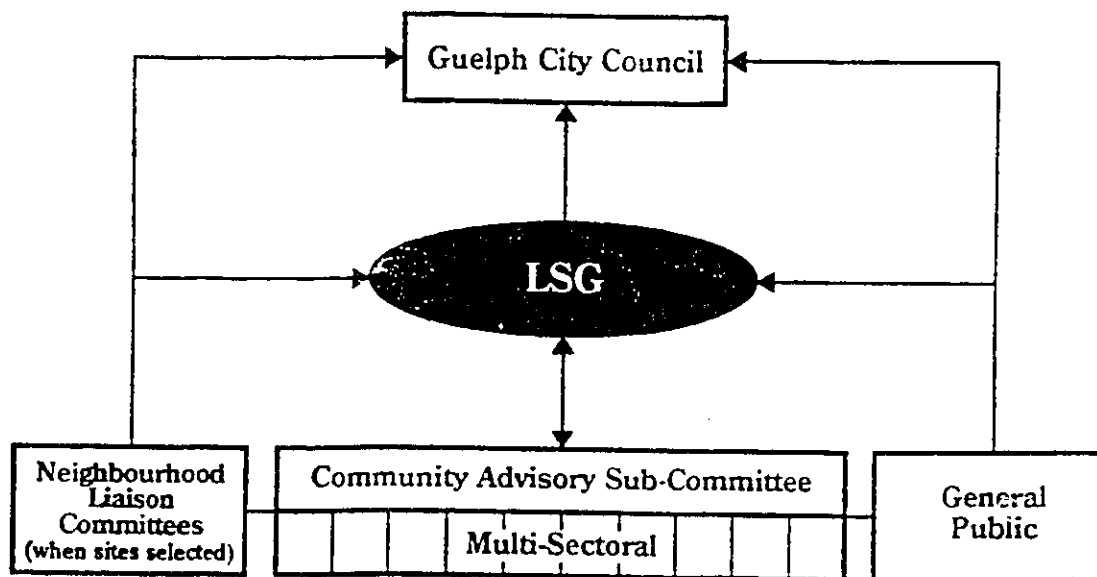
(Source: Update on City of Guelph Landfill Site Search, May 1994)

double-headed arrow between LSG and CASC). As such, the LSG was formally accountable to the CASC. The neighbourhood liaison group members could therefore attend CASC meetings, but if they did not accept the CASC Terms of Reference (i.e become members of CASC as well) they could only have input in CASC meetings as members of the public gallery.

The above discussion highlights the distinction between the general public, lay activists, and private interest group members that become involved in sub-political channels. The value orientations of these different groups can be analyzed by considering the types of values conflicts that arose in the Guelph Landfill Search Process. A consideration of such conflicts will reveal how the *political* dimension of an environmental issue can never be wholly divorced from the technical aspects (despite the intentions of the City to do just that). Such an examination will also reveal the extent to which environmental concerns are now inextricably linked to concerns in other sectors of the risk society.

Values Conflict in the Guelph Landfill Search Process

Conflicts based on differences in social values arose at several points in the GLSP. A first example has to do with the issue of social equity that was raised by different participants in the GLSP.

As we have discussed previously, the residents of the Victoria Road Neighbourhood Liaison Group had called attention to the fact that their area had already

played host to many undesirable developments: several old abandoned landfill sites, an iron foundry, a chemical plant, a beef slaughter house, and a fibreglass plant. They felt that it would not be fair to them to host the proposed landfill.

Secondly, the issue of social equity was raised in regard to CASC's consensus position that after closure of the proposed landfill site, measures should be taken to ensure that the site not be zoned for residential purposes, particularly for low income housing:

> The future use of land after the closing of the landfill should be compatible with the lands around it, otherwise it will be problematic. After the landfill is closed the land should *not* be zoned as residential. I am specifically talking about the building of low income housing near closed landfills. The public wants a guarantee that the land surrounding the landfill will be used *only* for industrial or commercial uses. (CASC Member, Fieldnotes, Joint LSG/CASC Meeting, April 6, 1994)

A CASC consensus position was reached in regard to this issue and the following recommendation was made to the LSG:

> That CASC recommend to the LSG that once a preferred site is selected in the current landfill site search, that lands adjacent to the selected site be designated in the Official Plan and zoned for uses other than residential in the future. (LSG Meeting Minutes, May 26, 1994)

The LSG Chair noted that the LSG did not have the authority to deal with this zoning issue since such matters must be dealt with by City Council, as required by the Ontario Planning Act. In a subsequent meeting the CASC decided to request the City to hold a planning forum in which CASC members could discuss the issue of land use after the closure of the proposed landfill. The forum never materialized as the attention of GLSP

participants turned towards issues related to the potential site comparison process.

The social equity argument was also raised by a group of Native people, in connection to the N-4 site (which was located near a Native burial ground):

> We will not take lightly the desecration and disruption of resting places of our dead. Building a landfill is an act of disrespect. Our ancestors are not just for archaeological consideration. *The buried dead are protectors of the natural environment.* If the burial grounds prevent a landfill, then the dead are fulfilling their responsibility. (Representative from the Six Nations Iroquois Confederacy of the Grand River, Guelph City Council Meeting, February 27, 1995)

In this case, the social equity argument was based on the conflict between Native and non-Native value orientations.[6]

In the above social equity examples, the values behind particular land uses come into conflict. The social equity issues raised in the case of the GLSP essentially dealt with the distribution of risks (issues that are increasingly becoming central to life in the risk society). In this context, the issue of risk distribution and land use are coupled. Because of the inclusive character of the GLSP, representatives from a wider sector of society became involved in the decisions pertaining to the distribution of risk. This naturally led to the emergence of a number of other value-based conflicts. We shall now briefly examine other such conflicts.

As discussed previously, in determining which criteria should be used to identify the potential landfill sites the CASC and LSG ranked the protection of ground water first

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[6] This particular type of values conflict frequently arise in situations dealing with development projects in rural settings (see Richardson et al., 1993:62-65, 134-143).

and land use compatibility second. It is in regard to the latter criterion that values

conflicts occurred. In considering land use compatibility criteria, some CASC members

felt that vacant industrial land should be given top priority to host a landfill since:

> Much of, or the majority of waste is generated by industrial users and
> industrial land is already serviced by trucks. The City and tax payers have
> already paid for industrial sites. As well, waste is an industry itself. For
> example, it generates money by tipping fees. (Fieldnotes, CASC Member,
> LSG Meeting, March 15, 1994)

To this, the City Administrator member of the LSG responded that:

> I am very afraid, and I find it very objectionable that CASC's priority is
> to site the landfill in empty industrial land. I feel that the City does much
> to have good relations with industry and the Chamber of Commerce.
> Guelph has invested very much money, for the past forty years, to attract
> industry and factories to the city. (Fieldnotes, LSG Meeting, March 15,
> 1995)

The City Engineer member of the LSG concurred:

> The high priority of the City is to promote economic activity, especially
> industrial. (Fieldnotes, LSG Meeting, March 22, 1994)

At a subsequent CASC/LSG meeting, a CASC member who represented the Guelph

Chamber of Commerce made the following comments which echoed a similar sentiment:

> As a representative of the Chamber, I am opposed to serviced industrial,
> zoned lands being the priority criteria. Our argument is based on
> economic grounds and job creation. The Chamber will object if this is
> approved. The Chamber is concerned that the health and success of a
> community is based on the heart of the economic sector. (Fieldnotes,
> Joint CASC/LSG Meeting, March 25, 1994)

In response, a CASC member argued that "public acceptance" would have a positive

effect on the economics of the site because, it would reduce the approval costs associated

with siting a landfill -- the costs of a hearing and compensation to neighbours. She also

noted that sites in an industrial area would already be perceived by the public to be the

best sites (Fieldnotes, Joint CASC/LSG Meeting, March 22, 1994).

Other CASC members maintained that vacant industrial land be given top priority

consideration as:

> We want to minimize the environmental and social impact of a landfill on
> residential settings. From the social point of view, industrial land is a
> better place for a landfill. (Fieldnotes, CASC Member, LSG Meeting,
> March 16, 1994)

The "log jam" between socio-economic versus environmental values was finally resolved

by building on the LSG Chair's suggestion that land use criteria not be considered in

isolation of other types of criteria in identifying potential landfill sites. Instead he

proposed that soil quality and depth criteria be used *in conjunction* with land use criteria.

He further suggested that instead of using the detailed land use types utilized in the

Official Plan[7], that the categories of "non-urban", "unserviced (no water/sewer)",

"existing ICI [Institutional, Commercial, Industrial] (developed)" and "existing

residential" be used instead. The two criteria groupings of groundwater protection and

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[7]   The City of Guelph Official Plan includes the following zoning
designations: general residential, central business district, regional commercial centre,
neighbourhood commercial centre, industrial, open space, floodway, aggregate extraction,
special policy areas, high density residential, district centre, community commercial
centre, service commercial, institutional, environmentally sensitive area, waste disposal,
special development areas.   Annexation of Puslinch Township allowed Guelph to use
the following additional land use categories (not yet applied at the time): agricultural,
estate residential, conservation, waste disposal site, hamlet, rural, industrial/commercial,
extractive, hazard lands.

land use compatibility were combined, and modified to produce the decision matrix used by the LSG to identify the potential sites (see Table 5.1).

The above discussion gives an indication of how economic, environmental and social values may come into conflict with one another in dealing with a landfill issue in the risk society.[8] Towards the end of the process, the particular conflict between economic versus environmental values became even more pronounced.

Environmental versus Economic Concerns in the Guelph Landfill Search Process

During the period in which the suitability of the Hanlon Road site was being determined by the LSG and their technical consultants, many businesses in the area started to speak out against the potential site. Prominent amongst these was the president of a brewery (third largest in Ontario, Fieldnotes, LSG Meeting, October 5, 1995) who stated the following:

> My grandfather founded [the brewery] in 1834 and he established it in Guelph because of its clear water and abundant and present labour force. In my industry "perception is reality". We tell people in North America and Europe to drink our product because of the purity of deep well water from the small town of Guelph. We sell the beer on the whole idea that the beer is pure. Our competitors will publicize that the well water used in our beer is right beside a landfill. We have a payroll of three million dollars and pay the City of Guelph taxes of $300,000 per year. I will have to be relocated if the landfill is built on the Hanlon Road site and will demand that the City compensate the company for the considerable cost of relocation. (Fieldnotes, Guelph City Council Meeting for Site Recommendation by LSG, October 12, 1994)

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[8]   Although, it should also be noted that the innovative process was intended to help facilitate the resolution of conflicts.

Arguments against the Hanlon Road site were also given by a representative from the employee's association of that brewery:

> I have actually been sent by the employees. I am saying on their behalf that there are 150 people there who would be very upset if the landfill were sited near [the brewery]. Let's put you in a marketing position. Bad publicity is bad publicity. [The brewery] doesn't have the backing or the muscle to deal with publicity like that. (Fieldnotes, LSG Meeting, October 5, 1994)

The fact that both representatives from labour and capital spoke out against the proposed landfill site gives credence to Beck's (1992b:111) claim that environmental risk issues may lead to the formation of unexpected alliances, such as that between capital and labour in the Guelph brewery. In this sense, environmental risk issues can never be purely technical issues because they will always involve a political dimension (as evidenced in the "jobs versus the environment" debate).

Both environmental and economic issues were identified by CASC as being crucial to the successful siting of a landfill site in Guelph:

> [T]here was general agreement that the way to proceed is to look for lands *which offer the highest degree of environmental protection*, coupled with "non-committed" lands (i.e. lands which are not currently zoned and serviced, but which can be slated for industrial/commercial uses in the future. (Letter to CASC from the Community Involvement Facilitator, March 28, 1994; emphasis mine)

In this context, the protection of ground water clearly represented environmental concerns while land use referred to issues associated with economics and development. It is important to note that although both environmental and economic issues were emphasized throughout the process, the latter came to play an increasingly greater role once the

technical (i.e. hydrogeological) work was completed. However, the participants in the

search had divergent views concerning which of the two issues had (or should have) been

emphasized in the search. For example, the City Administrator member of the LSG

made the following comments expressing his view that economic considerations were de-

emphasized in the search:

> I am plagued by the lack of attention given to economics in this process.
> The City cannot afford to have the landfill site at Hanlon Road because of
> the loss of industrial land and economic revenue. (Fieldnotes, Joint
> LSG/CASC Meeting, December 14, 1994)

On the other hand, other Guelph Landfill Search participants expressed the opposite

views:

> One thing we have learned from this exercise is that the public has
> identified ground water protection as *the* criteria and not just one of
> several criteria. The hydrogeological environment cannot be compensated
> for. Social and economic factors can be compensated for. (CORALS
> Member, Fieldnotes, Guelph City Council Meeting, February 27, 1995)

> As a Native we have a responsibility to the environment. This is where I
> come from. And I have a responsibility to my ancestors who are buried
> on the N-4 site. We are taught we do not own the land, but we have
> duties towards the land. We believe the steps taken to protect the
> environment are inadequate. *You consider economic factors too much,
> environmental factors too little.* (Representative from the Six Nations
> Iroquois Confederacy of the Grand River, Guelph City Council Meeting,
> February 27, 1995)

The important sociological point is not which of the above claims is true, rather it is the

observation that, of the diversity of issues that were addressed in the GLSP, those related

to environmental and economic concerns were given the most prominence. The

consideration of *both* aspects was evident throughout the whole process. For example,

the President of the Guelph Chamber of Commerce noted that:

> For the past year the GCC has participated in the Guelph Landfill Search through their representation in CASC. Our position is that you must consider the economic *and* ecological viability of the landfill site. The Hanlon Road site is the least preferred from an economic viewpoint. (Fieldnotes, Guelph City Council Meeting, October 12, 1994, emphasis mine)

In line with the above approach, residents in Puslinch Township, in their petition to City Council, expressed their main arguments against the Hanlon Road site in terms of both environmental and economic factors:

> In regards to a possible dump on The Hanlon Site, we believe this would be a suicidal decision for Guelph. Most of the business in the Industrial Park are very upset and have threatened to move out (a major job and tax loss). ... Last, but certainly very important, all the streams running through Preservation Park would slowly be poisoned killing all wildlife. Please don't vote for The Hanlon site. (Petition from residents in the annexed area, October 16, 1994)

The trade-off between economic versus environmental concerns in fact became *the* issue after the LSG's formal landfill site search was completed. In the next phase City Council had to decide between the LSG recommended Hanlon Road site and the N-4 site. The potential negative impacts of a landfill on these two sites explicitly directed attention to the divide between the need to consider the economic environment versus the need to consider the natural environment because the Hanlon Road site was close to an industrially zoned area (hence economic impacts were at issue) while the N-4 site was close to the Speed River (hence environmental impacts were at issue). This distinction was alluded to by the Reeve of Nichol Township (where the N-4 site was located):

> I am speaking on behalf of the Township of Nichol. How can City Council make *the moral judgment between the preservation of natural resources or negative financial impacts*. The comparison of the two sites is difficult. It is like comparing lead to gold. Do not act out of expediency. As politicians you are asked to do things based on expediency, rather than what is right. I ask you to do what is right. (Fieldnotes, Guelph City Council Meeting, February 27, 1995)

The above discussion illustrates how the tension between environmental and economic concerns were central to much of the debate that took place in the GLSP. This should not be a surprising finding because in reflexive modernity, the widespread impacts of environmental risks are starting to be realized and confronted by many more sectors of society. In particular, many more now realize that they are not wholly immune from negative environmental effects. As such, this includes the realization of the potential impacts on both the natural *and* economic environments. Modern environmental risks therefore compel lay, political, and technical actors to confront and reconcile the two goals of environmental sustainability and economic development as implicitly embodied in the development strategy of ecological modernization.

Section II The Eco-restructuring of Science in the Guelph Landfill Search Process

In dealing with environmental risk issues, the opening of a sub-political channel does not only represent an opening up of a channel for lay participants to become involved with political issues but technical issues as well. Previously, technical matters remained the exclusive domain of technical professionals, who based on their technical

assessments, would make recommendations to the political actors. The political actors would then vote on accepting or rejecting the recommendations. The key point made throughout this work is that in the GLSP, an effort was made to *share the power of the technical expert*. For example, it was noted in the <u>Site Comparison Methodology Workshop Participants' Guide</u> that:

> In other landfill site searches, it is common for the consultant to choose and apply the evaluation method and then present the results to the public. However, because the Guelph process emphasizes community involvement in the process, the comparative evaluation of the potential sites will happen in a public workshop. The method chosen for the Guelph Landfill Search should fit the type of discussion that the NLGs, CASC, and LSG have developed. (City of Guelph, <u>Workshop Guide</u>, August 9, 1994, p.4)

As we have seen, lay participants in the GLSP were also involved with such specialized matters as: the consideration of alternate waste disposal technologies, the selection of the method that should be used identify the potential sites, the determination of the criteria and methods that should be used to compare and rank the potential sites, the determination of suitable standards for the proposed landfill, and the development of compensation and impact management policies. Involvement in such technical matters illustrates another feature of dealing with environmental risks in late modernity, namely the incorporation of *social standards of relevance* in technical decision making. For example, it was noted in regard to monitoring the proposed landfill that:

> *A Community Monitoring Committee should be established to identify issues and concerns which are important to the community.* This Committee should be involved in the development of conditions of approval relating to site design, operations, monitoring, contingency planning and mechanisms to ensure that complaints are fairly, reasonably

and quickly addressed. (City of Guelph, <u>Landfill Site Search: Impact Management and Compensation Policies, Draft Discussion Paper</u>, March 29, 1994, p.6; emphasis mine)

As we have already discussed expert-lay interactions in the preceding chapters, we will therefore now turn to a more theoretical discussion of how and why the institution of science has restructured itself to allow such public involvement.

The Demonopolization of Technical Knowledge

As discussed above, decisions pertaining to what appear to be narrowly defined technical matters often involve extra-technical concerns. For example, in dealing with environmental risk many other issues arise -- the issue of social equity, competing claims to technical knowledge, and issues pertaining to trust -- all of which indicate that risk issues cannot be dealt with in a purely technical and neutral fashion in late modernity. At this point we will discuss how the institution of science has been reflexively re-organized so as to allow for discussions pertaining to a wide range of risk-related issues. The first factor that we will consider in our analysis of this process is the nature of technical knowledge in late modernity.

The type of science and engineering that is involved in the siting of a landfill is known as "impact science" (Richardson, Sherman and Gismondi, 1993:76). Generally, most of the technical work done in impact science is not original.[9] Engineering firms

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[9] In the case of the GLSP, it is important to note that the technical reports produced by the consultants were all open to public review. The relatively greater availability of such technical knowledge seems to confirm Beck's (1992) assertion that technical

which are hired to write environmental assessment documents usually gather data and information from literature searches and interviews with industry officials. Waller (1994:15) notes that this situation occurs because the economics of consulting encourages experts to standardize solutions or use existing knowledge to solve problems because doing so will reduce costs. As we have seen in the treatment of risk in the GLSP, the types and sources of data used were constantly questioned by the public. For example, the use of secondary sources of data such as well-driller logs and surficial soil maps were criticized by members of both the neighbourhood groups and CASC, as well as by the counter-experts. This presence of competing claims to technical knowledge (and the public awareness of this) further indicates the extent to which the institution of science has restructured itself to allow for the public discussion of technical matters. In essence, we can see that the *demonopolization of technical knowledge* was an important component involved in the restructuring of science.

Richardson et al. (1993:76) note that impact science could be done differently if the technical consultants were able to do their own original research to fill in the information gaps. Original research in the case of the GLSP was done by the consultants in terms of drilling boreholes to determine the soil profile in the preferred potential site during the confirmatory phase. However, it should be noted that members of CASC and the neighbourhood groups were insisting that LSG require the consultants to drill boreholes at an earlier stage -- *before* the four potential sites were to be compared. That is, they wished boreholes to be drilled on all four potential sites and not just the one

is, they wished boreholes to be drilled on all four potential sites and not just the one selected for further consideration. The rationale was that if all the potential sites were drilled, then there would then be more data available. This in turn would allow for a more thorough comparison of the potential sites.[10]

Original research was also conducted by members of the University of Guelph Landfill Committee with regard to the Victoria Road potential site. Both their data based on soil samples taken from undergraduate field studies of that site, as well as the data obtained from experiments performed by the University's hydrogeological consultant were presented to the LSG (and their technical consultants) during a joint meeting between the two groups. The LSG and their technical consultants considered the information provided by the University of Guelph and used it to modify the perimeter of the Victoria Road potential site, so that the landfill would not be situated on land that was particularly vulnerable to leachate infiltration.

Richardson et al.(1993:84), in their study of the hearings surrounding the construction of a kraft mill in Northern Alberta, note that impact studies seldom receive the type of scrutiny that follows the publication of scientific findings in academic journals. This is because impact studies are not submitted for peer review. However, in the case of the open GLSP, the technical work done by LSG's consultants was subject to review by the *counter experts* involved (i.e. the hydrogeologist hired by Puslinch

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[10]   As noted in our Chapter 5, the LSG decided against the drilling of boreholes in the comparison phase, consequently boreholes were only drilled on the preferred potential site (i.e. the Hanlon Road site).

Township and the scientists from the University of Guelph) and members of CASC and the neighbourhood groups (i.e. the "*lay-experts*"). The important point is that it is only in late modernity that a forum has been provided in which lay-experts, experts, and counter-experts can openly debate technical matters and influence technical decisions which have environmental risk implications.

In analyzing how technical information was treated in the GLSP it will be useful to consider the relationship between technical information and policy goals. In considering this relationship Raynor (1987:9) identifies the relevance of two variables -- systems uncertainty and decision stakes. *Systems uncertainty* refers to factors such as exactness, uncertainty, and ignorance that are routinely encountered in *technical studies*. On the other hand, *decision stakes* refer to the costs or benefits of the various *policy options*. The interaction between systems uncertainty and policy options leads to the development of the following three possibilities.

The first possibility is that which arises in *applied science* (or consensus science). In the domain of applied science, both the systems uncertainty and the decision stakes are *low*. That is, in consensus science the data and methods used in the academic technical community are constantly subject to peer review while at the same time the work is not subjected to policy considerations. Yearley (1992:519) notes that attention in academic science is usually directed to theoretical questions specific to their scientific discipline. For this reason, this type of technical knowledge often times does not meet the practical queries of environmental activists.

In the *clinical mode* of consultancy science (i.e. the second type), quantitative tools are used with experienced qualitative *judgements*. The existence of judgments : eans that divergent interpretations may arise.[11] At the same time, consultancy means that the decision stakes are raised as well. Thus, the clinical mode of science displays *considerable* systems uncertainty and considerable decision stakes.

A third situation arises when the systems uncertainty and the decision stakes are both *very high*. This may be the situation in environmental assessment processes because the scientific activity involved in such processes are replete with qualitative judgements and *value commitments*. In turn, these conditions promote modes of dialogue based on advocacy and adversary. This is why risk assessments often become politically charged issues (i.e. not narrow, technically defined matters).

The situation of very high systems uncertainty and decisions stakes in the GLSP is illustrated by the fact that values implicitly entered into much of the technical exercises. For example, the technical procedures involved in ranking and comparing the potential sites often led to discussions pertaining to the value trade-offs that needed to be made in, considering, weighing, and comparing the various economic, social, cultural and environmental criteria (i.e. the potential impacts on the various domains defined by the

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[11]   It was in this context (i.e. the presence of qualitative judgements and divergent interpretations) that the LSG's hydrogeologist insisted that there should be some "trust" in his experienced interpretation of well-drillers data.

criteria).[12]

The procedure for comparing and ranking the four potential sites consisted of first grouping the 46 publicly derived individual criteria into 6 groupings - public health and safety, the natural environment, the social environment, the cultural environment, the economic environment and public services. Each of these criteria groupings were then compared across the four sites. For example, the LSG would determine which of the potential landfill sites would be most adversely affected by the net cultural impacts (i.e. impacts after mitigation), then the second worst, third worst and so on. This would be done for each criteria grouping. In using this procedure the LSG had to collectively decide, on the basis of the net impacts data provided by the impact consultants and the public, which impacts would be greater or lesser across the four sites (the LSG would categorize the net impacts as "high", "medium" or "low"). This procedure ultimately resulted in a 6 x 4 summary matrix in which comparisons could be explicitly made (i.e. 6 criteria groupings used to compare 4 sites). If the net impacts for a particular grouping were considered to be the same for all potential sites then this criteria grouping would be screened out (i.e. that particular criteria grouping will not have a bearing on deciding which potential site is better, as the impact would be the same at all potential sites).[13]

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[12]   It should be kept in mind that, in order to do the comparison of the various criteria across the various potential sites, the LSG adopted a process developed and recommended by CASC. The end result of this process was the ranking of the four potential sites (the Hanlon Road site was ranked first).

[13]   The actual workshop sheets used in this exercise are given in Appendix 10.

It should be noted that although the above procedure is traceable, it does nevertheless, to some degree involve subjective judgments in doing the actual assessments (i.e. whether the net impacts/effects will be more damaging to one potential site than the others). It is for this reason, that a member of the Victoria Road Neighbourhood Liaison Group warned CASC and CORALS against the use of value-biased adjectives in their descriptions of the anticipated net impacts on the potential sites. For example, the use of the phrase 'impact on a prestigious industrial park'[14] in the publicly developed net impact tables was criticized by one VRNLG member. He noted that the LSG in doing the potential site comparison, may be consciously or unconsciously influenced by a subjective adjective such as "prestigious". Such value-biased adjectives, it was argued, would particularly weigh against those in less affluent areas, such as those in the Victoria Road potential site (Fieldnotes, Victoria Road Neighbourhood Liaison Group Meeting, September 19, 1994).

It was in comparing the potential sites using the procedure outlined above that subjective value judgments unavoidably entered into what was to be a purely technical process. It should be recalled that during a workshop, the public themselves had ranked the criteria groupings. This ranking in turn was also based on value judgements. For our present discussion it should be noted that the public had ranked the economic criterion grouping as fourth out of six, while protection of the natural environment and public

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[14]   This referred to the industrial park that was to be developed at the Hanlon Road potential site (in the annexed Puslinch Township area).

safety was ranked first. Thus, even if the (negative) economic impact was perceived to be particularly high at a specific potential site (i.e. the Hanlon Road site), while the impact to the natural environment was perceived to be much less, that particular site would be preferred for the siting of a landfill. In other words, the protection of the natural environment was given a higher priority by the public than the protection of the economic environment in ranking the potential sites. In this way, values entered into what was supposed to be a purely technical exercise.

The high level systems uncertainty in the science used in the GLSP is also illustrated by the conspicuous presence of various competing technical claims regarding: the character of the waste stream, the protection of ground water, the limits of monitoring, mitigative and landfill technologies, the flaws in the methodologies used to determine soil composition, references to contradictory hydrogeological studies and different sources of data (for example, data from boreholes versus well drillers logs).

The repercussions of systems uncertainty (and the awareness of uncertainty) are multiple. For example, we have already discussed how this can lead to a lack of trust in the system of science and technology. Secondly, as we have argued previously, the presence of systems uncertainty may promote a mode of thinking which enables both lay members and experts to deal with technical matters under such conditions of uncertainty, namely, risk consciousness. Risk consciousness therefore is a direct product of the character of science used in environmental assessment processes. Let us examine this relationship in more detail.

According to Beck (1992) the risks of simple modernity were never brought into the political arena in the past because they were perceived to be the "price of progress". However, once these risks to the environment threatened the physical, economic and social survival of the human species, such "residual risks" could no longer be unquestioningly accepted by the general public. The public trust of the technical experts became tenuous under such circumstances because too much was considered to be at stake. That is, there emerges a public awareness that the consequences of environmental destruction are very far reaching and consequential. This leads to a raised awareness of other problems associated with modern environmental risks. These include such issues as: the question of the distribution of environmental risks (i.e. the issue of social equity), and the awareness of the limits of science and "progress". The reflexive re-orientation of environmental impact science also provides space for lay involvement in technical matters. We will now examine the types of expert-lay interactions that were promoted by such a restructuring of science.

Changes in Expert-Lay Interactions

Fischer (1990:19) notes that technocratic decision-making often takes place in administrative bureaucracies that are not open to public scrutiny. The GLSP in striving to promote an open and inclusive process attempted to counter this type of entrenched technocratic monopoly. By doing this it was hoped that trust in both the technical and political actors would be fostered. In our situation it should be remembered that the LSG

consisted not only of four community liaison members, but four City Staff members (and their alternates) as well. The latter group consisted of the City's Waste Management Co-ordinator, the City Engineer, the City Planner, and other engineers and planners who were employed (but not elected) by the City. As such, the GLSP did involve those who could be described as "technocrats". In normal circumstance, technocrats and interest groups (such as environmentalists) are "virtual enemies" because the technocratic ideology holds that the political and social dimensions of a problem are to be avoided so that the problem can be reduced to technical considerations (Fischer,1990:20). It was on the basis of the technocratic ideology that in the past, landfill site searches were done through the *exclusive* collaboration of technocrats and their consultants (Hadden,, 1991:50; Kraft and Kraut, 1985, Powell, 1985; Davis and Lester, 1985; Andrews and Pierson, 1985; Saasz,1994). However, the GLSP was different because it *emphasized* the working relationship between the technocrats and public/private interest groups (i.e. CASC and the neighbourhood groups).[15] In adopting this approach, the City pursued a process that was intended to build trust between the two parties by separating the technical experts from their allegiances to political elites (i.e. the separation of consultants and City staff from members of Guelph City Council). For Fischer (1990:50), such a separation is essential to resolving the problem of technocratic rule.

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[15] In fact, it should be remembered that it was the City of Guelph's Engineering Department (i.e. the "technocrats") who proposed the Green Plan. The Green Plan was to encourage community involvement in environmental decision-making which in turn would necessitate the collaboration between community activists and technocrats.

Strategies aimed at promoting expert-lay collaboration is described by Fischer (1990:340) as "participatory research". The goal of participatory research is to discourage the mystification of expertise. The adoption of this type of strategy in effect allows for a restructuring of that sector of institutionalized science that deals with situations in which there are very high policy stakes and systems uncertainty.

An interesting sociological implication of the participatory model used in the GLSP was that it was based on a *phenomenological perspective*. Specifically, it encourages the actor to understand the other (and his/her problem) within the "logic of the situation" (Fischer,1990:365). In the case of the GLSP this meant that the lay participant was encouraged to "take the role" of the technical expert and vice versa. In fact, if this reciprocal role-taking were successful then an open awareness context would result (because each individual would then know the other's "true" identity and his/her own identity in the eyes of the other). However, as we have discussed in Chapter 4, it is difficult to build an interactive process on the basis of intersubjective understanding if there already exists a lack of trust. In the GLSP this lack of trust was not only due to the specific historical circumstances of the locality (such as issues related to annexation and the controversy filled previous search), but also because of the nature of science in late modernity. Examples of the latter include, the lay-actor's awareness of the competing claims to technical knowledge, and the associated problems of demonopolization, revisability and uncertainty of the type of science that deals with environmental issues. Under such circumstances the expert and the lay individual are

unsure of the motives and roles that each other plays (i.e. there exists a suspicious or closed awareness context). Although the GLSP was not completely successful in building this phenomenological (intersubjective) basis of interaction, it did allow for *some* collaborative interaction (despite the persistence of a lack of trust). Such partially collaborative expert-lay interactions can best be described as "*interactive engineering*".

Working form a perspective aimed at Third World development, Pacey (1983:145) develops the notion of "interactive innovation" on the realization that, often, engineers trained in Western societies are ignorant of the cultural and environmental conditions of those who will be using Western-based technologies. This leads to recurrent problems of technological breakdown and failure. Additionally, the indigenous technologies already present may be better suited to their particular environmental circumstances (relative to Western technologies).[16] To counter these types of problems an ongoing dialogue between the technical expert and the user is encouraged. However, to have this sort of interactive engineering requires a restructuring of the way science is normally

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[16] Pacey (1983:151) gives the following example to illustrate this point. In certain parts of Africa the natives traditionally built mud silos to store grain. However, grain was lost due to rats, insects and mould. As a result, the traditional technology was dismissed by Western trained engineers as worthless. The Western engineers then built metal silos which were very costly, and had the tendency to overheat. In the end, the metal silos were not any better than the traditional mud silos. From this experience the Western engineers became more aware of the problems of the indigenous peoples and they then refocused their attention to the problems of poor maintenance of the mud silos. To counter the problems of this type, Pacey (1983:158) suggests that there be active dialogue between the technical experts and those who are to use the technologies. Often times the latter group will offer crucial insights. This example points to the constructive restructuring of science that can occur with the demonopolization of technical knowledge.

done in such situations. It was in this spirit that the GLSP emphasized extensive community involvement in the technical decision making involved in the siting of a landfill.

In the following we will explore the relationship between risk consciousness and environmental consciousness to help explain how an environmental critique of science may have contributed to a restructuring of environmental impact science.

Risk Consciousness and Environmental Consciousness

Van der Daele (1992:325) notes that the impact of technology remains nonproblematic as long as there exists a confidence in the link between technological and social progress. Under these circumstances there exists a faith that science will be able to manage the problems that may arise. The results of our survey suggested that those involved in the communicative community did not have a strong trust in the system of science (see Chapter 4). Van der Daele (1992) also notes that there now exists an insistence by lay individuals that unforeseen and unknown consequences be dealt with in some manner in the process of doing impact science. The quandary is that if problems are unforeseen, how can you treat them? The strategy used by CASC members to address this quandary was one based on risk consciousness and contingency planning.

As we have discussed in Chapter 5, risk consciousness arises in situations in which there is systems uncertainty. In terms of science, risk consciousness enters into the technical treatment of environmental issues because one is dealing with the uncertainty

that arises from *incomplete* or *partial* knowledge. On the other hand, as more and more

scientific knowledge is gained, one would expect that this would presumably "fill in the

gaps" that exist in the partial knowledge base. This, however, does not occur because

as Murphy (1994:16) observes, a paradox emerges wherein the increase in scientific

knowledge leads to an increase in the awareness of our ignorance with regard to

environmental risk issues. For example, with an increase in knowledge, scientists were

able to develop instruments of heightened sensitivity which could now detect very low

levels of ultra violet radiation. However, the development of these instruments led to the

awareness of something which they were not previously aware of -- the hole in the ozone

layer. The hole in the ozone layer in turn has made us aware of our ignorance, and has

raised many more questions. Paradoxically therefore, the increased knowledge has led

to an increased awareness of our ignorance."[17] It is in dealing with such situations that

risk consciousness comes to play a crucial role.

Risk consciousness allows us to deal with this uncertainty in terms of likelihood

and contingency planning. There was no need for risk consciousness in simple modernity

because potential environmental threats were not framed in terms of risk (as noted by

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[17]   This paradox is particularly true for environmental impact science because
of the high degree of systems uncertainty. In other modes of science (such as in
consensus (academic) science) the paradox is not as prevalent because research problems
in this type of science are well-defined and simplified (due to the controlled conditions
of the laboratory) and therefore have *closure*. Technical problems in environmental
assessments and ecology, on the other hand, are *open-ended*, and much more complex
because of the interaction of many more variables. As a result closure is not possible.
This is what underlies the differences between such disciplines as physics as compared
to ecology (the former has closure, the latter does not).

Beck, 1992). However, today they are. The manner in which both lay society and the experts deal with risk is therefore different from the past.

Freudenberg and Pastor (1992:401) make the insightful observation that expert views of regulating risk and safety have changed from a *deterministic* perspective to a *probabilistic* perspective. The older, deterministic perspective was based on a traditional logic which classified things in black and white.[18] According to Freudenberg and Pastor (1992:401) under the deterministic view, facilities were *either* safe or dangerous. The objective for industry was therefore to place the regulatory level at the minimum amount of safety required (i.e. to reduce costs). In contrast, today a probabilistic view of safety and risk exists where there is a "grey area" between what is considered to be safe and what is considered to be dangerous. It is in this context that Beck (1992:64-65) notes that, discussions pertaining to environmental risks, often involve the notion of "acceptable levels" as a way of protecting health. For Beck, the problem with this notion is that it switches the aim from a focus on prevention of contamination, to a focus on the *permissible extent* of contamination:

> *That* it is permissible is no longer an issue on the basis of this decree. The really obvious demand for non-poisoning is rejected as *utopian*. At the same time, the bit of poisoning being set down becomes *normality*. It disappears behind the acceptable values. Acceptable values make possible

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[18]   This is in line with Beck's (1992) argument about the prominence of the insurance principle in dealing with risks in simple modernity. That is, insurance companies had specified limits on which basis they would insure or not insure a particular company, project, or activity. Today, risks are uninsurable because the risks cannot realistically be foreseen, or predicted. Also, the damage is not limited by time or space. Thus the insurance principle "breaks down" in late modernity.

a *permanent ration of collective standardized poisioning*. (Beck, 1992:65)

The important point for our study is that it is the *public awareness* of this "grey area" associated with environmental risk issues, in conjunction with the awareness of the systems uncertainty of environmental assessment science, that may account for the emergence of risk consciousness in the GLSP. As we have seen, participants in the GLSP were well aware (i.e. conscious) of the risks associated with a landfill and were not willing to accept any level of risk (hence the CASC emphasized the need to consider the maximum risk scenario).

Risk consciousness may also have allowed for the eco-restructuring of science. Because of the system uncertainty, and the probabilistic view of environmental impact science, the type of science involved in environmental assessments is particularly vulnerable to *critique*. In order to deal with critiques from social movement actors, the institution of science must to some extent accommodate lay involvement to maintain its legitimacy (especially in the face of well publicized eco-catastrophes). Just as the polity had to reflexively re-organize itself to deal with the ecological critique, so too did the institution of science. Similar to the restructuring of the polity, the restructuring of science has allowed environmental values and concerns to enter into the decision-making processes. In this vein, one of the consequences of this restructuring of science is the emergence of a new form of rationality; specifically, one which is sensitive to risk consciousness and ecological concerns. This is the subject of the following discussion.

The Rise of Eco-Rationality

For Weber, rationalization pertains to the process of applying the most effective and efficient *means* to obtain particular *goals*. Rationality therefore actually refers to two factors -- goals and means. Weber uses the term *substantive rationality* to refer to the logic of the adopted goals (and the values which underlie these goals), while *formal rationality* refers to the effectiveness of the means. For example, Murphy (1994:22-29) notes that, although the cutting of growth forests may be formally rational (i.e. uses efficient ways to cut down trees), it is not substantively rational (since the goal according to the pro-ecological *value* system is to preserve such forests). Murphy (1994:41) notes that in contemporary times there has been an intensification of rationalization in which irrational consequences (both natural and social) have been dealt with by means of further rationalization. For Murphy (1994:42), this has resulted in the sustainable development movement whereby ecological values underlie development goals, and more effective and efficient means are being adopted to pursue those goals that are not harmful to the environment. Ecological rationalization is illustrated by environmental assessment procedures because they typify attempts to incorporate ecological criteria into what is to be a formally rational process (Murphy, 1994:44).

As we have seen in the preceding chapters, the rational consideration of the natural environment was very much a central element in the treatment of risk in the GLSP. For example, CASC's insistence that the details of contingency planning be discussed as part of the landfill search process illustrates how the protection of the natural

environment was considered to be an integral part of rationally considering the problem of environmental risk. According to Murphy (1994:141) however, risk analysis procedures are inadequate in dealing with environmental risks because they often use weak data bases and make questionable extrapolations (as was ostensibly the case in using well drillers' data in the GLSP). However, the limits of risk analysis are very likely to be inherent and unavoidable features of the systems uncertainty associated with environmental impact science. Murphy's (1994:141) second critique of risk analysis is that it requires that there be scientific proof of risk, which has the effect of favouring risk-taking over risk avoidance. Third, risk analysis according to Murphy (1994:143) does not allow for accountability.

As discussed in our chapter on trust, the issue of accountability was a central concern in the GLSP, and efforts were made to ensure that the process remained open and traceable. As such, the strong emphasis on accountability in the GLSP represented another form of the restructuring of impact science based on ecological rationality.

To address the problems with risk analysis, Murphy (1994:143) suggests that risk analysis be *coupled with* environmental accounting. Environmental accounting documents the depletion of natural resources, energy, and the attendant generation of wastes that result from human production and consumption practices. Environmental accounting also takes into account the costs of restoring environmentally degraded features. In effect, environmental accounting is very much a part of the demonopolization of technical knowledge and the process of maintaining trust in the risk society:

> Environmental accounting is closely tied to accountability for present and past consequences, whereas risk analysis is not, even though the latter important in its own right for deciding possible courses of action. Risk analysis without environmental accounting threatens to become public manipulation based on wilful ignorance and the withholding of available information, whereas environmental accounting keeps risk analysis honest by making documentation available and eliminating the excuse of ignorance. (Murphy,1994:143)

The environmental accounting approach was utilized to a limited extent early on in the GLSP in terms of CASC and LSG's analysis of the City's measurements of waste quantities entering and diverted from the Eastview Landfill (CASC Meeting Records, December 14, 1993). For example, the waste diversion audit discussed in the early stages of the GLSP, listed the type of material diverted, the name of the company which would buy the material, and the weight of the material. From such data, projections were made in order to calculate the capacity of the proposed landfill. It should be noted that the procedures and results of this analysis were reviewed by the public during CASC and LSG meetings. As such, the use of environmental accounting in the GLSP illustrated another form of restructuring based on eco-rationality.

Conclusion

In order to confront the environmental risks of late modernity in a more effective and publicly accountable manner, the institutions of the local polity and impact science restructured themselves to allow for a greater involvement of the lay public in decision making process. The establishment of sub-political channels such as the CASC, LSG,

and the neighbourhood groups facilitated such an involvement. As such, sub-political channels represent a form of institutional restructuring in which environmental concerns can be incorporated into decisions pertaining to a wide range of political and technical matters, from economic development to social equity to risk assessment and management.

One of the most important ramifications of this institutional restructuring is that environmental concerns were now given a voice alongside traditional economic concerns. This was necessary because it was publicly realized that environmental risks have an impact on both spheres. This was evidenced by the fact that actors from both environmental and business groups were actively involved in Guelph's search for a landfill. In fact, as we have discussed in this chapter, economic and environmental concerns were both prominent considerations in the GLSP. This is to be expected in late modernity, because it is in confronting modern environmental risks that both individuals and institutions are compelled to make an effort to reconcile these two concerns. It is the attempt to do this that is at the heart of the process of environment-informed development, that is, ecological modernization.

In the following chapter we will review our findings and arguments about how the expert-lay trust relations, the treatment of risk, and the role of environmental and technological values and beliefs in the GLSP all contributed to the adoption of a reflexive orientation which directly and indirectly supported a process of institutional eco-restructuring. We will then discuss the empirical and theoretical implications of our study.

CHAPTER EIGHT

CONCLUDING REMARKS: TRUST, RISK, AND THE ENVIRONMENT

Chapter 8   Concluding Remarks: Trust, Risk, and the Environment

A Review of the Findings

In this case study we have attempted to show how some of the interactions and issues observed in the Guelph Landfill Search Process may be explained in terms of the theories of reflexive modernization, the risk society, and ecological modernization. The first factor that we have considered in pursuing this line of analysis was the concept of trust. It was found that despite the intentions of the City to build trust and confidence in the search process, a lack of trust still remained. The City had hoped that by encouraging inclusive community involvement by holding open public meetings and workshops, that the process itself, as well as the results, would be regarded as legitimate by the community. In this spirit, the GLSP was to be a politically neutral process in which the activities pursued would be of a largely technical nature. In attempting to maintain this neutrality, no elected officials were involved in these meetings and workshops. But, as we have discussed, this political neutrality could not be completely maintained because of the involvement of City Council.

Lay individuals in the Guelph community were provided the opportunity to participate in many specialized matters and activities that were not previously open to members of the general public. Such technical activities included the following: the consideration of alternate waste disposal technologies, the selection of the method that

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should be used to identify the potential sites, the determination of the criteria and methods that should be used to compare and rank the potential sites, the determination of suitable standards for the proposed landfill, and the development of compensation and impact management policies. However, as we shall discuss below, although the involvement of lay individuals in the technical exercises may have led to the sharing of the power of the technical expert, it did not necessarily lead to the sharing of the power of the political elites (in this case, members of City Council). This was because the capacity to make the final decision about the acceptability the landfill site was exclusively retained by City Council.

As a result of the general orientation of the GLSP, many of the interactions occurred between members of the lay community and technical experts. We have therefore focused particular attention on the trust relationship between these types of actors. As was discussed, the establishment of trust between the lay individual and expert was problematic in the GLSP for two main reasons. First of all, the historical circumstances of the GLSP, such as the controversial search carried out in the recent past, as well as the issue of annexation, meant that a certain amount of political distrust was carried into the GLSP. Therefore, on the basis of past experience, some members of the community (particularly those in the annexed area) entered the GLSP with a certain amount of suspicion or wariness. With this mindset, lay trust in the technical consultant was problematic as the technical consultant was viewed as an agent of the City.

Consequently, political distrust was an intervening variable for some of the expert-lay interactions observed in the GLSP. The existence of political distrust is not novel or surprising. What may be of more interest is the second source of lay distrust in technical experts we have identified in the GLSP, namely, distrust in the workings of science and technology.

We have argued that lay distrust in the institution of science and technology was re-enforced by the fact that participants in the GLSP were able to directly involve themselves with the environmental risks issues associated with the siting and design of an engineered landfill. They were therefore directly exposed to the inherent flaws associated with the science and technologies involved. As we have seen in our study, GLSP participants became aware of, and involved with, the risk and uncertainty pertaining to such matters as: (i) the reliability of the technologies involved in both the wet-dry recycling facility and the proposed landfill technologies (such as liners and monitoring technologies); (ii) the methods used to detect contamination; and, (iii) the limitations of hydrogeological data. Dealing with such matters led to a raised lay awareness of the limitations of science (at least in environmental impact science) which in turn may have led to the lay questioning and/or critique of science.

The reconsideration of the lay actors' views on science and technology is part of the reflexive process that we have argue : was a natural outcome of dealing with an environmental risk issue. In dealing with the risks of leachate contamination, participants

in the GLSP were compelled to consider many types of trade-offs. For instance, towards the end of the process, particular emphasis began to be directed towards the trade-offs involved in deciding between economic growth and environmental protection. In our study we have focused on the trade-offs that pertained to the relationship between environmental and technological beliefs and values. We chose to focus on this particular issue because many of the expert-lay interactions that were observed in the GLSP implicitly dealt with this. According to the theory of reflexive modernization, the unquestioned trust that lay individuals accorded to science and technology has become weakened as more and more individuals are exposed to the limitations of science (particularly in light of the fact that these limitations are made known through the publicization of high consequence technological failures). At the same time, there should be an enhanced sensitivity to environmental concerns as it is realized that the risks produced by science have important detrimental consequences for the environment (and health). Our quantitative analysis indicated that this realization may have occurred to some extent in that many participants subscribed to strong ecological values and beliefs while at the same time showing a decreased adherence to technological values and beliefs. Such a finding partially supports the notion that an ecologically inspired change has occurred amongst the members of the communicative community involved in the GLSP.

We then moved on to discuss how this ecologically inspired reflexive change was reflected in changes in the institutions of the local polity and environmental impact

science. The examination of several documents produced by the City (i.e. the City of Guelph Mission Statement, the Guelph Green Plan, and various documents pertaining to the GLSP) revealed an orientation that was receptive to the eco-restructuring of the local polity. Notably, such an eco-restructuring included plans for the establishment of channels that would allow for greater lay participation in local environmental matters. For example, we have seen that participants in the GLSP had greater access and input into the *technical* decisions related to the siting of a landfill in their community. This takes us to the next type of eco-restructuring we have investigated, namely, changes in the institution of environmental impact science itself.

The major example of eco-restructuring observed in the GLSP pertained to the demonopolization of technical knowledge. This demonopolization of technical knowledge had two main effects. First of all, lay participants in the GLSP had access to many technical documents that were usually not available to non-technical specialists. This had the effect of facilitating the process of self-learning which led to the development of the "lay-expert". This in turn promoted the emergence of competing technical claims made by the newly informed "lay-experts". It should be noted that the technical claims made by the "lay-experts" in the GLSP could not be simply ignored by the technical consultants because the process specifically encouraged a consensus decision-making strategy in which all issues and claims raised by lay participants were to be addressed by the technical consultants. In other words, the technical consultants were obliged to consider

the competing technical claims made by the "lay-experts" (and also the counter-experts). This led to the emergence of certain new types of problems, as illustrated by the controversy over the CASC derived Minimum Acceptability Standards. As we have discussed, the CASC insisted that the technical requirements in the Minimum Acceptability Standards be adopted by the LSG and their consultants. The LSG and their experts argued that the proposed Minimum Acceptability Standards were too limiting and that they would unreasonably obstruct the technical work that needed to be done. As it turned out, the LSG's position prevailed because of a decision made by City Council.

Another example of the eco-restructuring of science observed in the GLSP pertained to the emergence of "eco-rationality". That is, both the lay individuals as well as the technical experts formally incorporated ecological values in their technical work. In this context the environment was no longer treated as a mere "externality".

In the following we shall discuss some of the more general sociological implications of our findings.

The Search For A Landfill Site in the Risk Society

> My belief is that we should constantly be reminded that all of society does generate waste...So what if a landfill is visible and possibly an eyesore. I think that *landfills should be visible so much so that it may make us wake up* and try to eliminate or considerably reduce our waste generation and the necessity of its disposal. Perhaps we should dispose of our piles of garbage straight up in the air and offend people's sensibilities by making them monuments to *Homo Sapiens Myopus* instead of trying to hide solid waste in the ground where it can insidiously harm the environment now and for generations to come. (Letter from CASC Member to the LSG, September 9, 1994; emphasis mine)

> The end result of the LSG process is that *Guelph has created expectations of extremely high responsibility in the landfill.* Guelph has the opportunity to set a new standard for environmental protection from landfills. With a location within the City that opportunity would be grasped, but with a location in the country, *out of sight may well become out of mind.* There will be less political and financial will to do the job as carefully as if the landfill was in our own backyard. (Letter from the former LSG Chair to Guelph City Council, January 20, 1995, emphasis mine)

The above statements made by two prominent actors involved in the GLSP reveal several core features of reflexive modernization. First of all, they indicate how the treatment of environmental risks in late modernity involves a process of collective and *self-confrontation* that serves as the basis for *change* in both individuals and institutions, particularly with reference to the human-environment relation. In fact, the CASC member in the first citation feels that the process of confrontation and change should be actively encouraged (although he makes his argument in a rather "tongue-in-cheek" manner). Secondly, the above statements direct our attention to the *insidious* nature of the environmental risks we now face. That is, they focus attention on the fact that the

risks we now face are not detectable to our physical senses. Hence the plea for more careful and responsible monitoring and standards. Third, the statements reveal how today's environmental risks are not limited in space or time. Hence the references to the potentiality of affecting future generations. Fourth, they draw attention to the fact that our "environment" is very much "created" (to be discussed below). That is, it is realized that *decisions* as to how we should act (i.e. how we dispose of our waste) and decisions about risk management have consequences for our natural world. Lastly, they reinforce the point that environmental risks are *collectively faced* risks. In what follows we will briefly discuss the implications of these characteristics of reflexive modernization.

As we have discussed in the preceding chapters, it is the fact that environmental risks threaten our very survival (or at least one's accustomed way of living) that, in essence, provides the impetus for social change. As such, Beck (1995a:2) observes that the *awareness* of potential self-endangerment through the devastation of nature is fast becoming a motive force of history. To better understand this process of reflexive social change, it is useful to consider the theory of *ecological modernization* because as Mol (1994:11) notes, this perspective provides an explanatory framework for the way in which the 'environment question' transforms the institutions of late modernity.

The ecological modernization perspective stresses a development strategy in which the environmental crisis is overcome without leaving the path of modernization. Ecological modernization therefore involves the *continued* use of the institutions of modernity, but in a modified form (Mol,1994). Thus, as we have seen in our study, the

institutions of science and the polity do not simply disappear, but, in effect, they become restructured so that greater attention can be focused on, among other things, environmental concerns. Therefore, unlike the case with the institutions of simple modernity, *ecological rationality* is now given a chance to play a greater role in modern strategies of industrial development.

Following Huber's (1982,1985,1991) work on the characterization of institutional change in terms of the emerging relationship between ecology and the economy, Mol and Spaargaren (1993) (also Spaargaren and Mol (1992) and Mol (1994)) stress the importance of the institutionalization of environmental interests *within* the economic/industrial sphere. For example, in his insightful analysis of institutional eco-restructuring in the chemical industry, Mol (1994:22-24) shows how decisions on product development in chemical firms are now influenced by the consideration of the environmental effects or benefits that such products will have. In the present study we have not emphasized this economic aspect of the process of ecological modernization. Rather, we have focused on another aspect of ecological modernization, namely, the institutional *eco-restructuring* of the local polity and science at both the social-psychological and structural levels. In this context, although environmental values were not directly incorporated into economic decision making *per se*, it should nevertheless be noted that a first step was at least taken in this direction. That is, an *opportunity* was formally provided for the consideration of environmental values alongside economic ones. As we have seen, the trade-off (or reconciliation) that needed to be made between

environmental and economic concerns became a particularly important issue in the latter stages of the GLSP. Such a dual emphasis would not have even been raised in simple modernity. Thus, in this study, the adoption of an ecological modernization approach can be seen in terms of the greater opportunity for lay involvement in technical decision-making. It was because of this opportunity, that concerns about the environment (and issues such as social justice which are related to the distribution of risk) were at least given a chance to enter into the decision making process.

As we have seen throughout our study, the institutional transformations involved in adopting the ecological modernization perspective were not unproblematic. This is because, as Mol (1994:18) notes, the central features of reflexive modernization, such as the institutionalization of doubt, the disenchantment of science, and the inherent endangering characteristics of modern science and technology, must all be dealt with by both lay community members as well as the technical and political elites involved.[1] Consequently, the treatment of an environmental risk issue in late modernity is often two-sided:

> [T]he reflexive character of modernity with respect to its environmental dimension is double sided. It points both to the institutionalization of ecology via the transformation of the clusters of modernity as well as to the parallel undermining of these institutions by (ecologically inspired) anxieties and doubts. (Mol, 1994:26)

Such anxieties and doubts alluded to above were further exacerbated by the fact

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[1]   It is precisely for these reasons that many problems in the GLSP arose with regard to expert-lay trust relations, as well as in the risk management proce...

that participa ts in the GLSP maintained somewhat contradictory and ambivalent views of the relationship between technology and the environment (see Chapter 6). This ambivalence reveals the paradox with which lay individuals in late modernity must deal, namely, how can an increased awareness of the ever-present uncertainties involved in technology be reconciled with the need to trust such technologies to adequately deal with environmental problems? In other words, how does one deal with "residual risks" in the face of doubt, uncertainty and risk consciousness (i.e. thinking in terms of risk)? Under such circumstances, the 'Enlightenment inspired' respect for the authority of science to solve problems becomes weakened. That is, the comfort and sense of security that the lay individual once had by placing his or her trust in technical expertise, can no longer be maintained because of the increased awareness, knowledge, and involvement with modern environmental risk issues. In simple modernity, Giddens (1994a) notes that science (i.e. the abstract system of expertise) had much in common with *tradition*. In societies based on traditional forms of authority, many problems associated with doubt and ontological security were bracketed-out, as there existed an unquestioned faith in the traditional belief and value system (i.e. the situation was "taken-for-granted"). Under these conditions, competing claims to knowledge were dealt with, and limited to, the specialists involved in the particular field (such as the clergy in religious traditions), and were therefore unknown, or of no concern to the lay public. Competing claims to knowledge in traditional societies remained latent to the lay public and for that reason such claims would not and could not lead to doubts about the traditional beliefs and

values systems. Thus, Giddens (1994b:185) notes that in relation to science:

> The specific authority which science once enjoyed, which turned it into a
> sort of tradition, could only be protected in so far as there was an
> insulation dividing scientific expertise from the diverse forms of
> knowledgability of lay populations.

In the context of simple modernity therefore, science "was not very different from

tradition - a monolithic source of 'authority' in the generic sense" (Giddens,1994a:87).

Consequently, the authority of the expert was very much like the authority of a priest

or shaman in a traditional society. Today however, the authority of the technical expert

has become questioned. Thus, Giddens (1994a:87-88) asserts that:

> Science has lost a good deal of the aura of authority it once had. In some
> part, probably, this is a result of disillusionment with the benefits which,
> in association with technology, it has been claimed to bring to humanity.

In this study I have argued that this "disillusionment" with the benefits of technology is

very much tied to the lay awareness of the uncertainties and risks associated with modern

environmental problems. In the case of the GLSP, such an awareness was reinforced by

direct lay involvement with the actual methods and data of environmental impact science.

As we have seen, in dealing with environmental impact science, some members of the

lay community were exposed to the limits and uncertainties associated with such science.

In turn, this exposure may lead to a questioning of the authority of science as part of the

process that Beck (1992:156) refers to as the "demystification of the demystifier". That

is, science as the great demystifier, has itself become demystified, as the inherent and

unavoidable flaws of science become revealed to the lay public (especially through the

publicization of environmental catastrophes). It is this demystification of science that has led to its eco-restructuring. That is, as we have seen in the case of the GLSP, an institutional restructuring has taken place so as to *allow for* an ecological critique of scientific authority (through the medium of competing technical claims). This critique of science could not occur in simple modernity because science at that time retained its aura of traditional authority, and as Giddens (1994a:86) notes, the 'natural state' of tradition is *deference*.

As we have seen in the GLSP, trust in the expert-lay relationship was very much at issue. In fact, the emphasis on encouraging face-to-face interactions between lay individuals and experts may be seen as an attempt by the City of Guelph to re-establish trust along more *traditional* lines. Such traditional forms of trust relations are based on what Giddens (1990:80) calls "facework commitments". Today however, one must put more and more his or her trust in abstract systems of technical expertise. As such, trust can no longer be grounded in face-to-face interactions between the lay individual and the expert. Under these circumstances therefore, trust is necessarily based on "faceless commitments" as the expert who governs the abstract system is simply not present (Giddens, 1990). In the case of the GLSP, the encouragement of face-to-face expert-lay interactions may therefore be viewed as an attempt to regain the traditional character of trust based on facework commitments. However, the sort of trust that was sought in the GLSP was not the unadulterated deference-based trust of traditional society *per se*. Rather, the facework trust commitments promoted in the GLSP were of a novel sort that

emphasized a phenomenological orientation in which the lay person was meant to have

the opportunity to *take the role of the expert* and vice versa. In traditional societies of

the past, this process of reciprocal role-taking was not possible because the prevalent view

was that the lay individual could not, and should not, take the "sacred" role of the priest,

shaman, elder or specialist. In late modernity however, Giddens (1994a:91) notes that:

> Expert knowledge is open to re-appropriation by anyone with the necessary
> time and resources to become trained; and the prevalence of institutional
> reflexivity means that there is a continuous filter-back of expert theories,
> concepts and findings to the lay populations.

This "filter-back of expert theories" was in fact encouraged in the GLSP, as

demonstrated for example, by the fact that many lay participants became well-versed and

knowledgeable about the various aspects of hydrogeology, landfill technologies, and

contingency planning. The opening of a sub-political channel (including the institutional

restructuring of science and the local polity) therefore effectively promoted the

development of self-educated "lay-experts" who now had access to technical information

and decision-making structures not open to them in past. Thus Beck (1995a:52) in his

characteristically colourful manner asserts that:

> Gone forever is the power differential of primary modernization, in which
> scientific experts drove laypeople into clearly delineated and continually
> shrinking areas, like Indians being pushed back into reservations. Science
> and technology themselves come into view as causes of mistakes and
> problems.

Wynne (1988:163) observes that although greater public disclosure and

involvement may indeed lead to a loss of power on the part of the technical expert (as he

or she would no longer be sanctioned by the apparent power of science), at the same time, the technical expert would gain greater legitimacy. Such a legitimacy would stem from the fact that situation realities and socially negotiated measures would become publicly recognized as part of the process of environmental decision making. However, as we have seen in the case of the GLSP, lay access to technical information gave rise to other problems, such as, how to adequately deal with the inherent uncertainties associated with environmental risks.

Risk, or the probability of contending with the consequences of an adverse event, was intimately connected to the issue of uncertainty in several ways. For example, in dealing with the risk of leachate contamination, participants in the GLSP became aware of the uncertainty associated with: the reliability of landfill technologies to contain the leachate (and to detect it, in the case of its escape), the characterization of the waste stream, and the limits of contingency planning. Further, the lay awareness of the uncertainty of technical knowledge was made evident through their direct involvement with competing technical (hydrogeological) claims made by both the "lay-experts" and the hired counter experts involved in the GLSP.

Such types of uncertainties are characteristic to the types of risks we now face in late modernity. In this connection, Giddens (1990:151-154) notes that the notion of controlling risks through increased technical knowledge has become shattered because the lay public has become increasingly aware of the uncertainties involved with the nature and types of risks they now face. For example, such types of risk include: design faults

in technological systems, operator failures (i.e. the mistakes of the individuals operating in the abstract system), and, unintended consequences.[2] All of these types of risk therefore create problems of trust in regard to both technical experts, and abstract systems of expertise. Consequently, "radical doubt" becomes a characteristic feature of life in late modernity (Giddens, 1991:2-3), which we, along with Beck (1987) have connected to the notion of insecurity.

The relationship between technology and the environment is a complex and ambivalent one in reflexive modernity. The "natural" environment and the "created" environment stand in a particular and somewhat ambivalent relationship to one another. In the case of the GLSP, participants were dealing with the "created" environment of an engineered landfill (and its accompanying wet/dry recycling facility) which was to be situated in some "natural" environment locale. This brings us to the question of what exactly is meant by "the environment" in reflexive modernity.

According to Giddens (1994a:77), in simple modernity, the term "nature" was used to refer to that which was *external* to human influences and control. That is, "nature" referred to the untouched natural world. Today, in reflexive modernity however, the

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[2]   For Giddens (1990), unintended consequences refers to the effects that cannot be planned for, because, no matter how well the technological system was designed, once it is placed in the real world, the complexity of the possible interactions multiply in an unpredictable manner. Consequently, the potential for things to go wrong also multiplies. Such complex interactions cannot be known with any certainty thereby exacerbating the problems associated with risk management. The idea of "unintended consequences" is very similar to the notions associated with Perrow's (1984) idea of "normal accidents".

term "environment" is being used more and more. In other words, according to Giddens, a transition has occurred:

> [T]he very notion of 'the environment', as compared to 'nature', signals a more deep-lying transition. The environment, which seems to be more than an independent parameter of human existence, actually is its opposite: nature as thoroughly transfigured by human intervention. We begin to speak about 'the environment' only once nature, like tradition, has become dissolved. (Giddens,1994a:77)

It is in this light that Beck (1987) notes, that what was once a purely "natural" process such as the breast-feeding of an infant becomes transformed into an "environmental" issue once it is discovered that in the risk society, the mother's "natural" milk contains artificially produced chemicals that were inadvertently ingested by the mother. Hence, the "natural" world, or that which was once external to human influence, now becomes thoroughly transformed by human intervention in a rather unpredictable fashion. In the GLSP this distinction was illustrated by the fact that what was once the "natural" drinking water from groundwater wells in Guelph, became an "environmental" issue related to the possibility of leachate contamination from an engineered landfill.

The "environment" therefore becomes an issue that is intimately related to technological and expert systems of late modernity. As such, ecological dangers in late modernity are derived from the transformation of nature by human knowledge systems (Giddens , 1990:127). In other words, the risks we now face stem from the created environment. Consequently, environmental risk issues are to a large extent influenced and framed by the abstract systems of technical expertise. For example, the eco-

restructuring of science discussed in our study was very much influenced by the lay public's need to personally consider the inherent uncertainties and limits of the abstract systems of knowledge supporting waste management. Further, it was in the context of dealing with the technical expertise system associated with an environmental problem, that the issues of risk and trust became central factors in the unfolding of the GLSP. Thus, much of the analysis in our study has focused on expert-lay interactions.

Central to the eco-restructuring of the polity and science in the Guelph Landfill Search Process was the emphasis on *accountability*. This emphasis resulted not only from the specific historical circumstances of the GLSP, such as the previous joint search in which much of the work was done behind closed doors, but also because of the inherent nature of environmental risks in reflexive modernization. Lau (1992:23ξ) notes that even though environmental risks in general may not be very probable, the collective character of such risks, and their relevance to the common welfare, may lead to the development of a *social dynamic* in which the crucial question that is raised is, "Who decides on those risks that potentially threaten everyone? " Hence the public demand for accountability in late modernity.

In line with the above, Beck (1995a:126) notes that in reflexive modernization, ecological effects are deciphered socially in terms of the notion of risk. In this context, risk can be understood as *decision-based insecurity*. It is also because of this sense of insecurity that the need for accountability in decision making becomes even more crucial in the newly emerging social dynamic. As such, the social and political treatment of

environmental risks is now based on a motivational urgency that did not exist in the past epoch of simple modernity. Thus, as we have seen in the GLSP, part of the emerging social dynamic was the eco-restructuring of the institutions of the local polity and impact science so that there could be an increased level of expert-lay interactions (including increased lay access to technical information). This meant that the separation between those who make decisions about risk, and those who were to be affected by the risk, would be reduced. In turn, this gave rise to new problems associated with trust and the treatment of risk, as previously held views about progress, technology and the environment became questioned on the basis of the increased involvement with the landfill issue.

Lau (1992:239) notes that in the past, the idea of continuous scientific and technical progress provided a rationale or a legitimacy for the acceptance of risks because such risks were viewed as the "costs of modernization".[3] However today, the acceptance of risks can no longer be recognized as a civil virtue (in which risks are considered as the price for a better social future), because these very risks are now "catching up with us". It is in connection to this that Beck (1994b:175) notes we are now living in *the age of side effects*, as illustrated, for example, by the fact that we *now* must confront the problem of contamination from the leachate generated from landfills of the *past*.

Decision-making is particularly important in reflexive modernization because of the public realization that it is on the basis of technical and political decisions that our

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[3]   This notion is related to the idea of "tolerability", to be discussed shortly.

(common) "environment" is *created*. That is, it is now implicitly (perhaps unconsciously) understood that "nature" is no longer external to human influences and decision-making. Again, this realization is part and parcel of the process of confronting environmental risks (which we have argued formed the basis for the adoption of a reflexive orientation in late modernity). Therefore, Beck (1995a:128) notes that the political and social dynamism of ecological issues does not arise from the devastation of nature *per se*, but from the assurances and claims from public and private institutions that they will provide adequate control and security. It is against the current of such claims that the public accountability in decision-making is demanded. Let us examine in more detail the development of this increased opportunity for lay involvement in decisions pertaining to the management of environmental risks in late modernity.

In reviewing the historical trajectory of the professionalization of risk, Plough and Krimsky (1990:224) note that in the early twentieth century it was the rise of public health departments that provided the major impetus for the monitoring of risk (especially in regard to sanitation and food safety). At the end of WWII, the newly developing fields of operations research and systems analysis led to a new emphasis on the interpretation of statistical data in decision-making, via the adoption of formal procedures of risk analysis. As Plough and Krimsky (1990:225) note, such a quantitative orientation had the effect of *marginalizing the role of values in risk analysis*. With the rise of environmental advocacy in the 1970s, the expert model of quantitative risk analysis became challenged, as environmentalists demanded a role in the risk assessment

procedures. This enlarged the decision framework so that a broader range of issues and values could be incorporated in the treatment of risk.

Rimington (1991:19) notes that it is the issue of *tolerability*, or the willingness of lay individuals to live with risk, so as to secure certain benefits, that leads to the rejection of a purely technical and narrowly defined risk assessment procedure. For Rimington (1991:19), tolerability became problematic as lay individuals realize that it should not be the expert's business to *decide* for society what levels of risk are tolerable. Adoption of such a view mobilized individuals to seek political channels to influence decisions made about environmental risk.

In essence, our study has examined the issues that lay individuals dealt with in the sub-political channels that were already opened up for them by the municipal polity. It was in this context that we have sought to investigate how the nature and conditions of late modernity, such as: the condition of reflexivity, the rise of environmental activism, the intrusion of abstract systems into greater and greater aspects of social life, the public awareness of the uncertainty of scientific knowledge, the awareness of the insidious and global character of technologically produced risks, have influenced the expert-lay interactions that took place in the Guelph Landfill Search Process.

In adopting a reflexive orientation to deal with the landfill issue, participants in the GLSP demonstrated how the treatment of a modern environmental risk issue can by no means be confined to a limited set of technical criteria, despite the efforts of the City to create a purely technical and politically neutral process. The reflexive treatment of

environmental risk demands a holistic approach to the problem (as is characteristic to the science of ecology itself). For this reason, an environmental issue is not just an issue that pertains to the natural environment. It strikes a much deeper chord involving a (re)consideration of the taken-for-granted assumptions concerning our views of science and technology, progress, trust, and survival. As such, we have seen that in the GLSP, participants had to deal with many value based trade-offs relating to many different spheres of social life, including the economic, social, cultural, and technological. It is in this light that Beck (1995a:140) notes that,

> The environmental problem is by no means a problem of the world surrounding us. It is a crisis of industrial society itself, deeply rooted in the foundations of its institutions and with considerable political resonance. Threats are produced industrially, externalized economically, individualized juridically, legitimized scientifically, and minimized politically.

The institutional and individual changes promoted by the process of confronting the "environmental" issue are therefore very widespread in their impact.

In our study, we have examined how the adoption of a reflexive orientation influenced many of the interactions that took place in the GLSP. We further examined how the effects of the reflexive treatment of the environmental risks associated with the proposed landfill were revealed in the institutional eco-restructuring of the local polity and environmental impact science. Such social (institutional) change may be considered by some to be insufficient (for instance, Schnaiberg and Gould, 1994). As such, the case may therefore be made that in addressing the problems of locating a landfill, the real

issue of focusing on how household and industrial waste should be reduced has been ignored, or displaced. However, it should be pointed out that, often times, social change occurs incrementally. The opportunity to incorporate environmental concerns in the process of siting a landfill was at least indicative of a first step towards the possibility for a more substantial institutional eco-restructuring in the future. Perhaps as modern society confronts more and more environmental risks in the future, increased institutional eco-restructuring will no longer be considered as a desirable goal, but as a necessary one.

APPENDICES

Appendix 1   **List of Acronyms and Abbreviations**

CASC	Community Advisory Subcommitee
CORALS	Coalition of Residents Against Landfill Sites in the Hanlon and Millcreek Watersheds
EA	Environmental Assessment
EAA	Environmental Assessment Act (of Ontario)
EAC	Environmental Advisory Comittee
EPA	Environmental Protection Act (of Ontario)
EREJ	Eastview Residents for Environmental Justice
GLSP	Guelph Landfill (Site) Search Process
GRTEE	Guelph Round Table on Environment and Economy
GSSC	Green Strategy Steering Commitee
LSG	Landfill Search Group
MAS	Minimum Acceptability Standards (developed by CASC)
MBS	Management Board Secretariat (of the provincial government)
MOEE	Ministry of Environment and Energy
N-4 site	Site in Nichol Township identified in the City of Guelph/Wellington County landfill site search
NIMBY	Not In My Backyard
NLG	Neighbourhood Liason Group (CORALS and VRNLG)
OMAFRA	Ontario Ministry of Agriculture, Food and Rural Affairs

PAC	Public Advisory Committee (for the Wet/Dry facility and for the Waste Mangement Master Plan)
PLC	Public Liaison Committee (for the Eastview Landfill)
SRPG	Speed River Preservation Group (associated with the N-4 search)
SRG	Student Research Group (of the University of Guelph, School of Rural Planning and Development)
VRNLG	Victoria Road Neighbourhood Liaison Group
WWMP	Waste Management Master Plan
WWMMP	Waste Watchers Monitoring the Master Plan
U of G	University of Guelph

Appendix 2 Timeline of the Guelph Landfill Search Process

January 11, 1993   Guelph City Council rejects the siting of landfill in Nichol Township, Wellington County (9 to 4 vote), after much demonstrations and confrontations of residents (led by noted artist Ken Danby) at Guelph City Hall.

June 7, 1993   Council agrees to the formation of the Landfill Search Group (LSG) to search for a landfill within the City of Guelph boundaries.

July 5, 1993   Council appoints four public members to the LSG (20 members from the community applied) to join the four City members. Together they comprise the LSG. All members can vote, with five required for quorum.

August 13, 1993   First LSG meeting

October 18, 1993   Council approved : (i) LSG's selection of the retention of Gartner-Lee as the lead technical consultants in partnership with the LURA group (public involvement consultants), Braun Consulting Engineers, J.L. Cox Planning Consultants Ltd., and Market Vision (an opinion research firm).
(ii) the Terms of Reference issued by the LSG.

November 2, 1994   LSG agrees on the need to form a public input committee (Community Advisory Subcc·-mittee)

November 18, 1993   Community Advisory Subcommittee (CASC) Orientation Session

December, 1993   The results of the Survey of Residents of the City of Guelph (prepared by Market Vision)

December 7, 1993   CASC Meeting #1
Formation   of   the   Goals   and   Objectives
Subcommittee
Formation   of   the   Terms   of   Reference
Subcommittee

December 14, 1993   CASC Meeting #2
Formation   of   the   Technologies   Workshop
Subcommittee

January 12, 1994   CASC Meeting #3
Formation of the Office Space Subcommittee

January 19, 1994   Alternative Disposal Technologies Public
Workshop Part I

January 26, 1994   Alternative Disposal Technologies Public
Workshop Part II

February 1, 1994   CASC Meeting #6
Formation   of   the   Siting   Methodology   Workshop
Subcommittee (the "Ideas Group")

February 16, 1994   Public   Workshop   on   Alternative   Ways   to   Site   a
Landfill Part I

March 1, 1994   Agreed   that   a   "Without   prejudice"   clause   be
added   to   all   CASC   meetings   and   workshops,   to
protect   members   from   having   their   input   used
against them in a possible EA hearing.

Public   Workshop   on   Alternative   Ways   to   Site   a
Landfill Part II

March 2, 1994   LSG Meeting #14
LSG   adopts   CASC's   recommendation   to   use   the
landfill   search   method   of   opportunity   mapping
followed   by   the   application   of   constraint
criteria.

March 15, 1994	LSG adopts CASC recommendations that primary consideration be give to (i) the protection of groundwater and (ii) land use as constraint criteria.
March 16, 1994	LSG Site Comparison Draft Working Paper (prepared by Gartner-Lee)
March 22, 1994	Joint LSG/CASC Meeting (CASC #9) Foimation of the Compensation & Impact Management Subcommittee
March 25, 1994	CASC Ideas Group Subcommittee/LSG Meeting
March 28, 1994	LSG Draft of Site Identification Criteria (prepared by Gartner-Lee to assist CASC/LSG)
April 6, 1994	Joint LSG/CASC (#10) Meeting Discussion of notification procedures.
May 10, 1994	Announcement of Potential Sites Five potential sites were announced: four in the newly annexed area, the fifth close to downtown.
	CASC Meeting #14 Formation of the Site Comparison Criteria Workshop Subcommittee
May 12, 1994	LSG Open House
May 15, 1994	CASC Meeting #15 Appearance of the Coalition of Residents Against Landfill Sites in the Hanlon Creek Watershed (CORALS) Introduction of new consultants hired by Gartner-Lee (for {air, noise, dust},

transportation, visual and heritage, archaeology, economics)

May 18, 1994	LSG meeting with the public. Emotional and loud protests as well as picket signs brought by CORALS are present.
June 8, 1994	LSG Site Comparison Criteria Workshop
June 10, 1994	LSG Site Comparison Design and Operation Assumptions/Site Design Optimization Document
June 1, 1994	Formation of the Victoria Road Neighbourhood Liaison Group (VRNLG)
June 18, 1994	Public Workshop on Site Comparison Criteria
June 14, 1994	CASC Meeting #16 Formation of the Minimum Acceptable Standard Sub-Committee (MASC) Formation of the Technologies Subcommittee
June 23, 1994	CASC Meeting # 17 CORALS members dramatically walk out from meeting because of objections to meeting procedures and rules of order
June 29, 1994	Bus tour of Eastview, Britannia and Halton landfill sites
July 19, 1994	LSG Meeting #24 (with VRNLG) Meeting and potential site walkabout

July 21, 1994   LSG Meeting #25

Gartner-Lee consultant presents data on hydrogeology based on well logs. Recommends that no boreholes are required. Community disagrees.

One potential site (from the annexed area) is dropped from further consideration as it does not meet the required capacity for the landfill.

Under the advice of Pat Becker (MOEE advisor) the LSG agrees to accept CASC's Minimum Acceptable Standards document only for informational purposes, to be applied after the preferred site is selected (which goes against the intent of CASC which wants it applied before).

July 25, 1994   LSG Meeting #26

Meeting with the Coalition Of Residents Against Landfill Sites in the Hanlon and Mill Creek Watersheds (CORALS)

August 4, 1994   LSG Meeting #27

A hydrogeologist hired by the Puslinch Township contradicts the findings of the Gartner-Lee consultant.

August 8, 1994   Second meeting of the Technologies Subcommittee

August 9, 1994   Public Workshop on Selecting a Method to Compare Potential Site

August 10, 1994   CORALS Meeting

CORALS submits their community input document based on their own scheme (after refusal to fill out the LSG provide community input workbook).

| August 16, 1994 | CASC Meeting #20 |
| | Formation of the Weights and Ranking (of comparative evaluation criteria) Subcommittee |

Reluctance of many members to compare sites because the exercise will "pit one neighbour against another".

CASC recommends the matrix method (a combination of quantitative & qualitative aspects) as the approved method of site comparison.

| August 17, 1994 | LSG Meeting #28 |
| | Public notified of a meeting between the two hydrogeologists (from Gartner-Lee & Township of Puslinch). G-L consultants begin to review their report on this basis. |

| August 23, 1993 | University of Guelph/VRNLG presentation to LSG |
| | U of G professor notes that the Victoria Road site footprint has very permeable bedrock that is exposed to the surface, therefore making it a dangerous place for a landfill. On this basis they will recommend to the Ontario Ministry of Agriculture, Food and Rural Affairs & the Cabinet Secretariat that the site not be used for landfill purposes. (The City of Guelph cannot expropriate land from the Province of Ontario.) |

| August 24, 1994 | Third meeting of the Technologies Subcommittee |

| August 29, 1994 | CASC/Public Site Comparison: Weighting & Ranking Working Session |
| | CORALS refuses to participate on the basis that: the exercise pits neighbour against neighbour and the status of VR site is undetermined |

Only 27 people participated and participants expressed much confusion.

August 30, 1994	**LSG Meeting #30**

CORALS consultant argues that after meeting with the LSG hydrogeologist, he feel that the LSG consultant has misrepresented the technical data. Further, he contends that the process used to examine the hydrogeological data was in error.

LSG reconsiders the need for drilling after public urging, but reject it.

Sept. 1, 1994	**CASC Meeting #22**

CASC debates the validity of the Weighting & Rankings workshop results. A discussion ensues on quantitative versus qualitative data. Results are forwarded to LSG with cautionary statements.

LSG decides the revise the VR footprint on the basis of the data provided by the University of Guelph.

Sept. 2, 1994	**LSG Meeting #31**

LSG meets to discuss the impasse regarding Minimum Acceptability Standards. LSG puts forth their acceptance of MA Principles but not as "drop dead" standards.

Sept. 6, 1994	**Meeting of Guelph City Council**

CASC delegate recommends that Council advises LSG to apply minimum acceptability standards before the preferred site is selected by LSG.

LSG provides council with their own position paper on MAS. This was considered as a surprise and unfair move by many CASC members. This paper was accepted by Council, CASC's position was rejected.

Sept. 14, 1994	Joint CASC/LSG Meeting Discussion on how to reconcile the two positions on Minimum Acceptability Standards (does not become resolved). CASC members raise the issue of the unfair application of zoning, and the ignoring of MOEE guidelines on clusters.
Sept. 19, 1994	Victoria Road NLG Meeting Discussion of impacts due to revised footprint. Issue of social equity stressed.
Sept. 20, 1994	CORALS Meeting #7 Discussion of potential impacts.
Sept. 21, 1994	LSG Meeting #33 Minimum Acceptability Principles are developed by City Engineer and accepted by LSG. Technical consultant walks the LSG through the process of site comparison. Non-relevant criteria (derived from the public workshops) were screened in order to facilitate easier comparison.
Sept. 24, 1994	CASC Meeting #24 Issues of contingency technologies discussed. Disputes on this matter arise between CASC members and the LSG members and consultants. Discussion regarding the degree to which CASC represents the views of the community. In answer to correspondence from CORALS, LSG

states that it will not apply minimum acceptability standards prior to site selection.

LSG agrees to recommend to City Council that public participation in some form be maintained after announcement of preferred site.

CASC dissolves.

Sept. 27, 1994

LSG Meeting #34
John Sleeman president of the local brewery warns of the negative impact a landfill will have on his business. He warns that it will force him to relocate.

A developer, representing the Stone Road Mall warns that a landfill on the Hanlon Parkway will have a devastating impact on future business growth in the area.

LSG drops the Victoria Road site after considering the correspondence from the Management Board Secretariat via the U of G. (but will carry the site through the comparative analysis)

Community member of the LSG wants to ensure that the confusion between "preferred" site and "suitable" site is cleared up. LSG will recommend a preferred site, but the affected residents are to be involved in determining/evaluating the suitability of the site.

The LSG's site comparison continues via the ranking exercise. Priority order of ranking that resulted was: Hanlon Road, Victoria Road, Clair Road and Brock Road.

Oct. 5, 1994	LSG Meeting #35 Site ranking is confirmed.
Oct. 12, 1994	LSG's announces the Hanlon Road site as the preferred site to City Council.
Nov. 9, 1994	Joint LSG/CASC Meeting Discussion of the confirmatory work program.
Dec. 14, 1994	Joint LSG/CASC Meeting LSG votes 5 to 3 in favour of recommending the Hanlon Road site as suitable.
Feb. 21, 1995	Public Open House on the Site Comparison Process City Council is apprised by the technical consultants about how the comparison of the Hanlon Road site and the N4 site will be done.
Feb. 26, 1995	Special CASC Meeting CASC resurrects itself because many feel that both the sites being considered are environmentally inadequate. The motion is put forward to begin a new search, based on the data already present. This proposed new search would not employ any technical consultants.
Feb. 27, 1995	Guelph City Council Meeting City Council rejects the Hanlon Road site primarily because of perceived negative economic impacts. The proposal for a new search (consisting only of activists and no technical consultants is rejected by Council. N-4 is forwarded for further consideration under the Environmental Protection Act.

Appendix 3 The CASC Terms of Reference

TERMS OF REFERENCE: COMMUNITY ADVISORY SUB-COMMITTEE

Amended March 10, 1994 ("Without Prejudice" clause, in Section 4.0 - 4th bullet down)

PREAMBLE

These Terms of Reference reflect the consensus position of CASC. They were initially developed by a CASC sub-committee comprised of John Harris and Sally Leppard (facilitator). They have been revised based on discussions at a CASC meeting on January 12, 1994, and ratified on January 26 by consensus.

BACKGROUND INFORMATION

The City of Guelph established a Landfill Search Group in August, 1993 to "*recommend to City Council the preferred location for long-term capacity (at least 20 years) to dispose of the fraction of the waste stream which is identified by the Guelph/Wellington Waste Management Master Plan as destined for disposal in a landfill site*".

LSG has interpreted this mandate to include the review of innovative technologies to manage parts of the waste stream, to consider more than one landfill site, as well as to provide an inclusive process for public involvement to assist it in its work.

At LSG's meeting of November 23, 1993, and as a result of an Orientation meeting held for the general public on November 18, LSG endorsed the formation of a Community Advisory Sub-Committee which has now developed a Terms of Reference for review and approval by LSG. Copies of the original sub-committee report (dated December 12, 1993) and documentation of CASC's discussion on the TOR (January 12, 1994) are available at the facilitator's office.

1.0   PROPOSED GOAL AND PURPOSE OF THE COMMUNITY ADVISORY SUB-COMMITTEE

1.1   Goal

*   To provide a balanced, inclusive discussion and advisory forum for citizens and stakeholders to proactively collaborate with, and provide advice and recommendations to the LSG in its search for a new landfill site(s) within the City of Guelph's boundaries.

1.2   Purpose

*   To consider matters referred to it by the LSG relating to the landfill site search and provide advice and recommendations to LSG;

*   To examine and advise on issues put forward to it by members of the public, local community organizations, and neighbourhoods affected by potential sites, as requested by the public or LSG;

- To review reports, studies and other documents that may be referred to the CASC by stakeholder groups, sub-committees of CASC; and/or the general public and to provide input, advice and recommendations to LSG; and

- To strive towards achieving consensus when considering matters put forward to it by others or raised by members.

2.0 ROLE AND RESPONSIBILITIES

The Community Advisory Sub-Committee will function as a multi-sectoral public review and advisory body for the Landfill Search Group. Its role will be to review all aspects of the landfill site search project and provide timely advice, in consensus mode to the extent possible.

Members agree to assist the LSG in meeting its timetable to the extent possible.

To fulfil this role, the CASC and its members should:

- Be provided with the LSG's work program to ensure that CASC is aware of upcoming decision points and that its input is provided to the LSG in a timely fashion;

- Provide a community-based forum which incorporates the broad range of social, natural and economic environment perspectives relating to the City of Guelph's landfill site search;

- Become an up-to-date and knowledgeable group on the landfill site search process;

- Ensure liaison, communication and review of the CASC's work with their representative stakeholder groups, where applicable;

- Direct the activities of sub-committees where applicable;

- Strive to operate in a consensus mode, wherein members strive to listen to others and openly discuss their respective views;

- Strive to develop common ground and narrow areas of disagreement to the best of its ability and provide consensus recommendations to LSG whenever possible.

3.0 WORK PROGRAM

LSG will benefit from CASC's advice all the way through the landfill site search process. In accordance with the Consultant's work program, the following key advice is anticipated:

TASK 1:   Advise on the public involvement and communications program.
               Timing: November - December 1993

TASK 2: Development of CASC's Terms of Reference, review and advise on: the results of the public opinion research; waste quantities and characteristics; initial development of goals and objectives for the site search process; and advise on preparing the public forum on waste disposal technologies.
Timing: November 1993 - January 1994

TASK 3: Advise and recommend on: waste quantities, characteristics and technologies (continued); advise on preparing for the public forum on siting methodologies, environmental setting, and approvals; and the public consultation and communications program;
Timing: December 1993 - February 1994

TASK 4: Advise and recommend on: siting methodologies, site selection criteria, and community compensation plans;
Timing: February 1994 - April 1994

TASK 5: Advise and recommend on: site selection, comparison methodologies and advice on appropriate technologies (cont'd.); and communications and involvement of affected neighbourhoods;
Timing: April 1994 - June 1994

TASK 6: Advice on site comparison and the selection of the preferred site(s)/facilities.
Timing: April 1994 - June 1994

- LSG and/or CASC may identify other issues and advise as necessary.
- CASC will need access to technical and financial information to assist it in its work.
- CASC will need timely referrals from LSG to undertake its tasks.
- CASC may need access to office facilities to undertake its tasks.

4.0 MEMBERSHIP

For CASC to achieve its goal and purpose, membership should be multi-disciplinary and reflective of the social, economic and natural environments within the site search area. Membership of CASC should not only reflect the land based activities within the study area, but also the community-at-large, reflected by members of the general public.

The membership of CASC will be comprised of individuals who have a serious commitment to assisting the LSG in its work.

- CASC membership is open to anyone who accepts these Terms of Reference;

- Membership on the committee is voluntary;

- New members must endorse the preceding work of CASC and accept any consensus positions;

- Meetings of CASC will be held without prejudice to the right of any committee member to appear in support or opposition to a proposal. Further, any views or opinions expressed or not expressed by committee members at meetings will not and cannot be used against the member at public meetings and hearings (should a hearing be called).

- CASC members will need to determine procedures to include the opinions of people living on or nearby identified sites.

- It is incumbent on CASC members to review all draft minutes of meetings. In the event that a member(s) disagrees with a consensus position developed at a CASC meeting at which they were absent, they must register their dissent either in person or by proxy to another member. In the event of a proxy being provided to another member, the proxy holder has the discretion to determine how to deal with the disagreement at the meeting, in order that the process is not unduly delayed.

5.0 ORGANIZATION AND OPERATING PROCEDURES OF CASC

- Consensus is the operating rule of CASC. When consensus building techniques are not facilitating the progress of the meeting, CASC may determine that voting procedures are desirable. (See Appendix 1: "Guiding Principles of Consensus Processes" from the Canadian Roundtable, August 1993).

- Where voting is utilized, Roberts Rules of Order will be followed, and minority opinions will be documented in CASC reports to LSG.

- Rules of procedure may be established by the Facilitator with the consent of CASC membership;

- LSG may refer specific agenda items to CASC for its review and discussion at each regular meeting;

- CASC members may propose agenda items for review and discussion at each regular meeting;

- Minutes, agendas, secretarial and facilitation services will be provided by LURA Group or their designate, subject to satisfactory performance;

- Meeting minutes/records to be available within 4 days of the CASC meeting; Agendas to be distributed three days prior to upcoming meetings;

- LSG public liaison representatives have agreed to attend CASC meetings on a regular basis, to the extent possible, in order that they can develop a basis for understanding CASC's recommendations.

- Sub-committees may be formed to consider specific matters as requested by CASC; Sub-Committee representatives may be requested to report to LSG on CASC recommendations relative to their sub committee;

- A CASC representative may be identified by the members to represent CASC at LSG meetings, media briefings and other events where CASC's recommendations and advice is needed.

- At the request of any CASC member, these Terms of Reference may be considered for amendment and that any amendment consented to by CASC members shall be forwarded to LSG for review and approval.

6.0 REPORTING PROCEDURES

- CASC sub-committee representatives and/or the Facilitator or designate will report its discussions and recommendations to LSG in the form of written and/or oral reports.

- In the event of a dispute relating to LSG's acceptance of a CASC recommendation, it is incumbent on LSG/CASC to hold additional discussions in order that opportunities for agreement can be explored;

- In the event of an irreconcilable difference, CASC may publish its recommendations;

- CASC may provide delegations to City Council in the event of an unresolved dispute between CASC and LSG;

- LSG to present CASC consensus positions to council, whether or not there is concurrence;

By approving these terms of reference, LSG consents to this reporting procedure.

7.0 LIABILITY

Individual members of CASC are participating as volunteer, lay advisors to LSG. Committee members are covered by the City's Municipal Liability Policy and the Errors and Omissions Policy.

Appendix 4 The LSG's Goals and Objectives

LSG'S GOALS AND OBJECTIVES

This document presents the Landfill Search Group's proposed Goals and Objectives for the City of Guelph's Landfill Site Search. It is intended to provide a basis for public review and discussion.

The document consists of three parts:

1) **Goals and Objectives for the Siting Process** - These were prepared by the LSG based on Goals and Objectives developed by the Community Advisory Sub-Committee (CASC). The Goals and Objectives were adopted by LSG on February 9, 1994 for initial guidance.

2) **Connections to CASC Goals and Objectives** - This describes the connections between LSG's Goals and Objectives and those developed by CASC.

3) **Draft Process/Choice of Technologies Objectives** - These are draft objectives prepared by LSG Chair, Stephen Rodd, for discussion purposes. These also relate to CASC's Goals and Objectives.

GOALS AND OBJECTIVES FOR THE SITING PROCESS[1]

The following statements of four goals and six objectives for the siting process were based on and expanded from the Goals and Objectives developed by the CASC.

GOALS

1. Minimize impact on human health and safety

2. Minimize impact on the environment

3. Maximize service to the community

4. Minimize cost for dealing with the portion of the waste destined for landfill

OBJECTIVES

1. Maximize the protection of heritage, cultural systems, and natural systems of air, water, soil and wildlife from harmful effects of waste treatment and disposal, including emissions to the air and contamination of surface and ground water. (see goals 1 and 2)

2. Minimize risks to public health and safety which may arise directly or indirectly from the disposal site and land notion. (see goal 1)

3. Maximize the opportunity for flexibility in future operations on the site such as the possibility of industrial processing capabilities. (see goal 3)

4. Maximize the probability of identifying an acceptable site(s) within the City within the time limits which have been imposed. (see goal 3)

5. Consider known costs and risks of major damage to human health or the natural environment, considering both the probability of harmful exposure and the degree of hazard. (see goals 1 and 2)

6. The process should be inclusive of all interests in the community and should attempt to consider and incorporate the viewpoints of as wide a community as possible by encouraging and facilitating wide public information availability and involvement in decision-making. (see goals 1, 2 and 3).

[1]   Adopted by LSG on February 9, 1994 for initial guidance

DRAFT OBJECTIVES IN CHOICE OF TECHNOLOGIES[2]

1. Deal with the environmental impacts of waste generated by our generation within our lifetime.

2. Maximize recovery of any materials that can be justified by a combination of economic costs and benefits plus a reasonable consideration for society's environmental benefits from reduced rates of extraction of virgin natural resource materials and by reduced environmental effects such as carbon dioxide emissions. Keep separate, if reasonably possible, materials which may in the foreseeable future have potential for recycling because of either (a) there would be relatively large quantities of relatively homogeneous material, and/or (b) high content of potential energy, fibre and chemical content, or some other potential substitute for virgin raw materials.

OBJECTIVE IN THE PROJECT PROCESS[2]

1. Develop and implement a process, and policies to provide fair compensation to those persons who can be shown to suffer financially or to bear a burden for the sake of serving the rest of the community.

Technology objective 1 - this covers Natural Environment Objective 4, and Social Environment principle.

Process objective 1 - this is similar to CASC Human Environment objective 2, and Economic considerations objectives 1 and 2.

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[2] Draft objectives prepared by LSG Chair Stephen Rodd for discussion purposes.

CONNECTIONS TO CASC GOALS AND OBJECTIVES

The above statements of four goals and six objectives for the siting process above appear to incorporate all of the concerns expressed by CASC in its statement of Goals and Objectives with the exception of their two objectives pertaining to disclosure of expenditures.

Goal 1 is similar to Human Environment Objective 1.

Goal 2 is similar to the Natural Environment statement of principle.

Goal 3 appears to go beyond the principles and objectives stated by CASC but it does conform to CASC's challenge statement drawn from LSG's mandate from City Council.

Goal 4 appears to go beyond the provisions by CASC, but is similar to their Economic Considerations Objective 2.

The six objectives express in more detail the kinds of consideration which are pertinent to each one of the goals to state the goal in more operational terms. The objectives are useful to integrate the considerations involved.

In addition, two additional objectives are stated here which pertain to the choice of technologies.

Further, the objective about the project process is similar to the CASC Economic Consideration objectives 1 and 2, and Human Environment objective 2.

Objective 1 - this is the same as objectives stated by CASC under Natural Environment objectives 1.2 3 and 4.

Objective 2 - this is the same as CASC Human Environment principle and its objective 1.

Objective 3 appears to go beyond statements from CASC.

Objective 4 is not included within the CASC statements.

Objective 5 is implicit in a number of the CASC statements.

Objective 6 is consistent with the second challenge statement of CASC.

Appendix 5 Guiding Principles of Consensus Processes

GUIDING PRINCIPLES OF
CONSENSUS PROCESSES

Consensus processes are participant determined and driven - that is their very essence. No single approach will work for each situation - because of the issues involved, the respective interests and the surrounding circumstances. Experience points to certain characteristics which are fundamental to consensus - these are referred to as the guiding principles. These principles are described in detail on the following pages.

Principle #1 - Purpose Driven
People need a reason to participate in the process.

Principle #2 - Inclusive not exclusive
All parties with a significant interest in the issue should be involved in the consensus process.

Principle #3 - Voluntary Participation
The parties who are affected or interested participate voluntarily.

Principle #4 - Self Design
The parties design the consensus process.

Principle #5 - Flexibility
Flexibility should be designed into the process.

Principle #6 - Equal Opportunity
All parties must have equal access to relevant information and the opportunity to participate effectively throughout the process.

Principle #7 - Respect for Diverse Interests
Acceptance of the diverse values, interests, and knowledge of the parties involved in the consensus process is essential.

Principle #8 - Accountability
The parties are accountable both to their constituencies, and to the process that they have agreed to establish.

Principle #9 - Time Limits
Realistic deadlines are necessary throughout the process.

Principle #10 - Implementation
Commitment to implementation and effective monitoring are essential parts of any agreement.

Appendix 6 Photographs of Areas Surrounding the Potential Sites

Figure 1 (Above)   Entering the City of Guelph from the south
Figure 2 (Below)   Billboard erected by CORALS, the billboard was
                   situated directly across the street from the sign above.

Figure 3 (Above)   Leaving the City of Guelph (travelling south) one encountered the above billboard erected by CORALS.

Figure 4 (Below)   Protest signs put up by CORALS members living in the annnexed area.

Figure 5 (Above)   The Eramosa River located near the Victoria Road site.

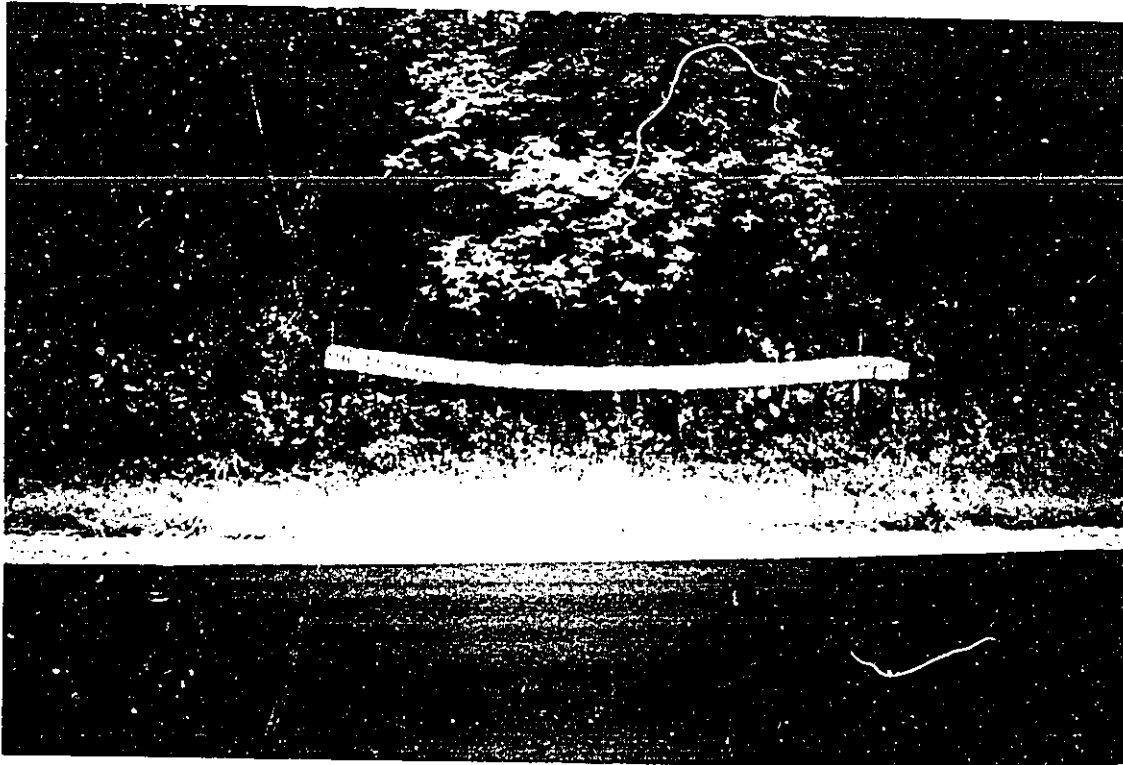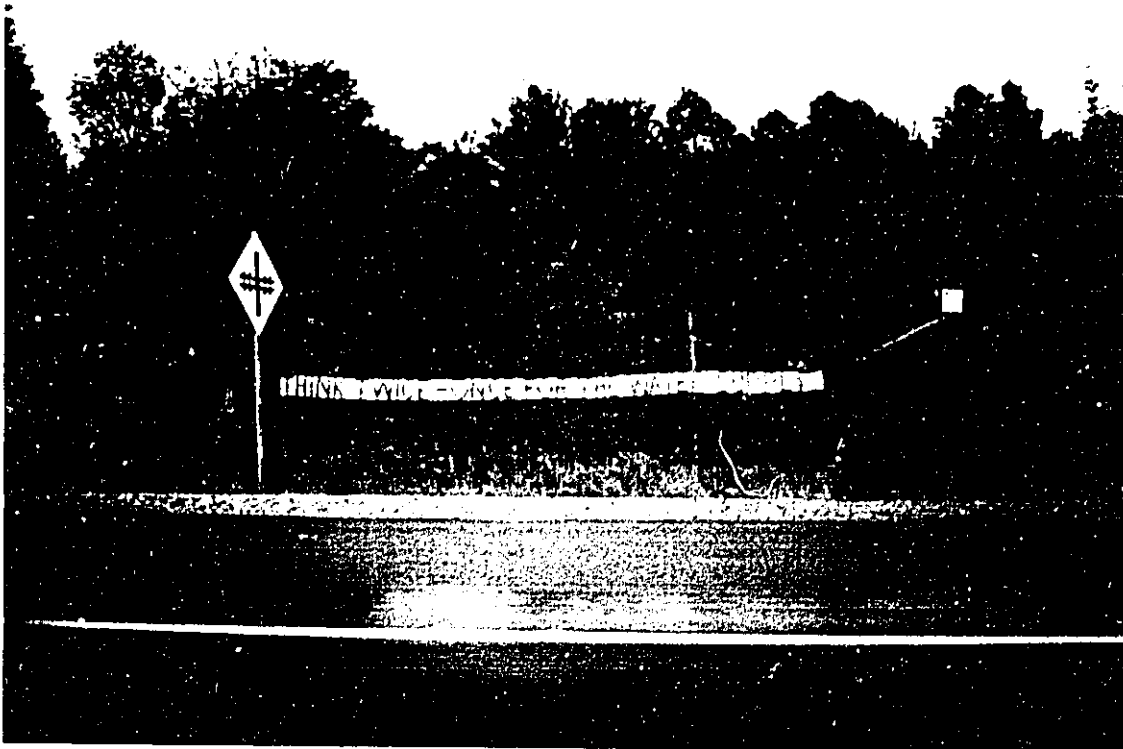Figure 6 (Below)   The Eramosa River located near the Victoria Road site.

Figure 7 (Above) Protest signs erected by the VRNLG.

Figure 8 (Below) Protest signs erected by the VRNLG.

Appendix 7 Newspaper Article

Article appearing in *The Guelph Daily Mercury*, December 8, 1993, p.3
(Circulation: 19,000/day)

McMaster student basing thesis on Guelph's search for landfill site

BY RICHARD DOOLEY
THE GUELPH MERCURY

A McMaster University student is making the Guelph landfill site search the subject of his doctoral thesis.

Harris Ali expects to defend his thesis next August and has written three chapters so far focusing on the formation of the community-based landfill search.

Ali has attended nearly all of the landfill search group (LSG) and community advisory subcommmitee (CASC) meetings to date and is busy collecting data on the search.

Guelph embarked on a landfill search shortly after rejecting the N4 landfill choice in Nichol Township being proposed by former search partner Wellington County.

The city-side search is confined to city limits and has looked at five potential sites, winnowing the search down to one potential site on Hanlon Road.

The five original sites sparked a wave of controversy in the city prompting opposition groups and critics of the proposal to criticize the LSG's choice of potential sites.

But Ali is most interested in the interaction between the public and elected officials and consultants hired to provide technical expertise.

The thesis depends on surveys Ali hopes people will return to him.

"I need at least 50 surveys to come back for the data to be meaningful," he said. "So far I've only gotten 20 back."

Ali said that if there are no more surveys returned to him soon, he may have to resort to a mass mailing using CASC sign-in sheets for meetings.

The exercise will be worthwhile, he said, in order to get the quantative data he needs for the statistical analysis.

Ali distributed copies of his four-page survey at LSG and CASC meetings in the last few months and even pressed LSG chairman Stephen Rodd into service to tell people the purpose of the survey.

The questionnaire asks participants their feelings on the environment and technology, the main focus of Ali's thesis.

"I'm looking at the relationship between technical specialists and the public," he said.

He is especially interested in how the public perceives and uses technical information disseminated by consultants.

"Do they trust that information or do they seek to educate themselves?"

Ali said the Guelph search, which is widely touted as innovative because of the high degree of public involvement, is remarkable for a number of reasons.

Not the least of which is the time members of the public have devoted to the search.

"There is a willingness by members of the public involved in the search to educate themselves and the amount of time they give to the issue," he said.

Ali is distributing more surveys at the Dec. 14 LSG meeting set for 7 p.m. at the University of Guelph Arboretum Auditorium.

Anyone who wants to offer any information regarding the search can contact Ali through the McMaster University Department of Sociology (905) 525-9140 or at (905) 279-6262.

Appendix 8 Survey Distributed to Participants in the GLSP

Affiliation: CASC, CORALS, LSG, VRNLG, other _____

Of the five choices given with each pair of statements, please circle the number that most closely expresses your opinion.
Please chose only one of the five choices.

Q1.

Science & technology have
improved our quality of life.

Science & technology have
worsened our quality of life.

1. strongly agree   2. mildly agree   3. undecided   4. mildly agree   5. strongly agree
        with first statement   with second statement

Q2.

Modern technology has increased
our freedom and independence.

Modern technology has reduced
our freedom and independence.

1. strongly agree   2. mildly agree   3. undecided   4. mildly agree   5. strongly agree
        with first statement   with second statement

Q3.

Complex technologies will always be
risky because of the chance of
human error.

Complex technologies can be made
virtually risk-free through continual
improvements.

1. strongly agree   2. mildly agree   3. undecided   4. mildly agree   5. strongly agree
        with first statement   with second statement

Q4.

Science and technology will always
be able to find solutions to our
problems.

Science and technology often create
more problems than they solve.

1. Very strongly agree   2. mildly agree   3. undecided   4. mildly agree   5. strongly agree
        with first statement   with second statement

Q5.

Nature should be preserved for its
own sake.

Nature should be used to produce
goods for people.

1. strongly agree   2. mildly agree   3. undecided   4. mildly agree   5. strongly agree
        with first statement   with second statement

Q6.

Economic growth should be given
priority over environmental
protection.

.Environmental protection should he
given priority over economic growth.

1. strongly agree   2. mildly agree   3. undecided   4. mildly agree   5. strongly agree
    with first statement   with second statement

Q7.

People should adapt to the
environment whenever possible.

The environment should he changed
to meet people's needs.

1. strongly agree   2. mildly agree   3. undecided   4. mildly agree   5. strongly agree
    with first statement   with second statement

Q8.

Natural resources should be saved
for the benefit of future generations.

Natural resources should be used
primarily for the benefit of the
the present generation.

1. strongly agree   2. mildly agree   3. undecided   4. mildly agree   5. strongly agree
    with first statement   with second statement

Q9.

People must learn to live in harmony
with nature to survive.

People must learn to control nature
in order to survive.

1. strongly agree   2. mildly agree   3. undecided   4. mildly agree   5. strongly agree
    with first statement   with second statement

Q10.

The earth is vast, with almost
unlimited room and resources.

The earth is like a spaceship, with
limited room and resources.

1. strongly agree   2. mildly agree   3. undecided   4. mildly agree   5. strongly agree
    with first statement   with second statement

Q11.

The balance of nature is strong
enough to cope with the impacts of
modern industrial countries.

Modern industrial countries are very
seriously disturbing the balance of
nature.

1. strongly agree   2. mildly agree
            with first statement

3. undecided

4. mildly agree   5. strongly agree
            with second statement

Q12.

Despite our special abilities. humans
are subject to the laws of nature like
other species.

Because we are human, we are not
subject to the laws of nature as are
other species.

1. strongly agree   2. mildly agree
            with first statement

3. undecided

4. mildly agree   5. strongly agree
            with second statement

Q13.

Public policies should be made at
the local level in order to reflect
local concerns.

Public policies should be made at the
national level to be consistent
throughout the nation.

1. strongly agree   2. mildly agree
            with first statement

3. undecided

4. mildly agree   5. strongly agree
            with second statement

Q14.

People should concern themselves with
society's welfare.

People should concern themselves with
their own welfare.

1. strongly agree   2. mildly agree
            with first statement

3. undecided

4. mildly agree   5. strongly agree
            with second statement

Q15.

Citizens should have more say
in deciding important political
issues.

Elected officials should have the major
say   in   deciding   important   political
issues.

1. strongly agree   2. mildly agree
            with first statement

3. undecided

4. mildly agree   5. strongly agree
            with second statement

Q16.

Citizens should have the major
say in deciding technical issues.

Experts should have the major say in
deciding technical issues.

1. strongly agree   2. mildly agree   3. undecided   4. mildly agree   5. strongly agree
        with first statement   with second statement

Q17.

Citizens should have the most
influence in deciding local
community issues.

Citizens should have some influence in
local community issues, but final
decisions should be made by public
officials.

1. strongly agree   2. mildly agree   3. undecided   4. mildly agree   5. strongly agree
        with first statement   with second statement

Q18.

Risks to public health should be
minimized even if economic
progress is slowed down.

Some risk to public health should be
accepted in order to ensure economic
progress.

1. strongly agree   2. mildly agree   3. undecided   4. mildly agree   5. strongly agree
        with first statement   with second statement

Q19.

Sophisticated technologies should be
used whenever possible.

Simple technologies should be used
whenever possible.

1. strongly agree   2. mildly agree   3. undecided   4. mildly agree   5. strongly agree
        with first statement   with second statement

Q20.

Energy production should have top
priority in national energy policy.

Energy conservation should have top
priority in national energy policy.

1. strongly agree   2. mildly agree   3. undecided   4. mildly agree   5. strongly agree
        with first statement   with second statement

Appendix 9
The Construction of Indexes for Technological and Ecological Beliefs and Values

The Technological Beliefs Index

Following Olsen et al. (1992:38), the following four pairs of technological belief statements were used in constructing the Technological Beliefs Index (the positive statement is given first, followed the by corresponding negative statement[1]):

-- Science and technology have improved our quality of life.
-- Science and technology have worsened our quality of life.

-- Modern technology has increased our freedom and independence.
-- Modern technology has reduced our freedom and independence.

-- Complex technologies can be made virtually risk-free through continual improvements.
-- Complex technologies will always be risky because of the chance of human error.

-- Science and technology will always be able to find   solutions   to   our problems.
-- Science and technology often create more problems than they solve.

The following procedure was then used to construct the Technological Beliefs Index:

(i) The response of strongly agree was recoded to be given a   weight of 2 points; mildly agree was given a weight of 1 point; and undecided or disagree a weight of 0.

(ii) These points were summed to create a scale ranging from 0 to 8.
For example, someone who answered "strongly agree" to all four questions would be given a score of 4 x 2= 8).

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[1]   In the actual survey the pairs of statements were presented such that the positive statement was not always first. This was done to avoid a response set.

(iii) Respondents were then classified as follows:
- Strong Technological Believer = 6-8 points
- Weak Technological Believer = 2-5 points
- Non-Technological Believer = 0-1 point.

The Ecological Beliefs Index

Following Olsen et al. (1992:62), the following four pairs of ecological belief statements were used in constructing the Ecological Beliefs Index (the positive statement is given first, followed by the corresponding negative statement):

-- People must learn to live in harmony with nature.
-- People must learn to control nature in order to survive.

-- The earth is like a spaceship, with limited room and resources.
-- The earth is vast, with almost unlimited room and resources.

-- Modern industrial countries are very seriously disturbing the balance of nature.
-- The balance of nature is strong enough to cope with the impacts of modern industrial countries.

-- Despite our special abilities, humans are subject to the laws of nature like other species.
-- Because we are human, we are not subject to the laws of nature as are other species.

The following procedure was then used to construct the Ecological Beliefs Index:

(i) The response of strongly agree was recoded to be given a weight of 2 points; mildly agree was given a weight of 1 point; and undecided or disagree a weight of 0.

(ii) These points were summed to create a scale ranging from 0 to 8.
For example, someone who answered "strongly agree" to all four questions would

be given a score of 4 x 2= 8).

(iii) Respondents were then classified as follows:
- Strong Ecological Believer = 6-8 points
- Weak Ecological Believer = 2-5 points
- Non-Ecological Believer = 0-1 point.

The Technological and Ecological Values Indexes

In contrast to beliefs, values are not "yes-no" ideas, rather, values are "either-or" ideas that require a choice to be made between different preferences (Olsen et al., 1992:42). In our study, we studied the preferences individuals expressed in regard to technological versus ecological values. Therefore, each value statement in the pair refers to either a technological value *or* an ecological value. Respondents had to choose between the two. Following Olsen et al. (1992:42) the following pairs of value statements were used in our survey (the technological value statement is given first, the ecological value statement second):

-- Nature should be used to produce goods for people.
-- Nature should be preserved for its own sake.

-- Economic growth should be given priority over environmental protection.
-- Environmental protection should be given priority over economic growth.

-- The environment should be changed to meet people's needs.
-- People should adapt to the environment whenever possible.

-- Natural resources should be used primarily for the benefit of the present generation.
-- Natural resources should be saved for the benefit of future generations.

The Technological Values Index

The degree to which the respondents agreed with the *first* of the above two statements was used to create the Technological Values Index. Following Olsen et al. (1992:45) the following procedure was used:

(i) The response of strongly agree was recoded to be given a weight of 2 points; mildly agree was given a weight of 1 point; and undecided or disagree a weight of 0.

(ii) These points were summed to create a scale ranging from 0 to 8.
For example, someone who answered "strongly agree" to all four questions would be given a score of 4 x 2= 8).

(iii) Respondents were then classified as follows:
- Strong Technological Valuer = 6-8 points
- Weak Technological Valuer = 2-5 points
- Non-Technological Valuer = 0-1 point.

The Ecological Values Index

As we have discussed, the four pairs of value statements discussed above serve as indicators for both technological and ecological values, depending on how the responses are scored. By *reversing* the scores of the technological values indicators, these same value indicators will serve as ecological values indicators. Reversing the scoring will therefore measure the degree to which individuals agree with the ecological values statements (i.e. the *second* statement of the values statement pairs given above). Following Olsen et al. (1992:65) the following procedure was used:

(i) The response of strongly agree was recoded to be given a weight of 2 points; mildly agree was given a weight of 1 point; and undecided or disagree a weight of 0.

(ii) These points were summed to create a scale ranging from 0 to 8.
For example, someone who answered "strongly agree" to all four questions would be given a score of 4 x 2= 8).

(iii) Respondents were then classified as follows:
- Strong Ecological Valuer = 6-8 points
- Weak Ecological Valuer = 2-5 points
- Non-Ecological Valuer = 0-1 point

Appendix 10 Worksheets Used by the LSG in the Potential Site Comparison Process

SUMMARY OF WORKSHEET

TECHNICAL CRITERIA	HANLON ROAD	BROCK ROAD	VICTORIA ROAD	CLAIR ROAD
PUBLIC HEALTH AND SAFETY				
HIGH ■ Potential impacts on humans due to contact with leachate	6 MOST 1 NO PREF.	4 MOST 1 MODERATE 1 LEAST 1 NO PREF.	3 LEAST 2 MODERATE 1 MOST 1 NO PREF.	4 MOST 1 MODERATE 1 LEAST 1 NO PREF.
LSG Consensus:				
Sub–Total:	Most	Moderate	Least	Moderate
MEDIUM ■ Potential for impact on aviation safety as a result of bird interference	7 MOST	5 MOST 2 MODERATE	6 LEAST 1 MODERATE	5 MOST 2 MODERATE
LSG Consensus:				
Sub–Total:	Most	Most	Least	Most
LOW ■ Traffic safety	6 MOST 1 MODERATE	5 MODERATE 1 MOST 1 LEAST	6 LEAST 1 MOST	5 MODERATE 1 MOST 1 LEAST
LSG Consensus:	Most	Moderate	Least	Moderate
■ Pedestrian and cyclist safety	7 MOST	6 MODERATE 1 MOST	7 LEAST	6 MODERATE 1 MOST
LSG Consensus:				
Sub–Total:	Most	Moderate	Least	Moderate
TOTAL:	MOST	MODERATE	LEAST	MODERATE

SUMMARY OF
WORKSHEET

TECHNICAL CRITERIA	HANLON ROAD	BROCK ROAD	VICTORIA ROAD	CLAIR ROAD
NATURAL ENVIRONMENT				
HIGH ■ Potential disruption to and/or loss of terrestrial habitat and important terrestrial features	3 LEAST 2 MODERATE 1 MOST 1 NO PREF.	5 LEAST 2 MODERATE	4 MOST 1 MODERATE 1 LEAST 1 NO PREF.	3 MODERATE 2 MOST 1 LEAST 1 NO PREF.
LSG Consensus:	Moderate	Least	Most	Mod. Preferred
■ Potential disruption to and/or loss of terrestrial ecosystem function	6 MOST 1 NO PREF.	6 LEAST 1 MODERATE	5 MOST 1 MODERATE 1 NO PREF.	5 LEAST 1 MODERATE 1 NO PREF.
LSG Consensus:	Most	Least	Most	Least
■ Potential disruption to and/or loss of wildlife movement corridors	3 NO PREF. 2 MOST 2 MODERATE	3 NO PREF. 2 MODERATE 2 LEAST	3 NO PREF. 3 MOST 1 MODERATE	3 NO PREF. 2 MOST 2 LEAST
LSG Consensus:	Mod. Preferred	Least	Most	Moderate
■ Potential disruption to and/or loss of aquatic habitat and other important aquatic features	6 MOST 1 MODERATE	6 MOST 1 LEAST	7 MOST	4 LEAST 3 MODERATE
LSG Consensus:	Most	Most	Most	Least
■ Potential disruption to and/or loss of aquatic ecosystem function	5 MODERATE 1 LEAST 1 NO PREF.	6 LEAST 1 NO PREF.	6 MOST 1 NO PREF.	5 MODERATE 1 MOST 1 NO PREF.
LSG Consensus:	Moderate	Least	Most	Mod. Preferred
Sub-Total:				
TOTAL:	MOD. PREFERRED	LEAST	MOST	MODERATE

SUMMARY OF
WORKSHEET

TECHNICAL CRITERIA	HANLON ROAD	BROCK ROAD	VICTORIA ROAD	CLAIR ROAD
SOCIAL ENVIRONMENT				
HIGH • Potential disruption to the use and enjoyment of residences, public institutions and any other sensitive land uses	7 MOST	4 LEAST 2 MODERATE 1 MOST	4 LEAST 3 MODERATE	4 LEAST 2 MODERATE 2 MOST
LSG Consensus:	Most	Least	Least	Least
• Potential changes to community character	5 MOST 2 LEAST	3 MODERATE 2 MOST 2 LEAST	3 LEAST 2 MOST 2 MODERATE	3 LEAST 2 MOST 2 MODERATE
LSG Consensus:	Most	Moderate	Least	Least
• Potential changes to community cohesion	4 MOST 2 NO PREF. 1 MODERATE	3 MODERATE 2 NO PREF. 1 MOST 1 LEAST	2 MOST 2 MODERATE 2 NO PREF. 1 LEAST	2 MODERATE 2 LEAST 2 NO PREF. 1 MOST
LSG Consensus:	Most	Moderate	Mod. Preferred	Least
• Compatibility with existing and/or future Municipal and County planned land use	5 MOST 1 MODERATE 1 NO PREF.	5 LEAST 1 MODERATE 1 NO PREF.	5 MODERATE 1 MOST 1 NO PREF.	6 LEAST 1 NO PREF.
LSG Consensus:	Most	Least	Moderate	Least
Sub–Total:	MOST	MODERATE	MOD. PREFERRED	LEAST
MEDIUM • Displacement of residences and public facilities	4 MODERATE 2 LEAST 1 MOST	5 MODERATE 1 MOST 1 LEAST	5 LEAST 1 MOST 1 MODERATE	5 MOST 1 MODERATE 1 LEAST
LSG Consensus:	MODERATE	MOD. PREFERRED	LEAST	MOST

SUMMARY OF WORKSHEET

TECHNICAL CRITERIA	HANLON ROAD	BROCK ROAD	VICTORIA ROAD	CLAIR ROAD
• Visual impact of the landfill	5 MOST 1 MODERATE 1 LEAST	3 LEAST 2 MOST 2 MODERATE	4 LEAST 2 MODERATE 1 MOST	3 MODERATE 3 LEAST 1 MOST
LSG Consensus:	Most	Mod. Preferred	Least	Moderate
• Potential displacement and/or disruption to the use and enjoyment of recreational activities, including open space	6 MOST 1 NO PREF.	4 MODERATE 1 MOST 1 LEAST 1 NO PREF.	5 LEAST 1 MODERATE 1 NO PREF.	3 MOST 3 MODERATE 1 NO PREF.
LSG Consensus:	Most	Moderate	Least	Mod. Preferred
• Compatibility with existing and/or future provincial or federal special land use	6 MOST 1 NO PREF.	5 MOST 1 LEAST 1 NO PREF.	5 LEAST 1 MODERATE 1 NO PREF.	5 MOST 1 LEAST 1 NO PREF.
LSG Consensus:	Most	Mod. Preferred	Least	Mod. Preferred
Sub-Total:	MOST	MODERATE	LEAST	MOD. PREFERRED
LOW • Compatibility of completed landfill with existing and/or future surrounding land uses within the City of Guelph and adjacent Townships	3 MOST 3 NO PREF. 1 MODERATE	3 NO PREF. 2 MOST 2 LEAST	3 NO PREF. 2 MOST 1 MODERATE 1 LEAST	3 NO PREF. 3 LEAST 1 MOST
LSG Consensus:	MOST	MODERATE	MODERATE	LEAST
Sub-Total:	"	"	"	"
TOTAL:	MOST	MODERATE	MODERATE	LEAST

SUMMARY OF
WORKSHEET

TECHNICAL CRITERIA	HANLON ROAD	BROCK ROAD	VICTORIA ROAD	CLAIR ROAD
ECONOMIC ENVIRONMENT				
HIGH • Disruption of businesses (including business losses and closure) due to the operation of the landfill	6 LEAST 1 MOST	5 MOST 1 MODERATE 1 LEAST	4 MODERATE 2 LEAST 1 MOST	5 MODERATE 1 MOST 1 LEAST
LSG Consensus:				
Sub–Total:	Least	Most	Moderate	Moderate
MEDIUM • Capital and operating costs, roadway improvement costs, and sewage treatment and water supply costs	3 MODERATE 3 LEAST 1 NO PREF.	4 MOST 2 LEAST 1 NO PREF.	6 MODERATE 1 NO PREF.	5 MOST 1 MODERATE 1 NO PREF.
LSG Consensus:	Least	Mod. Preferred	Moderate	Most
• Displacement of businesses	4 MODERATE 2 LEAST 1 MOST	4 MOST 3 MODERATE	5 LEAST 2 MOST	5 MOST 1 MODERATE 1 LEAST
LSG Consensus:	Moderate	Most	Least	Most
• Property value loss	5 MODERATE 2 LEAST	4 MODERATE 3 LEAST	7 MOST	4 LEAST 2 MODERATE 1 MOST
LSG Consensus:	Moderate	Moderate	Most	Least
Sub–Total:	LEAST	MOST	Results not recorded by facilitator	
LOW • Effects on the municipal tax base	4 LEAST 3 MODERATE	4 LEAST 2 MODERATE 1 MOST	5 MOST 2 MODERATE	5 MOST 2 MODERATE
LSG Consensus:	Least	Moderate	Most	Most
Sub–Total:				
TOTAL:	LEAST	MOST	MODERATE	MOD. PREFERRED

SUMMARY OF
WORKSHEET

TECHNICAL CRITERIA	HANLON ROAD	BROCK ROAD	VICTORIA ROAD	CLAIR ROAD
CULTURAL ENVIRONMENT				
HIGH				
LSG Consensus:				
Sub–Total:				
MEDIUM • Displacement of on-site cultural heritage and cultural landscapes	5 MODERATE 2 MOST	6 LEAST 1 MODERATE	6 MOST 1 MODERATE	5 MODERATE 1 LEAST 1 MOST
LSG Consensus:	Mod. Preferred	Least	Most	Moderate
Sub–Total:				
LOW • Potential disruption or disturbance to cultural heritage features off-site due to nuisance impacts	2 LEAST 2 NO PREF. 1 MOST 1 MODERATE	2 LEAST 2 NO PREF. 1 MOST 1 MODERATE	3 MOST 2 NO PREF. 1 LEAST	2 LEAST 2 NO PREF. 1 MODERATE 1 MOST
LSG Consensus:	Least	Least	Most	Least
Sub–Total:				
TOTAL:	Mod. Preferred	Least	Most	Moderate

SUMMARY OF
WORKSHEET

TECHNICAL CRITERIA	HANLON ROAD	BROCK ROAD	VICTORIA ROAD	CLAIR ROAD
PUBLIC SERVICES				
.HIGH ■ Level of service provided by the landfill	5 MOST 1 MODERATE 1 NO PREF.	5 LEAST 1 MODERATE 1 NO PREF.	5 MOST 1 MODERATE 1 NO PREF.	4 MOST 2 MODERATE 1 NO PREF.
LSG Consensus:	Most	Least	Most	Most
Sub–Total:				
MEDIUM				
LSG Consensus:				
Sub–Total:				
LOW ■ Operational impacts of landfill on public services (e.g., roads, utilities)	5 NO PREF. 1 MOST 1 MODERATE	5 NO PREF. 2 LEAST	5 NO PREF. 1 MODERATE 1 MOST	5 NO PREF. 1 MODERATE 1 LEAST
LSG Consensus:		SCREENED OUT		
■ Potential disruption to local traffic networks	6 MOST 1 MODERATE	4 MODERATE 2 MOST 1 LEAST	5 LEAST 1 MOST 1 MODERATE	5 MODERATE 1 MOST 1 LEAST .
LSG Consensus:				
Sub–Total:	Most	Moderate	Least	Moderate
TOTAL:	MOST	Least	Moderate	Mod. Preferred

(wd3-4/9350&0994) .

WORKSHEET

Key: Most = Most Preferred Site
Least = Least Preferred Site

CRITERIA GROUPS		HANLON ROAD	BROCK ROAD	VICTORIA ROAD	CLAIR ROAD
PUBLIC HEALTH AND SAFETY	100	Most	Moderate	Least	Moderate
NATURAL ENVIRONMENT	100	Moderately Preferred	Least	Most	Moderate
SOCIAL ENVIRONMENT	70	Most	Moderate	Moderate	Least
ECONOMIC ENVIRONMENT	52	Least	Most	Moderate	Moderately Preferred
CULTURAL ENVIRONMENT	33	Moderately Preferred	Least	Most	Moderate
PUBLIC SERVICES	24	Most	Least	Moderate	Moderately Preferred
TOTAL:		Most	Least	Moderately Preferred	Moderate

(Web-3/P)300/00W)

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