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**COWAM in Practice Methodological  
Task Force Research Brief:  
Defining an Affected Community**



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## Executive Summary

The long term management of radioactive waste creates site specific issues associated with storage and disposal facilities and the transportation of radioactive material. The resolution of these, sometimes controversial, issues requires an appreciation and accommodation of community issues and an essential element of these activities is an approach to defining the extent and composition of communities affected by radioactive waste management.

A community perspective can provide an insight into the relationship between a facility and people living in its vicinity. However, operationalising the community level perspective, to provide policymakers with a useful approach to critical local issues, requires us to discriminate between geographical and experiential elements of the concept of community and gets to the heart of the concept of community itself. Moreover, given the potentially fundamental impact of a radioactive waste facility in a locality, the distinction between the social and spatial elements of community is especially important in radioactive waste facility siting, as is unpacking the elements of the community experience.

For the purposes of CIP, a community level approach to radioactive waste management may be problematic, in that from a spatial perspective radioactive waste facility siting issues may not conform with existing conceptions or definitions of a community. Evidence suggests that a population immediately affected by a facility may be only a small part of what one may consider to be an existing community. However, the cultural, social, economic and political implications and resonances of the development of a facility may extend over a wide area, encompassing a number of communities or parts of communities. Moreover, as the technical implementation of a facility siting process proceeds, it may be that the actual community involved only emerges within a wider site selection process as geology and other technical and social considerations determine a facility's location within a wide zone of investigation.

In this CIP research brief, a two-stage approach to identifying an affected community is proposed. The first stage, which we term a Directly Affected Population (DAP) is identified using a technique such as *risk perception mapping*. This first stage focuses upon the individuals who perceive themselves as suffering some type of dis-benefit- especially perceived risks - as a consequence of the planning, construction or operation of a radioactive waste facility. It may be, however, that this DAP does not conform to an existing community, it may exist within a wider community or may extend over a number of communities in a wider area – especially if transportation routes to a facility are taken in to account.

The second aspect of the definition of an affected community focuses upon the elements of the experience of living in 'a community'. Drawing upon sociological perspectives, it exposes the relationship between individuals and the places in which they live. This wider relationship includes individuals' feelings and status of membership of a community; their emotional connection with this geographical and social space; their degree of influence in the governance of that place; and the ability of a locality to provide them with economic and physical resources. In short, these definitions provide an insight into the elements constituting a community as a place to live and to work.

These elements of a community definition give an insight into some of the community factors relating to definition and identity, which may come into play in a facility siting process. It is

argued that these factors need to be recognised and accommodated if a siting process is to be effective. Of crucial importance is the relationship between the perspectives of a DAP and wider definitions of community. These may emerge as a facility siting issue develops and result in very different perspectives on a particular facility siting project. The term ‘local community’ may be used to describe these groups with perspectives on the siting of a radioactive waste facility: one of the key roles of the governance arrangements of these facilities is to accommodate these ‘communities’ and allow their representation and articulation.

All of the elements of a community are relevant to facility siting processes. Of special concern for radioactive waste siting issues, however, is that a DAP may have a distinctive emotional relationship to a site. For example, the emotional element of a community definition, which may be felt and experienced by a DAP, may be very different, even at odds, with a resource based conception of the issue felt by a wider community especially if the siting of a radioactive waste facility is associated with the un-siting of an adjacent nuclear facility upon which the economy of a community depends, or significant community benefits packages on offer to the community.

It should be stressed that new radioactive waste facility siting projects may not conform to existing conceptions of community, or existing administrative areas. Indeed, the DAP associated with radioactive waste facility siting may create a new community of individuals defined by their particular relationship with the issue. Moreover, the DAP associated with a radioactive waste facility may actually be quite small given the probable location of radioactive waste facilities in rural areas of a low population density. This subset of a wider community or local administrative area may, however, come to have a very distinctive perspective on a proposed radioactive waste facility indeed this perspective may come to define this community of interest.

Thus, the governance ‘architecture’ for facility siting requires a high degree of flexibility, in terms of accommodating the interests and perspectives of directly affected populations as they emerge within wider communities and local authority areas. These populations of individuals may possess some elements of a community, especially the membership and emotional elements given their proximity to an issue as a defining feature of their identity. However, experience from the UK suggests that this group may have a distinctive profile in other respects, from the wider community or communities from which they have emerged as a subset.

A key challenge facing those responsible for the governance of radioactive waste facilities is to respect and accommodate this plurality of communities and the diversity of their interests and perspectives. Different stages of the process may require different modes and levels of representation as the issue moves from administrative areas to those, perhaps small in numbers, who are directly affected by a proposed facility. The identification of this DAP and a recognition and accommodation of their perspectives drawing upon a sociological definition of community offers a way of identifying and engaging the complex, contested notion of communities in radioactive waste facility siting and management.

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# 1. Introduction and Methodology

## 1.1 Introduction

This document reports the results of research undertaken by Westlakes Scientific Consulting Limited in pursuance of its role as a member of the Methodological Task Force (MTF), of the Community Waste Management in Practice (CIP) project. This research brief addresses the issue of defining communities in the context of the governance of radioactive waste. This topic was proposed by the CIP project's United Kingdom National Stakeholder Group (UKNSG) of which Westlakes Scientific Consulting is the UK National Facilitator (NF). This research was funded by the European Commission and the Nuclear Decommissioning Authority (NDA), in the UK.

It is widely recognised in the field of radioactive waste management that facility siting (which may encompass interim storage as well as long term disposal) is not just a technical issue. The success of a site selection process will be due in no small part to the appreciation and accommodation of community level issues and the effective engagement with communities, and their representatives, in the vicinity of a facility.

The importance of this topic is revealed by the origin of this research brief. It was chosen by the UK NSG of the CIP project, in its first meeting, as the most significant topic in radioactive waste governance in the UK worthy of investigation by the research group (MTF). In a workshop session devoted to key issues in radioactive waste governance, the following was the main question identified:

*“Thinking of both existing and new nuclear sites, who defines a community, and how do they do it, especially in respect of the following:*

- *Timing – when is the question asked?*
- *Purpose – what are they trying to do?*
- *Recognition – is this credible or valid?*
- *Representation – who speaks for the community so defined?*
- *Context – one size may not fit all.”*

Clearly, this is an issue of great concern among policy makers and professionals involved in radioactive waste management in the UK. This question was subsequently adopted by the CIP project as a key topic for investigation of wider relevance to the other EU countries involved in CIP (Romania, Slovenia, Spain and France) and more generally to form a significant part of the guidelines produced for the 27 member states of the European Union.

The notion of community and communities is an increasingly important aspect of many areas of policy in the UK, including radioactive waste management, yet there is a lack of clarity as to what actually constitutes ‘a community’. However, notwithstanding this definitional and

operational confusion, there exists an expectation among communities and policy makers that communities will have an influence in the policy process. It is clear that a community orientation places significant challenges on those framing community policies, or designing structures to identify, accommodate and give a voice to communities affected by the siting of a geological disposal or storage facility for radioactive wastes.

In this context, an effective radioactive waste facility siting process must embrace the community level, and a key issue in that process is defining the scope and scale of the community affected by the development of a facility.

In the UK the community level has a central place within the Government's policy for higher activity radioactive wastes and, as will be discussed, the current situation within the UK in respect of the implementation of this process is especially revealing about defining affected communities in radioactive waste facility siting. However, community is a complex, contested concept and there are a number of definitions and methods for defining a community. For example, does the affected community comprise existing communities which may be affected by a new facility, or does the facility create an entirely new community of those 'affected' by its siting?

Moreover, issues may have a shape which does not conform with existing definitions of community and which may create new communities of interest within or beyond more 'traditional' and 'established' conceptions of community. In extreme cases, such as the development of a radioactive waste facility, which may have profound implications for the environment and economy in its vicinity, the development of a radioactive waste facility may even undermine existing communities.

### *1.1.1 UK policy and case-studies*

This project has been undertaken at a significant time in the governance of radioactive waste in the UK. For the first time ever, a policy is being implemented which gives communities a central role in the selection of a site for geological investigation as a potential location to host a facility for the management of higher activity radioactive wastes. This new policy initiative is consistent with one of the key drivers in contemporary UK politics and policy; moving decision making closer to those (potentially) affected.

Foregrounding the role of communities in this way respects local variations and differences and is an example of the governance of radioactive waste involving multiple levels of government, society and communities. After decades of top-down government in the field of radioactive waste, the current UK Government policy enshrines a fresh approach, broadening the range of actors, influences, issues and communities involved in this national policy process.

This policy, *Managing Radioactive Waste Safely* (explored in detail later in this document), is at an early stage of its development. Indeed, at the time of writing (late 2009) it is in the first of six stages, seeking a without commitment Expression of Interest (EoI) from potential



host communities to enter into talks with Government regarding going forward for investigation as an area to determine geological suitability. It may actually be many years before a site is selected and years more before a facility begins accepting any radioactive wastes in the UK. However, the design of the MRWS policy, which was shaped by careful consideration of community siting issues and international experience and good practice, reveals the importance of the role of a community in a radioactive waste facility siting process.

Low level radioactive wastes (LLW) also require new facilities to be sited, and by the summer of 2009, the siting process was finalised for a facility near Dounreay nuclear site, near Thurso in Caithness, Scotland. This planned, but not yet constructed, facility is a disposal site for Low Level Waste produced as a result of the decommissioning operations associated with the Dounreay and Vulcan nuclear sites. This LLW facility, which emerged out of a Best Practicable Environmental Option process and a subsequent planning application, is the first new civil radioactive waste disposal facility to be located on a new site in the UK for many decades.

The use of the Dounreay LLW facility as a case study example gives us access to a recently completed radioactive waste facility siting process, and the associated experiences of those involved, from the local residents nearest the site, through to the strategic planning authority.

This coincidence of the CIP project with the UK Government's Managing Radioactive Waste Safely (MRWS) policy and the Dounreay LLW decision make the completion of this MTF research brief especially timely. These two policy initiatives give the opportunity to study the definition of affected communities in the governance of radioactive waste prospectively, in the form of an ongoing MRWS policy process and the issues it is already revealing, and retrospectively, in the form of the completed Dounreay LLW facility siting process.

### *1.1.2 Structure*

This research brief comprises four sections:

- Firstly, an overview of concepts and issues from the academic literature on communities that are judged to be of relevance to this research brief, taking into account the characteristics of radioactive waste and a discussion about affected communities and characterising an approach to develop the analysis of the case studies.
- Secondly, a review of current higher activity radioactive waste policy in the UK, the MRWS policy. In this review, we focus specifically upon the engagement of local communities and their representatives, in the facility siting stages of a geological disposal facility for higher activity wastes.
- Thirdly, a prospective review of the implementation of the MRWS process, drawing upon insights gained from the West Cumbria area and a retrospective review of the development of a low level radioactive waste disposal facility near Dounreay in Caithness, which has recently received planning consent to proceed with construction.

- Finally, a synthesis of conclusions from the above, into an approach to address the defining of affected communities in the context of radioactive waste facility siting.

The ultimate aim of the CIP project is to improve the governance of radioactive waste. It is hoped that the analysis, theorising and reflection in this MTF research brief will provide useful insights across the field of the governance of radioactive waste. More than this, however, the increased importance of communities in the governance of contemporary societies gives this research brief a wider relevance to those engaged in governance in other fields involving community level engagement.

## **1.2 The methodology**

In the spirit of collaborative research and consistent with the ethos of the CIP project, this document has been prepared with the input of stakeholders involved in the governance of radioactive waste at local, regional and national levels. It has drawn upon policy for radioactive wastes in England and Wales, where the Managing Radioactive Waste Safely (MRWS) policy is in its early stages of implementation; and in Scotland where a new LLW facility near the Dounreay nuclear facility in Caithness has just received permission from the planning authorities to proceed. Therefore, these cases provide a retrospective reflection on issues raised in a siting process, and also a prospective look at a facility siting process designed to accommodate community level engagement from the outset.

This research brief draws upon insights from practitioners and policy makers involved at national and regional and community levels and synthesises their input with insights from contemporary thinking and scholarly research. The CIP project has been undertaken as a collaborative research project, involving input from a range of participants involved in the project at local, UK national and European levels. Consistent with this collaborative ethos, the methodology used in the completion of this research brief involved the following:

- interviews with policy makers involved in radioactive waste policy in the UK;
- interviews with individuals and communities involved with radioactive waste issues;
- review and interpretation of published policy information;
- deliberations of the CIP UK national stakeholder group;
- discussion of issues in wider CIP project meetings; and the
- interpretation and analysis of relevant contemporary thinking in the academic literature.

Therefore, in summary, the methodological approach used in the development of this research brief has been to study policy documents and interpret them based upon an insight into approaches to community derived from the academic literature, and the insights from previous COWAM research, and to locate this research towards the salient areas through NSG discussion and interviews with participants involved in siting processes.

## **2. Scoping a definition of an affected community**

### **2.1 Insight from previous COWAM research**

Communities and their engagement are, CIP has postulated, at the heart of the successful management of radioactive waste. The theme of defining communities runs through many other issues covered by the CIP project. Within the CIP project, the defining an affected community brief has been grouped together with those covering benefits and compensation and a third focusing upon sustainable territorial development encompassing radioactive waste management, to form a research theme. In addition, issues such as the development of local democracy for engagement in radioactive waste governance, and long term issues for sustainable governance of radioactive waste management all require a workable approach to the issue of community identity.

The identification of affected communities, by the UK NSG members, and the subsequent selection of this issue by the Core Group of researchers and facilitators in the CIP project as a topic for wider investigation, builds upon the earlier work of the previous round of the COWAM project which noted the following ways of defining affected communities:

- Geographical communities
- Communities of interest
- Communities of concern
- Travel to work communities
- Decision making bodies
- Transport corridor

Each of the above represents a way of defining a community in the context of a radioactive waste facility siting, each from a slightly different perspective. In terms of an economy of definition, though, a number of these may be combined into essentially two approaches to defining an affected community in respect of facility siting:

- Firstly, a socio-spatial relationship with a new or proposed facility. This comprises firstly a spatial aspect encompassing ‘geographical communities,’ and ‘transport corridors’ which may be combined as spatially centred definitions of community. Secondly, a social aspect comprising ‘communities of concern’, and ‘communities of interest’. These are groups of individuals who may be distinguished by their interest in, and concern about, the development of a radioactive waste management facility: essentially, this socio-spatial group emerges in response to a facility.
- Secondly, elements of existing communities. Two elements of communities were identified which fit in with existing definitions of community. Firstly, an economic dimension, reflected in the term ‘travel to work communities’; and secondly a political aspect to community in respect of ‘decision making bodies’ and the network of relations around them.

This brief analysis above draws upon the earlier COWAM 2 project and provides a point of departure upon which this MTF brief is developed.

## 2.2 Communities and community

For the purposes of the task set for this research brief, to investigate the definition of an affected community, the concept of community is difficult and challenging. There are many different definitions of the concept of community, from the idyll of a traditional village to ‘virtual’ communities where members relate remotely, perhaps only electronically by the world-wide-web. Of particular relevance to this CIP project is the observation that community need not necessarily have geographical proximity as a defining characteristic. Indeed, individuals living in one location can, it is argued, be members of a range of communities (Obst and White 2007; Brodsky and Marx, 2001).

There is, however, a degree of commonality among these definitions. Firstly, they involve people and; secondly, there is some sharing relationship between them. This sharing can be some sort of common experience, perhaps deriving from (though not limited to) a spatial proximity, or some other connection such as politics, economics, a common interest or shared belief.

Definitions often straddle both *a priori* and relational communities, such as that used by the UK Government’s Department of Communities and Local Government, which recognises that while people are central, the nature of their interaction need not be territorial:

“**Community:** a specific group of people who all hold something in common. Community has tended to be associated with two key aspects: firstly people who share locality or geographical place; secondly people who are communities of interest.”

A categorically different approach is to define a community in respect of social interactions in cultural, political and economic contexts. Using this approach, community is envisaged as a fundamentally human phenomenon grounded in shared experience.

One of the most accepted sociological models of a community is the ‘Sense of Community Index’ (SCI) developed to unpack elements of what has been termed the ‘force’ or bonds which create and bind both relational and territorial communities (McMillan and Chavis, 1986; McMillan, 1996; Obst, Smith and Zinkiewicz, 2002; Obst and White, 2007). This approach to the components of a community experience comprises four key elements which we have summarised below as membership plus the political, economic and emotional elements of community:

- **Membership** - The feeling of belonging, of sharing a sense of personal relatedness to a group.

- **Political Influence** - A sense of significance, of being influential of making a difference within the group. This political element of community is considered especially important in a community as a functional construct, with the individual community member being able to influence the wider community, and also for the community itself to be influential and able to defend it and its members' interests in wider associations.
- **Reinforcement** - The feeling that membership of this group matters in terms of the receipt of resources fulfilling needs of members. This aspect of SCI relates to a community as a sustainable economy.
- **Emotion** - A shared culture, history and common symbols, perhaps including shared understanding of significant events.

Together, these elements create, to a greater or lesser extent, the experience of community in the form of affective individually felt bonds forming a community feeling among its members. This is not to say that all communities have a great deal of these attributes to a great extent but, for the purposes of this overview, a more viable and robust community will have more of these elements, and to a greater intensity.

The SCI approach gives an insight into key elements of community identity and reveals a number of points worthy of note which are relevant to this study and assist with defining an affected community in the context of radioactive waste management.

Firstly, community identity has a politically salient force, a dynamic that creates a sense of identity that is worth defending. A community provides individuals with something that is valued and membership of something that is of benefit. Communities are often strongest in adversity, when there is a threat to this community and individuals mobilise in its defence. Here the salience of a community and the status and worth of its membership may be especially strongly felt, as is the degree of influence an individual, and the community itself, is seen as having. In such a situation, the ability of a community to provide individuals with some power to influence the community itself, with a political role, a capacity for self determination and an ability to defend itself, is very important.

Secondly, some definitions of community may be associated with the economic or functional aspects of a community. The UK's Nuclear Decommissioning Authority (NDA), for example, defines a local community in their Socio-Economic Policy as a functional economic area:

‘The term ‘local community’ or ‘local’ should be defined based on where the majority of the local economic impact of site activity/decommissioning occurs; using measures such as travel to work area or local supplier base. The focus should be more sub-regional than local village/town focused’

The SCI approach, by identifying the elements of a felt and experienced community, provides a framework to assess the impact of locating a new facility within an existing or across

multiple existing communities, by giving an appreciation of the shape of these communities that may relate to the siting or siting process. It may be that the character of a radioactive waste siting issue will not conform to existing experiences of community. Indeed, it may be that a facility siting issue comes to overlie and even shape the experience of community for individuals within a DAP. Thus, radioactive waste management facilities may create localised DAPs within existing communities. The SCI approach allows an understanding of how these relate to one another in both an emotional and functional sense. However, the SCI approach is not focussed upon purely territorial definitions of community.

Communities may be more than merely aggregates of individuals (Etzioni 2000) or geographical spaces such as an *a priori* definition in the form of a line on a map may lead one to believe. The sense or experience of community derives its essential quality from relationships between individuals and from some commonality of perspective held by and shared between them. Given that commonality is a defining feature of communities, for the purposes of this research brief looking at an affected community, we propose to develop our research using the following working definition of a community as "...a group of people who have things in common such as territory, interests or other attachments". In the following section, we turn to the issue of an *affected* community.

### 2.3 Elements of defining an affected community.

There are two possible routes to defining an *affected* community in the context of a radioactive waste facility. Firstly, it could be an extant community that is affected by the development of an issue, thinking of a village, but one in which a facility is to be located and which will be affected in some way by such a development. Alternatively, a facility could create a new *community of interest* in its vicinity, in the sense that it creates a group of people who are affected by, or have a common interest, concern or relationship with, a radioactive waste facility. Thus, taking account of the relationship between individuals and a potential facility, the definition of an affected community will clearly include territorial as well as perceptual aspects.

Ruckelshaus (1984) focused upon the role of affected communities in the context of the then over five hundred 'National Priority Sites' addressed under the Comprehensive Environmental Response, Compensation and Liability Act, originally of 1980, and implemented by the United States Environmental Protection Agency (EPA). Ruckelshaus, writing as an insider in the EPA, reveals some key characteristics of an affected community. Commenting on the sites which involved affected citizens in the decision process of the cleanup of sites posing long term hazards to people and the environment, a telling passage gives an insight into key parameters of an affected community (emphasis added):

"Thousands of Americans live near priority sites. These people *fear* for their lives, their health and their property. They are *concerned* about the well-being and the future of their children."

He goes on to say that...

“The perceptions of these *frightened* people are based on something real — the hazardous waste *crisis* in their communities...”

These statements reveal two key elements of a community perceiving itself as affected by association with a ‘Superfund’ Site. Firstly, there is a territorial element in terms of proximity to a facility; secondly, there is a significant level of perceived risk as a consequence of proximity with the radioactive waste facility.

In the context of radioactive waste, perceived risk is an especially significant type of risk; a ‘dread risk’ (Slovic 1987) associated with uncontrollable, invisible and long-term hazards like man-made radioactive waste. Indeed, in the above quotation relating to the superfund sites, we see one of the key defining characteristics of a dread risk – its potential to affect people in the future - being present in this conception of ‘affected community’.

Radioactive waste is, therefore, widely perceived as a particularly difficult form of risk. Indeed, of all the risks confronting contemporary society, the ‘dread risks’ associated with man-made radiation in general and radioactive waste in particular are some of the most powerfully felt by individuals and are, consequently, politically significant. A risk centred perspective is an essentially individual level perspective focussing upon the individual and recognising that, in a wider community or group some individuals are more likely than others to suffer a perceived dis-benefit as a result of the development of a radioactive waste facility. This individualised perspective, which can be termed as libertarian i.e. the maximizing of individual rights, contrasts an essentially community-centred approach, which can be termed an egalitarian perspective, which implies individual submission to personal dis-benefit for the benefit of a larger group, or community.

## **2.4 Risk perception mapping**

Given the importance of perceived risk, some ability to identify perceived risk would appear to be an important tool in facility siting decisions, to allow for the definition of a directly affected population (DAP) in the sense of the depth and extent of its perceived risk.

The Risk Perception Mapping (RPM) approach (Stone 2001, Stoffle et al 1991) is a method of identifying the individuals who suffer the greatest level of perceived risk associated with a new project, like a radioactive waste facility development. It is, essentially, a survey based procedure to ask respondents about the degree of risk they feel associated with a facility. It provides an ability to map the depth and breadth of this perceived risk through identifying a number of individual responses to a set of questions focusing upon respondents’ awareness of the project and perception of the risks associated with the facility.

It may, however, not constitute a community as outlined in the SCI approach, though it is consistent with a ‘community of interest’. As the CIP project has identified, one of the key

issues confronting facility siting decisions is what constitutes a community *in practice*? As has been suggested, it may be that an 'affected community' in respect of a facility is a directly affected population, a subset within an existing community and that the elements of the SCI approach may extend spatially beyond the *risk shadow* cast by a facility as identified by the RPM method.

## 2.5 The LLW facility near Dounreay

The siting process for a low level radioactive waste disposal facility at Dounreay gives a retrospective view of a completed radioactive waste facility siting process.

In the summer of 2009 planning consent was approved by the Highland Council to construct a series of vaults to accommodate up to 175,000 cubic metres of lower activity radioactive waste from the decommissioning of the Dounreay nuclear facility and the adjacent Vulcan nuclear establishment. This decision followed a number of optioneering and consultation phases. The decision process included a Best Practicable Environmental Option (BPEO) exercise, in addition to consultation exercises. Through the siting process, this facility revealed the key aspects of a community very clearly.

The directly affected population comprised only a few houses in the vicinity of the Dounreay site, at Buldoo. This DAP, using the terminology of the two-stage approach to identifying an affected community, emerged during the development of the facility, following the aforementioned BPEO study. The DAP formed, to make their concerns known, a residents' group comprising the people living at Buldoo.

However, the other elements of a community are also revealed by the Buldoo case study. Drawing upon the elements of the community experience identified earlier, we can see the sociological elements of an affected community, and the complex relationships between the DAP and these elements, particularly at varying spatial scales and levels, and how these bear upon the governance process of the radioactive waste facility.

Taking each of these elements in turn:

**Membership** - the residents of Buldoo have multiple memberships of different communities at different levels, from Buldoo through Thurso, Caithness and the Highlands. These levels have different relationships with the DAP, as we will see particularly through the economic and political aspects of community experience.

**Emotion** - the connection between an individual and their place can be very strong, particularly if they have lived there all their life. The development of bonds can link a person to seemingly inanimate spaces. This phenomenon, *a sense of place*, can be very localised, manifesting itself through the conceptions, such as *my land*, *the land I was brought up on* and *my local place*. For people, especially for some of the Buldoo residents who farm and have a strong relationship with the land, the link is very strong, and forms a deep emotional connection.

**Economic** - this is the dominant frame. Buldoo is not a sustainable economic unit, and the residents rely on their wider functioning economic area. The residents know that the 'community' of Buldoo could not survive in its present form without its relationships with the wider economic area, which in this case can be envisaged as the Travel to Work Area of the Dounreay site.



**Political** - the DAP of Buldoo exists within a representative democratic structure which, in the case of this facility siting, is the Highland Council (who are the strategic planning authority). The Highland Council, being the largest Local Authority in the UK (and one of the largest Local Authority areas in Europe), is situated at a spatial level much larger than the DAP, and has its administrative centre over 100 miles away in Inverness.

So, how does the Buldoo case study illustrate the key aspects of community?

As an example, Buldoo and the Dounreay LLW facility siting process reveals the importance of framing issues and of accommodating competing frames in the governance process. One of the key tensions which existed in the planning process for the LLW facility was the complex relationship between the local emotional frame and the wider economic frame set within an overall political context, from which the DAP felt detached and isolated.

Crucially, though, the members of the DAP (Buldoo) recognised their relationship with the wider economic community of which they are considered a member, and their need to accommodate the interests of that area, for the good of the wider community. Membership of this economic community came with some obligation to act in its longer-term interests.

However, accommodation of the emotional frame within the structures of the political community (i.e. the planning process), which to some extent appeared to run counter to the interests of the economic community, proved difficult. The crucial issue for the emotional frame was to be accommodated within the process and respected as an integral element of the community experience of that DAP. This was not, apparently, well achieved in the planning process.

The emotional frame is an important element of community experience, but it is not the only one. The Buldoo residents recognised this, but the accommodation and articulation of this aspect was still not necessarily viewed with the same status as the dominant economic frame.

This case study reveals the different spatial extent of the elements of community experienced by individuals. In Buldoo, the emotional frame related to a small area, the land adjacent to their homes and the existing Dounreay site. The emotional issues relating to this small area contrasted with the concerns of the larger economic area, the TTWA of the Dounreay nuclear complex. Both of these concerns then had to be represented in the larger political area, the Highland Council.

Therein lay a problem, to reconcile economic and emotional issues and the difficulty of articulating competing frames within a rigid planning process which was relatively detached from the small area in question.

From the perspective of the Dounreay LLW case study, the two-stage approach to identifying a DAP, then assessing the spatial extent of the key elements of the community experience of that population would seem to offer a way forward which accommodates diversity within contexts and sites, yet relates the concept of community to the radioactive waste facility siting, through the experience of community among individuals affected by the perceived risks associated with a facility.

The utilisation of this approach allows for a deeper understanding of the underlying stakes in a contested and complex facility siting case, and potentially avoid the disconnect experienced by the DAP and their wider communities. The benefits are predominantly in respect of, firstly; political representation and the democratic process, whereby the proactive identification and engagement of the DAP will involve them in the process from an early stage, and; Secondly, identifying the functional economic area relating to a siting and the relationship of those most affected, the DAP, with this area, providing the sustainable economic basis of benefits packages.

However, it also reveals the key emotional aspect of community in respect of the spiritual and psychological aspects of a sense of place. Clearly, for the DAP this is a hugely important aspect of the community experience which can be difficult to articulate. Yet, to focus that experience into a planning inquiry or other rigid process can be extremely difficult. The two-stage approach outlined would allow the articulation of this position to occur in a manner appropriate to its distinct nature as an aspect of community experience.

### **3. Interpreting the Managing Radioactive Waste Safely higher activity radioactive waste policy in the UK**

We turn now to a prospective approach to defining a community,

One of the key Government initiatives in recent years in the UK for radioactive waste management is the Managing Radioactive Waste Safely (MRWS) policy White Paper. This was published in June 2008 following a lengthy period of consultation, engagement and deliberation (and is available on-line at <http://mrws.decc.gov.uk/>). In this MRWS policy, communities are centrally engaged in the siting process for an underground deep geological facility for higher activity radioactive waste. At the time of writing this policy is underway at a relatively early stage, and this section is a commentary on that policy.

Referring to the original question about defining an affected community; when is a definition attempted, and to what end, in the earlier case study we described an approach to defining an affected community in part retrospectively, that is to say once the facility is sited, or in prospect and a directly affected population can be identified using risk perception mapping techniques. In contrast, the approach enshrined in MRWS really looks to the community to emerge from within the process and to define itself within the context of a facility site.

#### **3.1 Background**

The UK Government, supported by United Kingdom Nirex Ltd, previously attempted unsuccessfully to find a long-term solution for higher activity radioactive wastes during the 1980s and 1990s. An extensive programme of site investigations was carried out which culminated in a proposal to construct a facility to investigate the geology near the Sellafield site in West Cumbria. Ultimately, UK Nirex failed to obtain planning consent for this facility, termed a 'Rock Characterisation Facility' (RCF) in 1997.

There were, however, lessons learned from the original policy process. According to the IAEA (2007), discussions with a wide range of interested and affected parties have revealed that, in the years leading up to the public inquiry, the decision-making process adopted by Nirex was flawed. In particular, it was recognised that the approach used:

- Was not transparent
- Was not developed in consultation with all interested and affected parties
- Did not have clear decision points
- Did not explain how decisions had been taken
- Did not provide opportunities for interested and affected parties to provide inputs.

With the previous policy process having ended unsuccessfully, in 2001 the UK Government and devolved administrations attempted again to find a long-term solution for managing higher activity radioactive wastes. To this end, they developed the Managing Radioactive Waste Safely (MRWS) programme to address long-term radioactive waste accumulated from a range of civil and defence related nuclear programmes. The stated aim was to find a practicable and implementable solution for the UK's higher activity wastes that:

- achieves long-term protection of people and the environment;
- does this in an open and transparent way that inspires public confidence;
- is based on sound science; and

- ensures the effective use of public monies.

The resulting MRWS policy was developed in four stages:

- Stage one addressed the scope of the problem and how stakeholders wanted to be engaged in the programme. (2001-2002)
- Stage two, which ran from 2002-2006 involved Government setting up an independent committee, the Committee on Radioactive Waste Management (CoRWM). This committee considered all potential long-term waste management options, and then screened all of these with public involvement, arriving at its recommendations in July 2006 - the implementation of geological disposal preceded by safe and secure interim storage. This second stage ended in October 2006 when the UK Government and the devolved administrations published a response to the recommendations made by CoRWM. In its response, the Government accepted CoRWM's main recommendation that geological disposal, preceded by safe and secure interim storage, was the way forward for the long-term management of the UK's higher activity radioactive wastes.
- In stage three, the UK Government consulted on the framework for implementing geological disposal in the UK. It should be noted that the Scottish Government decided not to participate in Stage three of the MRWS programme. At the time of writing, the Scottish Government's position regarding higher activity wastes was that it was in favour of long-term interim storage.
- Stage four comprised Government analysing the 181 responses obtained from the above consultation and developing and publishing the MRWS White Paper in June 2008. This document "Managing Radioactive Waste Safely: a Framework for Implementing Geological Disposal" sets out the framework for the implementation of geological disposal, in it engagement packages, wider benefits packages and a process for community engagement were described. This document also invited communities to enter discussions, 'without commitment', about hosting a geological disposal facility (GDF).

### 3.2 Communities in MRWS

The community discussions within the 2008 White Paper referred to above are framed within a decision making process involving communities at a number of stages. One of the defining features of this policy is voluntarism. Government makes it very clear that it does not want to be prescriptive about a facility site, imposing a centrally-made decision upon a community. In MRWS, "...communities voluntarily express an interest in taking part in the process that will ultimately provide a site..." (MRWS page 47). This commitment to community engagement is enshrined in the siting process specified in MRWS, which comprises six stages:

- **Stage 1.** Invitations issued and expressions of interest (EoIs) from communities. This is the decision point at which local communities, following a period of stakeholder engagement and preliminary discussion with local partners, may register a 'without commitment' interest in discussions with Government about potential involvement in the siting process. There follows;

- **Stage 2.** A consistently applied sub surface (un)suitability test, by the British Geological Society (BGS) which will result in the screening out of obviously unsuitable candidate areas on the basis of geology. Only after this screening out is there;
- **Stage 3.** Community consideration leading to a Decision to Participate. It is envisaged that there will be extensive community engagement at this point with a process of community engagement initiated. Following this engagement and consultation, the appropriate decision making body/ies make a formal commitment to participate in the facility siting process. There follows;
- **Stage 4.** Desk-based studies in participating areas; and then
- **Stage 5.** Surface investigations on remaining candidate sites.
- **Stage 6.** Finally, underground operations proceed (up to this stage, there is an unconditional right to withdraw from the process).

Following a formal Decision to Participate it is proposed that a formal Community Siting Partnership be set up, within the scope of a specific siting proposal, to facilitate engagement with communities and between various levels of community as described in the MRWS process within that area.

Though community involvement is central to MRWS, the concept of community is not actually defined within the policy document two terms are used to describe community engagement in the process, these two are ‘host communities’ and ‘wider local interests’ which are defined as:

- **“Host Community** – The community in which any facility will be built can be termed the ‘Host Community’. The ‘Host Community’ will be a small geographically defined area, and include the population of that area and the owners of the land. For example, it could be a town or village....
- **Wider Local Interests** – Outside the Host Community, there are likely to be other communities that have an interest in the development of a facility in the Host Community, and there needs to be a mechanism that allows them to become involved in the process. Such a community might be the next village, a neighbouring district or a community on the local transport routes to the Host Community. Such communities will be termed ‘Wider Local Interests’.” (MRWS page 48)

What MRWS does not contain is a *hard-and-fast* definition of what constitutes an ‘affected’ community’. The nearest it gets is a ‘host community’, as a community in which a facility will be built. The White Paper also identifies neighbouring communities, or those on transport routes in this ‘wider local interests’ category which is distinct from the ‘host community’ category.

This lack of a specific definition of ‘host community’ will probably result in the affected community emerging as the site selection process develops and as the site assessment process identifies favourable sites, becoming more focussed on specific geographical areas. It is likely that an affected community will emerge within MRWS as the process proceeds.

The UK Government’s MRWS facility siting process is based upon two key concepts. Firstly, voluntarism which represents a bottom-up community-led approach to selecting a site and secondly, partnerships to enable coalitions of interests, individuals and organisations to work together as host communities, wider local interests and decision making bodies, to

achieve the implementation of the policy. This ‘bottom-up’ approach is the ethos of MRWS and reflects past experience in the UK of issues encountered in centrally imposed siting attempts, and the need to accommodate a range of interests consistent with local situations and to configure the facility siting process to local contexts.

The real implications of community engagement and empowerment in MRWS are not yet fully evident. Indeed, it may be that the more detailed implementation of voluntarism will be played out in more localised community settings than are evident in the process at this early stage as affected communities emerge with the wider areas of local authorities who are currently making the running in the process.

Therefore, what is not clear from the MRWS process is the relationship between the different communities within the domain of decision making bodies, sometimes defined *a priori* as the geographical area of a community. This nested nature of communities and plurality of definitions was highlighted by UK NSG members in their framing of the topic of this MTF brief.

#### **4. Insights from progress with implementation of MRWS in Cumbria**

At the time of writing, the only approaches made to UK Government in the implementation of this stage of MRWS policy have come from the West Cumbria area. Three separate expressions of interest (EoIs) have been made by Copeland Borough Council, Allerdale Borough Council and Cumbria County Council (for the Allerdale and Copeland areas).

Copeland is the administrative area which comprises the Travel to Work Area (TTWA) of the Sellafield nuclear complex, the largest nuclear facility in the UK and currently one of the largest nuclear decommissioning projects in the Western world. In addition to Sellafield, Copeland contains the national Low Level Waste Repository near the village of Drigg. Together, these two facilities account for substantial amounts of radioactive waste of all levels, making Copeland, in effect, the centre for the UK's radioactive waste inventory. The second EoI has been made by Allerdale Borough, which abuts Copeland to the north and which, together with Copeland comprises, a functional policy, social and economic area termed 'West Cumbria'. The final EoI has been made by Cumbria County, on behalf of the Allerdale and Copeland areas.

Using the definitions in the MRWS policy, what has taken place is that three 'Decision Making Bodies' as democratically elected representative organisations, have made without commitment EoIs on behalf of the communities in their areas. Consistent with the MRWS approach the local authorities took soundings, canvassing opinions and view of key stakeholders, prior to making their approach to Government. It should be stressed, however, that these without commitment EoIs represent the earliest stage in engagement with Government by these decision making bodies, acting on behalf of their communities. Through this initial EoI stage of the process, they register without commitment interest in entering into discussions about potential, future involvement in the siting process. Clearly this EoI stage in no way represents any commitment to hosting a facility by the local authorities mentioned above.

In the context of this discussion of affected communities, it is important to recognise that in respect of the nuclear industry in general and radioactive waste in particular, the West Cumbria area has a unique relationship with the civil nuclear industry in the UK. It is widely recognised that the nuclear industry underpins the economy of the area. Moreover, because of its deeper relationship with the community which extends back over fifty years, the industry may also be said to form part of the very identity of the community, through its being embedded in the local culture and folklore. Indeed, the nuclear industry forms an important part of the West Cumbrian community, underpinning it economically and providing many of the symbols and stories forming the culture of the area. Moreover, West Cumbria has a long standing and mostly (though not wholly) uncontroversial relationship with nuclear waste. Indeed, the bulk of the UK's higher activity radioactive waste is currently stored at the Sellafield nuclear complex and a geological disposal facility development in Copeland, although changing the nature of the facility from storage to 'all time' disposal, would be more of a facility re-siting issue within the Copeland Borough area.

This nuclear dependence of West Cumbria is enshrined in the 'Britain's Energy Coast™' policy initiative for West Cumbria, which points out that the area hosts the world's single largest concentration of nuclear facilities and which embraces nuclear new build, decommissioning, and has the skills to manage radioactive waste. West Cumbria is a 'nuclear' economy, a status underscored on 23<sup>rd</sup> January 2009, during a visit by the Prime

Minister Gordon Brown, who announced Sellafield as a first-list candidate site for the construction of a new nuclear power station. Since then, two other sites in West Cumbria have been proposed as potential sites for consideration as locations for new nuclear reactors; Kirksanton and Braystones. However, each of these potential sites has village-based community action groups opposed to the development of a facility in their location. Thus, notwithstanding its unique relationship with the nuclear industry, community level issues relating to new facility sites within this area may still emerge.

The implementation of MRWS in West Cumbria does raise a number of issues in respect of defining an affected community. Earlier, we proposed two ways of defining an affected community, in terms of the DAP and the elements of a community derived from sociological perspectives on community, such as the SCI approach. In the following section we discuss the DAP and SCI approaches to community in respect of the definitions of community used in MRWS, and insights from interviews associated with the early stage one implementation in West Cumbria.

In the MRWS process community engagement occurs from the outset of the process, rather than emerging as a consequence of a facility siting decision or implementation. As a consequence of the voluntarism ethos of the MRWS policy, the engagement of a community can occur well before a location has been chosen for a facility, as has been the case in West Cumbria where local authorities have made EoIs on behalf of their sizeable areas, Copeland for example covers 732 square kilometres (Audit Commission).

Using the terminology of MRWS, these local authorities, as Decision Making Bodies, contain within them a number of possible affected communities, which could subsequently be defined using a technique like RPM. For example, given the scale of an area like Copeland, and also given the complexity of its geology, an actual facility location within a local authority area (over and underground) may not be known until quite late in the MRWS process, perhaps as late as stage five (surface investigations), which could identify a specific site, or even six (underground operations) at which point the issue becomes very 'real'. Consequently, a DAP, a community of individuals affected by this issue, will not be identified until relatively late in the siting process.

As a representation made by the Cumbria Association of Local Councils (CALC) to Cumbria County Council's 'soundings' process prior to their development of a without commitment EoI to Government under stage one of MRWS pointed out:

'...the community interests that must be paramount are the very local communities within a few miles of a potential disposal facility site. It follows from this that the local communities in closest proximity to a site must be fully engaged from the start in consultations and discussions with Government.' (Cumbria County Council 2009)

[Available on-line at:

<http://www.cumbria.gov.uk/elibrary/Content/Internet/538/755/2146/39755152421.pdf>]

However, these '...local communities in close proximity to a site...' as CALC argue above, will only emerge relatively late in the process within the wider local authority area that has made the initial EoI to Government. It will be impossible to predict, within the wider areas, where the actual facility will be sited, without the site assessment process and that may take many years.



The Dounreay LLW facility siting case study reveals that in the development of radioactive waste facilities and the implementation of a community-based siting process, the salient community in respect of a facility may develop over time and may emerge within the siting process as a subset of the wider administrative area.

Moreover, some definitions of community, such as geographical or economic definitions i.e. a local authority area or travel to work area, may contain a diversity and plurality of communities which people live and experience, at a smaller geographical scale. Indeed, the current situation with MRWS may conceal a range of latent community issues, which may emerge in the implementation of a facility siting exercise.

In the MRWS policy, neither partnership nor voluntarism are prescribed in detail as a defined part of the local implementation process, though both are clearly expressed as principles shaping the process. This lack of specificity of the implementation of voluntarism and partnership is in contrast to the uniform approach to geological investigation and site assessment of local areas described in the MRWS policy, and places great emphasis on local communities and their decision making bodies and other representatives, to achieve an accommodation of the interests of a small, more personally felt and lived communities such as those experienced at the level of a village or parish. At the same time protecting the interests of, and maximising value for, the wider functional and administrative areas.

Given the essentially localised nature of a radioactive waste facility, it may be that a Geological Disposal Facility will impact on a particular more localised community within the broader Copeland or Allerdale area, and as has been mentioned earlier, it may be that significant community issues may yet emerge in respect of a facility siting process.

It has been suggested that, in contrast to *a priori* definitions of community, lived and psychologically experienced communities are about membership, about meaning and about mobilisation in respect of engagement and defence. Felt and experienced individually, yet expressed collectively, they are based upon commonality of experience, shared meaning and the emotional connection. Given the scale of the implementation the development of a radioactive waste facility, new dynamics and relationships within overarching communities, such as local authority areas, may emerge.

However, the governance ‘architecture’ of geological disposal facility siting in the UK does have a degree of flexibility through the community siting partnership. This partnership process allows for local communities to be credibly represented, with scope to accommodate new issues as they emerge.

It is envisaged that the essentially local nature of the development of a radioactive waste facility will create community perspectives and interests, which will emerge from within the ‘communities’ as defined and represented by the decision making bodies which have made the preliminary EoIs to Government. Once the site investigations are underway in the next stages of the MRWS process, specific community issues are likely to emerge at a more local level. It may be, however, that the issue actually affects a number of perceived and lived communities, perhaps even straddling local authority areas.

## 5. Synthesis: An approach to identifying an affected community.

The focus of this research brief has been defining an affected community and this question emerged out of the original topic for research and discussion identified by the UK NSG.

In this section of the MTF brief, we begin to develop an approach to defining an affected community in respect of radioactive waste siting decision making. The question posed by the UK NSG at the start of the CIP process was:

*“Thinking of both existing and new nuclear sites, who defines a community, and how do they do it, especially in respect of the following:*

- *Timing – when is the question asked?*
- *Purpose – what are they trying to do?*
- *Recognition – is this credible or valid?*
- *Representation – who speaks for the community so defined?*
- *Context – one size may not fit all.”*

A two-stage approach based upon risk perception mapping and the lived sense of community of the identified issue community or directly affected population provides a method for identifying a community in respect of radioactive waste facility siting. Such an approach to defining a community may be used for a range of reasons and in a variety of contexts.

The evidence examined as input into this study from the UK suggests that all elements of the community experience are important in facility siting:

- Firstly, the political element of community in the form of the democratically elected body who speaks on behalf of the community identified as affected by a facility.
- Secondly, the resource, especially economic aspect of that community in respect of the compensation or benefits offered or sought for the facility.
- Thirdly, the emotional element, as people’s sense of place and even of identity may be affected by the development of a facility especially as a consequence of the perceived risks associated with radioactive waste.

### 5.1 The first stage – defining an affected community

The two-stage approach involved identifying the *issue community*, the extent of the (perceived) risk shadow associated with a facility (Stone 2001, Stoffle et al 1999). This definition of a directly affected population (DAP) is, we suggest, a fundamental first stage towards a robust facility siting process. It involves undertaking surveys to identify individuals who consider themselves to be ‘at risk’ from either an extant or proposed facility. Given that this is defined by perceived risk, the shape and scale of this risk perception shadow may be different from that identified by quantitative, probabilistic risk assessments. The shape of this DAP may also take into account transportation routes associated with a facility, as well as the facility itself.

The evidence, examined in relation to DAPs, shows that they may not conform with existing or traditional conceptions of a community. All that they identify is the depth and geographical extent of risk perception associated with a facility among members of a population in an area within which a facility is operating, or is proposed to be built. This is

the affected community, and is consistent with the concept of an issue community, defined as a group sharing a common concern about a topic or issue. Identifying an issue community does not, however, capture the essence of the community experience, to which we now turn.

## 5.2 The second stage – identifying the extent of the lived community experience

Following the identification of the issue community or DAP associated with a facility, we turn to the elements of the sense of community experienced by members of that community. To achieve this, we draw upon the Sense of Community Index model introduced earlier, using the elements of that model to get a grip on the aspects of community likely to be affected by the siting of a radioactive waste facility. Our logic in proposing this stems from the breadth and depth of the impact of a radioactive waste facility upon the individuals living in its vicinity. Especially in a rural area, where so many radioactive waste facilities are located, a facility siting impacts upon most if not all aspects of the lived experience of community.

There are four aspects of the SCI index, each of which is instructive in this assessment of the extent and composition of an affected community.

**Economic** – this is the functional economic area within which members of the DAP are located. Again, it may be that members of the DAP are located within a number of functional economic areas. For example, members of the Buldoo DAP adjacent to the Dounreay nuclear facility were well aware that the economic aspect of their community experience at Buldoo was embedded in a much wider economic area, the TTWA of the adjacent Dounreay nuclear facility. An economic focus of this stage of the process needs to take account of the functioning economic area within which an affected community is located, particularly when considering sustainable benefit packages for a host community.

**Emotional** – drawing upon the experience of the Dounreay LLW facility, this aspect of the community experience can be especially problematic, requiring a careful approach to its identification, articulation and accommodation in a siting process. For the purposes of this research brief the emotional element of community is equated with a *sense of place*. Essentially a place is a particular geographical space that has meaning to an individual or a group. This emotional aspect of community gets close to the lived experience of a locality experienced by individuals as a consequence of residence over time. It has been argued that there are three key components to a sense of place (Turner and Turner 2006)

- The physical characteristics of the environment;
- The activities afforded by the place, including social interactions; and
- The affect and meanings, including memories and associations, as well as connotations and denotations associated with the place.

Identifying these qualities within a DAP will require extensive engagement with members of a DAP most closely associated with a facility, in order to identify point three above, the feelings and meanings evoked by a particular geographical place. For example, in the Dounreay LLW case study, it was found that the location of a waste store had particular, very personal meaning for some individuals living immediately adjacent to the facility, as a result of their family and friends living on the land associated with the facility for many years. These were somehow lost, they felt, as a result of the development of a LLW facility.

**Political** – this is the identification of the unit of democratic government(s) serving this community. Evidence points to the importance of this element of a lived community experience (Davidson and Cotter 1989). Essentially, the stronger the sense of community the greater the likelihood of political participation as a sense of belonging to a community may result in an obligation to participate in the democratic process. In discussions in the UK NSG, it was suggested that the Parish level may be especially relevant in this context, given its narrower spatial focus and closer alignment with individuals’ sense of place. Given the possible scale of a radioactive waste facility, both in terms of underground works and transportation access, it may be that a DAP for a facility would extend over a number of parishes.

One of the key requirements of the governance of a community in the context of radioactive waste facility siting is its ability to accommodate different perspectives on a particular issue. The Dounreay LLW issue, for example, revealed the requirement to accommodate differences in respect of emotional, place-related, elements of the community experience of a DAP in a process dominated by economic interests of the wider functional economic area.

**Membership** - the fourth element of the SCI. Though community has been described as a benign concept (Tuan 2002) the issue of membership can be problematic, particularly in respect of setting boundaries defining who is within and who is outside a community. Membership of a community, it is argued, gives an individual ‘insider’ status, a sense of belonging bestowing a valued emotional security upon an individual.

The issue of benefits packages or compensation, for example, raises the salience of the status of membership in a community, with the prospect of significant sums available in the form of benefits packages. The result will be to make individuals in the DAP aware of their membership of the wider economic area, but also the difference between insiders and outsiders in this wider area,

From the approach we have developed in this application of the concept of community to the radioactive waste facility siting process, we have suggested that the lived experience of community embraces three key elements of community - economic (and wider resources), political and emotional (the sense of place). What is clear from the evidence examined as input to this research brief is that, in the context of radioactive waste facility siting, each of these elements of communities may have a different spatial extent. The lived experience of community may, therefore, operate simultaneously at a number of different spatial scales. We have suggested that the emotional or place-based elements of community may be felt only in their immediate vicinity by members of the DAP, whilst political and economic aspects of their community experience may involve wider administrative areas, or functional economic areas (themselves perhaps straddling more than one administrative area).

### 5.3 Using a community approach in radioactive waste management

The UK NSG identified three key issues in the governance of radioactive waste, with special reference to waste facility siting, through their initial research question:

“Thinking of both existing and new nuclear sites, who defines a community, and how do they do it, especially in respect of the following:

- Timing – when is the question asked?
- Purpose – what are they trying to do?
- Recognition – is this credible or valid?
- Representation – who speaks for the community so defined?
- Context – one size may not fit all.”

This can be summarised into three areas as *when* (the timing of the definition of a community), *what* (the purpose of this definition of a community) and *whom* (in respect of a community’s representation and the recognition of that representation by members of other communities and other stakeholders).

*Firstly, timing; when a community definition is made?*

The two-stage approach to identifying an affected community developed in this research brief is based upon two processes. Firstly, by identifying a DAP through surveying residents in the vicinity of a facility or a proposed facility, to identify their level of perceived risk. This first stage identifies an affected community based upon risk perceptions and is an essentially individualised perspective, defining an *issue community* based upon individual experience. In contrast, the second stage, identifying the emotional, economic and political elements of the lived community experience of those individuals in a DAP takes wider relationships into account and probes the *sense of community* within which individual members of the DAP live.

Defining an affected community based upon risk perception can, by definition, only be properly identified once a facility is constructed, or there is significant degree of awareness among a community of a facility’s design and location. Moreover, given the importance of experience and context in shaping risk perceptions, to define an affected community using an approach based upon perceived risk also requires individuals to have some experience with a facility in its social, economic and political context.

We suggest that a radioactive waste facility siting process relating to a new waste management facility should accommodate a process to define an affected community in its design. However, in such cases, a DAP can only be identified as a facility siting process proceeds. Referring to the MRWS experience in the UK, it may be that wider administrative and functioning economic areas can be engaged in a siting process at an early stage, creating a geographical area within which more specific siting investigations can take place, prior to the selection of a site. However, of special concern about community level engagement in a siting process is that it potentially lacks the emotional level focus of individuals’ place experience, which may be lost within a wider administrative or functioning economic area, as the Dounreay LLW facility case reveals.

For siting waste facilities at existing nuclear sites, the affected community process is much clearer cut as the DAP in relation to a facility may be more easily identified based upon existing relationships with its affected community and located within wider economic and administrative settings.

*Secondly, the purpose of defining a community.*

There are a number of reasons for defining a community associated with a radioactive waste facility. These are connected with the relationship between a facility and individuals living in its vicinity in respect of perceived risk, economics and resources, politics and representation and sense of place.

Identifying the *Directly Affected Population* (DAP) associated with a facility is key for community definition in radioactive waste facility siting. We have suggested that the DAP is an issue community defined in terms of the level of risk perceived by individual respondents in areas associated with a facility. The following elements are all related to the community experience of those who live within that DAP.

To identify the economic impact of a facility is another key reason for defining an affected community. This is achieved by defining the extent of the *functional economic area* within which the DAP issue community associated with a facility is located. Once this is achieved the sustainability of that community can be identified, and the relationship between that economy and the operation of a facility and benefits packages and compensation can be more easily quantified.

A practical reason to define a community is to identify the *political context* of a facility, specifically the democratic structure and processes through which members of the DAP influence and defend their community. Once a DAP is identified the political and administrative structures will be clear, however, it may be that the shape of the political and administrative government covering the DAP surrounding a facility will straddle a number of local government levels as well as areas.

The final element of community is the *sense of place* of individuals most closely affected with a facility. This is a complex issue which may bear upon both the level of government involved in the facility siting process and the strength of feeling within a DAP relating to the facility siting.

*Thirdly, recognition and representation.*

The acceptance of a community definition process and its outcome will be related to its ability to accommodate the interests and perspectives of an affected community, in the context of the social, economic and psychological elements of their community experience.

A key aspect of community as a lived experience as identified in this research brief, is that the spatial extent of the principal elements of community may cover different geographical areas. The complex, nested, arrangement of the key elements of the community experience places a need for a flexible and inclusive governance process with an ability to articulate the interests of the DAP in wider economic and political settings.

## 6. Summary and conclusion

This research brief for the CIP project has given insights into the concept of community and its use in the inclusive governance of radioactive waste management. This brief has drawn upon scholarly literature, past and present UK radioactive waste policy and discussion with members of the UK CIP National Stakeholder Group, to develop an approach to radioactive waste facility siting based upon individual and relational perspectives on community.

In respect of the overall CIP objective of improving the inclusive governance of radioactive waste, a two-stage process towards defining an affected community is proposed. This approach to defining an affected community in respect of radioactive waste draws upon both individual and relational aspects of community to:

- firstly, identify an *issue community* or Directly Affected population (DAP) based upon perceived risks associated with a facility or a proposed facility; and
- secondly, to identify the political, economic and emotional elements of the *lived community experience* of members of the DAP.

It has been noted that the political, economic and emotional elements of the lived community experience of individuals in a DAP may not be geographically coincident. It may be the case that the emotional, economic and political elements of their lived experience of community may have quite different spatial scales. Moreover, a radioactive waste facility may create a community of interest within or beyond existing communities.

Though it would seem sensible to use existing democratic structures, it may be that neither the extent of a DAP, or most elements of the lived community experience for members of a DAP, coincide with existing administrative areas or functional economic areas. Within siting processes, such as those involving site investigation to narrow down a wide area to a specific site, it is vital that there is sufficient flexibility to allow for the emergence, acknowledgment and articulation of emotional perspectives relating to radioactive waste in relation to the sense of place and community in a DAP.

A facility siting process based upon the elements of a lived, directly experienced community of members of a DAP provides a robust basis for benefits packages and compensation and political engagement, focusing upon functional economic areas and extant democratic structures and processes. An effective siting process must, however, allow for the emergence of issue communities or DAPs within wider administrative jurisdictions. This is especially so where administrations covering broad areas make claims to speak on behalf of a community, yet whose jurisdictions cover a wide area and contain within them a diversity of relationships with a facility. Given that the emotional elements of community among individuals in a DAP may be relatively narrowly defined geographically, the governance process involving community must balance these local emotional issues with wider economic and political elements of community.

The accommodation of emotional and economic aspects of community is especially important if a DAP is a subset of a wider functional economic area containing a wider population. In such circumstances it may be that the wider economic interests overshadow more localised, emotional issues among individuals whose sense of place is perceived as

threatened and negatively affected by the development, or proposed development, of a facility to dispose of or store radioactive waste.

A DAP is an issue community, not a functioning community with all of the elements of a lived and experienced community. The 'shape' of a DAP will be based upon risk perception and will be distinctive to the issue. It may be linear, reflecting transportation routes to and from a facility, or straddle a number of traditional communities reflecting risk perceptions relating to large scale underground works.

Probing the elements of the sense of community of those members of a DAP provides the emotional, economic and political elements of the affected community. Subsequently, this allows a community level perspective to determine responses to key resource and representation questions asked during a facility siting process such as who represents a community, and whether they are recognised. It also provides a spatial and economic basis for compensatory benefits in respect of sustaining a functioning economic area upon which a community is based.



## Appendix A      Documentation, references and texts

This appendix provides a list of the main sources of information drawn upon in constructing this research brief. The key documents are marked (\*).

\* Brodsky, A. E. and Marx, C. M. (2001). Layers of identity: Multiple psychological senses of community within a community setting. *Journal of Community Psychology* **29** (2) 1-18.

Buckler, S (2007) Theory, Ideology, Rhetoric: Ideas in Politics and the Case of ‘Community’ in Recent Political Discourse. *British Journal of Politics and International Relations* **9** 36-54.

\* Davidson, W.B. and Cotter, P.R. (1989) Sense of Community and Political Participation. *Journal of Community Psychology* **17**. 119-125.

\* Department of Communities and Local Government (2009) Glossary of Terms [Online] Available at: <http://www.communities.gov.uk/corporate/help/glossary>

\* Department for Business, Enterprise and Regulatory Reform, Welsh Assembly and Department of the Environment Northern Ireland (2008) Managing Radioactive Waste Safely: A Framework for Implementing Geological Disposal. London, Stationery Office. [Online] Available at: <http://www.decc.gov.uk/mrws>

\* International Atomic Energy Authority (2007) Factors Affecting Public and Political Acceptance for the Implementation of Geological Disposal. Vienna, IAEA. [Online] Available at: [http://www-pub.iaea.org/MTCD/publications/PDF/te\\_1566\\_web.pdf](http://www-pub.iaea.org/MTCD/publications/PDF/te_1566_web.pdf)

\* McMillan, D.M. (1996) Sense of Community. *Journal of Community Psychology* **24** (4) 315-325.

\* McMillan, D.W. and Chavis, D.M. (1986) Sense of Community: A Definition and Theory. *Journal of Community Psychology*, **14**. 6-23.

\* Obst, P., Smith, S.G. and Zinkiewicz, L. (2002) An Exploration of Sense of Community, Part 3: Dimensions and Predictors of Psychological Sense of Community in Geographical Communities. *Journal of Community Psychology* **30** (1) 119-133.

\* Obst, P.L. and White, K.M. (2007) Choosing to Belong: The Influence of Choice on Social Identification and Psychological Sense of Community. *Journal of Community Psychology* **35** (1) 77-90.

Peterson, N.A., Speer, P.W. and McMillan, D.W. (2008) Validation of A Brief Sense of Community Scale: Confirmation of the Principal Theory of Sense of Community. *Journal of Community Psychology* **36**. 61-73.

Pratchett, L. (2004) Local Autonomy, Local Democracy and ‘New Localism’. *Political Studies* **52**. 358-375.

\* Ruckelshaus, W.D. (1984) The Role of the Affected Community in Superfund Cleanup Activities. *Hazardous Waste* **1**(3) 283-288.

\* Slovic, P. (1987) Perception of risk. *Science* **236** 280-285.

\* Stoffle, R.W. *et al* (1991) Risk Perception Mapping Using Ethnography to Define the Locally Affected Population for a Low-Level Radioactive Waste Storage Facility in Michigan. *American Anthropologist* **93** (3) 611-635.

Stoker, G. (2004) New Localism, Progressive Politics and Democracy. *Political Quarterly* 117-129.

\* Stone, J.V. (2001) Risk Perception Mapping and the Fermi II nuclear power plant: toward an ethnography of social access to public participation in Great Lakes environmental management. *Environmental Science and Policy*, **4** 205-217.

Sonn, C.C. and Fisher, A.T. (1996) Psychological Sense of Community in a Politically Constructed Group. *Journal of Community Psychology* **24** (2) 417-430.

\* Tuan, Y. (2002) Community, Society, and the Individual. *Geographical Review* **92** (3) 307-318.

\* Turner, P. and Turner, S. (2006) Place, Sense of Place and Presence. *Presence* **15** (2) 204-217.