Controversial Projects and Potential Implications for the Consent-Based Siting of Nuclear Waste Management Facilities – 17345

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ABSTRACT[1]

The U.S. Department of Energy's (DOE) goal is to develop solutions for the long-term, sustainable management of the nation's spent nuclear fuel and high-level radioactive waste. The DOE is planning for an integrated waste management system to transport, store, and dispose of spent nuclear fuel and high-level radioactive waste from commercial electricity generation, as well national defense activities. To achieve this goal, the DOE is developing a process to site facilities collaboratively with the public, communities, stakeholders, and governments at the state, tribal, and local levels. The DOE is seeking the help of all Americans in developing a consent-based approach to siting that is fair and reflective of public input.

To inform DOE's efforts to develop a consent-based process for siting facilities an effort was undertaken to review other contentious projects including contaminated site remediation and facilities and infrastructure deployment to understand the role of different parties involved and of public involvement for both successful and unsuccessful projects.

INTRODUCTION

In December 2015, the DOE issued an Invitation for Public Comments in the Federal Register soliciting input on important considerations in designing a fair and effective process for siting [1]. One of the questions asked was "What models and experience should the Department use in designing the process?" To help answer this question, it is worthwhile to review the experience of projects that are characterized with a) having a combination of federal, state, Tribal and local government responsibilities; and b) which are considered somewhat controversial regarding perspectives on potential solutions. Projects with such characteristics represent excellent case studies to identify lessons that can be learned for the development of a consent-based siting process for nuclear waste management facilities. Such contentious or controversial projects include hazardous clean-up projects, wind farm deployment, prison siting, and pipeline and transmission line deployment.

To perform this review, the following approach was undertaken. First, a literature review of "controversial" projects that have the characteristics discussed above was

[1] This technical paper reflects concepts which could support future decision-making by DOE. No inferences should be drawn from this paper regarding future actions by DOE. To the extent this technical paper conflicts with the provisions of the Standard Contract, the Standard Contract provisions prevail.

conducted. The information obtained was then used to identify involved parties and their responsibility and authority. The approach to decision-making by the involved parties was then determined including 1) the identification of roles of the various participants during project implementation, 2) whether any "enforceable" agreements were developed, and 3) whether any benefits were included in a final agreement. Last, an analysis of what worked and why; or what didn't work and why was performed.

The insights gained were used to identify practices that could be undertaken in the consent-based siting of nuclear waste management facilities and potential steps and processes for public involvement.

PROJECT SUMMARIES

A number of projects were investigated and were further reviewed in detail. These projects, summarized below, encompass a number of different challenges, organization structures, varying degrees of success, and end-states. Several of the analyzed projects were/are led by private companies, while the rest represent government-led initiatives. The two types of projects offer different perspectives and important insights on ways that consent can be obtained and a project can be successful.

Hudson River Superfund Site

The Hudson River Superfund site is a public site that had been heavily polluted with PCBs and in 1983 the United States Environmental Protection Agency (EPA) designated the area as a Superfund site[2] [2]. A Superfund Record of Decision (ROD) was issued in 2002 calling for the dredging and disposal of certain sediments from the Upper Hudson. To comply with the decision, General Electric (GE), the polluter, has been remediating the site with EPA oversight. The first phase of the dredging project was conducted in 2009 and the second and final phase of dredging began in June 2011 and concluded in fall 2015.

In March 2016 the EPA initiated its second review of the cleanup of the site [3]. The purpose of this five-year review, legally required under the Superfund law every five years after the start of on-site construction, is to ensure that the cleanup is working as intended and will be protective of public health and the environment.

Throughout the remediation process the EPA provided both technical assistance and information within the affected communities as part of EPA protocols. The EPA provided many opportunities to review project documents and often delayed their work in order to allow public feedback during each phase of the remediation process.

Cape Wind Project

The Cape Wind Project is a private energy proposal to build a series of wind

[2] "EPA's Superfund program is responsible for cleaning up some of the nation's most contaminated land and responding to environmental emergencies, oil spills and natural disasters." (https://www.epa.gov/superfund)

turbines off the coast of Massachusetts in the Nantucket Sound [4]. The project faced five main steps related to permitting and siting and each step had different levels of challenge: Federal permitting, state permitting, local permitting, power lease agreements, and construction funding.

The Federal permitting process was straightforward. The project began in November of 2001 with the filing of an off-shore energy permit with the U.S. Army Corps of Engineers [5]. The Energy Policy Act of 2005 transferred Federal authority over off-shore energy projects to the U.S. Department of Interior (DOI). The DOI issued a draft environmental impact statement (EIS), a final EIS and a ROD in accordance with the National Environmental Protection Act (NEPA) and awarded Cape Wind the nation's first off-shore wind power lease in October, 2010 [4]. Additional permits approvals from the U.S. Army Corps of Engineers, the EPA, and the Bureau of Ocean Energy Management, Regulation, and Enforcement were achieved in 2011 [5].

Acquiring local and state permits proved to be more difficult. The Massachusetts Energy Facilities Siting Board approved the Cape Wind project in May 2005 [5]. In accordance with the Massachusetts Environmental Policy Act, the Massachusetts Secretary of Energy and Environmental Affairs approved the site in March 2007 upon certification of a Final Environmental Impact Report [5].

However, in October 2007 by a 12-0 vote the Cape Cod Commission ruled not to issue local permits for construction staging facilities without further study of the impacts by Cape Wind [6]. In May of 2009, the Massachusetts Energy Facilities Siting Board granted an exemption to Cape Wind and overruled the rejection from the Cape Cod Commission. This granted Cape Wind all the necessary permits to begin work on their project, however triggered a series of litigation from local groups [7]. In August of 2010, the Massachusetts Supreme Judicial Court ruled that the state had the power to overrule community opposition and grant the permits. The Massachusetts State Energy Facilities Siting Board granted a certificate of environmental impact and public interest, concluding all state and local permitting requirements [5].

Cape Wind reached power lease agreements with National Grid and NSTAR (now Eversource Energy) and both agreements were approved by the Massachusetts Department of Public Utilities [5].

Securing funding for the estimated $2.5 billion cost of the project proved difficult. Cape Wind was only able to secure almost half of the needed funding through deals with companies in Japan, Denmark, and the Netherlands. Cape Wind was also unable to secure loans for the project [8].

In January of 2015, both National Grid and NSTAR terminated their contracts with Cape Wind because they had failed to obtain financing by December 31, 2014 [9]. Since NSTAR and National Grid terminated their contracts, Cape Wind's leases for a port facility, headquarters, and staging/construction location have also been terminated. Cape Wind has also been suspended from participating in New

England's wholesale electricity markets.

Moab Uranium Mill Tailings Remediation Act Site

The Moab Uranium Mill Tailings Site located in Grand County, Utah was originally used for processing uranium ore, producing large quantities of radioactive waste and sludge [10]. The mill tailings were stored in a man-made pond on site and after the owner of the mill declared bankruptcy the pond was covered with dirt to prevent the materials from escaping into the Colorado River [11,12].

An amendment to the National Defense Authorization Act for Fiscal Year 2001 transferred ownership and remediation of the site from the U.S. Nuclear Regulatory Commission (NRC) to the DOE and required that remediation be performed in accordance with Title I of the Uranium Mill Tailings Radiation Control Act of 1978 [11,12].

The NRC completed an EIS prior to transfer of the site to the DOE with the preferred approach of stabilization of the tailings pile in-place [13,14]. The NRC's proposed remediation approach did not address the unmitigated impacts of contaminated groundwater and soil [11].

The passage of the National Defense Authorization Act for Fiscal Year 2001 effectively restarted the process [11,12]. DOE prepared a draft plan for remediation and submitted it to the National Academy of Science, per Congressional direction, and began the public scoping process in preparation for developing a draft EIS as required by NEPA. The draft EIS evaluated a range of alternatives, including a no-action alternative, and the final EIS detailed the preferred alternative of transporting the mill tailings by rail to the Crescent Junction site in Utah [13]. Remediation is still underway and it is estimated to be completed in the mid 2020s.

Boardman to Hemingway Transmission Line

PacificCorp, Bonneville Power Administration, and Idaho Power are jointly proposing to build a transmission line from a proposed substation near Boardman, Oregon to the Hemingway substation near Melba, Idaho [14]. The Bureau of Land Management (BLM) is the lead federal agency on the project and is responsible for conducting the NEPA process [15]. The Oregon Department of Energy and the Oregon Energy Facility Siting Council are conducting the Oregon energy facility siting process [16].

The project was initiated in 2007 by Idaho Power and the process to site and construct the transmission line is still underway [17]. Idaho Power initiated the Community Advisory Process (CAP) in March 2009 and met with representatives from counties along the potential routes from spring of 2009 through spring of 2010. Based on these interactions, Idaho Power selected a proposed route in April 2010.

BLM issued NOI in September 2008 and issued a draft EIS in December 2014. The

public comment period closed and a final EIS and a record of decision have yet to be issued. In February 2013 Idaho Power submitted a preliminary Application for Site Certificate to the Oregon Department of Energy that is still under review. Once this is deemed complete a public comment period will be initiated and public meetings will be held.

Warren County Polychlorinated Biphenyl Landfill

PCBs were illegally dripped and dumped across multiple counties of North Carolina onto the highway shoulders between June and August of 1978 [18]. The State considered several options for disposing of the PCB-contaminated soil including incineration, transportation to an existing landfill in Alabama, treatment along the roads, or development of a landfill within North Carolina [19]. However, EPA had not a proved the incineration and treatment-in-place processes, and the State had determined that transportation to Alabama was too costly. The State chose the development of a landfill in North Carolina as the best available alternative. The State used the TSCA landfill requirements for PCBs and its own siting criteria to screen and evaluate possible locations, ultimately selecting the Warren County site in 1978.

Opposition to the burial of the contaminated soil in Warren County began to mount due to the close proximity of the water table to the bottom of the proposed landfill. In spite of this opposition, the North Carolina legislature and governor passed the Waste Management Act in 1981 [20]. This law gave the Governor the right to choose a site prior to public meetings as well as giving the Governor the ability to site a landfill with force should a community object.

Between September and October of 1982 10,000 truckloads of PCB-contaminated soil were buried at the Warren County Landfill site [21]. Police were present, using arrests and threats often to curb public protest [22]. Under pressure from Warren County and the state, in October 1982 the North Carolina Governor issued a letter on October 19, promising to protect Warren County citizens and to remediate the landfill when it became feasible [22].

The EPA, under the Toxic Substances Control Act, permitted the landfill as a “dry-tomb” toxic waste landfill. However, the landfill was capped in November 1982 with between 500,000 and 1 million gallons of water within it [22]. In addition, erosion of the landfill cover was found to be occurring faster than expected and a large build-up of methane gas was discovered [22].

In May 1993 the Secretary of the North Carolina Department of Environment, Health, and Natural Resources announced a crisis at the PCB landfill due to an excessive amount of water within the landfill [21]. A concern shared by the Secretary and other experts was that continued water pressure could breach the protective liners and clay surrounding the landfill. After interactions with local residents from May to June 1993, the Secretary agreed to not pump any water out of the landfill unless it was tied to detoxification [21]. The Secretary also agreed to establish a PCB working group with community leaders, and agreed for the state to pay for an independent scientific representation. Cleanup of the landfill began in

March of 2001 and was completed at the end of 2003 [21].

The controversy surrounding the Warren County landfill was one of the first cases of environmental justice in the U.S. and Federal Government response [23]. There is a large amount of literature about this site, environmental racism, and environmental justice.

INSIGHTS DRAWN

A review of the five specific projects discussed above indicates that a successful consent-based siting process should consider several major factors: an understanding of consent, an active public engagement, a feeling of trust between the project implementers and the community, a feeling of fairness, and a respect for community well-being. Specific insights gained are discussed below.

Process for Gaining Consent to Proceed

The review of the history of the projects indicates that existing Federal decision-making processes, such as the Superfund cleanup and NEPA processes, provide for a robust mechanism for involving the public and stakeholders if effectively executed. While there are prescribed requirements for community involvement throughout these processes, going above and beyond the "minimum" engagement requirements appears to increase the chances of success. A sustained engagement and on-going dialogue with the public (locally, regionally, and perhaps nationally) appears to increase the likelihood that consent will be given to a project moving forward.

- While the BLM followed the NEPA process as required for its Federal decisions pertaining to the Cape Wind Project, the project's implementers struggled to achieve broad local consent. The exemption [7] granted by the Massachusetts Energy Facilities Siting Board over Cape Cod Commission's ruling against local permitting soured public relations and the ability to receive broad "consent" of the local community. While the project held fairly strong local and state-wide public and political support, a number of local groups and powerful and influential individuals who opposed the project and were the driving forces behind the litigation that slowed the project until it ultimately failed. There is or has been litigation against the project, with over 30 legal challenges through May 2014 [24].

- In the case of the Moab Uranium Mill Tailings Site, there was large public sentiment to move the uranium tailings due to their close proximity to the Colorado River and to population centers. The NRC followed the NEPA process and concluded the stabilize-in-place alternative was appropriate. However, public and political sentiment remained in favor of moving the tailings, likely influencing the language of the National Defense Authorization Act in 2001. Although the subsequent draft and final EISs developed by DOE had no-action alternatives, leaving the tailings where at its current location was not a preferred alternative. The key debate through the NEPA process was where the tailings should be moved to with concerns about transportation, as well as

cultural and spiritual damage to Tribal lands. The largest debate during the finalization of the EIS was a choice between an operating mill site with an existing disposal facility that was close to the Moab site (White Mill) or to the Crescent Junction Site [11]. Ultimately, the Crescent Junction site was chosen because it was one of the furthest from local populations and tribal nations and the transportation tailings would pass little through populated areas.

- In the case of Hudson River Project, the EPA followed the prescribed Superfund cleanup process for the remediation of the site. Public involvement is required throughout a Superfund cleanup project, through a record of decision (ROD) on how a site will be remediated and through the remediation itself. One important element of the EPA's success in remediating the Hudson River was the creation, update, and execution of a Community Involvement Plan (CIP) [25]. The CIP includes a wide range of technical assistance and information dissemination to the public, regular public meetings, a dedicated website in which locals can access paper copies of all documents, and an online vehicle for local residents to stay informed. The regularity of updates to the CIP combined with how accurately the CIP represented the activities being done in that region appears to have led to an increased in public approval for the site.

  In December 2009, the EPA's Office of Solid Waste and Emergency Response initiated its Community Engagement Initiative (CEI) to enhance engagement with local communities and other stakeholders, and to help stakeholders meaningfully participate in decision-making processes related to the cleanup and reuse of contaminated sites. This CEI was subsequently evaluated by EPA in October 2013 and the results showed a direct relationship between the level of dedication to informing the public and the level of public opinion and perception of a project [26].

Actively seeking and factoring in public input through a formal process that results in binding decisions appears to be beneficial. As discussed above, both the Hudson River and Moab UMTRA site remediation projects followed prescriptive decision-making processes (Superfund and NEPA, respectively) leading to final Record of Decisions. The RODs required the projects to follow a series of steps. 40 CFR part 300 requires the issuance of a responsiveness summary along with a ROD for Superfund remediation projects that discusses how significant aspects of a decision are aimed at responding to concerns raised during the public comment period on a proposed site remediation plan. A responsiveness summary was completed for the Hudson River Superfund project [27] and based on feedback during the public comment period the Hudson River Superfund ROD included several "technical commitments" and a commitment to develop a comprehensive public involvement program to be employed throughout the design and constructions phases of the project. The selection of the Crescent Junction Site for the ultimate disposition of the Moab uranium mill tailings based on feedback received under the NEPA process is similar.

Based on the projects reviewed, the use of agreements or decision documents (such as a Superfund ROD) with binding requirements/aspects can result in

improved public opinion of the project and the implementation plan. A decision whether to use such agreements should be made early in the process. However, it must be recognized that agreements having binding requirements/aspects may limit flexibility and adaptability, which are two factors that are generally seen as being positive by both the implementer and the public. The use of binding agreements may also pose some project risk as their use could present opportunities for opposing parties to delay a project with minute breaches in the agreements or claims of breaches.

The term “informed consent” is used primarily in medicine and originates from the legal and ethical rights of patients. It is a process by which appropriate information is provided to a patient so that the patient may make a voluntary choice to accept or refuse treatment. Effectively informing the public and giving them fair representation in the decision making process for siting nuclear waste management facilities could enhanced their “informed consent.”

The Hudson River Superfund remediation successful created “informed consent” through the regular provision of information pertaining to the project and the regular meeting and use of a Community Advisory Group (CAG) [28]. The Community Advisory Process (CAP) established by Idaho Power on the Boardman to Hemingway project and selection of routes following regular meetings with representatives from counties along the potential routes [29] appears to have helped provide “informed consent”.

A process that is enabled and encouraged to be flexible and adaptable to the needs of the community, within reasonable limits, appears to enhance community involvement and ultimate consent. The step-wise process through both the Superfund process (Hudson River) and the NEPA process (MOAB UMTRA) allowed for flexibility to include public feedback and to act on it. Another example of flexibility is the regularity in updating the Hudson River Superfund site Community Involvement Plan. The Warren County PCB Landfill is an extreme example of inflexibility where the solution was declared and that the public was essentially ignored, leading to deterioration of any support and the beginning of environmental justice [23].

Public Engagement

As discussed above, a sustained engagement and on-going dialogue with the public appears to be key to success. A primary goal of public engagement and outreach needs to be providing unbiased information and technical assistance. This should all be done with as much independence from the implementing organization as possible. As an example, the Hudson River Superfund cleanup had a neutral facilitator for the CAG meetings and EPA provided funding for the community to hire a private technical expert to provide independent technical assistance. A neutral facilitator is seen by the EPA as particularly effective at sites where some controversy is anticipated [30].

Information should be publicly available and easy to access. Local newspapers, commonly visited public areas, and use of the internet are helpful ways to provide

information and documentation. The Hudson River Superfund Site project team kept an information dispensary dedicated to containing public copies of all documentation provided by the EPA (draft and final EIS, draft and final ROD, 45 fact sheets) that was also easily accessible on the project website (www3.epa.gov/hudson/). The regional EPA team also created an email list that local residents could easily sign up for either at public meetings or on the website through which information was disseminated.

The provision of information should be complete, transparent, and understood by the local community. The largest complaint brought upon the Cape Wind Project from the Cape Cod Commission was the lack of certain documents or informational releases [6]. Such a lack of transparency can cause large delays from the public opinion losses that arise from it, again as was the case for the Cape Wind Project as the local community appears to have taken heed of the Cape Cod Commission and slowly reduced its favorable opinion of the project. The litigation the community initiated, supported, and/or funded and the associated delays were likely the ultimately problem that resulted in the failure of the project.

Actual or perceived bias can be difficult to overcome and was used by those in opposition of the Cape Wind, Hudson River, Moab, and Warren County projects, leading to challenges that were difficult for the project teams to overcome.

The Warren County PCB landfill project is the most striking example of how not to react to public opinion concerns. Initially the state government designated an independent scientific advisor to perform research and represent the community in negotiations. However, as the scientific advisor became more involved and found issues with the state's response to the PCB crisis, the advisor was either replaced or the position was eliminated entirely. These actions by the state government demonstrated bias and resulted in the loss of trust and support.

The Moab UMTRA remediation encountered similar issues with accusations of bias. In the case of the Moab UMTRA project, there were a few people who questioned the results of the EIS. As required by NEPA, DOE responded to these issues by releasing a comment response document as part of the EIS [31], similar to that developed for the Hudson River Superfund remediation project. The document addressed the concerns raised by further describing the science that supported the conclusions. It appears that that the issues raised were dropped shortly after or accepted as a difference in scientific approaches.

In addition, during the development of the EIS for the MOAB UMTRA remediation there were perceptions that the DOE had a favored alternative. This caused community concern, as it appeared that the decision was being made based upon ease, not taking into account the concerns of the community [11]. The opposition that arose from this indication resulted in several months of delay and required additional public outreach.

The degree of separation between those providing technical assistance and those implementing a project helps to minimize bias. In the case of the Hudson River

Site, the most effective manner of dispelling claims of biased information was through their CAGs. The neutrality of the facilitator and the independence from the EPA appears to have provided confidence to the public that they were not being manipulated. Also, similarly to how the Moab UMTRA Site had the NAS provide their technical assistance [11], the EPA often uses a series of long-term agreements with regional universities to help provide neutral facilitators and technical assistance for Superfund cleanup projects.

Public outreach that is engaged, forward thinking, and transparent is crucial to the success of a consent-based approach. As discussed above, going above and beyond any "regulatory" or "legal" requirement may increase the potential for success. This may be as little as holding additional meetings beyond what would be required for information dissemination with the community. The use of community advisory groups, such as was in place for the Hudson River Superfund remediation where representatives from each involved party would often provide information to the representatives prior to any action being taken, can help foster forward thinking. The use of neutral facilitators and the provision of technical assistance, as the EPA provides through their Technical Assistance Grant (TAG) [32] and the Technical Assistance Services for Communities (TASC) [33] programs, can support transparency.

Establishing, Building, and Maintaining Trust

Establishing, building, and maintaining trust is important and this can be accomplished through sustained, transparent, and positive engagement. In the case of the Hudson River Superfund remediation and the MOAB UMTRA site, while the Federal Government (EPA and DOE, respectively) had the final decision-making authority, both projects took considerable lengths to ensure that the states and local input were properly considered. The active use of and consideration of feedback from independent and non-biased scientific groups, such as the National Academy of Science's involvement on the MOAB UMTRA site project, can help build trust along with minimizing the potential for questions and litigation against specific reports.

In the case of the Boardman to Hemingway Transmission Line project, Idaho Power also established goals of building trust and cooperation in its Community Advisory Process [34], with measurable criteria for evaluating their performance towards meeting these goals. Their philosophy includes giving the public ownership of the siting process, developing a collaborative process that respects different perspectives and takes concerns into account, respecting environmental and cultural concerns not covered by the NEPA process. Idaho Power hosted 27 Project Advisory Team meetings, 15 public meetings and seven special topic meetings and numerous meetings with individuals and advocacy groups were held to establish their cooperative process and help build trust.

One element that appears to have contributed to the local opposition to the Cape Wind Project was a perceived level of arrogance or dismissiveness being expressed by representatives of the Cape Wind company projected during public meetings and

in interactions with critics [8].

Perceptions of bias, political favor, arrogance, or dismissiveness should be avoided. This can be accomplished through the various methods for community engagement, technical assistance, and independent assessment discussed above.

CONCLUSION

Contentious projects that have federal, state, and local government responsibilities and where there were different perspectives regarding potential solutions represent good cases studies that can be used to identify lessons learned for the development of a consent-based siting process for nuclear waste management facilities. This limited review of five specific projects of varying degrees of success indicates that a successful consent-based siting process should consider several factors: an understanding of consent, an active public engagement, building and maintaining of trust between the project and the community, a feeling of fairness, and a respect for community well-being. Specific insights gained from this review are listed below. Additional detailed review of these and other contentious projects is warranted to take advantage of lessons and experiences (both good and bad) in the development of a consent-based siting process for nuclear waste management facilities.

Lessons learned that are applicable for the development of a consent-based siting process for nuclear waste management facilities include:

- A sustained engagement and on-going dialogue with the public (locally, regionally, and perhaps nationally) appears to increase the likelihood that consent will be given to a project moving forward.
- Public outreach that is engaged, forward thinking, and transparent is crucial to the success of a consent-based approach.
- Actively seeking and factoring in public input through a formal process that results in binding decisions appears to be beneficial. A decision whether to use binding agreements should be made early in the process.
- Effectively informing the public and providing for their fair representation in the decision making process for siting nuclear waste management facilities could enhanced their “informed consent.”
- A process that is enabled and encouraged to be flexible and adaptable to the needs of the community, within reasonable limits, appears to enhance community involvement and ultimate consent.
- A sustained engagement and on-going dialogue with the public appears to be key to success.
- A primary goal of public engagement and outreach needs to be unbiased information dissemination and technical assistance.
- Information should be publicly available and easy to access. The provision of information should be complete, transparent, and understood

- Actual or perceived bias can be difficult to overcome. The degree of separation between those providing technical assistance and those implementing a project ensures to minimize bias.
- Establishing, building, and maintaining trust is important and this can be accomplished through sustained, transparent, and positive engagement.
- Any perception of political influence or corruption needs to be avoided to ensure enduring trust.

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