The Initial Environmental Assessments for the Nuclear Waste Repository Under Section 112 of the Nuclear Waste Policy Act.

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INTRODUCTION

The Nuclear Waste Policy Act (NWPA)[1], signed into law on January 7, 1983, establishes a procedural "roadmap" designed to culminate in at least one operational permanent repository (and presumably two) for this Nation's civilian spent nuclear fuel and high level radioactive waste.[2] The bulk of the new statute is de-

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1. 42 U.S.C. §§ 10101-10226 (1982).

2. Civilian nuclear reactors in general "burn" uranium by nuclear fission to produce electricity. The waste product is called "spent nuclear fuel." Spent nuclear fuel is highly radioactive, containing both fission byproducts (elements, such as cesium, with lower atomic numbers than uranium) and "transuranics" (elements with higher atomic numbers than uranium, such as plutonium). *See* Skinner & Walker, *Radioactive Wastes*, 70 AM. SCIENTIST 180 (1982). Efforts to arrange for facilities for storage and disposal of high level radioactive waste and spent nuclear fuel in the United States have been controversial. *See, e.g.*, Yellin, *High Technology and the Courts: Nuclear Power and the Need for Institutional Reform*, 94 HARV. L. REV. 489, 498 & n.42 (1982); Pohl, *Will It Stay Put?*, PHYSICS TODAY, December 1982, at 37. The story has not been a happy one from an administrative point of view. The initial assumption of the nuclear utility industry was that spent nuclear fuel would be "reprocessed" to extract plutonium and "unburned" uranium for subsequent use as nuclear fuel, leaving only "high level radioactive waste" (chiefly fission byproducts) for disposal. The utility industry accordingly operated on the understanding that a yet-to-appear reprocessing industry (and not the utility industry) would in general be responsible for the disposal of high level radioactive waste. *See* H. R. REP. NO. 491, Part I, 97th Cong., 2d Sess. 27 (1982). This assumption was overturned in 1977 when President Carter, motivated by concern about proliferation of nuclear weapons, deferred both reprocessing and the development of a mixed oxide (plutonium) fuel cycle. *See id*; S. REP. NO. 282, 97th Cong., 1st Sess. 4 (1981). An additional complicating factor has been the difficulty in identifying a repository site. There appears to be a relatively broad consensus (but not unanimity) in the scientific community that high level radioactive waste and spent nuclear fuel can be safely disposed (*see, e.g.*, Harrison, *Disposal of Radioactive Wastes*, 226 SCIENCE 11

voted to spelling out the procedures to be followed in selecting a site for the initial repository and for at least one additional repository.[3] Important portions of these procedures deal with the requirements

(1984)) (scientists appointed by the International Council of Scientific Unions conclude that nuclear wastes may be safely disposed of using current technology); Klinsberg & Duguid, *Isolating Radioactive Wastes*, 80 AM. SCIENTIST 182 (1982) (combination of relevant geologic technology, a systems approach and the multiple-barrier concept is expected to lead to a safe disposal strategy). However, efforts to establish a site for a repository for high level radioactive waste have been unsuccessful to date. *See, e.g.*, H. R. REP. No. 491, Part I, 97th Cong., 2d Sess. at 48-49 (1982). In the words of the General Accounting Office (GAO) "Since the 1950s, the Federal Government has attempted to identify and develop disposal sites, but in every case, attempts have failed or problems have surfaced primarily because of political and public opposition." GAO, NUCLEAR AND COAL WASTE DISPOSAL HAMPERED BY LEGAL, REGULATORY AND TECHNICAL UNCERTAINTIES 5 (May 4, 1982).

Richard Armour, in his poem "Unwelcome Mat," expresses a similar view:

> For the problem of nuclear
> Waste disposal
> I've a simple solution
> A pleasant proposal.
>
> Drop the stuff anywhere,
> Let this be clear,
> Anywhere, anywhere
> That isn't near here.

Wall St. J., Feb. 4, 1984.

3. The Nuclear Waste Policy Act (NWPA) was the result of four years of legislative effort to "solve" the problem of locating a site for disposal of spent nuclear fuel. The "problem" was viewed not as a technical matter but as principally administrative and political in nature. Thus, the solution embodied in the statute is in terms of establishing relatively complex regimes for consultation, comment and (hopefully to its proponents) accommodation by various federal, state and local agencies and interest groups. This is accomplished in the NWPA by elaborating, or in some cases abridging, the authorities enjoyed by the Secretary of the Department of Energy (DOE), the Nuclear Regulatory Commission (NRC) and the Administrator of the Environmental Protection Agency (EPA) under the Atomic Energy Act, 42 U.S.C. §§ 2011–2296 (1982), the Energy Reorganization Act of 1974, Pub. L. 93-436, 88 Stat. 1233 (1974) (abolishing the old Atomic Energy Commission, AEC, and establishing NRC and the Energy Research and Development Administration, ERDA); the Department of Energy Act, 42 U.S.C. § 7151(a) (1982) (abolishing ERDA and establishing DOE); and Reorg. Plan No. 3 of 1970, 3 C.F.R. 1072 (1966–1970 Comp.) *reprinted in* 42 U.S.C.A. § 4321 (West 1977) (establishing EPA and transferring to it AEC's authority to set "generally applicable" off-site standards for activities under the Atomic Energy Act).

One could analyze the NWPA as a rather classic illustration of Professor Schoenbrod's observation that

> Rather than make hard choices between economic and environmental goals, Congress generally prefers to leave the choices to administrators. When administrators are unable to discover adequate direction in the environmental statutes, Congress often reacts by engrafting onto the statutes new and more complicated decisionmaking procedures instead of clarifying the initial directives.

Schoenbrod, *Limits and Dangers of Environmental Mediation: A Review Essay*, 58 NYU L. REV. 1453, 1469 (1983). DOE estimates that it will cost $20 billion in the next 50 years to site, construct and operate repositories under the NWPA. *See Department of Energy Authorizations for Fiscal Year 1986 and 1987 Before the Subcomm. on Energy*

for consideration of environmental concerns. A driving force behind these various provisions was the desire to avoid litigation and delay over the application of environmental requirements to the development of a repository.[4]

One of the most important initial steps in the process specified for addressing environmental concerns is the preparation of environmental assessments (EA's) by the Department of Energy (DOE) for sites under intensive consideration as possible repositories. DOE is in the midst of implementing this step, which is governed by section 112 of the Act.[5] After a brief overview of the repository siting process as envisioned by the NWPA and a sketch of the related procedures, this article will focus on requirements for an EA as set forth in section 112. As will be seen, there appear to be a number of ambiguities—the stuff of which litigation and delay is made—relating to this key provision. This article will suggest some interpretations and actions that may be employed to minimize the risk of disruption to the siting process given the potential for litigation and delay at this early stage.

I.
OVERVIEW OF THE NWPA

A. Stages for Resolution of the Repository-Siting Question Envisioned in the Act

The NWPA can be analyzed as establishing a four-stage process leading to the operation of a repository.

- The first stage involves the nomination and subsequent selection by the DOE of several potential repository sites for more detailed analysis; i.e., for site characterization.
- The second stage involves the conducting and completion of site characterization activities to support a Presidential site recommendation.
- The third stage involves the preparation and completion of an environmental impact statement (EIS) and application to the Nuclear Regulatory Commission (NRC) for construction authorization for the site viewed as preferable after the conclusion of site characterization.

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and Environment of the House Comm. on Interior and Insular Affairs, 99th Cong., 1st Sess. 2 (March 5, 1985) (Statement by F. Kevin Boland, General Accounting Office)

4. *See, e.g.*, H.R. REP. No. 491, Part 1, 97th Cong., 2d Sess. 48 (1982) ("The specificity of the NEPA guidelines . . . [is] intended to avoid litigation and to ensure that the essential objectives of NEPA are met without . . . litigation").

5. 42 U.S.C. § 10132 (1982).

- The final stage involves completion of licensing activities and construction of the repository.

B. Summary of Some Key Procedural Requirements

The process envisioned by the NWPA is procedure-intensive, involving both federal and state governments as well as many different federal agencies. Many steps in the process, especially on the part of DOE and NRC, are dependent upon successful completion of previous steps, or upon action by, or concurrence from other agencies. The "environmental assessment" requirement of section 112 is an example of this complexity. First, the EA requirement is dependent upon prior action by DOE[6] and other agencies.[7] Moreover, the EA is a necessary precondition to further steps leading to an operational repository. In order to provide some context, selected features of the new law are outlined below.

1. Standards and regulations

The Administrator of the Environmental Protection Agency (EPA) is required to issue "generally applicable standards for the protection of the general environment from off-site releases from radioactive material" in repositories no later than January 7, 1984.[8] By January 1 of the same year, NRC is to issue technical requirements and criteria for approving applications for authorization to construct, operate, and close repositories.[9]

2. Guidelines

The Secretary of the Department of Energy (DOE), following consultation with the EPA Administrator, the Council on Environ-

6. For example, DOE must first issue certain guidelines. *See* 42 U.S.C. § 10132(a) (1982).

7. For example, numerous agencies must consult on the DOE guidelines. *See id.*

8. Nuclear Waste Policy Act § 121(a), 42 U.S.C. § 10141(a) (1982).

9. Section 121(b), 42 U.S.C. § 10141(b) (1982). The Atomic Energy Act authorizes NRC to issue regulations governing, and to require licensing of, possession or use of certain materials; namely, (a) "source material" (basically natural uranium or thorium); (b) "by-product material" (fission by-products such as cesium, or uranium and thorium mill tailings and residues); and (c) "special nuclear material" (basically enriched uranium and plutonium). It also requires licensing of civilian "production" and "utilization" facilities (nuclear reactors). In general, facilities operated for DOE are not subject to NRC jurisdiction, including NRC's licensing jurisdiction. 42 U.S.C. § 2140 (1982). *See, e.g.*, 10 C.F.R. § 40.11 (1984). Section 202 of the Energy Reorganization Act, however, provides, among other things, for NRC jurisdiction over construction and operation by DOE of repositories for the "receipt and storage of high level radioactive wastes resulting from activities licensed under [the Atomic Energy] Act." 42 U.S.C. § 5842(3) (1982).

mental Quality (CEQ), the Director of the Geological Survey, and interested Governors, and with the concurrence of NRC, must issue "general guidelines for the recommendation of sites for repositories" no later than July 6, 1983.[10]

3. Nomination of sites for site characterization and recommendations to the President

Following issuance of the guidelines, the Secretary must nominate 5 sites "that he determines suitable . . . for selection of the first repository site."[11] Although no date is provided for such nomination, the Secretary must recommend 3 of the nominated sites to the President for characterization not later than January 1, 1985.[12] In addition, the statute calls for additional nominations and recommendations involving a projected second repository by July 1, 1989.[13]

Each nomination of a site must be accompanied by an "environmental assessment." This assessment is supposed to include a "detailed statement of the basis for such recommendation and of the probable impacts of the site characterization activities planned for such site, and a discussion of alternative activities relating to site characterization that may be undertaken to avoid such impacts."[14] The assessment is subject to various procedural requirements and to judicial review.[15]

4. Initial Presidential review

Within 60 days (unless extended by not more than 6 months) after submission of "candidate site" recommendations, the President may approve or disapprove of each candidate site. If the President fails to act, the site is deemed approved. The Governor and legislature (or Indian tribe) of the affected state(s) must be notified of any approval or deemed approval.[16]

5. Site characterization

Site characterization activities are in general controlled by section

10. Section 112(a), 42 U.S.C. § 10132(a) (1982).
11. Section 112(b)(1)(A), 42 U.S.C. § 10132(b)(1)(A) (1982).
12. Section 112(b)(1)(B), 42 U.S.C. § 10132(b)(1)(B) (1982).
13. Section 112(b)(1)(C), 42 U.S.C. § 10132(b)(1)(C) (1982).
14. Section 112(b)(1)(E), 42 U.S.C. § 10132(b)(1)(E) (1982).
15. Section 112(b)(1)(F)-(H), 42 U.S.C. § 10132(b)(1)(F)-(H) (1982).
16. Section 112(c), 42 U.S.C. § 10132(c) (1982).

113 of the Act.[17] Various procedural requirements are prescribed, including preparation of (and hearings on) a site characterization plan.[18] Site characterization is limited to activities necessary to prepare an EIS.

6. Repository recommendation by the DOE Secretary

After the completion of site characterization at not less than three sites and after the completion of hearings, the Secretary must recommend an initial site for development of a repository. The Secretary must notify the affected State or Indian tribe at least 30 days before submitting his recommendation to the President. The Secretary must consider regional distribution and transportation issues in making the recommendation.[19] Perhaps most significant, the Secretary must prepare, make available to the public, and submit to the President "a comprehensive statement of the basis" for his recommendation, including, among other things, "a final environmental impact statement . . . [prepared pursuant to section 114(f)] and the National Environmental Policy Act of 1969. . . ."[20] This initial EIS is subject to all the requirements of NEPA with one exception. Section 114(f) of the Act specifically bounds the analysis of alternatives which under ordinary circumstances would be mandatory by providing, as to the EIS for the first repository, that

> compliance with the procedures and requirements of this [Act] shall be deemed adequate consideration of the need or a repository, the time of the initial availability of a repository, and all alternatives to the isolation of high-level radioactive waste and spent nuclear fuel in a repository.[21]

In short, section 112(f) constitutes a Congressional determination (a) that a repository is needed; (b) that the appropriate timing for construction of the repository is as specified in the statute; and (c) that deep underground burial is the desirable means to dispose of high-level radioactive waste and spent nuclear fuel. The need for a repository, its timing, and the propriety of deep underground disposal accordingly are premises on which the initial EIS may be based and are presumably not subject to litigation.[22]

17. 42 U.S.C. § 10133 (1982).
18. *Id.*
19. Section 114(a)(1), 42 U.S.C. § 10134(a)(1).
20. Section 114(a)(2)(D), 42 U.S.C. § 10134(a)(2)(D) (1982).
21. 42 U.S.C. § 10134(f) (1982).
22. There is, however, one clear source of potential confusion. Although section 112(f) indicates that certain factors and alternatives need not be considered with respect to an initial EIS for a repository, § 114(a)(1)(D), 42 U.S.C. § 10134(a)(1)(D) (1982), the

7. The Presidential recommendation to Congress

Not later than March 31, 1987, the President must submit his first recommendation of a site to Congress; a second site is required by March 31, 1990. These deadlines may be extended by up to 12 months provided that certain conditions are met.

8. Final site approval

The designation of a site as suitable is effective 60 days after the President recommends such site to Congress, unless the relevant State or Indian tribe files a "notice of disapproval" within 60 days of the President's recommendation, as provided in section 116 or 118 of the Act. If a "notice of disapproval" is filed, the site is deemed disapproved unless Congress passes a resolution of repository siting approval within 90 calendar days of continuous session after Congress receives the notice.[23]

9. DOE's application for construction authorization to NRC

Within 90 days after the Presidential recommendation is "effective," DOE must submit an application for construction authorization to the Commission, which in turn must meet various deadlines.[24] The Commission must restrict the amount of material which may be placed in the first repository until a second repository is in operation.[25]

10. Miscellaneous Requirements Relating to States

Sections 116–18 contain numerous additional requirements relating to the participation of states and Indian tribes in the siting process. These are briefly summarized as follows:

(a) By July 7, 1983, DOE must notify states with "potentially acceptable sites" of that fact;

(b) DOE must provide federal financial assistance after approval of candidate sites for repositories under section 112(c);

(c) DOE must respond to state inquiries within 30 days;

(d) DOE must endeavor to resolve differences with states harboring approved candidate sites;

(e) DOE must attempt to formulate a written agreement with

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last sentence of section 112(f) may be read to suggest that "need" for a repository and alternatives to geologic disposal should be considered in preparing an EIS for the projected second repository.

23. Section 115(c), 42 U.S.C. § 10135(c) (1982).

24. Section 114(b)-(d), 42 U.S.C. § 10134(b)-(d) (1982).

25. Section 114(d), 42 U.S.C. § 10134(d) (1982).

states harboring such sites providing for exchanges of information and recomendations.

11. DOE Coordinating Functions

Section 301 of the Act[26] provides for DOE to issue a "mission plan" to afford an "informational basis" for, *inter alia*, the repository program. The mission plan was to be (but was not) submitted to Congress by June 7, 1984 and is to be effective 30 days after submission.

The Secretary of DOE is also required to prepare a project decision schedule to coordinate all federal activities.[27]

12. Current status of implementation of the Act

DOE had completed initial site screening before the enactment of the NWPA. However, the agency has fallen markedly behind in meeting the various deadlines specified in the NWPA. It was late by a year and a half in issuing the guidelines. DOE's initial nominations and recommendations have also been delayed. The agency had issued EA's relating to the first nine candidate sites only on December 20, 1984.[28]

Similarly, EPA has yet to issue final disposal standards and is now over a year behind. According to a recent GAO report, the Presidential site recommendation is projected to lag the statutory schedule by three years.[29]

C. Overview of Basic Legal Positions with Respect to NWPA and its Section 112.

Edward Davis, the new President of the American Nuclear Energy Council (ANEC) and one of the principal representatives of the nuclear industry in pursuing the legislation which culminated in NWPA, has stated that "in all likelihood" the current stage will be

26. 42 U.S.C. § 10221 (1982).

27. Section 114(e), 42 U.S.C. § 10134(e) (1982).

28. 49 Fed. Reg. 47801 (Dec. 6, 1984); *See also id.* at 49540 (Dec. 20, 1984). *See, e.g.*, DOE, Draft Environmental Assessment, Yucca Mountain Site, Nevada Research and Development Area, Nevada (Dec. 1984). The draft EA's recommended three sites (Yucca Mountain, Nevada; Deaf Smith, Texas; and Hanford, Washington) to the President for site characterization. *See, e.g.*, Statement of John S. Herrington, Secretary of Energy before the Energy & Env. Subcomm. of the House Interior and Insular Affairs Comm., 99th Cong., 1st Sess. 9-10 (March 5, 1985).

29. GENERAL ACCOUNTING OFFICE, STATUS OF THE DEPARTMENT OF ENERGY'S IMPLEMENTATION OF THE NUCLEAR WASTE POLICY ACT OF 1982 AS OF SEPTEMBER 30, 1984 (1984).

"the most contentious and difficult phase of the program. . . . Lawsuits and judicial intervention are likely to occur. . . ."[30] Mr. Davis' admonition was well taken. Already a number of suits have been filed, one of which has been decided.[31]

The Act is designed in a fashion such that controversy and litigation may arise from at least three different directions: (1) disagreement over "substantive" issues; (2) disenchantment over missed deadlines; and (3) confusion over the sequence of procedures. These will be briefly considered in turn.

The conventional wisdom which prevailed in many corridors at the time of the adoption of the NWPA was that DOE, perhaps at the urging of nuclear utilities, would cut corners and engage in slipshod practices in a head-long dash to bring a repository on line. That view implicitly assumed that DOE and utilities would behave in an extraordinarily illogical and short-sighted fashion. A technically negligent or counterproductive act on the part of DOE would likely be detected well before completion of construction and licensing and almost certainly before closure of a repository. DOE and the nuclear industry would presumably wish to avoid the acute embarrassment and additional cost and delay attendant on the belated discovery of such an event. Presumably the agency and industry would endeavor to attain a relatively high degree of technical perfection in a long-term and public project such as this. More to the point, the nuclear utilities, and to some degree DOE, have a strong interest in assuring the timely construction and operation of a high level waste repository. This interest readily translates into a basic strategy of urging (a) careful siting and construction of the repository and (b) application of the statute in a "conservative" fashion so as to minimize the chances of litigation—or at least the chances of successful litigation—against DOE's implementation of the Act.[32] From the point of view of people who would like to see a

30. E. Davis, A Critique of the U.S. Department of Energy Nuclear Waste Management Program 7 (June 4, 1984) (Available from the American Nuclear Energy Council, Washington, D.C.).

31. *See, e.g.*, Environmental Policy Inst. v. Hodel, No. 84-2854, (9th Cir filed Dec. 18, 1984); Nevada v. Hodel, No. 84-7846 (9th Cir. filed Dec. 14, 1984); Texas v. Department of Energy, 764 F.2d 278 (5th Cir. 1985), *petition for cert. filed*, 54 U.S.L.W. 331 (Oct. 25, 1985) (No. 85-662) (Challenge of Texas to DOE designation of two sites as potentially acceptable for nuclear waste repositories was neither "final" nor ripe for judicial review).

32. There are two possibly legitimate countervailing interests which might lead to a flawed performance in establishing a repository. First, the repository program may be staffed by short-term managers who, because of their brief sojourn, realize that they run little risk of being held accountable for mismanagement and in consequence behave in a

resolution of disposal issues, the basic interest of DOE and the nuclear industry is, hopefully, reasonably close to that which is espoused by at least some environmental organizations and interested states.

There nevertheless is some room for "substantive" disagreement. From industry's point of view, and, to some extent, the point of view of DOE, adoption of a "conservative" approach must be tempered with the realization that an unduly restrictive interpretation of the statute may itself lead to delay and increased costs which can outweigh any benefits either in terms of further assurance of safe operation, or in terms of decreased political opposition or reduced risk of successful litigation. Accordingly, one can nevertheless expect some dissimilarity of views between the interests of DOE and the nuclear industry and some states and groups affiliated with the environmental movement. Apart from all this, it is possible that some groups may seek either to delay or prevent the establishment of a repository entirely because of philosophical opposition to nuclear power, or because of parochial economic or political opposition to a particular location. Some of this opposition may be couched in the form of "substantive" demands. Indeed, this may be the most likely cause of litigation over "substantive" positions taken by DOE.

A second source of potential litigation arises from the relatively comprehensive deadline schedule established by Congress to govern the site selection process. Under the Administrative Procedure Act (APA), statutory deadlines in general are judicially enforceable.[33] Subsection 119(a) of the NWPA specifically contemplates such litigation.[34] As applied in the context of the NWPA, lawsuits of this sort would seek judicial orders requiring DOE to take the action required by the statute under a court imposed time schedule. Judging from the experience of public interest groups with EPA and other agencies,[35] such litigation should result in court orders (or perhaps judicially approved negotiated settlements) compelling

haphazard fashion. Second, the repository program may give rise to a government-industry complex such as some authors have charged has plagued the American nuclear industry generally. *See* J. Cook, *Nuclear Follies*, FORBES, February 11, 1985, at 82. Such a complex may become economically dependent on the program and thus interested in extending it temporally and financially, possibly through unnecessary churning and contorted implementation.

33. 5 U.S.C. § 706(1) (1982) (APA provision authorizing court to compel action unlawfully withheld).

34. *See* section 119(a)(1)(B), 42 U.S.C. § 10139(a)(1)(B) (1982).

35. *See, e.g.*, Environmental Defense Fund, Inc. v. Hardin, 428 F.2d 1093, 1099 (D.C. Cir. 1970); Nader v. FCC, 520 F.2d 182, 206 (D.C. Cir. 1975); Sierra Club v.

DOE to take the requisite action. Whether such litigation occurs is likely to depend primarily on whether one of the sides to an administrative dispute believes that a court order compelling DOE action would be useful to neutralize political or legal opposition to DOE's implementaion of a particular portion of the Act.[36]

The final, and somewhat related, source of potential litigation arises from the very complexity of the NWPA. Many actions are contingent upon other actions and are sequential in nature. As in a dance, it is possible for one or more of the agencies involved in the siting process to get out of step, and the whole process may be suspended by a court order until the dance can be restarted somewhere closer to the beginning. Moreover, the NWPA does not expressly provide that it, NEPA, and the Atomic Energy Act (AEA) are the only applicable statutes. If other regulatory statutes are applicable, confusion over their requirements and the interrelationship of their requirements with those of the NWPA may be a fertile ground for controversy.

II.

ENVIRONMENTAL ASSESSMENTS UNDER SECTION 112

As can readily be seen, the provision for environmental assessments in section 112 is a part of a rather complex picture. Various portions of that picture have potential ramifications for the EA's envisioned by the section. The appropriate starting point for analysis is nevertheless the language of section 112 itself. That provision

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Ruckelshaus, 602 F. Supp. 892 (N.D. Cal. 1984) (requiring EPA to issue a final rule for radionuclides under the Clean Air Act by October 23, 1984).

36. Lawsuits to compel DOE action may also arise from another direction. One of the grounds employed by some states and by some intervenors in reactor licensing proceedings, to resist the licensing of new nuclear facilities is the lack of an operational repository for spent nuclear fuel. This has spawned not only state moratoria on licensing new nuclear power facilities, (*see* Pacific Gas & Electric Co. v. State Energy Resources Conservation & Development Comm, 103 S. Ct. 1713 (1983)) but also litigation which has resulted in court orders requiring NRC to determine whether there is "reasonable assurance" that repositories will be available when needed. *See* Minnesota v. NRC, 602 F.2d 412, 419 (D.C. Cir. 1979). The Commission, in partial reliance on the NWPA, has determined that there is reasonable assurance that repositories will be available when required. *See* 49 Fed. Reg. 34658 (August 31, 1984) (reasonable assurance that safe disposal in a mined geologic repository is technically feasible and that one or more repositories will be available by the years 2007-2009). If, however, DOE falls behind in its implementation of the NWPA, it is possible that the Commission on its own initiative or under the compulsion of a judicial directive, may begin to question this assurance. In order to forestall such a potential eventuality, at least some components of the nuclear industry may feel obliged to insist that DOE adhere relatively closely to the schedule which Congress specified.

establishes both substantive and procedural requirements pertaining to the preparation of an EA. These requirements will be considered in turn.

A. Substantive Requirements

1. The statute.

The principal substantive requirements for an EA are codified in section 112(b)(1)(E). That paragraph requires that an EA include a

> detailed statement of the basis for [each nomination of a site] and of the probable impacts of the site characterization activities planned for such site, and a discussion of alternative activities relating to site characterization that may be undertaken to avoid such impacts. Such environmental assessment shall include—
>
> (i) an evaluation by the Secretary as to whether such site is suitable for site characterization under the guidelines established under subsection (a) of this section;
>
> (ii) an evaluation by the Secretary as to whether such site is suitable for development as a repository under each such guideline that does not require site characterization as a prerequisite for application of such guideline;
>
> (iii) an evaluation by the Secretary of the effects of the site characterization activities at such site on the public health and safety and the environment;
>
> (iv) a reasonable comparative evaluation by the Secretary of such site with other sites and locations that have been considered;
>
> (v) a description of the decision process by which such site was recommended; and
>
> (vi) an assessment of the regional and local impacts of locating the proposed repository at such site.

Additional "substantive" requirements are found in section 112(a). That section requires the DOE Secretary to issue "guidelines." It further provides that the guidelines "shall" be used "in considering sites for *recommendation*" (emphasis added). The use of the word "recommendation" in this context results in some confusion. Under the scheme established in section 112, the "recommendation" to the President occurs after the "nomination" requiring an EA. This suggests that the guidelines need not be employed in the actual development of the EA's or in selecting sites for nomination. Consistent with this relatively narrow reading, DOE is taking the position that its guidelines are not applicable to the selection (initial screening) of sites for nomination for possible char-

acterization as a repository.[37]

Section 112(a) lists the following specific concerns or factors which the Energy Secretary must incorporate in the guidelines:

—location of valuable natural resources
—hydrology
—geophysics
—seismic activity
—atomic energy defense activities
—proximity to water supplies
—proximity to populations
—the effect upon the rights of users of water
—proximity to components of the National Park System, the National Wildlife Refuge System, the National Wild and Scenic Rivers System, the National Wilderness Preservation System, or National Forest Lands
—transportation and safety factors involved in moving waste to a repository
—the cost and impact of transporting to the site the solidified high-level radioactive waste
—the advantages of regional distribution of siting of repositories
—preference, to the extent practicable, for sites in different geologic media.

Section 112(a) also bars from use as a repository any site located (1) in a highly populated area and (2) adjacent to an area with a population of 1000 people per square mile.

2. Analysis

(a). Considerations Relating to DOE Guidelines and EPA Standards

DOE issued proposed guidelines on February 7, 1983.[38] In order to obtain statutorially required concurrence from NRC, DOE subsequently made a number of arguably quite significant but unpublished revisions to the proposed guidelines.[39] The agency did not promulgate final guidelines until December 6, 1984—almost 18 months late.[40]

37. *See, e.g.*, 49 Fed. Reg. 28,130, (July 10, 1984). *See infra* note 94 and accompanying text.

38. 48 Fed. Reg. 5,670 (Feb. 7, 1983) (proposing 10 C.F.R. Part 960).

39. *See* 49 Fed. Reg. 28,130 (July 10, 1984) (NRC concurrence) *See also* 49 Fed. Reg. 47,719, 47,723 (Dec. 6, 1984) (noting that DOE distributed copies of the revisions—so called "alternative" guidelines—to some of the interested public but failed to publish the revisions).

40. 49 Fed. Reg. 47,714 (Dec. 6, 1984).

Although fairly broadly written, the proposed guidelines do specify a number of "disqualifying factors." For instance, the guidelines disqualify sites whose restricted areas or support facilities are either located "within the boundaries of a component of the National Park System, the National Wildlife Refuge System, the National Wilderness Preservation System, or the National Wild and Scenic Rivers System" or "conflict irreconcilably with the previously designated resource-preservation use" of components of the aforementioned systems, National Forest Lands, or comparably significant state areas.[41] To take another example, a site is disqualified if conditions are such that the underground portion of the facility is not at least 200 meters from the directly overlying ground surface.[42]

Section 121 of the Act[43] provides for EPA standards and NRC criteria governing construction, operation and closure of a repository. Although NRC has issued final criteria,[44] EPA has thus far failed to finalize its proposed standards.[45] The EA should presumably demonstrate how a particular site conforms to the requirements of the two regulatory agencies. EPA's failure to issue final standards thus further clouds any analysis of the EA requirement. As an interim measure, the DOE guidelines specifically require conformance not only to the NRC criteria,[46] but also to the not yet finalized EPA standards.[47]

(b) Is an EIS required?

Certain portions of section 102[48] of the National Environmental Policy Act (NEPA) are action-forcing in nature. In particular, paragraphs (C) and (E), and to a much lesser degree (F), of section 102(2) are important, or potentially important, action-oriented provisions. Section 102(2)(C) of NEPA,[49] provides, among other things, that all agencies of the federal government must

> include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality

41. 49 Fed. Reg. 47,752 (1984) (to be codified at 10 C.F.R. § 960.5-2-5(2) & (3)).
42. 49 Fed. Reg. 47,762 (1984) (to be codified at 10 C.F.R. § 960.4-2-5(d)).
43. 42 U.S.C. § 10141 (1982).
44. 48 Fed. Reg. 28,194 (June 21, 1983) (promulgating 10 C.F.R. Part 60).
45. 47 Fed. Reg. 58,196 (Dec. 29, 1982) (proposing 40 C.F.R. Part 191).
46. *See, e.g.*, 49 Fed. Reg. 47,757 (to be codified at 10 C.F.R. § 960.1 & .3-1-5).
47. Indeed, DOE notes that "[i]n the event of a conflict between the guidelines and either 10 C.F.R. Part 60 or 40 C.F.R. Part 191, these NRC and EPA regulations will supercede the guidelines and constitute the operative requirement in any application of the guidelines." 49 Fed. Reg. 47,721 (Dec. 6, 1984).
48. 42 U.S.C. § 4332 (1982).
49. 42 U.S.C. § 4332(2)(C) (1982).

of the human environment, a detailed statement by the responsible official on—

(i) the environmental impact of the proposed action,

(ii) any adverse environmental effects which cannot be avoided should the proposal be implemented, [and]

(iii) alternatives to the proposed action, . . .

Section 102(2)(E) of NEPA, which is usually viewed as subsumed by the EIS requirement in section 102(2)(C),[50] requires agencies to study and develop "appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." Section 102(2)(F) calls for exploration of worldwide "initiatives" in the environmental area. However, this provision has not been the subject of significant reported litigation. All three of the key paragraphs—(C), (E) and (F)—are treated in an identical fashion under the NWPA (*i.e.*, whenever an EIS under (C) is specifically stated to be unnecessary, a similar statement is made for compliance with (E) and (F).[51])

The D.C. Circuit had construed NEPA to impose a wide-ranging substantive obligation on the former Atomic Energy Commission (AEC)—now the NRC—"to take environmental values into account" and to minimize environmental impacts in determining whether to authorize construction or operation of nuclear facilities.[52] The Supreme Court, however, subsequently ruled that NEPA is "essentially procedural."[53] Whether substantive or procedural in nature, NEPA has spawned intense litigation in the nuclear arena, usually arising from contentions that NRC failed to adequately consider some impact or alternative. If the future is anything like the past, section 102 of NEPA will be a matter of paramount importance in the case of the projected high level waste repository.

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50. *See, e.g.*, Boles v. Onton Dock, Inc., 659 F.2d 74, 76 (6th Cir. 1981)

51. *See* sections 112(e), 113(d) and 114(a)(4)(B), 42 U.S.C. §§ 10132(e), 10133(d) and 10134(a)(4)(B) (1982).

52. Calvert Cliffs Coordinating Comm. v. AEC, 449 F.2d 1109, 1112 (D.C. Cir. 1971). The D.C. Circuit has stated, among other things, that NEPA as applied to licensing actions under the Atomic Energy Act "mandates a rather finely tuned and 'systematic' balancing analysis in each instance." 449 F.2d at 1113. *See also* Public Service Co. v. NRC, 582 F.2d 77, 81 (1st Cir.), *cert. denied*, 439 U.S. 1046 (1978) (similar holding that NEPA requires NRC to minimize environmental harm); Izaak Walton League of America v. Marsh, 655 F.2d 346, 371, 377 (D.C. Cir.), *cert. denied*, 454 U.S. 1092 (1981) (NEPA imposes substantive requirement).

53. *See* Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 558 (1978), Strycker's Bay Neighborhood Council v. Karlen, 444 U.S. 223, 227 (1980).

An initial question raised by the EA provision is the extent to which NEPA applies. At its most extreme, this question evolves into an inquiry into whether an EIS must be prepared for each nomination.

This issue is directly addressed in section 112(e). That subsection expressly states that

> Except as otherwise provided in this section, each activity of the President or the Secretary under this section shall be considered to be a preliminary decisionmaking activity. No such activity shall require the preparation of an environmental impact statement under section 102(2)(C) of [NEPA], or to require any environmental review under subparagraph (E) or (F) of section 102(2) of [NEPA].

Note that this language clearly excludes preparation of an EIS only for "such activity." "Such activity" can refer either (a) to "each activity . . . under this section [112]" (*i.e., any* action under section 112) or (b) to each activity under section 112 which is a "preliminary decision-making activity."

If the former construction is correct, then quite clearly *no* EIS is required at the nomination stage. If the latter construction is correct, a more serious question is raised. This question arises due to subparagraph (F) of subsection 112(b)(1). That subparagraph states that:

> The issuance of any environmental assessment under this paragraph shall be considered to be final agency action subject to judicial review in accordance with the provisions of chapter 7 of Title 5 and section 119 of [the NWPA]. Such judicial review shall be limited to the sufficiency of such environmental assessment with respect to the items described in Clauses (i) through (vi) of subparagraph (E).

In short, paragraph (1)(F) indicates that issuance of an EA under section 112 is *not* a preliminary decision-making activity but instead a final agency action. An opponent of a repository therefore conceivably could contend that issuance of an EA is not immunized from the EIS requirement, that the issuance of an EA amounts to an EIS-triggering event under section 102 of NEPA and that the EA accordingly must meet EIS requirements.

There is a relatively compelling counterargument to this line of reasoning. First, it seems rather Kafkaesque to claim that an environmental report triggers a requirement for an even more intensive environmental report. Moreover, paragraph (F) expressly limits judicial review of the EA to "sufficiency" with respect to clauses (i) through (vi) of subparagraph (E). It is difficult to understand why Congress would so limit judicial review if a full EIS were contem-

plated. Logic suggests that an EIS is *not* what Congress had in mind. Finally, and in confirmation, the legislative history indicates that Congress did *not* intend that an EIS be prepared at the nomination stage. One of the principal objectives of the NWPA is to spell out with some precision the applicability of NEPA to the decision-making process with respect to repository siting.[54] The stage at issue here (that is, the nomination of sites by the DOE Secretary) was one of the most controversial in that repect. Congressman Ottinger, for example, sponsored efforts to require the preparation of an environmental impact statement (EIS) in accordance with NEPA at the nomination stage.[55] This position was, however, decisively rejected by the House Energy and Commerce Committee. That Committee adopted language imposing requirements to examine certain environmental matters but specifically barred application of any EIS obligations.[56] The House eventually worked out language requiring the preparation of "environmental assessments," but not EIS's at the nomination stage.[57] Moreover, the House subsequently expressly rejected a proposed amendment by Congressman Markey to require a full EIS at the nomination stage.[58] The controversy in the Senate was more elliptically resolved. Although not requiring DOE to prepare an EIS, the Senate instead required conformance with DOE's NEPA regulations.[59] The Senate, however, eventually acceded to the House's preference for an "environmental assessment" as opposed either to an EIS or to an ambiguous reference to DOE regulations.[60] In short, Congress opted for something other than an EIS at the nomination stage.

(c) How detailed must the EA be?

Given that an EIS is not required, the next question is, "what is?"

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54. *See, e.g.*, H.R. REP. NO. 491, Part 1, 97th Cong., 2d Sess. 47 (1982) ("The Committee has attempted . . . to provide a 'roadmap' for compliance by the Secretary of Energy and the Nuclear Regulatory Commission with . . NEPA "), 128 CONG. REC. H8165 (daily ed. Sept. 30, 1982) (Mr. Glickman: the proposed NWPA contains a NEPA "roadmap" which "carefully defines what environmental reports are required at any particular point").

55. *See* Amendment offered by Mr. Ottinger dated June 15, 1982, section 112

56. *See, e.g.*, H.R. REP. NO. 785, pt. I, 97th Cong., 2d Sess. 33, 36 (1982)

57. *See* H.R. 7187, discussed at 128 CONG. REC. H8161 (daily ed. Sept. 30, 1982 *See also* 128 CONG. REC. H8168 (daily ed. Sept. 30, 1982) (remarks of Congressman Dingell); *id.* at H8796 (daily ed. Dec. 2, 1982) (remarks of Congressman Ottinger)

58. *See* 128 CONG. REC. H8793-95 (daily ed. Dec. 2, 1982).

59. S. REP. NO 282, 97th Cong., 1st Sess. 11 (1981) (Senate Energy and Natural Resources Committee and Senate Environmental and Public Works Committee).

60. 129 CONG. REC. S15641-43 (daily ed. Dec. 20, 1982) (remarks of Senator McClure).

The starting point here is to inquire whether there are any applicable regulations outlining what an EA must contain. The answer turns out to be yes. NEPA did more than establish an EIS requirement; it established a new agency—the Council on Environmentl Quality (CEQ)—to coordinate NEPA matters for the federal government.[61] CEQ originally issued nonbinding "guidelines" interpreting NEPA. These guidelines were supplanted with regulations in 1978.[62] Under Executive Order 11991,[63] the CEQ regulations are binding on executive agencies such as DOE,[64] although the Supreme Court has left open their binding effect with respect to "independent" agencies such as NRC.[65] Moreover, DOE has explicitly adopted the CEQ NEPA regulations as its own. In particular, DOE regulations state that the agency adopts "the CEQ regulation for implementing the procedural provision of NEPA."[66] The CEQ regulations are thus an initial point of departure for purposes of evaluating what an EA must contain.[67]

Under the CEQ regulations, an EA ordinarily is a "concise public document" prepared to assess whether an EIS should be prepared.[68] It presumably focuses on whether a proposed action would significantly affect the environment. An EA, however, may be prepared simply to "facilitate preparation of [an EIS] when one is necessary."[69] The EA contemplated by section 112 is, if anything, such an animal. In particular, the NWPA expressly requires an EIS at a later stage when the Secretary recommends a final choice of reposi-

61. *See, e.g.*, 42 U.S.C. § 4342-44 (1982).

62. *See* 40 C.F.R. Part 1500 (1984).

63. 3 C.F.R. 124 (1978) *reprinted in* 13 Weekly Comp. of Pres. Doc. 808 (1977).

64. *See* Andrus v. Sierra Club, 442 U.S. 347, 357 (1979); Stop H-3 Ass'n v. Dole, 740 F.2d 1442, 1461 (9th Cir. 1984).

65. *See* Baltimore Gas & Electric v. NRDC, 462 U.S. 87, 99 n.12, 103 S. Ct. 2246, 2254 n. 12 (1983); San Luis Obispo Mothers for Peace v. NRC, 751 F.2d 1287, 1302 n.73 (D.C. Cir. 1984). The "independence" of NRC is statutorily provided for at 42 U.S.C § 5841(a)(1); *see also* Westinghouse Electric Corp. v. United States, 598 F.2d 759, 774-75 (3d Cir. 1979).

66. 10 C.F.R. § 1021.2 (1984).

67. It is perhaps pertinent to note that there is nevertheless some room to argue that the CEQ regulastions are inapplicable with respect to EA's prepared under the NWPA: Although the Senate version of what became the NWPA incorporated the DOE (i.e., CEQ) regulations for purposes of the environmental analysis required at the initial stages of the sitting process (*see* page 223 *supra*), there is nothing in the legislative history which clearly indicates that Congress intended to absorb all CEQ requirements for EA's when it used the term "environmental assessment" in the NWPA.

68. *See* 40 C.F.R. § 1508.9 (1984). *See generally* Township of Lower Alloways Creek v. Public Service Elec. & Gas Co., 687 F.2d 732, 740-41 (3d Cir. 1982).

69. 40 C.F.R. § 1508.9(a)(3).

tory site to the President.[70] The EA's for sites "nominated" by the Secretary for initial review are but a step along the way to preparing this ultimate EIS. EA's that are intended to facilitate the eventual preparation of an EIS are much more ambiguous in purpose and accordingly largely undefined in terms of required content. The only substantive requirement relating to such an EA in the CEQ regulations is found at 40 C.F.R. § 1508.9(b). This requires only that an EA include a "concise" discussion of the need for a proposal, alternatives to it, impacts of the proposed action and alternatives, and a list of persons and agencies consulted. These matters are certainly within the penumbra of the matters expressly required of an EA by the NWPA anyway. For practical purposes, then, the language of the NWPA controls what the EA should contain.[71] The only real gloss from the CEQ regulations is that the EA should be "concise."

The statute basically spells out three foci for the EA to discuss. Although to some degree these three foci are interrelated, they can be analyzed separately. The first focal point is the impact of site characterization activities. The second focal point is the impact of actual siting of a repository at the location under consideration. The third focal point is the decision process.

(i) Site Characterization Activities Under Clause (i) of § 112(b)(1)(E) and Alternatives Analysis

Under clause (i) of paragraph (E), the EA must contain

> an evaluation by the Secretary as to whether such site is suitable for site characterization under the guidelines. . . .

Clause (i) does not define what is "suitable." That is to say, one has to look outside the clause for guidance as to what the Secretary should examine to determine "suitability" for site characterization. The statute suggests two dimensions to "suitability." The first di-

70. 42 U.S.C. § 10134(a)(1)(D) (1982).

71. The language of the statute is the chief material available for elucidating the required contents of an EA for another reason: the legislative history relating to the contents of an EA is sparse. The requirement for an EA is a House provision, but neither of the bills covered by the pertinent House Reports (H.R. REP. NO. 491, 97th Cong., 2d Sess. (Interior) or No. 785 97th Cong., 2d Sess. (Energy)) contained a formal "environmental assessment" requirement at the nomination stage. The Energy Committee bill came closest, with a requirement for an EA phrased in much the same terms as the language which now appears in § 112(b)(1), but that requirement applied when a site was recommended for characterization. An EA at the nomination stage was first broached in H.R. 7187, a compromise bill worked up by committee and subcommittee chairmen and ranking minority members for consideration on the House floor *See* 128 Cong. Rec. H8161-99 (daily ed. Sept. 30, 1982).

mension of "suitability" under clause (i) relates to the appropriateness of the site for eventual use as a repository.[72] This will be discussed in the next section. The second dimension relates to impacts of, and alternatives to, characterization activities. As will be seen, clause (iii) specifically calls for an evaluation of the impacts of such activities. At first blush, clause (i) appears largely duplicative of clause (iii). However, the preamble in paragraph (E) specifically calls for the EA to discuss "alternative activities relating to site characterization to avoid . . . impacts." Clause (i) would doubtless be construed to require such an analysis. It is accordingly pertinent to focus for a moment on the question of alternatives.

Although we deal here with an EA, not an EIS, DOE critics will likely argue, especially in view of the preamble to paragraph (E) and aspects of the legislative history,[73] that the EA should be viewed as a mini-EIS on site characterization alternatives and that legal requirements relating to an EIS alternatives analysis should therefore be applied. It is accordingly relevant to note some of the principles which have been developed to guide the alternatives analysis under NEPA.

Under 40 C.F.R section 1502.14, the discussion of alternatives is the heart of the environmental impact statement requirement under NEPA. It "is intended to provide evidence that those charged with making the decision have actually considered other methods of attaining the desired goal, and to permit those removed from the decisionmaking process to evaluate and balance the factors on their own."[74] "The purposes of NEPA are frustrated when consideration

72. There is an argument that Clause (i) does not encompass appropriateness of a site for eventual use as a repository. That argument is that Clause (ii) specifically calls for evaluation of such matters only with respect to guidelines that do not require characterization as a prerequisite.

73. For example, in arguing against Mr. Markey's proposal to require an EIS rather than an EA at the nomination stage, proponents of the EA emphasized the thoroughness of the projected EA. Congressman Udall stated that an EA "is just about as good as an environmental impact statement" under the stringent requirements of the NWPA. *See* 128 CONG. REC. H8795 (daily ed. Dec. 2, 1982). Consonant with this remark, Congressman Udall's Interior Committee report explains that

> The Committee intends that throughout the repository development program, the Secretary and other agencies meet the general requirements and the spirit of NEPA. Where the Committee has specified that an environmental impact statement under NEPA is not required, the [Committee's language] nonetheless provides for the gathering and public consideration of relevant information and for use of informal hearings to provide educational and participatory opportunity.

H.R. REP. No. 491, 97th Cong., 2d Sess. 48 (1982).

74. Sierra Club v. Morton, 510 F.2d 813, 825 (5th Cir. 1975).

of alternatives and collateral effects is unreasonably constricted."[75]

The discussion of alternatives is bounded by a rule of reason.[76] Under this rule, remote and speculative alternatives need not be discussed.[77] Similarly, "[a]n alternative which would result in similar or greater harm need not be discussed."[78] In general, the alternative of "no action" must be considered.[79]

It is noteworthy that the NWPA places several specific constraints on the range of alternatives which are available for consideration in the EIS prepared for the repository ultimately recommended by the DOE Secretary to the President. In particular, under section 114(f), a properly developed EIS for the initial repository need not consider the alternatives of (a) no action, or (b) disposal other than in a repository. Moreover, the EIS need not consider alternative time schedules for construction and availability.[80] It follows as a logical matter that such site characterization activities as are required to prepare an EIS for the initial repository, and otherwise to fulfill the statute for this purpose, are likewise necessary. The alternative of no site characterization is thus unavailable as an option with respect to the first repository unless in fact no site characterization is required to prepare the EIS for that repository. Moreover, the timing of such characterization would also appear to be dictated by the statute.[81]

In addition to these implied restrictions on the alternatives which must or should be discussed in an EA under the NWPA, section 113 also provides some express limits on the alternatives analysis at that site characterization stage. *First*, subsection (b) prescribes an elaborate procedural mechanism to develop a site characterization plan.[82] *Second*, subsection (c) bars site characterization activities unnecessary to supply data for the eventual EIS. *Third*, paragraph (B) of subsection (b) places limits in terms of radioactive material and specific requirements for reclamation of the site and mitigation of significant adverse environmental effects due to site characteriza-

75. Greene County Planning Bd. v. Federal Power Comm'n., 559 F 2d 1227, 1232 (2d Cir. 1976), *cert. denied*, 434 U.S. 1086 (1978).

76. Robinson v. Knebel, 550 F.2d 422, 425 (8th Cir. 1977).

77. Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 557 (1978)

78. Sierra Club v. Morton, 510 F.2d 813, 825 (5th Cir.1975).

79. *See, e.g.*, Coalition for Canyon Preservation v. Bowers, 632 F 2d 774 (9th Cir 1980).

80. 42 U.S.C. § 10134(f) (1982). *See also* section 114(a)(1)(D), 42 U.S.C. § 10134(a)(1)(D).

81. This implication clearly holds only with respect to EAs prepared in connection with the first repository. *See* note 22 *supra*.

82. 42 U.S.C. § 10133(b)(1)(A) (1982).

tion activities. These constraints are appropriately factored into the alternatives analysis to determine what alternatives are "reasonable" and to evaluate their impacts.

(ii) Clause (iii) of Section 112(b)(1)(E) and the Question of a Worst Case Analysis for Site Characterization Activities

Clause (iii) requires "an evaluation by the Secretary of the effects of site characterization activities at such site on the public health and safety and the environment." This requirement is relatively straight-forward, except with respect to impacts which are uncertain to occur. Impacts which are uncertain raise an issue which is often critical in an environmental analysis. This is the consideration which must be afforded to the so-called "worst-case."

Again, there is little lore available on this subject with respect to an EA, but there are a host of authorities bearing on it in the EIS area. Unfortunately, these authorities are not in accord on critical issues. Because the EA may be viewed as a "mini-EIS" with respect to site charatcerization and because the worst-case requirements of an EIS therefore may be applied to an EA with respect to the site characterization questions, it is useful to explore briefly the confusion which reigns with respect to worst-case analysis for EIS's prepared under NEPA.

There are numerous cases, generally now somewhat dated, which hold in effect that if an agency establishes by expert opinion or other evidence that a worst case event is highly improbable, that event need not be discussed in an EIS prepared for purposes of NEPA.[83] More recent CEQ regulations, however, take an arguably much different approach. The CEQ regulations basically state that if information relevant to adverse impacts is important to a reasoned decision and is unknown, the agency must obtain the information if economically and technically feasible to do so. If this is not feasible, the agency must "include a worst-case analysis and an indication of the probability or improbability of its occurrence."[84] In its guidance document entitled "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations,"[85] CEQ

83. *See, e.g.*, Carolina Envtl. Study Group v. United States, 510 F.2d 796, 799-800 (D.C. Cir. 1975) (Class 9 event at reactor so improbable it need not be discussed in EIS for individual nuclear plant); Porter County Chapter of the Izaak Walton League of Am. v. AEC, 533 F.2d 1011, 1017-18 (7th Cir.), *cert. denied*, 429 U.S. 945 (1976). *See also* Warm Springs Dam Task Force v. Gribble, 621 F.2d 1017, 1026 (9th Cir. 1980) (EIS for a dam project need not discuss obvious and unacceptable worst-case effects.)

84. 40 C.F.R. § 1502.22 (1984).

85. 46 Fed. Reg. 18026, 18032 (1981) (to be codified at 40 C.F.R. pt. 1500-1508)

has confirmed that it intends its regulations to require discussions of the spectrum of adverse impacts "and the details of their potential consequences."

Although the CEQ regulations purport to require a worst-case analysis only for EIS's, the Ninth Circuit has recently applied that requirement to an environmental assessment document issued to supplement an EIS.[86] Given that an EA prepared for purposes of section 112 of the NWPA may be viewed as embodying a mini-EIS on site characterization activities, it is entirely conceivable that some group opposed to a repository will insist that to be adequate, the section 112 EA must include a worst-case analysis of those activities.[87] There are several counter arguments to the view that a worst-case analysis should be done (*e.g.*, the CEQ regulations do not apply, the older precedent should still control, the probabilities of an accidental release are so low that the information is simply not relevant). However, the issue may not be worth raising. Put another way, it may make sense simply to set out a reasonable worst-case analysis as to site characterization activities.

More particularly, the "worst-case" that could be expected from site characterization would appear quite limited. As to radiological impacts, it would be bounded at the outside by the amount of radioactive material (if any) which the Secretary intends to employ in tests during site characterization activities. The statute provides that such material may be employed at a repository only with NRC concurrence, and that if such material is employed, "the Secretary shall use the minimum quantity necessary to determine the suitability of such candidate site for a repository, but in no event more than the curie equivalent of 10 metric tons of spent nuclear fuel; and such radioactive fuel shall be fully retrievable."[88] Worst-case consequences are similarly limited by the pre-characterization requirement for plans to "control any adverse, safety-related impacts from

(proposed March 17, 1981). CEQ proposed (48 Fed. Reg. 36,486 (1983) to be codified at 40 C.F.R. pt. 1502) (proposed August 8, 1983) but withdrew (49 Fed. Reg. 4803) (1984) (40 C.F.R. pt. 1502) (proposed Feb. 3, 1984) guidance narrowing the scope of its worst-case requirement. The Council recently issued an Advance Notice of Proposed Rulemaking soliciting comments on a variety of issues relating to the existing requirement, and may ultimately revise it. 49 Fed. Reg. 50,744 (Dec. 31, 1984) (to be codified at 40 C.F.R. pt. 1502) (proposed Dec. 28, 1984).

86. *See* Southern Oregon Citizens Against Toxic Sprays, Inc. v. Clark, 720 F.2d 1475, 1480-81 (9th Cir. 1983), *cert. denied*, 105 S. Ct. 446 (1984).

87. *See* Save Our Ecosystems v. Clark, 747 F.2d 1240 (9th Cir. 1984) (environmental document must contain a worst-case analysis when it is the functional equivalent of an EIS).

88. Section 113(c)(2)(B) (i)-(ii), 42 U.S.C. § 10133(c)(2)(B)(i)-(ii) (1982).

. . . site characterization activities" and for "mitigation of any significant adverse environmental impacts raised by site characterization" should the site ultimately be determined unsuitable.[89] Furthermore, post-characterization requires the removal of any radioactive materials from the site as promptly as possible in the event that site characterization activities are terminated. The DOE is required both to reclaim the site and to mitigate significant adverse environmental impacts.[90] Under these conditions, it seems likely that any reasonable worst-case accident would be highly improbable and, in any event, not terribly serious. Indeed, it may turn out that the reasonable worst-case impacts are strictly non-radiological and are mundane matters such as increased risk of traffic accidents due to construction activities and so forth. In short, the worst-case would likely be quite tolerable.

B. Requirements of Section 112(b)(1)(E) Relating to Actual Construction and Operation

More complicated issues are posed by the various requirements in section 112 which look beyond site characterization. The pertinent requirements are set forth in clauses (i), (ii), (iv) and (vi).

1. Clause (i)

As already noted, clause (i) requires the Secretary to evaluate a site's suitability for characterization activities, and this arguably includes an evaluation of the site's appropriateness for eventual use as a repository.

The statute makes environmental (*e.g.*, hydrology, seismic activity, proximity to water supplies) and economic (*e.g.*, affect on water rights, valuable mineral rights) impacts broadly germane for purposes of the DOE guidelines; presumably all such impacts associated with site characterization should be discussed in the EA. In addition, the legislative history must be searched for the special nuances arguably intended by Congress in the application of the various factors enumerated for consideration in the statute. These are scattered throughout the legislative history.[91]

As a logical matter, "suitability" would also encompass patent disqualifications. That is, if the site is obviously disqualified under a

89. 42 U.S.C. § 10133(b)(1)(A)(ii)-(iii) (1982).

90. 42 U.S.C. § 10133(c)(3)-(4) (1982).

91. *See, e.g.*, 128 CONG. REC. H8778 (daily ed. Dec. 2, 1982) (Udall-Seiberling colloquy that areas adjacent to federally protected areas such as national parks may be used only as a last resort).

mandatory provision in the statute or any applicable standards or regulations, then it is not "suitable." For example, the statute bars siting a repository in a highly populated area or adjacent to an area with a population density not less than 1000 persons per square mile. The DOE guidelines, EPA standards, and NRC criteria obviously play a major role at this stage. Unfortunately, until final EPA standards are issued,[92] it is not possible to definitively assure compliance with clause (i). It is pertinent to note that both the DOE guidelines and the proposed EPA standards contain numerous proposed disqualifying criteria. For example, EPA's proposed standards, if adopted, would bar locating a repository in an area "where there has been mining for resources or where there is a reasonable expectation of exploration for scarce or easily accessible resources in the future." Furthermore, the proposed EPA standards bar repositories in locations "where there is a significant concentration of any material which is not widely available from other sources."[93]

2. Clause (ii) and the Question of a Worst-Case Analysis for Actual Repository Operation

Clause (ii) requires an evaluation by the Secretary as to whether each site

> is suitable for development as a respository under each . . . guideline that does not require site characterization as a prerequisite for application of such guideline.

Clause (ii) is subject to the same kind of ambiguities already discussed with respect to clause (i); namely, "suitable" is not self-defining and DOE has not issued final guidelines.

There is a broader concern triggered by clause (ii); that is that the clause can be interpreted to impose a relatively unbounded requirement to discuss environmental impacts for which information supplied by site characterization is not necessary. This translates into what potentially could amount to the bulk of an EIS. Put another way, clause (ii) will likely be construed in light of the preamble to subparagraph (E) which calls for a "detailed statement of the basis for such recommendation" and in light of comments like Congressman Udall's remark that an EA "is just about as good as an environmental impact statement."[94] These may be read to support the

92. EPA published proposed standards at 47 Fed. Reg. 58196 (1982) (to be codified at 40 C.F.R. pt. 191 (proposed Dec. 17, 1982). It was statutorially obligated to issue final standards by January 7, 1984).

93. *Id.* at 58,205.

94. 128 CONG. REC. H8795 (daily ed. Dec. 2, 1982).

view that an EA must provide all the information which a full-scale EIS would provide, except with respect to information for which site characterization activities are necessary antecedents. In short, clause (ii) arguably converts an EA into an "almost EIS."

One possible counterargument to this position is to view "site characterization" broadly as the entire information-gathering process relating to all aspects of a site and to urge that virtually all analysis pertaining to a site is contingent upon "characterization" and thus need not be discussed in detail in an EA. But the statute defines "site characterization" in terms of laboratory or field research aimed at resolving geological uncertainties,[95] not in terms of consideration of surface, demographic, and socioeconomic factors. In brief, one cannot escape clause (ii) by an expansive concept of site characterization. A conservative approach to compliance with section 112 would therefore involve as complete a presentation on non-subsurface geological factors as possible.

Site characterization, however, may be a necessary antecedent to a reasonable presentation concerning geohydrology, geochemistry, rock characteristics and site geometry. An important question is posed as to how to treat such matters in the EA absent the data which would be supplied by site characterization activities. This question quickly translates into a concern for whether the EA must present a worst-case analysis with respect to any impact analysis for which geological information is important but missing until supplied by site characterization activities.

As already noted, the CEQ regulations relating to EIS's provide that in situations involving gaps in knowledge relating to significant adverse effects, an agency is supposed to obtain the relevant information, or, if that is economically or technically infeasible, to supply a worst-case analysis complete with an indication of the probability or improbability if its occurence.[96] The most likely means by which a repository might fail so as to result in a potential hazard is through some groundwater pathway. The existence and extent of this possible failure mechanism is likely to be relatively uncertain until a particular site's hydrogeology is explored in the course of site characterization activities.

If the CEQ regulations were applied, DOE presumably must thoroughly "characterize" the site in question, or establish that it is

95. 42 U.S.C. § 10101(21)(B) (1982).
96. 40 C.F.R. § 1502.22 (1984).

technically or economically infeasible to do so and supply a worst-case analysis.

There are a number of indications, however, that the regime anticipated by CEQ's worst-case regulation was not what Congress intended for the EA's. With the limited exception of sites under development by August 1, 1982,[97] the statute forecloses a thorough characterization of a site until it has been approved for such work by the President. Moreover, the EA provision does not expressly call for an analysis of the geochemical/hydrologic impacts of actual operation except to the extent that discussion of such impacts is not dependent on site characterization. Finally, the principal argument advanced by Congressmen Broyhill and Lujan against Mr. Markey's proposal to require an EIS at the nomination stage was that requiring the Secretary to file an EIS made no sense "before he even steps on the ground."[98] In the words of Congessman Lujan, "if you cannot get into the property you cannot make an environmental impact statement."[99] In combination, these aspects of the statute and its legislative history seem to imply that Congress anticipated that nomination would necessarily be made in the context of uncertainty and that dabbling with "worst-case" considerations would be postponed until the characterization stage was completed.

Unfortunately, section 112(b)(3) complicates this analysis. Section 112(b)(3) states that

> In evaluating the sites nominated under this section prior to any decision to recommend a site as a candidate site, the Secretary shall use available geophysical, geologic, geochemical and hydrologic, and other information and shall not conduct any preliminary borings or excavations at a site unless (i) such preliminary borings or excavation activities were in progress upon the date of enactment of this Act or (ii) the Secretary certifies that such available information from other sources, in the absence of preliminary borings or excavation, will not be adequate to satisfy applicable requirements of this Act or any other law: Provided, that preliminary borings or excavation under this section shall not exceed a diameter of 6 inches.

In short, section 112(b)(3), while appearing to state a policy against resolution of geological uncertainties at the nomination stage, in fact permits at least limited resolution of these uncertainties if existing information is not "adequate" under "any . . . law." If the

97. *See* § 112(f), H.R. REP. No. 785, 97th Cong., 2d Sess. 6 (1982), 42 U.S.C. § 10132(f) (1982).

98. 128 CONG. REC H8794 (daily ed. Dec. 2, 1982) (statement by Rep. Broyhill).

99. *Id.* at H8794-95.

CEQ regulations (in particular, the CEQ worst-case requirements) relating to EIS's are applicable, then they are arguably a "law" requiring the compilation of new information, at least as could be derived from preliminary borings up to the permitted 6-inch limit.

One way out of this dilemma is to leapfrog the rather conflicting indications in the statute. There are at least two relatively simple arguments against a worst-case analysis that do not depend on some form of hyperventilated analysis of the language in the NWPA. First, section 112(e) makes (subject to the ambiguities already noted) the EIS requirement inapplicable at this stage, from which it arguably follows that the CEQ worst-case regulation similarly should not be applied. This argument is attractive in that a worst-case analysis relating to any uncertainties will presumably be supplied at a later time (i.e., at submission of an (EIS) and before significant resources are irretrievably committed. Second, one could argue that consideration of worst-case consequences of actual operation of a repository are simply not "essential" to the decision at the nomination stage. Indeed, Congress has arguably determined consideration of such consequences to be non-essential by adopting statutory language impeding the study of consequences at the EA stage. Since 40 C.F.R. § 1502.22 does not require worst-case analysis unless the information is essential, one could argue that the regulation, even if applicable, does not require a worst-case analysis.

The chief risk in any worst-case analysis is undue emphasis on remote possibilities which further investigation would reveal to be either impossible or less egregious than originally projected. If a worst-case analysis is to be included in EA's, it necessarily should be of a general and clearly tentative variety, pending the development of further information.

3. Clause (iv) and Questions Relating to the Methodology and Standards for Site Screening and Selection

Clause (iv) provides that the EA must contain

> a reasonable comparative evaluation by the Secretary of such site with other sites and locations that have been considered.

Clause (iv) could be construed in several different ways. *First*, it could be viewed as seeking an explanation of the process by which the Secretary arrived at the initial sites nominated as possible candidates for characterization. *Second*, it could be interpreted as seeking only a comparison of the particular site for which the EA is submitted with the other sites nominated. *Third*, it might be viewed as seeking both types of analysis.

As a matter of logic, an EA should compare the site for which it is prepared with the other sites nominated. One of the purposes of an EA is to assist in winnowing down the list of candidate sites to three for more detailed characterization. Some sort of comparison is obviously important to that purpose. The question of whether the comparison must also discuss how the Secretary arrived at the initial sites is more difficult. Discussion of the Secretary's approach would seem to be within the bounds of reasonable interpretation of the clause on its face. It also seems likely that DOE critics will complain if a discussion is omitted from the Secretary's process of selecting the initial sites to be nominated.

The legislative history is not terribly helpful. The language in Clause (iv) is a modified version of the language proposed in Clauses (iv) and (v) of section 113(b)(1)(A) of H.R. 6598, as reported by the House Committee on Energy and Commerce.[100] The section-by-section analysis provided for the Energy Committee simply paraphrases the language of the bill.[101] The situation on the Senate side is somewhat more illuminating. At the time of final adoption of the NWPA by the Senate, Senator McClure suggested that the comparative evaluation in clause (iv) was to be "of the site which is subject of the assessment and other sites which have been nominated."[102] The authoritative weight of this interpretation,

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100. The two clauses in § 113(b)(1)(A) of H.R. 6598 provided as follows:

> (iv) a reasonable comparative evaluation by the Secretary of current information with respect to such candidate site and other locations in the same geologic medium as such candidate site, under the guidelines established under section 112(a);
>
> (v) a description of any other sites that have been considered by the Secretary for site characterization. . . .

H.R. REP. No. 785, Part I, 97th Cong., 2d Sess. 7 (1982).

Section 112(b)(1)(C) of the House Energy bill provided that when a site was initially recommended for characterization and prior to preparation of an EA, the Secretary was to supply:

> a description of the method by which such candidate site was selected for proposed recommendation to the President. . . .

Id. at 6. This language, which would appear to require a discussion of how the Secretary approached the initial site selection problem, does not have an exact counterpart in the bill eventually enacted.

101. *See* H.R. REP. No. 785, Part I, 97th Cong., 2d Sess. 64 (1982). Similarly, Clause (iv) did not receive a dispositive explanation on the House floor. The closest explanation was that offered by Congressman Ottinger (who in fact preferred an EIS but supported the negotiated bill requiring an EA, *see* 128 CONG. REC. H8794 (daily ed Dec. 2, 1982)). Congressman Ottinger inserted a black-dotted statement (i.e., a statement not actually presented on the Floor) suggesting that the nomination/recomendation process was to produce "genuine" alternatives. *See id.* at H8796.

102. 128 CONG. REC. S15,641 (daily ed. Dec. 20, 1982). *See also id.* S15,656-57

however, is limited by the fact that clause (iv), as Senator McClure admitted, is a House provision.

Fortunately, this issue is rendered largely moot by the preamble to DOE's final section 112 guidelines. DOE there discusses its general approach in arriving at the initial nine sites to consider for nomination.[103] This general discussion clarifies the basis for the selection of the nine sites which are being examined for purposes of initial nominations and recommendations.

An even more fundamental questions remains: how is the Secretary to select the initial set of sites. An examination of alternatives limited to sites which do not meet basic criteria would seem suspect and, in the words of Congressman Ottinger, not "genuine." Clearly the selection process must be designed in such a fashion that a fair spectrum of available alternatives are considered. Certain sites are obviously excluded by the statute (*e.g.*, the population density criterion in section 112) or by the mandatory exclusions in the proposed EPA standards, DOE guidelines and the final NRC criteria. But that leaves a potentially enormous number of sites to consider.

Not surprisingly, the most detailed current thought on the selection process appears in DOE's final guidelines.[104] These guidelines anticipate a three stage site-selection process. At the first stage, *i.e.*, that of identifying a "potentially acceptable site," DOE would apply some ten "disqualifying conditions." The agency would make a "level 1" finding for each of these disqualifying conditions.[105] Presumably this would result in a list of possibly acceptable sites.

At the second stage, *i.e.*, that of nomination for and recommendation of sites for characterization, DOE would group sites into geohydrologic categories. The agency would attempt to "balance . . . favorable conditions and potentially adverse conditions" and select sites to recommend from different categories.[106] The agency would apply all of its qualifying and disqualifying guidelines at this stage. DOE would make "level 1" and "level 3" determinations, and possibly a higher level finding ("level 2" in DOE's lexicon) if the evidence were sufficient.[107] At the third stage, *i.e.*, repository site selection, all conditions would be applied and DOE would make more rigorous findings (*i.e.*, "level 2" or "level 4") on all

103. *See* 49 Fed. Reg. 47,716, 47,747 (to be codified at 10 C.F.R. pt. 960) (proposed Dec. 6, 1984).

104. 49 Fed. Reg. 47,714 (1984).

105. 49 Fed. Reg. 28,137 (1984) (to be codified at 10 C.F.R. § 960.3-2-1).

106. 49 Fed. Reg. 47,730 (1984) (to be codified at 10 C.F.R. § 960.3-2-2-2).

107. 49 Fed. Reg. 28,137 (1984); *see* 10 C.F.R. § 960.5-2-11, App. III (1985).

conditions.[108]

It seems clear that the DOE guidelines are "rules" for purposes of 5 U.S.C. § 551(4). An agency is ordinarily bound to follow its own rules and regulations.[109] If the guidelines were properly adopted, the procedure which they dictated for site selection would arguably be legally controlling. If DOE followed the specified procedure, it would accordingly be difficult to fault the agency's selection process.[110]

Unfortunately, the real world is not that easy. More specifically, there is already a seemingly broad divergence between the approach envisioned in DOE's guidelines for the initial screening of sites, and what DOE has actually done. The preamble to DOE's guidelines indicates that they contemplate a survey of the 17 physiographic provinces in the 48 continguous states, with a further narrowing of the survey to the most propitious regions, and then to areas within the regions. The survey would then narrow to locations within areas, and finally to sites.[111] This sounds like a relatively comprehensive formula. However, DOE had largely completed its initial screening process before enactment of the NWPA. Indeed, the month following the Act's adoption, DOE formally identified nine potential areas in six states for the first repository.[112]

DOE indicates in the preamble to its final guidelines that its initial selection of 9 sites arose in a less comprehensive fashion than that apparently required by the guidelines. More particularly, only four of the nine sites (namely, the four bedded salt formations in Texas and Utah) were selected on the basis of a national survey and progressive narrowing to areas and locations.[113] Three of the sites (the salt domes in Mississippi and Louisiana) were selected on the basis of a screening of some 200 salt domes. The two other sites (a basalt site in Washington and the tuff site in Nevada) were derived from a search for suitable sites on federal lands where radioactive

108. *Id.*

109. Vitarelli v. Seaton, 359 U.S. 535 (1959); Bray v. United States, 515 F.2d 1383, 207 Ct. Cl. 60 (1975); Union of Concerned Scientists v. Atomic Energy Comm'n, 499 F.2d 1069, 1082 (D.C. Cir. 1974).

110. Courts ordinarily insist on compliance with an agency's regulation, unless they are inconsistent with the statute. *See, e.g.*, Service v. Dulles, 354 U.S. 363 (1957); DeGregorio v. O'Bannon, 500 F. Supp. 541, 546-47 (E.D. Pa. 1980) (Pollak, J.) *See also* Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 549 (1978) (courts not to engraft procedures beyond statutory minimum).

111. 49 Fed. Reg. 47,715 (1984) (to be codified at 10 C.F.R. § 960.3).

112. GAO, *supra* note 28, at 3; 49 Fed. Reg. 47,716 (Dec. 6, 1984) (discussion).

113. 49 Fed. Reg. 47,716 (1984).

materials were already present.[114]

DOE takes the position that its guidelines do not apply to the initial screening of sites for the first repository.[115] The agency relies on section 116 of the Act for this argument.[116] That section requires DOE to notify states harboring "potentially acceptable sites" by March 7, 1983 (i.e., well before DOE would have final guidelines, even if it had met the statutory deadline for them). DOE in essence argues that section 116 constitutes congressional recognition that the initial screening would be complete by the time of enactment and would not have to take place under the guidelines. NRC has concurred in this construction.[117]

Since DOE cannot obtain much solace from its guidelines to protect its initial screening, one must ask whether there are any other potentially applicable legal requirements with which DOE's initial screening must conform. The uncertainties relating to the norms governing screening and the "balancing" which is entailed in nomination and recommendation can be addressed in generic terms.

There are basically two approaches to selecting among non-excluded sites: optimization and suitability. Under the optimization approach, DOE would engage in a process designed to identify the five "best" sites in the country, consistent with the various statutory and regulatory exclusions, for nomination. Under the suitability approach, DOE would engage in a much less sweeping effort to identify five sites which, although not necessarily the best, all appear "acceptable" for use as a repository. DOE's guidelines, although relatively demanding, leave room for either approach to be adopted, or something in between. The legal question there is whether DOE is obligated by statute to pursue a particular approach. Three statutes are germane to the optimization question: the NWPA, the AEA,[118] and NEPA. As discussed below, the controlling legal requirements for the site-selection process for the ini-

114. *Id.*

115. *See, e.g.*, 49 Fed. Reg. 47,716 (1984) & 10 C.F.R. § 960.3-2 (1985).

116. *Id.*

117. 49 Fed. Reg. 28,140 (1984). DOE's reading of Section 116 draws some support from other portions of the statute. For example, § 112(b)(1)(A) requires only that the guidelines be *issued* (not used) before the initial nomination. Section 112(a) calls for the guidelines to be "used" only for purposes of the initial "recommendations." This seems to leave room for non-application of the guidelines to the initial screening.

118. The Atomic Energy Act is relevant because the repository is subject to NRC Atomic Energy Act licensing authority pursuant to Section 202 of the Energy Reorganization Act of 1974, 42 U.S.C. § 5842 (1982). *See also* § 114(b), (d) and (f) of the NWPA, 42 U.S.C. § 10134(b), (d) and (f) (1983).

tial repository are somewhat ambiguous.[119]

The NWPA, on its face, does not require optimization. To the contrary, it provides only that the Secretary must nominate candidate sites which he "determines *suitable* for site characterization for selection of the . . . repository site" (emphasis added).[120] The various House and Senate reports applicable to the new statute also do not call for optimization. Moreover, it seems unreasonable to imply that optimization is required. The NWPA calls for consideration of a variety of political, social, and aesthetic factors in addition to environmental and safety factors. Most of these factors are not susceptible to quantification such that an objective optimization would be possible. In addition, certain of these factors (particularly of the political, social and aesthetic variety) are relatively transitory—that is, they change over time as a function of public mood and perception. This tends to render an attempt to optimize rather meaningless. Even more to the point, given the square statutory prohibitions against selection of certain sites (*e.g.*, the population criterion in section 112(a)) and given the potential veto authority which States and Indian tribes may employ in an arguably arbitrary fashion under sections 116 and 118, it would appear largely serendipitous if the "best" site somehow emerged at the conclusion of the process.

Similarly, the AEA does not require optimization. The guiding substantive requirement under the AEA is "to protect health or to minimize danger to life or property" and "to promote the common defense and security."[121] In the health and safety context, this has

119. *See, e.g.*, Nuclear Regulatory Commission, *Regulatory Guide 4.17* (July 1982) ("Standard Format and Content of Site Characterization Reports for High-Level-Waste Geologic Repositories"). In a fashion similar to the guidelines, Regulatory Guide 4.17 calls for a discussion of (a) "the application" of various criteria and (b) the method by which a site was selected, including "value judgments made, and an explicit identification of the tradeoffs" but does not suggest that DOE or any other agency must employ any particular methodology or decision-making rule in selecting candidate sites. *Id.* at 4-5.

120. Section 112(b)(1)(A) & (C), 42 U.S.C. § 10132(b)(1)(A) & (C) (1983). It is also pertinent to note that § 121—the provision for EPA standards and NRC regulations—does not on its face require optimization in terms of "perfect" safety or maximization of any other parameter. Legislative history on § 121 is sparse. Such as appears suggests that, aside from certain specified engineering requirements, EPA and NRC were to direct their regulatory requirements only at significant risks and were to impose such requirements only if the attendant costs were reasonably related to the expected benefits. *See, e.g.*, 128 CONG. REC. S15669 (daily ed. Dec. 20, 1982) (remarks of Senator Schmitt); *id.* H10521 (daily ed. Dec. 20, 1982) & E5461-62 (daily ed. Dec. 29, 1982) (reprinting DOE letter on how EPA and NRC authority is to be exercised).

121. 42 U.S.C. § 2201(b) (1982).

been construed to require a "reasonable assurance" of public health and safety. This does not necessitate a finding of perfect safety for a particular regulated activity. Indeed, perfect safety has been viewed as a goal which is incompatible with "modern technological societies" and the AEA has been specifically construed not to require an "unattainable guarantee of risk-free operation."[122] In the words of one court, "[a]bsolute or perfect assurances are not required by [the AEA], and neither present technology nor public policy admit of such a standard."[123] For analogous reasons, the AEA does not generally impose some kind of optimization requirement.[124] Instead, it in general requires only that there be a reasonable assurance that duly promulgated safety standards will be met.[125] NRC's specific requirements for licensing a "geologic repository" are codified in 10 C.F.R. part 61. In accordance with the general approach under the AEA, NRC's basic requirements for a repository license as specified in part 60 are simply (1) that construction of the repository has been "substantially completed in conformity with [DOE's license] application . . ., the provisions of the Atomic Energy Act, and the rules and regulations of the Commission;" (2) that the activity to be conducted at the repository "will be in conformity with [DOE's] application . . ., the provisions of the Atomic Energy Act and the Energy Reoganization Act, and the rules and regulations of the Commission;" (3) that "issuance of the license will not be inimical to the common defense and security and will not constitute an unreasonable risk to the health and safety of the public;" and (4) that the action is in compliance with the Commission's NEPA

122. Nader v. NRC, 513 F.2d 1045, 1050 (D.C. Cir. 1975); *see also* North Anna Envtl. Coalition v. NRC, 533 F.2d 655, 665 (D.C. Cir. 1976); Crowther v. Seaborg, 312 F. Supp. 1205, 1231 (D. Colo. 1970) (discussing basic radiation protection standards in 10 C.F.R. pt. 20).

123. Citizens for Safe Power v. Nuclear Regulatory Comm'n, 524 F.2d 1291, 1297 (D.C. Cir. 1975).

124. The Commission, however, has adopted a policy (the "ALARA" policy) encouraging its licensees to "make every reasonable effort to maintain radiation exposures and releases of radioactive materials in effluents to unrestricted areas, as low as is reasonably achievable." 10 C.F.R. § 20.1(c) (1984). "ALARA" is defined to "tak[e] into account the state of technology and the economics of improvements in relation to benefits to the public health and safety, and other societal and socioeconomic considerations, and in relation to the utilization of atomic energy in the public interest." *Id.* The ALARA policy may be read to encourage a kind of optimization with respect to exposure reduction, but it is not a requirement, and it is of limited applicability.

125. In general, it is not permissible in licensing proceedings before the Commission to challenge the Commission's safety standards. *See, e.g.*, Philadelphia Elec. Co., 8 A.E.C. 13, 20-21 (1974). Thus, compliance with safety standards is, absent "special circumstances" (*see* 10 C.F.R. § 2.758(b) (1984)), sufficient to warrant issuance of a license under the Act.

requirements.[126]

One must look to judicial interpretation for more precise guidance as to the existence of an optimization requirement, or other similar substantive requirement, in the context of siting facilities under AEA. As it happens, considerable lore has developed concerning AEA requirements in the case of siting nuclear power plants. More specifically, the AEA has been viewed as allowing rejection of a nuclear power plant site only if a "substantially preferable" alternative site is available.[127] These decisions are arguably germane to the problem of siting a nuclear waste repository. The result reached in the reactor siting cases, however, has rested on interpretations of the requirements of the AEA in combination with NEPA. The focus of concern for an optimization requirement thus shifts to NEPA.

The Commission's basic NEPA requirements are set forth in 10 C.F.R. part 51. Part 51 does not contain a "substantive" standard for geological repositories. Its most specific requirement with respect to repositories is that DOE characterize at least "three sites representing two geologic media at least one of which is not salt. . . ."[128] Part 51 nowhere expressly sets forth a standard of optimization, "substantial preferability," or any other standard for purposes of evaluating the siting of any nuclear facilities.

As with the AEA, one must turn to the general law under NEPA for any substantive requirement, including a requirement of optimization, applicable to the siting of a facility. If NEPA is "essentially procedural," as the Supreme Court has said, it presumably can not be construed to impose a substantive optimization requirement, or, for that matter, any other significant substantive requirement. Nevertheless, the First Circuit has suggested that NEPA imposes a substantive requirement to identify and presumably opt for a "substantially preferable" alternative. In particular, in *Roosevelt-Campobello International Park v. EPA*,[129] the court indicated that EPA under NEPA not only should determine if a proposed site for a port is "environmentally acceptable" but also should conduct an alternatives analysis to examine whether options exist which are "substantially preferable from an environmental

126. 10 C.F.R. § 60.41 (1984).

127. *See, e.g.*, New England Coalition on Nuclear Pollution v. NRC, 582 F.2d 87, 95-96 (1st Cir. 1978) ("obvious superiority" standard for evaluating alternatives); Seacoast Anti-Pollution League v. NRC, 598 F.2d 1221, 1228-33 (1984) (1st Cir. 1979) (similar).

128. 10 C.F.R. § 51.40(d) (1984).

129. 684 F.2d 1041, 1046-47 (1st Cir. 1982).

standpoint." Even more confusing in terms of a substantive requirement to select some "best" or "better" site, there are suggestions that NEPA requires selection, or at least identification, of what would be considered "to be the optimum site" if a project is publicly funded.[130]

As a minimum, DOE should be prepared to demonstrate that it has considered a reasonable range of environmentally acceptable sites in making its nominations and has complied with the specific requirement for evaluation of alternatives specified in NRC's NEPA regulations. A more conservative approach is to be prepared to show, as in the reactor construction permit cases and *Roosevelt-Campobello International Park*, that no legally-permissible alternative to the sites nominated is obviously superior. The most conservative approach which could be taken on this issue is to require a process aimed at identifying potentially optimal sites from all those which are environmentally acceptable, and to nominate those which appear the most optimal. Although DOE's guidelines to some degree move in the latter direction for purposes of screening sites for the *second* repository, it seems excessive, especially in its more pristine forms. As the Supreme Court has said,

> Common sense . . . teaches us that the 'detailed statement of alternatives' cannot be found wanting simply because the agency failed to include every alternative . . . conceivable by the mind of man.[131]

DOE simply cannot reasonably be expected to examine every possible alternative site.

One can approach the question of the appropriate standard to apply as a legal minimum from another perspective. If construction and operation of the repository complies with applicable EPA standards and NRC requirements, the public health and safety are presumably sufficiently protected regardless of the standard employed in selecting the site in question. Imposition of some "common law" optimization requirement is thus by definition unnecessary for health and safety purposes and thus of questionable value. In addition, it clearly introduces an element of controversy and subjectivity which may result in delay and confusion. Given Congress' evident concern in moving the repository siting process along as manifest in

130. *See, e.g.*, Roosevelt-Campobello Int'l Park v. EPA, 684 F.2d 1041, 1046 (1st Cir. 1982) (dictum). It should be noted that under the NWPA, the repository, although built by DOE, is funded from a fee charged to utilities. Thus it is not clear that the optimization suggestion for publicly-funded projects, even if correct, would be applicable to the repository site selection process.

131. Vermont Yankee Nuclear Power Corp. v. NRDC, 435 U.S. 519, 551 (1978).

the series of statutory deadlines in the NWPA, there seems little policy justification to impose some substantive optimization requirement upon DOE.

4. Clause (vi)

Clause (vi) requires

> an assessment of the regional and local impacts of locating the proposed repository at such site.

This clause read broadly could be viewed as requiring the same kind of impact analysis as that contained in an EIS. This, however, seems extravagant in view of Congress' specific rejection of an EIS at the nomination stage and the careful delineation of the evaluation required in the EA of "suitability" of a site for a repository specified in clause (ii). Indeed, it is not clear that clause (vi) adds anything not already required by clause (ii).

C. Procedural Requirements of Section 112(b)(1)(E)

Clause (v) requires that an EA contain

> a description of the decision process by which such site was recommended.

Since an EA is prepared at the time of nomination and before a site is "recommended," the word "recommended" in clause (v) probably should be read to mean "nominated."[132]

Clause (v) has two dimensions. First, it may afford DOE critics a specific avenue to demand disclosure of the basis for, and process of, selecting the nominated sites. This is another way of raising the difficult issue of whether DOE's nomination process must be designed to select the optimal sites or simply suitable sites, as discussed in the previous section with respect to clause (iv).

The second dimension of clause (v) relates simply to the complex procedural steps which DOE must follow in making the required nominations. The principal procedural requirements specified in the NWPA may be summarized as follows:

> (i) DOE must issue the section 112(a) guidelines before nominating any sites.[133]

132. The word "recommended" as used here may be an artifact of the House Energy and House Interior bills which envisioned a "recommendation" step which was not preceded by a "nomination" step. On the other hand, it may be intended to limit the required discussion to the process by which three sites were recommended to the President.

133. Section 112(b)(1)(A), 42 U.S.C. § 10132(b)(1)(A) (1982).

(ii) "Before nominating a site" DOE must notify "the Governor and legislature of the State in which a site is located, or the governing body of the affected Indian tribe . . . of such nomination and the basis for such nomination.[134] The Secretary must also notify and consult with the Governor of the pertinent State whenever he is required to notify or consult with an Indian tribe.[135]

(iii) Prior to nomination, DOE must hold public hearings "in the vicinity of such site to inform residents . . . of the proposed nomination . . . and to receive their comments." At the hearing, DOE must also solicit the recommendation of residents with respect to issues to be addressed in the EA.[136]

(iv) The Secretary must notify States or Indian tribes with "potentially acceptable sites" within 180 days after January 7, 1983.[137]

It should be noted, however, that the procedural requirements of the NWPA do not exhaust the universe of potentially applicable procedural requirements. For example, the House Energy Committee report states that except as modified by the legislation

> the NEPA process . . . applies throughout the repository development program. In particular, section 102(2)(G) of [NEPA] provides information requirements complementary to those contained in [the legislation].[138]

D. Judicial Review

It is said that Stalin, when informed of the position of the Pope on an issue, asked how many divisions the Pope had. In an analogous fashion, a dubious reader may view the concerns expressed above as interesting only insofar as effective judicial review of DOE action under section 112 is provided. Before concluding this analysis of the EA requirement, it is pertinent to discuss briefly the provisions for judicial review which are germane to DOE's compliance, or lack thereof, with section 112 and the EA requirement in partic-

134. Section 112(b)(1)(H), 42 U.S.C. § 10132(b)(1)(H) (1982).

135. Section 116(d), 42 U.S.C. § 10136(d) (1982).

136. Section 112(b)(2), 42 U.S.C. § 10132(b)(2) (1982).

137. Section 116(a), 42 U.S.C. § 10136(a) (1982). The notificaton provision in section 116 is confusing. "Potentially acceptable site" is defined in the provision as "any site at which, after geologic studies and field mapping but before detailed geologic data gathering, the Department undertakes preliminary drilling and geophysical testing for the definition of site location." 42 U.S.C. § 10136(a) (1982). But under Section 112(b)(3), preliminary drilling is as a general matter barred. Accordingly the provision seems to defy implementation as written. As already noted, DOE construes the provision as a congressional imprimatur for non-application of its guidelines to the initial screening of sites for the first repository.

138. H.R. REP. No. 785, 97th Cong., 2d Sess. 35 (1982).

ular. Ordinarily all final agency action is subject to judicial review in federal district court as provided in the Administrative Procedure Act, unless a statute bars review or makes some other dispensation.[139] In the case of section 112, there are three special review provisions which are applicable.

Section 119 provides review in the U.S. courts of appeals of any environmental assessment prepared under section 112(b)(1). More specifically, section 119 provides that the court of appeals "shall have original and exclusive jurisdiction" over such civil actions. In short, section 119 on its face restricts review of an EA to a court of appeals.

Section 112 (e) provides that

> Except as othewise provided in this section, each activity of the President or the Secretary under this section shall be construed to be a preliminary decision making activity. . . .

In general, agency action which is not yet final is not reviewable.[140] This subsection accordingly poses an obstacle to obtaining judicial review in the absence of something "otherwise provided" relevant to some or all of section 112. As might be expected, there is such a something in section 112(b)(1)(F).

Section 112(b)(1)(F) provides that

> [t]he issuance of any environmental assessment [under section 112(b)(1)] shall be considered to be final agency action subject to judicial review in accordance with the provisions of chapter 7 of title 5, United States Code, and section 119 of [the NWPA]. Such judicial review shall be limited to the sufficiency of such environmental assessment with respect to the items described in clauses (i) through (vi) of subparagraph (E).

Section 112(b)(1)(F) does two things. *First*, it confirms that issuance of an EA is "final agency action subject to judicial review," thus giving substance to the generic exclusion from review in section 112(e). *Second*, it purports to limit judicial review of the EA to certain aspects of its "sufficiency."

In sum, section 112(e) and section 112(b)(1)(F) in combination may be read to preclude substantive judicial review of any action under section 112 on the ground that any such actions are deemed

139. *See, e.g.*, 5 U.S.C. § 703 (1982); City of Rochester v. Bond, 603 F.2d 927, 931 (D.C. Cir. 1971); Association of Nat'l Advertisers, Inc. v. FTC, 565 F.2d 237, 239 (2d Cir. 1977).

140. *See, e.g.*, United States v. Feaster, 410 F.2d 1354, 1364 (5th Cir 1969), *cert. denied*, 396 U.S. 962 (1969); Aminoil U.S.A., Inc. v. California State Water Resources Control Bd., 674 F.2d 1227 (9th Cir. 1982).

to be "preliminary" rather than final, with the sole exception of issuance of an EA. If this reading is correct, litigation over the substance of the Secretary's actions in implementing section 112 is largely precluded. For example, the DOE guidelines issued under section 112(a) would appear to be immunized from direct substantive judicial review. Indeed, the first opportunity for parties in disagreement with the guidelines to raise their concerns would be in the form of a challenge to the sufficiency of EA's issued under section 112(b)(1).[141]

Unfortunately, the NWPA is not so simple. The precise intent of the expression regarding "preliminary decisionmaking activity" in section 112(e) is somewhat ambiguous. Senator Gorton tied the words "preliminary decisionmaking activity" solely to the application of NEPA and claimed that they were not to affect the law governing judicial review.[142] If Senator Gorton's interpretation was accepted, then the finality of DOE action for purposes of judicial review would be determined by reference to the general law on finality. This would render the DOE guidelines subject to review. But Congress dealt fully with the applicability of subsection (e); that sentence expressly excluded activities under subsection (e) from certain NEPA obligations. There would be no obvious rationale for the first sentence of subsection (e) unless it is directed to something in addition to NEPA. More bluntly, Senator Gorton's statement renders the first sentence of subsection (e) superflouous. In general, a statute is not to be interpreted so as to render portions of its language redundant.[143] Moreover, the House Report,[144] discussing the

141. There is one possible path around this. A party might attempt to claim that a defective guideline constitutes a "failure . . . to take . . . action . . . required" under the NWPA and that it is thus judicially reviewable under section 119(a)(1)(B). There is some indirect support for such a view. *See, e.g.*, H.R. REP. No. 785, pt. I, 97th Cong., 2d Sess. 64 (1982) (failure to take action in required way is judicially reviewable even if the action is deemed a "preliminary decisionmaking activity"). However, if review is sought of the manner in which an action was taken, particularly if that manner is at all discretionary, such an application of section 119(a)(1)(B) would appear to directly undercut the clear language of the statute providing for special, and narrow, judicial review. *Cf.* Center for Nuclear Responsibility, Inc. v. NRC, 586 F. Supp. 579 (D.D.C. 1984) (district court does not have jurisdiction to review certain NRC actions).

142. 128 CONG. REC. S15667 (daily ed. Dec. 20, 1982) (statement of Sen. Gorton).

143. 2 A. SANDS, SUTHERLAND STATUTORY CONSTRUCTION § 46.06, at 104 (4th ed. 1984); it might also be argued that the limiting language in Section 112 does not apply to a claim that action was taken in violation of the rulemaking procedures and requirements of the Administrative Procedure Act as opposed to a violation of the NWPA itself. *But see* Gott v. Walters, 756 F.2d 902, 910-11 (D.C. Cir. 1985) (rejecting such an argument as applied to action of Veterans Administration).

144. H.R. REP. No. 785, 97th Cong., 2d Sess. 63 (1982).

precursor language to subsection (e), described the first sentence as dealing with a matter (namely, the finality of agency action) different from the second sentence (namely, applicability of NEPA's EIS requirement). Accordingly, it seems fair to view section 112(e) as in fact limiting judicial review of actions under section 112 to the issuance of an EA.

The remaining question is how much judicial review of the EA is permitted under section 112(b)(1)(F). Paragraph (F) is somewhat ambiguous. On the one hand, the first sentence of the paragraph states that review is to be in accordance with 5 U.S.C. §§ 701-706. Under 5 U.S.C. § 705, a court may invalidate agency action if it is arbitrary and capricious, not in accordance with law, in excess of statutory jurisdiction, authority or limitations, or if the agency has failed to follow proper procedures. Under *Citizens to Preserve Overton Park, Inc. v. Volpe*,[145] a court applying this standard is to subject an agency's actions to "thorough, probing, indepth" review but must uphold an agency's actions if they comport with applicable procedure, are based upon a consideration of the relevant factors and are within the scope of the agency's authority. This suggests broad, if ultimately deferential, review of the EA, including the procedures employed in its development.

On the other hand, the second sentence states that judicial review is to be "limited to the sufficiency" of the EA "with respect to the items described in clauses (i) through (vi). . . ." This seems to contemplate a relatively limited review, perhaps to the extent of excluding not only procedural questions but also many substantive concerns. In reality, however, the second sentence probably does little to restrict the scope of review of an EA. An EA, like an EIS, is not a "decision" but an informational document to be used in making a decision. Review of the "sufficiency" of an informational document translates into review of the sufficiency of the information contained in the EA. Analogizing to an EIS, this would mean review of the adequacy of the discussion of impacts, alternatives, and impacts of alternatives. The adequacy of procedures employed in developing the information and in identifying the impacts and alternatives is also arguably an element of determining the sufficiency of an EIS. This seems to render reviewable most questions relating to the procedures adopted, and decisions made, in developing an EA.

Nevertheless, it is important to emphasize that, by analogy to the

145. 401 U.S. 402, 415-17 (1971) (the leading case on judicial review under the Administrative Procedure Act).

law governing judicial review of EIS's, the court's job is quite limited. It is to assure good-faith compliance with information gathering requirements and not to second-guess substantive decisions by the agency. Put another way, the contemplated review is presumably to assure that the EA is a good faith, reasonable, and objective presentation of environmental consequences.[146] So long as the agency has taken a "hard look" at these matters, a court is not supposed to interfere with an agency decision made within its statutory discretion (i.e., a decision which is not arbitrary, capricious or contrary to law).[147] In short, section 112(e) of the NWPA, the statute seems to cut off direct review of the nomination decision entirely, and leaves only the question of whether the agency has performed its information gathering correctly for purposes of judicial review.[148]

CONCLUSION

The EA provision in section 112 is a unique creature. It was conceived by Congress in a spirit of compromise to address environmental concerns at the nomination stage of the repository siting process. It was intended to avoid the delays and litigation that so frequently surround the EIS's prepared with respect to nuclear power plants. In many ways, however, the EA resembles an EIS. Quite bluntly, Congress failed to specify in any clear fashion how it was to be different from an EIS. Such a beast, neither fish nor fowl, is certainly the stuff of which litigation is made, and thus the whole exercise of requiring an EA rather than an EIS may prompt exactly the result Congress sought to avoid; namely, litigation and delays over the adequacy of DOE's compliance with environmental requirements at the nomination stage. Ultimately, the efficient resolution of conflicts over controversial matters such as the siting of a nuclear waste repository will depend not on creation of complex procedural regimes but on the establishment of reasonable and clear rules of decision, on the retention of competent officials to implement these rules, and on the assignment of sufficient authority to identifiable decision-makers to hold them accountable for the suc-

146. *See* Johnson v. Davis, 698 F.2d 1088, 1091 (10th Cir. 1983).

147. *See, e.g.*, Kleppe v. Sierra Club, 427 U.S. 390, 410 n.21 (1976); Stop H-3 Association v. Dole, 740 F.2d 1442, 1460-1461 (9th Cir. 1984); South Louisiana Environmental Council, Inc. v. Sand, 629 F.2d 1005, 1011 (5th Cir. 1980).

148. Again, a party might try to get around this by arguing that a nomination is so flawed as to constitute a "failure . . . to take . . . action . . . required" under the NWPA. *See* note 139 *supra*.

cess or failure of the program. If the Nuclear Waste Policy Act is to work, the various administrations which will implement the new law, and the courts, which in turn will review and interpret it, must strive to assure these conditions, within the constraints established by the statute.