Response to Public Comments for Draft Regulatory Guide DG-4021, "General Site Suitability Criteria for Nuclear Power Stations"

Proposed Revision 3 of Regulatory Guide 4.7

The NRC published a notice in the Federal Register, 76 FR 82201 (December 30, 2011) stating that Draft Regulatory Guide, DG-4021, (proposed Revision 3, of RG 4.7) was available for public comment. The public comment period ended on February 26, 2012. Comments were received from two organizations:

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The comments and the NRC staff's responses to the comments are presented in the following table.

Originator	Section of DG-4021	Specific Comment	NRC Response
Uranium Watch	Section A. Introduction Page 2	1. Section A. Introduction (page 2) states: *Chapter 9 of both Regulatory Guide 4.2 and NUREG-1555, "Standard Review Plans for Environmental Reviews for Nuclear Power Plants," (Ref. 7) discusses the selection of a site from among alternative sites; the applicant should present its site-plant selection process as the consequence of an analysis of alternatives for which environmental costs and benefits were evaluated and compared and then weighed against those of the proposed facility.*	
		1. 1. This statement ignores the possibility that proponents of a new reactor have already chosen a site and really do not have an alternative site that has been or will be seriously considered. It is misleading to think that the proponents of a new reactor are seriously considering alternative sites. By the time an application for an Early Site Permit or Combined License Application is submitted to the NRC, the	No change was made to RG 4.7 as a result of this comment. As noted in the DG-4021, Chapter 9 of Regulatory Guide 4.2 and NUREG-1555 provide guidance on the selection of a site from among alternative sites. Under the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. 4321 et seq.), as amended and implemented by Executive Orders 11514 and 11991 and the Council of Environmental Quality's regulations (40 CFR Parts 1500-1508 (Ref.4), it is a requirement

Uranium Watch (continued)		prospective licensee may already have committed resources and taken actions to secure water rights, easements, and other assets for a single site location, prior to conducting any serious analysis of other potential locations. Therefore, consideration of alternate sites is really pro-forma, and there are, in actuality, no alternative sites under consideration. For example, Blue Castle Holdings Inc., the proponent of the Blue Castle Project near Green River, Utah, is only seriously considering one site. The change applications for the appropriation of water rights for the proposed reactor are tied to that one proposed site(i). If another site were chosen, it would require several years to obtain new water rights or change the existing water rights to a new point of diversion and place of use. (i) http://www.uraaniumwatch.org/bluecastleproject.htm	that all agencies of the Federal Government prepare detailed environmental statements on proposed major Federal actions that will significantly affect the quality of the human environment. A major objective of NEPA is to require the federal agency, in this case NRC, in its decision making process, to consider the environmental impacts of each proposed major action and the available alternate actions, including alternative sites. 10 CFR 51.20 identifies applications for nuclear power plant licensing as a major federal action requiring an Environmental Impact Statement (EIS). This in turn triggers the requirement for consideration of alternatives to the proposed action. It can only be determined in the course of NRC license review whether an applicant has met the requirement.
	Introduction (page 3)	1.2. Introduction (page 3) references additional guidance developed by the International Atomic Energy Agency. The Revised Guide should also reference and incorporate information from *Siting Guide: Site Selection and Evaluation Criteria for an Early Site Permit Application;* Electric Power Research Institute (EPRI); No. 1996878; March 2002. The Nuclear Regulatory Commission (NRC) staff recently referred a prospective Early Site Permit (ESP) applicant to this guidance; therefore, this EPRI guidance has value to both NRC staff and an	The NRC agrees with the comment. The reference was incorporated into the guide.

Uranium Watch (continued)		ESP applicant (ii). See Section II herein (below). (ii) Trip report- October 2-6, 2011, Pre-Application readiness Assessment (C-1) Visit for and early site permit at the Blue castle Project Site; December 15, 2011 (ML113410311)	.
	Section B, Discussion, Atmospheric Extremes and Dispersion (page 4)	2. Section B, Discussion, Atmospheric Extremes and Dispersion (page 4) states: *"A 30-year weather record should be considered in an evaluation of the water requirements for the ultimate heat sink. More data and studies on longer term weather cycles should be examined because of concerns about the potential impact of climate change as it relates to nuclear safety and the environment. However, the atmospheric extremes that may occur at a site are not normally critical in determining the suitability of a site because safety-related structures, systems, and components (SSCs) can be designed to withstand most atmospheric extremes with associated site-specific costs."*	
		2.1. Here the NRC makes an unsupported assumption regarding the ability of safety related structures, systems, and components (SSCs) to withstand most atmospheric extremes associated with drought and climate change. This kind of assumption should not be part of the Revised Guide, because it is based, primarily, on the circumstances associated with the siting of nuclear reactors in areas that have a great deal of precipitation, areas where the	No change was made to RG 4.7 as a result of this comment. Atmospheric extremes should be considered in siting but there is a long-term data base on performance of complex industrial facilities under atmospheric extremes in both humid and arid regimes. In the evaluation of the suitability of sites, there should be reasonable assurance that the applicant can obtain, from the appropriate State, local or regional agency, permits for consumptive use of water in the quantities needed for a nuclear power plant of the stated capacity and type of cooling system.

Uranium Watch (continued)		average rainfall is less than 10 inches per year, areas where water supply is highly dependent on snow melt and summer rains, and where water availability would be significantly influenced by natural drought cycles and impacts associated with climate change.	This aspect is further discussed in Section C, of the revised guide under Section 8.2, "Water Availability."
	Section B, Discussion, Atmospheric Extremes and Dispersion	2.2. In some circumstances the applicant and the NRC must consider more than the 30-year weather record, because the long-term weather record may contain information pertinent to long-term weather cycles that would influence water availability in the western part of the United States. For example, a year with minimal snow or circumstances where the snow melts at a faster rate (e.g., due to dust on snow), would greatly reduce the flow of a river, such as the Green River. Currently, there is a proposal to site a reactor on the Green River in Utah, where there are a number of demands on the available water which would influence the availability of water for the proposed reactor during low-flow conditions, particularly when low flow conditions coincide with high demand from agriculture uses and the reactor project. The NRC must not assume that a 30-year record is sufficient and that any weather extremes, such as drought can be mitigated.	The NRC agrees with the comment but did not change the guide in response to the comment. It would be good to have a longer meteorological record than 30 years. However one may not be available at a perspective site. Regional information may be available to estimate waster loss due to extreme temperatures and very low humidity. The issue of long-term weather cycles can be compensated by examining extremes in the regional records and postulating a sequence of continuous conditions reasonable for the site.
	Section B, Discussion, Atmospheric Extremes and Dispersion	2.3. The applicant and NRC must also consider the actual legal availability of water at the proposed sites and any legal documents related to the appropriation of water for the proposed project.	The NRC agrees with the comment but did not change the guide in response to the comment. Local authorities will ultimately be responsible for water use through withdrawal and discharge permits and a licensee must present evidence of permits for adequate water supply and any limitations to be placed

Uranium Watch (continued)			on plant operations.
	Section B, Discussion, Atmospheric Extremes and Dispersion (page 5)	3. Section B, Discussion, Atmospheric Extremes and Dispersion (page 5) discusses atmospheric dispersion, but does not specifically mention inversions as a factor impacting the dispersion of radionuclides and other airborne materials from the reactor operation. In some areas, local atmospheric conditions cause inversions, which severely limit local atmospheric dispersion capabilities. The likelyhood of inversions should be a significant factor in siting a reactor and included in the siting criteria.	The NRC agrees with the comment and the suggestion was adopted in Section C, "Staff Regulatory Guidance," on page 16. The following text was added: *"In some areas, local atmospheric conditions cause inversion, which severely limit local atmospheric dispersion capabilities. Therefore, the likelihood of inversions due to local conditions should be considered in siting of a nuclear power plant."*
	Section B. Discussion, Atmospheric Extremes and Dispersion (page 6)	4. Section B. Discussion, Atmospheric Extremes and Dispersion (page 6) states: *"A cooling system designed with special consideration for reducing drift might be needed because of the sensitivity of the natural vegetation or the crops in the vicinity of the site to damage from airborne salt particles. The vulnerability of existing industries or other facilities in the vicinity of the site to corrosion by drift from cooling tower or spray system drift should be considered. Not only are the amount, direction, and distance of the drift from the cooling system important, but the salt concentration above the natural background salt deposition at the site is also important in assessing drift effects. None of these considerations is critical in evaluating the suitability of a site, but they could result in*	

Uranium Watch (continued)		*special cooling system design requirements or in the need for a larger site to confine the effects of drift within the site boundary. The environmental effects of salt drift are most severe where saline water or water with high mineral content is used for condenser cooling."*	
		4.1. Again, the NRC minimizes the potential for a siting criteria to influence site suitability. This kind of language should not be in the Revised Guide. In some areas, one of the primary economic base is agriculture, so that any negative impact to crops due to airborne salt particles could have a significant impact. Further, some crops would be impacted more than others. If a nearby community is highly dependent on the one particular food crop and/or the grazing of domestic animals on natural and domestic vegetation, the influence of airborne salt particles could be an important site suitability factor.	The NRC agrees with the comment and the guide was changed. The page 6 text was moved to page 17 in Section C to read as follows: *"A cooling system designed with special consideration for reducing drift might be needed because of the sensitivity of the natural vegetation or the crops in the vicinity of the site to damage from airborne salt particles. The vulnerability of existing industries or other facilities in the vicinity of the site to corrosion by drift from cooling tower or spray system drift should be considered. Not only are the amount, direction, and distance of the drift from the cooling system important, but the salt concentration above the natural background salt deposition at the site is also important in assessing drift effects. Special cooling system design requirements or in the need for a larger site to confine the effects of drift within the site boundary may be needed to address salt drift. The environmental effects of salt drift are most severe where saline water or water with high mineral content is used for condenser cooling."*
		4.2. In this section, the NRC should also include the uptake of radionuclides by domestic crops, natural vegetation, native and domestic animals, aquatic environments, and all the various elements in native and domestic animal food chains as a siting criteria that must be considered.	The NRC agrees with the comment but did not change the guide in response to the comment. The concept is addressed already in the sections on Atmospheric Extremes and Dispersion where ALARA (i.e., "as low as reasonable achievable") is specifically mentioned as well as the requirements of 10 CFR Part 20 and 40 CFR Part 190. The guide's section on Exclusion

Uranium Watch (continued)			areas and low population zone also covers the concept.
		4.3. This section should also include criteria associated with the impact of salt, radionuclides, and other materials that will be dispersed in the atmosphere from a reactor on transportation corridors, including nearby highways, railroads, and waterways. In areas where there are specific salinity considerations associated with a waterway, such as in the Colorado River Basin(iii), the release and dispersion of airborne salt particles could have significance. [(iii) http://www.crb.ca.gov/salinity/2008/2008%20review.pdf]	The NRC staff agrees with the comment. The guide was modified on page 17 to address salt deposition.
	Section B. Discussion, Exclusion Area and Low-Population Zone (page 6)	5. Section B. Discussion, Exclusion Area and Low-Population Zone (page 6) states: *"10 CFR 50.34(a)(1)(ii)(D)(1) requires the exclusion area to be of such a size that an individual assumed to be located at any point on its boundary would not receive a radiation dose in excess of 25 rem total effective dose equivalent (TEDE) over any 2-hour period following a postulated fission product release into the containment."*	
		5.1. The determination of an exclusion area boundary (EAB) for a proposed reactor is a major siting criteria consideration, because the amount of land needed would influence the site or sites under consideration and the possibility that a larger exclusion zone would	The NRC agrees with the comment but did not change the guide in response to the comment. The NRC staff believes that the current discussion in the regulatory guide appropriately reflects the level of significance of this siting criterion. If atmospheric dispersion or size of the Exclusion Area Boundary (EAB) and Low-Population Zone

Uranium Watch (continued)		be required for a proposed site. The significance of this criteria should be emphasized the the Revised Guide.	(LPZ) were insufficient to satisfy the dose requirements in 10 CFR 100.11, the design of the station would be required to include appropriate and adequate compensating engineering safety features. 10 CFR 50.34 (a)(1)(ii)(D)(1) requires the plant design to meet similar criteria as in 10 CFR 100.11. NRC's defense in depth strategy includes many layers of protection besides siting to ensure that levels of radioactivity released by the plant meet its various dose requirements. These layers include structural barriers and radiation reduction systems built into the design of the overall facility including the reactor fuel, reactor pressure vessel, and containment and auxiliary buildings. The size of the EAB and LPZ is only one of many protection layers.
	Section B. Discussion, Exclusion Area and Low-Population Zone (page 6)	5.2. The extent of the exclusion zone is dependent on a "postulated fission product release into the containment." However, the guidance does not discuss how the postulated fission product release into the containment is determined, how the dose to the site boundary due to a release into the containment (and not outside the containment) is calculated, and how the extent of the exclusion zone is determined. The draft Guidance references 10 CFR 50.34(a)(1)(ii)(D)(1), which references, 10 CFR. Part 100, which references Technical Information Document 14844, "Calculation of Distance Factors for Power and Test Reactor Sites," dated March 22, 1962. So, a technical document that will soon be 50 years old could be used to determine the postulated fission product release and exclusion zones.	The NRC disagrees with the comment and no change was made to RG 4.7 as a result of this comment. The guide does not include detailed guidance on how to postulate and quantify an accidental radiological release and its consequences. A regulatory guide on general siting is not the appropriate place for this type of guidance because estimating the consequences of accidental releases requires detailed knowledge about the facility design. NRC has extensive and current regulatory guidance on how to estimate the radiological consequences of various design basis accidents using the dose levels specified in 10 CFR 50.34(a)(1) as design requirements. One can find much of the regulatory guidance for facility design meeting the design requirements in the following regulatory guides: • Regulatory Guide 1.3, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Loss of Coolant Accident for Boiling Water Reactors"

Uranium Watch (continued)			(ADAMS Accession No. ML003793601) • Regulatory Guide 1.4, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Loss of Coolant Accident for Pressurized Water Reactors" (ADAMS Accession No. ML003739614) • Regulatory Guide 1.5, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Steam Line Break Accident for Boiling Water Reactors (Safety Guide 5)" (ADAMS Accession No. ML003739923) • Regulatory Guide 1.24, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Pressurized Water Reactor Radioactive Gas Storage Tank Failure (Safety Guide 24)" (ADAMS Accession No. ML083300020) • Regulatory Guide 1.25, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors (Safety Guide 25)" (ADAMS Accession No. ML083300022) • Regulatory Guide 1.77, "Assumptions Used for Evaluating a Control Rod Ejection Accident for Pressurized Water Reactors" (ADAMS Accession No. ML003740279)

Uranium Watch (continued)			• Regulatory Guide 1.98, "Assumptions Used for Evaluating the Potential Radiological Consequences of a Radioactive Offgas System Failure in a Boiling Water Reactor" (ADAMS Accession No. ML003740259) • Regulatory Guide 1.145, "Atmospheric Dispersion Models for Potential Accident Consequence Assessments at Nuclear Power Plants" (ADAMS Accession No. ML003740205) • Regulatory Guide 1.157, "Best-Estimate Calculations of Emergency Core Cooling System Performance" (ADAMS Accession No. ML0037393584) • Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors" (ADAMS Accession No. ML003716792) • Regulatory Guide 1.195, "Methods and Assumptions for Evaluating Radiological Consequences of Design Basis Accidents at Light-Water Nuclear Power Reactors" (ADAMS Accession No. ML031490640) This list is not all-inclusive, but the staff provides it to show how extensive the NRC's guidance is on evaluating the consequences of design basis accidents. In addition, Chapter 15 of NRC's standard review plan (NUREG-0800) (ADAMS Accession No. ML070660036) gives additional guidance on how to demonstrate

Uranium Watch (continued)			compliance with the requirements for evaluating the consequences of design basis accidents. The SRP guidance refers to specific regulatory guides, computer codes, NUREG documents, and industry standards.
	Section B. Discussion, Exclusion Area and Low-Population Zone (page 6)	5.3. Though not mentioned in the Revised Guide or in 10 C.F.R. 100.11, the NRC has developed alternate guidance for determining the EAB and emergency planning zones (EPZs). Apparently, "the instantaneous source term of TID-14844 was replaced in 1995 with a time-dependent source term of another set of US NRC guidelines called NUREG-1465, which covers the accident source terms for all light water reactor plants."(iv). NUREG-1465 was issued in 1995. In 1999, the NRC issued draft Reg. Guide DG-1081, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors. In 2001, NRC staff acknowledged problems with the documentation of design basis radiological analyses submitted in conjunction with license amendment requests(v). [(iv) *Key Impact Parameters for Application of Alternative Source Term to Kori Unit* **1;** Seung-Chan Lee, September 2009. http://article.nuclear.or.kr/jknsfile/v42/JK0420394.pdf (v) "*Deficiencies in the Documentation of Design Basis Radiological Analyses Submitted inConjunction with License Amendment Requests," October 18, 2001.* http://www.nrc.gov/reading-rm/doc-collections/gen-	No change was made to RG 4.7 as a result of this comment. The recommendations in these comments clearly surpass the scope of this regulatory guide in that the recommendations go beyond addressing general site suitability characteristics. They specifically focus on the basis for the design of a facility, and mitigation measures and features that address severe and beyond-design-basis events. The comments even suggest changes to NRC regulations stemming from what we have learned from the Fukushima Dai-ichi incident. Compliance with the Commission's regulations in 10 CFR Part 50 ensures adequate protection of the public health and safety during the operation of a nuclear power plant. In previous applications, the final safety analysis report (FSAR) demonstrated compliance with these regulations and established the design basis of the plant. The Commission has developed guidance and goals for resolving those safety issues related to reactor accidents more severe than the design-basis accidents. These "severe accidents" are those in which substantial damage is done to the reactor core, regardless of whether serious offsite consequences occur. Following the 1979 accident at the Three Mile Island (TMI) Nuclear Plant, Unit 2, NRC recognized that severe accidents needed further attention. The NRC evaluated, generically, the capability of existing plants to tolerate a severe accident.

Uranium Watch (continued)		comm/reg-issues/200 /riO101•9htmI] 5.4. Clearly, the NRC should develop a new technical guidance for determining the EAB and EPZs. Such guidance must take into consideration the experience of the NRC and the industry over the past 50 years and the accident, releases of radioactivity, and dispersion amounts and patterns at the Fukushima Diiachi nuclear reactors in Japan. The technical guidance must consider fission product releases from spent fuel pools, releases from fires and explosions, releases due to extended periods of loss of cooling water, cumulative releases from more than one reactor source, proliferation of radioactive "hot spots" offsite, and other potential sources of radioactivity from an expanded list of possible accident scenarios. The technical guidance must also consider fission releases from postulated accidents associated with the short-term and long-term presence of highlevel waste storage casks and low-level nuclear waste at the reactor site and also the impacts on the release of radionuclides due the inability of plant workers to work in or near the reactor during an accident. Considering the fact that the NRC recommended the evacuation of US citizens within 50 miles of the Fukushima Diiachi nuclear reactors last March, one can only conclude that there is the possibility that such an evacuation (beyond the NRC's 10-mile evacuation zone) might be necessary at a US reactor site.	The NRC found that the design-basis approach contained significant safety margins for the analyzed events. These margins permitted operating plants to accommodate a large spectrum of severe accidents. Based on this information, the Commission, in the Severe Accident Policy Statement, "Policy Statement on Severe Accidents Regarding Future Designs and Existing Plants," (50 FR 32138; August 8, 1985), concluded that existing plants posed no undue risk to public health and safety, and that no basis existed for immediate action on generic rulemaking or other regulatory changes affecting these plants because of the risk posed by a severe accident. To address this issue for operating plants in the long term, the NRC issued SECY-88-147, "Integration Plan for Closure of Severe Accident Issues," in May 1988 (Legacy Library Accession No. AN8806030338). This document identified the following necessary elements for closure of severe accidents: • performance of an individual plant examination • assessment of generic containment performance improvements (CPIs) • improved plant operations • a severe accident research program • an external events program • an accident management program Progress continues in these areas for operating plants. The Commission expects that new designs will achieve a higher standard of severe accident safety performance than previous designs. In an effort to provide this additional level of safety in the design of advanced nuclear

Uranium Watch (continued)			power plants, the NRC has developed guidance and goals to accommodate events that are beyond the design basis of the plant. Designers strive to meet these goals. For advanced nuclear power plants, including both the evolutionary and passive designs, the NRC concluded that vendors should address severe accidents during the design stage. Designers can take full advantage of the insights gained from such input as probabilistic safety assessments, operating experience, severe accident research, and accident analysis by designing features to reduce the likelihood that severe accidents will occur and, in the unlikely occurrence of a severe accident, to mitigate the consequences of such an accident. Applicants for certified designs incorporate insights and design features during the design phase. The NRC has issued guidance for addressing severe accidents in the following documents: • NRC Policy Statement, "Severe Reactor Accidents Regarding Future Designs and Existing Plants" (50 FR 32138; August 8, 1985) • NRC Policy Statement, "Safety Goals for the Operations of Nuclear Power Plants"(51 FR 28044; August 4, 1986) • NRC Policy Statement, "Nuclear Power Plant Standardization" (52 FR 34844; September 15, 1987) • NRC Policy Statement, "The Use of Probabilistic Risk Assessment Methods in Nuclear Regulatory Activities" (60 FR 42622; August 16, 1995). 10 CFR Part 52, "Early Site Permits; Standard Design Certification; and Combined Licenses for Nuclear Power Plants"

Uranium Watch (continued)			• SECY-90-016, "Evolutionary Light-Water Reactor (LWR) Certification Issues and Their Relationship to Current Regulatory Requirements," issued January 12, 1990 (ADAMS Accession No. 003707849), and the corresponding staff requirements memorandum (SRM), issued June 26, 1990 (ADAMS Accession No. ML003707885) • SECY-93-087, "Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water Reactor Designs," issued April 2, 1993 (ADAMS Accession No. ML003708021), and the corresponding SRM, issued July 21, 1993 (ADAMS Accession No. ML003708056) • SECY-96-128, "Policy and Key Technical Issues Pertaining to the Westinghouse AP600 Standardized Passive Reactor Design," issued June 12, 1996 (ADAMS Accession No. ML003708224), and the corresponding SRM, issued January 15, 1997 (ADAMS Accession No. ML00370192) • SECY-97-044, "Policy and Key Technical Issues Pertaining to the Westinghouse AP600 Standardized Passive Reactor Design," issued February 18, 1997 (ADAMS Accession No. ML003708316), and the corresponding SRM, issued June 30, 1997 (ADAMS Accession No. ML003708232) The first four documents provide guidance as to the appropriate course for addressing severe accidents and the use of probabilistic risk assessment (PRA). Title 10, Part 52, of the Code of Federal Regulations (10 CFR Part 52) contains general requirements for addressing severe accidents (10 CFR 52.47); and the SRMs relating to SECY-90-016, SECY-93-087, SECY-96-128, and SECY-97-044 (cited

Uranium Watch (continued)			above) provide Commission-approved guidance for implementing features in new designs to prevent severe accidents and to mitigate their effects, should they occur. In addition to NRC policy and guidance on severe accident and the use of probabilistic risk analysis, the NRC's Near-Term Task Force review of insights from the Fukushima Dai-ichi accident has made recommendations for enhancing reactor safety in the coming years (see the task force's "Recommendations for Enhancing Reactor Safety in the 21st Century", July 12, 2011, ADAMS Accession No. ML111861807). The NRC is currently evaluating these and other recommendations and will act on them accordingly.
	Section B. Discussion, Exclusion Area and Low-Population Zone	5.5. The NRC should not review any new ESP applications until it has developed new technical guidance, including an opportunity for public comment, to be used to determine a postulated fission product accident and the parameters of the exclusion and other zones established to be protective of the public health and safety.	No change was made to RG 4.7 as a result of this comment. Please refer to the response to the previous comment above.
		6. Other Land Requirements. The draft Guide fails to discuss other possible land requirements outside the exclusion zone; for example, land for intake structures, pumps, sediment removal ponds, and other structures at the point(s) of diversion on a water source, where the point of diversion and equipment necessary to transfer the water from the water source to the reactor are not part of the reactor site and within the exclusion zone. Limits on the availability of land next to the	The NRC staff agrees with the comment although no change was made in the guide. The commenter is correct that limits on the availability of land outside the exclusion zone could affect the feasibility of a site under consideration. As noted in Section C.11 of the revised guide on page 26, land use plans adopted by Federal, State, regional and local agencies need to be examined in the siting process, and any conflict between these plans and use of a potential site should be resolved by consultation with the appropriate agency.

Uranium Watch (continued)		water source could affect the feasibility of a site under consideration. An applicant should assess the land requirements at the point(s) of diversion to ascertain whether there is sufficient land available to support the required structures.	
	Section B Water Availability (page 9-10)	7. Water Availability (page 10). 7.1. The Revised Guide should discuss the need to address and analyze the conditions under which increased water usage and/or decreased water availability would precipitate forced curtailment of the operation of the proposed reactor. The criteria should require a quantitative analysis of the "hydrologic factors,"--duration and frequency of low-flow conditions--that would cause curtailment of reactor operations.	No change was made to RG 4.7 as a result of this comment. Water availability is addressed in Section C.8 "Water Availability." The availability of water in a drought situation is an operational management issue rather than a safety issue because a power plant must reduce power or shut down if water supplies become limited. Ground-water resources, if available may help supplement low-surface-water availability for a period of time. Depending upon State laws and River Basin agreements, surface-water and nearby-ground-water availability may become an issue to be resolved by the State or River Basin Commissions and other water authorities. The utility applying for the license has the responsibility for planning for water sources under a range of plant operations and environmental conditions.
	Section B Water Availability (page 9-10)	7.2. "Water Availability." The Revised Guide should not assume that the parameters associated with the water supply for the reactor project will not have already been established under a water right appropriation request and approval process by the time that an applicant submits an ESP application.	The NRC staff agrees with the comment although there is no change in the guide. This concept is addressed in Section 8.2 ("Water Availability"). It is incumbent on the applicant to consider these factors when doing preliminary site screening.
	Section B Water Availability (page 9-10)	7.3. The Revised Guide must clearly require an applicant to identify all factors that could cause the curtailment of the amount of water that is legally available for use at the proposed	The NRC staff agrees with the comment although there is no change in the guide. In the evaluation of the suitability of sites, there should be reasonable assurance that the applicant can obtain, from the appropriate State,

Uranium Watch (continued)		site for the reactor. These would include low-flow conditions, priority uses of available water, new use of previously appropriated (but unused) senior water rights, other legal commitments (such as the Colorado River Compact), required minimum stream flows to support navigation and river ecology (including threatened and endangered species), long term impacts of changing weather patterns, ice, flooding, high water velocity, and any other factor that has the potential to curtail the availability of water from the designated source of surface water for the reactor.	local or regional agency, permits for consumptive use of water in the quantities needed for a nuclear power plant of the stated capacity and type of cooling system. This aspect is further discussed in Section C, of the revised guide under Section 8.2, "Water Availability."
	Section B Water Availability (page 9-10)	7.4. The Revised Guide should discuss the need to determine the circumstances under which the use of water from the proposed water source could amount to 10% of the water flow. There should be a discussion of the suitability of a site where the withdrawal of water for a reactor may exceed 10% of the water flow on a regular basis.	No change was made to RG 4.7 as a result of this comment. Presumably the comment refers to the amount of water in a given river basin. The withdrawal amounts will be subject to State laws and River Basin agreements. Surface-water and nearby-ground-water availability may become an issue to be resolved by the State or River Basin Commissions and other water authorities. The utility applying for the license has the responsibility for planning for water sources under a range of plant operations and environmental conditions.
		7.5. The Revised Guide should include a discussion of various temperature requirements.	No change was made to RG 4.7 as a result of this comment. The focus of the guide is on siting criteria. The control of discharge temperature particularly cooling water is a design and operational practices consideration rather than a siting one.
	Section B Water Quality (page 10)	8. Water Quality (page 10)**.** The draft Guide states that the quality of surface water is generally not a determining site-feasibility	No change was made to RG 4.7 as a result of this comment. The environmental reviews address the issue of the impact of the facility on

Uranium Watch (continued)		factor. These kinds of generalized statements about what may or may not be significant siting criteria are not helpful. They may reflect past NRC experience, but might not apply to new reactor sites in very different environments. What could be a minor factor for one site could be a significant factor at another proposed site. The examples of potential environmental effects of site construction and operation listed in the draft Guide can be significant impacts that are not easily mitigated; for example, chemical alternations can include increased salinity of a whole river basin and threaten recovery of endangered and threatened species. II. OTHER SITE SELECTION AND EVALUATION CRITERIA	the environment. As for water quality, it is directly related to water use and availability. The utility can treat both the "raw water" to be used, and the "effluent discharge" based upon permit agreements with the State and/or River Basin commission.
	Section B. Discussion	1. The Draft Guide should include more detailed information, such as is found in the EPRI *Siting Guide: Site Selection and Evaluation Criteria for an Early Site Permit Application,* in Section 3. This Siting Guide is focused on comparing and screening various potential sites based on weighted siting criteria. However, it may be the case that an applicant has, in reality, chosen a site, made a commitment of resources to that site (e.g., acquiring water rights for use at that site only), and is using site selection criteria to justify the suitability of that site for an ESP, rather than conducting a fair evaluation of alternative sites. The various weighting criteria contained in the EPRI Siting Guide may be helpful in identifying potential	The NRC staff agrees with the comment. The guide was changed and the EPRI siting guide was incorporated into the discussion section of the guide. NEPA and Council of Environmental Quality regulations require the federal agency, in this case NRC, in its decision making process, to assess the environmental impacts of each proposed major action and the available alternate actions, including alternative sites. 10 CFR 51.20 identifies applications for nuclear power plants as a major federal action requiring an Environmental Impact Statement (EIS). This in turn triggers the requirement for consideration of alternatives to the proposed action. It can only be determined in the course of an NRC license review whether an applicant has met the requirement.

Uranium Watch (continued)		site characteristics that should be avoided or would require additional in-depth study. However all criteria might not have the same significance for the assessment of potential reactor sites.	
		2. The Revised Guide should more clearly identify those features and conditions that would not be consistent with requirements of obtaining a site permit.	No change was made to RG 4.7 as a result of this comment. Section C of the draft Regulatory Guide details regulatory guidance acceptable to the NRC when evaluating reactor siting and environmental issues. The guidance covers many components of reactor siting issues with discussions on what is acceptable and not acceptable to NRC staff.
	Section B. Discussion, Water Quality (page 10)	3. The Revised Guide should include more detailed information on the need to determine the ability of the water source to supply the facility's water requirements though the life of the ESP permit, construction, and operation periods (up to 100 years). Some of the information in Section 3.1.2.1 of the EPRI Siting Guide would provide additional elements to be included in the Revised NRC Guide. This would include a determination of the circumstances when use of water from the proposed water source could amount to 10% of the water flow.	No change was made to RG 4.7 as a result of this comment. To a degree the availability of water is conditional on local and regional water use restrictions which an applicant will have to take into consideration along with climatic conditions. The information in Section 3.1.2.1 of the EPRI Siting Guide discusses exclusion zone and LPZ issues relevant to siting.
		4. The draft Guide does not contain a detailed discussion of transportation and transmission related criteria. There may be challenges related to transportation, construction of railroad spurs and new or upgraded roadways that should be discussed in the site evaluation criteria. There may be additional challenges in the	No change was made to RG 4.7 as a result of this comment. An applicant performing siting analyses for a potential nuclear plant site, might face challenges related to transportation, construction of railroad spurs, new or upgraded roadways, transmission lines etc., when evaluating alternative sites. It is presumed that these challenges are considered by the applicant. Based on cost benefit and environmental impact

Uranium Watch (continued)		siting of new transmission lines to transmit the electricity to the electrical users, including the costs and siting issues (easements, permits, environmental impacts) associated with the construction of new transmission lines to and from the site. These issues associated with site selection criteria should be included in the Revised Guide.	analyses the applicant can decide which site is most amenable to the siting of the nuclear plant. NRC staff will evaluate the applicant's analyses to ensure that the applicable NEPA requirements have been met with regards to the evaluation of alternate sites.
		5. The Revised Guide should include a discussion of the evaluation of costs related to transportation, transmission of electricity to and from site, land rights, water rights, labor rates, power pricing, and other site-specific cost factors.	No change was made to RG 4.7 as a result of this comment. As stated in the previous response, the applicant may consider cost benefit and environmental analyses related to transportation, transmission of electricity to and from site, land rights, water rights etc., in their siting analyses. NRC staff will review the analyses to evaluate if it is acceptable or not.

John Drummond III	General comments on the entire Guide	My understanding is we have no IDEA what to do with the waste, what I have heard is there is Nuclear waste as we speak is underground just waiting for something to happen. and it will be active for 10000 years just satting (sic) for our kids to die or some kind of medical problems developing from leaking somewhere down the road. why are we creating more problems for our kids or should I say the future if there will be one? With all the educated people in this world this is what we can come up with, look at the space junk we created and whom will clean that up and how much money will it cost, will we get out of debt? Nope! we keep creating more waste and problems for the future. Stay away from Nuclear Power until we are educated to deal with it. Thanks	No change was made to RG 4.7 as a result of this comment. A discussion of nuclear waste disposal issues is beyond the scope of this Regulatory Guide. This guide is focused on issues related to the siting of nuclear power plants.