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Joan Claybrook, President

May 25, 2005

Michael T. Lesar
Chief, Rules and Directives Branch
Division of Administrative Services, Office of Administration
U.S. Nuclear Regulatory Commission
Mail Stop T-6D59
Washington, D.C. 20555-0001

3/10/05

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Re: Comments on the Draft Environmental Impact Statement for an Early Site Permit (ESP) at Exelon's ESP Site at the Clinton Power Station (NUREG-1815)

Dear Mr. Lesar:

Enclosed you will find the comments of Public Citizen on the NRC's draft Environmental Impact Statement (EIS) for the Early Site Permit (ESP) at Exelon's ESP site at the Clinton Power Station near Clinton, Illinois. These comments are presented in response to a notice published in the March 10, 2005 issue of the *Federal Register* (Vol. 70, No. 46, pg. 12022).

Public Citizen—in conjunction with the Nuclear Information and Resource Service, the Blue Ridge Environmental Defense League, and the Environmental Law and Policy Center—has been admitted as a party to the licensing proceeding for the Exelon ESP. As a formal participant with standing in this proceeding, we hope that our comments and recommendations on the draft EIS are considered seriously and taken into account before the NRC issues its final EIS on this project.

For the reasons presented herein, Public Citizen views the draft EIS for the Exelon ESP as deficient, and we disagree with the NRC staff's recommendation that the ESP should be granted. Please enter these comments into the official record on this proceeding.

Sincerely,



Joseph P. Malherek
Policy Analyst, Public Citizen's Critical Mass Energy Program

[Enclosure]

E-REDS = ADM-03

SESP Review Complete

Template = ADM-013

Call = T. Kenyon (TSK2)

Public Citizen's Comments on the NRC's Draft Environmental Impact Statement (EIS) for an Early Site Permit (ESP) at the Exelon ESP Site at the Clinton Power Station

General Comments on the NRC's ESP Licensing Process

The purpose of this Early Site Permit (ESP) process is ostensibly to “assess whether a proposed site is suitable should Exelon decide to pursue a [construction permit (CP)] or [combined construction and operating license (COL)]” (EIS, page xxv). Yet, this draft Environmental Impact Statement (EIS) fails to consider or to fully acknowledge numerous environmental issues that could demonstrate that the Clinton site is not suitable for an additional nuclear unit. The arbitrary separation of the ESP and COL compromises the ability of the U.S. Nuclear Regulatory Commission (NRC) to perform a thorough and adequate evaluation—at either stage or in total—of the potential environmental impacts from new reactor development. Under this regime—designed to “provide stability in the licensing process” (EIS, § 1.3)—far too many environmental impact considerations have been deferred to the COL stage of the licensing process.

In comments to the NRC regarding a draft EIS for a similar ESP sought by the energy company Dominion at its North Anna Power Station, the U.S. Environmental Protection Agency (EPA) registered its reservations with this licensing scheme: “EPA has concerns with this approach since it ignores the justification for the power plant addition in the early stage of project development as well as biases the subsequent energy alternative analysis toward nuclear power under the second EIS since the NRC would have approved the suitability under the ESP.”¹ The EPA underscored its concerns by pointing out the artificial twenty-year horizon allotted under the ESP, during which time circumstances and technologies may change dramatically, rendering the conclusions of the EIS moot. The EPA further noted that, typically, if an action has not taken place within three years of an EIS, a supplemental EIS is required.² Public Citizen agrees with the EPA's concerns about this problematic licensing disjunction.

This discordant licensing structure is also evident in the need for a “Site Redress Plan” (EIS, § 4.11), which addresses the activities that would be required to restore the ESP site to its present state in the case that Exelon is granted an ESP but fails to seek or acquire a CP or COL within twenty years to consummate the preparatory activities allowed under the ESP. The breadth of site-preparation activities allowed under the ESP (considered a “partial construction permit” under 10 C.F.R. 52.21) is remarkable, including clearing, grading, and excavating the site; building roads, service and support facilities; and even the construction of ancillary plant components such as cooling towers, intake and discharge structures, and a transmission system (EIS, pp. 4-42 to 4-43). This degree of construction activity and the financial investment it would require would appear to compel the construction of a nuclear unit, yet this reality is not appreciated at this stage of the licensing process, indicating the bizarre division between the ESP

¹ United States Environmental Protection Agency, “Comments to the Draft Environmental Impact Statement for an Early Site Permit (ESP) at the North Anna ESP Site – NUREG 1811 (North Anna ESP project), CEQ # 040569,” letter from William Arguto, NEPA Team Leader, EPA Region III, to Jack Cushing, NRC, March 1, 2005.

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and the COL. Clearly, the specific site and the specific reactor are one in the same project, and the division into the separate ESP and COL licensing processes is completely arbitrary, compromising the NRC's ability to perform an adequate evaluation of the potential environmental impacts from the project.

While Exelon has not firmly committed to constructing a new nuclear unit at the Clinton Power Station (CPS) or even selected a specific reactor design (EIS, pg. 1-5), it is part of an industry consortium called NuStart Energy Development that plans to apply for a COL. If granted an ESP, Exelon could be permitted to begin an extensive construction operation while numerous important issues, such as the need for power and the indefinite storage of additional waste onsite, have not been addressed.³ Simply declaring that NRC is not required to look at these issues does not make them go away.

Plant Parameter Envelope

The Vagueness of the PPE

No specific plant design has been chosen for the new nuclear unit at the CPS; instead, a plant parameter envelope (PPE)—a set of “bounding parameters”—has been specified. The new unit may consist of “one or more reactors or reactor modules” and have a maximum core thermal power rating of 6800 MW(t) (EIS, pg. 3-1). As many as eight reactors may be constructed at the CPS (EIS, pg. 3-3).

The scope of reactor types considered within the PPE—including five light water reactor (LWR) and two gas-cooled reactor types, not all of which have been approved by the NRC (EIS, § 3.2)—is far too broad, making it impossible to provide a reasonably precise judgment of the environmental impact of a new nuclear unit at the CPS, especially considering that Exelon is not even required to employ any one of these designs if it ultimately decides to build a new nuclear unit at the CPS (EIS, pg. 3-3). The EPA, in commenting on the draft EIS for a similar new nuclear development, criticized the NRC for this imprecision, noting that “There is inadequate design information available for some of the proposed units from which to make accurate environmental assessments of the impacts.”⁴ Exelon did not provide any specific design information on a heat dissipation system or radioactive waste-management system for a new nuclear unit at the CPS (EIS, pg. 3-10).

Furthermore, the inaccuracy of this review system is belied by the NRC staff's admission that they neglected to review Exelon's PPE values for correctness (EIS, pg. 3-5).

Accident Scenarios

In its analysis of the potential consequences of “design basis” accidents, Exelon used the characteristics of two particular reactor designs, assuming the impacts of such accidents would bound those of other possible reactor designs (EIS, pg. 5-66). For its analysis of “severe” accidents, Exelon evaluates the consequences for the current generation reactors—not of the kind

³ The NRC's regulations at 10 CFR Part 52.17(a)(2) note that ESP applications do not need to include “an assessment of the benefits (for example, need for power) of the proposed action.”

⁴ U.S. Environmental Protection Agency, “Comments to Draft Environmental Impact Statement for an Early Site Permit (ESP) at the North Anna ESP Site,” April 11, 2005.

that it would build at the CPS (EIS, pg. 5-66)—and the NRC only considers two reactor designs it considers bounding in its evaluation of potential hazards from a serious accident (EIS, pg. 5-69). How can the NRC reasonably judge accident consequences when several of the potential reactor designs proffered by Exelon have never been deployed?

National Environmental Policy Act Requirements

The draft EIS fails to adequately execute the requirements of the National Environmental Policy Act (NEPA) by not adequately providing a “detailed statement” of (1) alternatives to the proposed action, (2) unavoidable environmental impacts, (3) irremediable commitments of resources, and (3) the relationship between short-term uses of the environment and long-term productivity [42 U.S.C. § 4332(C)].

Instead of a thorough evaluation, these issues receive only brief, perfunctory attention in Chapter 10 of the draft EIS. For example, only a half-page is devoted to energy conservation as an alternative, which Exelon considers unreasonable, an assessment that the NRC staff appears to agree with (EIS, § 8.2.1.1).

Alternative Energy Sources

Regarding these NEPA requirements, of particular concern to Public Citizen is the deficient consideration of renewable energy sources draft EIS. While addressing renewable energy sources as an alternative, the draft EIS does not give a fair and thorough consideration of the potential of clean, sustainable energy, and it relies far too heavily on the faulty evaluations performed by Exelon (*see* EIS, § 8.2.3). Public Citizen and others have successfully intervened in the licensing proceeding for the Clinton ESP on the grounds that Exelon’s application “does not provide the basis for the rigorous exploration and objective evaluation of all reasonable alternatives to the ESP that is required NEPA.”⁵

The evaluation of alternatives to the proposed action in the EIS fails to achieve the requirements of 40 C.F.R. 1502.14, which compels agencies, *inter alia*, to “devote substantial treatment to each alternative considered in detail.” While the draft EIS gives fair attention to alternative sites for a new reactor, it gives only scant attention to renewable energy alternatives, despite the conservative admission that Illinois has at least 9000 MW(e) of wind power potential (EIS, pg. 8-17).

The draft EIS overstates the impacts of clean energy alternatives and understates the impacts of nuclear power, wrongly concluding that a new nuclear unit at the CPS would be “environmentally preferable” to a combination of clean energy generation alternatives such as wind, solar, and biomass, and even suggesting that a new nuclear unit is preferable in the areas of “air resources, ecological resources, water resources, and aesthetics” (EIS, § 8.2.4).

⁵ U.S. Nuclear Regulatory Commission, Atomic Safety and Licensing Board, “Memorandum and Order: Ruling on Standing and Contentions,” *In the Matter of Exelon Generation Company, LLC (Early Site Permit for Clinton ESP Site)*, Docket No. 52-007-ESP, ASLBP No. 04-821-01-ESP, Aug. 6, 2004: Appendix A.

Radioactive Waste and the Nuclear Fuel Cycle

High-Level Radioactive Waste

The draft EIS fails to evaluate the environmental impacts and security threat of indefinitely storing the additional irradiated fuel that would be generated by the proposed additional nuclear unit onsite. Another nuclear unit at Clinton could create annually 20 to 30 metric tons of additional irradiated fuel to the site. Despite the NRC's Waste Confidence Decision, the only national repository site under consideration, Yucca Mountain in Nevada, is far from a done deal. Numerous scientific questions remain about whether the site can safely store waste, and, recently, a scandal has erupted over the possible falsification of scientific studies used to justify the geologic suitability of the site.⁶

The NRC's assumption that at deep repositories like Yucca Mountain "no [radioactive] release to the environment is expected" (EIS, pg. 6-13) is unfounded—the geologic integrity of this site is far from proven. Moreover, the Department of Energy (DoE) has not yet submitted its license application to the NRC, although the statutory deadline was more than two years ago. DoE was supposed to begin accepting waste in 1998 and is highly unlikely to meet its revised goal of accepting waste by 2012. Further, Illinois law [220 ILCS 5/8-406(c)] prohibits the construction of a new nuclear power plant until the director of the Illinois Environmental Protection Agency finds that the U.S. government has identified and approved and demonstrable technology or means for the disposal of high-level nuclear waste.

Even if Yucca Mountain is opened, the site cannot hold the high-level radioactive waste that will be generated by existing reactors after 2010. Therefore, in addition to the waste generated by existing reactors, waste created by a new nuclear unit at Clinton would also have to remain onsite for an indefinite period of time. The NRC recently approved an unprecedented 40-year license extension for the nuclear operator Dominion to store high-level nuclear waste on-site at its Surry nuclear plant near Williamsburg, Virginia, indicating that fuel can reasonably be expected to be stored at reactor sites for at least that long.⁷ The environmental impacts of indefinite storage must be thoroughly evaluated in the final EIS.

Spent Fuel Reprocessing

The draft EIS only considers the "no recycle" option for irradiated fuel management, which treats spent fuel as waste to be stored at a federal waste repository, and does not fully consider the possible reprocessing of spent nuclear fuel (EIS, pg. 6-6). Yet, the DoE has had significant setbacks in its attempt to attain a license for a federal repository for irradiated nuclear fuel at Yucca Mountain, and the federal policy banning the reprocessing of spent nuclear fuel far from intractable. In fact, the DoE was granted more than \$67 million in fiscal year (FY) 2005 for the "Advanced fuel cycle initiative," a research and development program intended to provide technology to "recover the energy content in spent nuclear fuel," and it has requested \$70 million

⁶ See, for example, a press release from Congressman Jon Porter, "Chairman Jon Porter's Initial Probe into Allegations that Federal Scientists Falsified Data Used to Establish the Safety of the Yucca Mountain Nuclear Waste Repository Reveals Disturbing Results," April 1, 2005.

⁷ U.S. Nuclear Regulatory Commission, "NRC Approves 40-Year License Renewal for Independent Spent Fuel Storage Installation at Surry Nuclear Plant," [press release] Dec. 8, 2004.

from Congress for FY 2006 for the same program.⁸ This continued government interest in reprocessing, combined with the failure to establish a national repository for irradiated nuclear fuel, should compel the NRC to consider the impacts of spent fuel reprocessing in the final EIS.

Depleted Uranium

The draft EIS lacks a consideration of the environmental and public health impacts resulting from military applications of depleted uranium (DU), a byproduct of the enrichment process of the fuel cycle. Moreover, there is not a complete consideration of the impacts of managing this substance as a waste. There is no repository established for the permanent disposal of depleted uranium, but the impacts of such a hypothetical facility should be considered.

Uranium Milling and Mining

The draft EIS estimates that, for the reference reactor-year (a 1000-MW(e) LWR), 816,000 metric tons (MT) of raw ore would be required to produce 900 MT of yellowcake for ultimate use as fuel after conversion, enrichment, and fabrication (EIS, § 6.1.2.4 and § 6.1.2.5). Over time, as worldwide uranium ore supplies are depleted, requiring exploitation of less pure deposits of ore, would this ratio of ore to yellowcake increase? If so, would the environmental impacts of mining and milling become greater?

Transportation Accidents (§ 6.2)

This section and the accompanying Appendix G of the draft EIS do not give adequate weight and consideration to the possibility and consequences of severe accident scenarios resulting from the transportation of spent nuclear fuel. The possibility of extreme accidents, while slight, exists, as evidenced by recent incidents such as the Baltimore train tunnel fire of 2001 and the more recent accident in Graniteville, South Carolina in January, where a violent train crash and release of chlorine killed nine people, sent hundreds to the hospital, and required thousands to evacuate their homes.

Water Resources

CPS Impacts on Clinton Lake

Clinton Lake is an artificial reservoir that was created by Illinois Power Company in 1977 as a source of cooling water for the CPS; but it has become a popular recreation area (see EIS pg. 2-6), attracting nearly a million visitors in 2000 (EIS, pg. 2-5). The CPS draws cooling water from the lake and is one of the largest users of water in the region (EIS, pg. 5.3.2).

A "once-through" heat dissipation system from the CPS—the kind currently in use to serve the existing reactor, drawing 566,000 gallons per minute (gpm) from Clinton Lake (EIS, § 2.6.2.1)—which discharges heated water into Clinton Lake acts to induce greater evaporation and reduce the volume of the lake (EIS, § 5.3.1). The first Clinton unit raised the temperature of the lake by about 14°F (EIS, pg. 5-19). This elevated water temperature is considered by the NRC to be "the most significant water quality concern associated with the existing unit" (EIS, § 2.6.3.1), as water temperature is essential to the maintenance of a healthy aquatic environment (EIS, pg. 5-

⁸ U.S. Department of Energy, Office of Management, Budget and Evaluation/CFO, *Department of Energy FY 2006 Congressional Budget Request: Budget Highlights*, DOE/ME-0053 (Washington: DOE, Feb. 2005) 60-63.

19). Higher water temperatures can increase the number of thermophilic microorganisms, including harmful enteric pathogens such as *Salmonella sp.* (EIS, § 5.8.1).

Exelon proposes a closed-cycle cooling system to serve a new nuclear unit at the CPS (EIS, § 3.2.1.1)⁹—though it does not provide and specific design information on such a system (EIS, pg. 3-10). A closed-cycle system would consume greater quantities of water from Clinton Lake without recharge—approximately 44,843 gallons per minute (gpm) (EIS, pg. 3-8)—most of which would be released into the atmosphere as evaporation (§ 3.2.1.1).

The NRC staff found in its review that the frequency and magnitude of low water conditions resulting from the operation of an additional nuclear unit at the CPS are greater than those predicted by the applicant and may require mitigation measures in dry, low-water years, including the temporary shutdown of the plant, thus judging the impact of another nuclear unit on lake water level as “moderate” (EIS, § 5-7). The lower water levels may also expose shoreline and allow “exotic opportunistic species” to overtake native vegetation; the NRC staff reports that such impacts could be “substantial,” but defers more detailed evaluation until the CP or COL stage because of a lack of adequate information (EIS, § 5.4.1.4). Recreational use of the lake may also be adversely affected by lower water levels (EIS, pg. 5-37). Drought conditions in the Midwest are predicted to become more prevalent in coming decades due to climate change, which could exacerbate the problem.¹⁰

Will Clinton Lake be able to support this significant additional withdrawal, even in years of severe drought? How would the safe operation of the plant be affected in such a situation? Could lower lake levels cause or contribute to the severity of a loss-of-coolant accident? The final EIS should demonstrate a trenchant investigation into these questions, considering the desirability of preserving Clinton Lake and the critical importance of a healthy water supply to the safe functioning of the plant.

Aquatic Ecology

How will the addition of a new nuclear unit to the CPS, with great consumptive water use and potential thermal impacts (EIS, pg. 3-7), affect the health of the various species of fish that populate Clinton Lake, such as the striped bass, as well as threatened species such as the slippershell mussel and spike that may be present in the vicinity of the CPS (EIS, pg. 2-32, 2-35)? How would an investigation of the hydrodynamics of the lake—something currently lacking from Exelon’s environmental report for the Clinton ESP (§ 2.6.1.3)—aid in knowledge of such effects? Is it possible that the effects of “cold shock”—recorded instances of which occurred in 2001 and 2004, when a wintertime plant shutdown and loss of heated liquid discharge kills fish that have congregated in the warmer water (EIS, pg. 5-22)—could be exacerbated by the addition of a new reactor unit at the CPS if all reactor units must shut down simultaneously?

⁹ Exelon Generation Company, LLC, *Environmental Report for the Exelon Generation Company, LLC Early Site Permit* (Kennett Square, Pennsylvania: Exelon Nuclear, 2003) Section 1.1.4, 3.4.

¹⁰ U.S. Global Change Research Program, *Climate Change Impacts on the United States: Potential Consequences of Climate Variability and Change for the Midwestern United States*, 2000. <<http://www.usgcrp.gov/usgcrp/Library/nationalassessment/overviewmidwest.htm>>.

Impingement and Entrainment

Would the phenomena of impingement and entrainment—described in § 5.4.2.1 of the EIS—be amplified by the addition of a new nuclear unit at the CPS? How would the EPA regulations referenced (but not described) as mitigation measures effectively reduce aquatic life mortality? How can this very significant environmental impact be judged in the absence of a specific cooling water intake design selected by Exelon (EIS, pg. 5-17)? Clearly this is an important environmental effect, as evidenced by the study conducted in 1987-1988 at the CPS, during which it is estimated that over 43 million gizzard shad fish were killed from impingement (EIS, pg. 5-18).

Deficient Reporting on Water Resources

According to the EIS, Exelon has yet to provide site-specific data for the chemistry of groundwater under the ESP site (§ 2.6.3.2), nor has it reported velocity measurements within Clinton Lake, which are essential to understand the hydrodynamics of the lake (§ 2.6.1.3). How can the NRC adequately consider the impact of the operation of CPS's existing nuclear unit—much less an additional one—without this important information?

Critical Issues Missing from the Draft EIS

Vulnerability to Sabotage and Terrorism

Nuclear power plants have known vulnerabilities to terrorist attack and sabotage. According to the 9/11 Commission Report, the infamous terrorist organization al Qaeda specifically discussed targeting U.S. nuclear plants. Fuel storage pools, dry storage facilities, and reactor control rooms are not designed to withstand the type attack that occurred on September 11, 2001. The U.S. Government Accountability Office (GAO) concluded in recent testimony before the U.S. Senate that cargo and general aviation airfields are more vulnerable to security breaches than commercial airports.¹¹ Ignoring the threat because it is "highly speculative"¹² does not make the threat go away, and indicates one shortfall of using an exclusively risk-based approach.

One possible security measure to protect the reactor from assault by aircraft is to place a reactor below ground level. Therefore, an analysis in the draft EIS of the suitability of the site to place the reactor containment below-grade level should be done, which would require an in-depth analysis of geological and hydrological conditions at the site.

Need for Power and Who Benefits

According to NRC regulations at 10 CFR 52.17(a)(2), the need for power does not have to be addressed in the ESP process. But an evaluation of the need for power and who benefits is crucial to determining whether the ESP application should be considered at all. In fact, the first question that should be asked is whether residents of Illinois will receive any of the benefit of a new nuclear unit. Much of the electric power produced by Clinton will be fed into the PJM interconnection. PJM is the largest regional transmission organization (RTO) in the U.S. It

¹¹ U.S. Government Accountability Office, *Aviation Security: Improvement Still Needed in Federal Aviation Security Efforts*, Testimony of Norman J. Rabkin Before the Subcommittee on Aviation, Committee on Commerce, Science and Transportation, U.S. Senate, GAO-04-592T, March 30, 2004.

¹² Nuclear Regulatory Commission, *In the Matter of Private Fuel Storage L.L.C.*, Docket No. 72-22-ISFSI, (CLI-02-25), page 13, Dec. 18, 2002.

coordinates the movement of electricity in all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia. The final EIS should include an analysis of the exportation of electricity generated by the new nuclear unit at Clinton to other states where electricity prices are higher and revenues will be greater for Exelon.

Exelon's Property Taxes

The draft EIS reports that the annual property taxes paid by Exelon on its CPS have declined dramatically since 1996, when it paid roughly \$17.9 million to DeWitt County and other taxing districts, to a mere \$9.1 million in 2002 (Table 2-13). Over this period, Exelon's property tax payments have declined from 80 percent of the county's total property tax revenue in 1996 to 53 percent in 2002 (EIS, pg. 2-61).

The cause for the precipitous decline is attributed to "a transition period of declining property tax collections due to deregulation" (EIS, pg. 2-53). Whereas before deregulation property taxes were based on the "depreciated assessed value of the CPS" (pg. 2-53), the institution of deregulation has allowed Exelon to pay taxes based on the market value of power produced from the plant, and Exelon's assessed valuation of the plant has plummeted from \$559 million in 1996 to a mere \$165 million in 2003, only 40 percent of DeWitt County's assessment for that same year (EIS, Table 2-14).

Meanwhile, the draft EIS reports that the consensus feeling among DeWitt County officials is that the economy of the region has "reached bottom" (pg. 2-47), and Clinton School District 15 has been forced to cut its budget by \$3 million and spending reserves over the past several years (EIS, pg. 2-60).

As the economic value of the plant declines in the region, what guarantee is there that a new nuclear unit—built to export electricity for profit—would be an economic benefit to the region? And is it not likely that the Clinton School District could be overstressed by the children of the 3150 construction workers—many of whom may move to the area—required to build the CPS? A more thorough consideration of the place of Exelon and the CPS in DeWitt County, addressing these questions and investigating how the plant serves the community and how it may hurt it, should be included in the final EIS.

Other Issues

"Best Management Practices"

Please define the term "best management practices," which occurs throughout the draft EIS.

Electromagnetic fields and electric transmission line capacity

Despite a finding by the National Institute of Environmental Health Sciences (NIEHS) that "extremely low frequency-electromagnetic field (ELF-EMF) exposure cannot be recognized as entirely safe" and may pose a leukemia hazard, the staff does not consider this to be a significant environmental impact to the public (EIS, § 5.8.4). Would a stronger electromagnetic field produced by increased voltage capacity on the transmission lines from the CPS amplify this

hazard? Further, Exelon is allowed to wait until the COL licensing stage to determine whether transmission lines from the site meet the requirements of the National Electric Safety Code (NESC) regarding electrostatic effects from operation. Why is this issue not being addressed at this stage in the licensing process?

Transmission Capacity

Exelon predicts that four new transmission lines would be required to handle the electric load generated by a new nuclear unit at the CPS (EIS, pg. 3-13). Two segments of two parallel, double-circuit lines would be installed, running a total of about 40 miles to two separate substations (EIS, pg. 3-13). The width of the right-of-way required for these lines would be about 250 feet (EIS, pg. 3-13), and the construction of such lines would create at least a temporary loss of agricultural land, forest land, or open field habitat (EIS, pg. 4-10). How would such transmission line installation impact landowners? And given such a substantial footprint, and the fact that no analysis of impacts on cultural and historic resources along the transmission line easement has been performed (EIS, § 4-34), how can the NRC staff judge the impact of the construction of such lines to be "small" (EIS, § 4.1.2; pg. 4-34)?

Forestland Destruction

About three-and-a-half acres of forest habitat would be cleared for the construction of a new nuclear unit at the CPS, but their loss is considered "negligible" (EIS, pg. 4-7). Also, construction of electric transmission lines to serve the new generating capacity at the CPS may require the clearing of up to 74 acres of forest and may destroy habitat for the endangered Indiana Bat (EIS, § 4-16), but this impact is considered "minor" (EIS, pg. 4-10). Such impacts deserve more evaluation in the final EIS.

Environmental Justice

Exelon did not follow NRC guidance in assessing minority and low-income populations because of the presence of a single Native American person in a particular census block (EIS, pg. 2-67), and they "underemphasized" census block groups where the percentage of minority or low-income populations was high—notably an area in Logan county that contains two prisons (EIS, pg. 2-68). To what extent were Exelon's evidently faulty evaluations relied upon by the NRC in its own consideration of environmental justice issues?

Historic and Cultural Resources

95 archaeological sites and isolated finds from the historic and prehistoric period have been located within a two-mile radius of the CPS (EIS, § 2.9.1), including the Pabst Site, which falls within the Area of Potential Effect (APE), and contains a "large number" of prehistoric artifacts dating from 4000 to 6000 years ago (EIS, pg. 2-64). However, the Pabst Site was submerged by the creation of Clinton Lake and may have been destroyed (EIS, pg. 2-64), but the site may be excavated for construction of a new nuclear unit.

Since there is a "high potential for prehistoric sites" in the general area (EIS, pg. 2-65), what mitigation measures will be required in order to protect the integrity of these sites?

Conclusion

For the reasons articulated above, the NRC's EIS for the Exelon ESP site at the CPS is deficient in its consideration of the breadth of environmental impacts that could be reasonably expected from construction of a new nuclear unit. In the final EIS, Public Citizen requests that these matters be addressed fully and fairly.

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This discordant licensing structure is also evident in the need for a “Site Redress Plan” (EIS, § 4.11), which addresses the activities that would be required to restore the ESP site to its present state in the case that Exelon is granted an ESP but fails to seek or acquire a CP or COL within twenty years to consummate the preparatory activities allowed under the ESP. The breadth of site-preparation activities allowed under the ESP (considered a “partial construction permit” under 10 C.F.R. 52.21) is remarkable, including clearing, grading, and excavating the site; building roads, service and support facilities; and even the construction of ancillary plant components such as cooling towers, intake and discharge structures, and a transmission system (EIS, pp. 4-42 to 4-43). This degree of construction activity and the financial investment it would require would appear to compel the construction of a nuclear unit, yet this reality is not appreciated at this stage of the licensing process, indicating the bizarre division between the ESP

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The Vagueness of the PPE

No specific plant design has been chosen for the new nuclear unit at the CPS; instead, a plant parameter envelope (PPE)—a set of “bounding parameters”—has been specified. The new unit may consist of “one or more reactors or reactor modules” and have a maximum core thermal power rating of 6800 MW(t) (EIS, pg. 3-1). As many as eight reactors may be constructed at the CPS (EIS, pg. 3-3).

The scope of reactor types considered within the PPE—including five light water reactor (LWR) and two gas-cooled reactor types, not all of which have been approved by the NRC (EIS, § 3.2)—is far too broad, making it impossible to provide a reasonably precise judgment of the environmental impact of a new nuclear unit at the CPS, especially considering that Exelon is not even required to employ any one of these designs if it ultimately decides to build a new nuclear unit at the CPS (EIS, pg. 3-3). The EPA, in commenting on the draft EIS for a similar new nuclear development, criticized the NRC for this imprecision, noting that “There is inadequate design information available for some of the proposed units from which to make accurate environmental assessments of the impacts.”⁴ Exelon did not provide any specific design information on a heat dissipation system or radioactive waste-management system for a new nuclear unit at the CPS (EIS, pg. 3-10).

Furthermore, the inaccuracy of this review system is belied by the NRC staff's admission that they neglected to review Exelon's PPE values for correctness (EIS, pg. 3-5).

Accident Scenarios

In its analysis of the potential consequences of “design basis” accidents, Exelon used the characteristics of two particular reactor designs, assuming the impacts of such accidents would bound those of other possible reactor designs (EIS, pg. 5-66). For its analysis of “severe” accidents, Exelon evaluates the consequences for the current generation reactors—not of the kind

³ The NRC's regulations at 10 CFR Part 52.17(a)(2) note that ESP applications do not need to include “an assessment of the benefits (for example, need for power) of the proposed action.”

⁴ U.S. Environmental Protection Agency, “Comments to Draft Environmental Impact Statement for an Early Site Permit (ESP) at the North Anna ESP Site,” April 11, 2005.

that it would build at the CPS (EIS, pg. 5-66)—and the NRC only considers two reactor designs it considers bounding in its evaluation of potential hazards from a serious accident (EIS, pg. 5-69). How can the NRC reasonably judge accident consequences when several of the potential reactor designs proffered by Exelon have never been deployed?

National Environmental Policy Act Requirements

The draft EIS fails to adequately execute the requirements of the National Environmental Policy Act (NEPA) by not adequately providing a “detailed statement” of (1) alternatives to the proposed action, (2) unavoidable environmental impacts, (3) irremediable commitments of resources; and (3) the relationship between short-term uses of the environment and long-term productivity [42 U.S.C. § 4332(C)].

Instead of a thorough evaluation, these issues receive only brief, perfunctory attention in Chapter 10 of the draft EIS. For example, only a half-page is devoted to energy conservation as an alternative, which Exelon considers unreasonable, an assessment that the NRC staff appears to agree with (EIS, § 8.2.1.1).

Alternative Energy Sources: Regarding these NEPA requirements, of particular concern to Public Citizen is the deficient consideration of renewable energy sources draft EIS. While addressing renewable energy sources as an alternative, the draft EIS does not give a fair and thorough consideration of the potential of clean, sustainable energy; and it relies far too heavily on the faulty evaluations performed by Exelon (*see* EIS, § 8.2.3). Public Citizen and others have successfully intervened in the licensing proceeding for the Clinton ESP on the grounds that Exelon’s application “does not provide the basis for the rigorous exploration and objective evaluation of all reasonable alternatives to the ESP that is required NEPA.”⁵

The evaluation of alternatives to the proposed action in the EIS fails to achieve the requirements of 40 C.F.R. 1502.14, which compels agencies, *inter alia*, to “devote substantial treatment to each alternative considered in detail.” While the draft EIS gives fair attention to alternative sites for a new reactor, it gives only scant attention to renewable energy alternatives, despite the conservative admission that Illinois has at least 9000 MW(e) of wind power potential (EIS, pg. 8-17).

The draft EIS overstates the impacts of clean energy alternatives and understates the impacts of nuclear power, wrongly concluding that a new nuclear unit at the CPS would be “environmentally preferable” to a combination of clean energy generation alternatives such as wind, solar, and biomass; and even suggesting that a new nuclear unit is preferable in the areas of “air resources; ecological resources, water resources, and aesthetics” (EIS, § 8.2.4).

⁵ U.S. Nuclear Regulatory Commission, Atomic Safety and Licensing Board, “Memorandum and Order: Ruling on Standing and Contentions,” *In the Matter of Exelon Generation Company, LLC (Early Site Permit for Clinton ESP Site)*, Docket No. 52-007-ESP, ASLBP No. 04-821-01-ESP, Aug. 6, 2004: Appendix A.

Radioactive Waste and the Nuclear Fuel Cycle

High-Level Radioactive Waste

The draft EIS fails to evaluate the environmental impacts and security threat of indefinitely storing the additional irradiated fuel that would be generated by the proposed additional nuclear unit onsite. Another nuclear unit at Clinton could create annually 20 to 30 metric tons of additional irradiated fuel to the site. Despite the NRC's Waste Confidence Decision, the only national repository site under consideration, Yucca Mountain in Nevada, is far from a done deal. Numerous scientific questions remain about whether the site can safely store waste, and, recently, a scandal has erupted over the possible falsification of scientific studies used to justify the geologic suitability of the site.⁶

The NRC's assumption that at deep repositories like Yucca Mountain "no [radioactive] release to the environment is expected" (EIS, pg. 6-13) is unfounded—the geologic integrity of this site is far from proven. Moreover, the Department of Energy (DoE) has not yet submitted its license application to the NRC, although the statutory deadline was more than two years ago. DoE was supposed to begin accepting waste in 1998 and is highly unlikely to meet its revised goal of accepting waste by 2012. Further, Illinois law [220 ILCS 5/8-406(c)] prohibits the construction of a new nuclear power plant until the director of the Illinois Environmental Protection Agency finds that the U.S. government has identified and approved and demonstrable technology or means for the disposal of high-level nuclear waste.

Even if Yucca Mountain is opened, the site cannot hold the high-level radioactive waste that will be generated by existing reactors after 2010. Therefore, in addition to the waste generated by existing reactors, waste created by a new nuclear unit at Clinton would also have to remain onsite for an indefinite period of time. The NRC recently approved an unprecedented 40-year license extension for the nuclear operator Dominion to store high-level nuclear waste on-site at its Surry nuclear plant near Williamsburg, Virginia, indicating that fuel can reasonably be expected to be stored at reactor sites for at least that long.⁷ The environmental impacts of indefinite storage must be thoroughly evaluated in the final EIS.

Spent Fuel Reprocessing

The draft EIS only considers the "no recycle" option for irradiated fuel management, which treats spent fuel as waste to be stored at a federal waste repository, and does not fully consider the possible reprocessing of spent nuclear fuel (EIS, pg. 6-6). Yet, the DoE has had significant setbacks in its attempt to attain a license for a federal repository for irradiated nuclear fuel at Yucca Mountain, and the federal policy banning the reprocessing of spent nuclear fuel far from intractable. In fact, the DoE was granted more than \$67 million in fiscal year (FY) 2005 for the "Advanced fuel cycle initiative," a research and development program intended to provide technology to "recover the energy content in spent nuclear fuel," and it has requested \$70 million

⁶ See, for example, a press release from Congressman Jon Porter, "Chairman Jon Porter's Initial Probe into Allegations that Federal Scientists Falsified Data Used to Establish the Safety of the Yucca Mountain Nuclear Waste Repository Reveals Disturbing Results," April 1, 2005.

⁷ U.S. Nuclear Regulatory Commission, "NRC Approves 40-Year License Renewal for Independent Spent Fuel Storage Installation at Surry Nuclear Plant," [press release] Dec. 8, 2004.

from Congress for FY 2006 for the same program.⁸ This continued government interest in reprocessing, combined with the failure to establish a national repository for irradiated nuclear fuel, should compel the NRC to consider the impacts of spent fuel reprocessing in the final EIS.

Depleted Uranium

The draft EIS lacks a consideration of the environmental and public health impacts resulting from military applications of depleted uranium (DU), a byproduct of the enrichment process of the fuel cycle. Moreover, there is not a complete consideration of the impacts of managing this substance as a waste. There is no repository established for the permanent disposal of depleted uranium; but the impacts of such a hypothetical facility should be considered.

Uranium Milling and Mining

The draft EIS estimates that, for the reference reactor-year (a 1000-MW(e) LWR), 816,000 metric tons (MT) of raw ore would be required to produce 900 MT of yellowcake for ultimate use as fuel after conversion, enrichment, and fabrication (EIS, § 6.1.2.4 and § 6.1.2.5). Over time, as worldwide uranium ore supplies are depleted, requiring exploitation of less pure deposits of ore, would this ratio of ore to yellowcake increase? If so, would the environmental impacts of mining and milling become greater?

Transportation Accidents (§ 6.2)

This section and the accompanying Appendix G of the draft EIS do not give adequate weight and consideration to the possibility and consequences of severe accident scenarios resulting from the transportation of spent nuclear fuel. The possibility of extreme accidents, while slight, exists, as evidenced by recent incidents such as the Baltimore train tunnel fire of 2001 and the more recent accident in Graniteville, South Carolina in January, where a violent train crash and release of chlorine killed nine people, sent hundreds to the hospital, and required thousands to evacuate their homes.

Water Resources

CPS Impacts on Clinton Lake

Clinton Lake is an artificial reservoir that was created by Illinois Power Company in 1977 as a source of cooling water for the CPS; but it has become a popular recreation area (see EIS pg. 2-5, 6), attracting nearly a million visitors in 2000 (EIS, pg. 2-5). The CPS draws cooling water from the lake and is one of the largest users of water in the region (EIS, pg. 5.3.2).

A "once-through" heat dissipation system from the CPS—the kind currently in use to serve the existing reactor, drawing 566,000 gallons per minute (gpm) from Clinton Lake (EIS, § 2.6.2.1)—which discharges heated water into Clinton Lake acts to induce greater evaporation and reduce the volume of the lake (EIS, § 5.3:1). The first Clinton unit raised the temperature of the lake by about 14°F (EIS, pg. 5-19). This elevated water temperature is considered by the NRC to be "the most significant water quality concern associated with the existing unit" (EIS, § 2.6.3.1), as water temperature is essential to the maintenance of a healthy aquatic environment (EIS, pg. 5-

⁸ U.S. Department of Energy, Office of Management, Budget and Evaluation/CFO; *Department of Energy FY 2006 Congressional Budget Request: Budget Highlights*, DOE/ME-0053 (Washington: DOE, Feb. 2005) 60-63.

19). Higher water temperatures can increase the number of thermophilic microorganisms, including harmful enteric pathogens such as *Salmonella sp.* (EIS, § 5.8.1).

Exelon proposes a closed-cycle cooling system to serve a new nuclear unit at the CPS (EIS, § 3.2.1.1)⁹—though it does not provide and specific design information on such a system (EIS, pg. 3-10). A closed-cycle system would consume greater quantities of water from Clinton Lake without recharge—approximately 44,843 gallons per minute (gpm) (EIS, pg. 3-8)—most of which would be released into the atmosphere as evaporation (§ 3.2.1.1).

The NRC staff found in its review that the frequency and magnitude of low water conditions resulting from the operation of an additional nuclear unit at the CPS are greater than those predicted by the applicant and may require mitigation measures in dry, low-water years, including the temporary shutdown of the plant, thus judging the impact of another nuclear unit on lake water level as “moderate” (EIS, § 5-7). The lower water levels may also expose shoreline and allow “exotic opportunistic species” to overtake native vegetation; the NRC staff reports that such impacts could be “substantial,” but defers more detailed evaluation until the CP or COL stage because of a lack of adequate information (EIS, § 5.4.1.4). Recreational use of the lake may also be adversely affected by lower water levels (EIS, pg. 5-37). Drought conditions in the Midwest are predicted to become more prevalent in coming decades due to climate change, which could exacerbate the problem.¹⁰

Will Clinton Lake be able to support this significant additional withdrawal, even in years of severe drought? How would the safe operation of the plant be affected in such a situation? Could lower lake levels cause or contribute to the severity of a loss-of-coolant accident? The final EIS should demonstrate a trenchant investigation into these questions, considering the desirability of preserving Clinton Lake and the critical importance of a healthy water supply to the safe functioning of the plant.

Aquatic Ecology

How will the addition of a new nuclear unit to the CPS, with great consumptive water use and potential thermal impacts (EIS, pg. 3-7), affect the health of the various species of fish that populate Clinton Lake, such as the striped bass, as well as threatened species such as the slippershell mussel and spike that may be present in the vicinity of the CPS (EIS, pg. 2-32, 2-35)? How would an investigation of the hydrodynamics of the lake—something currently lacking from Exelon’s environmental report for the Clinton ESP (§ 2.6.1.3)—aid in knowledge of such effects? Is it possible that the effects of “cold shock”—recorded instances of which occurred in 2001 and 2004, when a wintertime plant shutdown and loss of heated liquid discharge kills fish that have congregated in the warmer water (EIS, pg. 5-22)—could be exacerbated by the addition of a new reactor unit at the CPS if all reactor units must shut down simultaneously?

⁹ Exelon Generation Company, LLC, *Environmental Report for the Exelon Generation Company, LLC Early Site Permit* (Kennett Square, Pennsylvania: Exelon Nuclear, 2003) Section 1.1.4, 3.4.

¹⁰ U.S. Global Change Research Program, *Climate Change Impacts on the United States: Potential Consequences of Climate Variability and Change for the Midwestern United States*, 2000. <<http://www.usgcrp.gov/usgcrp/Library/nationalassessment/overviewmidwest.htm>>.

Impingement and Entrainment

Would the phenomena of impingement and entrainment—described in § 5.4.2.1 of the EIS—be amplified by the addition of a new nuclear unit at the CPS? How would the EPA regulations referenced (but not described) as mitigation measures effectively reduce aquatic life mortality? How can this very significant environmental impact be judged in the absence of a specific cooling water intake design selected by Exelon (EIS, pg. 5-17)? Clearly this is an important environmental effect, as evidenced by the study conducted in 1987-1988 at the CPS, during which it is estimated that over 43 million gizzard shad fish were killed from impingement (EIS, pg. 5-18).

Deficient Reporting on Water Resources

According to the EIS, Exelon has yet to provide site-specific data for the chemistry of groundwater under the ESP site (§ 2.6.3.2), nor has it reported velocity measurements within Clinton Lake, which are essential to understand the hydrodynamics of the lake (§ 2.6.1.3). How can the NRC adequately consider the impact of the operation of CPS's existing nuclear unit—much less an additional one—without this important information?

Critical Issues Missing from the Draft EIS

Vulnerability to Sabotage and Terrorism

Nuclear power plants have known vulnerabilities to terrorist attack and sabotage. According to the 9/11 Commission Report, the infamous terrorist organization al Qaeda specifically discussed targeting U.S. nuclear plants. Fuel storage pools, dry storage facilities, and reactor control rooms are not designed to withstand the type attack that occurred on September 11, 2001. The U.S. Government Accountability Office (GAO) concluded in recent testimony before the U.S. Senate that cargo and general aviation airfields are more vulnerable to security breaches than commercial airports.¹¹ Ignoring the threat because it is “highly speculative”¹² does not make the threat go away, and indicates one shortfall of using an exclusively risk-based approach.

One possible security measure to protect the reactor from assault by aircraft is to place a reactor below ground level. Therefore, an analysis in the draft EIS of the suitability of the site to place the reactor containment below-grade level should be done, which would require an in-depth analysis of geological and hydrological conditions at the site.

Need for Power and Who Benefits

According to NRC regulations at 10 CFR 52.17(a)(2), the need for power does not have to be addressed in the ESP process. But an evaluation of the need for power and who benefits is crucial to determining whether the ESP application should be considered at all. In fact, the first question that should be asked is whether residents of Illinois will receive any of the benefit of a new nuclear unit. Much of the electric power produced by Clinton will be fed into the PJM interconnection. PJM is the largest regional transmission organization (RTO) in the U.S. It

¹¹ U.S. Government Accountability Office, *Aviation Security: Improvement Still Needed in Federal Aviation Security Efforts*, Testimony of Norman J. Rabkin Before the Subcommittee on Aviation, Committee on Commerce, Science and Transportation, U.S. Senate, GAO-04-592T, March 30, 2004.

¹² Nuclear Regulatory Commission, *In the Matter of Private Fuel Storage L.L.C.*, Docket No. 72-22-ISFSI, (CLI-02-25), page 13, Dec. 18, 2002.

coordinates the movement of electricity in all or parts of Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia and the District of Columbia. The final EIS should include an analysis of the exportation of electricity generated by the new nuclear unit at Clinton to other states where electricity prices are higher and revenues will be greater for Exelon.

Exelon's Property Taxes

The draft EIS reports that the annual property taxes paid by Exelon on its CPS have declined dramatically since 1996, when it paid roughly \$17.9 million to DeWitt County and other taxing districts, to a mere \$9.1 million in 2002 (Table 2-13). Over this period, Exelon's property tax payments have declined from 80 percent of the county's total property tax revenue in 1996 to 53 percent in 2002 (EIS, pg. 2-61).

The cause for the precipitous decline is attributed to "a transition period of declining property tax collections due to deregulation" (EIS, pg. 2-53). Whereas before deregulation property taxes were based on the "depreciated assessed value of the CPS" (pg. 2-53), the institution of deregulation has allowed Exelon to pay taxes based on the market value of power produced from the plant, and Exelon's assessed valuation of the plant has plummeted from \$559 million in 1996 to a mere \$165 million in 2003, only 40 percent of DeWitt County's assessment for that same year (EIS, Table 2-14).

Meanwhile, the draft EIS reports that the consensus feeling among DeWitt County officials is that the economy of the region has "reached bottom" (pg. 2-47), and Clinton School District 15 has been forced to cut its budget by \$3 million and spending reserves over the past several years (EIS, pg. 2-60).

As the economic value of the plant declines in the region, what guarantee is there that a new nuclear unit—built to export electricity for profit—would be an economic benefit to the region? And is it not likely that the Clinton School District could be overstressed by the children of the 3150 construction workers—many of whom may move to the area—required to build the CPS? A more thorough consideration of the place of Exelon and the CPS in DeWitt County, addressing these questions and investigating how the plant serves the community and how it may hurt it, should be included in the final EIS.

Other Issues

"Best Management Practices"

Please define the term "best management practices," which occurs throughout the draft EIS.

Electromagnetic fields and electric transmission line capacity

Despite a finding by the National Institute of Environmental Health Sciences (NIEHS) that "extremely low frequency-electromagnetic field (ELF-EMF) exposure cannot be recognized as entirely safe" and may pose a leukemia hazard, the staff does not consider this to be a significant environmental impact to the public (EIS, § 5.8.4). Would a stronger electromagnetic field produced by increased voltage capacity on the transmission lines from the CPS amplify this

hazard? Further, Exelon is allowed to wait until the COL licensing stage to determine whether transmission lines from the site meet the requirements of the National Electric Safety Code (NESC) regarding electrostatic effects from operation. Why is this issue not being addressed at this stage in the licensing process?

Transmission Capacity

Exelon predicts that four new transmission lines would be required to handle the electric load generated by a new nuclear unit at the CPS (EIS, pg. 3-13). Two segments of two parallel, double-circuit lines would be installed, running a total of about 40 miles to two separate substations (EIS, pg. 3-13). The width of the right-of-way required for these lines would be about 250 feet (EIS, pg. 3-13), and the construction of such lines would create at least a temporary loss of agricultural land, forest land, or open field habitat (EIS, pg. 4-10). How would such transmission line installation impact landowners? And given such a substantial footprint, and the fact that no analysis of impacts on cultural and historic resources along the transmission line easement has been performed (EIS, § 4-34), how can the NRC staff judge the impact of the construction of such lines to be "small" (EIS, § 4.1.2; pg. 4-34)?

Forestland Destruction

About three-and-a-half acres of forest habitat would be cleared for the construction of a new nuclear unit at the CPS, but their loss is considered "negligible" (EIS, pg. 4-7). Also, construction of electric transmission lines to serve the new generating capacity at the CPS may require the clearing of up to 74 acres of forest and may destroy habitat for the endangered Indiana Bat (EIS, § 4-16), but this impact is considered "minor" (EIS, pg. 4-10). Such impacts deserve more evaluation in the final EIS.

Environmental Justice

Exelon did not follow NRC guidance in assessing minority and low-income populations because of the presence of a single Native American person in a particular census block (EIS, pg. 2-67), and they "underemphasized" census block groups where the percentage of minority or low-income populations was high—notably an area in Logan county that contains two prisons (EIS, pg. 2-68). To what extent were Exelon's evidently faulty evaluations relied upon by the NRC in its own consideration of environmental justice issues?

Historic and Cultural Resources

95 archaeological sites and isolated finds from the historic and prehistoric period have been located within a two-mile radius of the CPS (EIS, § 2.9.1), including the Pabst Site, which falls within the Area of Potential Effect (APE), and contains a "large number" of prehistoric artifacts dating from 4000 to 6000 years ago (EIS, pg. 2-64). However, the Pabst Site was submerged by the creation of Clinton Lake and may have been destroyed (EIS, pg. 2-64), but the site may be excavated for construction of a new nuclear unit.

Since there is a "high potential for prehistoric sites" in the general area (EIS, pg. 2-65), what mitigation measures will be required in order to protect the integrity of these sites?

Conclusion

For the reasons articulated above, the NRC's EIS for the Exelon ESP site at the CPS is deficient in its consideration of the breadth of environmental impacts that could be reasonably expected from construction of a new nuclear unit. In the final EIS, Public Citizen requests that these matters be addressed fully and fairly.