UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	**Docket No. 52-007**
EXELON GENERATION COMPANY, LLC	)	**ASLBP No. 04-821-01-ESP**
(Early Site Permit for the Clinton ESP Site)	)	**October 17, 2006**

PREFILED TESTIMONY OF TAMAR JERGENSEN CERAFICI ON REQUIRED ENVIRONMENTAL FINDINGS

I. INTRODUCTION

Q. Please state your name.

A. My name is Tamar Jergensen Cerafici.

Q. Who is your current employer and what is your current position?

A. My current employer is CH2M HILL, a contractor for Exelon Generation Company, LLC (EGC or Exelon). My current position is Senior Environmental Specialist.

Q. Please summarize your professional qualifications.

A. Since 2001, I have been a Senior Environmental Specialist for CH2M HILL. I provide environmental and regulatory consulting services for nuclear permitting and licensing projects. I have been focusing on nuclear permitting and licensing regulations for the last five years. I have experience in developing and evaluating environmental impact statements under the National Environmental Policy Act (NEPA): from 2001 through 2003, I was a primary author and supported the development of an EIS for the U.S. Forest Service, and from 2004 through 2005, I authored the regulatory and compliance

portions of an Environmental Assessment under Bahamian law for a liquefied natural gas facility in the Bahamas. Since late 2005, I have been an author and assistant project manager for Environmental Reports that will support Combined Operating License Applications in North Carolina and other states. In 2006, I was appointed as a special faculty member of the Hofstra University School of Law, and from 1994 to 2004 I taught environmental law as an affiliate faculty member in the University of Idaho's graduate program in environmental science. I practiced general litigation and environmental law in the states of Idaho and Utah from 1989 to 2001. I have authored several papers and presentations on the environmental and regulatory implications of siting and managing new nuclear facilities in the United States and abroad. A copy of my professional qualifications is attached.

Q. On whose behalf are you testifying?

A. I am testifying on behalf of the Applicant, EGC.

Q. Please describe your involvement in the Early Site Permit (ESP) Application.

A. I assisted Exelon in preparation of the Environmental Report starting in 2001, and my involvement continues to the present time. I am the author of several sections of the Environmental Report, and was actively involved in final reviews of the entire application. That involvement has further included interaction with the NRC Staff (the Staff) during alternative site audits and requests for additional information. I have been active in reviewing many aspects of the ESP Application, including revisions to the Site Safety Analysis Report (SSAR) and the Environmental Report. I have also assisted Exelon with responses to contentions filed in this matter.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to provide a brief description of the Site Redress Plan and Environmental Report (ER), including a description of the applicable regulatory criteria. My testimony also describes the ways in which the Staff's Environmental Impact Statement (EIS) documents their review of the ER and Site Redress Plan, and how we believe the EIS (1) fully complies with the requirements of Section 102(2)(A),(C), and (E) of the National Environmental Policy Act (NEPA) and subpart A of 10 C.F.R. Part 51; (2) appropriately considers and evaluates the environmental factors contained in the record of the proceeding; and (3) considers reasonable alternatives (within the constraints of the Commission guidance on this matter), and appropriately determines that the ESP should be issued with the Permit Condition identified in Section 4.3.1 of the EIS.

II. SITE REDRESS PLAN

Q. What is the purpose of the Site Redress Plan?

A. The holder of an ESP with an approved Site Redress Plan may, in accordance with 10 C.F.R. §§ 52.17(c) and 52.25(a), perform the site activities allowed by 10 C.F.R. § 50.10(e)(1), provided that the final ESP EIS concludes that the activities will not result in any significant adverse environmental impacts that cannot be redressed. These activities could include: preparation for construction, including clearing, grading, construction of temporary access roads, etc.; installation of temporary construction support facilities; excavation for facility structures; construction of service facilities; drilling sample/monitoring wells or other borings; construction of non safety-related cooling towers, non safety-related plant structures, and fire protection equipment; expansion of

the existing switchyard and transmission system; modification of the existing discharge flume; and construction of other non safety-related structures, systems, and components.

Q. Are there any prerequisites to conducting such site activities for the EGC ESP facility?

A. Yes. Prerequisites that must be fulfilled before performing such activities include: (1) documentation of existing site conditions within the EGC ESP site by way of photographs, surveys, listings of existing facilities and structures, or other documentation (this record would serve as the baseline for redressing the site in the event ESP site-preparation activities were terminated as a result of project cancellation or expiration of the ESP); (2) coordination of the movement of the existing Clinton Power Station (CPS) protected area boundary, as required; (3) movement, demolition, or ownership transfer of existing CPS buildings and structures within the EGC ESP site; and (4) obtaining the necessary permits to perform preconstruction activities, such as local building permits, Illinois Environmental Protection Agency (IEPA) NPDES permit, IEPA Clean Water Act (CWA) permit, and the IEPA General Storm Water Permit. After these prerequisites are completed, planned site-preparation activities could proceed and might include none, some, or all of the activities pursuant to 10 C.F.R. §§ 52.17(c) and 50.10(e)(1).

Q. When would the Site Redress Plan be implemented?

A. The Site Redress Plan would be implemented if site-preparation activities were performed and the ESP were to expire. The objective of the Site Redress Plan is to ensure that the EGC ESP site would be returned to an environmentally stable and aesthetically acceptable condition suitable for non-nuclear uses. Under the Site Redress Plan, areas that were permanently disturbed would be stabilized and contoured to conform to surrounding areas.

Q. What were the results of the NRC Staff's review of the Site Redress Plan?

A. The Staff's review of the Site Redress Plan is included in Section 4.11 of the EIS. The EIS considers whether the pre-construction activities allowed pursuant to 10 C.F.R. § 50.10(c)(1) and as described by EGC are bounded by the environmental impacts for construction of the entire facility as analyzed in the EIS. The EIS concludes that the potential site-preparation activities described in the Site Redress Plan would not result in any significant adverse environmental impacts that could not be redressed.

Q. Are there any restrictions on implementing the site pre-construction activities authorized by 10 C.F.R. § 50.10(e)(1)?

A. Yes. Prior to site pre-construction activities, EGC must secure a number of permits related to hydrologic impacts, including Clean Water Act (CWA) permits from the U.S. Army Corps of Engineers and state agencies. Prior to conducting any activity pursuant to the ESP, EGC must submit a copy of its CWA 401 certification issued by the IEPA, or the agency's determination that no 401 certification is required. The Staff concluded that this Permit Condition and the permit process would be adequate to ensure that the impacts of pre-construction activities would be SMALL, localized, and temporary.

III. ENVIRONMENTAL REPORT

A. Purpose and Contents of the Environmental Report

Q. Briefly describe the ER.

A. As required by 10 C.F.R. Part 51 and 10 C.F.R. § 52.17(a)(2), EGC submitted an ER. The ER was developed using the format and content guidance provided in the "Environmental Standard Review Plan" (NUREG-1555). The ER discusses the existing environment at the site and in the vicinity; provides a bounding description of a nuclear

plant using the Plant Parameter Envelope; summarizes environmental impacts of construction and operation and considers appropriate mitigation measures; and reviews alternatives.

Q. Briefly outline the contents of the ER.

A. The ER contains the following principal sections: (1) an Introduction to the ER, (2) Environmental Description, (3) Plant Description, (4) Environmental Impacts of Construction, (5) Environmental Impacts of Station Operation, (6) Environmental Measurement and Monitoring Program, (7) Environmental Impacts of Postulated Accidents Involving Radioactive Materials, (8) Need for Power, (9) Alternatives to the Proposed Action, and (10) Environmental Consequences of the Proposed Action.

Q. Describe the regulatory criteria applicable to the ER.

A. The principal regulatory bases for the ER include the following:

- 10 C.F.R. Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions," including §§ 51.45, 51.50, 51.71, 51.75.
- 10 C.F.R. Part 52, "Early Site Permits; Standard Design Certifications; and Combined Licenses for Nuclear Power Plants," including §§ 52.17(a)(2), 52.18.
- NUREG-1555, "Standard Review Plans for Environmental Reviews of Nuclear Power Plants"
- Review Standard (RS) RS-002, "Processing Applications for Early Site Permits"

Q. Does the ER comply with these criteria?

A. Yes. The ER fulfills the regulatory requirements listed above.

Q. Does the ER assess impacts based on a specific power facility design?

A. No. The ER does not assess impacts based on a specific power facility design. Rather the ER considers a spectrum of feasible designs, based upon the PPE, as described in "Prefiled Testimony of Eddie R. Grant on Required Safety Findings."

B. NRC Review of the Environmental Report

Q. Briefly describe the NRC review of the ER.

A. Section 102 of NEPA requires an EIS for major Federal actions that significantly affect the quality of the human environment. 10 C.F.R. Part 52 contains the NRC regulations related to ESPs. As set forth in 10 C.F.R. § 52.18, the Commission has determined that an EIS will be prepared during the review of an application for an ESP. Upon acceptance of the EGC ESP application for docketing, the NRC began the environmental review process described in 10 C.F.R. Part 51 by publishing in the *Federal Register* a Notice of Intent (68 Fed. Reg. 66,130) to prepare an EIS and conduct scoping. The Staff held a public scoping meeting in Clinton, Illinois on December 18, 2003, and visited the EGC ESP site in March 2004. Subsequent to the site visit and the scoping meeting and in accordance with NEPA and 10 C.F.R. Part 51, the Staff evaluated the potential environmental impacts of constructing and operating a new nuclear unit at the EGC ESP site, issued a draft EIS, and requested public comments on the draft EIS. During the course of preparing this EIS, the Staff reviewed the ER, consulted with Federal, State, Tribal, and local agencies, and followed the guidance set forth in RS-002 to conduct an independent review of the issues. That Review Standard draws from the previously published NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," and NUREG-1555, "Environmental Standard Review Plans."

Q. How were public comments addressed by the NRC?

A. The NRC considered the public comments related to the environmental review received during the scoping process and the draft EIS. These comments and NRC responses are provided in Appendix D and Appendix E of the EIS, respectively.

Q. Describe how the NRC categorized the level of significance of environmental issues.

A. Following the practice the Staff uses in the "Generic Environmental Impact Statement for License Renewal of Nuclear Plants" (NUREG-1437) (NRC 1996) and supplemental license renewal EISs, environmental issues were evaluated using the three-level standard of significance – SMALL, MODERATE, or LARGE – developed by NRC using guidelines from the Council on Environmental Quality (40 C.F.R. § 1508.27). The footnote to Table B-1 of 10 C.F.R. Part 51, Subpart A, Appendix B, provides the following definitions of the three significance levels: SMALL – Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource. MODERATE – Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource. LARGE – Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource. Mitigation measures were considered for each environmental issue and are discussed in the appropriate sections.

Q. Were any issues excluded or deferred in NRC's review of the ER?

A. For some matters, such as need for power and the cost-benefit analysis, EGC elected not to provide information, as is permitted by 10 C.F.R. § 52.17(a)(2). In accordance with 10 C.F.R. § 52.18, the EIS also does not discuss those matters. Accordingly, those issues are not resolved for the ESP site, and as required by 10 C.F.R. § 52.79(a)(1), a combined license (COL) applicant referencing the ESP would need to provide additional

environmental information on those matters. The ER and the EIS also do not address severe accident design mitigation alternatives (SAMDAs). Evaluation of SAMDAs is dependent upon design information that is generally not available at the ESP stage. However, the design certifications do include an evaluation of SAMDAs, as discussed in Section VI.B.7 of the design certification rules in Appendices A, B, C, and D to 10 C.F.R. Part 52. If the COL applicant does not reference a design certification, it would need to include an evaluation of SAMDAs as required by 10 C.F.R. § 52.79(a)(1).

Q. How did the EGC ESP organization support the NRC Staff's review of the ER?

A. In the course of the Staff's review, the EGC ESP organization responded to four separate environmental related requests for additional information (RAIs) that included approximately fifty subparts. To support the Staff's environmental analysis, Exelon arranged meetings between the Staff and outside agencies and parties, such as Illinois Power transmission representatives. These efforts continued during the environmental review through teleconferences and subsequent meetings so that the Staff could ask clarifying questions. Exelon also supported Staff tours of the Clinton site.

Q. Please provide your opinion regarding the review performed by the NRC Staff.

A. The Staff used its detailed guidance in NUREG-1555 to structure its review; the Staff asked numerous RAIs and held meetings to elicit more detailed information from EGC; and the Staff conducted independent inspections and reviews. In my opinion, the review performed by the NRC Staff was systematic, comprehensive, and probing.

IV. ENVIRONMENTAL ISSUES

Q. Briefly describe the environmental issues that must be addressed under Section 102(2)(A), (C), and (E) of NEPA, Subpart A of 10 C.F.R. Part 51, and NUREG-1555.

A. The ER and EIS must address the affected environment, site layout, construction impacts, operation impacts, fuel cycle impacts, transportation impacts, cumulative impacts, alternatives, and other factors.

A. The Affected Environment

Q. What aspects of the site location are described in the ER and EIS?

A. ER § 2.1 provides information on the site location, and this matter is discussed in § 2.1 of the EIS. The ESP site is located in rural DeWitt County, Illinois, on the site of the existing Clinton Power Station. The site is located on man-made Clinton Lake. Clinton Lake was constructed for the purpose of supporting operation of CPS (which is currently a single unit but originally was intended as a two-unit station.)

Q. What aspects of land use are described in the ER and EIS?

A. ER § 2.2 provides information on the land use in the areas around the ESP site, and this matter is discussed in § 2.2 of the EIS. The site vicinity is 84 percent agricultural land, and the only special uses within the vicinity are recreational uses in the Clinton Lake State Recreation Area and two other small recreational areas. The topography is generally flat, with elevations ranging from 690 to 800 feet above mean sea level. EIS Figure 2-3 shows the transportation network in the vicinity. Anticipated transmission line rights-of-way would not interfere with existing local zoning plans because existing rights-of-way were assumed to be used. Land use within the region is also primarily agricultural, with the exception of the population centers of Springfield, Bloomington-Normal, and Champaign-Urbana.

Q. What aspects of demography are described in the ER and EIS?

A. ER § 2.5.1 provides information on demography, and this matter is discussed in § 2.8.1 of the EIS. DeWitt is the nearest community, approximately three miles from the proposed site. The City of Clinton, with a population of 7,485 as of the 2000 U.S. Census, lies approximately six miles west of the site. The nearest population centers are Bloomington-Normal (pop. 110,194), approximately 22 miles north of the site, Decatur, (pop. 81,860), 22 miles to the south, Champaign-Urbana (pop. 103,913), 28 miles to the east, and Springfield (pop. 114,454), 51 miles to the southwest.

Q. What aspects of meteorology and air quality are described in the ER and EIS?

A. ER § 2.7 provides information on meteorology and air quality, and this matter is discussed in § 2.3 of the EIS. The ESP site has a typical continental climate with moderately cold winters and warm summers. Prevailing winds in the region are from the south. Severe weather can be in the form of thunderstorms, hail, tornadoes, snow, and ice. Regional air quality measurements in 2002 found air quality to be Good or Moderate on the vast majority of days. The EIS reviews the site meteorological monitoring program, and concludes that the program provides data that represent onsite conditions as required by 10 C.F.R. § 100.20 and provides an acceptable basis for atmospheric dispersion estimates under 10 C.F.R. Part 50, Appendix I.

Q. What aspects of geology are described in the ER and EIS?

A. SSAR § 2.5 provides a detailed geological, seismological, and geotechnical description of the ESP site, and ER § 2.6 summarizes that information. The Staff's geological description and evaluation is in § 2.5 of the SER, and summarized in § 2.4 of the EIS. Fill material will need to be imported onsite during construction because the glacial material beneath the site is geotechnically unsuitable for use as a fill material.

Q. What aspects of radiological environment are described in the ER and EIS?

A. ER § 6.2 provides information on the existing CPS radiological monitoring program, and the Staff reviewed the program's historical data and periodic reporting for the existing unit. The EIS concludes that the data show that doses to the maximally exposed individuals around the site are a small fraction of the Federal environmental radiation standards (10 C.F.R. Part 20; 10 C.F.R. Part 50, Appendix I; 40 C.F.R. Part 190).

Q. What aspects of hydrology, water use, and water quality are described in the ER and EIS?

A. ER § 2.3 provides information on water, and this matter is discussed in § 2.6 of the EIS, including hydrology, water use, and water quality. The thermal load discharged into the lake from CPS results in local elevated temperatures. Before a new nuclear unit could begin to operate, EGC would need to obtain a National Pollutant Discharge Elimination System (NPDES) permit from the Illinois Environmental Protection Agency (IEPA).

Q. What aspects of ecology are described in the ER and EIS?

A. ER § 2.4 provides information on ecology, and this matter is described in § 2.7 of the EIS. The Staff prepared a biological assessment for threatened and endangered species identified by the U.S. Fish and Wildlife Service as potentially occurring in the area. No critical habitats are located on site, and no threatened or endangered plant or aquatic species are known to occur in the vicinity of the site or on anticipated transmission rights-of-way.

Q. What aspects of socioeconomics are described in the ER and EIS?

A. ER § 2.5 provides information on socioeconomics, and this matter is described in § 2.8 of the EIS, including descriptions of demography and community characteristics. The Staff's investigation included visits and interviews with the local population. Population

distribution was based on the 2000 U.S. Census, with projections at ten-year intervals to 2060 based on the 1990 Census and projection methodology developed by Illinois State University. The 2000 Census found a population of 12,358 within 10 miles of the site, with a total of 764,366 within 50 miles, and the 2060 projections estimate a decline to 10,462 within 10 miles and regional growth of less then 0.5 percent per year.

Q. What aspects of historical and cultural resources are described in the ER and EIS?

A. ER § 2.5.3 describes the cultural background and the known historic and archaeological resources at the ESP site and the surrounding area. This matter is also discussed in Section 2.9 of the EIS. The Staff consulted on the proposed action with the Illinois State Historic Preservation Agency (IHPA) and affected Native American tribes. The IHPA may require cultural resource studies prior to construction, depending on construction location.

Q. What aspects of environmental justice are described in the ER and EIS?

A. ER § 2.5 provides information on environmental justice, and this matter is discussed in EIS § 2.10. ER Figures 2.5-8 and 2.5-9 and EIS Figures 2-6 and 2-7 show distributions of minority and low-income populations in the region. According to 2000 Census Bureau data, DeWitt County is 97.1 percent white, with small African American, American Indian, and Hispanic populations. Between 8 and 10 percent of the population in the vicinity and region is classified as low-income or below the poverty level; the national percentage of low-income population is 11.3 percent. Concentrations of low-income and minority populations are present in the larger cities in the region, such as Champaign-Urbana, Decatur, and Springfield.

B. Site Layout

Q. What aspects of the PPE are described in the ER and EIS?

A. ER § 3.1 indicates that a specific technology and design for the proposed new plant has not been selected. Given the absence of a specific plant design, the EGC developed a set of bounding plant parameter values for the ESP application. The PPE values are listed in Table 1.4-1 of the SSAR. At the construction permit (CP) or COL stage, EGC will need to verify that the actual characteristics for the selected reactor are bounded by the PPE. If the actual design characteristics are not bounded by the PPE, EGC and the Staff will need to evaluate whether the environmental impacts of construction and operation remain bounded by the impacts analyzed in the ESP application, and EGC may need to request a variance from the ESP in accordance with 10 C.F.R. § 52.39(b).

Q. What aspects of the cooling system are described in the ER and EIS?

A. EGC proposed a cooling tower system for normal cooling, and a second mechanical draft cooling tower system as the ultimate heat sink (UHS), as appropriate. The water intake structure (shown in ER Figure 2.1-5 and EIS Figure 2-1) would be approximately 65 feet south of the CPS intake structure. Cooling tower blowdown and other discharges would be discharged through a flume leading to the CPS discharge. Radioactive and nonradioactive plant effluents will be discharged in such a manner as to comply with applicable Federal and State requirements.

Q. What aspects of the anticipated power transmission system are described in the ER and EIS?

A. ER § 3.7 provides information on the anticipated power transmission system and requirements for the proposed ESP facility, and this matter is discussed in § 3.3 of the

EIS. The existing transmission system has excess capacity to handle some, but not all of the output of a new facility bounded by the PPE; thus, the widening of existing rights-of-way may be required. This would probably result in some additional environmental impacts. Once a COL applicant has applied to the Federal Energy Regulatory Commission (FERC) for large-generator interconnection, a transmission analysis may be required under 18 C.F.R. Part 35 and the State's AmerenIP Open Access Transmission Tariff. AmerenIP owns the transmission lines, and is the transmission provider in Illinois. Once the transmission owner receives a request for an interconnection, it performs the evaluation on the behalf of its customer, the COL applicant. This process is explained in detail in the EIS.

C. Construction Impacts

Q. Describe the scope of analysis of construction impacts at the proposed site?

A. Construction impact characterizations are summarized in EIS Table 4-1. These include land use, air quality, water-related, ecological, socioeconomic, historic and cultural resources, environmental justice, and nonradiological and radiological health impacts. The EIS also investigates potential mitigation of adverse impacts.

Q. How do the ER and EIS address the impacts of construction on land use?

A. ER § 4.1 provides information on land-use impacts of construction, and this matter is discussed in § 4.1 of the EIS. All construction activities, except transmission, would take place within the ESP site boundary, and would be expected to be contained within the footprint of previously disturbed areas. Any work with potential impact on wetlands or the Clinton Lake Recreational Area would be conducted in accordance with applicable laws, regulatory requirements, and permits. The EIS concludes that the environmental

impact resulting from land use would be SMALL, and that there were no land use impacts that would render the site unsuitable for a new nuclear unit.

Q. How do the ER and EIS address the impacts of construction on meteorology and air quality?

A. ER § 4.4.1.2 analyzes the impacts of construction on meteorology and air quality, and this matter is discussed in § 4.2 of the EIS. Sources of potential air pollution would include dust, smoke, engine exhaust from construction vehicles, and concrete facility operation. Such impacts would be minimized by compliance with applicable regulations, permitting requirements, and through good operating practices. Thus, such impacts are expected to be temporary and limited in magnitude. The EIS concludes that the impacts from both construction activities and related transportation activities would be SMALL.

Q. How do the ER and EIS address the water-related impacts of construction?

A. ER § 4.2 provides information on the impacts of construction on water-related resources, and this matter is analyzed in § 4.3 of the EIS. Prior to construction, EGC must secure a number of permits related to hydrologic impacts, including CWA permits from the U.S. Army Corps of Engineers and state agencies. Prior to conducting any activity pursuant to the ESP, EGC must submit a copy of its CWA 401 certification issued by the IEPA, or its determination that no 401 certification is required. The Staff concluded that this Permit Condition and the permit process would be adequate to ensure that the impacts of pre-construction activities would be SMALL, localized, and temporary. Water use during construction would include dewatering during excavation and dust abatement measures, and is likely to be only a small fraction of water use during operation. Thus, the impacts of construction activities on water use would be SMALL, localized, and temporary. The

impacts of construction activities on water quality would likewise be SMALL, localized, and temporary, and could be minimized by good construction management practices to minimize the impact of accidental spills and storm water runoff.

Q. How do the ER and EIS address the ecological impacts of construction?

A. ER § 4.3 provides information on ecological impacts, and this matter is analyzed in § 4.4 of the EIS. Activities associated with the construction of the proposed ESP facility are not expected to impact adversely the four minor wetlands onsite. Based in part on compliance with Army Corps of Engineers CWA permitting requirements, which mandate best construction management and mitigation practices, the EIS concludes that the impacts of construction activities on habitat would be SMALL, unless new rights-of-way would be required to accommodate new transmission lines. If new rights of way are required, habitat and terrestrial ecosystem impacts could range from SMALL to LARGE. The amount of disturbance during plant construction would be determined at the time of a CP or COL application. Construction impacts to wildlife, including threatened or endangered species, would be negligible if any, due in part to compliance with regulations and permitting requirements. Aquatic impacts, such as the loss of some shoreline habitat and the temporary displacement of some aquatic species, would be SMALL. EGC has committed to consulting with the U.S. Fish and Wildlife Service to confirm whether further evaluation of the impact on threatened or endangered species is needed prior to plant construction.

Q. How do the ER and EIS address the socioeconomic impacts of construction?

A. ER § 4.4 provides information on socioeconomic impacts, and this matter is analyzed in § 4.5 of the EIS. Such impacts could include localized physical impacts, such as noise,

dust, and vehicle emissions, some additional traffic on local roads, and some population increase and housing pressure due to the construction workforce. Demographic impacts are expected to be SMALL, because most workers will come from the region. Other adverse socioeconomic impacts would be SMALL, except potential MODERATE impacts on roads and housing. Upgrading the existing rail line could mitigate the impact on roads, and market-driven mitigation should be sufficient to address housing impacts. The potential benefits include increased taxes to be collected by state and local jurisdictions, and beneficial economic impacts of construction expenditures on DeWitt and the surrounding counties.

Q. How do the ER and EIS address the impacts of construction on historic and cultural resources?

A. Section 4.1.3 of the ER addresses the impact of construction on historic and cultural resources, and this matter is analyzed in § 4.6 of the EIS. The Staff's and EGC's research and consultation has not revealed any traditional cultural properties in the vicinity. Therefore, the EIS concludes that impacts on historical and cultural resources would be SMALL, but mitigation might be warranted if such properties are discovered during construction.

Q. How do the ER and EIS address the environmental justice impacts of construction?

A. Section 4.4.3 of the ER addresses the impact of construction on environmental justice, and this matter is analyzed in § 4.7 of the EIS. The Staff reviewed the Applicant's information and conducted its own independent review, which revealed no disproportionately high adverse impacts on low-income or minority populations. The

EIS concludes that the offsite impacts on minority and low-income populations would be SMALL.

Q. How do the ER and EIS address the nonradiological health impacts of construction?

A. Section 4.4.1 of the ER addresses nonradiological health impacts of construction and this matter is analyzed in § 4.8 of the EIS. Such impacts could include public health risks from air pollution associated with construction activities, occupational injuries to onsite workers, and noise impacts. Compliance with applicable permits and regulations and dust-control systems should mitigate potential air pollution impacts. Occupational risks can be minimized by adherence to NRC, Occupational Safety and Health Administration, state, and local requirements. Noise impacts will be minimal due to the distance to offsite activities and can be further reduced by compliance with applicable regulations, including the use of standard noise control devices and the maintenance of a hearing conservation program. The EIS evaluated all nonradiological health impacts as SMALL, with no additional mitigation warranted.

Q. How do the ER and EIS address the radiological health impacts of construction?

A. ER § 4.5 provides information on radiological health impacts, and this matter is analyzed in § 4.9 of the EIS. Sources of radiation exposure for construction workers could include direct radiation exposure, liquid radioactive discharges, and gaseous radioactive effluents from the existing CPS during construction and site preparation. The estimated doses are well within the NRC's exposure limits, and thus these impacts would be SMALL.

Q. How do the ER and EIS address measures and controls to limit adverse impacts during site preparation and construction activities?

A. Section 4.6 of the ER discusses measures to minimize adverse impacts during construction. The potential impacts and mitigation measures are discussed above. Section 4.10 of the EIS summarizes measures to limit adverse environmental impacts during site preparation as follows: (1) compliance with applicable federal, state, and local laws, ordinances, and regulations intended to prevent or minimize environmental hazards; (2) compliance with existing permits and licenses; (3) compliance with existing EGC processes and procedures; (4) incorporation of environmental requirements into construction contracts; and (5) identification of environmental resources and potential impacts during the ER and ESP process.

D. Impacts of Operation

Q. Describe the scope of analysis of the impacts of operation at the proposed site?

A. Operational impact characterizations are summarized in EIS Table 5-15. These include land use, air quality, water-related, ecological, socioeconomic, historic and cultural resources, environmental justice, nonradiological and radiological health impacts, and the impacts of postulated accidents. The EIS also investigates potential mitigation of adverse impacts.

Q. How do the ER and EIS address the impacts of operation on land use?

A. Section 5.1 of the ER provides information on land use impacts of station operation, and this matter is analyzed in § 5.1 of the EIS. Land use impacts on the site and vicinity could include some widely-dispersed new housing development and some temporary housing needs for outage workers. Impacts along anticipated transmission rights-of-way would include routine vegetation maintenance and the clearing of temporary maintenance

access roads. The EIS concludes that land use impacts would be SMALL, and additional mitigation would not be warranted.

Q. How do the ER and EIS address the impacts of operation on meteorological and air quality?

A. Section 5.8.1.3 of the ER addresses the air impacts of station operation, and § 5.2 of the EIS analyzes meteorological and air quality impacts. Such impacts would include emissions of heat and moisture from the cooling towers, intermittent emissions of pollutants from the operation of auxiliary equipment and standby diesel generators, and small amounts of ozone and oxides of nitrogen produced by transmission lines. There are no major air pollution sources near the site, so interactions between the cooling tower plume and other pollutants would not significantly impact air quality. Assuming that the proposed facility's cooling towers would be similar to other towers at existing sites, the EIS concludes that impacts from cooling towers would be SMALL. The impacts from pollutants discharged during infrequent operation of auxiliary equipment and from the transmission lines would likewise be SMALL.

Q. How do the ER and EIS address the water-related impacts of operation?

A. Section 5.2 of the ER provides information on water-related impacts of station operation, and this matter is analyzed in § 5.3 of the EIS. Increased water loss and increased water temperatures due to new cooling towers would reduce the volume of water in Clinton Lake. EGC and the Staff independently evaluated these water use impacts. The Staff concluded that these impacts would be SMALL in normal water years, but could be MODERATE in below-average precipitation conditions. EGC would need to coordinate with the IEPA in such cases to implement mitigation measures, such as derating or

temporary shutdown of the proposed new unit. EGC's commitment to keep combined discharges from CPS and the ESP facility within the bounds of the existing permit would ensure that water quality impacts remain SMALL.

Q. How do the ER and EIS address the ecological impacts of operation?

A. Sections 5.3, 5.4.4, 5.6.1, and 5.6.2 of the ER discuss the ecological impacts of station operation, and this matter is analyzed in § 5.4 of the EIS. Terrestrial ecological impacts, such as the impacts of cooling towers on local vegetation, noise level, and the size of shoreline habitat on Clinton Lake would be SMALL. Ecological impacts of transmission line right-of-way management such as vegetation control, electromagnetic fields, and bird collisions would be negligible. Aquatic impacts such as reduced volume of lake water and length of shoreline due to cooling system requirements, fish loss by cooling system intake, and localized water temperature impacts due to cooling system discharge would generally be SMALL. Depending on the intake structure design and permit requirements that would be set by the IEPA, cooling water intake system impacts, however, could be MODERATE. Further, the impact to available aquatic habitat could be MODERATE in low-water years. The COL applicant will need to provide additional information on the intake structure design and expected permit requirements for the Staff to verify the significance determination for aquatic organisms. Operations will not impact any critical habitats, and the impacts to listed species, including the bald eagle and Indiana bat, will be negligible. Thus, impact on threatened or endangered species would also be SMALL, but EGC has committed to contact the U.S. Fish and Wildlife Service prior to operation to determine whether further evaluation is needed.

Q. How do the ER and EIS address the socioeconomic impacts of operation?

A. Section 5.8 of the ER provides information on socioeconomic impacts of station operation, and this matter is analyzed in § 5.5 of the EIS. These impacts include physical impacts on nearby communities such as noise, odors, exhausts, and thermal emissions, visual aesthetic impacts of new structures, small increases in local population and attendant increases in traffic, demand for housing, public services, and education. Most impacts would be SMALL, except for MODERATE aesthetic and recreational impacts due to lowered lake water level during severe drought and MODERATE housing impacts in DeWitt County. Drought impacts could be mitigated if necessary by changing the way the proposed new unit is operated. Housing impacts would be mitigated over time through market forces. The EIS also notes SMALL beneficial economic and tax impacts for the surrounding counties, except for DeWitt County, where the economic impacts would be beneficial and MODERATE, and the tax impacts could be beneficial and LARGE.

Q. How do the ER and EIS address the impacts of operation on historic and cultural resources?

A. Section 5.1.3 of the ER addresses the impact of operation on historic properties, and this matter is analyzed in § 5.6 of the EIS. The EIS states that operation of the facility is not expected to have any significant historic or cultural resources impact, and the EIS concludes that such impact from operations would be SMALL. Mitigation would only be warranted if there is a discovery of cultural resources.

Q. How do the ER and EIS address the environmental justice impacts of operation?

A. Section 5.8.3 of the ER addresses the impact of operation on environmental justice, and this matter is analyzed in § 5.7 of the EIS. The Staff reviewed the Applicant's

information and conducted its own independent review, which revealed no disproportionately high adverse impacts on low-income or minority populations. The EIS concludes that the impacts on minority and low-income populations would be SMALL, and mitigation would not be warranted.

Q. How do the ER and EIS address the nonradiological health impacts of operation?

A. Chapter 7 of the ER includes discussions of the nonradiological health impacts from station operation, and this matter is analyzed in § 5.8 of the EIS. Increase in lake temperatures could result in increased levels of thermophilic microorganisms, which can cause disease in humans. However, the expected small temperature increase would not significantly increase the abundance of these organisms. Likewise, the postulated noise levels from the proposed facility would be of small significance. Compliance with applicable regulations and standards will also minimize electromagnetic fields (EMF) and occupational health impacts. The EIS concludes that the impact of thermophilic microorganisms, noise, acute effects of EMF, and potential occupational health risks would all be SMALL. While conclusive information on the chronic effects of EMF is unavailable, current research does not suggest that the impact would be significant.

Q. How do the ER and EIS address the radiological health impacts of normal operation?

A. Section 5.4 of the ER provides information on radiological impacts of normal operations, and this matter is analyzed in § 5.9 of the EIS. The EIS evaluates the health impacts from routine radiological effluent releases from the proposed new facility at the ESP site. The combined radiation dose to the maximally exposed individual from the existing and proposed facilities would be well within the standards of 40 C.F.R. Part 190, 10 C.F.R. Part 20, and the design objectives of 10 C.F.R. Part 50, Appendix I. Based on the

information provided by the Applicant and the Staff's independent evaluation, the EIS concludes that there would be no observable health impacts on the public from normal operation of new nuclear units, that the health impacts would be SMALL, and that the radiological impact on biota would be SMALL. The EIS reviews potential impacts of occupational doses to workers and concludes that the doses would remain within regulatory limits and the health impacts would be considered SMALL. The EIS also reviews the proposed radiological monitoring program and concludes that the program is adequate.

Q. How do the ER and EIS address the environmental impacts of postulated accidents?

A. Chapter 7 of the ER describes the environmental impacts of postulated design basis and severe accidents, primarily using the ABWR and the AP1000 to characterize the environmental impacts from advanced light-water reactors. The impacts of accidents are analyzed in § 5.10 of the EIS. These designs were selected because they have already been analyzed under the NRC's design certification process, so the evaluation of postulated accidents for these designs is already well-established. Further, the potential consequences of accidents for other designs are expected to be bounded by these designs. The EIS concludes that the environmental risks of the analyzed design basis accidents and severe accidents would be small compared with the safety review criteria and goals. Based on the information provided by EGC and an independent review by the Staff, the EIS concludes that the analyzed severe accident impacts for advanced light water reactors (LWR) would be SMALL. The EIS did not evaluate the impacts of severe accidents involving other reactor designs, so if a non-advanced LWR design is chosen, further analysis would be required at the CP or COL stage. A CP or COL applicant would also

need to demonstrate that the environmental impacts of severe accidents remain bounded by the analysis of the surrogate designs.

Q. How do the ER and EIS address measures and controls to limit adverse impacts during operation?

A. In Section 5.10 of the ER, EGC provided information on measures and controls to limit adverse impacts during operation. The potential impacts and mitigation measures are discussed above. Section 5.11 of the EIS summarizes measures to limit adverse environmental impacts during site preparation as follows: (1) compliance with applicable laws, ordinances, and regulations to prevent or minimize adverse environmental impacts; (2) compliance with applicable permit and licensing requirements; and (3) compliance with EGC procedures applicable to environmental control and management. The EIS evaluates EGC's proposed measures and controls and concludes that they are technically and economically feasible, and adequate to avoid or mitigate adverse impacts.

E. Impacts of the Fuel Cycle, Transportation and Decommissioning

Q. How do the ER and EIS address the impacts of the fuel cycle and solid waste management?

A. Section 5.7 of the ER provides information on the impact of the uranium fuel cycle, and this matter is analyzed in § 6.1 of the EIS. The EIS evaluates fuel cycle impacts as given in Table S-3 of 10 C.F.R. § 51.51(b), including land use requirements, water use, generation of electricity through the use of fossil fuel, chemical effluents, radioactive effluents and waste, occupational dose, and transportation. The EIS concludes that the impacts for light-water reactors would be SMALL, and mitigation would not be warranted. The EIS also concludes that the impacts for the proposed gas-cooled reactors

would also be SMALL, but because of the uncertainty associated with the final design of gas-cooled reactors, and the potential technological changes to uranium fuel cycle activities, additional reviews would be required at the CP or COL stage if the applicant references a gas-cooled reactor design.

Q. How do the ER and EIS address the impacts of transportation of radioactive materials?

A. Section 5.7 of the ER also addresses transportation of radioactive materials, and § 6.2 of the EIS analyzes transportation of unirradiated fuel, spent fuel, and wastes under normal operating and accident conditions. The analysis in the EIS accounts for the environmental effects of such transportation as contained in Table S-4 to 10 C.F.R. Part 51. The EIS adjusts the Table S-4 values to account for the difference in reactor output compared to the reference reactor. Because of conservative approaches and data used to calculate doses, the EIS concludes that the environmental impacts of transportation of fuel and radioactive wastes to and from advanced light-water reactor designs would be SMALL, and would be consistent with the risk associated with transportation of fuel and radioactive waste from current-generation reactors presented in Table S-4 of 10 C.F.R. Part 51. The Staff could not validate the impacts for gas-cooled reactors and this issue would remain open if a COL applicant references such a design. If an ACR-700 or IRIS design is selected, a transportation accident analysis would need to be performed.

Q. How do the ER and EIS address the impacts of decommissioning?

A. At the ESP stage, an applicant need not provide information regarding the process of decommissioning. The Staff, however, reviewed NUREG-0586, "Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities, Supplement 1, Regarding the Decommissioning of Nuclear Power Reactors" (2002), and stated that it expects that

the impacts will be SMALL. This issue is not resolved and will need to be addressed in a COL application proceeding.

F. Cumulative Impacts

Q. How do the ER and EIS address cumulative impacts?

A. Section 7 of the EIS considers the potential cumulative impacts of constructing and operating one or more nuclear power units at the ESP site, including land use, air quality, water use and quality, terrestrial and aquatic ecosystems, socioeconomics, historic and cultural resources, environmental justice, nonradiological health, radiological impacts of normal operation, fuel cycle, transportation, and decommissioning. Cumulative fuel cycle and transportation impacts for other than light-water reactor designs and decommissioning impacts remain unresolved because information is not available, and will need to be addressed at the COL stage. For each impact area, the EIS concludes that the impacts would be generally SMALL, and additional mitigation would not be warranted. However, several areas have the potential for a MODERATE impact: (1) cumulative water use and quality impacts in dry years; (2) water intake structure impacts, if best available technology is not used; (3) aquatic environment impacts following dry years; (4) cumulative impacts of thermal discharge; (5) physical impacts to roads due to heavy truck traffic; and (6) aesthetic and recreational impacts in severe drought. In these cases, mitigation measures may be warranted, such as derating or shutdown of the unit.

G. Alternatives

Q. What alternatives are analyzed in the ER and EIS?

A. The ER and EIS analyze the no-action alternative, alternative energy sources, alternative sites, and alternative system designs.

Q. How do the ER and EIS address the no-action alternative?

A. Section 9.1 of the ER considers the no-action alternative, and the same matter is analyzed in § 8.1 of the EIS. While the no-action alternative would avoid all of the environmental impacts associated with the ESP, it would accomplish none of the benefits intended by the ESP process, including (1) early resolution of siting issues prior to large investments of financial and human resources; (2) early resolution of environmental issues; (3) the ability to bank sites for future nuclear plant location; and (4) facilitation of future decisions on whether to build new plants. The EIS concludes that, should the ESP be denied, all of EGC's remaining options to satisfy its objectives would have associated environmental impacts.

Q. How do the ER and EIS address energy alternatives?

A. Section 9.2 of the ER discusses energy alternatives, and the same matter is analyzed in § 8.2 of the EIS. The ER and EIS address these alternatives to determine whether they are viable as well as competitive with the energy generated by the new nuclear plant. The reports also consider whether the alternatives meet the purpose and need to build new baseload capacity. The EIS considers alternatives not requiring new generation, including energy conservation, purchased power, and extending the service life of existing plants. Based on the Commission's determination, the Staff concluded that conservation is not a reasonable alternative to base load generation. Service life extensions are also not reasonable alternatives, because they would not provide additional baseload generation capacity. The EIS compares new nuclear generation to other types of new generating facilities, such as coal, natural gas, and a combination of alternatives. This comparison is summarized in EIS Table 8-4. Based on this comparison, the EIS

concludes that none of the economically viable alternatives is environmentally preferable to a new nuclear unit at the ESP site. The EIS also addresses the impact of purchased power, which depends on the type of generating technology used and whether new rights-of-way need to be purchased. The purchased power, however, would likely come from coal, natural gas, or nuclear generation facilities, and thus would not avoid the environmental impacts of these types of power generation.

Q. How do the ER and EIS address system design alternatives?

A. Section 8.3 of the EIS considers plant design alternatives to the proposed heat dissipation systems. The EIS discusses the impact of wet cooling towers. While wet cooling towers (mechanical or natural draft) would contribute to higher temperatures in Clinton Lake, no information was available on the impact of dry cooling towers, so this issue will be reviewed further at the COL stage.

Q. How do the ER and EIS address the evaluation of alternative sites?

A. Because EGC proposes to co-locate a new plant with an existing facility, § 9.3 of the ER and § 8.5 of the EIS evaluate in detail six other reactor sites as potential ESP site locations in the Region of Interest: Dresden, Braidwood, LaSalle County, Quad Cities, Byron, and Zion. Greenfield or former industrial sites were considered not environmentally preferable to the proposed site, because the impact on any non-nuclear site would be greater than that on any site with an existing facility. The environmental impacts of a new nuclear facility on each of the six sites were compared with the environmental impacts of the EGC ESP facility at the Clinton site. EGC eliminated three of the existing reactor sites (Byron, Quad Cities, and Dresden) as not having sufficient land for a new facility. The remaining three sites (Braidwood, Zion, and LaSalle County)

were compared with Clinton to determine whether any of the sites was "environmentally preferable" to the Clinton site. EGC chose the Clinton site as the preferred site, in part because no alternative sites were environmentally preferable or "obviously superior." The Staff reviewed EGC's findings, visited each site, and performed its own evaluation to determine whether an alternative site is "obviously superior" to the proposed site. The comparisons of the environmental impacts of construction and operation on the proposed site and alternative sites are summarized in EIS Tables 9-1 and 9-2. Based on the comparison of the proposed site with alternative sites in Section 9.1 of the EIS, the EIS concludes that while there are some differences in the environmental impacts of construction and operation at the ESP site and the alternatives, none of the differences is sufficient to determine that any alternative site is environmentally preferable. Thus, none of the alternative sites is obviously superior to the proposed site.

Q. Does this approach comply with the approach outlined in NUREG-1555?

A. Yes. Both the ER and the EIS carefully reviewed the candidate site criteria from NUREG-1555. The Staff noted that candidate sites are those sites within the Region of Interest that can be reasonably found and made available for the siting of a nuclear power plant. As described in Section 9.0 of the EIS, the Staff analyzed EGC's proposed site as it compared to other nuclear sites within the region of interest using the two-part analysis provided in NUREG-1555. That is, the Staff first determined whether any of the alternative sites were "environmentally preferable," as described above; if any of the sites were "environmentally preferable," then the Staff would have then determined whether these sites were "obviously superior." Because the Staff concluded that none of the

alternative sites were environmentally preferable to the proposed EGC site, it concluded that none of the alternative sites were "obviously superior" to the Clinton site.

H. Other Factors

Q. Do the ER and EIS address any other factors?

A. Yes. They address unavoidable adverse impacts, irreversible and irretrievable commitments of resources, and the relationship between short-term uses and long-term productivity of the environment.

Q. How do the ER and EIS address unavoidable adverse impacts?

A. Section 10.1 of the ER discusses unavoidable adverse impacts, and this matter is analyzed in § 10.1 of the EIS. There would be no unavoidable adverse impacts from the granting of the ESP, but the construction and operation of a new nuclear power facility would result in some unavoidable impacts, including disturbed land, decrease in lake level during dry periods, increased use of local services, and radiation dose from construction and operation. Most of these impacts would be SMALL, but the impact of the cooling system on water in low water years would be MODERATE, but could be mitigated by the State of Illinois through its authority to regulate water use and quality.

Q. How do the ER and EIS address irreversible and irretrievable commitments of resources?

A. Section 10.2 of the ER discusses irreversible and irretrievable commitments of resources, and this matter is analyzed in § 10.2 of the EIS. These include the commitment of construction materials such as concrete and steel, and of uranium during operation. The estimated use of construction materials that will take place during the CP or COL stage, and the uranium ore commitment is expected to be of small consequence in comparison to the availability of such resources.

Q. How do the ER and EIS address the relationship between short-term uses and long-term productivity of the human environment?

A. EIS § 10.3 concludes that activities authorized by the ESP are unlikely to adversely affect the long-term productivity of the environment. A full assessment of the impact of construction and operation of the proposed facility on long-term productivity will be performed at the CP or COL stage.

V. REQUIRED ENVIRONMENTAL DETERMINATIONS

Q. In your opinion, how have the Staff and EGC complied with the requirements of NEPA Section 102(2)(A)?

A. Yes. NEPA Section 102(2)(A) requires federal agencies to "utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision-making which may have an impact on man's environment." The NRC Staff utilized a systematic, interdisciplinary approach integrating their use of the natural and social sciences in their decision-making regarding environmental impacts as required under NEPA. EGC's ER strictly followed the format in NUREG-1555 (NRC's Environmental Standard Review Plan), and the NRC's EIS closely parallels NUREG-1555, thereby ensuring both a systematic and interdisciplinary approach. Furthermore, the Staff utilized the expertise of professional scientists, engineers, and social scientists and logically documented its conclusions.

Q. In your opinion, has the Staff complied with the requirements of NEPA Section 102(2)(C)?

A. Yes. Section 102(2)(C) of NEPA requires a Federal agency to address in its environmental impact statement: (1) the environmental impact of the proposed action; (2) any adverse impacts which cannot be avoided should the proposal be implemented; (3) alternatives to the proposed action; (4) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity; and (5) any irreversible and irretrievable commitment of resources which would be involved in the proposed action should it be implemented. As shown in the following table, the final EIS addresses each of these five requirements in Section 102(2)(C).

Comparison of EIS against NEPA Section 102(2)(C)

NEPA Section 102(2)(C)	EIS Section
(1) the environmental impact of the proposed action	4 – Construction Impacts 5 – Operational Impacts 6 – Impacts of Fuel Cycle, Transportation, and Decommissioning 7 and 10.4 – Cumulative Impacts
(2) any adverse impacts which cannot be avoided should the proposal be implemented	10.1 – Unavoidable Adverse Environmental Impacts
(3) alternatives to the proposed action	8.1 – No-Action Alternative 8.2 – Energy Alternatives 8.3 – System Design Alternatives 8.5, 8.6, and 9 – Alternative Sites
(4) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity	10.3 – Relationship between Short-Term Uses and Long-Term Productivity of the Human Environment
(5) any irreversible and irretrievable commitment of resources which would be involved in the proposed action should it be implemented	10.2 – Irreversible and Irretrievable Commitments of Resources

Section 102(2)(C) also requires that an agency "consult with and obtain the comments of any Federal agency which has jurisdiction by law or special expertise with respect to any environmental impact involved." The Staff has complied with this requirement.

Q. In your opinion, has the Staff complied with the requirements of NEPA Section 102(2)(E)?

A. Yes. Section 102(2)(E) of NEPA requires a Federal agency to "study, develop, and describe appropriate alternatives to the recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." Chapter 8 of the EIS considers the no action alternative, energy alternatives, plant design alternatives, and alternative sites. The EIS satisfies the requirements under NEPA with respect to consideration of alternatives.

Q. In your opinion, has the Staff complied with the requirements of Subpart A to Part 51?

A. Yes. Subpart A to Part 51 contains a number of requirements related to an EIS for a construction permit (and by implication, for an ESP). In particular, Part 51 includes several procedural requirements related to the EIS: (1) issuance of a notice of intent to prepare an EIS (§ 51.116); (2) scoping (§§ 51.28 and 51.29); (3) notice and distribution of a draft EIS for public comments (§§ 51.73, 51.74, and 51.117); (4) responding to public comments (§ 51.91); (5) notice and distribution of the final EIS (§§ 51.93 and 51.118); and (6) public availability of EIS (§ 51.120). Additionally, 10 C.F.R. §§ 51.70, 51.71, and 51.75 and Appendix A to Part 51 have a number of substantive requirements for an EIS. The most specific criteria are contained in Appendix A, which in general encompass the more general criteria in §§ 51.70, 51.71, and 51.75. The following 12 criteria are contained in Appendix A, supplemented by some additional criteria from

Sections 50.71 and 50.75: (1) Cover sheet, (2) Summary, (3) Table of Contents, (4) Purpose of and Need for Action, (5) Alternatives including the proposed action, (6) Affected Environment, (7) Environmental Consequences and Mitigating Actions, including assessment of aquatic impacts and radiological impacts (including the radiological impacts from the fuel cycle as provided in Table S-3 in Part 51), (8) List of Preparers, (9) List of Agencies, Organizations and Persons to Whom Copies of the Statement are Sent, (10) Substantive Comments Received and NRC Staff Responses, including analysis of major points of view (11) Index, (12) Appendices, (13) Status of compliance, and (14) Recommendations. As shown in the tables below, these requirements have been satisfied.

Comparison of EIS against Procedural Requirements in Part 51

Part 51 Procedural Requirement	Conformance to Requirement
(1) issuance of a notice of intent to prepare an EIS (§ 51.116)	68 Fed. Reg. 66,130 (November 25, 2003)
(2) scoping (§§ 51.28 and 51.29)	EIS Appendix D
(3) notice and distribution of a draft EIS for public comments (§§ 51.73, 51.74, and 51.117)	70 Fed. Reg. 12,022 (March 10, 2005)
(4) responding to public comments (§ 51.91)	EIS Appendix E
(5) notice and distribution of the final EIS (§§ 51.93 and 51.118)	71 Fed. Reg. 42,884 (July 28, 2006)
public availability of EIS (§ 51.120)	The draft EIS was publicly available, as discussed in EIS, p. E-1. The final EIS is publicly available at http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1815/

Comparison of EIS against Substantive Requirements in Part 51

Substantive Requirement	Conformance to Requirement
(1) Cover sheet	EIS, pp. i – iii; 71 Fed. Reg. 42,884 (July 28, 2006)
(2) Summary	EIS Executive Summary

(3) Table of Contents	EIS, pp. v – xix
(4) Purpose of and Need for Action	EIS Section 1.3
(5) Alternatives including the proposed action	EIS Sections 8 and 9
(6) Affected Environment	EIS Section 2
(7) Environmental Consequences and Mitigating Actions	EIS Sections 4, 5, 6, 7, and 10.1 – 10.3; including an assessment of aquatic impacts in Sections 4.3 and 5.3 and radiological impacts in Sections 4.9, 5.9, and 6, and fuel cycle impacts from Table S-3 in EIS Table 6-1.
(8) List of Preparers	EIS Appendix A
(9) List of Agencies, Organizations and Persons to Whom Copies of the Statement are Sent	*See* EIS Appendix B and Appendix E
(10) Substantive Comments Received and NRC Staff Responses	EIS Appendix E
(11) Index	*See* Table of Contents
(12) Appendices	EIS Volume 2
(13) Status of compliance	EIS Section 1.5 and Appendix F
(14) Recommendations	EIS Section 10.5

Q. Do you have an opinion on whether the final balance of conflicting factors contained in the record of this proceeding support issuance of the ESP?

A. Yes. As discussed above with respect to the impacts of the EGC ESP facility, the impacts would be SMALL, with the exception of some temporary impacts that could be MODERATE and could be mitigated. Therefore, a balance among the factors contained in the record of the proceeding demonstrates that the ESP site is suitable from an environmental standpoint for the EGC ESP facility, and ESP should be issued as proposed in the EIS in order to preserve the option of using the site for eventual construction and operation of the EGC ESP facility. The need for power from the EGC ESP facility will be determined at the COL stage, and a final cost-benefit balance will performed at that time.

Q. Do you have an opinion on whether, after considering reasonable alternatives, the ESP should be issued?

A. Yes. As discussed above, a range of alternatives have been considered, including the no-action alternative, alternative energy sources, alternative sites, and alternative facility designs. The no-action alternative is not preferable because it would not accomplish the benefits of the ESP (including banking the site for future possible use); there are no reasonable alternative energy sources that are environmentally preferable; there are no obviously superior sites; and due consideration has been given to design alternatives to reduce the impact of heat dissipation. Therefore, all reasonable alternatives have been considered, the ESP does not need any additional conditions to protect environmental values, and the ESP should be issued as recommended in the EIS.

Q. Do you have any concluding remarks?

A. For the foregoing reasons, the NEPA review conducted by the NRC Staff has been adequate; the ER and EIS contain sufficient information to support the Environmental Findings and issuance of the ESP; the Clinton ESP site is a suitable location for a nuclear station of the general size and type bounded by the PPE; and the ESP should be issued subject to the terms and conditions specified in the EIS.

Q. Does this conclude your testimony?

A. Yes.

STATEMENT OF PROFESSIONAL QUALIFICATIONS OF TAMAR JERGENSEN CERAFICI, J.D.

CH2M HILL • 2001 to present • Senior Environmental Specialist
Representative Projects

- **Progress Energy; Task Lead/PM/Lead Regulatory; Starting 2005:** Currently developing first-of-a-kind Combined Operating License Application (COLA) for locating new generation nuclear plants (e.g., AP1000, ESBWR, and USEPR) at various sites in the Southeast. Major tasks include: developing regulatory strategy for application; leading development of Environmental Report and the interface with site safety reports for the application, and shared project management duties. These licenses will be among the first new generating licenses in the United States since 1979.

- **Exelon Generation Company, LLC; Lead Author/Regulatory Analyst; Starting 2001:** provide regulatory interpretation and general application of NRC regulations for a first-of-a-kind Early Site Permit – Leading strategic and regulatory support for Exelon in discussions with NRC staff regarding site safety characteristics (*e.g.* authored successful argument for risk-based PMF calculations). Developed site alternative analysis and provided overall environmental regulatory/legal compliance analysis for the Exelon ESP project, the first Early Site Permit to be submitted to the Nuclear Regulatory Commission.

- **International Confidential Client Due Diligence Project; Lead Regulatory Analyst; Starting 2005:** Provide regulatory analysis for confidential international client's acquisition of major nuclear services firm. Tasks include review of properties and compliance history to identify past and continuing environmental liabilities under the EPA's "all appropriate inquiries" rule; educate purchaser in environmental and nuclear regulatory structure in the United States, provide opinion on level of liability, cost of decommissioning older sites, and legacy liabilities of acquisition. Currently providing analysis and review of the acquisition's environmental management policies. Part of the assignment will include evaluation and development of ISO 14001-compliant systems.

- **Maersk; Lead Regulatory Analyst; 2005-2006:** Provide analysis and support for client's acquisition of long-term lease in the Hurricane Katrina zone. Develop inquiries plan, and perform analysis of potential environmental liabilities.

- **Huntsman Chemical/Graham & Dunn, Client Service Manager analyst; Current (2005-06):** Lead legal/regulatory liaison between counsel for Huntsman Chemical and CH2M HILL to investigate and determine CERCLA liabilities at mine site in southeastern Idaho; duties also include analysis of historical documentation, review of current CERCLA litigation, and development of pre-litigation and negotiation support strategy.

- **Bechtel BWXT-Idaho; Senior Regulatory Analyst, Negotiator for INEEL CERCLA Disposal Facility; 2001- 2004:** Regulatory analysis, prepare operational and construction documentation (including performance assessment and operational plans) for MLLW CERCLA disposal landfill and evaporation pond at the Idaho National Environmental and Engineering Laboratory (INEEL). Provide regulatory support directly to Bechtel BWXT

Idaho, LLC (BBWI, the INEEL site operations contractor) during Agency review of WAG 3 CERCLA compliance documents at the INEEL, negotiating with agencies, interpreting regulations. Regulatory support included a wide range of mixed waste management and compliance issues. Provide lead regulatory support for compliance with DOE Orders and radiological exposure regulations, including DOE O 435.1 (Radioactive Waste Management). Prepared radiological performance assessments, waste management plans, and waste acceptance procedures for mixed low level wastes (hazardous wastes and PCB-contaminated) on a variety of projects at the INEEL.

- **CH2M♦WG Idaho, LLC (CWI), Senior Regulatory and Compliance Analyst; 2005:** Provided due diligence regulatory review and compliance analysis for incoming cleanup contractor, evaluated and suggested compliance strategies for nuclear waste and legacy waste cleanup at the Idaho National Laboratory.

- **Braintree Electric Light Division, Regulatory Analyst; 2004-2005**: Prepare contractual documents, as well as regulatory and legislative analysis for ground-breaking power and desalination plant in Braintree, MA. Duties will include developing regulatory strategy, ways to use existing regulations, developing proposed regulations, liaison with counsel of record.

- **El Paso Energy, Author/Regulatory Analyst, LNG Facility/Power Plant, Bahamas; 2004**. Developed the regulatory strategy sections for the environmental impact report required under Bahamian Law.

- **United States Forest Service; Author/Senior Regulatory Analyst; 2002-2003:** *Salmon-Challis National Forest Noxious Weed Management Program Environmental Impact Statement.* Authored text and developed comparisons tables, background and alternative review for innovative noxious weed control projects throughout Salmon-Challis National Forest. Provided regulatory/analytical review for all phases of the EIS, including alternatives and cumulative effects analyses; prepared comment resolutions.

- **United States Air Force; Regulatory Analyst; 2002-2003:** Provide regulatory assistance on a variety of projects, including development of innovative waste management plans for the US Air Force's decommissioning of Johnston Atoll, and Standards of Practice for cleanup at the U.S. Air Force Base at Kadena, Japan.

Law Practice ♦ 1989 - 2001

1996-2001 **Seventh District Court (Idaho), James C. Herndon, Consulting Attorney.** Provided support for state district court judge, as well as intensive research in environmental and natural resources issues.

1998-2000 **Pike & Smith, Senior Associate.** General litigation practice in federal court, emphasizing environmental and bankruptcy matters. Representative clients include:

Bank of Idaho:	Advise regional bank about environmental and brownfields issues arising out of property acquisitions and bankruptcy matters.

Satterfield-Helm Development, Inc.:	Successfully negotiated "fast-track" cleanup plan between a large regional development firm and the Idaho DEQ.

1996-1997 **V-1 Oil Company**: Special environmental counsel for litigation between large southeastern Idaho oil and propane distribution company and EPA/State of Idaho involving alleged leaking underground storage tanks.

1997 **Custer County, Idaho:** As special County Attorney, negotiated roadway and abandonment issues between Custer County and United States Forest Service.

1997-2000 **Lemhi County, Idaho:** Assisted Lemhi County Prosecutor to define access and NEPA issues during 2000 wildfire season for negotiation with property owners and United States Forest Service.

1997 **Jensen Oil Company,** Environmental Consultant/Attorney; successfully developed and implemented plan for EPA approval of innovative tank tightness and monitoring strategy

1994-1995 **Ecology and Environment, Inc.,** In-House Counsel/Consultant. Liaison between DOE Operations Office's Corporate Counsel, Environmental Programs, and contractors at the INEEL. Assisted in facilitation of public meetings and analysis and resolution of public comments on NEPA and CERCLA. Prepared negotiation and regulatory compliance strategies for DOE-ID.

1993-1994 **Cox Ohman & Brandstetter**, Senior Associate. Managed general litigation caseload emphasizing personal injury defense and environmental litigation.

1992-1993 **Beard, St. Clair, Petersen & Sullivan**, Associate. Managed general litigation caseload, including environmental and agricultural litigation.

1990-1992 **Hon. Grant L. Young**, Law Clerk. Provided courtroom support and litigation research for State District Judge.

Academic • 1994 - 2006

2006-2007 **Special Professor of Law, Hofstra University:** Develop International Environmental Law Curriculum for Hofstra's annual Summer Program in Nice, France, in partnership with the University of Nice. Taught and advised approximately 30 students from 18 law schools in the United States and France.

1994-2004 **Professor, Affiliate Faculty, University of Idaho**: Develop environmental law courses, graduate advisor, for graduate program in environmental science; guest lecturer at University of Idaho School of Law.

Professional Organizations	Idaho State Bar – Active Utah State Bar – Inactive American Bar Association (Section on Energy, Environment, and Resources, Chair: Energy Facilities and Siting Committee; past Vice Chair for the following Committees: In-House Counsel Committee; Energy Facilities and Siting Committee; Environmental Litigation and Toxic Tort Committee) National Association of Environmental Professionals, Conference Proceedings Editor

Presentations and Awards	Planning Committee Member, Fall Meeting, 2006, ABA Section on Environment, Energy, and Resources. President's Recognition, National Association of Environmental Professionals, 2005.
Publications	*"NEPA and the New Nuclear World: Challenges, approaches and regulatory innovations for siting and building new commercial nuclear plants."* Presentation and paper for National Association of Environmental Professionals; April 2004. *"Challenges, approaches and regulatory innovations for siting and building new commercial nuclear plants."* A roundtable discussing permitting initiatives, regulatory developments, and new approaches for developing nuclear power in the United States. Presentation for American Bar Association, 32nd Annual Conference on Environmental Law, March 2003.
Education	J.D., J. Reuben Clark School of Law, Brigham Young University (Order of the Barrister), 1988 M.A. (English) University of Utah, 1988 B.A. (English) University of Utah, 1984
Professional Registrations	Admitted To The Bar, ID - 1992 Admitted To The Bar, UT – 1989

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	**Docket No. 52-007**
EXELON GENERATION COMPANY, LLC	)	**ASLBP No. 04-821-01-ESP**
(Early Site Permit for the Clinton ESP Site)	)	**October 17, 2006**

CERTIFICATE OF SERVICE

I hereby certify that copies of the attached letter dated October 17, 2006, from Steven P. Frantz to the Licensing Board Members and Exelon Generation Company, LLC's (1) "Prefiled Testimony of Thomas P. Mundy on Exelon Generation Company's ESP Application," (2) "Prefiled Testimony of Eddie R. Grant on Required Safety Findings," and (3) "Prefiled Testimony of Tamar Jergensen Cerafici on Required Environmental Findings" in the above captioned proceeding have been served as shown below by deposit in the United States mail, first class, this 17th day of October, 2006. Additional service has also been made this same day by electronic mail as shown below.

Office of the Secretary* U.S. Nuclear Regulatory Commission Attn: Rulemakings and Adjudication Staff Washington, DC 20555-0001 email: hearingdocket@nrc.gov	Office of Commission Appellate Adjudication U.S. Nuclear Regulatory Commission Washington, DC 20555-0001
Dr. Paul B. Abramson Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission Washington, DC 20555-0001 email: pba@nrc.gov	Dr. Anthony J. Baratta Atomic Safety and Licensing Board Panel U.S. Nuclear Regulatory Commission Washington, DC 20555-0001 email: ajb5@nrc.gov
Dr. David L. Hetrick 8740 E. Dexter Drive Tucson, AZ 85715 email: dlmwh@dakotacom.net	Ann P. Hodgdon Robert M. Weisman Office of the General Counsel U.S. Nuclear Regulatory Commission Washington, DC 20555-0001 email: aph@nrc.gov, rmw@nrc.gov

Raphael P. Kuyler

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October 17, 2006

Dr. Paul B. Abramson, Chairman
Dr. Anthony J. Baratta
Dr. David L. Hetrick
Atomic Safety and Licensing Board Panel
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: **Exelon Generation Company, LLC (Early Site Permit for Clinton ESP Site), Docket No. 52-007-ESP: Submittal of Prefiled Direct Testimony**

Dear Licensing Board Members:

In accordance with the Atomic Safety and Licensing Board's ("Board's") August 2, 2006 Order in the above proceeding, Exelon hereby provides the enclosed prefiled direct testimony. It consists of three separate documents: (1) "Prefiled Testimony of Thomas P. Mundy on Exelon Generation Company's ESP Application," (2) "Prefiled Testimony of Eddie R. Grant on Required Safety Findings," and (3) "Prefiled Testimony of Tamar Jergensen Cerafici on Required Environmental Findings."

Also in accordance with the Board's request during the October 3, 2006 prehearing teleconference, Exelon hereby provides the following list of exhibits that it intends to introduce as evidence at the November 7-9, 2006 mandatory hearing in Decatur, Illinois:

1. Exelon Generation Company, LLC, Early Site Permit Application, Revision 4, April 14, 2006;

2. The following slide presentations to be given by Exelon's witnesses at the hearing:

   - Overview of Clinton Early Site Permit Application (Thomas P. Mundy)

   - Safety Assessment of Clinton Early Site Permit (Eddie R. Grant)

- Environmental Analyses for Clinton Early Site Permit (Tamar J. Cerafici)

Sincerely,

Steven P. Frantz
Counsel for Exelon Generation Company, LLC

Enclosures

cc: Service List