PSEG Early Site Permit Application Environmental Review
Environmental Site Audit Trip Report

May 7-11, 2012

1. Introduction

On May 25, 2010, PSEG Power, LLC and PSEG Nuclear, LLC (PSEG) submitted to the U.S. Nuclear Regulatory Commission (NRC) an application for an early site permit (ESP) at the PSEG ESP site (also referred to as "the proposed site" and "Site 7-4"). The PSEG ESP site is located north of and adjacent to PSEG's existing Salem Generating Station (SGS) and Hope Creek Generating Station (HCGS) complex on the southern part of Artificial Island on the east bank of the Delaware River in Lower Alloways Creek Township, Salem County, New Jersey (Figures 1 and 2).

The PSEG ESP site comprises 819 acres, of which 734 acres are located within PSEG's current property boundary (Figure 3). The remaining 85 acres are located within the U.S. Army Corps of Engineers' (Corps) Artificial Island Confined Disposal Facility (CDF). PSEG has developed an agreement in principle with the Corps regarding the future acquisition of this 85-acre parcel through a land exchange, and has identified a potential land parcel for such an exchange (Site 15G in Gloucester County, New Jersey).

The Corps (Philadelphia District) is a cooperating agency with the NRC in preparing the environmental impact statement (EIS) for PSEG's ESP application. Therefore, ongoing engagement with the Corps is needed to understand the Corps' acquisition and disposition process and to adequately address the action in the joint NRC-Corps EIS for the PSEG site.

In addition to the PSEG ESP site (Site 7-4), PSEG has identified four alternative sites:

- Site 4-1 (Hunterdon County, New Jersey)
- Site 7-1 (Salem County, New Jersey)
- Site 7-2 (Salem County, New Jersey)
- Site 7-3 (Cumberland County, New Jersey)

These alternative sites, as well as the Alternative Sites Audit conducted on April 17-19, 2012, are described in detail in the *PSEG Early Site Permit Application Environmental Review Alternative Sites Audit Trip Report*.

On May 7-11, 2012, staff from the NRC, the Corps, various Federal and State agencies, and three National Laboratories conducted an Environmental Site Audit for the PSEG ESP application (see Appendix A for a complete list of participants). The Audit participants toured the PSEG ESP site and the proposed causeway site, and some toured the SGS protected area and the potential land exchange parcel (Site 15G). Some

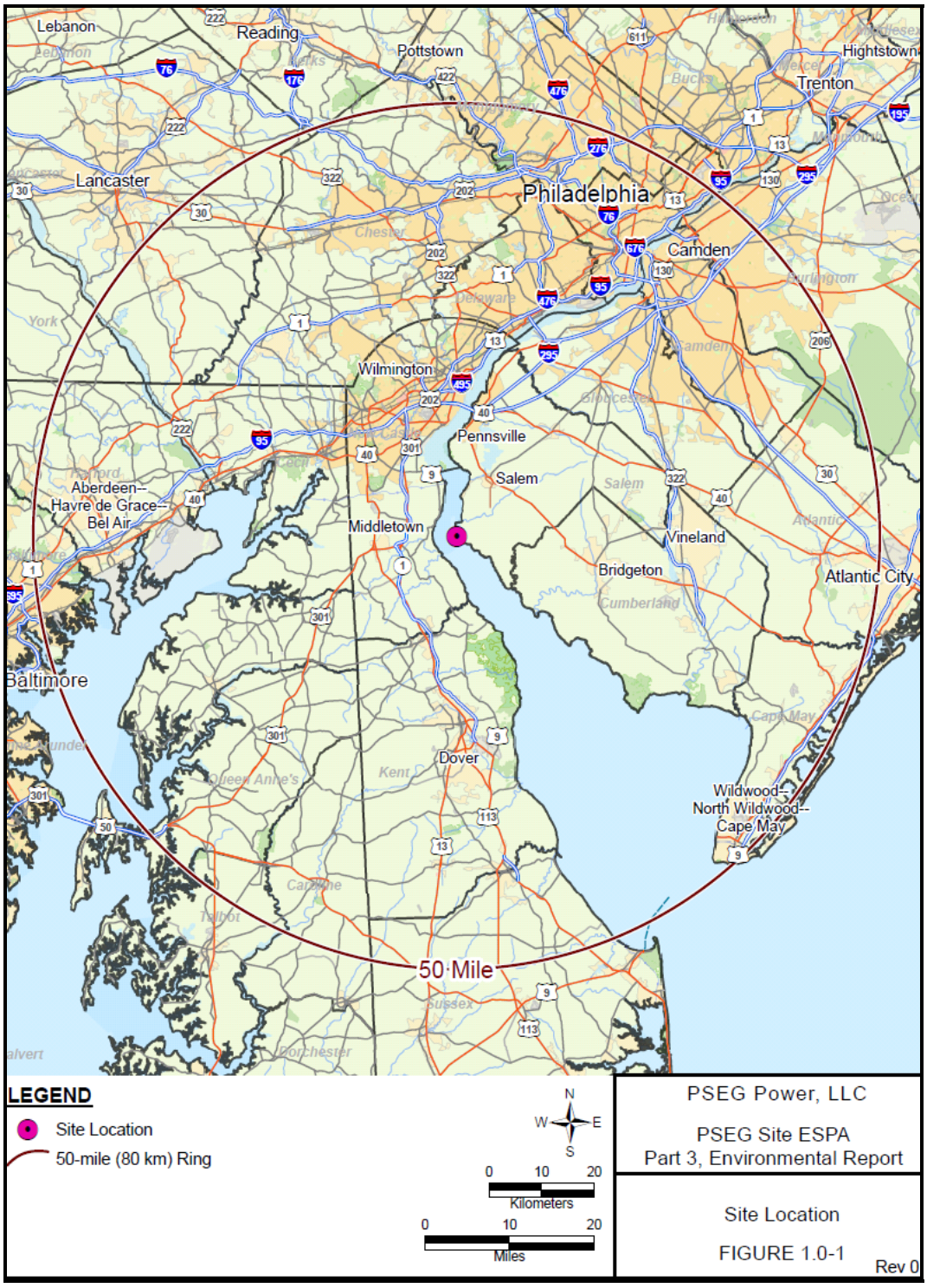

Figure 1. Map showing the location of the PSEG ESP Site (*Source:* PSEG 2010)

Figure 2. Photo of Salem Generating Station and Hope Creek Generating Station (the PSEG ESP Site is located on the undeveloped area to the left of the HCGS cooling tower in this photo) (*Source:* PSEG 2010)

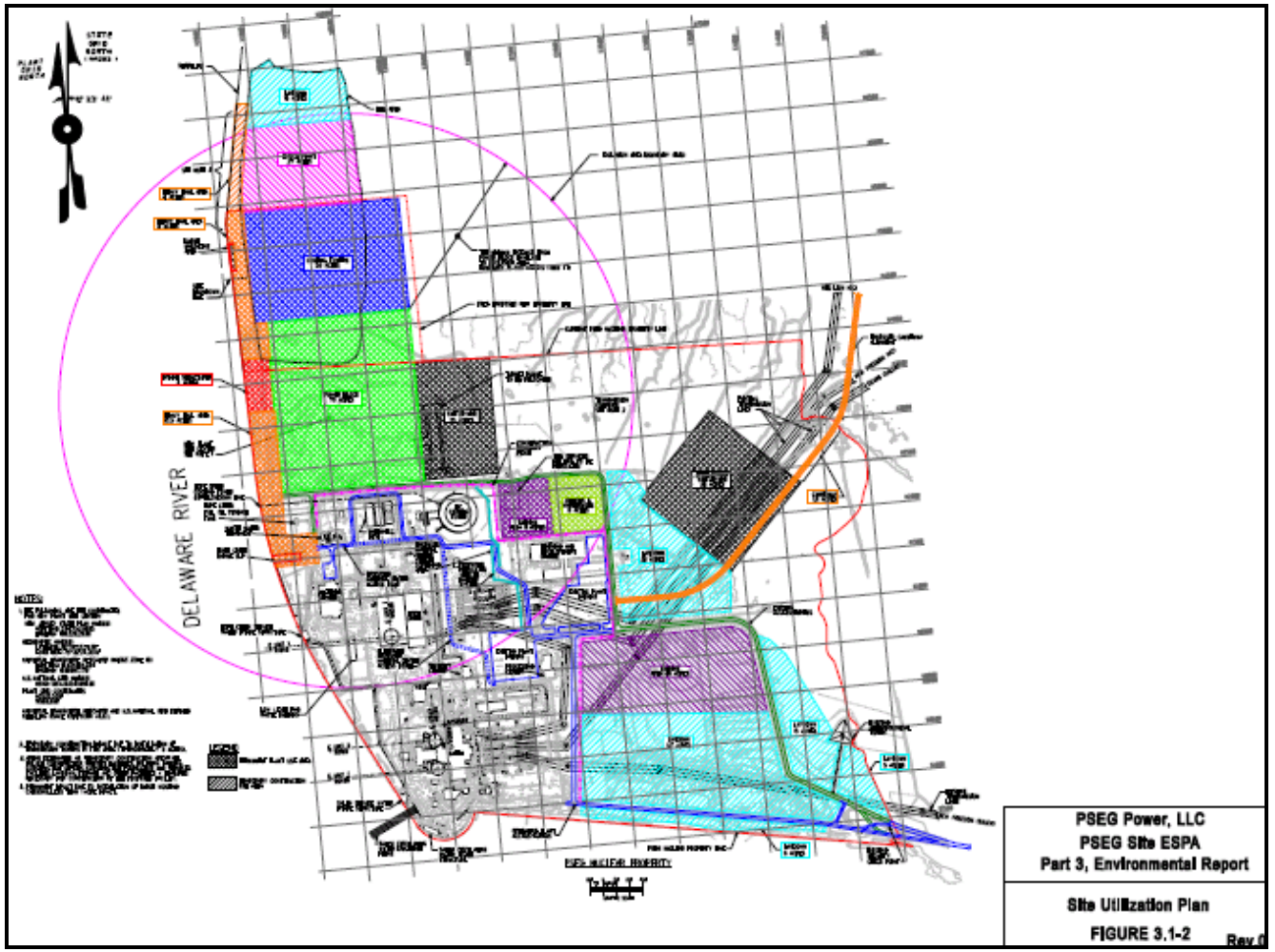

Figure 3. Site Utilization Plan for the PSEG ESP Site
(*Source:* PSEG 2010)

participants also went on other off-site tours and visits, as described in Section 4 of this report. Section 2 of this report discusses the scope and objectives of the Environmental Site Audit, and Section 3 describes the Audit logistics.

2. Environmental Site Audit Scope and Objectives

Section 102 of the National Environmental Policy Act (NEPA) of 1969, as amended (42 USC 4321 et seq.) directs that an environmental impact statement (EIS) be prepared for major Federal actions that have the potential to significantly affect the quality of the human environment. The NRC has implemented Section 102 of NEPA in 10 CFR Part 51, *Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions*. Further, in 10 CFR 51.20, the NRC has determined that the issuance of an ESP under 10 CFR Part 52 is an action that requires an EIS. As part of the review of the PSEG ESP application, the NRC staff is preparing an EIS. The Environmental Site Audit was intended to assist the staff in determining whether additional information is required to support the completion of the EIS.

The NRC staff conducted the Environmental Site Audit on May 7-11, 2012. The scope and objectives for the NRC staff were:

- Become familiar with the proposed site and the surrounding environment.

- Obtain additional information as set forth in the Information Needs Table developed by the staff, which may include information that the staff requires to the complete the environmental review. Collect additional data to assist in the environmental review, analysis and documentation of the applicant's action as part of the development of its EIS.

- Interact with Federal, State, and local agencies to discuss their concerns, as well as provide them the opportunity to see the site and interact with the applicant. The staff invited the following resource agencies to attend the Audit: the Army Corps (Philadelphia District); the Environmental Protection Agency (EPA) (Regions 2 and 3); the U.S. Fish and Wildlife Service (FWS); the National Oceanic Atmospheric Administration National Marine Fisheries Service (NMFS); the New Jersey Department of Environmental Protection (NJDEP); the Delaware Department of Natural Resources and Environmental Control; and the Delaware River Basin Commission (DRBC).

For the EIS, the NRC staff and the Corps staff (the "Review Team") will evaluate numerous topics for the proposed ESP Site and each of the four alternative sites, including land use, hydrology (surface water and groundwater), ecological resources (terrestrial and aquatic), socioeconomics, environmental justice, cultural resources, meteorology and air quality, non-radiological health, radiological health, need for power, and alternatives. During the Site Audit, the Review Team discussed these topics and others with the applicant to determine whether additional information may be needed to complete its environmental review.

3. Environmental Site Audit Logistics

The Environmental Site Audit was conducted on May 7-11, 2012. During the Site Audit, the NRC staff and other participants met at the PSEG Energy and Environmental

Resource Center (EERC) in Salem, New Jersey, and traveled to conduct the various tours and visits described in Section 4 of this report. The Site Audit was completed on the morning of May 11 with a publicly-noticed Exit Briefing conducted at the PSEG EERC. Appendix A to this report lists the Site Audit participants.

4. Environmental Site Audit Daily Details

4.1 Monday, May 7

In the morning, Site Audit participants gathered at the PSEG EERC in Salem, New Jersey. There were approximately 70 persons in attendance, including staff from PSEG and its contractors, NRC, Corps, Oak Ridge National Laboratory (ORNL), Argonne National Laboratory (ANL), Brookhaven National Laboratory (BNL), Pacific Northwest National Laboratory (PNNL), and various Federal and State agencies (Appendix A of this report contains a daily list of participants).

The Site Audit began with welcoming remarks and an overview briefing from PSEG staff. Jamie Mallon (PSEG) gave an overview of PSEG, its parent company, and other subsidiaries, its existing SGS and HCGS facilities, and its plans for a new reactor unit(s) at the PSEG ESP site.

Gary Ruf (PSEG) gave a presentation on the proposed ESP project, including the proposed land exchange between PSEG and the Corps. The presentation included visual depictions of the new reactor unit(s) on the ESP site which would be useful in the EIS description of the proposed project.

Mike Wiwel (PSEG) provided a brief presentation on the new transmission lines that might be needed for any new reactor unit(s) at the PSEG ESP site. Wiwel disclosed that the existing transmission lines connected to the SGS/HCGS site are adequate to carry the additional power that would be generated the new nuclear unit(s), but that grid stability issues might be associated with any such new electrical connections. Potential grid stability issues cannot be investigated further until the technology for the new reactor unit(s) is selected. The new transmission lines and the routes that are discussed in the ER are therefore hypothetical until such time as a reactor design is identified by PSEG.

Following the opening briefings and presentations at the EERC, participants were transported by bus to the end of Money Island Road, where the proposed causeway to the PSEG ESP site would originate. PSEG staff gave a presentation on the proposed causeway route and alignment, and showed an artist's rendering of the proposed causeway design. This same location provided the participants with a visual perspective of the physical results of PSEG's Estuary Enhancement Program, which has been successful in eradicating invasive vegetative species, restoring native marsh grasses and enhancing reproductive success of aquatic organisms.

Participants were then transported by bus to PSEG's existing SGS/HCGS site, where the visit to the PSEG ESP site included an overview from the rifle range tower and tours of the existing HCGS barge facility and the Artificial Island Confined Disposal Facility (CDF). PSEG staff showed participants the proposed locations of the nuclear power block, the cooling towers, the water intake and discharge, and the laydown areas for the new unit(s).

In the afternoon, PSEG staff took approximately half of the participants on a boat tour along the Delaware River, where participants were able to observe the proposed ESP site (the current Artificial Island CDF) from the perspective of the river. Participants also viewed the Lower Alloways Creek Restoration Site and the Mason's Point dyke reconstruction area. However, wind and wave conditions made it unsafe to complete the boat tour to the SGS/HCGS site itself.

PSEG staff took the other half of the participants on a walking tour inside the SGS protected area, where participants saw the outside of the containment structures and fuel pool buildings, cooling water intake structures, intake screens, trash racks, pump impellers, and fish entrainment prevention mesh. Participants also saw the fish return flow canal and sampling building.

At the conclusion of these two tours, the participants who had taken the boat tour were given an opportunity to take the walking tour of the SGS protected area.

Not all of the Audit participants took the Delaware River boat tour or the SGS protected area tour. The **Socioeconomics/Environmental Justice Team** (Michael Purdie and Dan Mussatti of NRC and Barry Shumpert of ORNL) met with officials from Cumberland County, New Jersey, including Freeholder Director Carl Kirstein, County Administrator Ken Mecouch, Assistant Administrator Kim Wood, and Planning Director Robert Brewer. Participants discussed current socioeconomic characteristics of the county and potential SE/EJ concerns related to the proposed project.

In the evening, the Socioeconomics/Environmental Justice Team met with Sean Elwell, Mayor of Elsinboro Township, New Jersey. Participants discussed current socioeconomic characteristics of the township and potential SE/EJ concerns related to the proposed project, including impacts associated with the proposed causeway, which would terminate in the township.

The **Cultural Resources Team** (Jack Cushing of NRC and Dan O'Rourke of ANL) toured the architectural resources in the vicinity of the PSEG ESP site with Gary Bickle (AKRF) and Brenda Evans (PSEG). Tour participants examined several historically significant properties and visited the communities of Greenwich and Hancock's Bridge. Bickle and Evans provided information on local industries such as marsh banks and muskrat harvesting. Participants ended the day at the PSEG EERC discussing sources of information on local history.

The **Meteorology/Air Quality Team** (Kevin Quinlan of NRC and Mengdawn Cheng of ORNL) participated in an afternoon breakout session with Jamie Mallon (PSEG), Mike Shervin (S&L), Paul Derezotes (S&L), Tim Krause (S&L), and Paul Schwartz (NJBNE). Participants were told that Jack Southers (PSEG) is in charge of meteorological tower management and computer interface, monitoring site, and instrument maintenance. Participants also learned that there is no air quality monitor on-site, that radiation monitor(s) would be installed once the reactor technology for the new plant(s) is identified and finalized, and that the new plant(s) would have TLD monitors and particulate filters. Derezotes (S&L) described the creation of a climate region for his climate analysis. Most of the meteorology/air quality sections in the ER came from the corresponding sections in the SSAR report.

4.2 Tuesday, May 8

In the morning, Site Audit participants gathered at PSEG's EERC in Salem, New Jersey. The day began with a presentation by Tim Krause (S&L) describing the process used to identify, evaluate, and select potential sites for nuclear power plant development [the *Alternative Sites Audit Trip Report* contains a detailed description of this presentation]. The process involved the sequential identification of candidate areas, potential sites, candidate sites, and the proposed site. The numerical scoring system used to rank the sites was included in the discussion.

Bill Elzinga (AMEC) gave Audit participants an overview of the macro-corridors used in PSEG's analysis of potential transmission line corridors. Elzinga discussed the purpose and need to develop at least one new transmission line (grid stability), and identified and described two such macro-corridor routes. He also presented and discussed the method used by PSEG to evaluate potential environmental impacts along the proposed routes. Elzinga echoed Mike Wiwel's (PSEG) remarks of May 7 that the existing transmission lines connected to the SGS/HCGS site are adequate to carry the additional power that would be generated by a new nuclear unit(s), but that grid stability issues might be associated with any such new electrical connections. Grid stability investigations would be performed by the Pennsylvania, Jersey, Maryland Power Pool (PJM) after the technology for the new reactor unit(s) is selected. The new transmission lines and the routes that are discussed in the ER are therefore hypothetical until such time as a reactor design is identified by PSEG. Although there was not a specific breakout session on the topic of transmission lines, Wiwel's and Elzinga's presentations addressed many of the Transmission Line items in the Site Audit Information Needs Table. However, the Review Team will need additional information to assess the potential impacts of constructing a new transmission line for the new reactor(s).

Tim Rooney (Army Corps) gave Audit participants an overview discussion of the Corps' dredging activities in the Delaware River, the use of CDFs for disposal of the dredged material, and the proposed land exchange between PSEG and the Corps (i.e., potential PSEG property in Site 15G for Corps land on Artificial Island). Rooney discussed the historical use of Site 15G and presented maps and other data about the site. Rooney's presentation addressed many of the items related to Site 15G in the Information Needs Table. However, the Review Team will need additional information to assess the potential impacts of the proposed land exchange and the use of Site 15G as a CDF.

In addition to these three overview presentations, Site Audit participants took part in other presentations, tours, and breakout sessions, as detailed below by resource area.

4.2.1 Land Use

The **Land Use Team** (Mike Willingham of NRC and Bo Saulsbury of ORNL) participated in a breakout session to discuss the potential impacts of the proposed causeway. Other participants included Ed Bonner (Corps), Bryan Bellacima (Corps), Gary Ruf (PSEG), Gary Bickle (AKRF), Nathan Riddle (AKRF), Bill Elzinga (AMEC), and Steve Stumne (AMEC).

Participants discussed existing land use along the causeway route, which is almost exclusively water-based recreational use of the Mad Horse Creek Wildlife Management

Area (WMA). PSEG would avoid impacts to recreational use of the WMA by elevating the causeway and providing a bridge(s) to allow boat access to continue.

Participants discussed PSEG's causeway construction and lighting techniques. PSEG has not selected a specific causeway construction technology, but the ER assessment assumes a 50-foot-wide causeway and monorail construction using modular causeway sections. Also, PSEG has not selected specific lighting for the causeway, but it would follow standard operating procedures for minimizing the visual impacts of lighting.

Participants discussed the Deed of Conservation Restriction that exists for land along the causeway route. PSEG owns the land, but granted it to the State of New Jersey under a Deed of Conservation Restriction. The State would need to lift the Deed before PSEG could develop the causeway, and PSEG would likely be required to grant the State equivalent land for conservation elsewhere.

Participants discussed potential land use impacts to residents in the vicinity of the causeway due to heavy construction traffic on the causeway. This issue is addressed in the "Traffic Impact Report" (Document TR441 in the electronic reading room).

After completing the discussion of the causeway, participants began to discuss land use issues for the PSEG ESP site. The Team noted that a new or revised figure similar to ER Figure 3.1-2 (Figure 3 in this report), which shows the Site Utilization Plan for the PSEG ESP site, is needed for the EIS because the existing figure cannot be read when printed on an 8.5" x 11" page.

The State of New Jersey has completed its Coastal Zone Management Act (CZMA) consistency determination for the proposed action, but the State of Delaware has stated that there is no need to issue its CZMA determination at this time.

The State of New Jersey is in the process of revising the Coastal Area Facility Review Act (CAFRA) node designation for a 294-acre section of the Artificial Island CDF to "utility." The utility node designation would allow development of the CDF (and thus the PSEG ESP site) with 80 percent impervious surface, whereas the CDF's current CAFRA designation allows development with only 3 percent impervious surface. The existing SGS and HCGS facilities are currently designated as the 520-acre "PSEG Utility Node" under CAFRA.

4.2.2 Hydrology (Surface Water and Groundwater)

The **Hydrology Team** (Daniel Barnhurst and Mohammed Haque of NRC, Michael Hauptmann of BNL, and Rajiv Prasad of PNNL) participated in a presentation by Ken Strait (PSEG) on PSEG's Estuary Enhancement Program. The presentation detailed the estuary's net increase in fish biomass when compared to the losses associated with the existing SGS/HCGS cooling water intakes. The presentation also included a discussion of the natural history of the wetlands and how they are degraded by phragmites species.

After the Estuary Enhancement Program presentation, the Team participated in a breakout session to discuss cooling water design, water balance, and alternative cooling systems technologies. The session was led by Dan Blount (S&L), who gave a presentation on cooling water design and water balance topics, and participants

discussed potable and fire water supply, heat dissipation systems, discharge plume, permits, alternative heat dissipation systems, and CORMIX modeling.

4.2.3 Ecology (Terrestrial and Aquatic)

The **Terrestrial Ecology Team** (Mike Willingham of NRC and Neil Giffen of ORNL) and the **Aquatic Ecology Team** (Nancy Kuntzleman of NRC and Glenn Cada of ORNL) participated in Ken Strait's (PSEG) presentation on PSEG's Estuary Enhancement Program. The purpose of the Program is to offset losses of fish due to entrainment in SGS's open cycle cooling system, and it has been made a part of the NPDES permit conditions. The Program was launched in 1994 and includes five elements: (1) restoration of 20,000 acres of degraded wetlands (particularly Phragmites removal); (2) construction and maintenance of 13 fish ladders at low head dams to enhance migration of river herring (alewives and blueback herring); (3) an extensive biological monitoring program, including impingement and entrainment sampling at SGS, bottom trawls and ichthyoplankton tows in the Delaware River; (4) a study of behavioral technologies to reduce impingement and entrainment; and (5) contribution to an artificial reef program. Documents related to the EEP can be found at www.pseg.com/environment.

After the Estuary Enhancement Program presentation, the Terrestrial Ecology Team participated in the breakout session on potential impacts of the proposed causeway, as described above for Land Use. The discussion included the extent to which PSEG had performed wildlife surveys in the vicinity of the proposed causeway. Participants also discussed the availability of information for the Mad Horse Creek Wildlife Management Area (WMA).

The Aquatic Ecology Team participated in the Hydrology breakout session to discuss cooling water design, water balance, and alternative cooling systems technologies led by Dan Blount (S&L). Many of the figures and analyses are more conservative than would actually occur because of the need to provide a plant parameter envelope (PPE) that encompasses any eventual reactor design.

4.2.4 Socioeconomics and Environmental Justice

In the morning, the Socioeconomics/Environmental Justice Team met with officials from New Castle County, Delaware, including County Executive Chief of Staff Dennis Phifer, Director of Economic Development Karl Kalbacher, Manager of Community Services Marcus Henry, Chief of Emergency Communications David Roberts, Coordinator of Emergency Management David Carpenter, Emergency Management Planner Joe Cochron, and Director of Public Services Wayne Merrit. Participants discussed current socioeconomic characteristics of the county and potential SE/EJ concerns related to the proposed project.

In the afternoon, the Team met with officials from Gloucester County, New Jersey, including Freeholder Director Robert Damminger and County Administrator Chad Bruner. Participants discussed current socioeconomic characteristics of the county and potential SE/EJ concerns related to the proposed project. Following that meeting, the Team met with staff from the South Jersey Transportation Planning Organization, including Team Leader David Heller and Assistant Planner Andrew Tracy. Participants discussed the availability of data and published reports that might help in assessing the transportation impacts of the proposed project on the southern New Jersey region.

In the evening, the Team met with Ellen Pompper, Mayor of Lower Alloways Creek Township, New Jersey. Participants discussed current socioeconomic characteristics of the township and potential SE/EJ concerns related to the proposed project, which is located within the township.

4.2.5 Cultural Resources

In the morning, the Cultural Resources Team met with Jesse Zanavich and Craig Lukezic of the Delaware State Historic Preservation Office in their offices in Dover, Delaware, to discuss the environmental review for the ESP. The Team also met briefly with Gwen Davis, Deputy SHPO, with the Delaware State Historic Preservation Office. Topics discussed included the status of cultural resource surveys for the ESP, visual effects in the area of potential effect, and the collection of background data for the region.

In the afternoon, the Team met with Nathan Riddle (AKRF) to examine historic properties in the area of potential effect in Delaware. Sites visited included the Augustine Beach Hotel, Port Penn Historic District, and the Reedy Island Rear Range Light. The Team then returned to the PSEG EERC to discuss land use and alternatives related to the Corps' involvement in the project and the permits needed for the proposed causeway.

4.2.6 Alternatives

The **Alternatives Team** (Andy Kugler of NRC and Greg Zimmerman of ORNL) participated in a breakout session on Alternative Sites. Other participants included Mike Wiwel (PSEG), Tim Krause (S&L), and John Kennel (Delaware DNREC).

Participants discussed the methodology used in the *Alternative Siting Study*, especially the numerical scoring system for the candidate sites, and PSEG staff provided clarification on the details of the scores that were developed to rank the sites. Participants also discussed and resolved differences between the water requirement totals used in the siting analysis and in the evaluation of water supply impacts at each of the alternative sites.

4.2.7 Non-Radiological Health and Radiological Health

The **Non-Radiological Health and Radiological Health Team** (Don Palmrose of NRC and Anthony Armstrong and Ryan Manager of ORNL) participated in a breakout session on radiological health and radiological waste. Other participants included Jamie Mallon (PSEG), Bob Gary (PSEG), John Lunai (S&L), Joe Johnson (S&L), Deb Barsotti (AMEC), Bill Elzinga (AMEC), Jay Voughitios (NJBNE), and John Kennell (Delaware DNREC).

Participants discussed radiation health information needs and PSEG staff provided additional information to assist in development of the EIS. After the breakout session, the Team discussed additional information needs.

The Team also met with Dave Robillard (PSEG) to request that LADTAP II and GASPAR II calculation packages be uploaded to the electronic reading room.

Afterwards, the Team read through the LADTAP II and GASPAR II calculation packages to determine if any additional information would be needed related to liquid and gaseous effluents.

4.2.8 Meteorology and Air Quality

In the morning, the Meteorology/Air Quality Team visited the primary meteorological monitoring site at the SGS/HCGS site and was briefed by Jack Southers (PSEG). The site is a 300-ft tower with monitors located at 33, 150, 179, and 300 ft height. The data products produced by the monitors include wind speed and direction, delta T, and stability classes for all these height levels every 2 seconds. Data are transmitted to control room backup and site-wide atmospheric monitoring, as well as to a permanent archive, which has been keeping data for the past 30 years.

In the afternoon, the Team participated in a breakout session to discuss information needs for meteorology and air quality. Other participants included Joe Johnson (S&L), Mike Shervin (S&L), Paul Derezotes (S&L), Jim Paumiler (S&L), and Pat Brennan (S&L).

4.2.9 Accidents

In the morning, the **Accidents Team** (Don Palmrose of NRC and Juan Carbajo of ORNL) participated in a breakout session to discuss information needs with Jamie Mallon (PSEG), Joe Johnson (S&L), Mike Launi (S&L), Karen Tuccillo (NJBNE) and Jay Vouglitois (NJBNE). After the breakout session, the Team reviewed the MACCS Calculation supplied by PSEG.

4.2.10 Transportation

In the morning, the **Transportation Team** (Don Palmrose and Norma Garcia-Santos of NRC and Steve Maheras and Tara O'Neil of PNNL), participated in a conference call to discuss information needs with Jamie Mallon (PSEG), Mike Launi (S&L), and Joe Johnson (S&L). Garcia-Santos and Maheras were not at the Audit, but participated by phone. During the call, participants systematically went through Sections 3.8, 5.7.1, 5.7.2, and 7.4 of PSEG's ER.

4.3 Wednesday, May 9

In the morning, the Audit participants met at the PSEG EERC and continued their resource-specific breakout sessions.

4.3.1 Land Use

The Land Use Team participated in a breakout session to discuss potential impacts at the alternative sites and at the proposed land exchange site (Site 15G). Other participants included Brendan Daly (PSEG), Gary Ruf (PSEG), Mike Wiwel (PSEG), Gary Bickle (AKRF), Nathan Riddle (AKRF), Tim Krause (S&L), Bill Elzinga (AMEC), and Steve Stumne (AMEC).

Participants discussed existing land use at the four alternative sites (Tim Rooney's May 8 presentation addressed most questions about existing land use at Site 15G). Site 4-1 has lands that are designated as "County Preserved Farmland" under the State of New

Jersey's program (and, according to the *Field Verification Report* in the electronic reading room, so do Sites 7-1, 7-2, and 7-3). There is no defined process for lifting the Preserved Farmland designation, but PSEG staff stated that it can be done (perhaps by providing equivalent land for preservation elsewhere).

Participants discussed the Deed of Conservation Restriction that exists for land in Site 7-3. PSEG owns the land, but granted it to the State of New Jersey under a Deed of Conservation Restriction. The State would need to lift the Deed before PSEG could develop the site, and PSEG would likely be required to grant the State equivalent land for conservation elsewhere.

Participants discussed what would happen to the existing residents within the boundaries of the alternative sites if any of those sites was developed. The residents would be relocated, but PSEG cannot use eminent domain because it is a merchant power provider (however, PSE&G can use eminent domain because it is a regulated public utility). PSEG would have to buy out the existing residents in a regular real estate transaction.

After completing the discussion of alternative sites, participants continued the May 8 discussion of land use issues for the PSEG ESP site. The Team noted that the ER lists major public and trust land areas in the region around the proposed and alternative sites, but that no map is provided. PSEG staff referred the team to "I-Map," which is NJDEP's GIS map-based system. Also, PSEG staff cited the web site: www.natlands.org/preserves-to-visit/find-one-near-you/.

Participants discussed the volumes and sources of fill material that would be needed at the proposed and alternative sites. PSEG estimates that 7.5 million cubic yards of fill material would be needed at the proposed ESP site. The amount of fill material needed at the alternative sites would vary. PSEG's *Alternative Site Evaluation Study* contains rough estimates of the fill needed to grade each of the alternative sites. However, PSEG has prepared an internal report that identifies over 20 potential borrow sites along the Delaware River and in Maryland near Chesapeake Bay. The Team requested that this internal report be placed in the electronic reading room. The proposed ESP site and Sites 7-1, 7-2, and 7-3 would use the same borrow source(s); no borrow source(s) has been identified for Site 4-1. PSEG would get fill material from existing borrow sites that are licensed or permitted (i.e., no new borrow sites).

Participants discussed seasonal access to the transmission line corridor for agricultural land use. PSE&G would develop agreements with individual farmers for the use of land within the transmission corridor, including seasonal restrictions.

In the afternoon, the breakout session on Land Use was combined with a breakout session on Cumulative Impacts. The Team (Andy Kugler of NRC and Greg Zimmerman and Bo Saulsbury of ORNL) participated in the combined session with Dave Robillard (PSEG), Gary Ruf (PSEG), Gary Bickle (AKRF), Tim Krause (S&L), Bill Elzinga (AMEC), Lingard Knutson (EPA), and John Kennel (Delaware DNREC).

PSEG staff described their approach to aggregating the impacts from ER Chapters 4 and 5 into the cumulative impact level in ER Chapter 10. Participants discussed deviations in PSEG's method from that used by the NRC. After the breakout session, the

Team reviewed PSEG's spreadsheet calculations for the total acreage potentially affected at each of the alternative sites.

Next, the Team participated in a breakout session to discuss PSEG's plant parameter envelope (PPE) approach with Jamie Mallon (PSEG), Gary Ruf (PSEG), Dan Blount (S&L), Mike Launi (S&L), and Mike Shervin (S&L).

PSEG staff explained the origin of the PPE parameters as described in SSAR Table 1.3-1 and the site characteristics as described in SSAR Table 2.0-1. In developing the PPE, PSEG assumed two AP1000 units, while only one unit of each of the other designs was assumed. Participants discussed and resolved an apparent discrepancy among the water withdrawal values used in the *Alternative Site Evaluation Study*, the ER, and the PPE. Participants also discussed how aesthetics had been included in the PPE and how the "rated thermal power" and the "maximum thermal power" had been derived and used.

4.3.2 Hydrology (Surface Water and Groundwater)

In morning, the Hydrology Team participated in a breakout session to discuss information needs with Steve Criscenzo (AMEC), Dan Blount (S&L), Anthony Bonasera (GEOMAP), Nelson Brenton (AMEC), Ed Keating (PSEG), and Gary Ruf (PSEG). During the session, the Team received all the requested modeling-related calculation packages that were developed for the safety review.

In the afternoon, the Team participated in a breakout session to discuss information needs with Steve Criscenzo (AMEC), Dan Blount (S&L), Anthony Bonasera (GEOMAP), Nelson Brenton (AMEC), Ed Keating (PSEG), and Gary Ruf (PSEG). Participants discussed dredging, NJPDES requirements, other permitting, wastewater treatment and disposal systems, alternative sites requirements, monitoring, and modeling of groundwater mounding and changes to groundwater flow.

4.3.3 Ecology (Terrestrial and Aquatic)

The Terrestrial and Aquatic Ecology Teams participated in morning and afternoon breakout sessions on alternative sites and the proposed land exchange led by Tim Krause (S&L). Participants discussed information needs specific to terrestrial and aquatic ecology at the alternative sites and at Site 15G. Other participants included Bill Elzinga (AMEC), Steve Stumne (AMEC), Matt Basler (AMEC), Brendan Daly (PSEG), and Ken Strait (PSEG).

4.3.4 Socioeconomics and Environmental Justice

In the morning, the Socioeconomics/Environmental Justice Team met with officials from Salem County, New Jersey, including Freeholder Director Julie Acton, Department of Planning and Agriculture Director Louis Joyce, and County Chamber of Commerce Executive Director Jennifer Jones. Participants discussed current socioeconomic characteristics of the county and potential SE/EJ concerns related to the proposed project.

In the afternoon, the Team participated in a breakout session to discuss information needs with Mike Wiwel (PSEG), Lee Walton (AMEC), Bill Elzinga (AMEC), and Tim

Krause (S&L). Topics discussed included regional economic trends, existing public services, housing conditions, tax collection and revenue distribution, existing and planned transportation systems, environmental justice concerns, and the rationale for the ER's impact conclusions for the preferred and alternative sites.

4.3.5 Cultural Resources

In the morning, the Cultural Resources Team participated in a breakout session to discuss information needs with Nathan Riddle (AKRF) and Gary Bickle (AKRF). After the breakout session, the Team participated in a conference call with PSEG staff and the Delaware SHPO to discuss the visual resource report the SHPO is currently reviewing.

In the afternoon, the Team continued its breakout discussion with Riddle and Bickle on information needs. Participants discussed the significant amount of background research that has been conducted and should be provided to the NRC. Participants discussed whether the transmission line corridors are within the scope of the environmental review.

4.3.6 Non-Radiological Health

In the morning, the Non-Radiological Health Team participated in a breakout session with Jamie Mallon (PSEG), Bob Gary (PSEG), Brendan Daly (PSEG), Dan Blount (S&L), John Lunai (S&L), Joe Johnson (S&L), Deb Barsotti (AMEC), Mike Shervin (S&L), Wayne Ingram (AMEC), and Bill Elzinga (AMEC). Participants discussed non-radiological health and waste information needs, including alternative site selection metrics.

In the afternoon, the breakout session continued focusing on alternative site selection metrics for both radiological health and non-radiological health with the following additional participants: Allen Fetter (NRC), Steve Maheras (PNNL—by phone), Tara O'Neil (PNNL), and Tim Krause (S&L).

4.3.7 Radiological Health

In the morning, the Radiological Health Team met to discuss construction worker direct radiation dose from the ISFSI (this topic was addressed later in the day during a breakout session). The Team then participated in the breakout sessions described above under Non-Radiological Health. Participants discussed direct radiation dose from the ISFSI and alternative site impacts for radiological health, non-radiological health, and transportation.

4.3.8 Transportation

The Transportation Team participated in a conference call to discuss information needs with Allen Fetter (NRC), Tara O'Neil (PNNL), Jamie Mallon (PSEG), Mike Launi (S&L), and Joe Johnson (S&L). During the call, participants discussed the unresolved issues remaining from the May 8 conference call, including verification of PPE values and inclusion of transportation impacts for the alternative sites in the ER.

4.4 Thursday, May 10

In the morning, the Audit participants met at the PSEG EERC and continued their resource-specific breakout sessions.

4.4.1 Hydrology (Surface Water and Groundwater)

In both the morning and afternoon, the Hydrology Team participated in breakout sessions with Steve Criscenzo (AMEC), Dan Blount (S&L), Anthony Bonasera (GEOMAP), Nelson Brenton (AMEC), Ed Keating (PSEG), Gary Ruf (PSEG), and Jeff Pantazes (PSEG). In the morning session, participants discussed the need for graphic layer maps that were used to produce the ER maps (both from GIS and other sources), history and usage constraints on the Merrill Creek Reservoir, CORMIX modeling, new information not included in the ER regarding a tritium leak at SGS, the use of groundwater for recirculating water, and alternative intake structure designs. In the afternoon session, participants discussed clarification of State of New Jersey permitting processes, cumulative impacts of transmission line corridors, sea level rise, flood plain, water reuse, and the proposed causeway.

4.4.2 Ecology (Terrestrial and Aquatic)

In the morning, the Terrestrial Ecology Team participated in the Hydrology breakout session described above to provide input on terrestrial ecology related to the two potential alternative routes for off-site transmission lines. After the breakout session, the Team participated in a field visit to the Money Island Road area to look at the proposed causeway route.

The Aquatic Ecology Team spent the morning reviewing documents provided by PSEG, including the 2006 NJPDES Permit Application for SGS, the 2000-2010 Biological Monitoring Program Annual Reports, and various COE and state permits.

In the afternoon, both the Terrestrial and Aquatic Ecology Teams participated in a breakout session with Ken Strait (PSEG), Gary Bickle (AKRF), Karen Tuccillo (NJBNE), Paul Schwartz (NJBNE), Jay Vouglitois (NJBNE), Matt Basler (AMEC), Steve Stumne (AMEC), and Brendan Daly (PSEG). Participants discussed two questions related to wetland delineation and protection measures that were unresolved after the Wednesday breakout session, as well as documents needed in the electronic reading room or on the project docket.

4.4.3 Socioeconomics and Environmental Justice

In both the morning and afternoon, the Socioeconomic/Environmental Justice Team participated in breakout sessions to discuss information needs with Mike Wiwel (PSEG), Lee Walton (AMEC), Bill Elzinga (AMEC), and Tim Krause (S&L). In the morning session, participants discussed the physical components of the proposed project; construction workforce requirements; and the impacts of construction in terms of noise, air quality, transportation, recyclable and non-recyclable solid waste, indirect job creation, tax receipts of local and state governments, housing, public services, and environmental justice.

In the afternoon session, participants discussed the impacts of project operations on the regional economy, direct and indirect tax revenues of local and state governments, induced population growth, and environmental justice. Participants also discussed

potential SE/EJ impacts at the alternative sites and at Site 15G along with the aesthetic impacts of construction and operation of the proposed project.

4.4.4 Cultural Resources

In the morning, the Cultural Resources Team visited the New Jersey State Historic Preservation Office in Trenton, New Jersey, to review and collect background historical information on the project area. The Team reviewed survey coverage for cultural resources in the area of potential effect for the ESP and collected the survey reports for these locations.

In the afternoon, the Team participated in a conference call with the Corps, PSEG, and the New Jersey SHPO to discuss the ESP environmental review for the ESP. Participants discussed the scope of the ESP environmental review, the roles of the various agencies, and the potential path forward for completing the Section 106 review. Participants discussed whether the Corps would be the lead Federal agency for the Section 106 review, whether the transmission line corridors are within the scope of the review, and how the proposed land exchange would be addressed in the EIS. The Corps stated that it is considering developing a programmatic agreement on cultural resources.

Later in the afternoon, the Team met with Greg Lattanzi, Registrar for the Bureau of Archaeology and Ethnology, at the New Jersey State Museum. Lattanzi maintains data on all archaeological sites found in New Jersey, and his records cover both National Register listed sites and those that have yet to be evaluated. The Team reviewed the material and noted which sites are located near the ESP area of potential effect.

4.4.5 Alternatives

The Alternatives Team participated in a breakout session on Energy Generation Alternatives with Mike Wiwel (PSEG), Tim Krause (S&L), and Chris Ungate (S&L). Participants discussed PSEG's approach to the evaluation of alternatives for energy generation, as well as their resulting impact level findings. In particular, the Team asked about the basis of the statement in the ER that the alternative of importing power from outside New Jersey was "undesirable."

PSEG staff identified a "calculation package" but was not able to provide it for the Team's review during the Audit. The information contained in the calculation package is expected to provide the details requested in several of the items regarding energy generation alternatives in the Site Audit Table.

PSEG staff referred the Team to ER Chapter 8 for additional information to supplement the ER Chapter 9 information on energy/power needs, alternatives for obtaining the needed energy, and information about the renewable energy portfolio. Participants discussed capacity factors for nuclear, coal and gas, as well as capacity factors for technologies that could be used in combination with coal or gas.

Participants discussed the comparative levels of emissions from the combinations of various energy alternatives (as compared to all-coal and to all-gas), as well as the issue of how carbon dioxide emissions were handled in the ER for the combination of energy alternatives.

PSEG staff clarified how renewables are included in the PJM projections. PSEG staff identified an initiative, the Long Term Capacity Agreement Pilot Program (LCAPP), in the State of New Jersey as being the State's attempt to encourage the addition of baseload capacity from a variety of sources. PSEG staff provided a web link to the publicly available March 2011 LCAPP report, which the Team subsequently obtained.

PSEG staff directed the Team to an on-line news article (dated May 20, 2010, at njspotlight.com) on a proposal to install 74 MW of solar-generated capacity on 92 acres in Salem County, New Jersey. PSEG staff also directed the Team to the "interconnections" portion of the PJM website, http://www.pjm.com/planning/generation-interconnection/generation-queue-active.aspx, which contains information about proposed solar capacity in the queue to be considered by PJM for possible future connection to the grid.

4.4.6 Need for Power

In the morning, the **Need for Power Team** (Dan Mussatti and Michael Purdie of NRC and Dave Bjornstad of ORNL) met with Jamie Mallon (PSEG) and Chris Ungate (S&L) to discuss the additional information needed to supplement ER Chapter 8. The discussion focused on three topics. First, NRC staff noted recent events and changes that have bearing on the relevance of data in the current version of ER Chapter 8. Specifically, recent events such as the agreement to close the Oyster Point nuclear facility and the downturn in the national economy that might affect electricity loads were discussed. Second, information from the updated New Jersey Energy Master Plan (December 11, 2011) was discussed as germane to NRC's analysis. Third, the selection of the state of New Jersey as the relevant service area required discussion as to whether any relevant load or capacity changes outside New Jersey (for example, proposed nuclear capacity in Maryland) would affect statements in Chapter 8 of the ER. Participants also discussed the appropriateness of the chosen forecasts and of the ancillary benefits of the proposed facility.

4.5 Friday, May 11

In the morning, some of the Audit participants met at the PSEG EERC, where Allen Fetter (NRC) conducted a dial-in Exit Briefing on the activities conducted during the Site Audit. Approximately six individuals called in to the Exit Briefing. Fetter provided an overview of the Audit and then asked the on-line participants for any questions. No questions were asked. Jamie Mallon (PSEG) closed out the Exit Briefing by offering his comments on the week's activities.

Following the Exit Briefing, some members of the Review Team traveled to Site 15G, the parcel that PSEG could acquire and give to the Corps in exchange for the 85-acre parcel PSEG proposes to acquire from the Corps at the Artificial Island CDF. Site 15G is located in Gloucester County, New Jersey, about 30 miles upriver from the PSEG ESP site. The Team met with PSEG staff, PSEG contractor staff, and Corps staff (Ed Bonner and Bryan Bellacima) at Site 15G. The Team conducted a walking tour around the perimeter of the site. Subsequent to the tour of site 15G, Ed Bonner and Byran Bellacima took Michael Willingham and Allen Fetter on a tour of Pedricktown CDF, a 1400+ acre site located a few miles southwest of 15G.

The Cultural Resources Team visited the Abel Nicholson House with Brenda Evans (PSEG). This is a historic property located near the PSEG ESP site. The house was constructed in 1722 and incorporates a pattern brick design that is common in the region. The Team also examined other historic homes in the region before concluding the Audit.

4.6 Summary of Issues of Concern by Technical Discipline

4.6.1 Land Use

Most of the Land Use items in the Information Needs Table were resolved for purposes of the Site Audit. Specific items that remain open include:

- **LU-01:** Open item regarding the specific GIS maps and data needed from PSEG (this also covers item GEN-06).

- **LU-02:** Open item - new or revised figure similar to ER Figure 3.1-2 (ESP Site Utilization Plan) (this also covers part of item GEN-09).

- **LU-02:** Open item - the status of the proposed revision to the CAFRA node designation for the 294-acre section of the Artificial Island CDF to "utility."

- **LU-03:** Open item - the Deed of Conservation Restriction that exists for land along the causeway route. For example, how many acres of Conservation land would be removed from that designation for causeway construction? If required by the State of New Jersey, where would PSEG find equivalent land for conservation elsewhere?

- **LU-04 and LU-05:** Open item - "County Preserved Farmland" that would be affected at Site 4-1 (and perhaps at Sites 7-1, 7-2, and 7-3). For example, how many acres of Preserved Farmland would be removed from that designation for

power plant construction? If required by the State of New Jersey, where would PSEG find equivalent farm land for preservation elsewhere?

- **LU-04 and LU-05:** Open item - the Deed of Conservation Restriction that exists for land at Site 7-3. For example, how many acres of Conservation land would be removed from that designation for power plant construction? If required by the State of New Jersey, where would PSEG find equivalent land for conservation elsewhere?

- **LU-04:** Open item - the number of existing residences that would have to be relocated at each of the alternative sites, as well as the process for buying residences and relocating residents.

- **LU-09:** Open Item - fill material requirements and potential borrow sites, internal report for docket that estimates the fill material needed at the proposed and alternatives sites and identifies 20+ potential borrow sites.

4.6.2 Hydrology (Surface Water and Groundwater)

Most of the Hydrology items in the Information Needs Table were resolved for purposes of the Site Audit. In general, discussions with the applicant covered a large amount of information. Topics included water supply and intake structures, cooling water designs, site hydrogeology, horizontal and vertical groundwater flow and modeling, surface water flow and modeling, sea level rise, tritium observed at SGS, water balance, the 15G land exchange, permitting at the proposed and alternative sites, groundwater and surface water monitoring, transmission lines, the causeway, and estuary enhancement. In addition to the discussions, the Audit site tours were valuable to gain perspective on the operating and proposed plants' environmental impacts.

Some of the Hydrology items in the Information Needs Table were most likely addressed in the NRC Safety Review RAI process, but this needs to be confirmed. Applicable Safety Review RAI numbers have been added to appropriate items in the Information Needs Table.

Specific items that remain open include:

- **HYD-02:** PSEG will refer us to information that clarifies the rate at which MODFLOW model stabilized in the dewatering simulation.

- **HYD-15:** Corrosion and anti-fouling chemical additions at the proposed location have not been completely addressed but is likely in the ER. PSEG will provide the existing plants' NJPDES permits and applications in the electronic reading room.

- **HYD-16:** PSEG will provide ongoing monitoring and calibration procedures for field sampling in the electronic reading room. PSEG will also add a list of analytical labs so we can check certification.

- **HYD-18:** There was discussion of an offshore pipe intake with wedge wire screen and velocity caps as part of the additional questions added to the Information

Needs Table during the Audit. This was considered infeasible with the bidirectional river flow regime and debris loadings. Open item - to request that this information be submitted on the docket.

- **HYD-20:** Staff may need additional information on corrosion and anti-fouling chemical additions at the alternate locations if not already addressed in the ER.

- **HYD-21:** We need to confirm that the dewatering model calculation package showing anticipated groundwater mounding at the new plant location is in the electronic reading room.

- **HYD-22:** PSEG will place the Merrill Creek Reservoir "operations agreement" documents in the electronic reading room. NRC will contact DRBC for Merrill Creek release history.

- **HYD-25:** We may need more information on water use and availability and permitting requirements at alternative sites. PSEG stated that many of these issues are addressed in the Alternative Site Impact Quantification Study which is in the reading room. We will review and decide what to request on the docket. PSEG will look for clarifying information from DRBC regarding available water use at alternative sites.

- **HYD NEW:** We likely will need an RAI for the data, plausible release mechanisms, and recovery well operations for the areal tritium distribution outside the defined tritium plume at SGS.

- **Additional Question on Intake Structures:** We may need more information on the alternative options be discussed for the record.

- **ALT-25:** Salem City water and pipelines to surface water reservoirs were also considered for cooling water, but this is not described in the ER. We will likely need an RAI to document this for the EIS.

- **Causeway:** PSEG agreed to re-examine the description of the causeway in the ER to eliminate the need to deal with the change in flooding due to the continuous berm worst case assumption.

- **Sea-Level Rise:** PSEG has not considered GCC-related sea-level rise in the ER analyses. We may need additional information on this topic for the following items from sources other than PSEG: HYD-06, HYD-07, HYD-12, HYD-14, HYD-18, HYD-19, HYD-20, HYD-22, HYD-23, and HYD-24.

- **316b Demonstration:** PSEG stated that the through-screen velocities did not consider potential blockage from frazil ice formation (related to information needs HYD-09 and AE-22).

4.6.3 Ecology (Terrestrial and Aquatic)

Most of the Terrestrial Ecology items in the Information Needs Table were resolved for purposes of the Site Audit. Specific items that remain open include:

- **TE-01:** PSEG agreed to provide narratives on any threatened and endangered (T&E) wading bird species based on the updated New Jersey T&E species list, along with a table listing New Jersey "special concern" species. Also, PSEG provided further information on the function of preserves and refuges in the vicinity of the proposed site and agreed to provide similar information for the alternative sites.

- **TE-02:** PSEG agreed to provide a USGS land use land cover (LULC)-based type map.

- **TE-03:** PSEG agreed to put copies of USFWS response letters and other agency correspondence on the docket.

- **TE-06:** The two potential off-site transmission line corridors continue to be an open issue as a specific route will not be chosen until the COL stage, when a reactor technology is selected and an grid stability evaluation by the PJM is done.

- **TE-09:** PSEG will research avian protection measures for transmission lines and provide that information.

- **TE-10:** NRC will review for adequacy the information in ER Section 4.3.1.2 on assessment of potential impacts of artificial light on wildlife.

- **TE-11:** PSEG agreed to update the T&E list for the proposed and alternative sites based on the latest New Jersey list update and will provide life histories on any additional species. PSEG agreed to provide a separate list of New Jersey "special concern" species. Life histories on these species are not needed. PSEG will do additional green frog surveys this spring/summer to better characterize the distribution of the species on the proposed site.

- **TE-13:** PSEG agreed to place the following documents on the docket:

  -- *Biological Inventory and Habitat Characterization Report for Alloway Creek Site* (January 1996)
  --*Alloway Creek Watershed Phragmites-Dominated Wetland Restoration Management Plan, Elsinboro and Lower Alloway Creek Townships, Salem County, New Jersey* (February 18, 2004).

  PSEG agreed to place the following document (which outlines maintenance conducted along transmission line corridors) in the reading room:

  --*PSEG Environmental Compliance Matrix* (January 2011).

- **TE-14:** PSEG agreed to put letters pertaining to wetlands jurisdiction and interpretations from NJDEP and Corps on the docket.

- **TE-15:** PSEG agreed to provide data already collected for the 15G site, along with additional data to be collected in spring/summer 2012.

All of the Aquatic Ecology items in the Information Needs Table were resolved for purposes of the Site Audit. There is considerable experience related to the potential aquatic impacts of the proposed power plant on Artificial Island owing to the presence of SGS and HCGS. Experience at HCGS provides a good indication of the impacts of a closed cycle cooling system on the Delaware River estuary, and the larger impacts associated with SGS are the bases for the extensive biological monitoring programs that PSEG continues to conduct. The data and analyses from these biological monitoring programs are in the public record and are all available in electronic format for us to consider in our analysis. PSEG has agreed to put this material in the electronic reading room or on the docket, as per review team request.

4.6.4 Socioeconomics and Environmental Justice

Most of the Socioeconomics and Environmental Justice items in the Information Needs Table were resolved for purposes of the Site Audit. However, the following items include elements that could require RAIs: SOC-01, SOC-07, SOC-08, SOC-11, SOC-14, and GEN-08 (which was assigned to SE/EJ during the Site Audit). Also, the following items include elements that are expected to be resolved when PSEG places materials in the electronic reading room, as agreed during the Audit: SOC-02, SOC-03, SOC-06, SOC-09, SOC-13, SOC-19, SOC-20, SOC-22, and SOC-25. If the requested items are not placed in the electronic reading room, or if they are needed as references for the EIS, they will become the subjects of RAIs.

From discussions with local officials, the Team gained an updated understanding of socioeconomic conditions in the four-county region of interest (ROI) for the proposed action. Officials reported that there is a need for jobs in the region and that housing availability has increased since the data reported in the ER. With some localized exceptions, schools and other public services in the ROI have available capacity. The Team also learned of specific impact concerns of local officials, such as concern for heavier traffic and light/noise pollution within Elsinboro Township associated with the proposed causeway. More detail is available in the Socioeconomics/Environmental Justice Field Notes that are included as Appendix B to this report.

Breakout sessions with PSEG staff and contractors clarified some ambiguities related to the ER and produced agreements to make some needed information available. The applicant provided 2000 data, projections out to 2080, and the methods for the projections in 2.5.1 and 2.5.1.1 as required by 10 CFR 51.45(c). PSEG does not plan to update demographic, economic, and environmental justice information based on the 2010 *Census and American Community Survey*. Consequently, this updating will become part of the ESP EIS effort. The updated 2010 census data is readily available and the applicant's methods for projecting out to 2080 have been provided to the review team.

4.6.5 Cultural Resources

Most of the Cultural Resources items in the Information Needs Table were resolved for purposes of the Site Audit. We discussed several topics during the Audit, including what cultural resources are present in the area of potential effect, the status of cultural resource investigations, the scope of the National Historic Preservation Act (NHPA) review for the project, discussions of the roles and responsibilities of the various

agencies for the cultural resource review, information sources, and what is needed to complete the NHPA review for the environmental review for the ESP. Major outcomes of the site audit include a familiarity with the local history and the resources that are present.

Specific outcomes and open issues from the Audit include:

- The review team discussed the status and completeness of the cultural resource surveys with both the New Jersey and Delaware State Historic Preservation Offices. Minor editing is needed, but generally the cultural resource survey efforts are satisfactory.

- The scope of the Cultural Resources analysis will include the PSEG ESP site and its immediate area. The visual area of potential effect extends 4.5 miles from the PSEG ESP site.

- The proposed land exchange involving Site 15G is within the scope of the Cultural Resources analysis.

- The proposed transmission line corridors may not be included in the ESP EIS if they are not necessary for a new power plant.

- Which agency will serve as the lead Federal agency for the NHPA review was not finalized, and the actual approach for completing the Section 106 review remains under discussion.

- PSEG conducted a significant amount of research on cultural resources that was not incorporated into the ER. PSEG has committed to providing this information to the NRC.

- Discussions are ongoing concerning the completion of the NHPA review. Development of a programmatic agreement is currently being considered.

4.6.6 Alternatives

Most of the Alternatives items in the Information Needs Table were resolved for purposes of the Site Audit. There are, however, some unresolved issues as discussed below.

In regard to PSEG's alternative site selection process, the review team will need additional explanations on how the list of "potential sites" was derived from within the identified candidate areas. The review team will also need additional information on the specific selection criteria that were used and how those criteria were applied in the selection process. The review team may also need additional explanation as to how the value of 35,000 gpm water withdrawal requirement was derived and used in the *Alternative Site Evaluation Study* because a higher value (78,196 gpm) has been used elsewhere in the ER and its supporting studies.

In regard to energy generation alternatives, the review team will need additional clarification on the basis for the statement in the ER that the alternative of importing

power from outside New Jersey is “undesirable.” The review team may also need additional information from PSEG seeking clarification as to whether—in its evaluation of the competitive energy alternatives—PSEG (1) included the same transmission line impacts for the alternatives as for the proposed nuclear plant, and (2) included the same cooling system impacts for the alternatives as for the proposed nuclear plant. The review team will need to obtain and inspect PSEG’s “calculation package” that was used to develop the numerical basis for the comparison of energy generation alternatives. PSEG stated that this package would be placed into the electronic reading room.

PSEG did not develop specific contributions from various emission sources for the combinations of energy alternatives. The review team will need additional information on the comparative levels of the emissions from the combinations of energy alternatives (as compared to all-coal and to all-gas). Also, the issue of how carbon dioxide emissions were handled in the ER for the combinations of energy alternatives was unresolved during the Audit.

In regard to the cumulative impacts at the proposed site and each of the alternative sites, the review team will need additional information and an explanation of how the various impact levels from ER Chapters 4 and 5 were aggregated and combined with other cumulative impacts to arrive at the impact levels as reported in ER Chapter 10. The review team will request information about other nearby existing or proposed projects and activities in the vicinity of the proposed site and each of the alternative sites that could potentially contribute to cumulative impacts. PSEG should re-examine the cumulative impacts once such projects and activities have been identified.

The review team requested several references from the ER during the Site Audit, but the documents were not made available. The review team will develop a list of the specific references that need to be examined.

While no specific breakout session was conducted on the issues associated with PSEG’s identification of two possible macro corridors for new transmission lines connected to the proposed site, the existence of two possible routes presents challenges for the evaluation of impacts in the ESP EIS. The review team will need to obtain and examine a copy of PSEG’s *Macro Corridor Study*.

4.6.7 Non-Radiological Health

Most of the Non-Radiological Health and Non-Radiological Waste items in the Information Needs Table were resolved for purposes of the Site Audit. Specific items that remain open include:

- **NRH-01:** PSEG staff discussed new plant construction worker health and safety and agreed to provide the PSEG *Industrial Safety Strategic Improvement Plan* for review in the electronic reading room. All construction staff would be contractually obligated to follow PSEG safety guidelines and procedures. Causeway construction is estimated to take 24 to 36 months, and would be the first construction activity associated with the new plant.

- **NRH-02:** PSEG uses a contracted industrial hygienist. PSEG staff agreed to provide information on the industrial hygiene program and biocide cooling water treatment procedure. Specifically, the generic procedure and 1 to 2 years of

thermophilic microorganism sampling data from the cooling tower should be put in the electronic reading room.

- **NRH-04:** PSEG staff agreed to provide phone records or some other reference of discussions with the Salem County Department of Health stating that there have been no surface water advisories or reported cases of thermophilic organisms in surface waters of the project area. New Jersey and Delaware both participate in the EPA and CDC programs of waterborne and recreational disease reporting and surveys. Some waterborne disease incidences have been reported in New Jersey; however, there were no incidences associated with surface waters in the region of interest. No waterborne disease outbreaks have been reported in Delaware.

- **NRH-11:** Discussions were held with PSEG staff regarding the supplemental information that may be required to assess the non-radiological health impacts at each of the alternative sites. Specifically, information on population densities within the region of interest for each of the alternative sites was requested to assist in site to site comparisons, and an RAI may be required.

- **NRW-02:** PSEG staff discussed existing PSEG non-radioactive waste management, including recycling, waste types, waste destinations, and waste minimization/mitigation measures. PSEG agreed to provide a list of waste disposal facilities, their locations, and type of waste/material accepted for the PSEG region of interest in the electronic reading room. PSEG staff stated that present and reasonably foreseeable future projects in the region of interest should not impact PSEG's non-radioactive waste disposal or waste handling activities. Furthermore, PSEG staff surmised that the existing PSEG waste minimization and recycling programs would only increase in efficiency with continued reduction in the need for off-site disposal of nonradioactive waste.

4.6.8 Radiological Health

Most of the Radiological Health items in the Information Needs Table were resolved for purposes of the Site Audit. Specific items that remain open include:

- **RH-10:** More information may be needed to determine the radiological health impacts of the alternative sites. Don Palmrose (NRC) concluded that we should speak with the NRC staff conducting the safety review to see how they handled this issue. Palmrose also said that possible RAIs could emerge if we need more information to determine the radiological health impacts of the alternative sites.

4.6.9 Meteorology and Air Quality

Most of the Meteorology and Air Quality items in the Information Needs Table were resolved for purposes of the Site Audit. Specific items that remain open include:

- **Met-02:** PSEG will perform additional investigation. There was some disagreement on short-term estimates using 50 percentile.

- **Met-04:** Need to confirm with lifetime greenhouse gas emissions document in the electronic reading room.

- **Met-09:** AERMOD modeling results are based on existing HCGS emissions data and building structures. Source inputs for AERMOD based current plant emissions data presented in ER Table 5.8-1 except PM2.5. Check with Jim Paumiler (S&L).

- **Met-10:** SACTI model document and I/O data available; to be uploaded in the electronic reading room.

- **Met-13:** GHG data and associated ancillary data available in the document (same as Met-04).

4.6.10 Accidents

Most of the Accidents items in the Information Needs Table were resolved for purposes of the Site Audit. New sources of information were provided and new questions/issues may arise as the new sources are reviewed. PSEG subsequently uploaded the MACCS calculation and inputs to the electronic reading room, but an RAI will be required to place these files on the docket. Specific items that remain open include:

- **ACC-01:** The DBA calculations in the ER were taken from the vendor calculations (for four reactors) and scaled down to the new location by using a location-specific χ/Q value (for the 50 percentile of the meteorological data from years 2006, 2007 and 2008. These χ/Q values may be incorrect; they could be in error by a factor of ~10 in the non-conservative direction—PSEG will check these numbers. If the numbers are incorrect, PSEG will correct them and the dose calculations.

- **ACC-01:** Participants viewed the map of the EAB (SSAR Fig. 1.2-3). There is no map of the LPZ, which is a circle with a radius 5 miles from the plant/reactor center.

- **ACC-01:** The calculated doses for the US-APWR (ER Table 7.1-39) should be for the 0-2-hr period (instead of the 0-8-hr period as the releases are). PSEG will check/confirm this. With respect to the 2-hr source term releases for the US-APWR, Don Palmrose (NRC) will check with Michelle Hart (NRC) to determine if they are needed.

- **ACC-01:** PSEG will add an additional table to ER Chapter 7 to cross-reference the tables of the DCD with the tables of the ER.

- **ACC-01:** The references used (DCD from page 7.1-4) are old references and newer versions of the DCDs exist. PSEG will not use the newer versions at this time, but will wait and use the latest versions when the COL is submitted. This could save multiple revisions since two of the designs (US-APWR and US EPR) are still under NRC review and more changes to the DCDs are possible.

- **ACC-01:** The units in the releases (Ci, MBq) and in the doses (rems and Sv) are different for different plants, and therefore not consistent, because they were copied from the vendor DCDs. PSEG will take no action to make them consistent at this time.

- **ACC-02:** Surface water users are described in ER Section 2.3.2.1. NJBNE staff pointed out that 1/3 of the drinking water is surface water, and that there are two reservoirs (Laurel and Elkinton Pan) that need to be considered. PSEG will check/confirm this.

- **ACC-04:** Accidents were not evaluated for the alternative sites because PSEG does not have meteorological data for those sites. Population density at the alternative sites appears to be larger than at the proposed site.

4.6.11 Transportation

Most of the Transportation items in the Information Needs Table were resolved for purposes of the Site Audit. Open items include TR-02 and TR-11 (verification of PPE values) and TR-10 (inclusion of transportation impacts for the alternative sites in the ER). In addition, PSEG stated that they would upload additional transportation-related material to the PSEG website, in document 2009-06944.

5. References

PSEG (PSEG Power LLC and PSEG Nuclear LLC). 2010. *PSEG Site Early Site Permit Application, Part 3 Environmental Report, Revision 0*. May 25.

S&L (Sargent & Lundy). 2010. *Alternative Site Evaluation Study*. Prepared for PSEG Power, LLC. Report SL-010099. Project 12380-008. March 2010.

Appendix A. Daily Sign-In Sheets for the PSEG ESP Environmental Site Audit, May 7-11, 2012

May 7, 2012

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Appendix B. Socioeconomic/Environmental Justice Field Notes from the PSEG ESP Environmental Site Audit, May 7-11, 2012

PSEG ESP Application Site Audit
Socioeconomics/Environmental Justice
Field Notes
May 7-9, 2012
Daniel Mussatti (NRC), Michael Purdie (NRC), Barry Shumpert (ORNL)

Appendix B. Socioeconomic/Environmental Justice Field Notes from the PSEG ESP Environmental Site Audit, May 7-11, 2012

May 7th, 2012

Afternoon Meeting with Cumberland County: Attendees from Cumberland County Freeholder Director Carl Kirstein, Cumberland County Administrator Ken Mecouch, Planning Director Robert G. Brewer, and Assistant County Administrator Kim Wood.

When asked about potential environmental concerns with respect to the ESP application for PSEG, the local officials indicated that municipal level schools and water supply resources are near capacity but that the wastewater system has extra capacity. However, the concern came from the fact that the county is 100 percent dependent on groundwater, which the plant should not affect. If there were a large influx of new workers, there could be potential strains on their local resources. There may also be some traffic impacts on route 540. When the original units were constructed, there were reports of negative social impacts from gang and drug activity. Bridgeton still has some gang activity. However, the local officials indicated that Bridgeton received little impact from outage workforces. There are approximately 1000 rooms hotel available and there are three hotels in planning stages that have been delayed for economic reasons. With the exception of a campground at the New Jersey Motor Sports Park, here are no RV parks in the county because of zoning. Zoning is decentralized in the county. The local officials indicated that there is some housing near Jericho, and during construction of earlier units, some construction workers brought modular homes to the area near Schepps Valley off Jericho Road. Bridgeton is a town of 22,000 and half of the population rents.

The officials noted that about 15,000 migrant workers come in the summer to support agriculture. Most of these stay in available rental housing in the Bridgeton area and are bused to worksites.

The major single tourist attraction in the county is the New Jersey Motor Sports Park, a road-racing course that draws up to 20,000 people to weekend events. The county officials indicated that there is a thriving Birder industry; there are a lot of recreational fishermen in the area, but little in the way of subsistence type activities. The county has 13 percent unemployment and felt the effects of the recent economic downturn later than most of the nation. The county has lost revenue because of the housing downturn. Historically, there has been a thriving glass industry in the county, but that is now gone. There is a local community college and vocational technology school for other training opportunities.

The county receives little from the plant in the way of revenues due to the franchise receipt tax going to the state and being redistributed. The county's emergency management service is basically good but has some infrastructure issues that are currently being addressed.

The officials noted that a potential beneficial impact of the potential plant would be new jobs, increased incomes, and increased investment in housing. They raised the possibility of taking advantage of this opportunity by training potential workers at the local community college, vocational technology centers, and the county office of training.

Evening Meeting with Elsinboro Township Mayor Sean Elwell

Mayor Elwell indicated that the township is 13.1 square miles with 1036 residents. It is described as an agricultural community with approximately 550 homes. The township has little public service. For example, snow removal is contracted out. Fire/Ambulance is 100 percent volunteer; police force is provided through a contract with Lower Alloways Creek Township. Mayor Elwell believes there is a potential need to widen and strengthen roads if the plant is constructed and also has concerns about roadway maintenance. The mayor indicated that there are 6-7 homes near the causeway intersection with Money Island Road. Mayor Elwell believes that construction workers might come from Chestnut Street, left on Amwellbury Road, around to Money Island Road to the causeway. There are approximately 12-15 homes that could be affected along this route, and Amwellbury Road is a school bus route for elementary and high school students. The mayor describes the neighborhood along Money Island Road as working, middle-class and notes that a Catholic Charities Home is also located there. The mayor mentioned the possibility of light pollution and noise impacts from the causeway depending on PSEG mitigation strategies. The mayor notes that increased traffic in the township could increase fire and ambulance response times as these departments are entirely staffed by volunteers who might have trouble getting out of their driveways in peak traffic periods.

Mayor Elwell noted that there may be a beneficial impact to the purpose tax receipts in Elsinboro Township. The township receives little in the way from Energy Receipts Tax because of the way the State obligates that money. Schools are not at capacity. There is no significant subsistence fishing or farming in the township. The mayor states that a many township residents work at PSEG, with education being another major employment sector. The township is also a bedroom community for large employment centers in Delaware and Pennsylvania.

May 8, 2012

Morning Meeting with New Castle County Government Officials: Attendees County Executive Chief of Staff Dennis Phifer, Esq., Director of Economic Redevelopment Karl Kalbacher, General Manager of Department of Community Services Marcus Henry, Chief of the Emergency Communications Division David Roberts, Coordinator of the Office of Emergency Management David Carpenter, Planner of the Office of Emergency Management Joe Cochran, Senior Manager of Department of Special Services J. Wayne Merrit

Karl Kalbacher and Marcus Henry indicated there maybe some subsistence fishing along the Delaware River and to contact DNREC for more information. They were concerned with the potential additional fish kill. Joe Cochran and David Carpenter indicated the main concerns were perception issues and need to worry about evacuation routes. They indicated, however, that PSEG had always been open with respect to emergency planning and they expected the same for the potential new unit. Dennis Phifer indicated that there is the potential for an aesthetic impact along the river because there is increased awareness with new cooling towers. However, eventually the residents would get accustomed to the new view shed just like they have for the existing units. None of the local officials were concerned about housing and rental property impacts. J. Wayne Merrit indicated that the public services could handle the new workforce easily. Karl Kalbacher indicated that Appoquinimink school district is at or

over capacity and could potentially have some spill over if there is a large in-migrant population. The officials noted that the county's water and wastewater systems have extra capacity. Dennis Phifer pointed us to a finance report that notes the economic benefits associated with new employment would go to the state not the county, which relies on property taxes. The officials stated that there strong trade unions in New Castle County could provide workers for plant construction. Marcus Henry noted that there is considerable available housing for construction or operations workers but not much transient housing (e.g., RV parks) in the northern half of the county. David Carpenter pointed out the national wildlife refuge along the coast that our ecologists should look into. Karl Kalbacher went in depth with respect to the energy resources developments in Delaware. Bloom Energy increased production by 30 mw at the Red Lion substation. He also pointed us to Calpine Energy and DelMarVa Power. The officials did not anticipate any traffic problems in the county or on the Delaware Memorial Bridge due to plant construction related traffic.

Afternoon Meeting with Gloucester County Government Officials: Attendees Freeholder Director Robert Damminger and County Administrator Chad Bruner.

Robert Damminger and Chad Bruner pointed out they have little impact from outages down at the plant. They do have unions in the county that are involved with work at the plant. They believe the only traffic impact of the potential project would be an increase of heavy trucks on Highway 295, which would have little effect on municipalities. The officials indicated that if there were any impacts from construction, they would most likely be in the Greenwich, Logan, Woolwich, and Paulsboro areas in the southern portion of the county. There are potential EJ populations around Logan. These areas are in education "growth districts" and they are "bursting at the seams" with school children. Property tax money goes to the 24 municipalities.

The southern portion of the county is mostly septic wastewater. The county is attempting to partner with Salem County and DuPont to treat wastewater and get away from septic. The county has a large available housing stock for ownership and rentals. There are no large campgrounds or RV parks. Zoning occurs at the municipal level. There are plenty of hotel rooms available, but they tend to fill up during anniversaries for revolutionary war reenactments. There is a large wine industry and many equestrian events. The county has a lot of recreational fisherman.

Unemployment is at 8.1 percent and the area has typically had a heavy petrochemical industry that has gotten smaller in scale, employment wise, not output wise. Employers are typical of service and local government industries. Many union workers from the county work at SGS and HCGS during outages and would be available for new plant construction. The county does not get many incoming outage workers.

Housing vacancies in the county have increased in recent years and there is a large stock of reasonable rental units. RV parks are limited to a few "mom and pop" type operations. Some migrant workers come into the county to work in orchards and on truck farms.

Afternoon Meeting with South Jersey Transportation Planning Organization: Attendees David Heller, Team Leader and Andrew Tracy, Assistant Planner.

The TPO handles the area of Salem County, Cumberland County, Cape May County, and Atlantic County. They have an array of traffic counts from the Spring and Summer of 2011, which were collected as part of an update of the regional travel demand model to be released this year. The PSEG plant is a "generator" in this model, and the potential causeway would be included. Most of the traffic count locations were in higher traffic areas, especially along the Garden State Parkway. The NJDOT also conducted traffic counts in 2009. The TPO don't look at "600 level roads and above." They indicated that they are in a non-attainment area and congestion management within that area should only require additional roads as a last resort.

The TPO's Draft Regional Plan will be released for public review later in May and should be out in final form by the end of July. Both the draft and final will be posted on the agency's website. There is also a 2010 report on the website that may be relevant to identification of impacts on environmental justice populations

Evening Meeting with Lower Alloways Creek Township Mayor Ellen Pompper

Mayor Pompper indicated PSEG is the largest employer in L.A.C. and that the township has few other businesses. She indicated that traffic during outages and shift changes can be difficult around the site. During construction of the original units, a person couldn't "back out of their driveway." With this in mind, she believed the causeway would be helpful to alleviate the impact of traffic on L.A.C. There are little sound or light pollution issues.

The township has a volunteer fire department, own EMS and police force. The main fire company is in Hancocks Bridge. The Hancocks Bridge/Canton area is on public sewer but the rest of the township is septic. She is also indicated the schools have capacity and she is not concerned due to the New Jersey School Choice rule. Hospitals are not crowded in Salem and many people go elsewhere in Delaware and Philadelphia if needed. The township has no school or purpose tax and the energy receipts tax goes to the state. The township is barely affording their police, but still comfortable.

Mayor Pompper indicated that there are only single family homes in the township. There are no apartment complexes or hotels. There is a small campground and trailer park on Quinton Road. There is a bridge in disrepair near the trailer park, however. There are some nurseries but no migrant farm labor.

Mayor Pompper also discussed a local population near Canton that has roots in L.A.C. This population is aging and declining in size. The population has a history of trapping muskrat, shad fish, and crabbing.

Overall, Mayor Pompper had little concern if there is plant construction and operation in her township.

<u>May 9, 2012</u>

Morning Meeting with Salem County Freeholder Director Julie Acton, Department of Planning and Agriculture Director Louis Joyce, and Salem County Chamber of Commerce Executive Director Jennifer Jones.

After the introductions, Louis Joyce indicated that the SEIS for license renewal was "relatively generic, but did a good job." There is also an Artificial Island EIS available.

Julie Acton indicated a new plant would have a beneficial, socioeconomic impact. Jennifer Jones and Louis Joyce agreed and indicated it would be helpful for the tax base, housing, and rateables (also known as millage). Louis Joyce indicated there is no income or sales taxes at the county level, but are collected at the state level. Louis Joyce expanded on the energy receipts tax which is taxed on the value of the utility infrastructure and the generation of power. The state has kept more taxes as time has passed.

Jennifer Jones and Julie Acton indicated most houses and buildings in the county were from the 1970s and 1980s era from construction of the original units. Louis Joyce said there was a large increase in county population during that time, but tapered off after construction finished. From 1990-2010, there has been 1.1% growth in population. They believe there is a large stock of housing available at very affordable rates, especially in the Pennsville/Carneys Point area. They also believe plenty of rentals are available. The officials noted that some people in Lower Alloways Creek Township rent out rooms to outage workers. Jennifer Jones and Julie Acton indicated there are three campgrounds, two new hotels, and furnished rooms available. Louis Joyce indicated that there is HUD housing at Westside Court in Salem City. There appears to be little EJ impact along Grieves parkway even though a low income housing development (Westside Court) is located there.

The officials agreed that heavy truck traffic associated with construction and operation of a new plant would have little impact on local roads, noting that these same roads are currently used by heavy trucks from the local glass factory. Louis Joyce stated that the land around the north end of the potential causeway is preserved farmland and is not zone for commercial use. He also noted that the county would probably want to conduct a traffic study to evaluate the impacts of the new causeway on local traffic patterns.

Jennifer Jones discussed the local population around Canton. The population is due to the fact that L.A.C. was separated from the rest of South New Jersey until the plants were constructed. They are old time residents of L.A.C. The locals have been able to acquire jobs at the plant and local fire department. They maintain a connection to their history by trapping and crabbing. It appears to be more of a "hobby" than for subsistence.

Louis Joyce discussed water and wastewater. Lower Alloways Creek Township has two wastewater plants at 20-25% capacity and relies on wells for groundwater. Salem City has one wastewater system at 40% capacity. The Salem City water system has a 1.5 MGD capacity and currently operates at half that level. A new water treatment plant has come online as well. Quinton Village and Alloway village are potential places for new workers to live and their water is treated from the Salem Plant. There is planning in place for a regional system with Gloucester County and the DuPont Chambers Works in Carneys Point. It could handle 20 million GPD of wastewater. The water supply is not a problem because it's self contained in Salem County and the plant has its own water supply system.

The local officials were then asked about other public services. None had any concerns for Police/Fire/EMS. Salem hospital is underutilized. Nursing homes are also underutilized. Salem City does not bus students, although some other towns bus students in. Lower Alloways Creek Township and the City of Salem have their own police departments, and Elsinboro Township contracts with LAC for police service. The remainder of the county is patrolled by the sheriff's office and state police.

According to the local officials, there are a lot of local fish/wildlife areas, a few state parks, and each municipality has a public park.

The final topic was EJ populations. Julie Acton and Jennifer Joyce believe the extra resources from the plant would be helpful to break the negative low income cycle and provide more opportunities for minority and low-income populations in the City of Salem. There is a lack of employment issue. There are training programs in place at Salem Community College and at vocational technology centers, however, but they are underutilized.