PSEG Early Site Permit Application

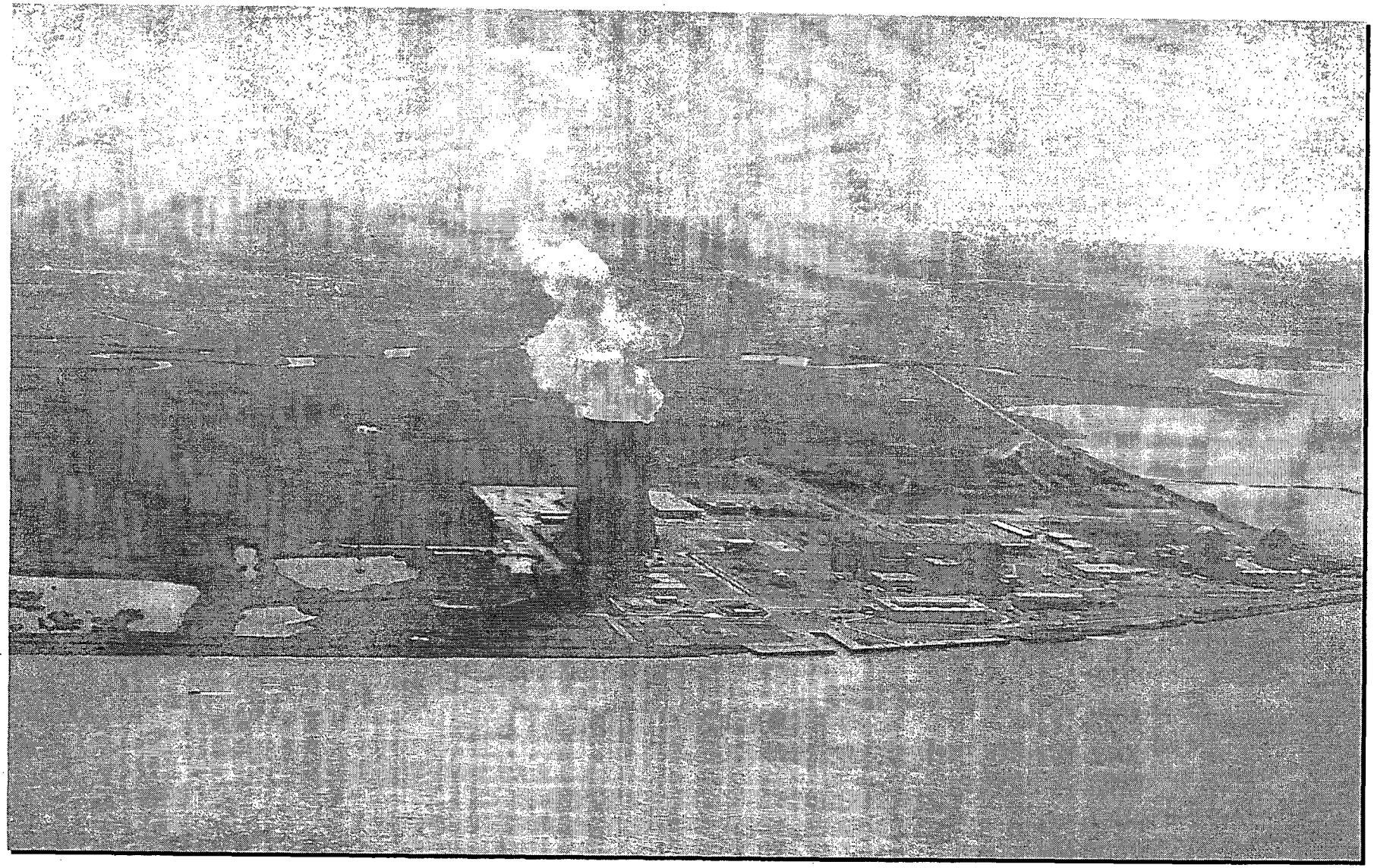
ESP Application Overview

June 14, 2010

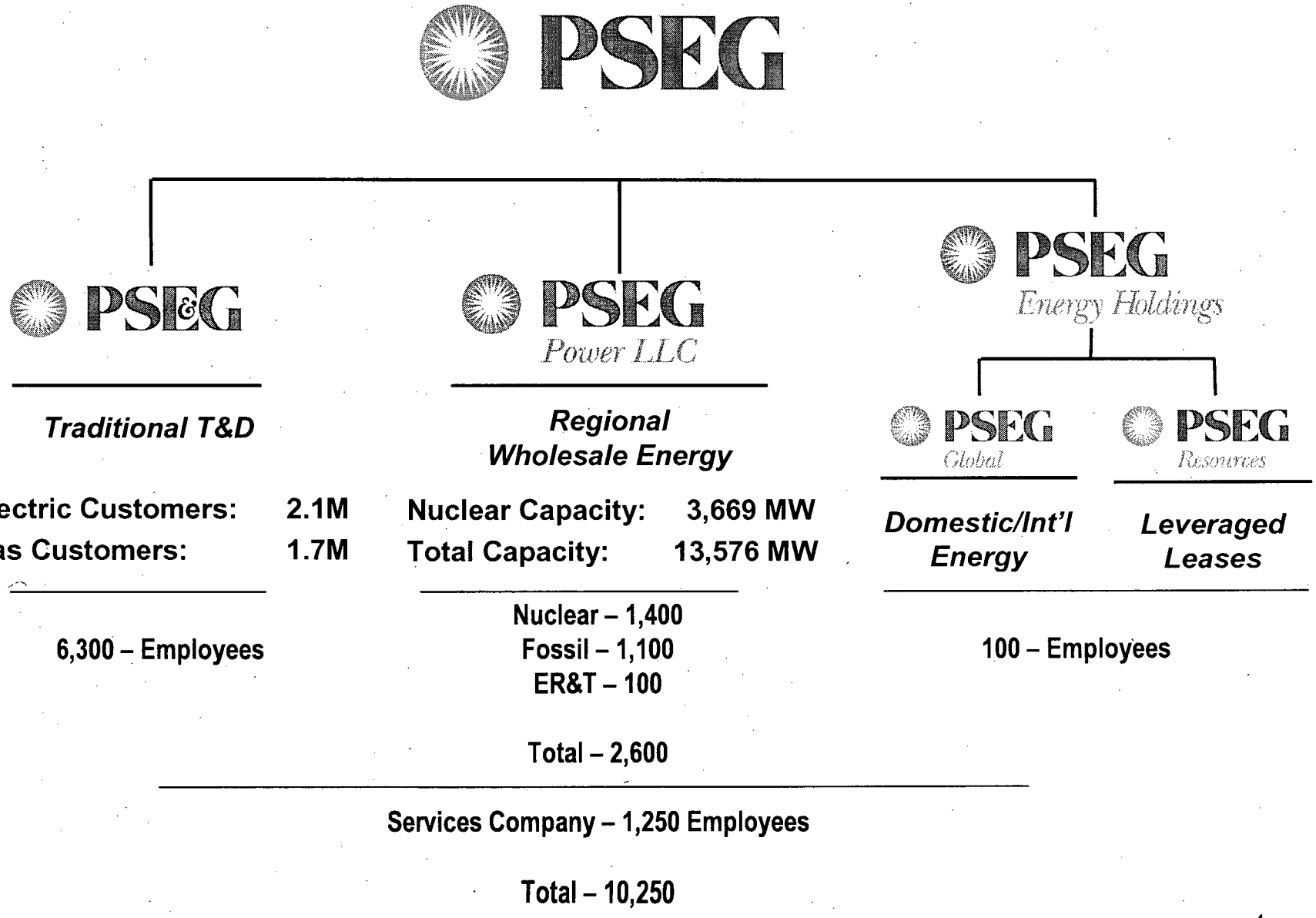
PSEG ESPA Overview Agenda

- **Welcome and Introductions**
- **ESPA Project Development**
- **Site Utilization Plan**
- **ER Update**
  - Aligned ROI and RSA
  - Clarified/expanded selected ER sections
- **SSAR Overview**
  - Chapters 2, 3, 11, 13, 15, 17
- **Regulatory Interactions and Stakeholder Outreach**

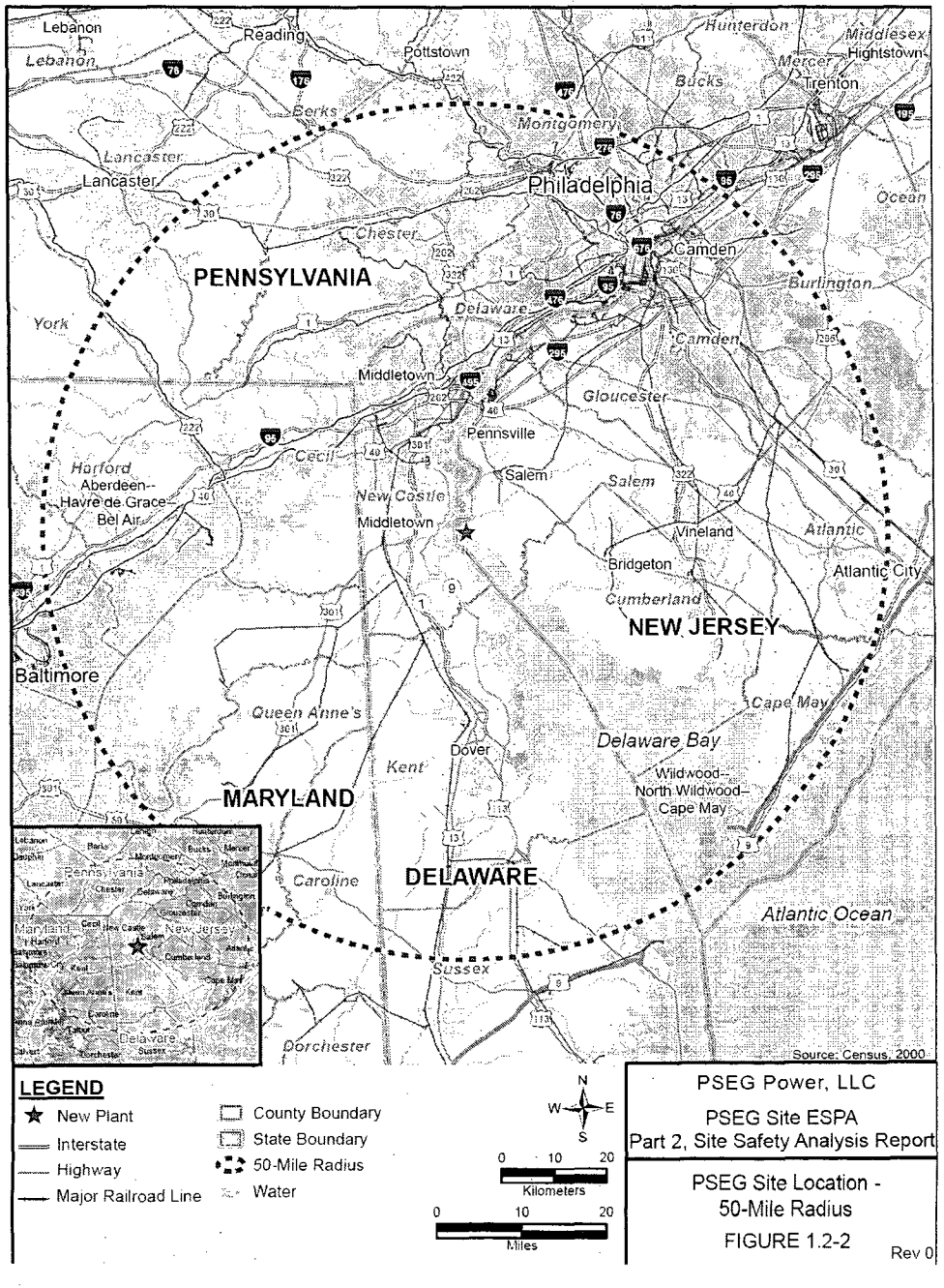
PSEG Site



PSEG Corporate Structure



PSEG ESP Site And Regional Vicinity (NJ, DE, PA AND MD)

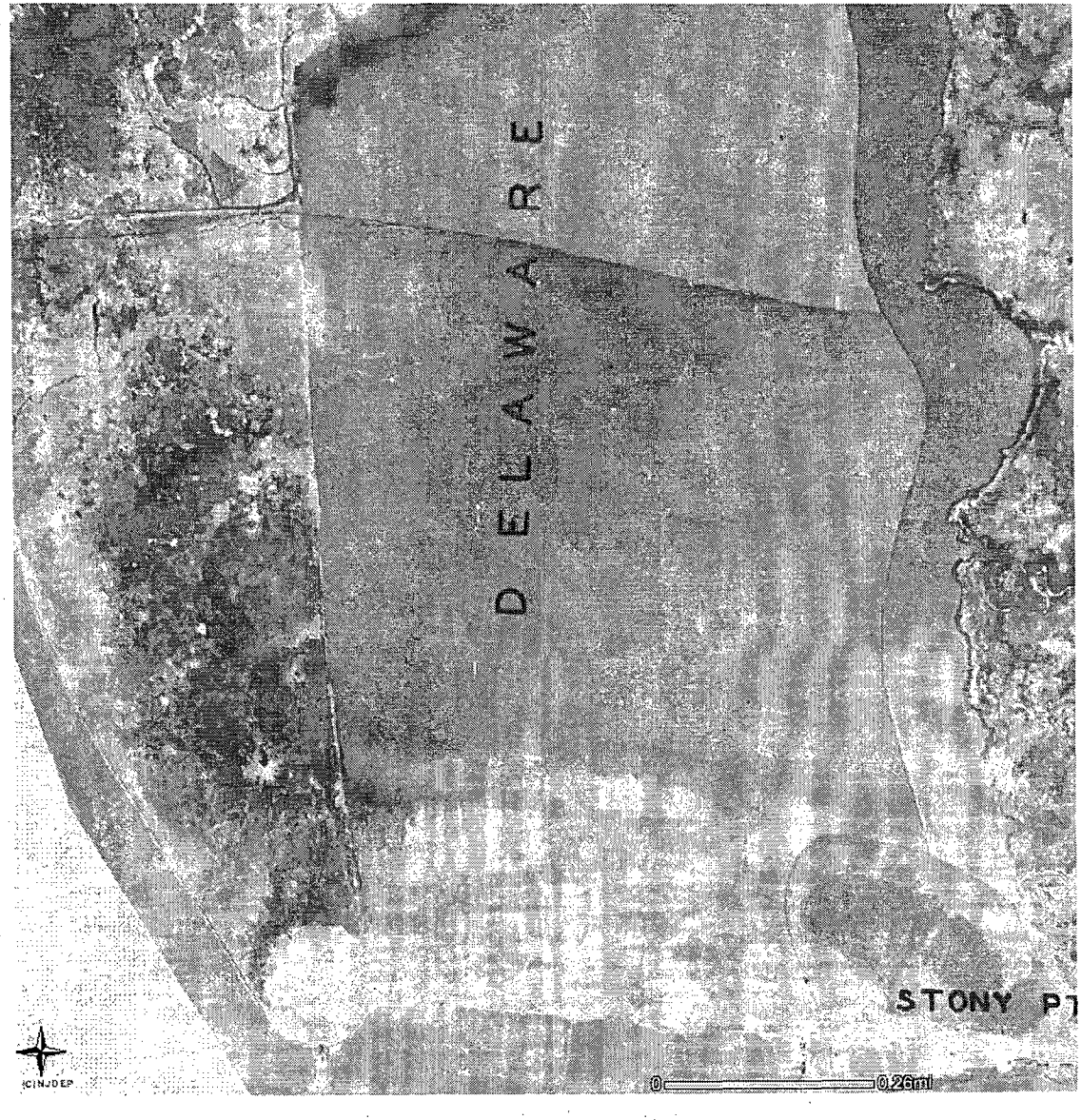


PSEG Site

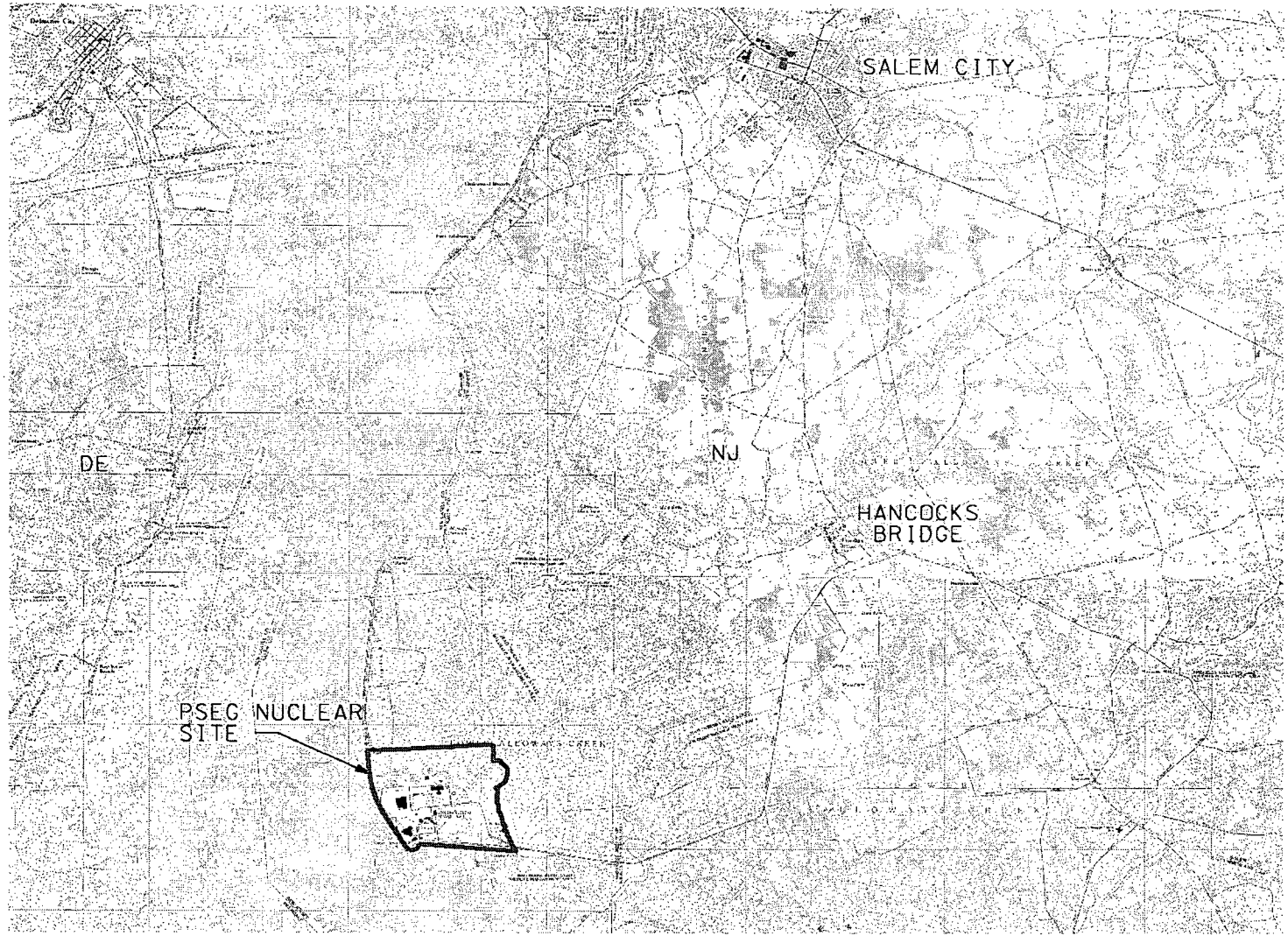
Located on the existing PSEG Nuclear Site (Salem and Hope Creek Generating Stations) in Hancocks Bridge, NJ

- 30 miles southwest of Philadelphia, PA
- 18 miles south of Wilmington, DE
- 7-1/2 miles southwest of Salem, NJ

USACE Creation of Artificial Island



Current PSEG Site And Local Vicinity



PSEG NUCLEAR SITE

Project Development

Completed an initial feasibility study in 2007

Tracked domestic/international industry developments during early 2008

- Conducted technology evaluations and peer discussions
- Initiated commercial discussions with reactor technology vendors

Monitored regulatory progress on Part 52 applications during early 2008

Decision to pursue an ESP made in mid 2008

- Facilitates early interactions with stakeholders to resolve issues
- Follows NRC's prescribed process

Sargent & Lundy selected as ESP prep contractor in late 2008

Issued Letters of Intent to NRC in December 2008 (and February 2010) committing to second quarter 2010 ESPA submittal

Early Site Permit Application

PSEG Power LLC and PSEG Nuclear LLC are applicants

Reactor technology has not been selected

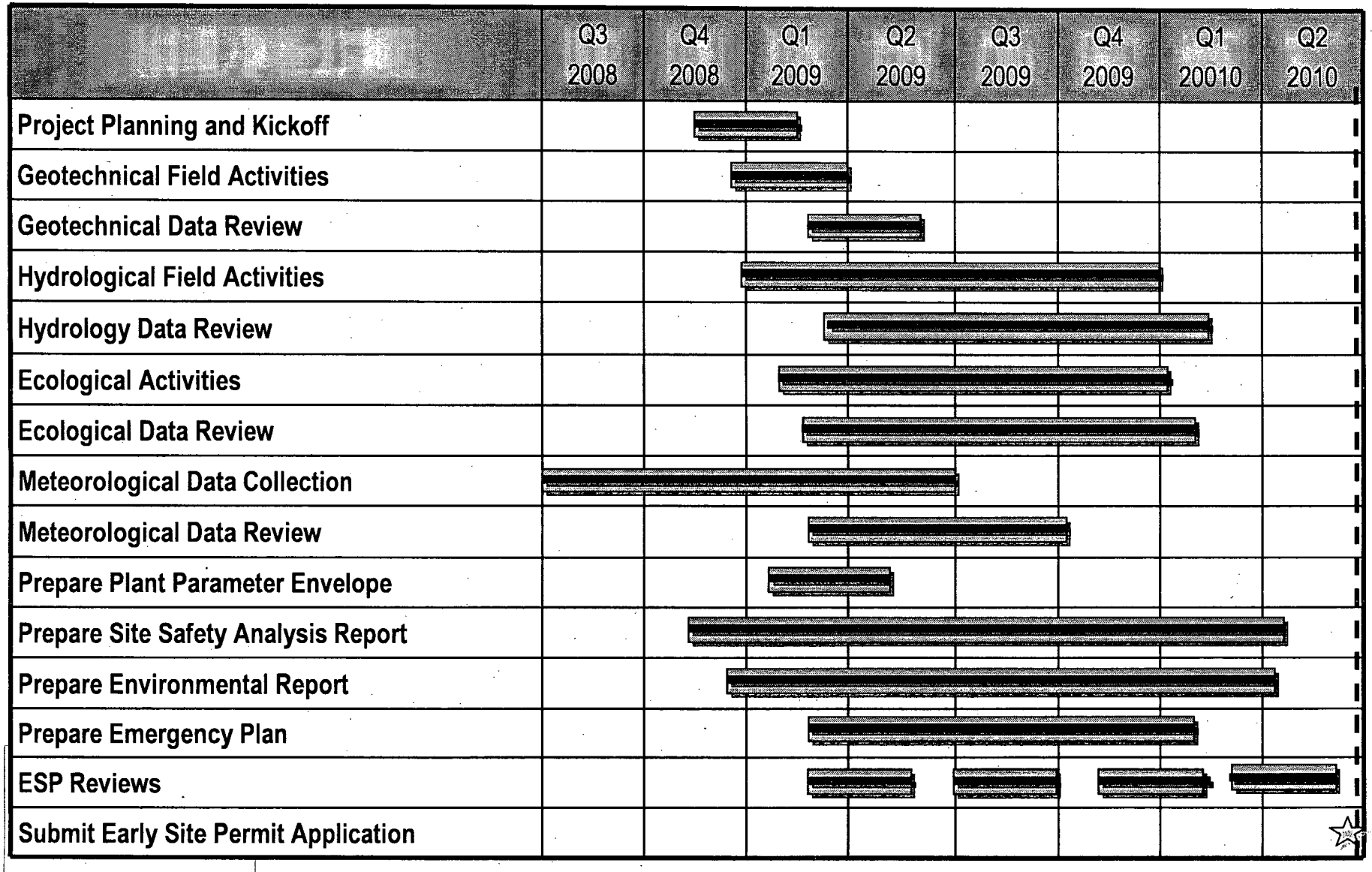
Application includes:

- Site Safety Analysis Report to address impacts of the environment on the plant – hurricane, earthquake, etc.
- Emergency Plan – consistent with existing plants
- Environmental Report

ESPA based on a "plant parameter envelope" (PPE)

- Assumes single large unit or two smaller units
- Impacts address footprints and other parameters such as water use
- Up to 2200 MWe for the two unit plant [Westinghouse AP-1000]

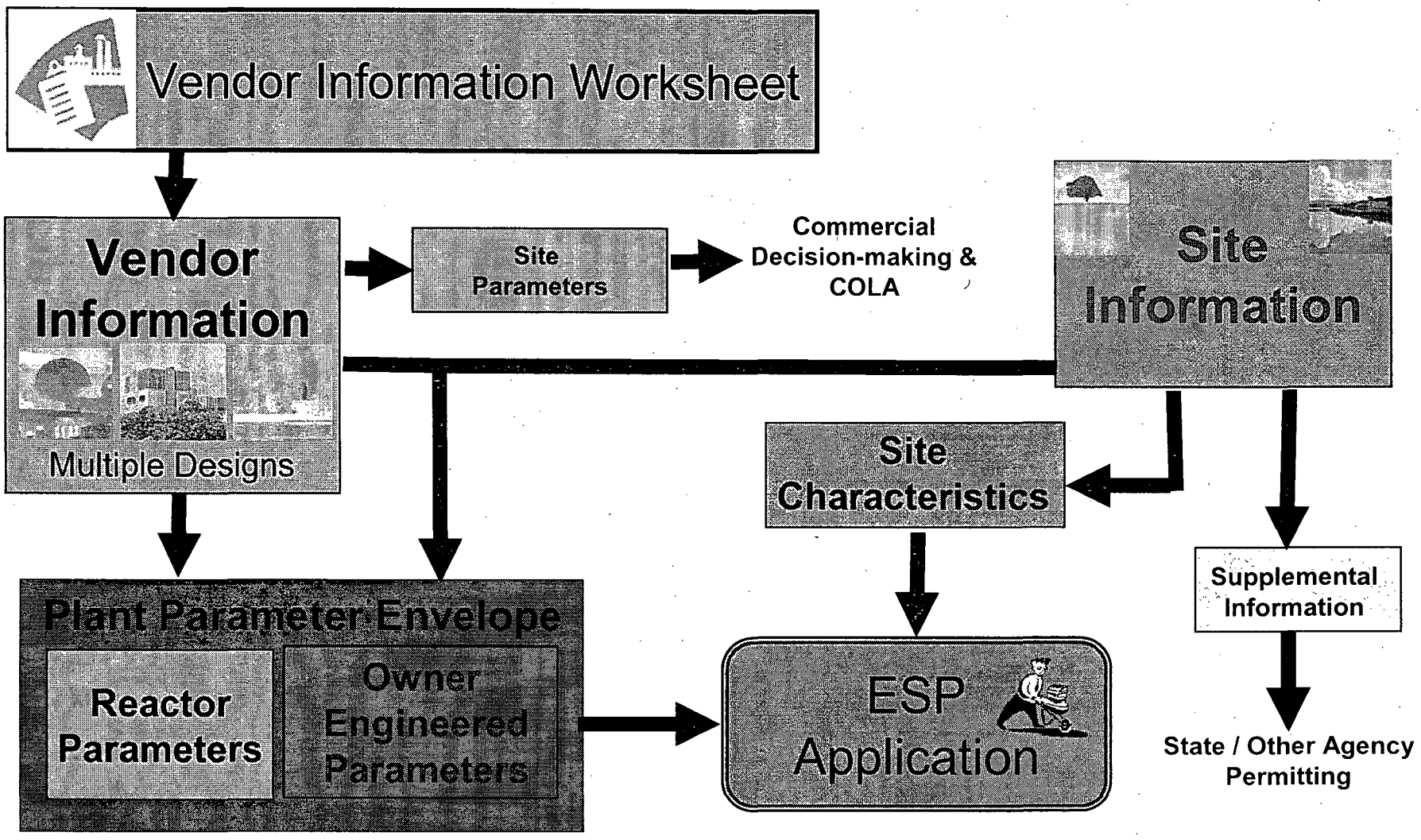
ESPA Project Management Schedule



PPE Presentation - March 23, 2009 NRC Staff Briefing

- We wanted to follow the Part 52 process as it was designed by filing an Early Site Permit
- However, the reactor technology designs are not yet mature
  - Significant regulatory risk exists until Design Certification reviews are complete
  - Significant technology and commercial risks exist until detailed designs are more complete
- The PPE approach identifies bounding values for parameters that define the facility's interaction with the environment, allowing us to engage our external stakeholders in conversations about these issues early

Plant Parameter Development Approach



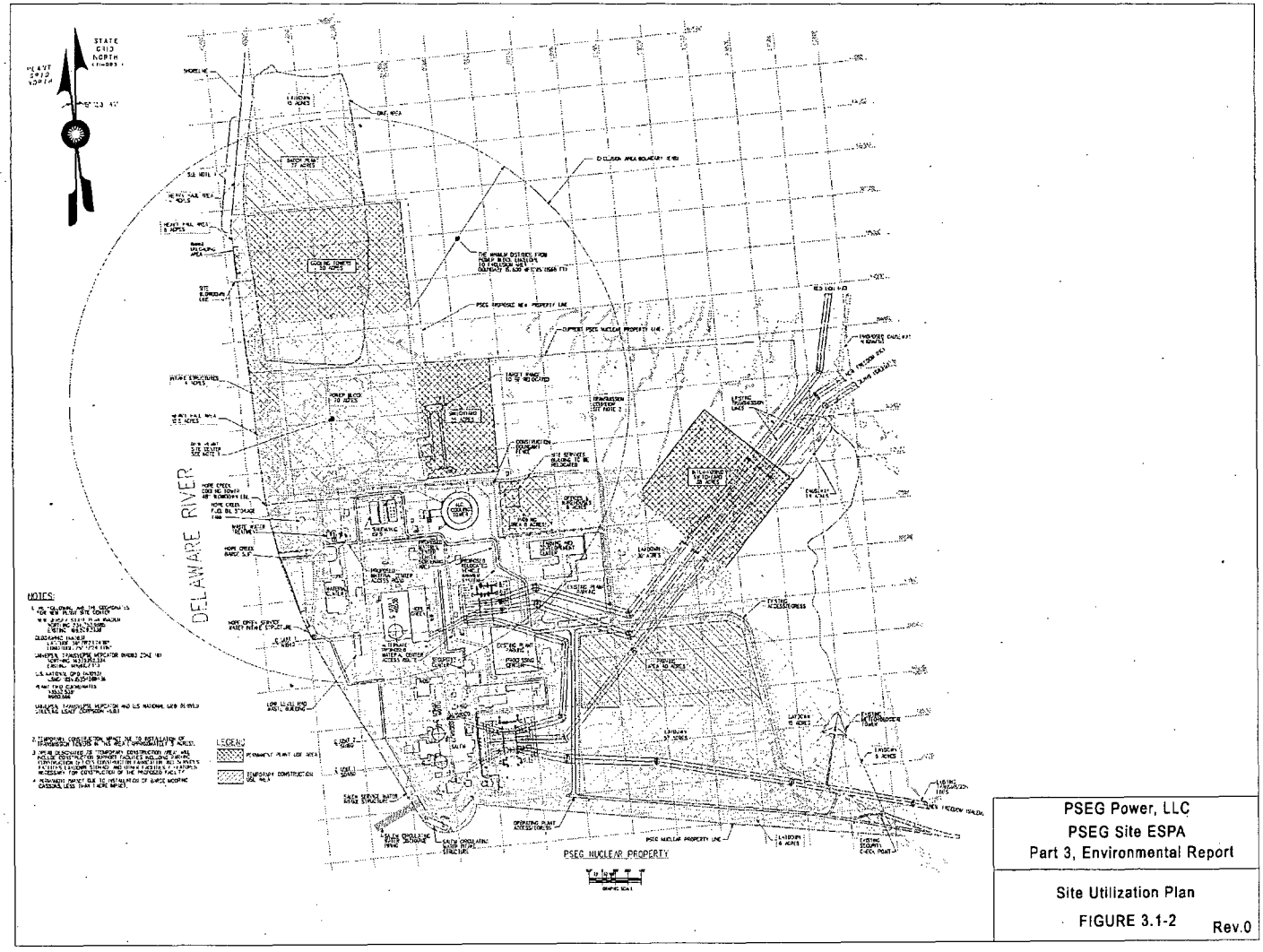
Plant Parameter Development Approach (Cont'd)

- PPE Tables
  - Design Parameters
  - Site Parameters*
  - Chemical Emissions
  - Radionuclide Releases
- Sample Format

Table A-1 Plant Parameters Envelope				
Parameter	**Value**	**Units**	**Reference**	**Definition**
1. Structures				
1.1 Building Characteristics				
1.1.1 Height		ft		The height from finished grade to the top of the tallest power block structure, excluding cooling towers.
1.1.2 Foundation Embedment		ft		The depth from finished grade to the bottom of the basemat for the most deeply embedded power block structure.
1.1.3 Foundation Plan Dimensions		ft		The length and width of the basemats for the Seismic Category I structures.
1.2 Precipitation (for Roof Design)				
1.2.1 Maximum Rainfall Rate		in/hr		The probable maximum precipitation (PMP) value that can be accommodated by a plant design. Expressed as maximum precipitation for 1 hr in 1 mi^2 with a ratio for five minutes to the 1 hr PMP of 0.32 as found in National Weather Service Publication HMR No. 52.
1.2.2 Snow Load		lb/ft^2		The maximum 100-year return interval snow load on structure roofs that can be accommodated by the plant design.

* Site Parameters will be compared to Site Characteristics

PSEG Site Utilization Plan



Early Site Permit Application - Environmental Report Update

Since the mid-April NRC environmental pre-application review:

- Revised Need for Power analysis to align ROI and RSA
- Clarified selected ER sections based on NRC questions
- Continued state and federal agency consultations
- Received NJDEP Letter of Interpretation [formal wetland delineation]
- Filed NJ Coastal Consistency Determination Certification
- Submitted Alternate Site Evaluation and Delaware / New Jersey Historic Preservation Office reports and correspondence to NRC
- Received USACE HQ Concept Approval for land exchange

USACE Land Acquisition

SAR Chapter 2 Sections

Geography and Demography - Section 2.1

Identification of Potential Hazards in Site Vicinity - Section 2.2

Meteorology - Section 2.3

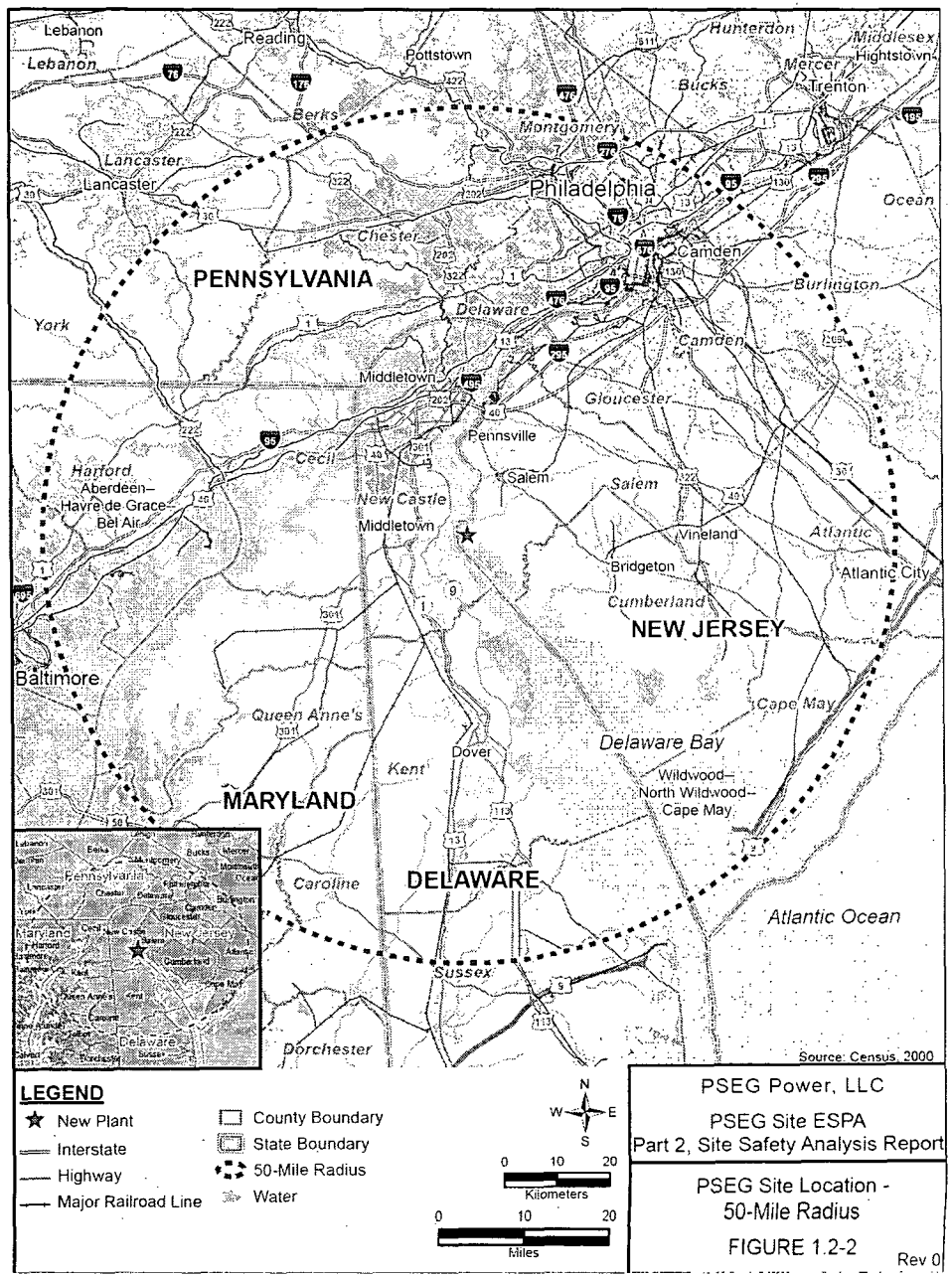
Hydrology - Section 2.4

Geology, Seismology, and Geotechnical Engineering - Section 2.5

SAR 2.4 Hydrology

- The Delaware River is the longest undammed river east of the Mississippi River

- The Delaware River Basin covers 13,600 square miles (sq. mi.) and includes portions of DE, MD, NJ, NY, and PA



SAR 2.4 Flooding scenarios investigated

Flooding due to PMP on the site (Subsection 2.4.2)

PMF on rivers and streams (Subsection 2.4.3)

Potential dam failures (Subsection 2.4.4)

Maximum surge and seiche flooding (Subsection 2.4.5)

Probable maximum tsunami (PMT) (Subsection 2.4.6)

Ice effect flooding (Subsection 2.4.7)

Channel diversions (Subsection 2.4.9)

SAR 2.4.5 Probable Maximum Surge and Seiche Flooding

Per Regulatory Guide 1.59 and ANS2.8 – Consider combined effects of:

- Surge from the Open Coast
- Propagated to the site
- With Coincident 10% exceedance High Tide
- With Coincident wind setup

= PMS Stillwater Level

- PMS Stillwater Level
- With Coincident Wave Runup
- With Sea Level Rise

= Design Water Level

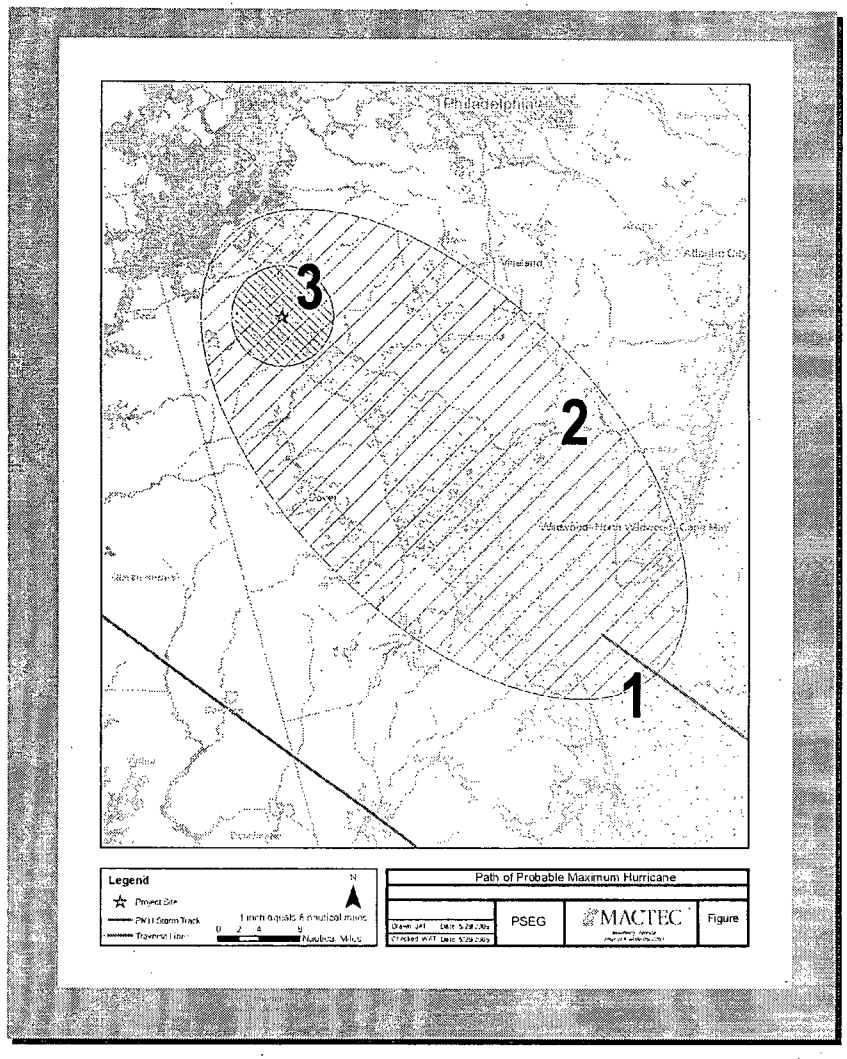
Info presented at public meeting December 9th,2009

SAR 2.4.5 Open Coast to the Site

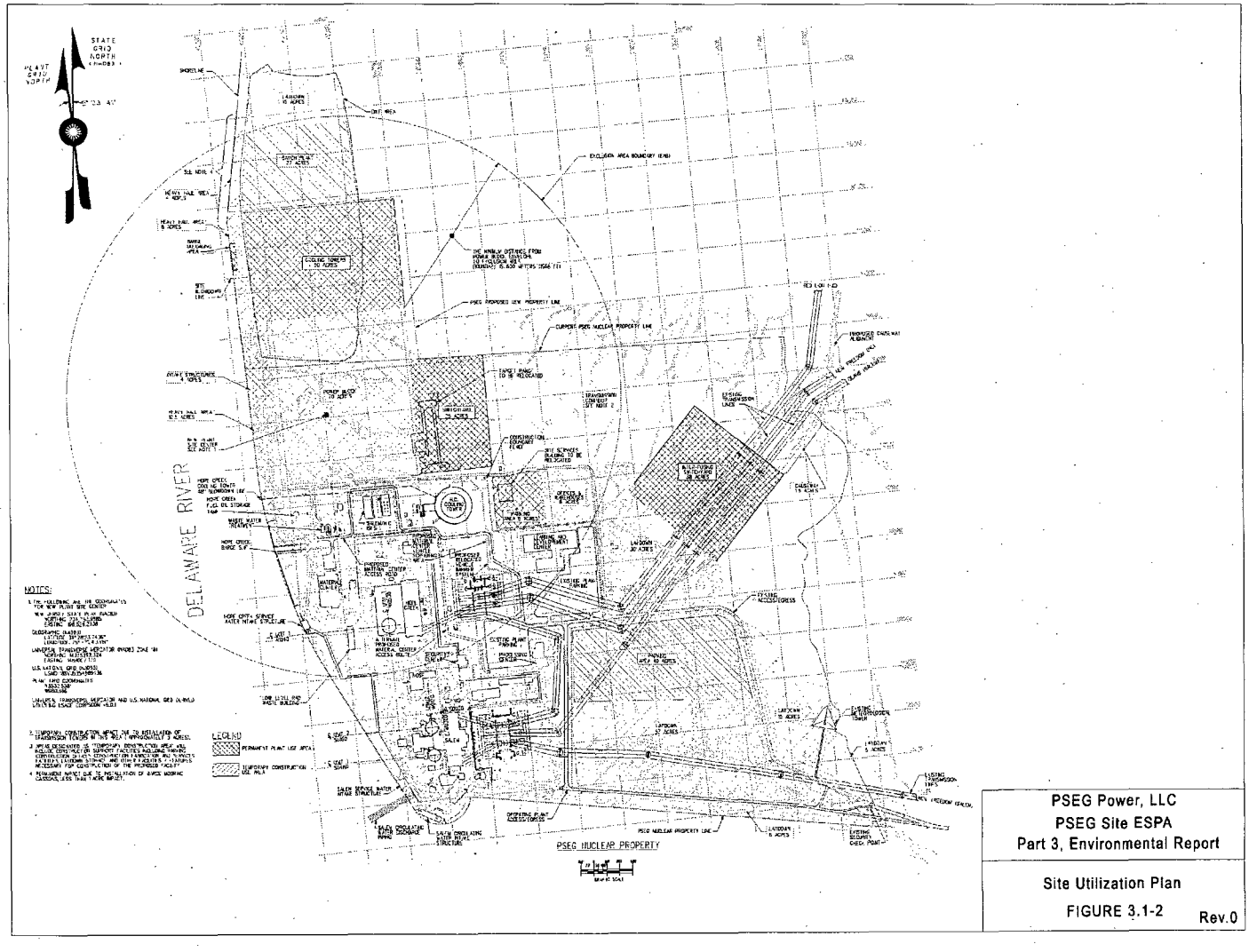
1. Surge at open coast
   Bodine Method

2. Propagation of surge and setup within Delaware Bay
   HEC-RAS

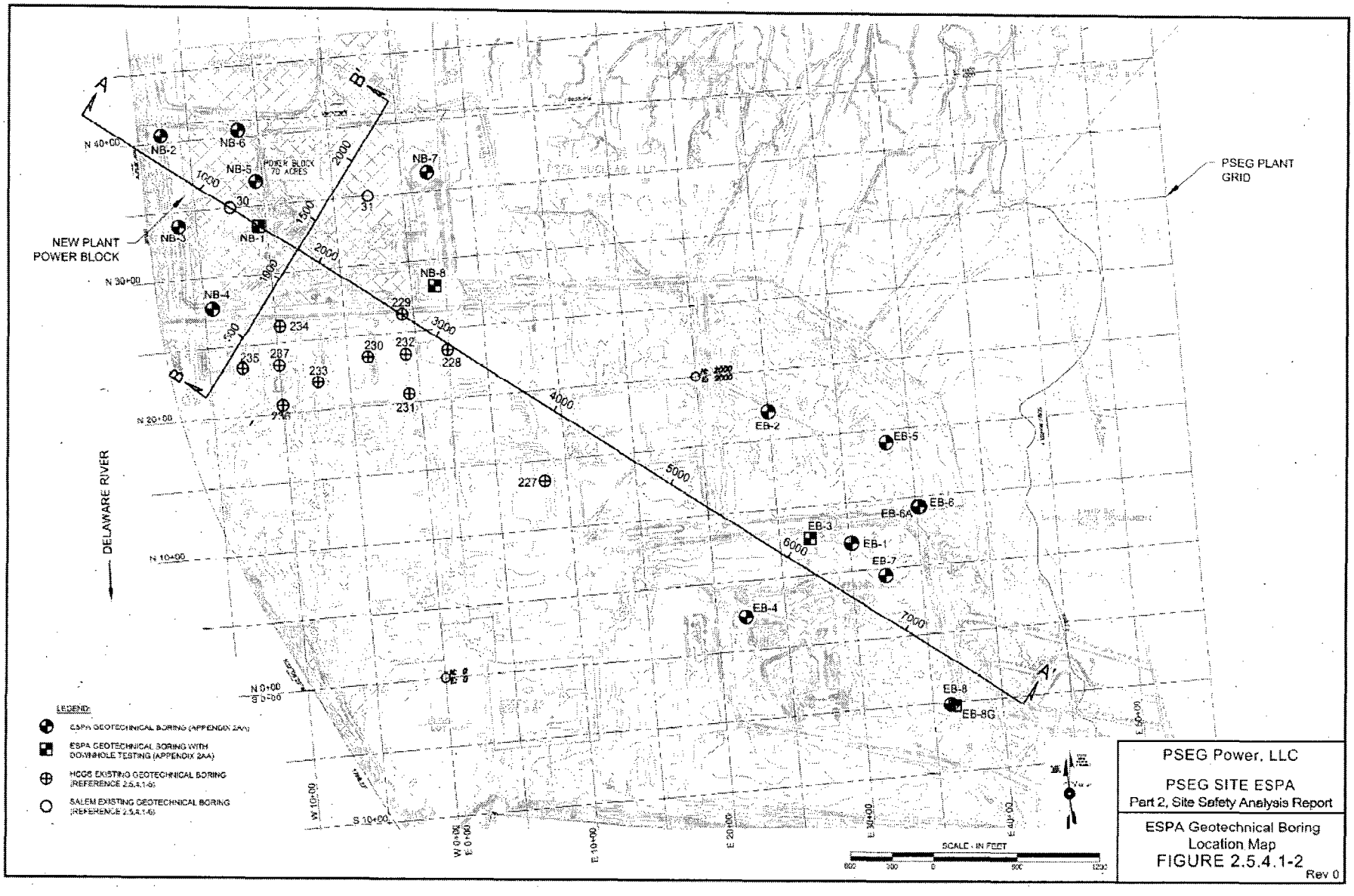
3. Wave Runup
   USACE Coastal Engineering Manual



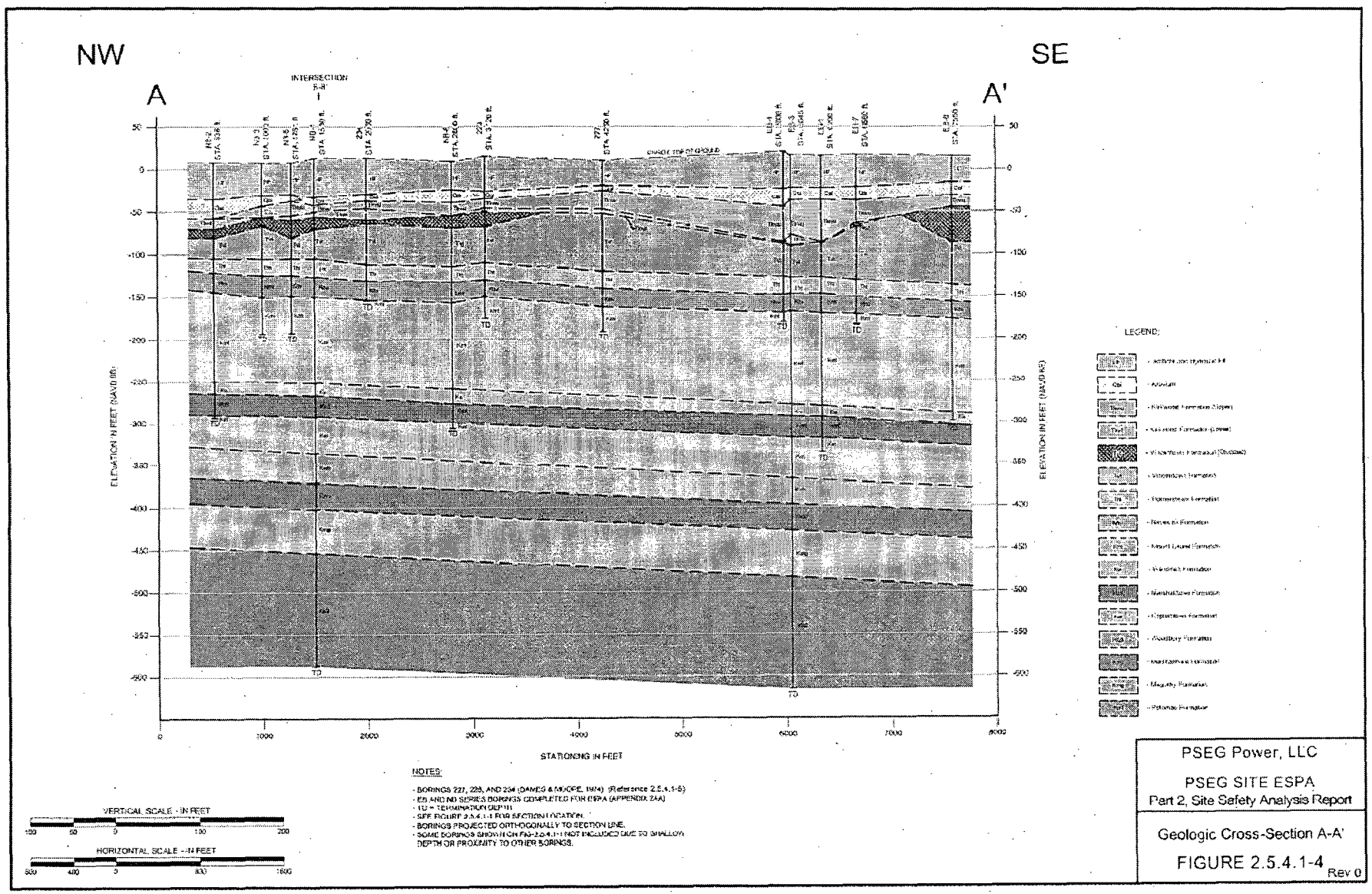
PSEG Site Utilization Plan



SAR 2.5 Geotechnical Borings



SAR 2.5 PSEG Site Stratigraphy



SAR 2.5 Seismology

- Followed the procedures outlined in RG 1.165, and 1.208

- EPRI-SOG source characterizations are used for the PSEG Site
  - Included updated seismic source characterization of the Charleston Seismic Zone

- The GMRS is developed for the top of the Competent Layer, (Vincentown Formation).

SAR 2.2 Waterborne Hazards

- **The primary source of hazards to the new plant is chemical shipments on the Delaware River**

- **Vessel data sources**
  - Several partial data sets
    - Specific chemicals are unknown
    - Number of trips of each chemical are unknown

SAR 2.2 Waterborne Hazards

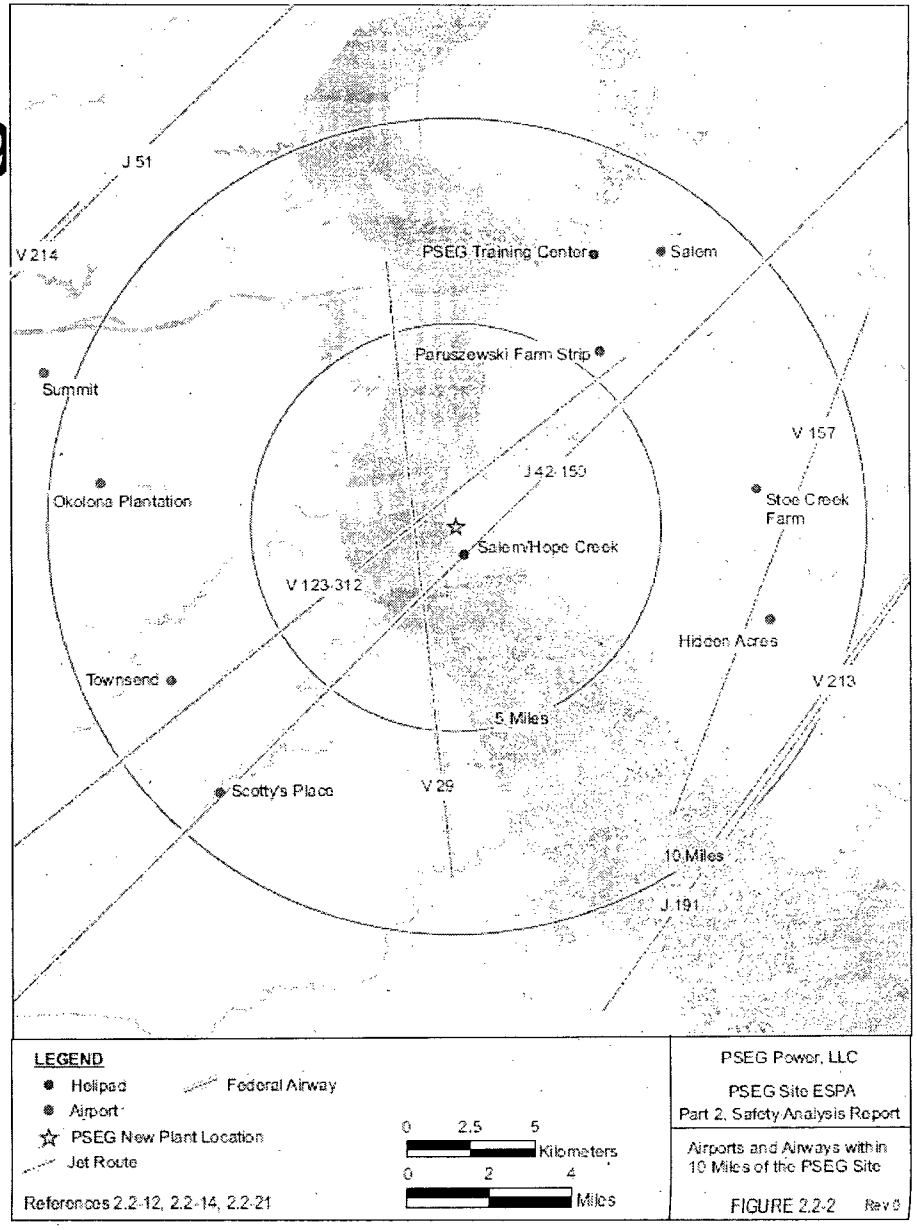
- **A probabilistic analysis is used to determine the frequency of hazards due to chemicals that are transported on the Delaware River**
  - Conservative input used to determine allowable shipments
  - Existing data used to determine estimated number of shipments
    - Smaller shipment sizes maximize the estimated number of trips

Discussed in NRC Public Meeting December 9th, 2009

SAR 2.2 Aircraft Hazards

FAA data received August 13, 2009

- Number of flights on airways
- Radar could not be sorted into separate airways due to the close proximity.
- Unable to provide data on military operations



SAR 3.5.1.6 Aircraft Hazards Analysis

- **Department of Energy (DOE) Standard DOE-STD-3014-96**
  - Large Aircraft
    - The analysis determined that large aircraft meet the NUREG-0800, Section 3.5.1.6, acceptance criteria.
  - Small Aircraft
    - The crash probabilities for each reactor technology are used to conservatively determine the core damage frequency (CDF) caused by a small aircraft crash.
    - The resultant CDFs (Table 3.5-6) for each of the reactor technologies meet the NUREG-0800, Section 3.5.1.6 acceptance criteria of less than 1E-07

Discussed in NRC Public Meeting December 9th, 2009

SSAR 11,13,15

SSAR 11

- Addresses the normal releases

SSAR 13

- Security and Emergency Plan (Part 5)

SSAR 15

- Accident analysis

SSAR Chapter 17

- ESP QAPD is separate from operating units' QATR
- QAPD is based on NEI 06-14A, Rev. 8 template
- ESP QAPD sections not applicable IAW NEI 06-14A and NUREG-0800:
  - Section 3.4 – Setpoint Control
  - Section 9 – Control of Special Processes
  - Section 12.1 – Installed Instrument and Control Devices
  - Section 13.1 – Housekeeping
  - Section 14 – Inspection, Test and Operating Status
  - Part III – Non-Safety Related SSC Quality Controls
  - Part IV – Reg. Guides 1.8, 1.26 and 1.33
  - Part V – Additional Quality Assurance and Administrative Controls for the Plant Operational Phase

Stakeholder Outreach

Broad external communications of ESPA submittal

- Continued wide-ranging external discussions concerning new plant
  - Regional business leaders
  - County and local officials
  - NJ, DE and Federal regulatory agencies
  - Environmental group tours / updates
- Community meetings to discuss application and development plans
- Continued PSEG Site tours including both environmental and regulatory stakeholders

Agency Meetings/Consultations

1/09	DRBC
1/09	USACE Phila – Regulatory
10/08	NJDEP Management
1/09	NJDEP Management
2/09	NJDEP HPO
3/09	US Coast Guard
3/09	PRPA
4/09	DE SHPO
4/09	NMFS
4/09	NJDEP Land Use
4/09	DNREC F&W
4/09	DEMA
4/09	US F&WS
5/09	DNREC Water Resources
6/09	USACE Exec Management
6/09	NJDEP F&W / Land Use
7/09	USEPA Regions 2 and 3
7/09	New Castle Cons District
7/09	USACE Phila – Regulatory
8/09	NJ and DE SHPO
9/09	USACE Balt – Real Estate
10/09	USCG Site Tour
10/09	USEPA Site Tour
10/09	FEMA Site Tour
12/09	Emergency Plan rollout
1/10	NJ and DE SHPO
2/10	DRBC Exec Management
2/10	NJDEP Land Use
3/10	USACE Phila - Regulatory
3/10	DNREC Secretary
4/10	USACE Phila Commander
4/10	USEPA Regions 2 and 3
4/10	DNREC Coastal
4/10	NMFS
5/10	NJDEP Management
5/10	NJDEP Coastal
5/10	DNREC Air, Water, Waste