

**BEFORE THE NEW JERSEY
BOARD OF PUBLIC UTILITIES**

In the Matter of the Petition of Public
Service Electric and Gas Company for a
Determination Pursuant to the Provisions
Of N.J.S.A. 40:55D-19
(Susquehanna-Roseland)

Docket No. EM09010035

**FREDON PARENTS AGAINST THE LINES
FIRST SET OF DISCOVERY REQUESTS
TO PUBLIC SERVICE ELECTRIC AND GAS COMPANY**

Fredon Parents Against the Lines (“Fredon PALS”) hereby propounds the following Discovery Requests, PALS-1 through PALS-118, to Public Service Gas and Electric Company (“PSE&G” or “Petitioner” or “you”), to be answered by those officers, employees or agents of the Petitioner as may be cognizant of the requested information and who are authorized to answer on behalf of the Petitioner. These Discovery Requests are propounded on a continuing basis so as to require you to submit supplemental answers and/or documents should additional information become known that would have been includable in your answers and document production had they been known or available, or should information and/or documents supplied in the answers or production prove to be incorrect or incomplete. Fredon PALS reserves the right to propound additional Discovery Requests as and if additional information is required.

ADDITIONAL INSTRUCTIONS

A. If you object to any part of a Discovery Request, answer all parts of such Discovery Request to which you do not object, and as to each part to which you do object, separately set forth the specific basis for the objection.

B. If you claim any form of privilege or other protection from disclosure as a ground for withholding information responsive to a Discovery Request contained in a non-written communication, state the following with respect to the non-written communication:

1. the date thereof;
2. the identity of each of the participants in the non-written communication;
3. the identity of each person present during all or any part of the non-written communication;
4. a description of the non-written communication which is sufficient to identify the particular communication without revealing the information for which a privilege or protection from non-disclosure is claimed;
5. the nature of your claim of non-discoverability (*e.g.*, attorney-client privilege); and
6. each and every fact on which you rest your claim of privilege or other protection from disclosure, stated with sufficient specificity to permit Fredon PALS to make a full determination as to whether your claim is valid.

C. If you claim any form of privilege or other protection from disclosure as a ground for withholding information responsive to a Discovery Request contained in a document, set forth with respect to the document:

1. the date and number of pages;
2. the identity of the author(s) or preparer(s);
3. the identity of the addressee, if any;
4. the title;
5. the type of tangible thing (*e.g.*, letter, memorandum, telegram, chart, report, recording disc);
6. the subject matter (without revealing the information as to which privilege or protection from non-disclosure is claimed);
7. the identity of each person who has received the document or to whom knowledge of the contents of the document was communicated;
8. the identity of the present custodian(s);
9. the nature of your claim of non-discoverability (*e.g.*, attorney-client privilege); and
10. each and every fact on which you rest your claim of privilege or other protection from disclosure, stated with sufficient specificity to permit Fredon PALS to make a full determination as to whether your claim is valid.

D. If you claim any form of privilege or other protection from disclosure, otherwise than as set forth in Instructions B and C, as a ground for not answering any Discovery Request, set forth:

1. the nature of your claim as to non-discoverability; and
2. each and every fact on which you rest your claim or privilege or other protection from disclosure, stating such facts with sufficient specificity to

permit Fredon PALS to make a full determination as to whether your claim is valid.

E. If you know of any document, communication or information but cannot give the specific information or the full information called for by a particular Discovery Request, so state and give the best information you have on the subject and identify every person you believe to have the required information.

F. The singular form of a noun or pronoun shall be considered to include within its meaning the plural form of the noun or pronoun, and vice versa; the masculine form of a pronoun shall be considered to include also within its meaning the feminine and neuter forms of the pronoun, and vice versa; and the use of any tense of any verb shall be considered to include also within its meaning all other tenses of the verb. In each instance, the Discovery Request shall be construed so as to require the most inclusive answer or production.

G. Please attach written material to any answer for which written material is requested and/or available. If such written material is not available, state where it may be obtained. Label the written material with the number of the Discovery Request to which it pertains.

H. On each Discovery Request response, list the name and title of the person or persons who prepared the response or who is responsible for the information contained therein.

DEFINITIONS

As used in these Discovery Requests, the following terms have the meaning as set forth below:

A. The terms "PSE&G" or "Petitioner" or "you" or "your company" shall include the named entities and all of their subsidiaries and affiliates, the Petitioner's former and present officers, attorneys, employees, servants, agents and representatives, and any person acting on the Petitioner's behalf for any purpose.

B. The terms "relates to" or "relating to" mean referring to, concerning, responding to, containing, regarding, discussing, describing, reflecting, analyzing, constituting, disclosing, embodying, defining, stating, explaining, summarizing, or in any way pertaining to.

C. The term "including" means "including, but not limited to."

D. "List", "describe", "explain", "specify" or "state" shall mean to set forth fully, in detail, and unambiguously each and every fact of which the Petitioner or its agents or representatives have knowledge which is relevant to the answer called for by the Discovery Request.

E. The terms "document" or "documents" as used herein shall include, without limitation, any writings and documentary material of any kind whatsoever, both originals and copies (regardless of origin and whether or not including additional writing thereon or attached thereto), and any and all drafts, preliminary versions, alterations, modifications, revisions, changes and written comments of and concerning such material, including but not limited to: correspondence, letters, memoranda, notes, reports, directions, studies, investigations, questionnaires and surveys, inspections, permits, citizen complaints, papers, files, books, manuals, instructions, records, pamphlets, forms, contracts, contract amendments or

supplements, contract offers, tenders, acceptances, counteroffers or negotiating agreements, notices, confirmations, telegrams, communications sent or received, print-outs, diary entries, calendars, tables, compilations, tabulations, charts, graphs, maps, recommendations, ledgers, accounts, worksheets, photographs, tape recordings, movie pictures, videotapes, transcripts, logs, workpapers, minutes, summaries, notations and records of any sort (printed, recorded or otherwise) of any oral communication whether sent or received or neither, and other written records or recordings, in whatever form, stored or contained in or on whatever medium including computerized or digital memory or magnetic media that:

1. are now or were formerly in your possession, custody or control; or
2. are known or believed to be responsive to these Discovery Requests, regardless of who has or formerly had custody, possession or control.

F. The term “date” shall mean the exact day, month and year, if ascertainable, or if not, the best approximation thereof, including relationship to other events.

G. The term “person” or “persons” means and includes any individual, committee, task force, division, department, company, contractor, state, federal or local government agency, corporation, firm, association, partnership, joint venture or any other business or legal entity.

H. The terms “identify” and “identity” when used with reference to a natural person mean to state his or her full name, present or last known address, present or last known telephone number, present or last known place of employment, position or business affiliation, his or her position or business affiliation at the time in question, and a general description of the business in which he or she is engaged.

I. The terms “identify” and “identity” when used with respect to any other entity mean to state its full name, the address of its principal place of business and the name of its chief

executive officers.

J. The terms “identify” and “identity” with respect to a document mean to state the name or title of the document, the type of document (*e.g.*, letter, memorandum, telegram, computer input or output, chart, etc.), its date, the person(s) who authored it, the person(s) who signed it, the person(s) to whom it was addressed, the person(s) to whom it was sent, its general subject matter, its present location, and its present custodian. If any such document was but is no longer in the possession of the Petitioner or subject to its control, state what disposition was made of it and explain the circumstances surrounding, and the authorization, for such disposition, and state the date or approximate date thereof.

K. The terms “identify” and “identity” with respect to any non-written communication mean to state the identity of the natural person(s) making and receiving the communication, their respective principals or employers at the time of the communication, the date, manner and place of the communication, and the topic or subject matter of the communication.

L. The term “oral communication” means any utterance heard, whether in person, by telephone, or otherwise.

M. The term “identify the sources” means to identify and specify all documents and non-written communications upon which you rely in support of the allegation, contention, conclusion, position or answer in question, to state the references drawn from each such source upon which you rely in support of such allegation, contention, conclusion, position or answer and to identify all individuals whom you know to be knowledgeable with respect to the subject matter of such allegation, contention, conclusion, position or answer. Where a source is a public record (*e.g.*, a newspaper, trade journal, judicial or administrative opinion), a quotation and page

reference of the material relied upon shall be supplied.

N. The term to “state the basis” for an allegation, contention, conclusion, position or answer means (a) to identify and specify the sources therefore, and (b) to identify and specify all facts on which you rely or intend to rely in support of the allegation, contention, conclusion, position or answer, and (c) to set forth and explain the nature and application to the relevant facts of all pertinent legal theories upon which you rely for your knowledge, information and/or belief that there are good grounds to support such allegation, contention, conclusion, position or answer.

O. The terms “and” and “or” have both conjunctive and disjunctive meanings as necessary to bring within the scope of the Discovery Requests and request any information or documents that might otherwise be construed to be outside their scope; “all” and “any” mean both “each” and “every”.

P. The terms “Board” and “BPU” refer to the New Jersey Board of Public Utilities unless otherwise specified.

Q. Unless otherwise stated, the period of time for which these Discovery Requests are requested extends from January 1, 2004 to the present.

FREDON PALS FIRST SET OF DISCOVERY REQUESTS TO PSE&G

- PALS-1 Please reference page 3, line 5, of the Testimony of Esam A. F. Khadr (“Khadr Testimony”) and provide a copy of “California Energy”.
- PALS-2 Please reference page 3, line 10, of the Khadr Testimony and provide a copy of Mr. Khadr’s testimony on behalf of “PJM Transmission Owner Group”.
- PALS-3 Please reference page 3, line 14, of the Khadr Testimony and provide a copy of Mr. Khadr’s testimony on behalf of “Lower Delaware Valley”.
- PALS-4 Please reference the EAK-2 drawing of the Khadr Testimony and explain the meaning of the symbols on the Essex ⇔ Aldene and Bayway ⇔ Linden lines.
- PALS-5 Please reference the Khadr Testimony and provide a more comprehensive drawing than EAK-2 which shows the interconnection of the all lines as they are now – without the proposed Susquehanna – Roseland project.
- PALS-6 Please reference the Khadr Testimony and provide a more comprehensive drawing than EAK-2 which shows the interconnection of the all lines as they would be if the proposed Susquehanna – Roseland project were completed.
- PALS-7 Please reference page 8, line 8 of the Khadr Testimony and explain further the meaning of looping-in.
- PALS-8 Please reference page 8, line 8 of the Khadr Testimony and explain more completely what is being referred to as the 500kV network.
- PALS-9 Please reference page 8, line 8 of the Khadr Testimony and explain more completely what is meant by “ensures redundancy of the 500kV network”.
- PALS-10 Please reference page 8, line 10 of the Khadr Testimony and explain more completely what is meant by future reinforcements of the JCP&L 230kV and 115kV system.

- PALS-11 Please reference page 8, line 10 of the Khadr Testimony and explain more completely where the power for future reinforcements of the JCP&L 230kV and 115kV system would come from.
- PALS-12 Please reference page 8, line 20 of the Khadr Testimony and state when the ties to the Roseland switching station will be overloaded.
- PALS-13 Please reference page 9, line 1 of the Khadr Testimony and explain what is meant by a “strong” 500kV source.
- PALS-14 Please reference the Khadr Testimony and regarding the existing 230kV line, what is its peak rated Amperage and Power capacity.
- PALS-15 Please reference the Khadr Testimony and regarding the existing 230kV line, what is it's the typical Amperage and Power that it carries.
- PALS-16 Please reference the Khadr Testimony and regarding the proposed / replaced 230kV line, what is its maximum rated Amperage and Power capacity.
- PALS-17 Please reference the Khadr Testimony and regarding the proposed 500kV line, what is its maximum rated Amperage and Power capacity.
- PALS-18 Please reference page 9, line 15 of the Khadr Testimony and provide a complete description of all possible scenarios that could result in dangerous situations. Please include single and multiple points of failure scenarios and completely describe all possible resultant failures.
- PALS-19 Please reference page 10, line 17 of the Khadr Testimony and state the voltage tolerance targeted by PSE&G at critical points within the network.
- PALS-20 Please reference page 10, line 21 of the Khadr Testimony and more accurately define what voltage level is being referred to as a “critically low level”.
- PALS-21 Please reference page 11, line 18 of the Khadr Testimony and explain what is included in the definition of a “facility”.
- PALS-22 Please reference page 11, line 21 of the Khadr Testimony and explain what is included in the definition of a “system element”.
- PALS-23 Please reference page 12, line 22 of the Khadr Testimony and detail the margin of error of the simulation model, all inputs to the simulation model, and all outputs of the simulation model.

- PALS-24 Please reference page 15, line 19 of the Khadr Testimony and state all differences in results from the previous study and the 2008 retool.
- PALS-25 Please provide the results of all studies from the 1997 to-date.
- PALS-26 Please state in which year the need for the Susquehanna – Roseland project first appeared.
- PALS-27 Please reference page 16, line 19 of the Khadr Testimony and state all “viable solutions/alternatives” that were considered.
- PALS-28 Please reference EAK-4b of the Khadr Testimony and explain what is meant by each of the following categories used in this exhibit:
- a. Criteria Violation,
 - b. Contingency,
 - c. Criteria test,
 - d. Description of Upgrade,
 - e. Upgrade In-Service Date.
- PALS-29 Please reference EAK-4b, page 5, b0489 of the Khadr Testimony and explain more completely the meaning of each category of b0489.
- PALS-30 Please reference EAK-4b, page 5, b0489 of the Khadr Testimony and state and completely explain the ‘Contingency’ of b0489.
- PALS-31 Please reference EAK-4b, page 5, b0489 of the Khadr Testimony and completely explain how adding the proposed 500kV circuit remedies all Criteria Violations of b0489.
- PALS-32 Please reference page 21, line 5 of the Khadr Testimony and state whether there was any independent verification of the PJM and PSE&G studies.
- PALS-33 Please reference page 23, line 5 of the Khadr Testimony and explain more completely what is meant by “future connection of the Northern JCP&L 230kV system to the 500kV network”.
- PALS-34 Please reference page 23, line 5 of the Khadr Testimony and provide an appropriate drawing that depicts the “future connection of the Northern JCP&L 230kV system to the 500kV network”.

- PALS-35 Please reference EAK-6 of the Khadr Testimony and provide an updated exhibit EAK-6 for each year of the 15 year planning period.
- PALS-36 Please reference page 23, line 20 of the Khadr Testimony and explain the meaning of “leakage” in this context.
- PALS-37 Please reference page 24, line 3 of the Khadr Testimony and explain more completely the impact and implications of the ‘just approved additional 500kV line’.
- PALS-38 Please reference page 24, line 3 of the Khadr Testimony and provide an appropriate drawing that depicts the interconnection of the ‘just approved additional 500kV line’ with the network.
- PALS-39 Please reference page 25, line 15 of the Khadr Testimony and state all ‘reliability criteria violations’ that would not be addressed by a new 230kV line between Stanton and Roseland.
- PALS-40 Please reference page 17, line 3 of the Khadr Testimony and provide the new load forecast that was to be issued in early 2009.
- PALS-41 Please reference page 17, line 3 of the Khadr Testimony and provide the results of the 2009 re-tool.
- PALS-42 Please reference page 28, line 13 of the Khadr Testimony and explain to what level demand response programs need to be effective for them to negate the need for the construction of the project.
- PALS-43 Please reference page 28, line 17 of the Khadr Testimony and explain more completely if any of the NJ EMP was included in the PJM simulation modeling.
- PALS-44 Please reference page 31, line 14 of the Khadr Testimony and explain more completely all aspects that were not included in the EMF studies.
- PALS-45 Please reference page 31, line 14 of the Khadr Testimony and itemize all future network changes that could be envisioned if the proposed Susquehanna – Roseland project is completed.
- PALS-46 Please reference page 31, line 14 of the Khadr Testimony and estimate the impact of all not included aspects on the EMF studies.
- PALS-47 Please reference page 2, line 18 of the Testimony of John P. Ribardo (“Ribardo Testimony”) and confirm that the new 500kV circuit is the only change to the planned for the Susquehanna – Roseland project.

- PALS-48 Please reference page 2, line 18 of the Ribardo Testimony and confirm that there are no changes planned to the existing 230kV circuit or completely detail any and all changes.
- PALS-49 Please reference page 6, line 7 of the Ribardo Testimony and completely explain how PSE&G reached the conclusion that there are "...no health risks associated with EMF...".
- PALS-50 Please reference page 3, line 11 of the Testimony of Robert Pollock ("Pollock Testimony") and provide copies of all wetland and threatened and endangered species studies performed for maintenance and planning purposes of the Roseland-Bushkill right-of-way.
- PALS-51 Please reference page 3, line 13 of the Pollock Testimony and provide copies of all wetlands delineations and species specific investigations performed for the permitting and planning of "the Project".
- PALS-52 Please reference page 5, line 14 of the Pollock Testimony and confirm it is true and explain how it is not contradictory to state that "...clearing will be minimal" then to go on to say that this will result in "...no additional impacts to existing stream corridors".
- PALS-53 Please reference page 5, line 20 of the Pollock Testimony and describe all environmental impacts that are associated with "the Project".
- PALS-54 Please reference page 6, line 13 of the Pollock Testimony and list and completely describe all impacts that would be "permanent in nature".
- PALS-55 Please reference page 7, line 3 of the Pollock Testimony and explain your use of the phrase "it is my understanding".
- PALS-56 Please reference page 7, line 3 of the Pollock Testimony and list any and all impacts that would occur outside of the existing Right-of-way.
- PALS-57 Please reference page 7, line 22 of the Pollock Testimony and state whether existing maintenance activities include the use of helicopters.
- PALS-58 Please reference page 7, line 22 of the Pollock Testimony and state whether future maintenance activities would include the use of helicopters should the Susquehanna-Roseland Project be completed.
- PALS-59 Please explain how the Susquehanna-Roseland Project would be constructed meaning: what happens to the existing lines / towers and when. When would the new towers/ lines be installed.
- PALS-60 Please reference page 8, line 5 of the Pollock Testimony and list and

completely describe all visual impacts that would result from the Susquehanna-Roseland Project.

- PALS-61 Please reference page 8, line 5 of the Pollock Testimony and state how many actual wires are used in the existing 230kV circuit (including conductors and grounds/shields).
- PALS-62 Please reference page 8, line 5 of the Pollock Testimony and describe the orientation / configuration of all wires used in the existing 230kV circuit (including conductors and grounds/shields).
- PALS-63 Please reference page 8, line 5 of the Pollock Testimony and state how many actual wires would be used in replacement 230kV circuit if the Susquehanna-Roseland Project were completed.
- PALS-64 Please reference page 8, line 5 of the Pollock Testimony and describe the orientation / configuration of all wires used in the replacement 230kV circuit if the Susquehanna-Roseland Project were completed.
- PALS-65 Please reference page 8, line 5 of the Pollock Testimony and state how many actual wires would be used in the proposed 500kV circuit if the Susquehanna-Roseland Project were completed.
- PALS-66 Please reference page 8, line 5 of the Pollock Testimony and describe the orientation / configuration of all wires used in the proposed 500kV circuit if the Susquehanna-Roseland Project were completed.
- PALS-67 Please reference page 8, line 5 of the Pollock Testimony and state the total number of wires used in the existing 230kV circuit and the total number of wires that would be used if the Susquehanna-Roseland Project were completed.
- PALS-68 Please reference page 8, line 5 of the Pollock Testimony and completely describe any and all visual impacts that would result from the Susquehanna-Roseland Project considering but not limited to towers, wires, clearing, etc.
- PALS-69 Please reference page 8, line 5 of the Pollock Testimony and state whether PSE&G would also work with each and every affected entity to resolve any visual impacts resulting from the Susquehanna-Roseland Project where an entity is any affected party, town, organization, etc.
- PALS-70 Please reference page 3, line 16 of the Testimony of Robert L. Gibbs ("Gibbs Testimony") and list any / all properties that PSE&G has purchased related to the proposed Susquehanna-Roseland Project.

- PALS-71 Please reference page 3, line 16 of the Gibbs Testimony and list all purchase details of any / all properties that PSE&G has purchased related to the proposed Susquehanna-Roseland Project. This is to include, at a minimum, name of seller(s), location of property, date of purchase, purchase price, etc.
- PALS-72 Please reference page 3, line 16 of the Gibbs Testimony and provide a copy of all real-estate appraisals that were performed in relation to any / all properties that PSE&G has purchased related to the proposed Susquehanna-Roseland Project.
- PALS-73 Please reference page 3, line 17 of the Gibbs Testimony and list any / all additional real estate rights associated with PSE&G easements that PSE&G needs to acquire for the Project.
- PALS-74 Please reference page 3, line 19 of the Gibbs Testimony and completely describe what is meant by "access points" and "laydown areas".
- PALS-75 Please reference page 3, line 19 of the Gibbs Testimony and list any / all access points and laydown areas that PSE&G needs to acquire for the Project.
- PALS-76 Please reference page 4, line 4 of the Gibbs Testimony and list and describe each and every additional easement right that PSE&G has determined it would need in relation to the proposed Susquehanna-Roseland Project.
- PALS-77 Please reference page 4, line 8 of the Gibbs Testimony and identify the PSE&G easement that "limits the number of circuits on the ROW to one circuit".
- PALS-78 Please reference page 4, line 8 of the Gibbs Testimony and identify any and all PSE&G easements that limit the number of circuits on the ROW.
- PALS-79 Please reference page 4, line 8 of the Gibbs Testimony and identify any and all PSE&G easements that limit the number of towers on the ROW.
- PALS-80 Please reference page 4, line 13 of the Gibbs Testimony and provide a copy of each survey that PSE&G has prepared for each of the properties where PSE&G needs to acquire additional rights.
- PALS-81 Please reference page 4, line 22 of the Gibbs Testimony and more completely describe PSE&G's plans to use N.J.S.A. 48:3-17.6 and 48.3-17.7 in relation to the proposed Susquehanna-Roseland Project including but not limited to easements, access points, and access roads.

- PALS-82 Please reference page 4, line 22 of the Gibbs Testimony and identify any and all cases in which PSE&G has already used or is in the process of using or plans to use N.J.S.A. 48:3-17.6 and 48.3-17.7 in relation to the proposed Susquehanna-Roseland Project, including but not limited to easements, access points, and access roads.
- PALS-83 Please reference page 2, line 11 of the Testimony of Richard F. Crouch (“Crouch Testimony”) and identify all projects you have worked on and are aware of that utilized underground transmission assets.
- PALS-84 Please reference page 2, line 11 of the Crouch Testimony and, for each of the above identified projects, please briefly summarize each project in terms of voltage of the circuit and length of the circuit.
- PALS-85 Please reference page 3, line 3 of the Crouch Testimony and more completely describe what is meant by ‘the reconfiguration’ of the existing 230kV circuit.
- PALS-86 Please reference page 3, line 5 of the Crouch Testimony and more completely describe the timeline of the deconstruction and reconstruction.
- PALS-87 Please reference page 3, line 5 of the Crouch Testimony and completely describe any and all impacts to the grid due to having deconstructed the existing 230kV circuit and how such impacts are planned to be dealt with.
- PALS-88 Please reference page 3, line 7 of the Crouch Testimony and state where the existing 230kV circuit connects into now and where the reconstructed 230kV circuit would connect if the Susquehanna-Roseland Project were completed.
- PALS-89 Please reference page 4, line 19 of the Crouch Testimony and state the maximum rated Voltage, Amperage, and Power capacity of the existing 230kV line.
- PALS-90 Please reference page 4, line 19 of the Crouch Testimony and state the typical Voltage, Amperage, and Power carried by the existing 230kV line.
- PALS-91 Please reference page 4, line 19 of the Crouch Testimony and state the maximum rated Voltage, Amperage, and Power capacity of the proposed 230kV line.
- PALS-92 Please state the maximum rated Voltage, Amperage, and Power capacity of the proposed 500kV line.

- PALS-93 Please reference page 5, line 5 of the Crouch Testimony and describe, when designing transmission lines, how is the width of the right-of-way determined and what margins have been included.
- PALS-94 Please reference page 5, line 11 of the Crouch Testimony and explain why the line segments were re-conducted in the 1970's and what changes, if any, this allowed to the voltage, current, or power carrying capacity of the transmission lines.
- PALS-95 Please reference page 5, line 18 of the Crouch Testimony and completely explain how the proposed structures / transmission lines would enhance "lightning induced outage performance".
- PALS-96 Please reference page 6, line 3 of the Crouch Testimony and state how many of the existing structures are over 100 feet tall?
- PALS-97 Please reference page 6, line 3 of the Crouch Testimony and state how many of the proposed structures would be over 100 feet tall?
- PALS-98 Please reference page 6, line 13 of the Crouch Testimony and explain why Exhibit RFC-2 does not include any examples of the Three Pole Tubular Tower type.
- PALS-99 Please reference page 6, line 13 of the Crouch Testimony and provide an exhibit similar to Exhibit RFC-2 that does show examples of the Three Pole Tubular Tower type.
- PALS-100 Please reference page 6, line 13 of the Crouch Testimony and provide an exhibit similar to Exhibit RFC-2 that shows an example of all considered tower types in proximity to the Fredon School and from a vantage point from the Fredon Lodestart Park looking toward the Fredon School.
- PALS-101 Please reference page 6, line 13 of the Crouch Testimony and provide an exhibit similar to Exhibit RFC-2 that shows an example of all considered tower types in proximity to the Fredon School and from a vantage point heading south on Route 94 in front of the Fredon School.
- PALS-102 Please reference page 6, line 17 of the Crouch Testimony and state the planned tower type and construction method for each proposed tower of the Susquehanna-Roseland Project.
- PALS-103 Please reference page 6, line 17 of the Crouch Testimony and clearly identify each proposed tower that is a candidate for the Three Pole Tubular Tower type.

- PALS-104 Please reference page 6, line 17 of the Crouch Testimony and clearly explain the design criteria that is to be used to determine the tower type for each proposed tower.
- PALS-105 Please reference page 7, line 6 of the Crouch Testimony and state why earthquakes were not considered in the design of the structures.
- PALS-106 Please reference page 7, line 17 of the Crouch Testimony and completely explain all “additional design and maintenance restrictions” imposed due to the right-of-way widths being less than preferred by PSE&G.
- PALS-107 Please reference page 7, line 17 of the Crouch Testimony and completely explain why PSE&G has proposed a design in which the widths of all rights-of-way are on the order of 25% less than the right-of-way width preferred by PSE&G.
- PALS-108 Please reference page 7, line 20 of the Crouch Testimony and explain how the proposed design minimizes visual impacts.
- PALS-109 Please reference page 9, line 16 of the Crouch Testimony and state the characteristics of the conductors of the existing 230kV circuit including type of conductor, diameter of conductor, lbs/ft, and breaking strength.
- PALS-110 Please reference page 9, line 18 of the Crouch Testimony and given the conductor diameter, number of conductors, and orientation of the existing 230kV circuit vs. the conductor diameter, number of conductors, and orientation of the proposed 230kV and 500kV circuits, compare and contrast the visual impacts of the proposed transmission line to the existing transmission line.
- PALS-111 Please reference page 9, line 19 of the Crouch Testimony and clearly explain why there are two conductors proposed for the 230kV circuit and four conductors proposed for the 500kV circuit.
- PALS-112 Please reference page 9, line 19 of the Crouch Testimony and clearly explain all reasons why PSE&G has proposed six times more conductors for the new transmission line (18) vs. the 3 conductors of the existing transmission line.
- PALS-113 Please reference page 10, line 13 of the Crouch Testimony and provide a complete analysis that specifies the State of NJ audible noise levels that are being targeted by the proposed transmission line design, what the resultant noise levels are for the proposed transmission line design, and what margins have been achieved.

- PALS-114 Please reference page 10, line 13 of the Crouch Testimony and provide a complete analysis that specifies the State of NJ electric field levels that are being targeted by the proposed transmission line design, what the resultant electric field levels are for the proposed transmission line design, and what margins have been achieved.
- PALS-115 Please reference page 11, line 3 of the Crouch Testimony and more clearly state whether PSE&G would be using reverse phasing on the proposed transmission line and on which portions of the Susquehanna-Roseland Project said reverse phasing would be employed.
- PALS-116 Please reference page 11, line 18 of the Crouch Testimony and state the width of the right-of-way at each existing PSE&G transmission structure that is over 145 feet tall and include identifying and locating information for each such tower.
- PALS-117 Please reference page 14, line 14 of the Crouch Testimony and provide a timeline / schedule for the proposed construction process.
- PALS-118 Please reference page 17, line 9 of the Crouch Testimony and state all locations that are being considered as 'construction lay down yards' for the Susquehanna-Roseland Project.
- PALS-119 Please reference page 4, line 11 of the Testimony of Kyle G. King ("King Testimony") and provide copies of the EPRI EMF series of handbooks.
- PALS-120 Please reference page 4, line 8 of the King Testimony and clarify if the 'corona related effects' of the Susquehanna-Roseland Project would be greater or less than those of the existing transmission line.
- PALS-121 Please reference page 5, line 1 of the King Testimony and provide a table or graph that show the magnetic fields of the appliances listed in your testimony at distances from 1 foot from the appliance to distances of 20 feet from the appliance in increments of 1 foot.
- PALS-122 Please reference page 5, line 14 of the King Testimony and completely explain whether there are any differences between the effects, including but not limited to health and safety, of EMF from a static magnetic field as compared to a dynamic magnetic field.
- PALS-123 Please reference page 5, line 14 of the King Testimony and completely explain whether there are any differences in the effects, including but not limited to health and safety, of EMF from magnetic fields as a function of the frequency of the source that generated them.

PALS-124

Please reference page 6, line 14 of the King Testimony and provide a complete EMF study including but not limited to electric & magnetic fields and corona effects - audible noise, radio noise, ultraviolet light for the following scenarios:

- a. Individual EMF profiles per line (so no cancellation effects) at:
 - i. the power levels you have been using to-date (presumably median),
 - ii. the max current capacity of each line.
- b. Combined EMF profiles (so with cancellation effects) based on:
 - i. the power levels you have been using to date,
 - ii. the max power level of the 230kv vs. the median 500kv,
 - iii. the max power level of the 500kv vs. the median 230kv,
 - iv. the max of each line.
- c. Combined EMF profiles as above but without cancellation techniques:
 - i. the power levels you have been using to date,
 - ii. the max power level of the 230kv vs. the median 500kv,
 - iii. the max power level of the 500kv vs. the median 230kv,
 - iv. the max of each line.
- d. Please also specify the assumptions / details of this analysis in terms of, but not limited to:
 - i. power levels used,
 - ii. if the power levels are averages, medians, or peaks,
 - iii. if the power levels used are the same as those values used in the load study that led to the '~23 outages' identified in the load study,
 - iv. any geometric assumptions (e.g. linearity of the lines),
 - v. other relevant assumptions.

PALS-125

Please reference page 6, line 14 of the King Testimony and provide a detailed representation (e.g. graphs) of the time varying nature of the voltage, amperage, and power levels in each phase of the existing 230kV circuit and each phase of the proposed 230kV circuit and each phase of the proposed 500kV circuit.

PALS-126

Please reference page 6, line 14 of the King Testimony and clearly state how closely the voltage, amperage, and power levels used in Exhibit KGK-2 and in the above requested scenarios resembles the actual time varying voltage, amperage, and power levels in the existing and proposed power line circuits.

- PALS-127 Please reference page 6, line 21 of the King Testimony and provide projected voltage, amperage, and power level projections from the year 2013 to the end of life of the proposed power line circuits.
- PALS-128 Please reference page 6, line 21 of the King Testimony and update all EMF studies (those in KGK-2 and in the above requested scenarios) to use projected power levels from years 2013 to the end of life of the proposed power line circuits.
- PALS-129 Please reference page 6, line 21 of the King Testimony and clearly state whether the EMF studies in KGK-2 assumed balanced (equal) current in each phase of the existing 230kV circuit, each phase of the proposed 230kV circuit, and each phase of the 500kV circuit.
- PALS-130 Please reference page 6, line 21 of the King Testimony and clearly state whether the actual current is in fact balanced (equal) in each phase of the existing 230kV circuit, each phase of the proposed 230kV circuit, and each phase of the 500kV circuit.
- PALS-131 Please reference page 6, line 21 of the King Testimony and update all EMF studies (those in KGK-2 and in the above requested scenarios) to use accurate voltage, amperage, and power levels per phase rather than balanced (equal) for each phase.
- PALS-132 Please reference page 7, line 5 of the King Testimony and clearly state who generated the EPRI Transmission Line Workstation computer programs, when they were developed, when and how they were validated.
- PALS-133 Please reference page 7, line 5 of the King Testimony and clearly state any modeling assumptions / limitations / approximations made by the EPRI Transmission Line Workstation computer programs.
- PALS-134 Please reference page 7, line 5 of the King Testimony and detail the effects any modeling assumptions / limitations / approximations of the EPRI Transmission Line Workstation computer programs on the results of all EMF studies of Exhibit KGK-2 and the above requested EMF studies.
- PALS-135 Please reference page 7, line 7 of the King Testimony and state how much of the actual proposed transmission lines are located above a "flat ground plane".
- PALS-136 Please reference page 7, line 11 of the King Testimony and quantify the margin of error of the EPRI Transmission Line Workstation computer programs.

- PALS-137 Please reference page 7, line 13 of the King Testimony and completely list all requirements and regulations including but not limited to design requirements, state regulations, federal regulations, and international regulations pertaining to electric fields, magnetic fields, audible noise, radio noise, and ultraviolet light.
- PALS-138 Please reference page 7, line 13 of the King Testimony and clearly state whether the electric fields, magnetic fields, audible noise, radio noise, and ultraviolet light that would result from the proposed Susquehanna-Roseland Project meet any and all above listed requirements and regulations.
- PALS-139 Please reference page 8, line 2 of the King Testimony and update all EMF studies (those in KGK-2 and in the above requested scenarios) to include the variance of the current and associated magnetic field for each line segment of the Project.
- PALS-140 Please reference page 8, line 2 of the King Testimony and update all EMF studies (those in KGK-2 and in the above requested scenarios) to determine the average level of current and associated magnetic field for each line segment of the Project.
- PALS-141 Please reference page 8, line 2 of the King Testimony and update all EMF studies (those in KGK-2 and in the above requested scenarios) to determine the maximum level of current and associated magnetic field for each line segment of the Project.
- PALS-142 Please reference page 8, line 16 of the King Testimony and clearly state the accuracy of the measured magnetic fields vs. the calculated magnetic fields for each measurement taken.
- PALS-143 Please reference page 8, line 16 of the King Testimony and clearly describe the location of each measurement taken and the geography of each location including but not limited to ground slope, straightness of the power lines, etc.
- PALS-144 Please reference page 9, line 1 of the King Testimony and clearly state the accuracy / margin of error of the computer model.
- PALS-145 Please reference page 9, line 19 of the King Testimony and state your confidence in the accuracy of the "currents" provided by witness Esam Khadr in the "Loading Study".
- PALS-146 Please reference page 10, line 6 of the King Testimony and state the maximum continuous current that can be carried by the existing 230kV circuit and the corresponding maximum magnetic field.

- PALS-147 Please reference page 10, line 14 of the King Testimony and clarify if the state of NJ 3kV/m electric field limit is for an average measurement, a median measurement, a maximum measurement, or other.
- PALS-148 Please reference page 10, line 21 of the King Testimony and clarify if the cited electric fields produced by the proposed 500kV circuit and 230kV circuit are average values, median values, maximum values, or other.
- PALS-149 Please reference page 10, line 22 of the King Testimony and clarify if the cited electric field produced by the existing 230kV circuit is an average value, median value, maximum value, or other.
- PALS-150 Please reference page 11, line 8 of the King Testimony and clarify if the cited Florida and New York magnetic field right-of-way edge limits are for an average measurement, a median measurement, a maximum measurement, or other.
- PALS-151 Please reference page 11, line 15 of the King Testimony and clarify the meaning and use of “normal” in this context.
- PALS-152 Please reference page 12, line 8 of the King Testimony and clarify if the cited noise levels are average values, median values, maximum values, or other.
- PALS-153 Please reference page 4, Exhibit KGK-2, of the King Testimony and extend all EMF studies out to 600 feet from the centerline of the existing corridor.
- PALS-154 Please reference page 6, Exhibit KGK-2, of the King Testimony and explain why the vertical separation between conductors of the lattice towers is 4’ more than the mono-pole towers thereby making a lattice tower 8’ taller than a mono-pole tower given the same geographical location.
- PALS-155 Please reference page 5, Exhibit KGK-2, of the King Testimony and clearly explain the orientation / alignment of the (bundled) conductors for each phase of the proposed 230kV circuit and for each phase of the proposed 500kV circuit.
- PALS-156 Please reference page 8, Exhibit KGK-2, of the King Testimony and clearly explain the sensitivity of the EMF study (including but not limited to electric & magnetic fields and corona effects - audible noise, radio noise, ultraviolet light) to the vertical, horizontal, and bundle spacing of the conductors.

- PALS-157 Please reference page 8, Exhibit KGK-2, of the King Testimony and clearly explain how the EMF studies took into account any vertical, horizontal, and bundle conductor spacing inaccuracies of the model vs. the existing 230kV circuit or the proposed 230kV circuit or the proposed 500kV circuit.
- PALS-158 Please reference page 10, Exhibit KGK-2, of the King Testimony and state whether the proposed towers can be offset on the right of way to align the electric and magnetic field profiles with that of the existing 230kV circuit.
- PALS-159 Please reference page 10, Exhibit KGK-2, of the King Testimony and state whether the 500kV circuit can be placed on the south side of the ROW from Pennsylvania to Jefferson or at least as it would pass nearby to the Fredon School which is to the north of the ROW.
- PALS-160 Please reference page 15, Table 4, Exhibit KGK-2, of the King Testimony and clearly state whether the edge ROW magnetic field levels of the proposed Susquehanna-Roseland Project are higher or lower than existing 230kV circuit on the northern side of the ROW for the Bushkill-Jefferson line segment and on the Southern side of the ROW for the Jefferson-Roseland line segment and by what percentage the levels have increased from the existing levels.
- PALS-161 Please reference page 16, Table 5, Exhibit KGK-2, of the King Testimony and clearly state whether the edge ROW magnetic field levels of the proposed Susquehanna-Roseland Project are higher or lower than existing 230kV circuit on the northern side of the ROW for the Bushkill-Kittatinny, Kittatinny-Newton, & Newton-Jefferson line segments and on the Southern side of the ROW for the Jefferson-Montville & Montville-Roseland line segments and by what percentage the levels have increased from the existing levels.
- PALS-162 Please reference page 16, Table 5, Exhibit KGK-2, of the King Testimony and completely explain why PSE&G is proposing a transmission line design in which the EMF levels at the edge ROW are in many places significantly higher than the existing transmission line.
- PALS-163 Please reference page 16, Table 5, Exhibit KGK-2, of the King Testimony and completely explain why there is such a large variation in increases in EMF levels between the different line segments e.g. ~497% at the edge ROW for the Montville-Roseland line segment vs. ~85% for the Kittatinny-Newton line segment.
- PALS-164 Please reference page 22, Exhibit KGK-2, of the King Testimony and clearly state all reasons for which any transmission circuit would experience sag.

- PALS-165 Please reference page 22, Exhibit KGK-2, of the King Testimony and clearly state whether each phase of the 230kV circuit would carry the same current.
- PALS-166 Please reference page 22, Exhibit KGK-2, of the King Testimony and clearly state whether each conductor of a given bundle of a given phase of the 230kV circuit would carry the same current.
- PALS-167 Please reference page 22, Exhibit KGK-2, of the King Testimony and clearly state whether each conductor of each bundle of each phase of the 230kV circuit would experience the same sag.
- PALS-168 Please reference page 22, Exhibit KGK-2, of the King Testimony and clearly list all portions of the proposed Susquehanna-Roseland Transmission Line where the assumption that the “transmission line conductors are assumed to be parallel to each other” would be not be true.
- PALS-169 Please reference page 22, Exhibit KGK-2, of the King Testimony and update all EMF studies (those in KGK-2 and in the above requested scenarios) to use actual conductor orientations rather than the assumption that all conductors are parallel to each other.
- PALS-170 Please reference page 22, Exhibit KGK-2, of the King Testimony and clearly state how the EMF studies in KGK-2 and in the above requested scenarios take into account that “...currents on transmission lines can vary considerably over short periods of time...”.
- PALS-171 Please reference page 23, Figure 9, Exhibit KGK-2, of the King Testimony and clearly explain why the calculated EMF falls off faster than the measured EMF.
- PALS-172 Please reference page 33, Figure 17, Exhibit KGK-2, of the King Testimony and clearly explain why PSE&G is proposing a transmission line design for which the audible noise levels are higher than those of the existing transmission line.
- PALS-173 Please reference page 37, Figure 18, Exhibit KGK-2, of the King Testimony and clearly explain why PSE&G is proposing a transmission line design for which the radio noise levels are higher than those of the existing transmission line.