
Garrett P. Lent

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File #: 209803

September 14, 2026

VIA ELECTRONIC FILING

Matthew Homsher, Secretary
Pennsylvania Public Utility Commission
Commonwealth Keystone Building
400 North Street, 2nd Floor North
P.O. Box 3265
Harrisburg, PA 17105-3265

**Re: Letter Of Notification Of PPL Electric Utilities Corporation, Filed Pursuant To 52 Pa. Code Chapter 57 Subchapter G, For Approval To Rebuild Approximately 1.1 Miles Of New Parallel Double Circuit 230 kV Transmission Taps That Are Needed to Connect the Existing Susquehanna-Harwood #1 & #2 Transmission Lines on the New Tomhicken 230 kV Switchyard That Are Respectively Located in Luzerne County, Pennsylvania.
Docket No. A-2025-3059443**

Dear Secretary Homsher:

Attached for filing is PPL Electric Utilities Corporation's ("PPL Electric") Objections and Motion to Strike Portions of the Written Direct Testimony of the Office of Consumer Advocate in the above-referenced proceeding. Copies will be provided as indicated on the Certificate of Service.

Respectfully submitted,



Garrett P. Lent

GPL/sll
Attachment

cc: The Honorable Erin L. Gannon (*via email; w/attachment*)
The Honorable John Coogan (*via email; w/attachment*)
Certificate of Service

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing has been served upon the following persons, in the manner indicated, in accordance with the requirements of 52 Pa. Code § 57.72(d)(3).

VIA E-MAIL

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Dated: September 14, 2026



Garrett P. Lent

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Letter of Notification of PPL Electric Utilities :
Corporation, Filed Pursuant to 52 Pa. Code :
Chapter 57 Subchapter G, For Approval to Build :
Approximately 1.1 Miles of New Parallel Double : Docket No. A-2025-3059443
Circuit 230 kV Transmission Taps that are :
Needed to Connect the Existing Susquehanna- :
Harwood #1 & #2 Transmission Lines to the New :
Tomhicken 230 kV Switchyard that are :
Respectively Located in Luzerne County, :
Pennsylvania :

NOTICE TO PLEAD

YOU ARE HEREBY ADVISED THAT, PURSUANT TO PARAGRAPH 12 OF THE SCHEDULING ORDER ISSUED ON MARCH 20, 2026, IN THE ABOVE-CAPTIONED PROCEEDING, **ANSWERS TO THIS MOTION ARE DUE WITHIN THREE DAYS**. YOUR ANSWERS SHOULD BE FILED WITH THE SECRETARY OF THE PENNSYLVANIA PUBLIC UTILITY COMMISSION, P.O. BOX 3265, HARRISBURG, PA 17105-3265. A COPY SHOULD ALSO BE SERVED ON THE UNDERSIGNED COUNSEL.

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Dated: September 14, 2026

Attorneys for PPL Electric Utilities Corporation

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Letter of Notification of PPL Electric	:	
Utilities Corporation, Filed Pursuant to 52	:	
Pa. Code Chapter 57 Subchapter G, For	:	
Approval to Build Approximately 1.1 Miles	:	Docket No. A-2025-3059443
of New Parallel Double Circuit 230 kV	:	
Transmission Taps that are Needed to	:	
Connect the Existing Susquehanna-	:	
Harwood #1 & #2 Transmission Lines to the	:	
New Tomhicken 230 kV Switchyard that	:	
are Respectively Located in Luzerne	:	
County, Pennsylvania	:	

**PPL ELECTRIC UTILITIES CORPORATION’S
OBJECTIONS AND MOTION TO STRIKE PORTIONS OF THE WRITTEN
TESTIMONY OF THE OFFICE OF CONSUMER ADVOCATE**

TO ADMINISTRATIVE LAW JUDGES ERIN L. GANNON AND JOHN M. COOGAN:

Pursuant to Section 5.103 of the Pennsylvania Public Utility Commission’s (“Commission”) regulations¹ and Paragraph 12 of the Scheduling Order dated March 20, 2026, PPL Electric Utilities Corporation (“PPL Electric” or the “Company”) hereby files these Objections and Motion to Strike portions of the written testimony submitted by Frank Felder and Rao Konidena on behalf of the Office of Consumer Advocate (“OCA”). PPL Electric further submits that, pursuant to Paragraph 12 of the Scheduling Order, OCA’s Answer to PPL Electric’s Objections and Motion to Strike should be submitted on an expedited basis, i.e., within three (3)

¹ 52 Pa. Code § 5.103.

days,² and that any argument regarding PPL Electric’s Objections and Motion to Strike take place at the evidentiary hearings scheduled for September 17 and 18, 2026.

As explained herein, PPL Electric respectfully submits that Administrative Law Judges Erin L. Gannon and John M. Coogan (the “ALJs”) should enter the proposed Order attached hereto as **Appendix A** and strike irrelevant and immaterial testimony regarding facts and issues outside the scope of this proceeding, and outside the scope of the Commission’s jurisdiction, as well as improper legal opinion testimony presented by OCA witnesses. Specifically, PPL Electric requests that the ALJs strike all testimony that is irrelevant to, and outside the scope of, the findings and determinations that the Commission is required to make in order to authorize PPL Electric to site and construct the high voltage (“HV”) transmission lines under 52 Pa. Code Ch. 57, Subch. G (and specifically 52 Pa. Code § 57.76(a)) that are the subject of the instant letter of notification. Failure to exclude this irrelevant testimony from the record risks confusing the issues involved in this proceeding, as well as the specific relief sought by PPL Electric. Moreover, as explained herein, excluding this testimony from the record will not foreclose OCA from raising its concerns in a proper proceeding before a proper forum.

Attached to the proposed Order as **Exhibit A** are redacted versions of OCA Statements 1 and 2, and 1SR and 2SR that identify the portions of the testimony that PPL Electric submits should be stricken. Related, as explained in Section II.E, PPL Electric submits that, if its Objections are sustained and this Motion to Strike is granted, then it is necessary, reasonable, and appropriate to strike responsive portions of PPL Electric’s rebuttal and rejoinder testimony that respond to the irrelevant, immaterial, and out of scope testimony of OCA. Attached to the proposed order as

² Alternatively, PPL Electric requests that its Objections and Motion to Strike be addressed prior to the submission of any briefs in this matter.

Exhibit B are redacted versions of PPL Electric Statement Nos. 1-R, 5-R, and 6-R, as well as PPL Electric Statement Nos. 1-RJ and 5-RJ that identify the portions of this testimony that should be stricken.

In support thereof, PPL Electric states as follows:

I. BACKGROUND

1. The proceeding at Docket No. A-2025-3059443 (“Letter of Notification”) was initiated on December 19, 2025, when PPL Electric filed the above-captioned “Letter Of Notification Of PPL Electric Utilities Corporation, Filed Pursuant To 52 Pa. Code Chapter 57 Subchapter G, For Approval To Build Approximately 1.1 Miles of New Parallel Double Circuit 230 kV Transmission Taps that are Needed to Connect the Existing Susquehanna-Harwood #1 & #2 Transmission Lines to the New Tomhicken 230 kV Switchyard that are Respectively Located in Luzerne County, Pennsylvania” (hereinafter, the “Letter of Notification”) with the Commission. In the Letter of Notification, PPL Electric requested Commission approval to build approximately 1.1 miles of new double-circuit 230 kilovolt (“kV”) transmission taps that are needed to connect the existing Susquehanna-Harwood #1 and #2 230 kV Transmission Lines to the new Tomhicken 230 kV Switchyard (“Tomhicken Switchyard”). The Project also includes the construction of two new 0.1-mile-long 230 kV transmission lines from the Tomhicken 230 kV Switchyard to a new customer-owned 230-34 kV substation. The new 230 kV HV transmission lines and the Tomhicken 230 kV Switchyard (together, the “Tomhicken 230 kV Switchyard Project” or the “Project”) are located in Hazle Township, Luzerne County, Pennsylvania.

2. PPL Electric filed the Letter of Notification pursuant to the provisions of 52 Pa Code § 57.72(d)(iii) and (vi), which provide that letter of notification may be filed with the Commission in lieu of a full siting application where the HV line is located entirely within existing

transmission line right of way and within the property of the sole customer to be served by the line so long as the right of way will not be substantially altered, and where the HV line has a proposed route of 2 miles or less, respectively.

3. On December 30, 2025, OCA filed a Notice of Intervention and Public Statement.
4. On January 7, 2026, the OCA filed a Protest.
5. On March 12, 2026, Erika Cook filed a Protest.
6. On March 13, 2026, John Zola filed a Protest.
7. On March 20, 2026, a Scheduling Order was issued, which, in part, adopted a procedural schedule for the Letter of Notification proceeding.
8. On March 24, 2026, an In-Person Evidentiary Hearing Notice was issued, setting the hearing in the above-captioned matter for Thursday, September 17 and Friday, September 18, 2026 at 10:00 AM.
9. On May 7, 2026, OCA filed its first Motion to Consolidate.
10. On May 13, 2026, PPL Electric filed its direct testimony in the Tomhicken 230 kV Switchyard Project proceeding, consisting of PPL Electric Statement Nos. 1-4.
11. On May 19, 2026, Erika Cook filed a Motion to Deny the Pending Applications and Zoning Exemption Petition Submitted by PPL Electric Without Prejudice (“first Motion to Deny”).
12. On May 27, 2026, PPL Electric filed its Answer to OCA’s first Motion to Consolidate.
13. On June 8, 2026, PPL Electric filed its Answer to Erika Cook’s first Motion to Deny Applications/Petition Without Prejudice.
14. On June 18, 2026, OCA’s first Motion to Consolidate was denied.

15. OCA did not seek interlocutory review of the denial of its first Motion to Consolidate.

16. On June 23, 2026, Erika Cook's Motion to Deny Applications/Petition Without Prejudice was denied.

17. On June 30, 2026, public input hearings were held in Hazleton, PA.

18. On July 8, 2026, the active parties submitted their direct testimony.

19. On July 15, 2026, OCA submitted supplemental direct testimony pertaining to public input hearing testimony.

20. On August 7, 2026, PPL Electric submitted its rebuttal testimony.

21. Also on August 7, 2026, OCA filed its Renewed Motion for Consolidation.

22. On August 12, 2026, Erika Cook submitted a Renewed Motion to Deny the Application (LON) Without Prejudice or Stay the Application (LON).

23. On September 4, 2026, OCA submitted its surrebuttal testimony in this matter.

24. On September 8, 2026, the ALJs issued an Order Denying the Renewed Motion to Deny the Application Without Prejudice of Stay the Application filed by Ms. Cook.

25. Also on September 8, 2026, the ALJs issued an Order Denying the Renewed Motion for Consolidation of OCA.

26. On September 14, 2026, PPL Electric served its rejoinder testimony.

II. OBJECTIONS AND MOTION TO STRIKE

27. PPL Electric objects to, and respectfully moves to strike, portions of the OCA's pre-served written testimony, because they are irrelevant to this proceeding, the scope of which is limited to the Commission's review and determination of whether to authorize PPL Electric to site and construct specific "HV transmission lines" or "HV lines." *See* 52 Pa. Code §§ 57.71,

57.72(d)(1)(iii) and (vi), 57.75(e), and 57.76(a) (describing the Commission’s requirements, review, and determinations to be made with respect to a “proposed HV transmission line” or a “proposed HV line”). Moreover, even if the identified portions of OCA’s testimony were relevant—and they are not—including this information risks confusing the issues in this proceeding, and confusing the relief sought by PPL Electric.

28. “Relevant and material evidence is admissible” in proceedings before the Commission. 52 Pa. Code § 5.401(a).

29. Under Rule 401 of the Pennsylvania Rules of Evidence, evidence is relevant if: (1) “it has any tendency to make a fact more or less probable than it would be without the evidence”; and (2) “the fact is of consequence in determining the action.” Pa.R.E. 401(a)-(b).

30. The Pennsylvania Supreme Court has declared that “[r]elevant evidence is ‘any evidence that tends to make a fact in issue more or less probable.’” *Commonwealth v. Patterson*, 91 A.3d 55, 74 (Pa. 2014) (emphasis added) (quoting *Commonwealth v. DeJesus*, 880 A.2d 608, 614 (Pa. 2005)). To determine whether a fact is “of consequence” or “in issue” (i.e., material), the Commission and Pennsylvania courts examine whether the subject fact is relevant to the required elements of the underlying cause of action. *See Petition for a Declaratory Order of the Borough of Weatherly Regarding the Provision of Electric Service*, Docket No. P-2023-3038615, 2023 Pa. PUC LEXIS 126, at *11-12 (Opinion and Order entered May 18, 2023) (explaining that a customer complaint failed to allege any facts relevant to the “germane issue” of “whether the Borough’s electric service constitutes ‘public utility’ service” in a petition for declaratory order proceeding); *Crespo v. Hughes*, 167 A.3d 168, 180 (Pa. Super. 2017), *appeal denied*, 2018 Pa. LEXIS 1825 (Pa. Apr. 12, 2018) (concluding that evidence was properly excluded where it was “not relevant to any fact that is of consequence in the underlying cause of action” (emphasis added)); *Vasil v.*

Dep't of Military & Veterans Affairs, 230 A.3d 529, 536 (Pa. Cmwlth. 2020) (“The facts which directly affect the outcome of the case are gleaned from considering the substantive law underlying the cause of action.” (citation omitted)).

31. “[R]elevance of a given piece of evidence is a prerequisite to its admissibility.” *Id.* However, “[e]vidence will be excluded if . . . [i]ts probative value is outweighed by . . . [c]onfusion of the issues.” *Id.* § 5.401(b)(2)(i).

32. The scope of this proceeding, as a matter of law, is limited to PPL Electric’s proposal to site and construct the HV transmission lines³ that are the subject of the Tomhicken 230 kV Switchyard Project. 52 Pa. Code § 57.71 (“Upon the application of a public utility for authorization to locate and construct a HV transmission line or any portion thereof, upon approval of the application by the Commission first had and obtained, and upon compliance with existing laws, it shall be lawful for a public utility to commence construction of the HV transmission line or portion thereof.” (emphasis added)). Indeed, the specific cause of action involved in this case is PPL Electric’s request for Commission approval to site and construct approximately 1.1 miles of new HV transmission lines under 52 Pa. Code Ch. 57, Subch. G.

33. The only issues that have been properly raised in this proceeding are whether: (1) this Project qualifies for the use of a Letter of Notification; (2) this Project is necessary to address a specific need; and (3) whether the Letter of Notification is consistent “applicable law or Commission policy regarding transmission line siting and, therefore, in the public interest.”⁴ Relatedly, the Commission’s regulations require the Commission to determine that: (1) there is “a

³ As defined under 52 Pa. Code § 57.1 (defining “HV transmission line” or “HV line”).

⁴ See *Letter of Notification of PPL Electric Utilities Corporation for approval to reconstruct the Elimspport-Lycoming #2 and #3 230 kV Transmission Line located in Williamsport Borough and Armstrong and Washington Townships, Lycoming County, Pennsylvania*, Docket No. A-2021-3029267, 2022 Pa. PUC LEXIS 73, at *8 (Order entered Feb. 24, 2022); see also footnote 9, *infra*.

need” for the HV transmission line; (2) the HV transmission line “will not create an unreasonable risk of danger to the health and safety of the public”; (3) the HV transmission line “is in compliance with applicable statutes and regulations providing for the protection of the natural resources of this Commonwealth”; and (4) the HV transmission line “will have minimum adverse environmental impact, considering the electric power needs of the public, the state of available technology and the available alternatives.”⁵ In addition, the Commission has determined that its existing rules and policies satisfy its obligations under the Environmental Rights Amendment as described in *Pa. Environmental Defense Foundation v. Com. Of Pa.*, 161 A.3d 911 (Pa. 2017).⁶

34. This case does not include a request for Commission approval of the Project’s costs, which will ultimately be placed into transmission rates, or their appropriate allocation or recovery. Neither does this case concern matters of federal or statewide policy regarding the interconnection of large load data centers generally. In addition, the Company’s large load tariff provisions, which were found to be just and reasonable and approved by the Commission recently on June 11, 2026, are also not before the Commission for review in this proceeding.⁷

35. Admitting the testimony of OCA witnesses Felder and Konidena that falls outside of this scope would not tend to make any fact in issue in this proceeding more or less probable. Rather, it would serve only to confuse the issues in this proceeding, because Mr. Felder and Mr.

⁵ 52 Pa. Code § 57.76(a). PPL Electric notes that it does not object to any of the testimony presented by OCA witnesses that addresses one, or more, of these issues. It further notes that OCA presented no testimony with respect to 52 Pa. Code § 57.76(a)(2)-(4) findings and determinations.

⁶ *Application of Pennsylvania Electric Company Seeking Approval to Locate Construct, Operate and Maintain a High-Voltage Transmission Line Referred to as the Bedford North-Central City West 115 kV HV Transmission Line Project*, Docket Nos. A-2016-2565296 et al., at pp. 12-14 (Order entered March 8, 2018) (“*Penelec Order*”) (“Our siting Regulations are in accord with the Environmental Rights Amendment by requiring that the environmental impact of the proposed transmission siting route be minimized.”). PPL Electric notes that OCA presented no testimony with respect to environmental issues, or the Commission’s duties and obligations under the Environmental Rights Amendment.

⁷ *Pa. PUC, et al. v. PPL Electric Utilities Corporation*, Docket Nos. R-2025-3057164, et al. (Opinion and Order entered June 11, 2026).

Konidena ask the Commission to: (1) make binding determinations on matters squarely within the jurisdiction of the Federal Energy Regulatory Commission (“FERC”); (2) impose extra-legal standards for approval of the Letter of Notification that are not grounded in the applicable law; and (3) amend provisions of the Company’s Commission-approved tariff.

36. For the reasons explained below, these concerns are not at issue in this case and OCA’s testimony related to these issues should be stricken as irrelevant and outside the scope of this proceeding.

A. OCA’S TESTIMONY REGARDING TRANSMISSION RATES, INCLUDING COST ALLOCATION AND RECOVERY METHODS, ARE IRRELEVANT TO THE INSTANT LON, ARE OUTSIDE THE SCOPE OF THIS LETTER OF NOTIFICATION PROCEEDING, AND ARE OUTSIDE THE SCOPE THE COMMISSION’S JURISDICTION OVER THE SITING AND CONSTRUCTION OF HV TRANSMISSION LINES

37. The Commission should strike the portions of OCA’s testimony that ask the Commission to make determinations in this proceeding regarding: (1) the inclusion of Project costs in FERC-jurisdictional transmission rates; (2) the appropriate allocation of those Project costs between the Customer and other transmission ratepayers; and (3) the appropriate method for recovery of those Project costs. These issues are irrelevant to the findings and determinations that the Commission must make to the approve the instant Letter of Notification, outside the scope of the instant Letter of Notification, and outside the scope Commission’s jurisdiction over the siting and construction of HV transmission lines.

1. Issues of the reasonableness and/or prudence of transmission costs, rates, allocation and/or cost recovery are subject to the exclusive jurisdiction of FERC.

38. The Federal Power Act (“FPA”) vests in FERC the exclusive jurisdiction to regulate wholesale sales of electricity and the transmission of electricity in interstate commerce, as well as practices affecting the rates for such activities. 16 U.S.C. §§ 824(b), 824e(a); *see also*

Hughes v. Talen Energy Mktg., LLC, 578 U.S. 150, 153 (2016). “Public utilities must file transmission rates and charges with the Commission[, i.e., FERC,] and demonstrate that the rates and charges are ‘just and reasonable.’” *City of Lincoln v. FERC*, 89 F.4th 926, 928 (D.C. Cir. 2024) (citing 16 U.S.C. § 824d(a), (c), (e)).

39. Of particular importance here, “the FPA obligates FERC to oversee all prices for those interstate transactions and all rules and practices affecting such prices. The statute provides that ‘[a]ll rates and charges made, demanded, or received by any public utility for or in connection with’ interstate transmissions or wholesale sales — as well as ‘all rules and regulations affecting or pertaining to such rates or charges’ — must be ‘just and reasonable.’” *FERC v. Elec. Power Supply Ass’n*, 577 U.S. 260, 266 (2016) (citing 16 U.S.C. §824d(a)) (emphasis added).

40. FERC is also charged with enforcing that “just and reasonable” standard, such that “if ‘any rate [or] charge,’ or ‘any rule, regulation, practice, or contract affecting such rate [or] charge[,]’ falls short of that standard, the Commission must rectify the problem: It then shall determine what is ‘just and reasonable’ and impose ‘the same by order.’” *FERC v. Elec. Power Supply Ass’n*, 577 U.S. 260, 266 (2016) (citing 16 U.S.C. §824e(a)).

41. Moreover, “the Supreme Court has consistently found the States’ attempts to second-guess the reasonableness of FERC tariffs preempted pursuant to the filed-rate doctrine. That doctrine provides that interstate power rates filed with FERC or fixed by FERC must be given binding effect by state utility commissions determining intrastate rates . . . as a matter of federal pre-emption through the Supremacy Clause. Once FERC determines that a rate is ‘reasonable,’ state utilities cannot impose any inconsistent rate—even when acting in an area of exclusive state jurisdiction.” *Transource Pa. LLC v. DeFrank, et al.*, 156 F.4th 351, 376 (3d Cir. 2025) (internal quotations and citations omitted).

42. FERC recently confirmed that its jurisdiction squarely includes the ability to investigate the reasonableness of PJM Interconnection L.L.C.’s (“PJM”) tariff provisions related to interconnecting large load data centers with the interstate transmission system, stating:

That authority includes jurisdiction over the wholesale sale and transmission of electricity in interstate commerce, including all facilities used for such sale and transmission. As relevant here, the Commission must ensure that the rates, charges, and classifications for such transmission of electricity--as well as the practices directly affecting such transmission of electricity--are just and reasonable and not unduly discriminatory or preferential. The Supreme Court has held that the Commission’s authority over interstate transmission is not limited to wholesale transmission service and that the Commission has authority over unbundled retail transmission service. As part of its transmission authority, the Commission has exercised jurisdiction over the terms of certain interconnections to the transmission system as an element of transmission service, including the interconnection of wholesale load to the transmission system.

PJM Interconnection, L.L.C., 195 F.E.R.C. ¶ 61,211, Docket No. EL26-67-000, 2026 FERC LEXIS 842, at *40-41 (June 18, 2026) (emphasis added).⁸

43. Consistent with these authorities, the Commission cannot make determinations regarding the appropriate costs to include in transmission rates, the proper allocation of those costs, or specific transmission-level cost-recovery mechanisms in this state-level proceeding. To do so would intrude into FERC’s exclusive jurisdiction over these issues.

44. This position is consistent with the routine language included in Commission orders approving LONs, which specifically notes that no decisions are being made about Project costs or accounting.⁹

⁸ Notably, OCA witness Felder specifically cites to this order, which makes clear both (1) the scope of FERC’s jurisdiction over these issues and (2) that FERC is taking action to address the issues that Mr. Felder proceeds to raise in his testimony. See OCA St. 1, p. 11.

⁹ See, e.g., *Letter of Notification of Mid-Atlantic Interstate Transmission, LLC for Approval of the Jackson – Three Mile Island 230 kV Transmission Line Rebuild and Reconductor Project in Londonderry Township, Dauphin County, Conoy Township, Lancaster County, and Conewago, Dover, Jackson, and Newberry Townships, York County, Pennsylvania*, Docket No. A-2026-3063643, at p. 5 (Order entered Aug. 27, 2026) (stating that the Commission’s “approval of the Letter of Notification does not address the issues of accounting treatment, and cost recovery”); *Letter of Notification of Transource Pennsylvania, LLC for Approval to Construct 230 kV and 500 kV transmission lines to*

45. Therefore, OCA's testimony regarding FERC-jurisdictional issues related to transmission costs, and transmission cost allocation should be stricken. Failure to do so risks confusing the issues that are germane to the Letter of Notification, with issues outside the scope of the Commission's jurisdiction.

*Bramah Substation located in Peach Bottom Township, York County, Pennsylvania, Docket No. 2-2026-3060029, 2026 Pa. PUC LEXIS 247, at *6 (Order entered Aug. 6, 2026); Letter of Notification of Transource Pennsylvania, LLC for Approval to Construct 230 kV and 500 kV transmission lines to Bramah Substation located in Peach Bottom Township, York County, Pennsylvania, Docket No. 2026-3060029, 2026 Pa. PUC LEXIS 247, at *6 (Order entered June 18, 2026); Letter of Notification of PPL Electric Utilities Corporation for Approval to Relocate approximately 0.4 miles of the Keystone – Juniata 500 kV Transmission Line and Juniata – Alburdis 500 kV Transmission Line in Centre Township, Perry County, Pennsylvania, Docket No. A-2025-3059384, 2026 Pa. PUC LEXIS 174, *7 (Order entered Jun. 4, 2026); Letter of Notification of PPL Electric Utilities Corporation for approval to reconstruct a section of the Frackville – Columbia 230 kV Transmission Line located in Catawissa, Cleveland, Conyngham, Franklin, Hemlock, Locust, Montour, and Roaring Creek Townships, Columbia County, and Butler Township, Schuylkill County, Pennsylvania, Docket No. A-2025-3057843, 2026 Pa. PUC LEXIS 40, *9 (Order entered Feb. 19, 2026); Letter of Notification of PPL Electric Utilities Corporation for approval to construct the Susquehanna 230 kV and 500 kV Transmission Line Project in Conyngham and Salem Townships, Luzerne County, Pennsylvania, Docket Nos. A-2025-3056806, P-2025-3056867, at p. 9 (Order entered Sept. 25, 2025); Letter of Notification of PPL Electric Utilities Corporation for approval to reconstruct the Fox Hill – Shawnee 230 kV Transmission Line and Shawnee – Bushkill 230 kV Transmission Line located in Smithfield Township, Monroe County, Pennsylvania, Docket No. A-2025-3054291, 2025 Pa. PUC LEXIS 237, *9 (Order entered Jul. 24, 2025); Letter of Notification of PPL Electric Utilities Corporation for approval to reconstruct the Harwood – East Palmerton 230 kV Transmission Line and Siegfried – East Palmerton 230 kV Transmission Line located in Jim Thorpe Borough and Banks, Franklin, Lehigh, Lower Towamensing, Packer, Penn Forest, and Towamensing Townships, Carbon County, Hazle Township, Luzerne County, and Allen and Lehigh Townships, Northampton County, Pennsylvania, Docket No. A-2024-3047924, 2024 Pa. PUC LEXIS 175, *10 (Order entered Jun. 13, 2024); Letter of Notification of PPL Electric Utilities Corporation for approval to reconstruct sections of the Siegfried – Frackville 230 kV Transmission Line, Eldred – Frackville 230 kV Transmission Line, and Columbia – Frackville 230 kV Transmission Line located in Butler Township, Schuylkill County, Pennsylvania, Docket No. A-2023-3040694, 2023 Pa. PUC LEXIS 237, *8 (Order entered Sep. 21, 2023); Letter of Notification of PPL Electric Utilities Corporation for approval to reconstruct the South Akron-Millwood 230 kV Transmission Line located in East Lampeter, Pequea, Upper Leacock, West Earl, and West Lampeter Townships, Lancaster County, Pennsylvania, Docket No. A-2022-3034794, 2022 Pa. PUC LEXIS 419, *9 (Order entered Dec. 22, 2022); Letter of Notification of PPL Electric Utilities Corporation for approval to reconstruct a section of the Saegers-Elmsport/Clinton-Elmsport 230 kV Transmission Line and the Saegers-Elmsport/Saegers-Clinton 230 kV Transmission Line located in Brady, Clinton, and Washington Townships, Lycoming County, Pennsylvania, Docket No. A-2022-3034224, 2022 Pa. PUC LEXIS 337, *9 (Order entered Oct. 27, 2022); Letter of Notification of PPL Electric Utilities Corporation for approval to reconstruct the Manor-Millwood 230 kV Transmission Line located in Conestoga, Manor, and Pequea Townships, Lancaster County, Pennsylvania, Docket No. A-2021-3029689, 2022 Pa. PUC LEXIS 101, *8 (Order entered Mar. 10, 2022); Letter of Notification of PPL Electric Utilities Corporation for approval to reconstruct the Elmsport-Lycoming # 2 and # 3 230 kV Transmission Line located in Williamsport Borough and Armstrong and Washington Townships, Lycoming County, Pennsylvania, Docket No. A-2021-3029267, 2022 Pa. PUC LEXIS 73, *8 (Order entered Feb. 24, 2022).*

2. Facts and testimony regarding FERC-jurisdictional transmission costs, transmission cost allocation, or transmission cost recovery, are not relevant to the material facts at issue in a letter of notification proceeding.

46. The Commission’s regulations clearly state the scope of the Commission’s review of a request to site and construct HV transmission lines.

47. Specifically, “[u]pon the application of a public utility for authorization to locate and construct a HV transmission line or any portion thereof, upon approval of the application by the Commission first had and obtained, and upon compliance with existing laws, it shall be lawful for a public utility to commence construction of the HV transmission line or portion thereof.” 52 Pa. Code § 57.71. A letter of notification is an “abbreviated” process that only requires the utility to submit the information set forth in 52 Pa. Code § 57.72(c) (1)—(3), (5) and (6). 52 Pa. Code § 57.72(d)(4) (setting forth the required content of a letter of notification).

48. The Commission must make the four findings and determinations set forth at 52 Pa. Code § 57.76(a) to approve a request to site and construct an HV transmission line. Specifically, (1) there is “a need” for the HV transmission line; (2) the HV transmission line “will not create an unreasonable risk of danger to the health and safety of the public”; (3) the HV transmission line “is in compliance with applicable statutes and regulations providing for the protection of the natural resources of this Commonwealth”; and (4) the HV transmission line “will have minimum adverse environmental impact, considering the electric power needs of the public, the state of available technology and the available alternatives.”¹⁰ In rendering such determinations, the Commission’s regulations allow it to consider and review evidence related to the matters set forth in 52 Pa. Code § 57.75(e).

¹⁰ 52 Pa. Code § 57.76(a).

49. These aspects of the Commission’s regulations set forth the “facts in issue”—i.e., the material issues of fact—involved in the Commission’s review and approval of the siting and construction of HV transmission lines pursuant to a letter of notification. Thus, in order to be relevant and within the scope of a letter of notification proceeding, any facts or evidence offered by a party must tend to make any of these material facts more or less probable. *See Petition for a Declaratory Order of the Borough of Weatherly*, 2023 Pa. PUC LEXIS 126, at *11-12; *Crespo*, 167 at 180; *Vasil*, 230 A.3d at 536.

50. Critically, however, the material facts at issue in a letter of notification proceeding under the Commission’s regulations do not involve FERC-jurisdictional transmission costs, or the FERC-jurisdictional allocation of transmission costs between interconnecting customers and a utility’s FERC-jurisdictional transmission rate base.

51. Indeed, the required content of letter of notification implicates none of these facts. *See* 52 Pa. Code § 57.72(d)(4) (stating that the required content of a letter of notification is limited to the information set forth in 52 Pa. Code § 57.72(c) (1)—(3), (5) and (6)). The Commission’s regulations do not contemplate that it will consider evidence surrounding issues of FERC-jurisdictional transmission costs, or the allocation of such costs. 52 Pa. Code § 57.75(e). And, the Commission’s regulations setting forth the four explicit findings and determinations that it must make to approve the siting and construction of an HV transmission line do not contemplate these facts. 52 Pa. Code § 57.76(a).

52. The Commission has also recognized that its review and approval of the siting and construction of specific HV transmission lines by way of a letter of notification do not involve findings or determinations regarding the reasonableness or prudence of FERC-jurisdictional transmission costs, or of the reasonableness of FERC-jurisdictional transmission cost allocation or

recovery.¹¹ This precedent further confirms that the Commission does not consider these issues relevant to its disposition of a letter of notification and, moreover, need not consider or review such evidence to make the determinations required by its regulations.

53. OCA's attempts to attack the transmission costs, cost allocation, and cost allocation through this letter of notification proceeding appear to be based on its mistaken belief that the Commission's siting and construction approval would foreclose the ability to challenge those issues. However, these FERC-jurisdictional issues can be and are more appropriately pursued at the federal level. For instance, OCA has, and would retain, its right under Section 206 of the FPA to challenge an existing transmission rate, tariff provision, classification, or practice as unjust or unreasonable. Moreover, the Commission precedent discussed above recognizes that approving letters of notifications does not mark a final determination regarding project costs or their allocation. OCA and other interested parties maintain the ability to argue their position(s) at the federal level, or at statewide proceedings that address these larger policy issues.

54. For example, as OCA acknowledges in its testimony, FERC is actively addressing the issues of reliability backstop procurement¹² as well as interim resource adequacy service¹³ at dockets initiated by PJM in July and August 2026, respectively. In addition, Vice Chair Barrow's Motion made at the September 10, 2026, Public Meeting initiated statewide proceedings related to the large load issues of curtailment and cost allocation, which will be the subjects of a Tentative Order and a Technical Conference later this year.¹⁴

¹¹ See footnote 9, *supra*.

¹² See *PJM Interconnection, L.L.C., Reliability Backstop Procurement to Address Resource Adequacy Concerns Stemming From Large Loads*, Docket No. ER26-3380-000.

¹³ See *Proposal of PJM Interconnection, L.L.C. to Establish Interim Resource Adequacy Service and a Large Load Registry to Address System Reliability*, Docket No. ER26-3515-000.

¹⁴ See *Motion Directing Staff to Issue Tentative Order Pursuant to the Public Utility Commission's Provisions at 52 Pa. Code Section 57.72 (Emergency load control and energy conservation by electric utilities) and Establish a Technical Conference On Large Computational Load Cost Allocation*, 3064961-CMR (Public Meeting held Sept. 10, 2026).

55. Excluding OCA's testimony in this case does not foreclose review of these issues, but instead ensures that these FERC-jurisdictional issues are handled in an appropriate forum.

56. Therefore, OCA's testimony on these topics is irrelevant, because it does not tend to make any fact in issue in this proceeding more or less likely.

3. The irrelevant, immaterial testimony advanced by OCA witnesses Felder and Konidena should be stricken and excluded from evidence.

57. The instant Letter of Notification places no facts in issue regarding transmission costs, or their allocation; PPL Electric has requested no such findings or determinations from the Commission, and the Commission has consistently recognized that its review and approval of a utility's request to site and construct an HV transmission line does not reach such issues.¹⁵

58. Failure to exclude this information from the record would also risk confusing the issues in this proceeding, which are limited to PPL Electric's request to site and construct specific HV transmission lines through the instant LON.

59. Critically, this confusion is made self-evident by the surrebuttal testimony offered by OCA witness Konidena. Specifically, Mr. Konidena takes issue with PPL Electric witnesses stating and explaining why issues related to cost allocation are outside the scope of this proceeding, and then arguing that because PPL Electric responded to the substance of his claims, the issues must be in scope. *See* OCA St. 2SR, pp. 17 ("If PPL's cost allocation methodology may properly be argued and defended in this proceeding, my recommendation that the Commission review the Policy underlying that methodology should be considered on the same basis."), 18 ("Mr. Taylor cannot maintain that cost allocation is outside the scope of this proceeding while simultaneously

¹⁵ *See* footnote 9, *supra*.

asking the Commission to credit his testimony defending the reasonableness of that same allocation.”).

60. Essentially, OCA’s testimony argues that because it raised irrelevant and immaterial facts and issues, PPL Electric has conceded the relevance of these points by responding to those facts and issues. This is incorrect, and ignores the procedural posture of this case.

61. At this time, while written testimony has been served in this case, it has not been offered for admission into the evidentiary record, and has not been admitted into evidence. Moreover, “any motions with respect to, or objections to, written testimony must be presented in writing no later than three days prior to the day that the witness sponsoring that testimony is scheduled to testify.” Scheduling Order, p. 4.

62. The filing of the instant Motion adheres to the procedures identified by the ALJs for objecting to testimony. Moreover, PPL Electric’s rebuttal and rejoinder testimony responding to irrelevant and out of scope testimony submitted by OCA properly preserves PPL Electric’s rights in the event that the instant Motion is denied. If it is granted, however, PPL Electric has recognized that it is necessary, appropriate, and reasonable that its responsive rebuttal and rejoinder testimony should also be stricken. *See* Section II.E., *infra*.

63. For the reasons identified above, the following testimony advanced by OCA witnesses Felder and Konidena should be stricken as irrelevant to the germane issues with the Commission’s jurisdiction that are material to the Commission’s review and approval of the instant LON:

- OCA St. 1, p. 20, lines 22-23, p. 21, lines 1-14 (discussing PPL Electric’s FERC-jurisdictional transmission rate cost allocation policy);
- OCA St. 1, p. 29, lines 7-13 (making recommendations that PPL Electric be required to amend allocation of FERC-jurisdictional transmission rates between interconnecting customers and transmission ratepayers);

- OCA St. 2, p. 5, lines 10-16 (recommending that the Commission not approve the cost allocation for the Project);
- OCA St. 2, p. 12, line 17-19 (making recommendation that all costs be allocated to customer);
- OCA St. 2, p. 25, lines 2-14, 18-20 (discussing perceived inconsistencies with cost allocation of specific components of the proposed Tomhicken Switchyard);
- OCA St. 2, p. 30, lines 7-10 (drawing conclusion regarding function of the Switchyard as between serving customer or network);
- OCA St. 2, p. 31, lines 1-13 (arguing that allocation of specific component of Tomhicken Switchyard was improper);
- OCA St. 2, p. 31, lines 7-19, p. 32, lines 1-3 (asking the Commission to reallocate project costs in FERC-jurisdictional transmission rates);
- OCA St. 2, p. 40, lines 10-15 (arguing that cost allocation should justify the design of the Project);
- OCA St. 2, p. 41, lines 1-15 (arguing that Nescopeck alternative could result in a cost allocation more favorable to transmission ratepayers, asking Commission to require quantitative cost-benefit analysis to determine appropriate Project configuration);
- OCA St. 2, p. 47, lines 12-13, 16-19, p. 48, lines 1-2 (arguing that all costs should be allocated to the Customer);
- OCA St. 2, p. 48, lines, 6-20, p. 49, lines 1-5, 8-17, p. 50, lines 1-18 (discussing PPL Electric's FERC transmission rate allocation policy, arguing its applicability to the LON);
- OCA St. 2, p. 51, lines 17-19, p. 52, lines 1-2, 6-8, p. 53, Table 1, p. 54, lines 3-17, p. 55, lines 1-18, p. 56, lines 1-13 (making arguments regarding network vs. customer benefits of the Project which witness claims should drive cost allocation of the project);
- OCA St. 2, p. 57, lines 12-20, p. 58, lines 1-18, p. 59, lines 1-20, p. 60, lines 1-16, p. 61, lines 1-2 (purporting to perform a network benefits analysis for Phases 1 and 2, related to the proper allocation of FERC-jurisdictional transmission costs);
- OCA St. 2, p. 62, lines 17-19, p. 63, lines 18-20, p. 64, lines 8-20 (asking the Commission to review and amended the anticipated transmission rate cost allocation for the Project as a condition of approval, further analyzing customer-driven vs. network upgrade nature of specific project components);

- OCA St. 2, p. 65, lines 1-9 (recommending that the Commission review and approve cost allocation policy and specific allocation of Project as condition of approval);
- OCA St. 2, p. 73, lines 13-20, p. 86, lines 10-18, p. 87, lines 1-9 (discussing cost allocation of Phase 1 as compared to Phase 2);
- OCA St. 2, p. 87, lines 14-17, p. 88, lines 4-19, p. 89, lines 1-16, p. 90, lines 1-20, p. 91, lines 3-18, p. 92, lines 1-8, 11-21, p. 93, lines 1-13, p. 93, lines 18-20, p. 94, lines 2-6, 10-18, p. 95, lines 1-4, 7-20, p. 96, lines 1-20, p. 97, lines 17-19 (summarizing findings regarding cost allocation, making recommendations for Commission to condition approval of Project based on those findings);
- OCA St. 2, p. 98, lines 8-13, 16-19, p. 99, lines 1-15, p. 101, lines 17-18, p. 102, lines 1-15, p. 103, lines 1-19, p. 104, lines 1-19, p. 105, lines 1-17, p. 106, lines 1-19, p. 107, lines 1-8, 12-16, p. 108, lines 1-18, p. 109, lines, 1-12, p. 110, lines 8-21 (further discussions, recommendations, and conclusions regarding FERC-jurisdictional transmission rate cost allocation);
- OCA St. 2, p. 100, lines 3-19, p. 101, lines 1-14, p. 111, lines 1-4 (comparing Project cost allocation with that of other LONs);
- OCA St. 2, p. 111, lines 8-21, p. 112, lines 1-4 (summarizing conclusions and recommendations regarding FERC-jurisdictional cost allocation); and
- OCA St. 1SR, p. 16, lines 15-18, 21-24, p. 17, lines 1-6 (discussing the role of cost allocation in LON proceedings).

B. OCA’S TESTIMONY REGARDING FEDERAL AND STATEWIDE LARGE LOAD POLICIES IS IRRELEVANT TO AND OUTSIDE THE SCOPE OF THIS PROCEEDING

64. Similarly, OCA witness Felder testifies at length regarding federal and statewide large load policies, several of which are actively being considered in FERC or Commission proceedings.

65. This case does not concern matters of federal and statewide policy regarding the interconnection of large load data center customers generally. This proceeding concerns one utility’s proposed siting and location of specific HV transmission lines.

66. Moreover, the Commission's regulations make clear that the Commission's authorization for a utility to site and construct HV transmission lines is based upon the law as it presently stands, and not upon the law as it may stand at some point in the future. Section 57.71 specifically states that, in addition to the Commission's approval, a request to site and construct an HV transmission line must be shown to be compliant "with existing laws." 52 Pa. Code § 57.71. "Existing" is an adjective that is defined as "that exists or is being used at the present time." *Existing*, Cambridge Dictionary, <https://dictionary.cambridge.org/us/dictionary/english/existing> (last visited Sept. 12, 2026).

67. In his testimony, Mr. Felder improperly asks the ALJs and the Commission to make policy determinations on a wide variety of issues that by his own admission are actively under consideration at the federal and state level. For example, Mr. Felder discusses: (1) the White House Ratepayer Pledge (OCA St. 1, pp. 10-11); (2) PJM's policy regarding large loads (OCA St. 1, p. 1); (3) FERC's policy regarding large loads (*Id.*, p. 11); (4) the North American Reliability Corporation's ("NERC") policy regarding large loads (*Id.*, p. 12); (5) the PJM Board of Managers' and PJM's policy on large loads (*Id.*, pp. 13-15); and (6) FERC's Expansion Rate Policy (*Id.*, pp. 22-24).

68. Any information regarding ongoing law and policy developments are not rooted in the currently applicable (i.e., "existing") law governing the siting and construction of HV transmission lines and, therefore, none of these policies are controlling in this proceeding. *See* 52 Pa. Code § 57.71.

69. Moreover, this single utility siting proceeding is not the appropriate forum to make determinations related to the ongoing development of law and policy at both the state and federal levels. Any consideration of these policies would require the ALJs and the Commission to address

the issue of the Company's compliance with such, yet-to-be-determined laws and/or policies. This would conflict with the express requirement of 52 Pa. Code § 57.1 that the siting and construction of the contemplated HV lines be compliant with existing law, and improperly expand this proceeding well beyond its scope. Imposing binding determinations based on yet-to-be-determined laws and/or policies would also undermine existing processes for setting new law or policies, including notice and comment by impacted stakeholders, and could result in requirements being imposed in this proceeding that actively conflict with or duplicate the eventual legal or policy determinations that may be made at the state and/or federal level.

70. Simply because these matters are current topics in the public discourse surrounding large load interconnections does not make them relevant to the determinations that must be made in the case at hand, which is narrowly focused on approval of the siting and construction of specific HV transmission lines under the streamlined letter of notification process. The policies and ongoing legal developments referenced by Mr. Felder are irrelevant because they have no application to this proceeding, which requires that PPL Electric demonstrate that its request to site and construct the contemplated HV transmission lines is compliant with "existing law." Therefore, the policies and ongoing legal developments cited by Mr. Felder do not tend to make any fact at issue more or less probable.

71. Furthermore, PPL Electric reiterates that a failure to exclude this evidence risks confusing the issues in this case. Indeed, where the regulations require PPL Electric to demonstrate compliance with "existing law," testimony regarding ongoing legal and policy developments risks confusing what laws PPL Electric must demonstrate that it complies with.

72. PPL Electric also emphasizes that, as explained above in Section II.A, OCA's concerns can and should be raised in the appropriate federal or statewide forum. OCA's attempts

to frame this proceeding as the last opportunity for these issues to be addressed are misplaced and should be rejected. For example, the Vice Chair's recent Motion demonstrates that the Commission will be addressing matters of curtailment and cost allocation through statewide proceedings.¹⁶

73. Therefore, the following irrelevant information, allegations, and materials set forth in the OCA's testimony should be stricken:

- OCA St. 1, p. 10, lines 15-24, p. 11, lines 1-12 (discussing White House Ratepayer Pledge);
- OCA St. 1, p. 1 (discussing PJM's policy regarding large loads);
- OCA St. 1, p. 11, lines 14-23 (discussing FERC's policy regarding large loads);
- OCA St. 1, p. 12, lines 1-19 (discussing the North American Reliability Corporation's ("NERC") policy regarding large loads);
- OCA St. 1, p. 13, lines 2-25, p. 14, lines 2, 4-12, 14-19, p. 15, lines 1-14 (discussing the PJM Board of Managers' and PJM's policy on large loads);
- OCA St. 1, p. 15, lines 2-16 (discussing Pennsylvania Governor's policy on large loads)
- OCA St. 1, p. 16, lines 19-23, p. 17, lines 1-4 (discussing PUC's policy on large loads);
- OCA St. 1, p. 22, lines 16-19, p. 23, lines 1-19, p. 24, lines 1-2, 7-18 (discussing FERC's expansion rate policy);
- OCA St. 2, p. 5, lines 17-23 (restating policy recommendations of OCA Witness Felder);
- OCA St. 1SR, pp. 3-4, Table SR1 (describing "key dates" related to policy developments);

¹⁶ See *Motion Directing Staff to Issue Tentative Order Pursuant to the Public Utility Commission's Provisions at 52 Pa. Code Section 57.72 (Emergency load control and energy conservation by electric utilities) and Establish a Technical Conference On Large Computational Load Cost Allocation*, 3064961-CMR (Public Meeting held Sept. 10, 2026). This motion opened Docket No. M-2026-3064961, which remains pending before the Commission.

- OCA St. 1SR, p. 5, lines 2-8 (responding to PPL Electric Witness Taylor’s testimony rebutting existence of any “policy gap” needing filled in this proceeding);
- OCA St. 1SR, p. 5, lines 10-28, p. 6, lines 1-35, p. 7, lines 1-36, p. 8, lines 1-11 (restating in full recent policy statements by Commission Chairman and Governor Shapiro related to cost allocation and other statewide large load interconnection policies);
- OCA St. 1 SR, p. 8, lines 14-25, p. 9, lines 1-22, p. 10, lines 1-21, p. 11, lines 1-2 (recounting additional “recent” developments of federal policy and ongoing federal proceedings);
- OCA St. 1SR, p. 12, lines 13-20, p. 13, lines 19-25, p. 14, lines 3-16 (discussing federal policies);
- OCA St. 1SR, p. 16, lines 3-12 (discussing statewide large load policy proceedings);
- OCA St. 2SR, p. 2, lines 13-18, p. 3, lines 3-18 (summarizing cost allocation recommendations);
- OCA St. 2SR, pp. 4-14 (responding to PPL Electric rebuttal testimony disputing relevance of cost allocation, continuing to recommend that the Commission consider and make specific determinations regarding FERC-jurisdictional rates in this proceeding);
- OCA St. 2SR, pp. 14-19 (arguing that PPL Electric did not appropriately allocate costs in Bay 1 of the Tomhicken Switchyard);
- OCA St. 2SR, p. 23, line 7, through p. 40, line 20 (testimony regarding the appropriate cost allocation between Phase 1 and Phase 2 of the Project, responding to PPL Electric rebuttal testimony regarding cost allocation methodology); and
- OCA St. 2SR, p. 45, line 17, through p. 51, line 8 (comparing anticipated Tomhicken Project cost allocation to another LON’s cost allocation).

C. OCA’S TESTIMONY RECOMMENDING CHANGES TO PPL ELECTRIC’S TARIFF ARE OUTSIDE THE SCOPE OF THIS PROCEEDING

74. PPL Electric is not seeking approval of a new tariff supplement, modifications to Rate Schedule LP-6, or approval of new large-load interconnection policies in this proceeding.

There is no such request in the LON, any of the supporting attachments, or any of the Company's supporting testimony.

75. Moreover, such a request would be clearly outside the scope of 52 Pa. Code Ch. 57, Subch. G, which explicitly applies to requests to site and construct proposed HV transmission lines, and makes no reference to requests to implement, revise, or modify a utility's Commission-jurisdictional tariff. The required findings and determinations that must be made by the Commission to approve PPL Electric's request to site and construct the proposed HV transmission lines similarly make no reference to the review or approval of the utility's Commission-jurisdictional tariff. *See* 52 Pa. Code § 57.76(a).¹⁷

76. Still, OCA explicitly asks the ALJs and the Commission to require changes to the Company's tariff as a condition of approval for the Letter of Notification. For example, Mr. Felder asks the ALJs and the Commission to determine appropriate customer funding obligations, security requirements, stranded-cost protections, minimum load commitments, credit support provisions, and other large-load tariff protections in this proceeding. (*See*, OCA St. 1, pp. 20, 24, 27-30.) Mr. Felder also asks the ALJs and the Commission to require the Company to incorporate into its tariff a large load registry, a large load supply requirement, a reliability backstop procurement cost allocation stipulation, a large load stranded cost allocation, and large load curtailment provisions. (*See* OCA St. 1, pp. 4, 25-30.)

77. This testimony is irrelevant for two reasons.

78. First, as explained in Section II.A., *supra*, the Commission's regulations applicable to HV line siting and construction approvals do not include any of these matters. The facts

¹⁷ It is particularly telling that the Commission's regulations at 52 Pa. Code Ch. 57, Subch. G include no cross-reference to the Commission's regulations at 52 Pa. Code Ch. 53, which govern public utility tariffs.

advanced by OCA witness Felder are not included as a part of (a) the information required to be filed in a letter of notification, (b) the evidence the Commission will review in its consideration of a letter of notification, or (c) the required findings and determinations under the regulations.

79. The Company has no burden in this case to demonstrate that its existing Commission-approved tariff provisions are just and reasonable. Approval of the LON does not require any review or approval of the terms of the Company's Commission-jurisdictional tariff provisions, curtailment policies, or emergency procedures. Essentially, OCA witness Felder is arguing that additional informational and evidentiary requirements should be read into the Commission's regulations.

80. Second, as noted in Section II.B., *supra*, the relevant question in this case is whether PPL Electric's request to site and construct the contemplated HV transmission lines is in compliance with the law as it exists today. OCA's testimony regarding compliance with yet-to-be-implemented laws and policies is premature, and risks creating obligations with respect to PPL Electric and this specific Project that are inconsistent or conflict with future federal and state obligations.

81. PPL Electric further notes that OCA's claims that PPL Electric must demonstrate compliance with the Commission's large load model tariff are inconsistent with the language of the order adopting this model tariff. Critically, the Commission stated in this order that "[u]pon review of the record, including comments filed and through this Final Order, we announce the Commission's guidelines for a model large load tariff." *Interconnection and Tariffs for Large Load Customers*, Docket No. M-2025-3054271, p. 5 (Final Order entered May 12, 2026) (emphasis added). The Commission's tentative order echoed that it was establishing "guidelines" through the model tariff, rather than binding legal requirements. *See Interconnection and Tariffs*

for Large Load Customers, Docket No. M-2025-3054271, pp. 4, 13, 44 (Tentative Order entered Nov. 6, 2025) (describing the order as setting forth tentative guidelines for which the Commission sought public comment). The language of the model tariff order makes clear that it is akin to a “policy statement.” Policy statements provide nonbinding guidance and do not have the force of law.¹⁸

82. Finally, if OCA seeks to challenge the provisions of the Company’s tariff or its Rate Schedule LP-6, which was approved by the Commission in *Pa. PUC, et al. v. PPL Electric Utilities Corp.*, Docket Nos. R-2025-3057164, et al. (Opinion and Order entered June 11, 2026),¹⁹ then OCA can file a formal complaint and initiate a complaint proceeding against the rates, terms, and conditions contained in PPL Electric’s existing, Commission-approved tariff. In such a proceeding, OCA’s claims regarding alleged deficiencies in PPL Electric’s tariff would, at least, be properly within the scope of the cause of action. Presently, the instant Letter of Notification involves none of these issues.²⁰

83. Therefore, the following irrelevant information, allegations, and materials set forth in the OCA’s testimony should be stricken:

- OCA St. 1, p. 4, lines 1-11 (summarizing proposed modifications to PPL Electric’s tariff);

¹⁸ See *Petition of Philadelphia Gas Works for a Statement of Policy on the Application of Philadelphia Gas Works’ Cash Flow Ratemaking Method*, 2009 Pa. PUC LEXIS 2018, *20 (December 30, 2009) (policy statements are only an indication of how the PUC intends to proceed); *Pa. Associated Builders & Contrs., Inc. v. Commonwealth Dep’t of Gen. Servs.*, 996 A.2d 576, 583 (Pa. Cmwlth. 2010); *R.M. v. Pennsylvania Hous. Fin. Agency*, 740 A.2d 302, 308 (Pa. Cmwlth. 1999).

¹⁹ PPL Electric notes that OCA was a signatory of the non-unanimous settlement reached and approved, with modification, in the Company’s rate case, which included the LP-6 tariff provisions it now seeks to amend.

²⁰ OCA may claim that PPL Electric must demonstrate that its request to interconnect the Customer to be served by the proposed HV transmission lines is consistent with its existing, Commission-approved tariff. PPL Electric does not dispute this fact. A utility’s Commission-approved tariff has the force and effect of law and is binding upon the utility. 66 Pa.C.S. § 1303; *Lynch v. Pa. PUC*, 594 A.2d 816 (Pa. Cmwlth. 1991) (finding a Commission-approved Tariff is *prima facie* reasonable and carries the force and effect of law). However, whether PPL Electric is compliant with its existing tariff is not the same question as whether, as a pre-requisite to the approval of the instant LON, PPL Electric should be required to revise or modify its existing tariff. OCA witness Felder’s testimony does not address the former, but focuses solely on the latter.

- OCA St. 1, p. 25, lines 14-21, p. 26, lines 3-14, p. 27, lines 1-21, p. 28, lines 1-22, p. 29, lines 1-5, 15-21, p. 30, lines 1-8, 12-16, 17-18, p. 31, lines 1-3 (proposing modifications to PPL Electric's tariff);
- OCA St. 1SR, p. 11, lines 6-12, p. 12, lines 3-20 (responding to PPL Electric Witness Taylor's rebuttal testimony regarding out-of-scope tariff recommendations); and
- OCA St. 1 SR, p. 17, lines 10-21, p. 18, lines 1-21, p. 19, lines 1-20, p. 20, lines 1-20 (arguing that tariff changes are appropriately raised in this letter of notification proceeding).

D. OCA'S TESTIMONY CONTAINING LEGAL CONCLUSIONS SUBMITTING BY NON-ATTORNEY WITNESSES SHOULD BE STRICKEN FROM THE RECORD

84. Neither of OCA's witnesses are attorneys. (*See*, OCA St. 1, p. 1; OCA Exhibit FF-1, pp. 1-2; OCA St. 2, pp. 1-3; OCA St. 2, Exh. A.)

85. Yet, both of OCA's witnesses provide testimony which contains legal conclusions. (*See, e.g.*, OCA St. 1, pp. 20, 21, 22, 30; OCA St. 2, p. 56.)

86. The Commission has provided that witness testimony concerning the elements of the case is permissible so long as that "witness does not testify as to the ultimate legal conclusion," and that "[a]rgument as to the ultimate legal conclusion should [not be presented] in the form of expert opinion testimony." *Pa. P.U.C. et al. v. North Penn Gas Company*, 1981 Pa. PUC LEXIS 10, **18-19, Docket No. R-80111375 (Dec. 4, 1981).

87. Therefore, the following improper legal opinions and/or conclusions set forth in the OCA's testimony should be stricken:

- OCA St. 1, p. 20, lines 3-8, 12-16 (providing legal conclusions related to Commission's jurisdiction and authority to regulate transmission-level interconnection terms through retail tariffs and duties of utilities to provide safe, reasonable, and adequate service under the Public Utility Code);
- OCA St. 1, p. 21, lines 18-21, p. 22, lines 1-6 (containing legal conclusions about PPL Electric's discretion to determine allocation of costs between customers and transmission rates and FERC oversight of the same);

- OCA St. 1, p. 22, lines 8-13 (summarizing legal opinion of OCA counsel regarding Commission authority to impose retail-level “protections” in large load tariff provisions);
- OCA St. 1, p. 30, lines 16-17 (concluding that interconnecting the customer could compromise PPL Electric’s “ability to satisfy the requirements of the Public Utility Code”);
- OCA St. 2, p. 56, lines 16-17, p. 57, lines 1-9 (discussing FERC precedent and the legal impact of a policy statement); and
- OCA St. 1SR, p. 11, lines 15-27, p. 12, lines 1-2 (interpreting and providing legal conclusions regarding PPL Electric’s duty under Section 2807(a) of the Public Utility Code).

E. TREATMENT OF THE COMPANY’S RESPONSIVE TESTIMONY TO OCA’S OUT-OF-SCOPE TESTIMONY

88. PPL Electric has consistently stated that the aforementioned facts and issues are not relevant to, and are outside the scope of, the instant LON and the Company’s request for approval to site and construct specific HV transmission lines. (*See, e.g.*, PPL Electric St. No. 1-R, pp 2-5; PPL Electric St. No. 5-R, pp. 7-11.)

89. Nevertheless, the Company responded to OCA’s testimony regarding these issues in recognition of the fact that pre-served written testimony would be moved into the record subject to any objections at a later date. Scheduling Order, p. 4 (“any motions with respect to, or objections to, written testimony must be presented in writing no later than three days prior to the day that the witness sponsoring that testimony is scheduled to testify.”).

90. The Company recognizes that, to the extent that the portions of OCA’s direct and surrebuttal testimony identified in its Motion are stricken, then the Company’s rebuttal and rejoinder testimony responding to the same should also be stricken from the record. Doing so is necessary, appropriate, and efficient for purposes of clarifying the record in the manner requested by the Company’s Motion.

91. Accordingly, if OCA's testimony is struck, the following portions of the Company's rebuttal and rejoinder testimony should be excluded from the record:

- PPL Electric St. No. 1-R, p. 1, lines 20-21 (describing scope of rebuttal testimony);
- PPL Electric St. No. 1-R, p. 2, lines 19-25, p. 3, lines 1-15 (summarizing OCA's testimony on the proposed cost allocation of the Project);
- PPL Electric St. No. 1-R, p. 3, lines 17-19, 21-23, p. 4, lines 1-17 (testifying that the summarized testimony and recommendations regarding cost allocation are not relevant to the scope of the instant proceeding, and providing reasoning as to why);
- PPL Electric St. No. 1-R, p. 7, lines 1-31, p. 8, lines 1-28 (describing proceedings in which the Commission declined to make findings or determinations regarding cost allocation);
- PPL Electric St. No. 1-R, p. 8, lines 30-35, p. 9, lines 1-6 (explaining relevance of prior Commission decisions to the instant proceeding);
- PPL Electric St. No. 1-R, p. 9, lines 18-20 (arguing that OCA offered arguments about issues not germane to the instant findings and determinations);
- PPL Electric St. No. 1-R, p. 15, line 5 (indicating that Section V pertains to cost allocation issues raised by OCA);
- PPL Electric St. No. 1-R, p. 15, lines 16-17, 21-24, p. 16, lines 1-6 (summarizing OCA testimony and recommendations pertaining to cost allocation);
- PPL Electric St. No. 1-R, p. 19, lines 2-12 (disagreeing with OCA's recommendation that the Company perform a forward-looking quantitative analysis);
- PPL Electric St. No. 1-R, p. 19, lines 14-21, p. 20, lines 1-7 (disagreeing with OCA's recommendation that the Commission require PPL Electric to submit its Policy on Cost Allocation for review and approval, and conditions for approval of the Project's cost allocation);
- PPL Electric St. No. 1-R, p. 20, lines 19-23, p. 21, lines 1-6 (discussing whether the proposed cost allocation of the Project justifies network benefits in response to OCA testimony);
- PPL Electric St. No. 1-R, p. 21, lines 8-23, p. 22, lines 1-8 (describing purpose of PPL Electric's Cost Allocation Policy in response to OCA testimony);

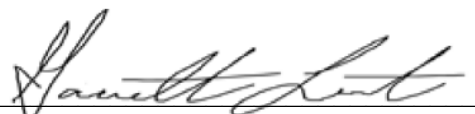
- PPL Electric St. No. 1-R, p. 22, lines 10-22, p. 23, lines 23, p. 24, lines 1-4 (describing the Company's method for cost allocation in response to OCA testimony);
- PPL Electric St. No. 1-R, p. 24, lines 6-20, p. 25, lines 1-21, p. 26, lines 1-4 (discussing cost allocation precedent in response to OCA testimony);
- PPL Electric St. No. 5-R, p. 11, line 19 through p. 38, lines 20 (responding to OCA testimony concerning transmission rates and cost allocation in transmission rates);
- PPL Electric St. No. 5-R, p. 38, line 22, through p. 52, line 8 (responding to OCA testimony concerning large load tariff issues and recommendations);
- PPL Electric St. No. 5-R, p. 52, line 10, through p. 55, line 16 (responding to OCA testimony concerning resource adequacy and other federal and statewide policy issues);
- PPL Electric St. No. 6-R (responding to OCA testimony on transmission rates, concerning the difference between transmission and distribution rates, the calculation of transmission rates, and the projected impact of the Project on transmission rates);
- PPL Electric St. No. 1-RJ, p. 4, line 9 through p. 5, line 13, p. 6, lines 3-21 (summarizing the out of scope testimony and recommendations offered by OCA witnesses);
- PPL Electric St. No. 1-RJ, p. 7, lines 2-24, p. 10, lines 16-23, p. 11, lines 1-2, p. 12, lines 1-20, p. 13, lines 1-23, p. 14, lines 1-4, p. 15, lines 16-22 (responding to OCA surrebuttal regarding cost allocation in FERC-jurisdictional transmission rates);
- PPL Electric St. No. 5-RJ, p. 6, line 1 through p. 12, line 2 (responding to OCA testimony regarding federal and statewide policy issues);
- PPL Electric St. No. 5-RJ, p. 12, line 4 through p. 15, line 13 (responding to OCA testimony regarding large load tariff issues and related federal policy); and
- PPL Electric St. No. 5-RJ, p. 15, line 15 through page 23, line 23 (responding to OCA testimony regarding FERC-jurisdictional cost allocation issues).

III. CONCLUSION

WHEREFORE, PPL Electric Utilities Corporation respectfully requests that Administrative Law Judges Erin L. Gannon and John M. Coogan sustain its Objections, grant its Motion to Strike, and enter the proposed Order attached hereto as Appendix A and strike the portions of the identified portions of the written testimony described above and identified in the proposed Order and Exhibits A and B thereto.

Respectfully submitted,

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Date: September 14, 2026

Attorneys for PPL Electric Utilities Corporation

APPENDIX A

PROPOSED ORDER GRANTING MOTION TO STRIKE

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of PPL Electric	:	
Utilities Corporation, Filed Pursuant to 52	:	
Pa. Code Chapter 57 Subchapter G, For	:	
Approval to Build Approximately 1.1	:	Docket No. A-2025-3059443
Miles of New Parallel Double Circuit 230	:	
kV Transmission Taps that are Needed to	:	
Connect the Existing Susquehanna-	:	
Harwood #1 & #2 Transmission Lines to	:	
the New Tomhicken 230 kV Switchyard	:	
that are Respectively Located in Luzerne	:	
County, Pennsylvania	:	

ORDER GRANTING MOTION TO STRIKE

Upon consideration of the Motion of PPL Electric Utilities Corporation (“PPL Electric”) to Strike Certain Portions of the Office of Consumer Advocate’s (“OCA”) testimony:

IT IS ORDERED THAT:

1. The Motion is hereby GRANTED.
2. That the portions of OCA’s testimony concerning transmission rates, including their allocation and recovery, are hereby stricken, as set forth in **Exhibit A**.
3. That the portions of OCA’s testimony concerning matters of federal and statewide large load policy are hereby stricken, as set forth in **Exhibit A**.
4. That the portions of OCA’s testimony recommending changes to PPL Electric’s Commission-approved tariff are hereby stricken, as set forth in **Exhibit A**.
5. That the portions of PPL Electric’s testimony responding to the OCA testimony stricken in **Exhibit A** are hereby stricken, as set forth in **Exhibit B**.

Dated: _____

Honorable Erin L. Gannon
Administrative Law Judge

Honorable John M. Coogan
Administrative Law Judge

Exhibit A

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of PPL Electric :
Utilities Corporation Filed Pursuant to 52 Pa. :
Code Chapter 57 Subchapter G, for Approval :
to Build Approximately 1.1 Miles of New : Docket No.: A-2025-3059443
Parallel Double Circuit 230 kV :
Transmission Taps that are Needed to :
Connect the Existing Susquehanna-Harwood :
#1 & #2 Transmission Lines on the New :
Tomhicken 230 kV Switchyard that are :
Respectively Located in Luzerne County, :
Pennsylvania :

DIRECT TESTIMONY

OF

Frank A. Felder, Ph.D.

On behalf of the

PENNSYLVANIA OFFICE OF CONSUMER ADVOCATE

Date Served: July 8, 2026

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Introduction

Q. Please state your name and business address.

A. My name is Frank A. Felder, and my business address is 1855 Saint Francis Street, #1612, Reston, VA, 20190.

Q. By whom are you employed and in what capacity?

A. I am a Principal at Independent Electricity Consultants LLC.¹

Q. What is the purpose of your testimony in this case?

A. The purpose of my testimony is to identify and describe the applicable public policy issues of reliability and affordability in this matter and how they can be addressed in the context of the interconnection of large loads to the electric power system. I am providing testimony at the request of the Pennsylvania Office of Consumer Advocate (“OCA”).

Q. Have you previously provided testimony before the Pennsylvania Public Utility Commission?

A. I have not previously provided testimony before the Pennsylvania Public Utility Commission (“Commission”).

Q. What are your qualifications to provide this testimony in this case?

A. I am a long-standing consultant and former professor whose research, teaching, and consulting have centered on the engineering, economics, and public policy of electricity markets in the U.S. and internationally. From 2004 to 2020 I was an Assistant, Associate, and Research Professor of the Bloustein School of Planning and Public Policy, at Rutgers University, New Jersey. I also directed the Center for Energy, Economic and Public Policy and the Rutgers Energy Institute. In both capacities, I led research and teaching initiatives on the power sector including numerous studies for the New Jersey Board of Public

¹ <https://www.independentelectricityconsultants.com/>.

1 Utilities. As a consultant, I have advised every sector of the power industry – utility
2 generation, independent power producers, Regional Transmission
3 Organizations/Independent System Operators (“RTOs/ISOs”), transmission utilities, non-
4 utility transmission developers, distribution utilities, retail load aggregators/electric
5 generation suppliers, public utility commissions, and federal and state government
6 agencies on the topics of reliability, electricity markets and regulation, electricity policy,
7 and economic development. I also have extensive international experience in electricity
8 markets and in training industry professionals.

9 Since April 2024, I have been engaged by the OCA to assist it with its filings for
10 the Commission’s Distributed Energy Resource and Large Load Model Tariff
11 proceedings.² Since August 2025, I have also been engaged by the OCA on matters relating
12 to large loads and the PJM Interconnection (“PJM”), the power system operator, wholesale
13 market administrator, and transmission planner for the Mid-Atlantic region, which includes
14 Pennsylvania.³ I have been involved in PJM’s several and extensive stakeholder processes
15 since September 2025 aimed at addressing the challenges large loads pose to the bulk
16 power system (generation and transmission) and wholesale electricity markets.

17 I hold a Ph.D. in Technology, Management, and Policy and a master’s in science in
18 Technology and Policy from the Massachusetts Institute of Technology, and a bachelor’s
19 in science in applied mathematics and a bachelor’s in arts in mathematics from Columbia
20 University.

21 Please see Exhibit 1, Frank A. Felder, curriculum vitae, for additional information.

² Pennsylvania Public Utility Commission, Distributed Energy Resources Participation in Wholesale Markets, Docket No. L-2023-3044115, and Pennsylvania Public Utility Commission, Interconnection and Tariffs for Large Load Customers, Docket No. M-2025-3054271.

³ <https://www.pjm.com/about-pjm>.

Q. Have you prepared Exhibits to accompany your testimony?

A. Yes. Exhibit 1 is my curriculum vitae.

Summary

Q. Please summarize your conclusions and recommendations.

A. I find the following:

Matters of Fact

1. The massive and rapid build-out of data centers and AI facilities is resulting in substantial ongoing and expected increases in electricity demand in Pennsylvania and the Mid-Atlantic region.
2. This ongoing and expected increase in electricity demand risks reductions in the reliability of the electric power system.
3. This ongoing and expected increase in electricity demand is shifting the electricity-related costs caused by large loads to ordinary ratepayers.
4. Federal and Pennsylvania policies affirm that large loads should not reduce the reliability of the electric power system.
5. Federal and Pennsylvania policies are that large loads pay for their costs, not ordinary ratepayers.
6. The PPL Electric Utilities Corporation (“PPL”) electric distribution tariff does not have provisions that protect non-large load ratepayers from the reliability reductions and cost shifting that federal and Pennsylvania policies are aimed at preventing.

Matters of Policy

7. There is a policy gap between federal and Pennsylvania policies and the PPL tariff.

- 1 8. [REDACTED]
- 2 [REDACTED]
- 3 a. [REDACTED]
- 4 b. [REDACTED]
- 5 c. [REDACTED]
- 6 d. [REDACTED]
- 7 [REDACTED]
- 8 e. [REDACTED]
- 9 f. [REDACTED] t
- 10 9. [REDACTED]
- 11 [REDACTED]

I. Description of the Proposed Project and Issues

Q. Please summarize your understanding of proposed project.

A. PPL submitted a Letter of Notification (“LON”) requesting that the Commission approve the construction of approximately 1.1 miles of new double-circuit 230 kilovolt (“kV”) transmission taps (“Tap Lines”) that are needed to connect the existing Susquehanna-Harwood #1 & #2 230 kV Transmission Lines to the new Tomhicken 230 kV Switchyard (the “Project”).⁴ The Project also includes the construction of two new 0.1-

⁴ Letter of Notification of PPL Electric Utilities Corporation Filed Pursuant to 52 Pa. Code Chapter 57 Subchapter G, for Approval to Build Approximately 1.1 Miles of New Parallel Double Circuit 230 kV Transmission Taps that are Needed to Connect the Existing Susquehanna-Harwood #1 & #2 Transmission Lines on the New Tomhicken 230 kV Switchyard that are Respectively Located in Luzerne County, Pennsylvania, Docket No. A-2025-3059443, June 15, 2026. Hereafter “LON”.

1 mile-long 230 kV transmission lines (“Connecting Lines”) from the Tomhicken 230 kV
2 Switchyard to a new customer-owned 230-34 kV substation.⁵

3 **Q. What is the stated immediate need for the Project?**

4 A. PPL submits that the Project is immediately needed to serve one new customer
5 (“New Customer”) based upon its request for 230 kV electrical service by March 2027.
6 According to PPL’s direct testimony, the New Customer’s load ramping schedule will
7 increase in stages from an initial load of 12 megawatts (“MW”) to approximately 276 MW
8 by December 2027, and approximately 965 MW by 2033.⁶ In his direct testimony, Mr. Rao
9 Konidena provides additional information regarding the size and timing of the New
10 Customer’s facility. For the purposes of my testimony, what is critical is that the New
11 Customer’s project is large and phased in over time. My understanding is that this New
12 Customer is a Data Center.

13 **Q. According to PPL, will the Project be needed for future customers?**

14 A. Yes. PPL claims that the Project, along with a second phase (Docket No. A-2026-
15 3061547), will be needed to address both the New Customer’s future needs as well as those
16 of future customers and PPL’s system needs.⁷

⁵ Direct Testimony of Joseph Lookup, Statement No. 1, Docket No. A-2025-3059443, May 13, 2026, page 2, lines 2-9.

⁶ Direct Testimony of Joseph Lookup, Statement No. 1, Docket No. A-2025-3059443, May 13, 2026, page 3, lines 18-23.

⁷ PPL Electric Utilities Corporation, Statement No. 1, Direct Testimony of Joseph Lookup, Statement No. 1, Docket No. A-2025-3059443, May 13, 2026, page 4, lines 5-10.

II. Public Policy Issues

A. Overall Context of Large Loads and Data Centers

Q. Please describe the overall context regarding large loads and data centers in Pennsylvania and the region.

A. Pennsylvania, the region that includes PJM, and the United States are experiencing a dramatic increase in electricity demand driven primarily by new, large loads that are almost exclusively data centers.⁸ The head of Exelon, the largest U.S. utility by customer count, has warned that the U.S. could face blackouts starting in 2027 due to AI and that electricity bill increases are needed to fund new infrastructure.⁹ These large loads are physically connected to an electric distribution company (“EDC”), such as PPL, which is connected to the transmission system that PJM operates. They consume large amounts of electricity and are growing both in size and in number.¹⁰ PJM forecasts summer peak load growth of 3.6% per year for the next 10 years and 2.4% for the next 20 years, resulting in a 10-year increase of 65,733 megawatts (“MW”) and a 20-year increase of 96,704 MW, driven almost exclusively by data centers.¹¹ PJM forecasts approximately 30 gigawatts (“GW”) of new load from data centers between 2025 and 2030.¹² For instance, in May

⁸ NERC, Large Loads Task Force White Paper, Characteristics and Risks of Emerging Large Loads, July 2025, p. 2, <https://www.nerc.com/globalassets/who-we-are/standing-committees/rstc/whitepaper-characteristics-and-risks-of-emerging-large-loads.pdf>, “Emerging large loads have grown substantially in recent history, and forecasts that data centers alone may account for as much as 12% of all U.S. electricity consumption by 2028 (up from 4.4% in 2023).”
⁹ Martha Muir, Financial Times, Utility boss warns US faces blackouts due to power supply shortfall, June 27, 2026, <https://www.ft.com/content/14d2e591-7cd5-4456-904f-1b7fdc5cbc1a?syn-25a6b1a6=1>.

¹⁰ McKinsey & Company, Scaling bigger, faster, cheaper data centers with smart designs, August 1, 2025, <https://www.mckinsey.com/industries/private-capital/our-insights/scaling-bigger-faster-cheaper-data-centers-with-smarter-designs>.

¹¹ PJM, 2026 PJM Load Forecast Report, January 14, 2026, p. 6, <https://www.pjm.com/-/media/DotCom/library/reports-notices/load-forecast/2026-load-report.pdf>. See also Modo Energy, Data centers define PJM’s 2046 load forecast, undated, <https://modoenergy.com/research/en/pjm-load-forecast-data-centers-2046>.

¹² PJM Inside Lines, 2025 Year in Review: Planning Prepares for Burgeoning Electricity Demand, January 8, 2026, <https://insidelines.pjm.com/2025-year-in-review-planning-prepares-for-burgeoning-electricity-demand/>. Also see Modo Energy, Data centers define PJM’s 2046 load forecast, undated, <https://modoenergy.com/research/en/pjm-load-forecast-data-centers-2046>, which, using PJM data, finds “The large load component, principally data center

2026, PPL announced that its data center pipeline had increased to 28.3 gigawatts (“GW”) by 2034 up from 25.2 GW three months earlier.¹³ As a point of comparison, 1 GW, which is the equivalent of 1,000 MW, is the size of a very large power plant. As another point of comparison, PJM’s peak demand in 2025 was 161 GW.¹⁴

For ease of explanation, I use the term *large load* generically to refer to data centers and AI facilities. I recognize that there are more specific definitions of large loads used by different organizations. Where appropriate, I refer to those specific definitions and use the capitalized term *Large Load*.

Q. What are the public policy challenges related to the electric power system due to the rapid and substantial deployment of large loads?

A. Large loads can contribute to national security and economic development. Their public acceptability, presumably, depends, in part, on the ability to address two key public policy issues: reliability and affordability.¹⁵

additions, accounts for more than 100% of peak demand growth over the next five years as base demand contracts. PJM’s large load adjustments grow by 35.1 GW between 2026 and 2031, against total demand growth of 34.6 GW. Beyond 2031, the balance shifts slightly. The base layer begins to contribute and data center additions decelerate, but remain dominant.”

¹³ Ethan Howland, Utility Dive, PPL ‘advanced’ data center pipeline grows to 28.3 GW in Pennsylvania, May 11, 2026, <https://www.utilitydive.com/news/ppl-data-center-pipeline-pjm-blackstone-earnings/819804/>. See PPL Electric Utilities Corporation, Response to the Set II Data Requests of the Office of Consumer Advocate (OCA), Docket No. A-2025-3059443, Joseph B. Lookup, OCA II-8, March 27, 2026, “Large load adjustments, per the 2026 PJM Load Report is as follows: 2026: 189 MW, 2027: 394 MW, 2028: 1,274 MW, 2029: 1,876 MW, 2030: 4,996 MW. PJM issues the load report, which includes the large load adjustments, based on utility. To the extent that “organic load growth” means non-large load customer load growth, the Company is not anticipating any significant load growth over the next five years.”

¹⁴ PJM, Summer 2025 Weather Normalized RTO Coincident Peaks (MW), November 4, 2025, <https://www.pjm.com/-/media/DotCom/planning/res-adeq/load-forecast/summer-2025-peaks-and-5cps.pdf?ref=blog.gridstatus.io>.

¹⁵ Rachel Mural, Dipesh Pherwani, Chaitanya Gupta, Yiqi Yu, Ai Takahashi, Dongjoo Kim, Subir Majumder, Henry Lee, Minlan Yu, and Le Xie, AI, Data Centers, and the U.S. Electric Grid: A Watershed Moment, February 2026, p. 2, https://www.belfercenter.org/sites/default/files/2026-02/Mural%20et%20al_AI%20Data%20Centers%20Grid_20260206.pdf, “While overregulation could hinder AI development, insufficient regulation risks grid instability, rising consumer costs, reliance on high-emission energy sources, public backlash, and setbacks to state and corporate climate goals.”

Regarding reliability, if large loads are added to the electric power system without sufficient new supply to serve them or without meaningful policies to curtail their electricity consumption during times of supply shortages, then the reliability, specifically the resource adequacy, of the system will be degraded.¹⁶ This degradation could result in mandatory load shedding of ordinary ratepayers, such as residential customers. As more load is added to PJM that is not sufficiently supplied or curtailable, the frequency, magnitude, and duration of potential mandatory load-shedding events increase.

The second public policy challenge is affordability. The rapid connection of massive amounts of large loads has the potential to increase wholesale market prices for energy, capacity, and ancillary services,¹⁷ and increase transmission and distribution rates. With proper transmission and distribution rate design, however, it is possible (but not guaranteed) to protect non-large load customers from transmission and distribution rate

¹⁶ See PPL Electric Utilities Corporation, Response to the Set II Data Requests of the Office of Consumer Advocate (OCA), Docket No. A-2025-3059443, Joseph B. Lookup, OCA II-23, March 27, 2026, “Resource adequacy is required for Electric Distribution Companies (“EDCs”) to provide reliable service, however, EDCs cannot own generation to ensure resource adequacy.” The Necessity Statement, Attachment 1 to the LON, on page 5, states the following: “PJM then studies the proposed solution to ensure that the changes do no harm (DNH test) to the system by creating overloads, voltage violations, or other criteria violations.”

NERC, Large Loads Task Force White Paper, Characteristics and Risks of Emerging Large Loads, July 2025, p. 16, <https://www.nerc.com/globalassets/who-we-are/standing-committees/rstc/whitepaper-characteristics-and-risks-of-emerging-large-loads.pdf>. Large loads also have important implications for operational reliability. Operational reliability is the ability of the electric power grid to withstand the sudden outages of large power plants or transmission facilities by maintaining grid stability without resulting in load curtailments. See NERC, NERC Issues Level 3 Alert, Reliability Guideline Focused on Large Load Challenges, May 4, 2026, <https://www.nerc.com/newsroom/nerc-issues-level-3-alert-reliability-guideline-focused-on-large-load-challenges>.

¹⁷ Monitoring Analytics (the PJM Independent Market Monitor), 2026 Quarterly State of the Market Report for PJM: January through March, p. 20, May 14, 2026, https://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2026/2026q1-som-pjm.pdf, finds that comparing the first quarter of 2025 to the first quarter of 2026, energy prices have increased 78.5%, capacity prices 398.1%, ancillary service prices 69.0%, and transmission 5.3%. The report further states on p. 2, “Data center load growth is the primary reason for recent and expected capacity market conditions, including total forecast load growth, the tight supply and demand balance, and high prices.” Monitoring Analytics, 2025 State of the Market Report, Volume 1: Introduction, March 12, 2026, p. 18, https://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2025/2025-som-pjm-vol1.pdf, finds that energy prices have increased 47.3%, capacity prices 252.0%, ancillary service prices 16.8%, and transmission 1.8%.

increases, and perhaps even lower them. In addition to protecting ratepayers from higher costs due to large loads, ratepayers should be protected from stranded costs, that is, the costs that ratepayers end up paying because large loads did not interconnect at the time and amount that were forecasted or halted service prematurely. The result is stranded assets – generation, transmission, and distribution facilities. When this occurs, EDCs, such as PPL, do not receive the expected payment from large loads and then attempt to recover their costs from ordinary ratepayers. Increasing electricity rates through cost shifting from large loads to ordinary ratepayers, whether directly due to large loads or due to the risk of stranded costs, is an affordability issue, particularly given the challenges that almost 20% of Pennsylvanian families have in paying their utility bills.¹⁸

Q. Is stranded cost a concern with large loads?

A. Yes. As stated from the start of the Commission docket on Interconnection Tariffs for Large Load Customers, protecting customers from stranded costs is the Commission’s primary concern: “First and foremost, the Commission must protect the Commonwealth’s ratepayers. In this case, that means ensuring that if any upgrades are undertaken to enable the interconnection of large loads, they are made with a high degree of ratepayer protection

¹⁸ The Pennsylvania Independent, Pennsylvania lawmakers introduce legislation to lower energy costs, May 1, 2026, <https://pennsylvaniaindependent.com/economy/pennsylvania-lawmakers-introduce-legislation-to-lower-energy-costs/>, reports that electricity shutoffs in the Commonwealth increased about 21% between October 2024 and October 2025 and one in five households have difficulty in paying their utility bills. See also, CAUSE-PA, Distributed Energy Resources Participation in Wholesale Markets, Chapter 57 Docket No., L-2023-3044115, June 9, 2026, p. 3, <https://www.puc.pa.gov/pdocs/1934550.pdf>, “Pennsylvania is experiencing these same trends. Energy insecurity impacts roughly 1 in 4 Pennsylvania households. According to the latest United States Census Bureau Household Pulse Survey, around 24.4 percent of Pennsylvania households could not afford their home energy bills in 2024, compared to 23 percent nationwide. And costs are only going up. Over the past year, electric generation prices have skyrocketed across the Commonwealth, driving up residential rates as much as 40 percent in some service areas. Hundreds of thousands of Pennsylvania families pay more than 10 percent of their household income on home energy costs, with many facing energy burdens of 30 percent or higher. In 2025, nearly 390,000 Pennsylvania households faced involuntary termination of electric or gas service—a 10 percent increase from 2024.”

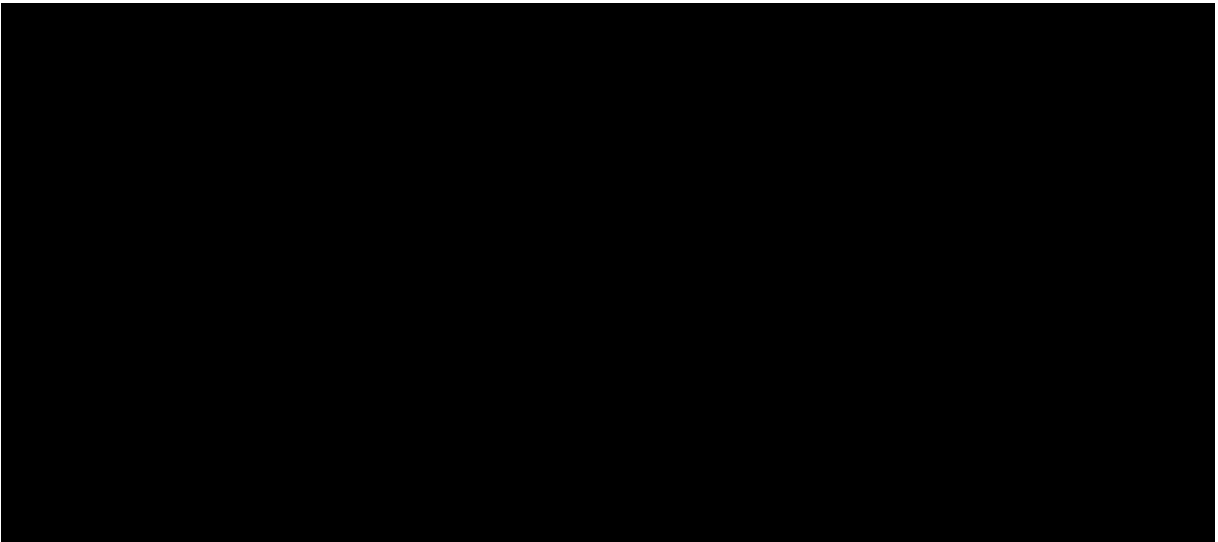
1 against the risk of utility investment for projects that may not materialize. In such cases,
2 questions may arise about who will ultimately bear these stranded costs.”¹⁹

3 **Q. How would you characterize the federal and state policies that are being considered**
4 **and implemented regarding large loads and the electric power system?**

5 A. The federal and state policies regarding large loads and the electric power system
6 are emerging. Both federal and state governments have important roles in ensuring that
7 large loads do not adversely affect the reliability of the electric power system or shift costs
8 to ordinary ratepayers. The federal government, the Federal Energy Regulatory
9 Commission (“FERC”), PJM, the Commonwealth of Pennsylvania, the Pennsylvania
10 Commission, and the data center community all acknowledge the need for and the
11 importance of policies to protect ordinary ratepayers from the potential adverse reliability
12 and cost consequences of rapidly interconnecting massive amounts of large loads to the
13 power system.

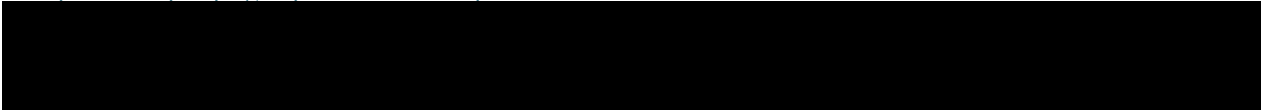
14 **Q. What is the White House’s policy regarding large loads?**

15 A.



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¹⁹ PA PUC, En Banc Hearing Concerning Interconnection and Tariffs for Large Load Customers, Public Meeting of March 27, Agenda No. 3054271-CMR, Motion of Chairman Stephen M. DeFrank, <https://www.puc.pa.gov/pcdocs/1871997.pdf>.



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[REDACTED]

Q. What is the FERC's policy regarding large loads?

A.

[REDACTED]

[REDACTED]

Q. What is the view of the North American Reliability Corporation (NERC) on the impact of large loads on reliability?

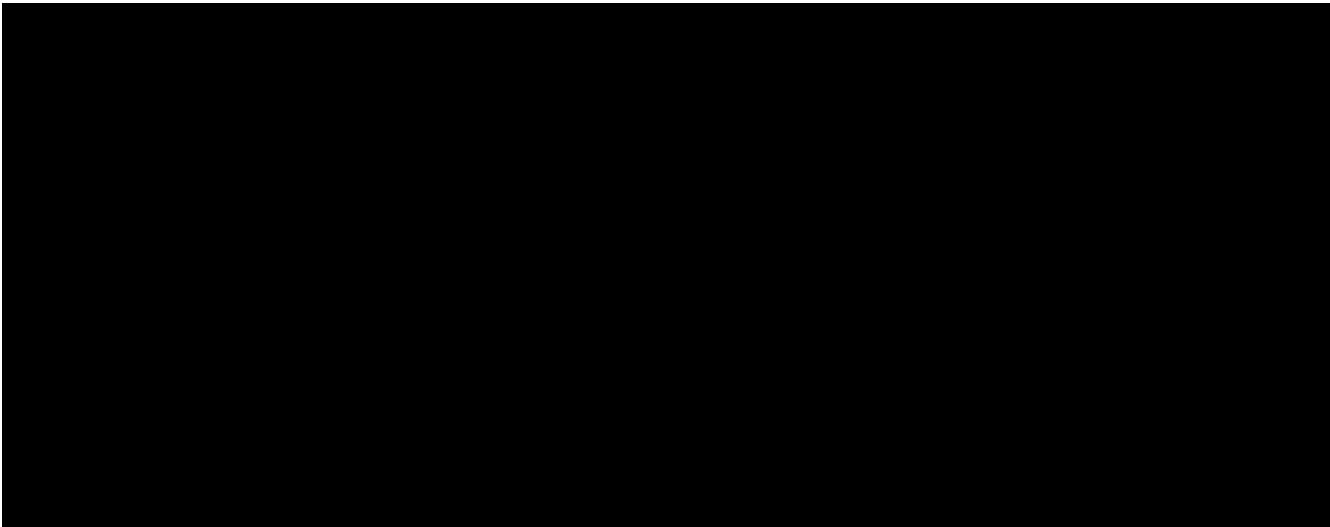
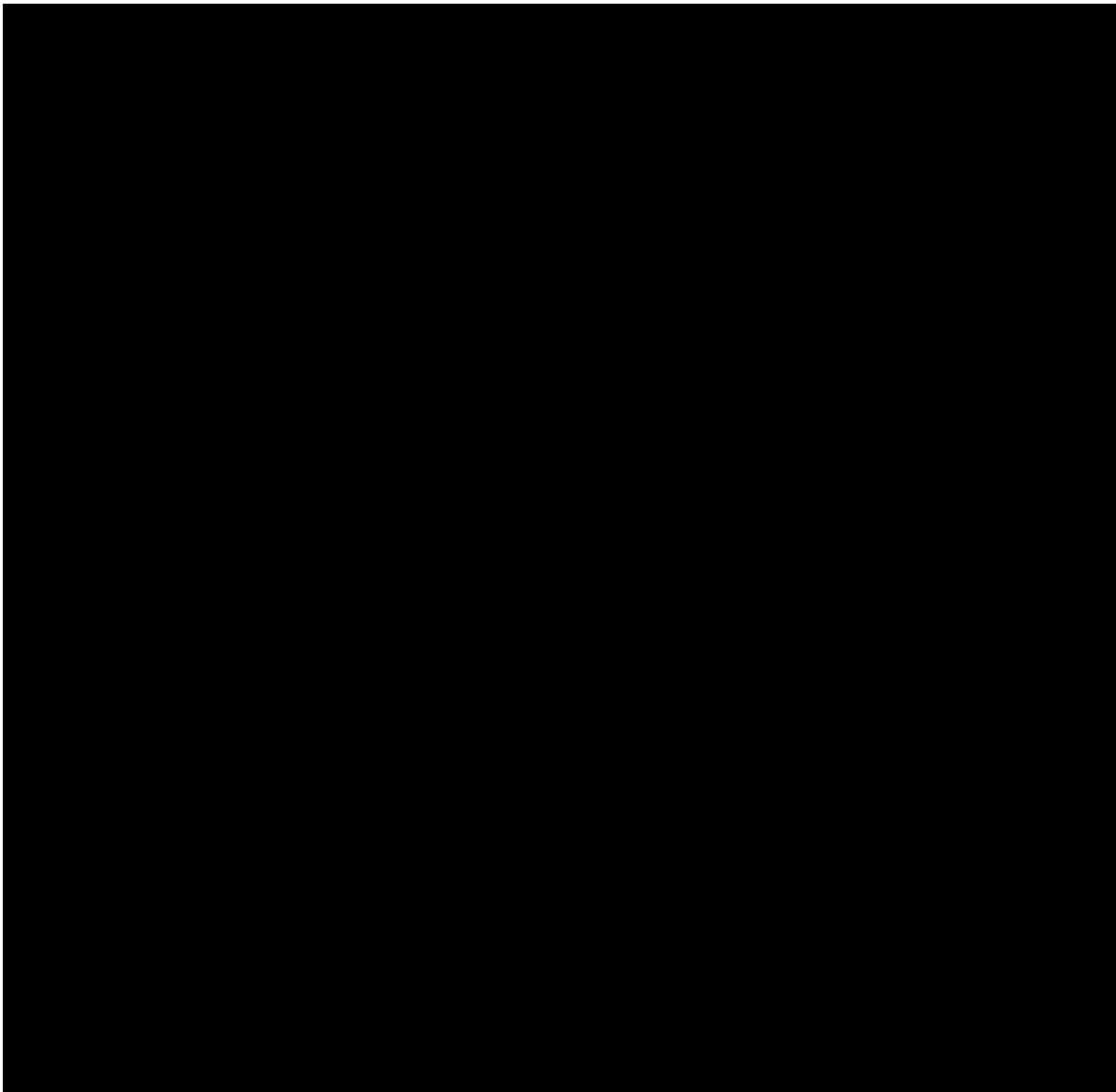
A.

[REDACTED]

[REDACTED]

Q. What is PJM Board of Managers’ policy regarding large loads?

A.



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Q. What is the status of PJM’s efforts to address large loads?

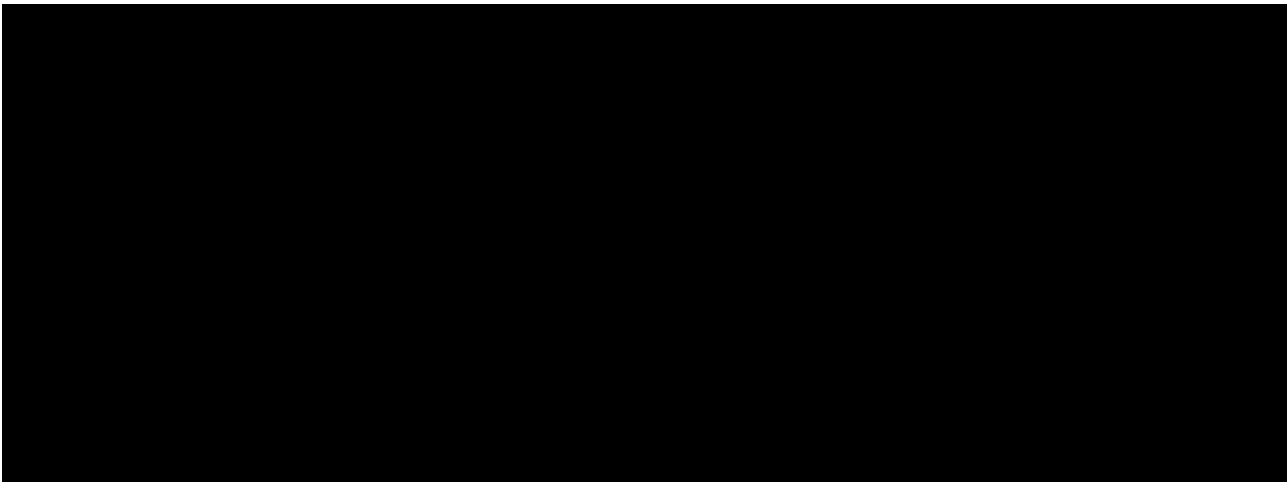
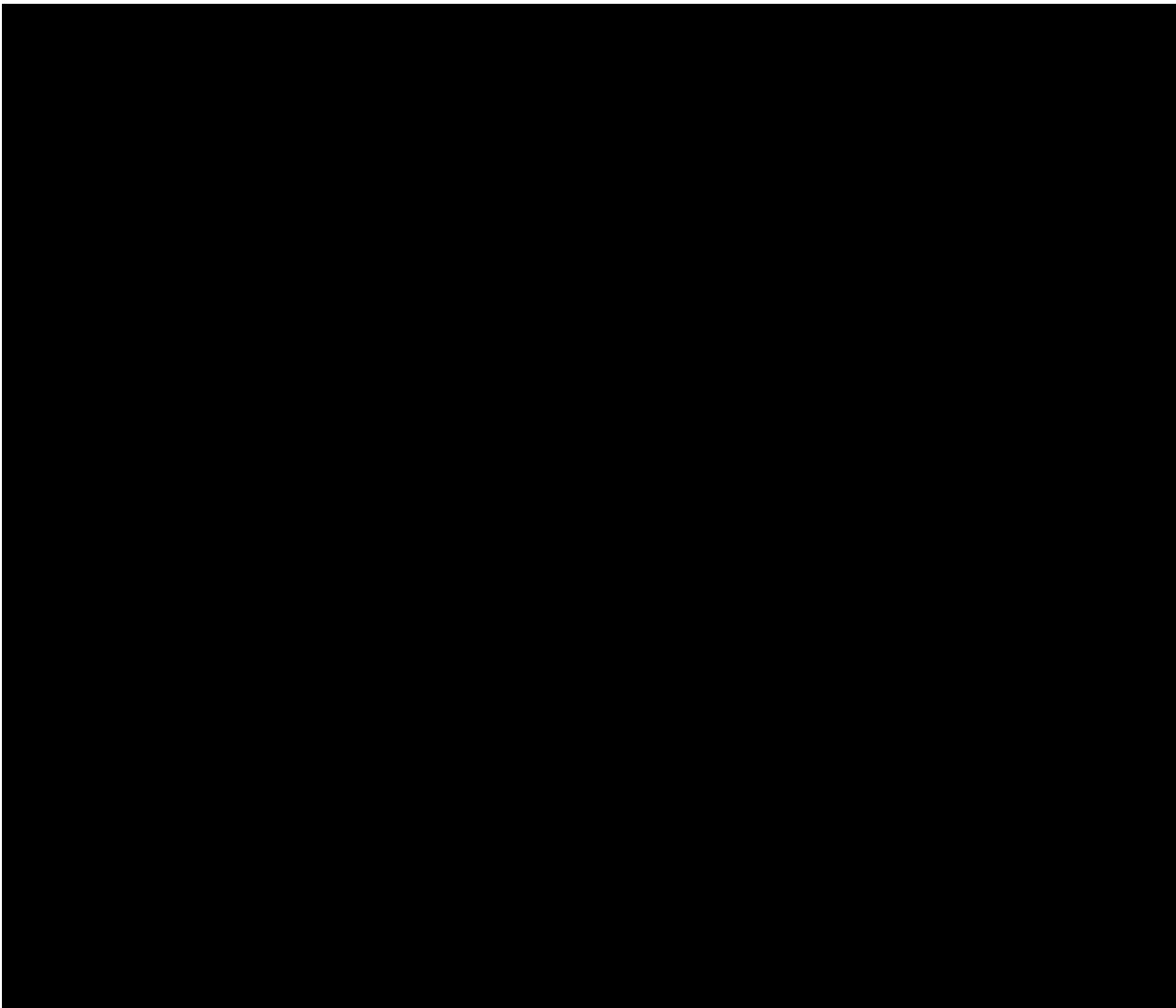
A.

Q. What are the two major concerns with PJM Staff’s RBP and C&M proposals?

A.

Files Price Collar, Expedited Interconnection as Part of Large Load Plan, March 2, 2026, <https://insidelines.pjm.com/pjm-files-price-collar-expedited-interconnection-as-part-of-large-load-plan/>, “Further efforts directed by the Board remain the focus of intensive deliberation among PJM Members and stakeholders as they address longer-term solutions to issues of insufficient power supplies, affordability and grid reliability in the face of extraordinary demand.”

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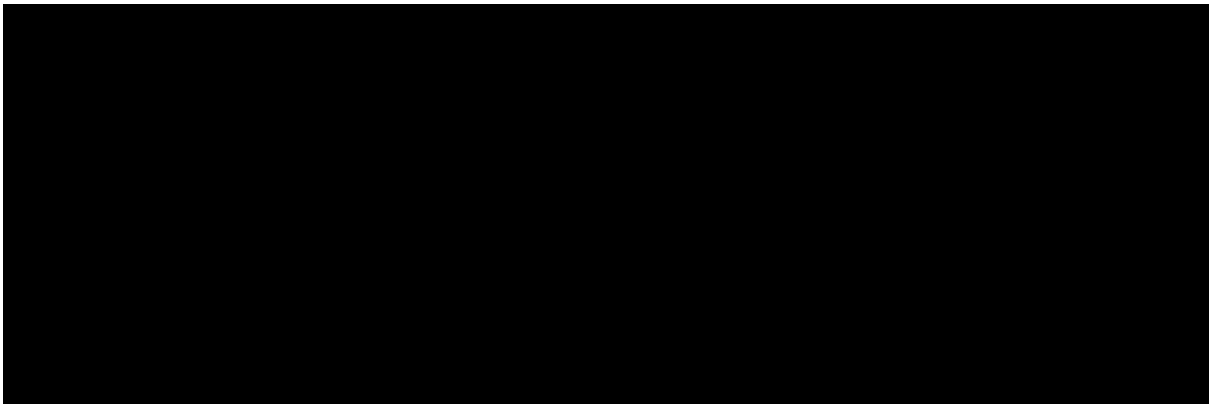
1 **Q. What is the Governor of Pennsylvania’s policy regarding large loads?**

2 A. The Governor’s policy focuses on reliability and affordability. “Governor Shapiro’s
3 ‘all-of-the-above’ energy strategy is focused on diversifying Pennsylvania’s power grid to
4 secure the Commonwealth’s energy future while building more reliable, affordable, and
5 sustainable energy.”³⁷ The policy further states:

6 “In its initial application for GRID certification, a project developer must provide DOR
7 and OTO with an energy plan detailing how it will provide for its energy needs without
8 imposing costs on Pennsylvanians and other utility ratepayers. Developers must agree to
9 build, bring online, or buy incremental electric capacity needed to meet new energy
10 demand while paying the full cost of the capacity. That capacity must generally come from
11 resources located within the same deliverability area as the proposed GRID project, and
12 must also include increasing percentages of energy coming from dispatchable clean firm
13 energy resources located within the Commonwealth, up to 32 percent in 2035. Developers
14 must also pay all costs associated with interconnection, transmission, distribution, network
15 upgrades, ancillary services, or dedicated facilities caused in whole or in part by the
16 project’s electricity demand.”³⁸
17

18 **Q. What is the Pennsylvania Commission’s policy regarding large loads?**

19 A.



³⁷ Commonwealth of Pennsylvania, Governor Shapiro Releases Full Governor’s Responsible Infrastructure Development (GRID) Standards to Protect Pennsylvanians and Establish Strict Guardrails to Hold Data Center Developers Accountable, May 27, 2026, <https://www.pa.gov/governor/newsroom/2026-press-releases/gov-shapiro-releases-full-grid-standards-to-protect-pennsylvania>.

³⁸ Commonwealth of Pennsylvania, Governor Shapiro Releases Full Governor’s Responsible Infrastructure Development (GRID) Standards to Protect Pennsylvanians and Establish Strict Guardrails to Hold Data Center Developers Accountable, May 27, 2026, <https://www.pa.gov/governor/newsroom/2026-press-releases/gov-shapiro-releases-full-grid-standards-to-protect-pennsylvania>. Also, see PAPUC, Interconnection and Tariffs for Large Load Customers, Docket No. M-2025-3054271, Final Order, May 12, 2026, <https://www.puc.pa.gov/pdocs/1929842.pdf>.

B. PPL's Positions and Tariff Create Policy Gaps and Risks to Reliability and Affordability

Q. What is PPL's position regarding the reliability and affordability implications of interconnecting large load customers?

A. PPL's position is that it is not responsible for the reliability and affordability implications of large loads. PPL has not determined whether the New Customer, or its suppliers, is bringing its own new capacity; what the New Customer's impact on resource adequacy, energy, capacity, and ancillary costs is; or whether the New Customer is compliant with the White House Ratepayer Protection Pledge.⁴² PPL's tariff is silent on all these issues, as well.

PPL claims that it "has an obligation to provide non-discriminatory service to existing and new customers."⁴³ PPL does not provide any further explanation of how to apply its obligation to serve in a situation when there are insufficient supply to meet demand, such as the situation that presently exists in PJM and is likely to persist and increase over time.

Joseph B. Lookup, Response to the Set X Data Requests of the Office of Consumer Advocate (OCA), Docket No. A-2025-3059443, May 21, 2026, OCA X-1 (a), (g), (h), and (i).

⁴³ Joseph B. Lookup, Response to the Set X Data Requests of the Office of Consumer Advocate (OCA), Docket No. A-2025-3059443, May 21, 2026, OCA X-1 e.

In my opinion, by interconnecting new large loads without ensuring that they or their suppliers have sufficient new supplies and reserves to maintain resource adequacy, PPL's practice creates three risks for PPL's existing customers: (1) to experience a degradation in service reliability, (2) to pay increased wholesale electricity costs, and (3) by interconnecting new large loads without ensuring appropriate transmission cost allocation PPL's practice creates avoidable cost shifting from large loads to ordinary ratepayers. These three risks can be largely mitigated or avoided.

Q. Please further explain the reliability and cost risks that you identify above.

A. In Section II.A. above, I observed that data centers are the predominant driver of new large load interconnection requests and differ materially from legacy large load customers in scale, pace of development, and operational characteristics.⁴⁴ As customers, data centers present unique risks to reliable electric utility service due to their large peak demands high load factors, and development uncertainty. Data centers also materially influence transmission and generation planning outcomes by requiring large amounts of new generation and transmission facilities to serve them.⁴⁵ Data centers also will increase costs for bulk grid services and present unique cost-shifting risks to existing customers if

⁴⁴ Rachel Mural, Dipesh Pherwani, Chaitanya Gupta, Yiqi Yu, Ai Takahashi, Dongjoo Kim, Subir Majumder, Henry Lee, Minlan Yu, and Le Xie, AI, Data Centers, and the U.S. Electric Grid: A Watershed Moment, February 2026, p. 2, https://www.belfercenter.org/sites/default/files/2026-02/Mural%20et%20al_AI%20Data%20Centers%20Grid_20260206.pdf, "In July 2024, a voltage fluctuation in northern Virginia triggered the simultaneous disconnection of 60 data centers, prompting a 1,500-megawatt (MW) power surplus, which forced emergency adjustments to prevent cascading outages." The report states, on page 5,

"Data centers use large, steady electricity loads with limited ability to reduce (or ramp down) their power usage; simultaneously, their energy demand can fluctuate according to equipment usage and job complexity."

⁴⁵ See, for example, State of Maryland Office of People's Counsel, PJM Transmission Cost Impacts on Electricity Customers in Maryland An Overview of PJM Transmission Planning and Costs, March 2026, p. 1, <https://opc.maryland.gov/Portals/0/Files/Publications/Rising%20Transmission%20Costs%202026-03-25%20CORRECTED%20FINAL.pdf>, which finds that PJM may assign Maryland ratepayers an additional \$5.4 billion in new capacity costs between 2031 and 2035. See also, Union of Concerned Scientists, New UCS Analysis Reveals Billions of Dollars in Unreported Data Center Costs Passed onto PJM Customers, September 29, 2025, <https://www.ucs.org/about/news/billions-dollars-unreported-data-center-costs-pjm>, states "A new analysis by the Union of Concerned Scientists (UCS) reveals how millions of people across Illinois, Maryland, New Jersey, Ohio, Pennsylvania, Virginia and West Virginia are footing the bill for an additional \$4.3 billion in electricity infrastructure projects approved in 2024 solely to connect wealthy private companies' data centers."

interconnection and service proceed without adequate customer protection mechanisms.⁴⁶
PPL is forecasting a significant quantity of new data center customers in its service
territory.

Q. Please explain your statement that these risks can be mitigated?

A. The risks can be mitigated by PPL because PPL controls the interconnection of
these new data center customers and controls the terms and conditions of their
interconnection, subject to its Commission-approved distribution tariff. Also, the risk can
be mitigated by PPL putting into place appropriate rules at the distribution tariff level that
protect ordinary ratepayers from the unique reliability and costs risks created by new data
centers.

Q. Please explain why you believe the PPL tariff is relevant to your opinion in this case?

A. Based on the way PPL has structured its retail tariff and interconnection policies,
the data center seeking to interconnect PPL's distribution system cannot do so unless and
until the high-voltage transmission infrastructure is sited and constructed.⁴⁷ Thus, the two
go together: data centers interconnect to PPL's distribution system and the regional bulk
power grid at the same time. It is, of course, an engineering necessity that for the data center
to be able to receive power from PPL's distribution facilities, those facilities must be
connected to the transmission system and the rest of PJM. The rules and regulations of

⁴⁶ Rachel Mural, Dipesh Pherwani, Chaitanya Gupta, Yiqi Yu, Ai Takahashi, Dongjoo Kim, Subir Majumder, Henry Lee, Minlan Yu, and Le Xie, AI, Data Centers, and the U.S. Electric Grid: A Watershed Moment, February 2026, p. 2, https://www.belfercenter.org/sites/default/files/2026-02/Mural%20et%20al_AI%20Data%20Centers%20Grid_20260206.pdf, "While overregulation could hinder AI development, insufficient regulation risks grid instability, rising consumer costs, reliance on high-emission energy sources, public backlash, and setbacks to state and corporate climate goals."

⁴⁷ PPL Retail Distribution Tariff, Supplement No. 2 to Electric Pa. P.U.C. No. 202 at Original Page 35C ("This Rate Schedule is for large general service supplied from available lines of 69,000 volts or higher to large load (data center) customers...").

1 interconnection are governed by PPL's tariff subject to the Commission's oversight and
2 approval.⁴⁸ Data center impacts, while reflected upstream in transmission and generation

3 [REDACTED]
4 [REDACTED]
5 [REDACTED]
6 [REDACTED]
7 [REDACTED]
8 [REDACTED]

9 **Q. Would you recommend that the Commission incorporate additional customer**
10 **protection measures into PPL's tariff to the extent that it can do so without exceeding**
11 **the scope of its jurisdiction?**

12 **A.**

13 [REDACTED]
14 [REDACTED]
15 [REDACTED]
16 [REDACTED]
17 [REDACTED]
18 [REDACTED]
19 [REDACTED]

20 **Q. What is PPL's position regarding transmission upgrade costs incurred for**
21 **interconnecting large load customers?**

22 **A.**

23 [REDACTED]

[REDACTED]

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[REDACTED]

Q. What do you mean when you talk about PPL’s discretion to determine network upgrades and how to recover the costs of network upgrades?

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[REDACTED]

[REDACTED]

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[Redacted]

Q. Can you please expand on this discretion discussion?

A.

[Redacted]

Q. Have the OCA and FirstEnergy recently addressed this discretion before FERC, and if so, how does this relate to this proceeding?

A.

[Redacted]

[Redacted]

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Q. In your opinion, what would an Expansion Rate Policy achieve?

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Q. Should the Commission require PPL’s tariff to require PPL and the data center large load customer to enter a negotiated rate structure to pay for the expansion rate facilities where such agreement protects PPL’s existing customers and protects PPL’s and the data center’s rights under FERC ratemaking requirements?

A.

Q. What is PPL’s position regarding new PJM costs assigned or allocated to PPL related to interconnecting large load customers?

A. PPL’s tariff is silent regarding new PJM costs assigned or allocated to PPL related to interconnecting large load customers. This means PPL’s tariff is silent regarding RBP (Reliability Backstop Procurement) obligations.

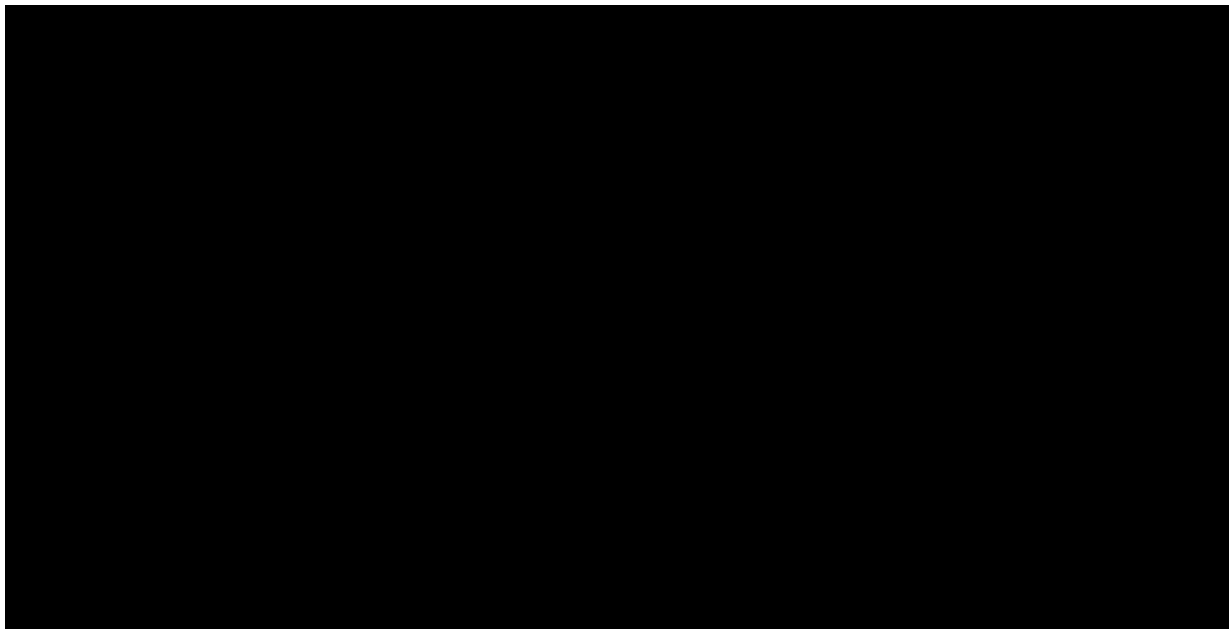
Q. Based upon your synopsis of federal, PJM, and state policies and PPL’s position regarding large load, in your opinion, is there a gap in policy related to large loads, reliability, and affordability?

A. Yes, in my opinion, a policy gap exists between the aspirations of federal and state policy and PPL’s tariff. Federal and state policies are adamant that new large loads should not cause reliability problems or impose any costs on ordinary ratepayers. As just indicated by PPL’s positions on the issues of costs impacts and reliability impacts, its tariff does not have provisions that fill this gap.⁵⁹

C. Addressing the Policy Gap Between Federal and State Goals and PPL’s Retail Tariff and Addressing the Increased Risks to Reliability and Affordability through PPL’s Retail Tariff

Q. What do you propose to fill the gap between federal and state goals and PPL’s Tariff?

A.



⁵⁹ See Energy Systems Integration Group’s Large Load Task Force, Interconnection Processes for Large Loads: Current Practices and Recommendations, June 2026, p. xi, <https://www.esig.energy/wp-content/uploads/2026/06/ESIG-Large-Loads-Interconnection-Process-report-2026a.pdf>, which notes in general the “lack of clarity around regulatory authority over large load interconnection standards and procedures” and the need for “coordination between independent system operators (ISOs) and regional transmission organizations (RTOs) and utilities.”

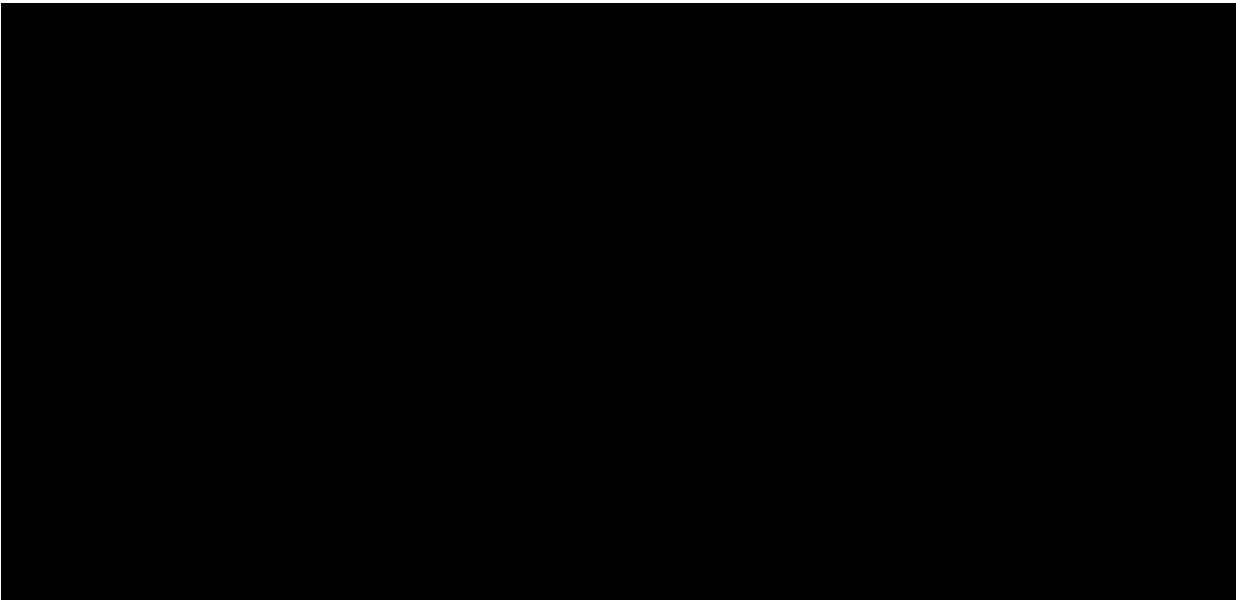
Q. Please describe the Large Load Registry and how it helps to ensure reliability and avoid cost shifting.

A.

[Redacted]

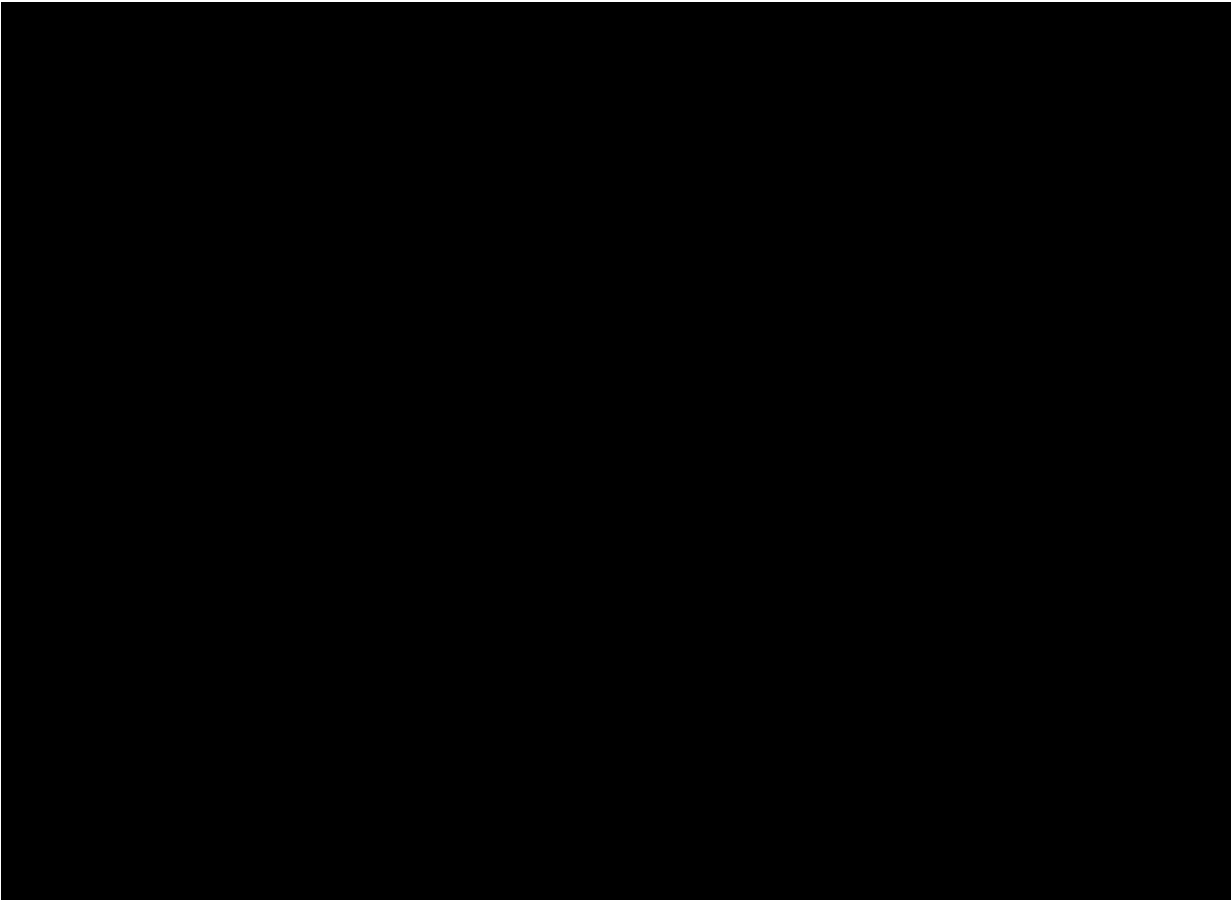
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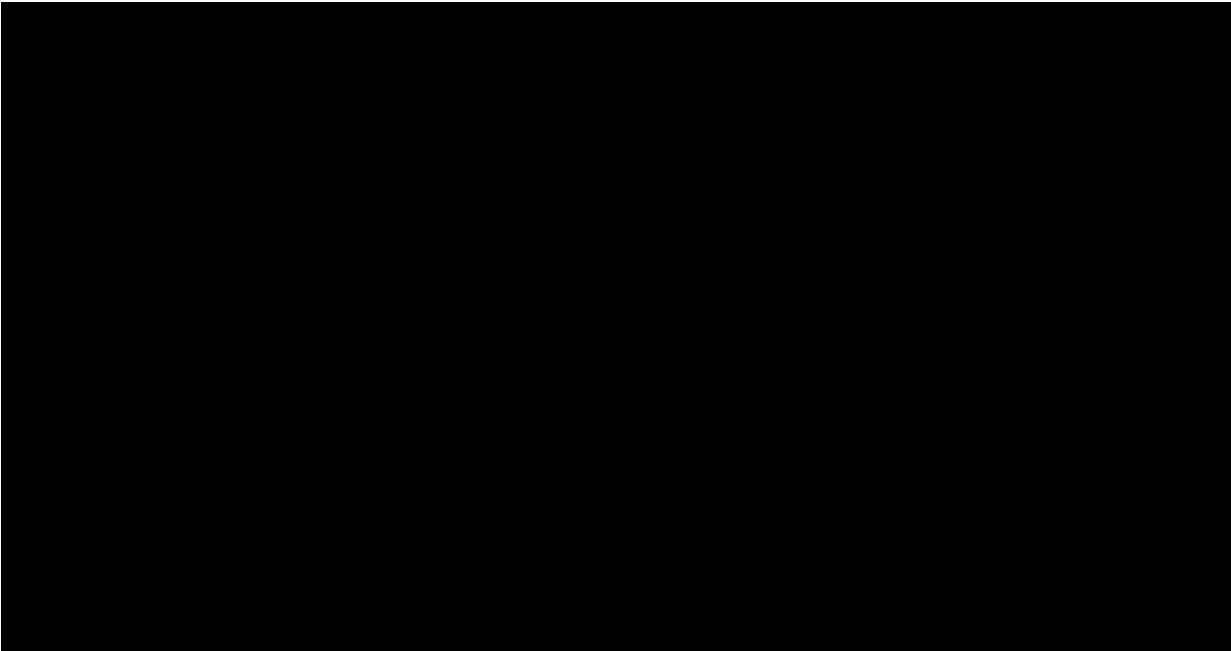


Q. Please describe your proposal regarding supply requirements for Large Loads.

A.



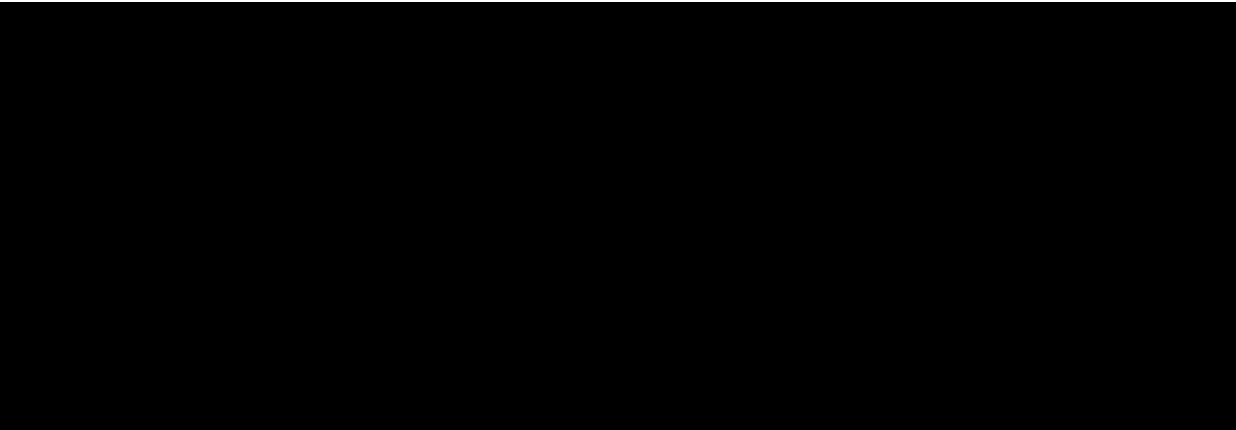
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10 **Q. Please describe your proposal regarding PJM’s Reliability Backstop Procurement**
11 **proposal.**

12 A.

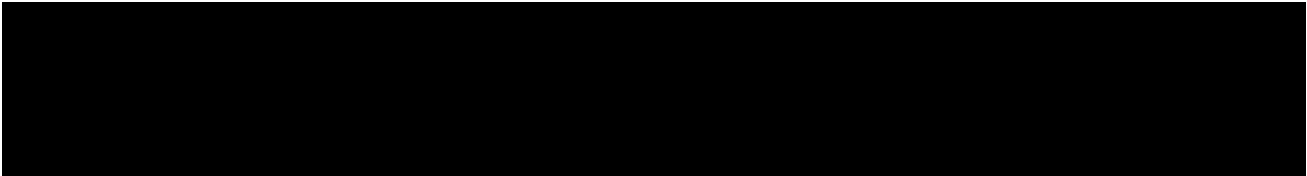
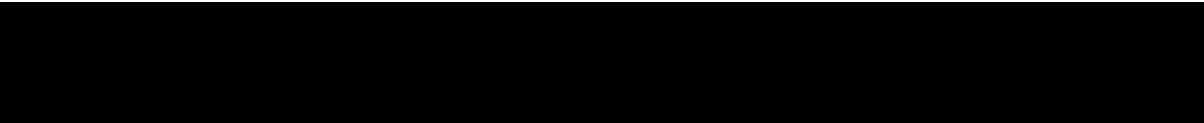
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18 **Q. How would your recommendation change if PJM’s proposals regarding the**
19 **Reliability Backstop Procurement and Connect & Manage are changed or not**
20 **adopted?**

21 A.

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[Redacted]

Q. Please describe your cost allocation proposal for transmission and distribution costs.

A.

[Redacted]

Q. Please describe your proposal regarding credit and collateral for large loads.

A.

[Redacted]

Q. Please describe your proposal regarding the mandatory load shedding of large load customers.

A.

[Redacted]

[Redacted]

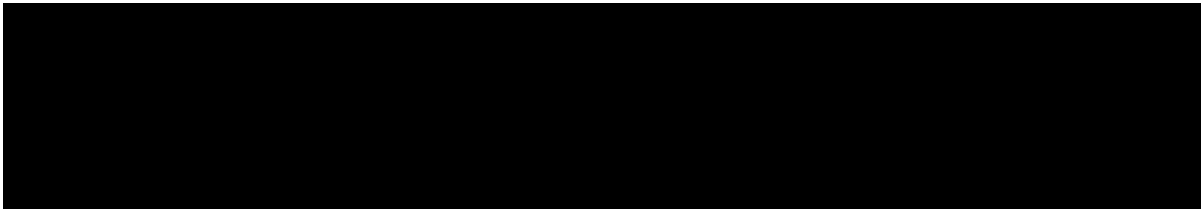
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Q. Your recommendations touch on issues regarding resource adequacy, load shed priority, and cost allocation. Are these issues related to the facilities proposed in this proceeding?

A.

[Redacted]

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III. Summary and Conclusion

Q. Does this conclude your testimony?

A. Yes. I reserve the right to update any portion of my testimony as needed if additional relevant information is made available during this proceeding.

Exhibit FF-1

Curriculum Vitae of Frank A. Felder, Ph.D.

FRANK A. FELDER, Ph.D.

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<https://www.independentelectricityconsultants.com>

SUMMARY

Internationally recognized inter-disciplinary researcher, advisor, and educator in the electricity sector

- Author/co-author of 53 peer-reviewed publications and numerous research reports, book chapters, discussion papers, policy briefs, and presentations ([Google Scholar profile](#))
- Rank in top 1.2% of researchers worldwide and 0.51% in energy by [ScholarGPS](#)
- Advised national and state governments on clean energy policy, electricity markets, renewables and energy efficiency in China, India, Gulf Cooperation Council, and elsewhere
- Awarded over \$23 million in research grants and contracts
- Presented in 15 countries and trained 3,000+ professionals from 40+ countries in electricity markets
- Directed large research and advisory teams at major research university and international think tank
- Consulted with all parts of the electric power industry domestically and internationally

PROFESSIONAL AND ACADEMIC EXPERIENCE

Principal, Independent Electricity Consultants, LLC, 1998 to present, expert witness, consulting, and training services to the electric power industry on wholesale and retail electricity markets throughout North America, Canada, Africa, Asia, and Europe. Clients included RTOs/ISOs, USAID, EPA, EIA, NARUC, NASEO, generators, transmission companies, energy service companies, rate payer advocates, and law firms.

Senior Visiting Researcher, Oxford Institute for Energy Studies, Jun. 2023 to present

Program Director, Renewables and Utilities (formerly Energy Transitions and Electric Power), KAPSARC, International Energy Think Tank, Riyadh, Saudi Arabia, Dec. 2020 to Dec. 2022

- Led program of 10 engineers and economists with a budget of \$3.2 million conducting research and providing advisory services involving power system modeling, renewable integration, demand management, smart meters, rate design, cost of service, industrial development, electric vehicles, electricity innovation, and green hydrogen
- Also, *Acting Program Director, Markets and Industrial Development*, Jun. 2021 to Oct. 2021
Led program of 12 economists, MBAs, and analysts on oil, natural gas, and petrochemicals with a budget of \$5.5 million conducting research and providing advisory services on oil supply-demand modeling, hydrocarbon markets and policies, storage, and blue hydrogen
- Visiting Researcher, March 1, 2023 to February 28, 2025

Research Professor, Edward Bloustein School of Planning and Public Policy, Rutgers University, New Jersey, Jul. 2018 to Nov. 2020, *Associate Research Professor*, Sep. 2007 to Jun. 2018, *Assistant Research Professor*, Sep. 2004 to Aug. 2007

- *Director*, Rutgers Energy Institute, July 2018 to September 2020, led 70+ interdisciplinary faculty and staff institute on research, education and outreach initiatives sponsored by the Deans of Arts and Sciences, Business, Engineering, Environmental and Biological Sciences, and Planning and Policy
- *Director*, Center for Energy, Economics & Environmental Policy, October 2006 to November 2020, *Acting Director*, Feb. 2006 to Sep. 2006, conducted policy and economic analyses for the New Jersey Board of Public Utilities

- *Program Director*, Public Informatics, Bloustein School of Planning and Public Policy, Jul. 2018 to Nov. 2020, developed new master's program in data science and analytics for planning and policy students

Assistant Professor of Management, Manhattan College, School of Business, NYC, 2002-2004

Senior Consultant, The Economics Resource Group, Inc., Cambridge, MA, 1994-1998

Nuclear Engineer and Officer, U.S. Navy, 1987-1992

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA

- Ph.D. in Technology, Management and Policy (Engineering Systems Division), September 2001, Probabilistic Risk Analysis of Restructured Electric Power Systems: Implications for Reliability Analysis and Policies
- M.S. in Technology and Policy, 1994

Columbia University, New York, NY, B.S. Applied Mathematics, 1987; B.A. Mathematics, 1987

PUBLICATIONS AND RESEARCH (*indicates student or post-doctoral advisee)

Peer-Reviewed Publications

Albalawi, A., Nezamuddin, N., Muhsen, A., Gertin, T., Felder, F. A., Almansour, A., & Elshurafa, A. M. (2026). A spatial and technical assessment of floating offshore wind energy in the red sea using a GIS-AHP framework. *Scientific Reports*, <https://doi.org/10.1038/s41598-026-49570-4>.

Alhadhrami, K., Petitet, M., Abouof, S., Darandary, A., Laing, T., Felder, F., and Elshurafa, A. (2026). Achieving Net-Zero in Saudi Arabia's Power Sector by 2060 considering land and mineral availability, *Energy*, 140067, <https://doi.org/10.1016/j.energy.2026.140067>.

Kumar,* P., Caggiano, H., Shwom, R., Felder, F., and Andrews C., (2025). "Reflections on Energy Efficiency Policies in Sustainable Transition: Bedrock, Gamechanger, or More of the Same?" *Environmental Policy and Governance*, <https://doi.org/10.1002/eet.70022>.

Petitet, M., Felder, F., and Elshurafa, A. (2025). "Cross-Border Electricity Trading in the GCC Countries, Egypt, Jordan and Iraq: Hourly Market Coupling or Bilateral Agreements?" *Energy*, 136320, <https://doi.org/10.1016/j.energy.2025.136320>.

Petitet, M., Felder, F., and Elshurafa, A. (2024). "Finding Opportunity in Economic Power Dispatch: Saving Fuels Without Impacting Retail Electricity Prices in Fuel-Producing Countries," *Energy Economics*, 138, 107841, <https://doi.org/10.1016/j.eneco.2024.107841>.

Petitet, M., Ünél, B. and Felder, F. (2023). "Making Electricity Capacity Markets Resilient to Extreme Weather Events." *Economics of Energy & Environmental Policy*, 12(2), <https://doi.org/10.5547/2160-5890.12.2.mpet>

Fuentes, R. and Felder, F. (2023). "Systematically Mapping Innovations in Electricity Using Startups: A Comprehensive Database Analysis," *Technology in Society*, 74, 102282, <https://doi.org/10.1016/j.techsoc.2023.102282>.

- Zhou,* J., Coit, D., Felder, F., and Tsianikas, S. (2023). "Combined Optimization of System Reliability Improvement and Resilience with Mixed Cascading Failures in Dependent Network Systems," *Reliability Engineering & System Safety*, 237, 109376, <https://doi.org/10.1016/j.ress.2023.109376>.
- Soummame, S., Elshurafa, A., Alatawi, H., and Felder, F., (2003). "Modeling cross-seasonal fuel savings from load shifting in the Saudi industrial sector and interlinkages to export revenues," *Energy Strategy Reviews*, 47, 101093, <https://doi.org/10.1016/j.esr.2023.101093>.
- Kumar,* P., Caggiano, H., Shwom, R., Felder, F., and Andrews C., (2023). "Saving from home! How income, efficiency, and curtailment behaviors shape energy consumption dynamics in US households?" *Energy*, 271, 126988, <https://doi.org/10.1016/j.energy.2023.126988>.
- Athawale, R. and Felder, F., (2023). "Overbuilding Transmission: A Case Study and Policy Analysis of the Indian Power Sector," *Energy Policy*, 174, 113437. <https://doi.org/10.1016/j.enpol.2023.113437>.
- Kumar*, P., Caggiano, H., Cuite, C., Felder, F. and Shwom, R., (2023). "Analyzing spillovers from food, energy, and water conservation behaviors using insights from systems perspective," *Behavioural Public Policy*, 1-35. <https://doi.org/10.1017/bpp.2022.41>.
- Selcuklu, S, Coit, D., and Felder, F., (2023). "Electricity generation portfolio planning and policy implications of Turkish power system considering cost, emission, and uncertainty," *Energy Policy*, 173, 113393. <https://doi.org/10.1016/j.enpol.2022.113393>.
- Kumar*, P., Caggiano, H., Cuite, C., Andrews, C., Felder, F., Shwom, R., Floress, K., Ahamed, S., and Schelly, C. (2022). "Behaving or Not? Explaining Energy Conservation via Identity, Values, and Awareness in Suburban American Homes," *Energy Research & Social Science*, 92, 102805. <https://doi.org/10.1016/j.tej.2022.107186>.
- Elshurafa, A., Muhsen, A. and Felder, F. (2022). "Cost, footprint, and reliability implications of deploying hydrogen in off-grid electric vehicle charging stations: A GIS-assisted study for Riyadh, Saudi Arabia," *International Journal of Hydrogen Energy*, August 2022, 32641-32654. <https://doi.org/10.1016/j.ijhydene.2022.07.160>.
- Elshurafa, A., Al Atawi, H., Hasanov, F. Felder, F., (2022). "Cost, Emission, and Macroeconomic Implications of Diesel Displacement in the Saudi Agricultural Sector: Options and Policy Insights", *Energy Policy*, 168, 113090. <https://doi.org/10.1016/j.enpol.2022.113090>.
- Felder, F., & Kumar*, P. (2021). A review of existing deep decarbonization models and their potential in policymaking. *Renewable and Sustainable Energy Reviews*, 152, 111655. <https://doi.org/10.1016/j.rser.2021.111655>.
- Zhou*, J., Coit, D. W., Felder, F., & Wang, D. (2021). Resiliency-based restoration optimization for dependent network systems against cascading failures. *Reliability Engineering & System Safety*, 207, 107383, <https://doi.org/10.1016/j.ress.2020.107383>.
- Nguyen*, H., and Felder, F. (2020). Generation Expansion Planning with Renewable Energy Credit Markets: A Bilevel Programming Approach, *Applied Energy*, 276(15), <https://doi.org/10.1016/j.apenergy.2020.115472>.
- Hochman, G., Goldman, A., Felder, F., Mayer, J., Miller, A., Holland, P., Goldman, L., Manocha, P., Ze, S., Aleti, S. (2020). The potential economic feasibility of direct electrochemical nitrogen reduction as a route to ammonia, *ACS Sustainable Chemistry & Engineering*, 8(24), 8938-8948, <https://doi.org/10.1021/acssuschemeng.0c01206>.

- Froio*, Z., Kumar*, P. and Felder, F. (2020), Not Adding Up: Free Ridership and Spillover Calculations in *Energy Efficiency Evaluations*, *Energy Efficiency*, 13, 991-1005. <https://doi.org/10.1007/s12053-020-09872-6>.
- Selcuklu*, S., Coit D., Felder, F. (2020). Pareto Uncertainty Index for Evaluating and Comparing Solutions for Stochastic Multiple Objective Problems, *European Journal of Operational Research*, 284(2), 644-659. <https://doi.org/10.1016/j.ejor.2020.01.004>.
- Rodgers*, M., Coit, D., and Felder, F. (2019). A Metamodeling Framework for Quantifying Health Damages of Power Grid Expansion Plans, *International Journal of Environmental Research and Public Health*, 16, 1857. <https://doi.org/10.3390/ijerph16101857>.
- Rodgers*, M., Coit, D., and Felder, F. (2019). Assessing the Effects of Power Grid Expansion on Human Health Externalities, *Socio-Economic Planning Sciences*, 66, 92-104. <https://doi.org/10.1016/j.seps.2018.07.011>.
- Rodgers*, M., Coit, D., Felder, F., Carlton, A. (2018), Generation Expansion Planning Considering Health and Societal Damages - A Simulation-Based Optimization Approach, *Energy*, 164, 951-963. <https://doi.org/10.1016/j.energy.2018.09.004>.
- Song*, S., Qing, L., Felder, F., Wang, H., and Coit, D. (2018). Integrated optimization of offshore wind farm layout design and turbine opportunistic condition-based maintenance, *Computers & Industrial Engineering*, 120, 288-297.
- Figuerola-Candia*, M., Felder, F. and Coit, D. (2018). Resiliency-Based Optimization of Restoration Policies for Electric Power Distribution Systems, *Electric Power Systems Research*, 161, 188-198. <https://doi.org/10.1016/j.epsr.2018.04.007>.
- Zhou*, J., Huang, N., Coit, D. W., & Felder, F. A. (2018). Combined effects of load dynamics and dependence clusters on cascading failures in network systems. *Reliability Engineering & System Safety*, 170, 116-126. <https://doi.org/10.1016/j.cie.2018.04.051>.
- Felder, F. and Athawale, R. (2018). “PACT-a-Mole”: the case against using the Program Administrator Test for energy efficiency programs. *Energy Efficiency*, 11(1), 1-11.
- Shan*, X., Felder, F., & Coit, D. (2017). Game-theoretic Models for Electric Distribution Resiliency/Reliability from a Multiple Stakeholder Perspective. *IIE Transactions*, 49(2), 159-177.
- Felder, F., & R. Athawale. (2016). Optimizing New York’s Reforming the Energy Vision. *Utilities Policy*, 41C, 160-162.
- Farkas*, C. M., Moeller*, M. D., Felder, F. A., Henderson, B. H., Carlton, A. G. (2016). High Electricity Demand in the Northeast U.S.: PJM Reliability Network and Peaking Unit Impacts on Air Quality. *Environmental Science & Technology*, 50 (15), 8375-8384.
- Athawale, R., Felder, F., & Goldman*, L. (2016). Do CHPs Perform? Case Study of NYSERDA Funded Projects. *Energy Policy*, 97, 618-627.
- Felder, F. (2016). Why Can’t We All Get Along? A Conceptual Analysis Combined with a Case Study. *Energy Policy*, 96, 711-716.
- Li*, S., Coit, D., & Felder, F. (2016). Stochastic optimization of electric power generation expansion planning with discrete climate change scenarios. *Electric Power Systems Research*. 140, 401-412.

- Chandramowli*, S., Felder, F., Mantell, N., Irving, W., & Seneca, J. (2016). LP-CEM: A modeling tool for power systems planning incorporating climate change effects and macro-economic trends. *Energy Strategy Review*, 11, 1-18.
- Tekiner-Mogulkoc*, H., Coit, D., & Felder, F. (2015). Mean-Risk Stochastic Electricity Generation Expansion Planning Problems with Demand Uncertainties Considering Conditional-Value-at-Risk and Maximum Regret as Risk Measures. *International Journal of Electrical Power and Energy Systems*, 73, 309-317.
- Farkas*, C., Moeller*, M., Felder, F., Baker, K.R., Rodgers, M., & Carlton, A. G. (2015). Temporalization of Peak Electric Generation PM Emissions during High Energy Demand Days. *Environmental Science & Technology*, 49(7), 4696-4704.
- Bridges*, A., Felder, F., McKelvey*, K. & Niyogi*, I. (2015). Screening for Health Effects in Energy Planning. *Energy Research and Social Science*, 6, 74-77.
- Athawale, R., & Felder, F. (2014). Incentives for Combined Heat and Power Plants: How to increase society benefits. *Utilities Policy*, 31, 121-132.
- Chandramowli*, S., & Felder, F. (2014). Impact of Climate Change on Electricity Systems - A Review of Models and Forecasts. *Sustainable Energy Technologies and Assessments*, 5, 62-74.
- Tekiner-Mogulkoc*, H., Coit, D., & Felder, F. (2012). Electric Power System Generation Expansion Plans Considering the Impact of Smart Grid Technologies. *International Journal of Electrical Power and Energy Systems*, 42(1), 229–239.
- Chandramowli*, S., Transue*, M., & Felder, F. (2011). Analysis of Barriers to Development in Landfill Communities Using Interpretive Structural Modeling. *Habitat International*, 35, 246-253.
- Tekiner*, H., Coit, D., & Felder, F. (2010). Multi-period Multi-objective Electricity Generation Expansion Planning Problem with Monte-Carlo Simulation. *Electric Power Systems Research*, 80(12), 1394-1405.
- Transue*, M., & Felder, F. (2010). Comparison of Energy Efficiency Incentive Programs: Rebates and White Certificates. *Utilities Policy*, 18(2), 103-111.
- Felder, F. (2009). A Critical Assessment of Energy Accident Studies. *Energy Policy*, 37, 5744-5751.
- Felder, F., & Haut, R*. (2008). Balancing Alternatives and Avoiding False Dichotomies to Make Informed U.S. Electricity Policy. *Policy Sciences*, 41, 165-180.
- Greenberg, M., Mantell, N., Lahr, M., Felder, F., & Zimmerman, R. (2007). Short and Intermediate Economic Impacts of a Terrorist-Initiated Loss of Electric Power: Case Study of New Jersey. *Energy Policy*, 35, 722-733.
- Felder, F., & Hajos*, A. (2006). Using Restructured Electricity Markets in the Hydrogen Transition: The PJM Case. *Proceedings of the IEEE* (special issue), 94(10), 1864-1879.
- Guirguis, H., & Felder, F. (2005). Accounting for Extreme Values in GARCH Forecasts of Day-Ahead Electricity Prices. *KIEE International Transactions on Power Engineering*, 5-A(3), 300-302.
- Felder, F. (2005). Top-Down Composite Modeling of Bulk Power Systems. *IEEE Transactions on Power Systems*, 20(3), 1655-1656.

Guirguis, H., & Felder, F. (2004). Further Advances in Forecasting Day-Ahead Electricity Prices Using Time Series Models. *KIEE International Transactions on Power Engineering*, 4A(3), 159-166.

Felder, F. (2004). Incorporating Resource Dynamics to Determine Generation Adequacy Levels in Restructured Bulk Power Systems. *KIEE International Transactions on Power Engineering*, 4A(2), 100-105.

Yoon, Y., & Felder, F. (2003). A Critique of Designing Resource Adequacy Markets to Meet Loss of Load Probability Criterion. *KIEE International Transactions on Power Engineering*, 3A(1), 35-41.

Farr, J., & Felder, F. (2003). An Introduction to Electricity Market Auctions Using a Spreadsheet. *INFORMS Transactions on Education*, 4(1), 11-22.

Felder, F. (1996). Integrating Financial Theory and Methods in Electricity Resource Planning. *Energy Policy*, 24(2), 149-154.

U.S. National Science Foundation Grants (Peer Reviewed)

RAPID: COVID-19, Consumption, and Multi-dimensional Analysis of Risk (C-CAR), CBET 2031677, \$190,764, Senior Investigator, June 1, 2020 through May 31, 2021.

Collaborative Research: CAS: Electrochemical Approaches to Sustainable Dinitrogen Fixation, CHE/CAS 1955014, \$295,216, Senior Investigator, August 1, 2020 through July 31, 2023.

Collaborative Research Modeling Strategic Regulators in Network Infrastructure Planning, \$399,002, (Rutgers University grant of \$85,890), Principal Investigator, CMMI 1825225, September 1, 2018 through August 31, 2021.

Electrochemical Approaches to Sustainable Dinitrogen Fixation, \$300,000, Senior Investigator, CHE 1665146, September 1, 2017 through August 31, 2020.

EAGER: Smart & Connected Communities, National Science Foundation, \$250,000, Senior Investigator, AGS1645786, August 1, 2016 through July 31, 2018.

EaSM-3: Regional decadal predictions of coupled climate-human systems, National Science Foundation, OCE1419584, \$1,200,000, co-PI, June 1, 2014 through August 31, 2017. Designated Bloustein PI for \$414,615.

Green Energy Technology for Undergraduates Program (GET UP!), National Science Foundation, EEC1263250, \$367,890, Senior Personnel, March 15, 2013 through February 29, 2016. Presented to high school teachers and undergraduate students on July 9, 2014.

Climate to Humans: A Study of Urbanized Coastal Environments, Their Economics and Vulnerability to Climate Change, National Science Foundation, OCE1049088, \$3,853,332, co-PI, March 1, 2010 through February 28, 2016. Designated Bloustein PI for \$525,448. Additional \$225,000 assigned Bloustein.

IGERT: Solutions for Renewable and Sustainable Fuels in the 21st Century, National Science Foundation OCE1049088, \$3,197,329, co-PI and Lead on Policy and Infrastructure Logistics for Efficient Fuel Technology Deployment, September 1, 2009 through August 30, 2014. Funded 24 doctoral students (including 2 Bloustein students) and 4 master students. Served on Leadership, Committee and Admission Committee. Developed and taught two new graduate seminars.

Nanotechnology for Clean Energy, National Science Foundation, 0903661, Faculty, \$1,218,737, 2008-2013. Developed graduate course given to Rutgers and Princeton Universities.

The Electricity Journal

Felder, F. A. and Petitet, M. (2022). Extending the reliability framework for electric power systems to include resiliency and adaptability, *The Electricity Journal*, 35(8), 107186. <https://doi.org/10.1016/j.tej.2022.107186>

Fuentes, R., Hasan, S. and Felder, F. A. (2022). How can Energy Storage catalyze GCC Electricity policy? Issues and Options. *The Electricity Journal*, 35(4), 107110.

Athawale, R., & Felder, F. A. (2022). Electric utility death spiral: Revisited in the context of tariff design. *The Electricity Journal*, 35(1), 107062.

Felder, F., Unel, B., & Dvorkin, Y. (2021). Modeling strategic objectives and behavior in the transition of the energy sector to inform policymaking. *The Electricity Journal*, 34(8), 107009.

Elshurafa, A. M., Alatawi, H., Soummane, S., & Felder, F. A. (2021). Assessing effects of renewable deployment on emissions in the Saudi power sector until 2040 using integer optimization. *The Electricity Journal*, 34(6), 106973.

Baldwin, S. and Felder, F. (2019). Residential Energy Supply Market: Unmet Promises And Needed Reforms. *The Electricity Journal*, 32(3), 31-38.

Freed, M. and Felder, F. (2017). Non-energy benefits: Workhorse or unicorn of energy efficiency programs? *The Electricity Journal*, 30(1), 43-46.

Felder, F. (2015). Should Relief be Granted from the Clean Power Plan for Reliability Reasons? *The Electricity Journal*, 28(6), 5-11.

Felder, F., and Athawale, R. (2014). The Life and Death of the Utility Death Spiral. *The Electricity Journal*, 27(6), 9-16.

Chandramowli*, S., & Felder, F. (2014). Climate Change and Power Systems Planning – Opportunities and Challenges. *The Electricity Journal*, 27(4), 40-50.

Felder, F. (2013). Nuclear Power in the Second Obama Administration. *The Electricity Journal*, 26(2), 25-31.

Felder, F. (2012). Watching the ISO Watchman? *The Electricity Journal*, 25(10), 24-37.

Felder, F. (2011). Examining Electricity Price Suppression Due to Renewable Resources and Other Grid Investments. *The Electricity Journal*, 24(4), 34-46.

Felder, F. (2010). The Practical Equity Implications of Advanced Metering Infrastructure. *The Electricity Journal*, 23(6), 56-64.

Farr, J. and Felder, F. (2005). Competitive Electricity Markets and System Reliability: The Case for New England's Proposed Locational Capacity Market. *The Electricity Journal*, 18(8), 22-33.

Felder, F. (2004). Shining Light, Not Shedding Light. *The Electricity Journal*, 17(7), 51-54.

Farr, J., & Felder, F. (2002). A Critique of Existing Market-based Market Performance Monitoring and Mitigation Policies. *The Electricity Journal*, 15(6), 10-18.

Felder, F. (2002). The Need for Governance of Restructured Electric Power Systems and Some Policy Implications. *The Electricity Journal*, 15(1), 36-43.

Rotger, J., & Felder, F. (2001). Reconciling Market-Based Transmission and Transmission Planning. *The Electricity Journal*, 14(9), 31-43.

Felder, F. (2001). An Island of Technicality in a Sea of Discretion': A Critique of Existing Electric Power Systems Reliability Analysis and Policy. *The Electricity Journal*, 14(3), 21-31.

Felder, F., Hopper, G., & Lukens, J. (1998). The Benefits of Retail Electricity Competition in Low-Cost States: Expectations for an Evolving Industry, *The Electricity Journal*, 11(7), 75-81.

Felder, F., & Peterson, S. (1997). Market Power Analysis in a Dynamic Electric Power Industry. *The Electricity Journal*, Volume # needed, 10(3), 12-19.

Jaffe, A., & Felder, F. (1996). Should Electricity Markets Have A Capacity Requirement: If So, How Should It Be Priced? *The Electricity Journal*, 9(10), 52-60.

Felder, F. (1996). Integrating Financial Thinking with Strategic Planning to Achieve Competitive Success. *The Electricity Journal*, 9(4), 62-67.

Felder, F. (1995) Modeling Natural Gas Prices as a Random Walk: The Advantages for Generation Planning. *The Electricity Journal*, 8(9), 61-67.

Law Review Journals

Tortta, J., Dressel, A., Agbre, S., Benevento, D., Butrus, G., Chambers, T., ...Spina, S. (2014). Report of the System Reliability & Planning Committee. *Energy Law Journal*, 35(2), 1-21.

Felder, F. (2014). Climate Change Mitigation and the Global Energy System. *Villanova Environmental Law Journal*, 25(1), 89-106.

Book Chapters

Hochman, G., Goldman, A. and Felder, F. (2022). "Alternative ammonia production processes and the use of renewables." In Murthy, G. *Biomass, Biofuels, Biochemicals- Green-Economy: Systems analysis for sustainability*. Elsevier pre-publication.

Felder, F. (2020) "Market Versus Planning Approaches to Transmission and Distribution Investment." In M. R. Hesamzadeh, J. Rosellon, & I. Vogelsang. *Transmission Network Investment in Liberalized Power Markets*. Springer, pre-publication.

Athawale, R., & Felder, F. (2016). Residential Rate Design and Death Spiral for Electric Utilities: Efficiency and Equity Considerations. In F. Sioshansi (Ed.), *Future of Utilities - Utilities of the Future: How technological innovations in distributed energy resources will reshape the electric power system* (pp. 193-209). Amsterdam: Elsevier Press, 2016.

Felder, F. & Chandramowli*, S (2016). Impact of Extreme Events on the Electric Power Sector: Challenges, Vulnerabilities, Institutional Responses, and Planning Implications from Hurricane Sandy. In K. M. O'Neill, & D. J. Van Abs, (Eds.), *Taking Chances on the Coast After Hurricane Sandy* (pp.

242-257). New Brunswick, NJ: Rutgers University Press.

Felder, F. (2014). What Future for the Grid Operator? In F. Sioshansi (Ed.), *Distributed Generation and its Implications for the Utility Industry* (pp. 399-415). Amsterdam: Elsevier Press.

Felder, F. (2013). The evolution of demand side management in the United States. In F. Sioshansi (Ed.), *End of Electricity Demand Growth: How energy efficiently can put an end to the need for more power plants* (pp. 179-200). Amsterdam: Elsevier Press.

Felder, F. (2012). The Equity Implications of Smart Grid: Questioning the Size and Distribution of Smart Grid Costs and Benefits. In F. Sioshansi (Ed.), *Smart Grid: Integrating Renewable, Distributed & Efficient Energy* (pp. 85-100). Amsterdam: Elsevier Press.

Felder, F., Andrews, C., & Hulkower, S. (2011). Which Energy Future. In F. Sioshansi (Ed.), *Energy Sustainability and the Environment: Technology, incentives, behavior* (pp. 30-61). Amsterdam: Elsevier Press.

Felder, F., Mantell, N., Lovrien, N., Buehler, & Cottrell, A. (2009). Energy Master Planning: The Case of New Jersey. In E. Kahraman & A. Baig (Eds), *Environmentalism: Environmental Strategies and Environmental Sustainability* (pp. 41-72). Hauppauge, New York: Nova Science Publishers.

Reports

Felder, F., [A Net Zero Energy System with Liberalized Markets and Regulated Transportation and Delivery](#), Oxford Institute of Energy Studies, Paper EL59, May 2025.

Alhadhrami, K., Petitet, M., Abuouf, S., Darandary, A., Laing, T, Felder, F., and Elshurafa, A, Are There Adequate Materials and Land Resources for the Saudi Power Sector to Achieve Net Zero by 2060?, April 2025.

Felder, F., [The Importance and Implications of FERC Order 1920 for State Energy Offices](#), September 2024.

Felder, F. and Petitet, M., [An Emerging Framework for the Probabilistic Cost-Benefit Analysis of the Reliability, Resiliency and Adaptability of Electric Power Systems](#), KAPSARC Discussion Paper, July 2024.

Petitet, M., Ricuad, B., Felder, F., and Elshurafa, A., [How Can Bilateral Contracts Support Electricity Trade? A Regional Electricity Model Perspective for the GCC Plus Egypt, Jordan, and Iraq](#), KAPSARC Discussion Paper, June 2024.

Felder, F., [The Challenges of Incorporating Consumer Reliability Preferences into Electricity Markets with a Capacity Requirement](#), Oxford Institute of Energy Studies, Paper EL54, May 2024.

Al-Balawi, A., Nezamuddin, N., Felder, F., Muhsen, Abdelrahman, and Elshurafa, A., *Assessment of the Potential of Floating Offshore Wind Turbines in the Red Sea*, KAPSARC Discussion Paper, May 5, 2024.

Petitet, M., Felder, F., and Elshurafa, A., *Finding Opportunity in Economic Dispatch: Saving Fuels Without Impacting Retail Electricity Prices*, KAPSARC Discussion Paper, March 17, 2024.

Al-balawi, A., Felder, F., and Khan, M. (2023). *Recent Developments and Trends of Cybersecurity in the Power Sector*, KAPSARC Commentary, October 26, 2023.

Petitet, M., Elshurafa, A., and Felder, F. (2023). *From Europe to the Middle East: How the European Energy*

Crisis Can Reshape the Power Sector Reform Endeavors? Discussion Paper, Oct. 24, 2023.

Felder, F., Petitet, M., Hasan, S., and Elshurafa, A. (2023). *Modeling of the Interconnected Middle East and North Africa Electricity System: Including Uncertainties to Better Inform Policymakers*, KAPSARC Commentary, September 26, 2023.

Aljamed, F., Felder, and Elshurafa, A. (2023). *An Overview of Integration Costs of Variable Renewables in the Power Sector*, KAPSARC Commentary, June 19.

Fuentes, R., Chen, D., and Felder, F. (2023). *What Innovations Are Chinese Startups Pursuing*, KAPSARC Commentary, June 13.

Elshurafa, A., Petitet, M. and Felder, F. (2023). *How Firm Capacity and Forced Outage Rate Assumptions of Renewables Impact Capacity Expansion Model Results*, KAPSARC Discussion Paper, March 9.

Fuentes, R. and Felder, F. (2023). *Innovation by Gulf Cooperation Council Electricity Startups: A Global Comparison*, KAPSARC Commentary, February 28.

Petitet, M. and Felder, F. (2023). *Lessons from the European Electricity Crisis*, KAPSARC Instant Insight, February 20.

Elshurafa, A., Abdelrahman M., and Felder, F. (2023). *Cost, Footprint, and Reliability Implications of Deploying Hydrogen in Offgrid Electric Vehicle Charging Stations: A GIS-assisted Study for Riyadh, Saudi Arabia*, KAPSARC Discussion Paper, January 29.

Elshurafa, A., Al Atawi, H., Hasanov, F., and Felder, F. (2022). *Cost, Emission, and Macroeconomic Implications of Diesel Displacement in the Saudi Agricultural Sector: Options and Policy Insights*, KAPSARC Discussion Paper, August 24.

Petitet, M., AlHadhrami, K. and Felder, F. (2022). *One Year after the Texas Blackout: Lessons for Reliable and Resilient Power Systems*, KAPSARC Discussion Paper, June 14.

Alhaidari, N., Elshurafa, A. and Felder, F. (2022). *Achieving Renewable Energy Targets Without Compromising the Reliability of the Power Sector*, KAPSARC Discussion Paper, March 22.

Felder, F. and Petitet, M. (2021). *Renewables, Reliability and Efficiency in Electricity Markets*, KAPSARC Discussion Paper, Dec. 29.

Fuentes, R., Hasan, S. & Felder, F. (2021). *How Can Energy Storage Catalyze the Electricity Policies of Gulf Cooperation Council Members? Issues and Options*, KAPSARC Discussion Paper, Sep. 27.

Elshurafa, A., Al Atawi, H., Soummane, S., and Felder, F. *Assessing the Role of Renewables in Reducing Emissions in the Saudi Power Sector Using Mixed-Integer Optimization*, June 2.

Felder, F. and Al Atawi, Hatem. (2021). *What Texas Tells Us About Lessening the Frequency and Severity of Electricity Blackouts*, KAPSARC Instant Insight, Feb. 28.

Burtraw, D., Blumsack, S., Bushnell, J., Felder, F., and Wood, F., *Peer Review of EPA's Power Sector Modeling Platform v6 using Integrated Planning Model*, March 2020, Industrial Economics Inc. for the U.S. Environmental Protection Agency.

Irving, W., Felder, F., Andrews, C., Traszka, J., and Senick, J., *Research Support for the New Jersey Community Solar Energy Pilot Program*, New Jersey Board of Public Utilities, February 19, 2019.

Cottrell, A., Nielsen, V., Cassidy, B., O'Rourke, K., Felder, F., Freed, M., Jafari, M., Mahani, K., Hunter, S. and Walker, T. *CHP and Fuel Cell Evaluation Study for New Jersey*, November 3, 2016.

Bank, J., Cheng, D., Costyk, D., Leyo, M., Seguin, R., Woyak, J., Acharay-Menon, A., Steffel, S., Athawale, R., and Felder, F., *Model-Based Integrated High Penetration Renewables Planning and Control Analysis*, Final Report, DOE SUNSHOT, DOE Award Number: DE-EE0006328, September 30, 2015.

Center for Energy, Economic and Environmental Policy, *Analyzing the Costs and Benefits of Electric Utility Hardening Efforts in Response to Severe Weather*, Final Report to the New Jersey Board of Public Utilities, November 30, 2014.

Consumer Advisory Council to the New York Independent System Operator, *Recommendations of the NYISO Consumer Advisory Council to the NYISO Board of Directors*, November 11, 2013.

Center for Energy, Economic & Environmental Policy, *EDC Solar Long-term Contracting Program Analysis*, August 15, 2012.

Seneca, J., Mantell, N., Lahr, M., Felder, F., Zobian, A., Irving, W., *Economic Impacts of PSE&G's Burlington-Camden Transmission Network Upgrade*, Submitted to PSE&G, December 2011.

Center for Energy, Economic & Environmental Policy, *A Review of Connecticut's Renewable Portfolio Standards*, July 2011.

Center for Energy, Economic & Environmental Policy, *Analysis for the 2011 Draft New Jersey Energy Master Plan Update*, March 2011.

Lathrop, R., Clough, B., Cottrell, A., Ehrenfeld, J., Felder, F., Green, E., Specca, D., Vodax, M., Xu, M., Zhang, Y. and Vail, C., *Assessing the Potential for New Jersey Forests to Sequester Carbon and Contribute to Greenhouse Gas Emission Avoidance*, prepared for the New Department of Environmental Protection, March 2011.

Center for Energy, Economic & Environmental Policy, *PSE&G Energy Technology Demonstration Grant Program – Final Report*, March 2011.

Lahr, M., Coughlin, E. and Felder, F., *Economic Impacts of Energy Infrastructure Investments*, October 2010.

Seneca, J., Mantell, N., Lahr, M., Hughes, J., Felder, F., Cottrell, A., Irving, W. and Knox, P. "Economic Impact Analysis: Proposed Upgrades to PSE&G's Branchburg-Roseland-Hudson Transmission Lines," Edward J. Bloustein School of Planning and Public Policy, Rutgers University, September 2010.

Seneca, J., Mantell, N., Felder, F., Lahr, M., Cottrell, A. and W. Irving, "Economic Impacts of the Proposed BlueOcean Energy Offshore Liquid Natural Gas Terminal on New Jersey: Update and Expansion of the 2007 Study," Edward J. Bloustein School of Planning and Public Policy, Rutgers University, July 2010.

Bloustein School, Modeling Report of the Energy Master Plan, April 17, 2008.

Felder, F., "New Performance-Based Standards for Standby Power: Reexamining Policies to Address Changing Power Needs," Clean Energy Group Report, December 2007.

Seneca, J., Mantell, N., Lahr, M., Felder, F., Irving, W. and Davy, J. “Economic Impacts of the Proposed BlueOcean Energy Offshore Liquid Natural Gas Terminal on New Jersey”, Edward J. Bloustein School of Planning and Public Policy, Rutgers University, July 2007.

Seneca, J., Hughes, J., Felder, F., Lahr, M., Mantell, N., Lovrien, N. and Irving, W. “Economic Impact of BP’s Proposed Crown Landing LNG Terminal”, Edward J. Bloustein School of Planning and Public Policy, Rutgers University, February 2007.

Center for Energy, Economic & Environmental Policy, *New Jersey Meadowlands Commission Renewable Energy Task Force: Background Report on New Jersey’s Energy & Policy Landscape*, August 2006.

Center for Energy, Economic & Environmental Policy, *New Jersey’s Energy Infrastructure: Investing in our Future*, March 2006.

Center for Energy, Economic & Environmental Policy, *Northeast RPS Compliance Markets: An Examination of Opportunities to Advance REC Trading*, October 12, 2005.

Center for Energy, Economic & Environmental Policy, *Appliance Cycling Evaluation*, September 2, 2005.

Center for Energy, Economic & Environmental Policy, *Assessment of Customer Response to Real Time Pricing Report: RESA Final Report for Task 1*, June 30, 2005.

Center for Energy, Economic & Environmental Policy, *Evaluation of CO2 Emission Allocation as part of the Regional Greenhouse Gas Initiative (RGGI)*, June 30, 2005.

Center for Energy, Economic & Environmental Policy, *Economic Impact Analysis of a 20% New Jersey Renewable Portfolio Standard*, December 1, 2004.

Center for Energy, Economic & Environmental Policy, *New Jersey and the Hydrogen Economy*, July 21, 2004.

Felder, F. and Hansen, K., *The U.S. Nuclear Power Industry and Electric Industry Restructuring*, Center for Advanced Nuclear Energy Systems, Massachusetts Institute of Technology, MIT-NFC-TR-032, July 2001.

Apostolakis, G., Golay, M., Chaniotakis, E., Borgonova, E., Felder, F., Ghosk, T., Sui, Y., Rempe, J., Leahy, T. and Knudson, D. “Review of Applicable U.S. Department of Energy and U.S. Nuclear Regulatory Commission Activities (Project Task 1),” MITNE-316, Department of Nuclear Engineering, M.I.T., Cambridge, MA, June 1999.

Golay, M., Dulik, J., Felder, F., and Utton, S. “Project on Integrated Models, Data Bases and Practices for Risk-Informed, Performance-Based Regulation of Nuclear Power: Final Report”, MIT-ANP-TR-060, Program for Advanced Nuclear Power Studies, M.I.T., Cambridge, MA, December 1998.

Conference Papers, Presentations and Posters

Felder, F. “Comparison of Policy Options in Response to Suppliers’ Misconduct in U.S. Retail Residential Energy Markets,” U.S. Association for Energy Economics 41st North American Conference, Baton Rouge, LA, Nov. 2024

Felder, F. “The Economic Challenges of Incorporating Consumer Reliability Preferences in Electricity Markets with Capacity Requirements,” International Association for Energy Economics 45th International Conference, Istanbul June 27, 2024.

Felder, F. "Probabilistic Cost Benefit Analysis of the Reliability, Resiliency, and Adaptability of Electricity Systems," United States Association for Energy Economics 40th Annual Conference, Chicago, Nov. 7, 2023.

Alhadhrami, K., Petitet, M., and Felder, F. "Lessons for the Region from Recent Blackouts for Reliability and Resilient Power Systems," 10th Saudi Arabia Smart Grid Conference, Riyadh, December 13, 2022 (paper and presentation by Alhadhrami).

Elshurafa, A., Petitet, M., and Felder, F. "How do Firm Capacity and Force Outage Rate Assumptions Impact Capacity Expansion Models," 10th Saudi Arabia Smart Grid Conference, Riyadh, December 13, 2022 (paper and presentation by Elshurafa).

Felder, F. "Outlook of the Renewable Energy Market in Saudi Arabia and the MENA Region," KAPSARC and CREIA Webinar, Saudi-China Collaboration on Renewable Energy Value Chain, June 9, 2022.

Felder, F. "Technical, Economic and Political Issues with International Electricity Trading," Policy Center for the New South and KAPSARC Workshop, Renewables and the Future of Geopolitics, Rabat, Morocco, March 21, 2022.

Felder, F. Presentation to the Participants Committee of the New England Power Pool at its Annual Summer Meeting on future pathways of electricity market design, "What Pathways Have Others Chosen Or Are Considering," June 24, 2020, (remote).

Kumar, P., Cuite C., Felder F., and Shwom R. "Evaluating Spillovers from Behavioral Interventions for Food, Energy, Water (FEW) Conservation", Rutgers Climate Symposium 2019, Science and Society: Perspectives on A Green New Deal, November 20, 2019, Rutgers University, New Jersey.

J. Zhou, D. W. Coit, F. A. Felder (2019), "Joint Effects of Local and Global Load Redistribution Model On Mixed Cascading Failures in Network Systems," INFORMS Annual Meeting, October 2019, Seattle, WA, USA, oral presentation.

Kumar, P., Felder F., and Shwom R. "Exploring relationship between willingness to pay for the energy efficient appliances and socio-economic factors in Europe." Energy and Society in Transition: 2nd International Conference on Energy Research and Social Science, May 28, 2019, Arizona State University, Tempe, USA.

Kumar, P., Cuite C., Felder F., and Shwom R. "Evaluating Role of Human Factors in Energy Efficiency Behavior.", Department of Human Ecology Student Poster Session, May 7, 2019, Rutgers University, New Jersey.

Felder, F., "Energy Outlook," moderator and panelist, PSEG Board of Directors meeting, June 18, 2019.

Felder, F., "New Jersey's Roadmap to Zero Carbon Emissions in 2050!?" 8th Annual Renewable Energy, Clean Tech and Climate Change Conference, New Jersey Institute for Continuing Legal Education, May 2, 2019.

Felder, F., "Energy & Transportation," moderator, Eleventh Annual Krueckeberg Doctoral Conference in Urban Studies, Urban Planning, and Public Policy, Bloustein School of Planning and Public Policy, Rutgers University, New Brunswick, NJ, March 7, 2019.

Zhou, J., Tsianikas, S., Coit, D., and Felder, F. “Resiliency based optimization for western U.S. transmission grid against cascading failures”, Proceedings of the 2019 IISE Annual Conference, Orlando, FL, May 18-21, 2019.

Felder, F., “Climate Change, Coastal Flooding, and the Electric Power Grid,” Geographical Sciences Committee, National Academies of Sciences, Engineering, and Medicine, Washington DC, December 6, 2018.

Felder, F., “Aligning Research and Government Policies to Advance Science in the Food, Energy, Water Nexus”, Yixing Jiangsu, China, October 25, 2018.

Felder, F., “Advancing Offshore Wind in New Jersey”, Time for Turbines: What a Difference a Year Makes, Atlantic City, August 20, 2018.

Zhou, J., Coit, D., and Felder, F., “Optimal Restoration for Resilience of Dependency Systems Against Cascading Failures”, Proceedings of the 2018 IISE Annual Conference, 2018.

Felder, F., “Climate Change and New Jersey Energy Policy”, New Jersey Office of Legislative Services, Trenton, NJ, April 10, 2018.

Felder, F., “Energy Economics”, Mandela Washington Fellows Program, July 20, 2017, Rutgers University.

Song, S., Q. Li, Felder, F., H. Wang, & D. Coit, “Integrated Optimization of Offshore Wind Farm Layout Design and Turbine Opportunistic Condition-Based Maintenance,” INFORMS, Nashville, TN, Nov. 16, 2016.

J. Zhou, N. Huang, D. W. Coit, F. A. Felder (2016), “Critical effect of dependence clusters on cascading failures in network systems,” INFORMS Annual Meeting, November 2016, Nashville, TN, USA, oral presentation.

Moeller, M., Felder, F., K. Baker, A. Carlton, “Air Pollution Externalities and Energy Choices: Linking Electricity Dispatch, Air Quality and Health Impact Models,” CMAS: Community Modeling and Analysis System Conference, University of North Carolina, Oct. 24, 2016.

Felder, F., “Analysis of United States Policies to Promote CHP,” The 15th International Symposium on District Heating and Cooling, September 15, 2016, Seoul, Korea.

Felder, F., “Energy Economics”, Mandela Washington Fellows Program, July 15, 2016, Rutgers University.

Felder, F., “Understanding Electricity, Emission and Renewable Resource Markets,” New Jersey Department of Environmental Protection Clean Air Council, May 11, 2016.

Shankar N. Chandramowli, Frank A. Felder, Xiaozhun G. Shan, “Assessing the Policy Interaction Effect of Renewable Portfolio Standards (RPS) and Clean Power Plan (CPP) Emissions Goals for States in the U.S. Northeast,” Proceedings of the ASME 2016 Power and Energy Conference, PowerEnergy2016, Charlotte, North Carolina, June 26-30, 2016 (paper and presentation).

Felder, F., “Energy Security and Resiliency,” Institute of Public Utilities Grid School 2015, Michigan State University, Charleston, SC, March 9, 2016.

Felder, F., U.S. Northeastern Electricity Markets, Renewable and Electricity Transition to the 21st

Century, International Workshop, Hong Kong, Feb. 21-23, 2016 (paper and presentation).

Felder, F., “International Experiences in Power Market Development and Cross Border Electricity Trade: Lessons Learned from Emerging and Developed Markets,” USAID South Asia Regional Initiative for Energy Integration, Conference on Sustainable Development of Power Sector and Enhancement of Electricity Trade in the South Asia Region: Policy, Regulatory Issues, Challenges and Way Forward, January 15, 2016, New Delhi, India.

Felder, F., “U.S. Electricity Market Trends and the PJM Energy Market,” Konkuk University, December 17, 2015.

Felder, F., “U.S. Electricity Market Trends,” Konkuk University, December 15, 2015.

Felder, F., “U.S. Electricity Markets and Demand Response,” Korea University, December 14, 2015.

Song, S, Felder, F., Bowers, L., Seroka, G., Dunk, R., Miles, T. and Coit, D. “Wind Farm Design and Application to Offshore Wind in New Jersey Given Installation and Maintenance Policies,” FERC Workshop/9th Annual Trans-Atlantic Intraday Electricity Markets and Planning, Energy Infrastructure and Systems, October 30, 2015.

Felder, F., *Capacity Building Program for Designing, Managing and Operating a Power Trading Entity in Nepal*, Workshop Facilitator, US Energy Association on behalf of USAID, September 14-18, 2015.

Park, J., Park, Y., Felder, F. and Athawale, R., "Calculating the Energy Cost Savings of Battery Energy Storage System for Frequency Control of Bulk Power Systems", International Conference on Electrical Engineering (ICEE 2015), Hong Kong, China, 5-9 July, 2015. (Paper No. ICEE15A-016-FP).

Felder, F., “Optimizing Reliability and Resiliency of Electric Distribution Systems,” Center for Research in Regulated Industries, 28th Annual Western Conference, Monterey, CA, June 24-26, 2015.

Selcuklu, S, Coit, D. and Felder, F., “Aleatory and Epistemic Uncertainty Classification of the GEP Problem,” ISERC, Nashville, TN, 2015.

Felder, F., “An Update on the American society of Civil Engineers’ Infrastructure Report Card,” Panel Participant, New Jersey Utilities Association 100th Annual Conference, Atlantic City, June 3-5, 2015.

Felder, F., “Optimizing Reliability and Resiliency of Electric Distribution Systems,” Center for Research in Regulated Industries, 34th Annual Eastern Conference, Shawnee on Delaware, PA, May 13-15, 2015.

Felder, F & Athawale, R., “Efficiency and Equity Considerations in Designing Rates in the Context of the Death Spiral for Electric Utilities,” 34th Annual Eastern Conference, Shawnee on Delaware, PA, May 13-15, 2015.

Felder, F., “Energy Security and Resiliency,” Institute of Public Utilities Grid School 2015, Michigan State University, Chicago, IL, March 12, 2015.

Felder, F., “Transformative Technologies,” Institute of Public Utilities Grid School 2015, Michigan State University, Chicago, IL, March 11, 2015.

Felder, F., Athawale, R., Chandramowli, S. "Planning for the Future Electric Grid," New Jersey American Planning Association, New Brunswick, NJ, January 29, 2015.

Selcuklu, S., Coit, D. and Felder, F. "Aleatory and Epistemic Uncertainty Classification of the Generation Expansion Problem," Industrial and Systems Engineering Research Sessions (ISERC) 2015, May 30-June 2, 2015, Nashville, TN.

Felder, F., *Expert Topic Briefing: Negotiating a Universal Agreement on Climate Change*, World Affairs Council of Philadelphia, Philadelphia, PA, Dec. 10, 2014.

Felder, F., "Framework for Assessing Reliability," Center for Research in Regulated Industries, Rutgers University, Nov. 21, 2014 (presentation).

Chandramowli, S. and Felder, F., "LP-CEM: A modeling tool for power systems planning Incorporating climate change effects and macro-economic trends". Mid-Atlantic Regional Climate Symposium, Rutgers University, New Brunswick, NJ, November 20, 2014.

Shan, X., Felder, F., and Coit, D. "Game-theoretic Model for Electric Distribution Reliability from a Multiple Stakeholder Perspective," INFORMS, San Francisco, CA, Nov. 12, 2014 (presentation).

Shan, X., Felder, F., and Coit, D. "Game-theoretic Model for Electric Distribution Reliability from a Multiple Stakeholder Perspective," FERC Workshop/Trans-Atlantic Infraday, Washington, DC, November 7, 2014 (presentation).

Felder, F., Shan, X. and Coit, D. "Multi-Objective Framework for Evaluating Resiliency Measures for Electric Power Systems," FERC Workshop/Trans-Atlantic Infraday, Washington, DC, November 7, 2014 (presentation by Felder).

Chandramowli, S. and Felder, F., "LP-CEM: A Modeling Tool for Power Systems Planning Incorporating Climate Change Effects," Energy Policy Research Conference, San Francisco, Sept. 4, 2014 (paper and presentation by Felder).

Felder, F., "Energy Policy and Ethics," Rutgers University Research for Teachers in Engineering for Green Energy Technology and the Green Energy Technology for Undergraduates Program, New Brunswick, NJ, July 9, 2014.

Felder, F., "Combined Heat and Power & Resiliency: Case Study for Post-Sandy New Jersey," 2014 Louisiana Public Service Commission Combined Heat and Power Training Workshop, Louisiana State University, Baton Rouge, LA, June 25, 2014.

Felder, F., "How the Grid Works?" New Jersey Educational Foundation, Inc., *Energy 101*, New Brunswick, NJ, June 17, 2014 (presentation).

Shan, X., Felder, F., and D. Coit, "Game-theoretic Model for Electric Distribution Reliability with Government Intervention," CESUN 2014, June 8-11, 2014 (paper and presentation).

Chandramowli, S. and Felder, F., "Integrating Power System and Macroeconomic Modeling to Project the Impacts of Climate Change in New Jersey," CESUN 2014, June 8-11, 2014 (poster).

Li, S., Coit, D., Selcuklu, S., and Felder, F., "Electric Power Generation Expansion Planning Robust Optimization Considering Climate Change," Proceedings of the 2014 Industrial and Systems Engineering Research Conference, Y. Guan and H. Liao (eds), 2014.

Athawale, R. and Felder, F., “Incentivizing Combined Heat and Power Plants – How to Maximize Society Benefits?” 33rd Annual Eastern Conference, May 14-16, 2014 (paper and presentation).

Felder, F., “ISO Governance, ISO Principal-Agent Problem and Social Welfare,” Center for Research in Regulated Industries, 33rd Annual Eastern Conference, May 14-16, 2014 (paper and presentation).

Felder, F., “Will the Potential for a Death Spiral in Electricity Rates Hinder Transformation of the Electric Power System?” Rutgers Energy Institute Ninth Annual Energy Symposium, May 6, 2014.

Curchitser, E. and Felder, F., “Climate-to-humans: A study of urbanized coastal environments, their economics and vulnerability to climate change,” Decadal and Regional Climate Prediction using Earth System Models (EaSM) PI Meeting, NSF, January 27-29, 2014 (presentation by both).

Selcuklu, S., Coit, D., Felder, F., M. Rodgers, and N. Wattanapongsakorn, “A New Methodology for Solving Multi-Objective Stochastic Optimization Problems with Independent Objective Functions,” IEEE International Conference on Industrial Engineering and Engineering Management (IEEM2013), Bangkok, Thailand, December 10-13, 2013 (paper and presentation by Coit).

Felder, F., “Case Study of the New York Independent System Operator’s Governance,” FERC Workshop/Trans-Atlantic Infraday (TAI), November 7-8, 2013 (presentation).

Felder, F., “RTO Governance Best Practices and Needed Improvements,” APPA’s Roundtable Discussion of the Current State of the RTO-Operated Electricity Market, Washington, DC, October 17, 2013, (presentation).

Chandramowli, S. and Felder, F., “Impact of Climate Change on Electricity Systems and Markets,” INFORMS, Minneapolis, MN, Oct. 8, 2013 (interactive session, presented by Chandramowli).

Selcuklu, S., Felder, F., D. Coit, and M. Rodgers, “Pareto Uncertainty Index in Multi-Objective Genetic Algorithm: An Application to GEP,” INFORMS, Minneapolis, MN, Oct. 8, 2013 (presentation by Selcuklu).

Felder, F., “Analyzing the Reliability and Resiliency of New Jersey's Urban Energy Systems in Response to Climate Change,” DIMACS/CCICADA Workshop on Urban Planning for Climate Events, Rutgers University, Sept. 23, 2013 (presentation).

Felder, F., “EaSM Electricity Model Update,” Regional Economists Network, Bloustein School, June 7th, 2013 (presentation).

Felder, F., “J.D. Power 2013 Hurricane Sandy Responsiveness Survey,” New Jersey Utilities Association 98th Annual Conference, Galloway, NJ, June 6, 2013 (panel).

Felder, F., “Costs and Benefits of Combined Heat and Power,” NJ Spotlight Webinar: Combined Heat and Power New Jersey, May 7, 2013 (presentation).

Felder, F., “Integrating New Jersey Renewable Energy Policies into Energy Markets,” New York City, New York, May 1, 2013 (presentation and panel).

Felder, F., “Climate Change Mitigation and the Global Energy System,” Villanova Environmental Law Journal, Villanova, Pennsylvania, April 13, 2013 (presentation).

Felder, F., “Climate Change Mitigation and the Global Energy System,” Rutgers Law School Environmental Law Society, Newark, New Jersey, February 27, 2013 (presentation and panel).

Felder, F., “The NJ Spotlight Roundtable Series: Can the Energy Sector Drive New Jersey’s Economy?” Ewing, New Jersey, January 28, 2013 (panel).

Farkas., C., Carlton, A., Felder, F., K Baker., and M. Rodgers., “Coupled Energy Market Trading and Air Quality models for improved simulation of peak AQ episodes,” *Community Modeling and Analysis System Conference*, Durham, North Carolina, October 15-17, 2012 (presentation).

Selcuklu., S., Coit, D., Felder, F. and Rodgers, M., “Multi-Objective Generation Expansion Planning (GEP) Problem Optimization Using Pareto Uncertainty Index,” INFORMS, Phoenix, Arizona, October 12-15, 2012 (presentation).

Rodgers, M., Coit, D., Felder, F. and Selcuklu, S., “A Roadmap for Formulating the Generation Expansion Planning Model to Include Societal Health Costs,” INFORMS, Phoenix, Arizona, October 12-15, 2012 (presentation).

Felder, F., Ohio Clean Energy Transmission Conference, “What Drives Electricity Prices,” Panel Discussion, Ohio State University, August 6, 2012 (presentation).

Felder, F., “Social and Economic Dimensions of Energy Choices,” *Third Annual International Summer Symposium*, Rutgers University, June 4-6, 2012 (presentation).

Felder, F., “Design and Governance of Market-Based Electric Power Systems,” *Third International Engineering Systems Symposium*, Council of Engineering Systems Universities, Amsterdam, Netherlands, June 18-20, 2012 (presentation).

Felder F. and Loxley, C., “The Implications of a Vertical Demand Curve in Solar Renewable Portfolio Standards,” 31st Annual Eastern Conference, Advanced Workshop in Regulation and Competition, Center for Research in Regulated Industries, Rutgers University, June 16-18, 2012 (paper and presentation).

Tekiner, H., Coit, D. and Felder, F., “Generation Expansion Planning (GEP) Problems Considering Uncertainty and Risk,” INFORMS, Austin, TX, Nov. 10, 2010 (presentation by D. Coit).

Felder, F., “Electricity Markets Workshop”, co-course developer and trainer for USAID Contract for South African Power Pool, January 31 through February 4, 2010, Kenya (presentations).

Tekiner, H., Coit, D. and Felder, F., “Effects of Smart Grid Technologies on Generation Expansion Plans,” Conference on Applied Infrastructure Modeling and Policy Analysis, Washington, DC, Nov. 13, 2009 (paper and presentation).

Tekiner, H., Coit, D. and Felder, F., “Solving the Single-period Multi-objective Power Generation Expansion Planning Problem,” *Proceedings of the Industrial Engineering Research Conference (IERC)*, Miami, FL, June 2009.

Coit, D., Felder, F., and Tekiner, H. “Modeling Trade-offs between Costs, Reliability, and Air Emissions for Computer Data Centers,” CCC Workshop on Green Computing, May, 2009.

Felder, F., “Electricity Markets Workshop”, co-course developer and trainer for USAID Contract for Central African Power Pool, January 25 through January 30, 2009, Gabon (presentations).

Felder, F., “A Framework for Evaluation of Energy Policy Proposals,” IEEE Energy2030, Atlanta,

GA, Nov. 17-18, 2008 (presentation and paper in the conference proceedings).

Tekiner, H., Coit, D. and Felder, F. Multi-objective Power Generation Expansion Planning Problem with Monte Carlo Simulation, *INFORMS*, Washington DC, October 2008, pp. 1394-1405.

Felder, F., "Electricity Markets Workshop", co-course developer and trainer for USAID Contract for Bangladesh, August 10 through 14, 2008, (presentations).

Felder, F., "Electricity Markets Workshop", co-course developer and trainer for USAID Contract for Sri Lanka, August 16 through 20, 2008, (presentations).

Felder, F., "Electricity Markets Workshop", co-course developer and trainer for USAID Contract for Eastern African Power Pool, June 15 through June 20, 2008, Senegal (presentations).

Coit, D., Felder, F., and Tekiner, H. Distributed vs. Centralized Planning and Trade-Off Analyses for Electric Power Systems in a Carbon Constrained World, *REI Third Annual Research Symposium*, April 2008.

Felder, F., "Opportunities For and Benefits of Greater Regional Collaboration on Energy Efficiency," Regional Strategies for Advancing Energy Efficiency in the Northeast, Boston, MA, NESCAUM, Boston, MA, March 27, 2008.

Felder, F., "Evaluation of an Appliance Cycling Load Management Program," *INFORMS Annual Meeting*, Denver, CO, October 24-27, 2004.

Felder, F., "Different Formulations of the Reliability Problem of Restructured Power Systems," *CORS/INFORMS International*, Banff, Alberta Canada, May 16-19, 2004.

Felder, F., "Advances in Probabilistic Risk Assessment Applied to Management Issues with an Application to the Reliability of a Check Processing Facility," *Trust, Responsibility, and Business*, Society for the Advancement of Management Conference Proceedings 2003.

Felder, F., "Modeling Improvements to Evaluate the Reliability of Restructured Electric Power Systems," presentation, *INFORMS Annual Conference*, Atlanta, Oct. 19-22, 2003.

Felder, F., "Extension of Probabilistic Risk Assessment Methodology to Management Decisions with an Application to Restructured Electric Power Systems," presentation, *INFORMS Annual Conference*, San Jose, Nov. 17-20, 2002.

Yoon, Y. and Felder, F., "Study of Loss of Load Probability in Designing Installed Capacity Market," *IEEE Conference Proceedings*, Chicago, IL, July 2002, pp. 830-835.

Felder, F. and Golay, M., "Risk Analysis in Support of Improved Safety at US Dept. of Energy Facilities," *PSAM-5 Conference*, Osaka, Japan, 2000, pp. 753-758.

Felder, F., Peterson, S., Tobiason, S., "Testing the Merits of Providing Customized Risk Management," *USAEE/IAEE 17th Annual North American Conference*, Oct. 27-30, 1996.

Felder, F., "The Application of Financial Option Theory to Electric Utility Decision Making in Integrated Resource Planning and Maintenance Shutdowns," *American Power Conference Proceedings*, April 18-20, 1995.

Felder, F., "Price Forecasting and Risk Management: An Application of a Random Walk Model to

Fuel Choice in Generation Planning,” *USAAE Proceeding*, November 1994.

Other Publications

Felder, F. and Petitet, M., Lessons From the European Electricity Crisis, Instant Insight, KAPSARC, February 20, 2023, <https://www.kapsarc.org/research/publications/lessons-from-the-european-electricity-crisis/>.

Felder, F., Policy Responses Needed for Grid Reliability Crisis, Energy Intelligence, September 1, 2022, <https://www.energyintel.com/00000182-f871-d92d-a5b7-f8fdcc270000>.

Felder, F., Policy Responses to the Reliability Crisis in the Power Grid, Instant Insight, KAPSARC, June 6, 2022.

Petitet, M., Unel, B., Fuentes, R., and Felder, F., Climate and Power System Reliability in the Aftermath of the Texas Blackouts, IAAE Energy Forum, 3rd Quarter 2021, pp. 12-16.

Felder, F. and Al Atawi, H., What Texas Tells Us About Lessening the Frequency and Severity of Electricity Blackouts, Instant Insight, KAPSARC, February 28, 2021, <https://www.kapsarc.org/research/publications/what-texas-tells-us-about-lessening-the-frequency-and-severity-of-electricity-blackouts/>.

Felder, F., and Kumar, P. (2019). The Importance of Determining the Net Economic Impacts of Offshore Wind Energy for New Jersey, *NJ Spotlight*, September 19, 2019.

Felder, F. and Kumar, P. (2019). Measuring Energy Efficiency the Right Way, *NJ Spotlight*, February 19, 2019.

Felder, F. (2019). New Energy Directions, *NJ Municipalities*, February 2019, pp. 28-29.

Felder, F. If We Want Clean Energy, We Must Get Energy Prices Right, *NJ Spotlight*, April 18, 2017.

Athawale, R., & Felder, F. (2016, December 28). Economic Forecasts New. *New Jersey Business*.

Athawale, R., & Felder, F. (2015, December). Economic Forecasts New. *New Jersey Business*, 46-47.

Bogomolny, D., Felder, F., and Weiner, S. (2005, April). Untangling Environmental Markets. *Environmental Finance*, 27.

Felder, F. (2004). New U.S. Generation Market Power Analysis and Mitigation Procedures: What is the Federal Regulatory Commission Up To? *IPPSO FACTO*, 32-33.

Felder, F. (2003). Lessons Learned from Restructuring the United States Electric Power Industry. *IPPSO FACTO*, 17(4), 38-41.

Felder, F. (2003). The Other Side of Story Telling. *SAM Management in Practice*, No. 3, 1-4.

Felder, F. (1997). Untangling the Reliability Issue. *Electric Perspectives*, 42-48.

Kalt, J., Jaffe, A., Jones, S., and Felder, F. (1996). Regulatory Reform and the Economics of Contract Confidentiality: The Example of Natural Gas Pipelines. *Regulation*, 1, 60-65.

Jorgensen, G., and Felder, F. (1995). New England Power Pool: A Bridge to Competition. *Public Utilities Fortnightly*, 133(13).

Jones, S. and Felder, F. (1995). Natural Gas Pipelines: Roadmap to Reform. *Public Utilities Fortnightly*, 11-13.

Felder, F. (1995, January). Focusing In On Futures and Options. *Electric Perspectives*, 20(1), 47-54.

Jones, S. and Felder, F. (1994). Using Derivatives in Real Decision Making. *Public Utilities Fortnightly*, 132(19).

Book Reviews

Felder, F. (2023). Review of the book *Electricity Capacity Markets*, Todd S. Aagaard and Andrew N. Kleit. *The Electricity Journal*, 36(4), 107271. <https://doi.org/10.1016/j.tej.2023.107271>

Felder, F. (2018). Review of the book *Competition and Regulation in Electricity Markets*, Sebastian Eyre and Michael G. Pollitt (eds.). *The Energy Journal*, 39(1), 255-258.

Felder, F. (2017). Review of the book *The Economics of Electricity Markets* by Darryl R. Biggar and Mohammad Reza Hesamzadeh. *The Energy Journal*, 38(1), 294-296.

Felder, F. (2016). Review of the book *Electricity Restructuring in the United States: Markets and Policy from the 1978 Energy Policy Act to the Present*, by S. Isser. *The Energy Journal*, 37(3), 294-296.

Felder, F. (2016). Review of the book *Electricity Markets and Power System Economics*, by D. Gan, D. Feng, & J. Xie. *The Energy Journal*, 37(2), 289-290.

Felder, F. (2014). Review of the book *Transforming the Grid: Electricity System Governance and Network Integration of Distributed Generation*, by D. Bauknecht. *The Energy Journal*, 35(3), 184-186.

Felder, F. (2013). Review of the book *Carbon Capture and Storage: Technologies, Policies, Economics and Implementation Strategies*, by S. M. Al-Fattah, M. F. Barghouty, & B. O. Dabbouti. *The Energy Journal*, 34(4).

Felder, F. (2011). Review of the book *Electricity Restructuring: The Texas Story*, by L. L. Kiesling and A. N. Kleit. *The Energy Journal*, 32(3), 239-241.

Felder, F. (2009). Review of the book *Deregulation, Innovation and Market Liberalization*, by L. L. Kiesling. *The Energy Journal*, 30(4), 192-195.

Felder, F. (2008). Review of the book *Competitive Electricity Markets and Sustainability*, by F. Lévêque. *The Energy Journal*, 29(3), 177-180.

Felder, F. (2008). Review of the book *Electric Choices: Deregulation and the Future of Electric Power*, by A. N. Kleit. *The Energy Journal*, 29(1), 175-178.

Felder, F. (2007). Review of the book *Electricity Market Reform: An International Perspective*, by F. P. Sioshansi & W. Pfaffenberger. *The Energy Journal*, 28(1), 173-174.

Felder, F. (2006). Review of the book *Electricity Deregulation: Choices and Challenges*, by J. M. Griffin & S. L. Puller. *The Energy Journal*, 27(4), 181-183.

- Felder, F. (2006). Review of the book *Risk Assessment of Power Systems: Models, Methods and Applications*, by W. Wi. *Interfaces*, 36(2), 179-180.
- Felder, F. (2005). Review of the book *Optimization Principles: Practical Applications to the Operation and Markets of the Electric Power Industry*, by N. Rau. *Interface*, 35(5), 440-441.
- Felder, F. (2005). Review of the book *The Next Generation of Electric Power Unit Commitment Models*, by B. Hobbs, M. Rothkopf, R. O'Neill, & H.P. Chao. *Interfaces*, 35(2), 181-182.
- Felder, F. (2005). Review of the book *Risk Modeling, Assessment, and Management*, 2nd Edition, by Y. Y. Haimes. *IIE Transactions*, 37(6), 586.
- Felder, F. (2004). Review of the book *The End of a Natural Monopoly: Deregulation and Competition in the Electric Power Industry*, by P. Z. Grossman & D. H. Cole. *The Energy Journal*, 25(4), 135-138.
- Felder, F. (2004). Review of the book *Electricity Pricing in Transition*, by A. Faruqui & K. Eakin. *The Energy Journal*, 25(2), 143-144.
- Felder, F. (2004). Review of the book *Efficiency Versus Sustainability in Dynamic Decision Making: Advances in Intertemporal Compromising*, by B. Blaser. *Interfaces*, 34(2), 162-163.
- Felder, F. (2004). Review of the book *Stochastic Models in Reliability and Maintenance*, by S. Osaki. *Interfaces*, 34(1), 74-75.
- Felder, F. (2003). Review of the book *Electricity Economics: Regulation and Deregulation*, by G. S. Rothwell & T. Gómez. *The Energy Journal*, 24(3), 151-152.
- Felder, F. (2003). Review of the book *Power System Operations and Electricity Markets*, by F. I. Denny & D. E. Dismukes. *The Energy Journal*, 24(3), 153.
- Felder, F. (2002). Review of the book *Power System Economics: Designing Markets for Electricity*, by Steven Stoft. *The Energy Journal*, 23(4), 112-114.
- Felder, F. (2001). Review of the book *Pricing in Competitive Electricity Markets*, by A. Faruqufsi & K. Eakin. *The Energy Journal*, 22(4), 112-114.
- Felder, F. (1999). Review of the book *Deregulation of Electric Utilities*, by G. Zaccour. *The Energy Journal*, 20(3), 160-162.
- Felder, F. (1998). Review of the book *Electric Utility Restructuring: A Guide to the Competitive Era*, by P. Fox-Penner. *The Energy Journal*, 19(3), 133-135.
- Felder, F. (1998). Review of the book *International Comparisons of Electricity Regulation*, R. J. Gilbert & E. P. Kahn. *The Energy Journal*, 19(1).
- Felder, F. (1997). Review of the book *A Shock to the System: Restructuring America's Electricity Industry*, by T. J. Brennan. *The Energy Journal*, 18(3), 140-142.
- Felder, F. (1996). Review of the book *The Privatization of Public Utilities*, by L. S. Hyman. *The Energy Journal*, 17(4), 163-165.

Felder, F. (1994). Review of the book *Electric Utility Mergers: Principles of Antitrust Analysis*, by M. W. Frankena & B.M. Owen. *The Energy Journal*, 15(4), 233-234.

Sponsored Research

Study of Public Procurement, Financial, and Legal Authorities Necessary to Facilitate the Development of Town Center Distributed Energy Resources (Microgrids), \$60,000, New Jersey Board of Public Utilities, Senior Investigator, March 1, 2019 through February 28, 2021.

Rutgers Energy Institute, Rutgers University, \$900,000, Director, July 2018 through June 2021.

Clean Energy Evaluation and Market Assessments, New Jersey Board of Public Utilities, \$926,284, Principal Investigator, July 2016 through October 2017.

Clean Energy Evaluation and Market Assessments, New Jersey Board of Public Utilities, \$926,284, Principal Investigator, September 2015 through June 2016.

Clean Energy Evaluation and Market Assessments, New Jersey Board of Public Utilities, \$908,231, Principal Investigator, June 24, 2014 through November 6, 2015.

New Jersey Energy Resilience Bank, New Jersey Board of Public Utilities (funded by U.S. Department of Housing and Urban Development), \$230,000, Principal Investigator, October 17, 2014 to March 31, 2017.

Solar Utility Networks: Replicable Innovations in Solar Energy (SUNRISE), U.S. Department of Energy (Subcontractor to PHI Services Company), \$30,000, Principal Investigator, September 1, 2014 to August 31, 2016.

Clean Energy Evaluation and Market Assessments, New Jersey Board of Public Utilities, \$1,356,553, Principal Investigator, June 2013 through November 2014.

Review of Impact Evaluation Contractors and Work Product, PSE&G, \$113,479, Principal Investigator, January 15, 2012 to December 30, 2015.

Electricity Demand and the Impacts on Air Quality, Rutgers University Faculty Grant Proposal, \$10,261, Principal Investigator, December 6, 2011 to December 30, 2012.

Evaluation of Reports re: Proposed Atlantic Wind Connection Backbone Transmission Project, Atlantic Wind Connection, \$13,860, co-Principal Investigator, September 1, 2011 to October 31, 2011.

Review of Connecticut Renewable Portfolio Standards, Connecticut Energy Advisory Board, \$58,963, Principal Investigator, February 18, 2011 to December 31, 2011.

Collection of Wind Resource Data, New Jersey Board of Public Utilities, \$4,889, Principal Investigator, January 1, 2011 to September 30, 2011.

Economic Impacts of Water Main Infrastructure Investments, Winning Strategies, \$40,782, Principal Investigator, December 20, 2010 to June 1, 2011.

Economic Impact of Accelerated Infrastructure Improvement Projects, New Jersey Natural Gas Company, \$13,436, Principal Investigator, November 8, 2010 to January 14, 2011.

Economic Impacts of Water Main Infrastructure Investments, Aqua America, Inc., \$17,702, Principal Investigator, November 15, 2010 to March 31, 2011.

Energy Technology Grants, PSEG Services Corporation, \$236,000, Principal Investigator, December 1, 2009 to December 31, 2011.

Impacts of Energy Infrastructure, New Jersey Natural Gas, \$13,587, June 17, 2010 to August 3, 2010.

Describe and Quantify the Economic Benefits of the NJ DEP Action Plan for the NJ Global Warming Response Act, New Jersey Department of Environmental Protection, \$15,630, Principal Investigator, July 14, 2009 to October 14, 2009.

MOA between Rutgers' Center for Energy, Economic and Environmental Policy (CEEPP) and the New Jersey BPU/Clean Energy Program, New Jersey Board of Public Utilities, \$1,830,281, Principal Investigator, June 1, 2009 through May 31, 2013 (covering four contracts).

Innovative Partnership Institute, New Jersey Department of Environmental Protection, \$6,000, co-Principal Investigator, April 2009.

New Jersey Department of Environmental Protection: Assessing the Potential for New Jersey Forests to Sequester Carbon and Contribute to Greenhouse Gas Emission Avoidance, \$7,000, co-Principal Investigator, May 2009.

New Jersey Office of Clean Energy Program: Research and Related Activities Regarding the Energy Efficiency Program, Principal Investigator, \$244,367, September 1, 2008, to April 30, 2009.

Comprehensive Assessment of the PA Technical Reference Manual, Clean Power Markets, \$187,950, Principal Investigator, October 1, 2008 to December 31, 2012.

New Jersey Hydrogen Learning Center, New Jersey Board of Public Utilities, Principal Investigator, \$73,928, May 1, 2008 to June 20, 2009.

New Jersey State Energy Master Plan (Part 3), New Jersey Board of Public Utilities, Principal Investigator, \$200,127, November 1, 2007 to October 31, 2008.

New Jersey State Energy Data Center (Part 2), New Jersey Board of Public Utilities, \$175,989, Principal Investigator, Nov. 14, 2006 through December 31, 2007.

New Jersey State Energy Master Plan (Part 2), \$216,570, New Jersey Board of Public Utilities, Principal Investigator, October 1, 2006 to June 30, 2008.

Diesel Generator and Performance Standard Abstract, Clean Energy Group, \$10,000, Principal Investigator, April 30, 2007 to December 31, 2007.

Rutgers Energy Institute, The Future Electric Power System in a Carbon Constrained World, \$30,000, co-Principal Investigator, 2007-2008.

New Jersey Meadowlands Renewable Energy Task Force, New Jersey Meadowlands, \$100,000, Principal Investigator, May 15, 2006 to October 31, 2008.

Natural Resources Defense Council, Energy Efficiency, \$15,000, Principal Investigator as of Oct. 30, 2006 (co-Principal Investigator prior), July 26, 2005 through Dec. 31, 2006.

New Jersey Board of Public Utilities, New Jersey State Energy Data Center, \$99,965, Principal Investigator as of Oct. 30, 2006 (co-Principal Investigator prior), Dec. 1, 2005 through Dec. 31, 2006.

New Jersey Board of Public Utilities, New Jersey State Energy Master Plan, \$140,747, co-Principal Investigator, Feb. 1, 2005 through May 24, 2006.

New Jersey Board of Public Utilities, New Jersey Hydrogen Learning Center, \$200,000, Principal Investigator as of Oct. 30, 2006, Feb. 1, 2005 through Aug. 31, 2007.

New Jersey Board of Public Utilities, New Jersey Energy Efficiency Evaluation, \$523,837, Principal Investigator as of Oct. 30, 2006, (investigator prior), Jan. 1, 2005 through Dec. 31, 2006.

New Jersey Board of Public Utilities, State Technologies Advancement Collaborative, \$43,881, co-Principal Investigator, May 11, 2005 through August 31, 2006.

New Jersey Board of Public Utilities, Evaluation of CO₂ Emission Allocation as part of the Regional Greenhouse Gas Initiative, \$15,000, co-Principal Investigator, April 15, 2005 through June 30, 2005.

Retail Electricity Supply Association, Assessment of Customer Response to Real Time Pricing, \$41,000, co-Principal Investigator, Jan. 1, 2005 through Oct. 31, 2005.

New Jersey Board of Public Utilities, Economic Impact Analysis of a 20% New Jersey Renewable Portfolio Standard, 2004, \$204,247, Senior Investigator, Nov 1, 2003 through Jan. 31, 2005.

New Jersey Board of Public Utilities, New Jersey Electric Distribution Reliability Standards, \$33,999, Investigator, Feb. 1, 2004 through Dec. 31, 2004.

Rutgers University Teaching

Data Analytics: Using Big Data (graduate)

Climate Change, Public Health and Policy (undergraduate)

Sustainable Energy Policy and Planning (graduate)

Introduction to Statistics (undergraduate and graduate)

The Science, Technology and Policy of Global Climate Change (undergraduate Byrne seminar, honors undergraduate seminar, undergraduate seminar at University of Konstanz)

Energy Engineering, Economics and Policy (graduate seminar; joint course with Princeton University)

Integrated Energy Challenges and Opportunities I and II (year-long graduate seminar)

Energy Planning for Communities Living in Landfills (Planning Studio)

Directed Studies: Victoria Nielsen (Fall 2013); Allison Bridges, Kathryn McKelvey, and Ishanie Niyogi (Spring 2013); Shankar Chandramowli (Summer 2012, Fall 2012, Fall, 2013), Zachary Froio (Fall 2017), Pratyusha Kiran (Fall 2017), Pranay Kumar (Fall 2017), Ashley Scull (Fall 2017)

In-depth Introduction to Electricity Markets (two-day professional short course)

Cost Benefit Analysis of Energy Efficiency and Renewable Energy Projects (one-day professional short course)

Environmental Management (four-day professional short course)

Rutgers University Student Advising and Service

Post-doctoral, Dissertation, Master Thesis, and Undergraduate Advisor/Committees:

- Jose Espiritu Nolasco, System Reliability Estimation and Component Replacement Analysis for Electricity Transmission and Distribution Systems, Oct. 2007 (external department doctoral committee member)

- Hatice Tekiner, Multi-Objective Power Generation Expansion Planning Considering Environmental Impacts and Smart Grid Technologies, Jan. 2008 to May 2010 (external department doctoral committee member)
- Ariel Martin, Development of a Decision Support System to Operate the Supplemental Lighting System in a Tomato Greenhouse Equipped with an On-site Power Generator, October 2013 (external department doctoral committee member)
- Bernhard Brauß, The Issue-Attention Cycle in Energy Policy, Bachelor Thesis, University of Konstanz, Department of Politics & Public Administration, March 2012 (Appraiser)
- Shuya Li, Robust Optimization of Generation Expansion Planning Problems Considering Climate Change's Uncertain Impact, September 2012 to May 2014 (external department masters committee member)
- Caroline Farkas, Impact and Sensitivity Analyses of Energy Sector Emissions: Air Quality Modeling of the PJM Region, Dec. 21, 2015, (external department doctoral committee member)
- Saltuk Bugra Selcuklu, Multi-objective Generation Expansion Planning Considering Uncertainty and Modeling with the Pareto Uncertainty Index, October 2015 (external department doctoral committee member)
- Shankar Chandramowli, Impact of Climate Change on Electricity Systems and Markets, January 2015 (doctoral committee chair)
- Xiaojun (Gene) Shan, Ph.D., Improving the Modeling of Offshore Wind and Electric Distribution Reliability for Public Policy Formulation, post-doc advisor, Jan. 2014-Dec. 2014
- Rebeca Meier, "Feed-in Tariff or Renewable Portfolio Standard – A Quantitative Analysis of the Impact of current Energy Policies on the Provision of Renewable Energy," Joint Masters Thesis with University of Konstanz and Rutgers University, Spring 2016
- Shane Patel, Fall 2014, "Characteristic Problems of Government-Supported Demonstration Scale Energy Innovation: Establishing A Framework for the Evaluation of Energy Innovation Government Programs, undergraduate research paper
- Chhayang Patel, 2014-2015 academic year, undergraduate Arresty Research Program Adviser
- Rutgers Energy Institute Summer Intern co-Adviser (Kaila Roffman, Summer 2015; Christopher Cohane, Summer 2014)
- Allison Bridges, Leveraging Amenity-Led Growth and Collective Action For Sustainable Development In Florianópolis, 1965-2016, April 2016, (doctoral committee member)
- Eric Zimmermann, Internship Supervisor, Summer 2016
- Brian Kemp, Internship Supervisor, Summer 2016
- Mark Rodgers, Simulation-based Optimization Models for Electricity Generation Expansion Planning Problems Considering Human Health Externalities, August 2016 (co-chair, doctoral committee)
- Sanling Song, Improving the Modeling of Offshore Wind and Electric Distribution Reliability for Public Policy Formulation, Feb. 2016 to Mar. 2017
- Carla Corona, Understanding Transitions to Sustainability in Developing Countries: The Chilean Energy Transition, May 2016
- Jacob Yu, Solar Market Analysis, Rutgers Energy Institute Summer Internship, 2017
- Ioanna Tsoulou, A Social-ecological Approach for Heat Adaptation of Senior Low-income Housing, March 2020, (doctoral committee member)
- Jian Zhou, Joint Optimization of System Hardening and Restoration for Resilience Enhancement against Cascading Failures, August 2020 (doctoral committee member)
- Hieu Nguyen, Collaborative Research Modeling Strategic Regulators in Network Infrastructure Planning, post-doctoral supervisor, August 2019 to August 2020
- Jip Kim, Strategic Planning for Low-Carbon Power Systems, May 2021, NYU (doctoral committee member)
- Pranay Kumar, Energy Conservation Behaviors in U.S. Households: Combining Top-Down and Bottom-up Approaches, May 2023 (doctoral committee member)

Rutgers University Senate (July 1, 2019 to September 30, 2020)
Bloustein Search Committee, Research Analyst in Urban Informatics (January to February 2019)
Bloustein Faculty Search Committee (Fall 2018 to Spring 2019)
Bloustein Teaching and Advising Committee (Spring 2018)
Bloustein School Non-tenure Track Appointment and Promotion Committee (April 2018 to present)
Bloustein School Strategic Planning Committee for Research, Practice and Service (March-April 2018)
Hult Prize Challenge, Judge (December 2017)
Bloustein School Search Committee, Research Professor/Director of Research and Evaluation, Heldrich Center for Workforce Development (2017 to 2018)
School of Graduate Studies, Graduate Faculty in Energy Systems (Spring 2015 to present)
Bloustein School Liaison with School of Engineering regarding Masters of Energy Systems (Spring 2015)
Board of Advisors, Rutgers EcoComplex Advisory Board, Member, May 6, 2014 to present
Bloustein Faculty Council: Non-tenure Track Committee, May 2014
Lead Instructor for a class on “Sustainable Energy” for New Jersey Governor’s School in Engineering & Technology (Summer 2012); Lecturer Summer 2018
Steering Committee, Edward J. Bloustein School of Planning and Public Policy, September 2006 to August 2008
Associate Director, Rutgers Energy Institute, May 2007 to April 2009
New Jersey State Sustainability Institute, Expert Advisory Board (July 2006 to Dec. 2007)

Other Academic Activities

Editorial Boards

Member of Editorial Board, *Energy Efficiency* (January 2020 to present)
Member of Editorial Board, *Utilities Policy* (September 2016 to present)
Member of Editorial Board, *The Electricity Journal* (January 2013 to date)
Book Review Editor, *The Energy Journal* (January 2012 to July 2019)
Member of Editorial Board, *KIEE International Transactions on Power Engineering* (2005 to 2006)
Member of Editorial Board, *SAM Advanced Management Journal*, (December 2002 to August 2004)

Reviewer

Utilities Policy (February 2025; July 2025), *Journal of Critical Infrastructure Policy* (August 2024), *Reliability Engineering & System Safety* (March 2022), *Energy Policy* (October 2020), *Applied Energy* (June 2018), *WIREs Energy and Environment* (December 2017), *Journal of Planning Education and Research* (June 2017; July 2018), *Energy Research and Social Science* (January 2017), *Energy Efficiency Journal* (November 2020, October 2020, October 2019, February 2018, October 2016), *The Energy Journal* (May, 2025; April, 2025; August 2019, August 2016; March 2017), *Netherlands Foundation for Fundamental Research on Matter, FOM* (May 2016); *International Political Science Review* (April 2016), *MIT Press* (January 2016), *CSEE Journal of Power and Energy Systems* (November 2015), *Sustainable Cities and Society* (August 2015), *IBM Journal of Research and Development* (May 2015), *Nature Climate Change* (April 2015), *Utilities Policy* (December 2018, June 2018, March 2018, Jan. 2017, Oct. 2016, Jan. 2015, June 2015, July 2015, August 2015, Oct. 2015, April 2016; July 2016), *PNAS* (Dec. 2014), *Environmental Science & Technology* (Nov. 2014, March 2016; April 2018), *European Journal of Transport and Infrastructure Research* (Sept. 2014, Nov. 2017), *Climatic Change* (June 2018, Sept. 2014), *Transportation Research Part D: Transport and Environment* (June 2014, March 2018), *Electric Power Systems Research* (Mar. 2014), *International Journal of Management Science and Engineering Management* (August 2013), *Policy Sciences* (June 2013), *Environmental Science and Technology* (August 2013), *Academy of Finland* (April 2013), *Nazarbayev University* (Winter 2013; Fall 2013; Winter 2017), *Journal of Regulatory Economics* (January 2013), *New Jersey Department of Environmental Protection* (May 2013)

Invited Academic Activities

Peer Reviewer, U.S. Environmental Protection Agency, Integrated Planning Model, Fall 2020.
International Conference of Applied Energy, “Applied Energy Symposium: MIT A+B,” Session co-Chair, May 22-23, 2019.
Geographical Sciences Committee, National Academies of Sciences, Engineering and Medicine, “Climate Change, Coastal Flooding, and the Electric Power Grid,” December 6, 2018.
China-US 2018 Joint Eco-environmental Symposium: Advances in Critical Needs for the Nexus of Food, Energy, and Water Systems, Invited Keynote Speaker, October 24-28, 2018
Symposium on Realizing the Value of Nuclear Engineering – A Celebration of Michael Golay’s Career, Cambridge, MA, March 26-27, 2018
Peer Reviewer, US Department of Energy, International Electricity Market Model (Nov. 2016)
University of Texas Interdisciplinary Electricity Conference, “The Nexus of Markets and the Environment,” Austin, TX, April 21-22, 2016
Initiative for Sustainable Electric Power Systems Workshop, Penn State University, November 19-20, 2015, invited speaker
INFORMS 2015, organized session on Optimizing Reliability and Resiliency of Electric Power Systems, November 2015
University of Texas Interdisciplinary Electricity Conference, “The Nexus of Markets and the Environment,” Austin, TX, April 9-10, 2015
Organizing Committee, Center for Research in Regulated Industries, Rutgers Business School, 34th Annual Eastern Conference
Session Chair, FERC Workshop/Trans-Atlantic Infraday, Electricity Markets Restructuring, Nov. 7, 2014
Invited Lecturer, Center for Sustainable Electric Power Systems Seminar, Penn State University, October 14, 2014
Rutgers Energy Institute, 9th Annual Symposium, “Will the Potential for a Death Spiral in Electricity Rates Hinder Transformation of the Electric Power System?”, May 6, 2014
Invited Panelist, 2014 Biennial Workshop in Service Engineering (BeWiSE), Penn State University, September 16-17, 2014
Technical Program Committee, Council of Engineering Systems Universities (June 8-11, 2014)
Invited Participant, KAPSRC, Workshop on Energy Systems Modeling (October 3, 2013)
Invited Participant, MIT Conference on Modeling Social, Technical and Natural Systems for Policy (September 25-27, 2013)
Discussant, Center for Research in Regulated Industries (May 16 & 17, 2013)
Expert participant in *Gathering Global Intelligence to Accelerate Development—Foreign Experts Traveling in Anhui Specialized in New Energy*, (September 24-27, 2012)
Participant, Council of Engineering Systems Universities Conference, Delft, (June 18-20, 2012)

OTHER PROFESSIONAL ACTIVITIES

International Activities

- Peer Review of Multilateral Cross-Border Power Trade, U.S. Department of State and National Association of Regulatory Utility Commissioners, Kuching Malaysia, August 28-29, 2024
- Peer Review of Competitive Wholesale Electricity Market Establishment Strategies, U.S. Department of State and National Association of Regulatory Utility Commissioners, Ulaanbaatar, Mongolia, May 27-29, 2024
- Sustainable Development of Power Sector and Enhancement of Electricity Trade in the South Asian Region: Policy, Regulatory Issues and Challenges, USAID, January 15, 2016, New Delhi, India
- Capacity Building Program for Designing, Managing and Operating a Power Trading Entity in Nepal, USAID, September 14-18, 2015
- Workshop on Efficient and Effective Electricity Market Design, Operation and Management, Kenya, USAID, Feb. 1-5, 2010
- Regional Electricity Markets Workshop, Libreville, Gabon, USAID, January 25-30, 2009

- Electricity Market Development Program, Bentota, Sri Lanka USAID, August 18-20, 2008
- Electricity Market Development Program, Dhaka, Bangladesh, USAID, August 13-15, 2008

Senior Advisor, Digital Wind, January 1, 2025 to present

Consumer Advisory Council, New York Independent System Operator, March 18, 2011 to December 1, 2013,
Co-Chair.

Energy Services Providers, Troy, NY, Director, March 2005 to July 2006
Member of the Board of Directors of a retail electricity supplier.

Validigm Corporation, New York, NY, *Director*, June 2000 to December 2000
Member of the Board of Directors of a high-tech, computer network evaluation and applications
company.

HONORS AND AWARDS

Associate Member, Sigma Xi, Scientific Research Honor Society of North America
Member, Tau Beta Pi, National Engineering Honor Society
Member, Alpha Sigma Nu, American Nuclear Society Honor Society
Twice awarded the Navy Achievement Medal

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of PPL Electric :
Utilities Corporation filed pursuant to 52 :
PA Code Chapter 57 with respect to the :
approval to build approximately 1.1 miles : Docket No. A-2025-3059443
of new parallel double circuit 230 kV :
transmission taps that are needed to :
connect the existing Susquehanna- :
Harwood #1 & #2 transmission lines on the :
New Tomhicken 230 kV switchyard that :
are respectively located in Luzerne County, :
Pennsylvania :

VERIFICATION

I, Frank A. Felder, Ph.D., hereby state that the facts above set forth in my Direct Testimony, OCA Statement No. 1, are true and correct to the best of my knowledge, information, and belief and that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa.C.S. Section 4904 (relating to unsworn falsification to authorities).



DATED: July 8, 2026

Signature:

Frank A. Felder, Ph.D.

Address: Independent Electricity
Consultants LLC
1855 Saint Francis Street
#1612
Reston, VA 20190

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of PPL Electric	:	
Utilities Corporation Filed Pursuant to 52	:	
Pa. Code Chapter 57 Subchapter G, for	:	
Approval to Build Approximately 1.1 Miles	:	Docket No.: A-2025-3059443
of New Parallel Double Circuit 230 kV	:	
Transmission Taps that are Needed to	:	
Connect the Existing Susquehanna-	:	
Harwood #1 & #2 Transmission Lines on	:	
the New Tomhicken 230 kV Switchyard	:	
that are Respectively Located in Luzerne	:	
County, Pennsylvania	:	

DIRECT TESTIMONY
OF
Rao Konidena
On behalf of the
PENNSYLVANIA OFFICE OF CONSUMER ADVOCATE
Date Served: July 8, 2026

PUBLIC VERSION

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Tomhicken Konidena Testimony DRAFT

I. Introduction

Q: Please state your name and company.

A: My name is Rao Konidena. My business address is Rakon Energy LLC, Roseville, MN 55113.

Q: By whom are you employed and in what capacity?

A: I am the President of Rakon Energy LLC. Rakon Energy is owned and operated by me.

Q: On whose behalf are you testifying?

A: I am testifying on behalf of the Office of Consumer Advocate (“OCA”).

Q: Please describe your background and state your qualifications in transmission planning.

A: I have been an independent energy consultant for almost a decade, primarily focusing on transmission and distribution reliability studies and policy. I worked in Transmission Asset Management at Midcontinent Independent System Operator (“MISO”), similar to PJM, from September 2003 to May 2018. I started as an Applications Engineer for Planning, where I ran transmission reliability studies, transmission capacity calculations, and analysis for the MISO Transmission Expansion Plan (“MTEP”).

1 I was later promoted to Lead, Resource Forecasting in 2006, responsible for a
2 team of engineers running the capacity forecasting software. That forecasting work is
3 incorporated in the MTEP non-transmission alternatives section. After a promotion to
4 Manager of Resource Forecasting in 2009, I led Demand Response and Energy
5 Efficiency forecasting for MTEP.

6 I worked in compliance, process, and project management for the Transmission
7 Asset Management (“TAM”) division as Senior Manager of TAM Operations from 2013
8 to 2015. In this role, my team and I were responsible for division-wide financial and
9 strategic planning, supporting corporate planning and compliance efforts. I came back to
10 the Policy Studies department in the Principal Policy Advisor role for MISO in 2015,
11 leading the long-term load forecasting project with Purdue University's State Utility
12 Forecasting Group and Applied Energy Group demand response (“DR”), energy
13 efficiency (“EE”) and distributed generation (“DG”) potential study at MISO.

14 Before leaving MISO in 2018, I led policy efforts on energy storage and
15 distributed energy resources within economic transmission planning. I presented to MISO
16 state commissions, including the Iowa Utilities Board, the South Dakota State Public
17 Utilities Commission, and the Organization of MISO States.

18 As an independent consultant, I have submitted direct testimonies on behalf of my
19 clients at the Public Service Commission of Wisconsin (Transmission Line Certificate of
20 Public Convenience & Need docket), Minnesota Public Utilities Commission
21 (Aggregator of Retail Customer docket), Kansas Corporation Commission (Demand
22 Response Aggregator docket), California Public Utilities Commission (Diablo Canyon
23 Power Plant extension docket), North Carolina Utilities Commission (Duke Energy

Carolinas General Rate Case and Duke Energy Consolidated Carbon Plan and Integrated Resource Plans), Maryland Public Service Commission (Transmission Line Certification of Public Convenience And Necessity docket) and Illinois Commerce Commission (Transmission Line Certificate of Public Convenience and Necessity).

I have also provided energy storage expertise to the OCA in the Pennsylvania Public Utilities Commission energy storage Docket No. M-2020-3022877. I provide generic electrical engineering expertise for OCA in the transmission, distribution services and miscellaneous electric issues.

My resume is attached as Appendix A.

Q: Please provide your educational background.

A: I received a Bachelor of Engineering in Electrical & Electronics Engineering from Bangalore University, a Master of Science in Electrical Engineering from the University of Texas at Arlington, and a Master of Business Administration from the University of Minnesota.

Q: In the past, have you provided written testimony before this Commission?

A: Yes. I have previously testified before this Commission in the Letter Of Notification Of PPL Electric Utilities Corporation (“PPL”), Filed Pursuant To 52 Pa. Code Chapter 57 Subchapter G, For Approval To Rebuild The Existing Double- Circuit Stanton-Summit #3 And #4 230 kV Transmission Lines Connecting the Stanton 230 kV Substation And A Two-Pole Turn Structure That Are Respectively Located In Luzerne And Lackawanna Counties, Pennsylvania. Docket No. A-2022-3037374.

1 I have also testified in the FirstEnergy Pennsylvania Electric Company Base Rate
2 Case. Docket No. R-2024-3047068.

3
4 **Q: Are you sponsoring any exhibits?**

5 **A:** Yes. I am sponsoring the following exhibit.

6 Exhibit RK-1 — PPL Electric Utilities Corporation Policy on Cost Allocation for Large
7 Customer Interconnections (OCA I-6 Attachment 1). This document is PPL's internal cost
8 allocation policy that governs the customer-versus-ratepayer split for large load
9 interconnection projects. PPL confirmed this policy has never been reviewed or approved
10 by this Commission.

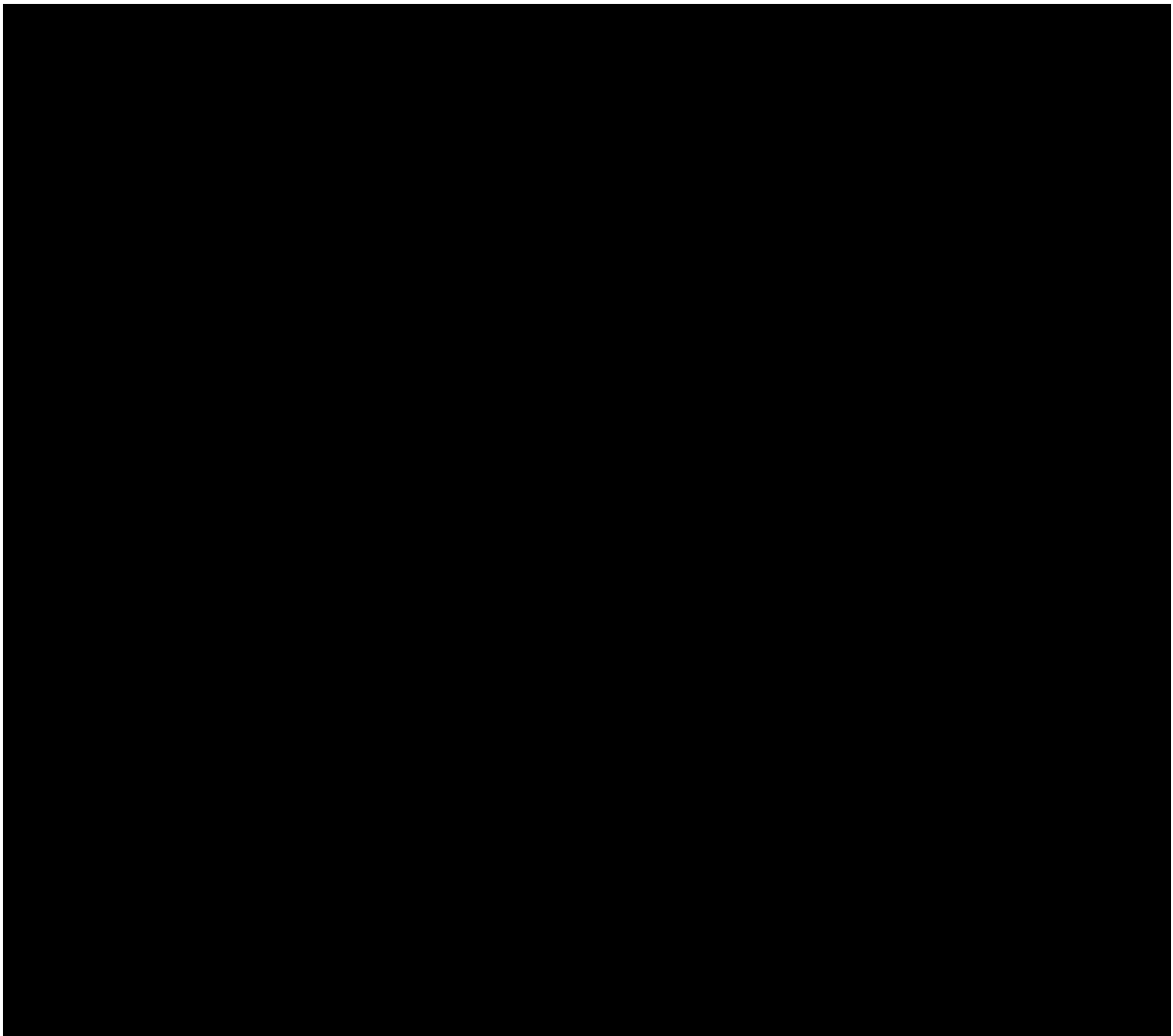
11
12 **Q: Throughout your testimony you use certain terms interchangeably. Can you clarify**
13 **your use of those terms?**

14 **A:** Yes. When I refer to "the Tomhicken Switchyard," "the Switchyard," or "the Project," I
15 am referring to the same facility — the Tomhicken 230 kV Switchyard and associated
16 Phase 1 infrastructure that is the subject of this proceeding at Docket No. A-2025-
17 3059443. When I refer to "the network" or "the system" in the transmission context, I am
18 referring to the same thing — PPL's bulk electric transmission system. When I refer to
19 "the Customer" or "the customer," I am referring to the large load customer whose
20 interconnection request is the need driver for this project. These terms are used
21 interchangeably throughout my testimony.

1 When I refer to an "N-1 contingency," I am referring to the loss of a single
2 transmission element such as a transmission line or transformer — a routine event that all
3 transmission systems must be designed to survive. When I refer to an "N-1 reliability
4 deficiency," I am referring to a planning failure — the finding that the system cannot
5 survive an N-1 contingency without violating thermal ratings or voltage limits. These are
6 distinct concepts: an N-1 contingency is the event; an N-1 reliability deficiency is the
7 consequence when the system was not adequately planned to handle that event.

8
9 **Q: What is your recommendation to this Commission?**

10 **A:**



II. Tomhicken Switchyard Description

Q: Please provide a description of Tomhicken Switchyard.

A: The Tomhicken Switchyard consists of:

- “[A]pproximately 1.1 miles of new double-circuit 230 kilovolt (‘kV’) transmission taps (‘Susquehanna-Tomhicken #1 & #2 230 kV and Tomhicken-Harwood #1 & #2 230 kV lines’ or ‘Tap Lines’) that are needed to connect the existing Susquehanna-Harwood #1 & #2 230 kV Transmission Lines to the new Tomhicken 230 kV Switchyard (the ‘Project’) and
- the construction of two new 0.1-mile-long 230 kV transmission lines (‘Connecting Lines’) from the Tomhicken 230 kV Switchyard to a new customer-owned 230-34 kV substation.”¹

PPL states that the “new 230 kV Connecting Lines, Tap Lines and Tomhicken Switchyard are located in Hazle Township, Luzerne County, Pennsylvania.”²

Q: What is PPL’s stated need for the Tomhicken Switchyard?

A: PPL’s stated need is Customer load interconnection. The initial load request, the in-service date of the initial load request, the peak load, and the in-service date of the peak load have changed since the Letter of Notification was filed on December 19, 2025.

¹ Page I-1, Attachment I Necessity Statement.

² *Id.*

Specifically, in the Letter of Notification (“LON”), PPL stated that a “prospective Customer is requesting 230 kV electrical service with an in-service date of December 15, 2026 and an initial load of 240 MW. The Customer’s load will increase in stages to approximately 1,980 MW by 2033.”³

PPL updated the Customer’s peak load to 965 MW in Discovery – “The Customer has since revised their total load request to 965 MW. The Customer’s current initial load request is for 12kV with an in-service date of December 15, 2026, and a total load request of 965 MW by 2031.”⁴

PPL further updated the initial load request to 12 MW “with an in-service date of March 2027”⁵ and stated that the “Customer’s load will increase in stages to approximately 276 MW by December 2027, and to approximately 965 MW by 2033.”⁶

A further discrepancy exists between PPL's direct testimony stating the customer reaches 965 MW by 2033 and OCA I-1 Attachment 2 **HIGHLY CONFIDENTIAL**

STARTS [REDACTED] **HIGHLY CONFIDENTIAL ENDS.**⁷ PPL confirmed that the **HIGHLY CONFIDENTIAL STARTS** [REDACTED] **HIGHLY CONFIDENTIAL ENDS**

Similarly, the 276 MW intermediate milestone date differs between direct testimony (December 2027) and OCA I-1(a) (March 2027). PPL confirmed that the

³ Page 7, LON.

⁴ PPL Response to OCA I-1(a).

⁵ Line 19, Page 3, PPL Statement No. 1.

⁶ Lines 22-23, Page 3, PPL Statement No. 1.

⁷ PPL Response to **HIGHLY CONFIDENTIAL** OCA-I-1 Attachment 2.

⁸ PPL Response to **HIGHLY CONFIDENTIAL** OCA VII-1 (a).

1 **HIGHLY CONFIDENTIAL STARTS** [REDACTED]

2 [REDACTED] **HIGHLY CONFIDENTIAL ENDS.**

3
4 **Q: Is Tomhicken Switchyard addressing a reliability need?**

5 **A:** No, the Tomhicken Switchyard is not addressing a pre-existing system reliability need.

6 Rather, it addresses a reliability need that was created by this Customer's peak load
7 interconnection request — specifically, the N-1 reliability deficiency¹⁰ that arises when
8 the customer's 965 MW/1,016 MVA peak load¹¹ is added to the existing Susquehanna-
9 Harwood lines.

10 Absent this Customer's peak load request, no reliability need requiring this
11 switchyard would exist because PPL stated that “the existing capacity will be utilized to
12 serve the customer’s initial load request”.¹² Meaning, the existing Susquehanna-Harwood
13 lines can accommodate the customer’s initial load request of 12 MW mentioned above,
14 but cannot accommodate the peak load request of 965 MW.

⁹ PPL Response to **HIGHLY CONFIDENTIAL** OCA VII-1 (a).

¹⁰ Existing Susquehanna – Harwood lines have each summer normal rating of 718 MVA. Source: PPL Response to OCA I-4(b). But if one of them trips, they cannot handle the Customer’s 1,016 MVA peak load on top of the existing load.

¹¹ Megawatts (MW) measure real power — the actual power consumed by the customer's load to perform useful work. Megavolt-amperes (MVA) measure apparent power — the total power the transmission system must carry, which includes both real power (MW) and reactive power (MVAR). The relationship between MW and MVA is governed by the power factor, which represents the ratio of real power to apparent power. A power factor of 0.95 — as assumed here — means that for every 1,016 MVA the transmission system must carry, 965 MW is real power actually consumed by the customer, with the remainder attributable to reactive power requirements. Transmission lines are rated in MVA rather than MW because the physical heating effect on conductors — which determines thermal ratings — depends on the total current flowing through the line, which corresponds to apparent power (MVA) rather than real power (MW) alone. For this reason, comparing the customer's peak demand to transmission line thermal ratings requires converting MW to MVA. The customer's peak demand of 965 MW, assuming a power factor of 0.95, corresponds to approximately 1,016 MVA. 965 MW divided by 0.95 power factor = 1,016 MVA.

¹² PPL Response to OCA I-4(d).

PPL's Mr. Lookup testified that the existing Susquehanna-Harwood lines "are heavily loaded and have a history of transmission congestion."¹³ I agree that the existing Susquehanna-Harwood lines have a history of transmission congestion, but I disagree that they are currently heavily loaded due to the following reasons.

First, neither circuit exceeded 100% of its normal thermal rating in any year from 2021 through 2025 — meaning no reliability violation existed on the S-H path prior to this customer's request.¹⁴ Loading below 100% of normal rating is not a reliability violation under North American Electric Reliability Corporation (NERC) or PJM standards. **Second**, PPL confirmed that "the installation of [Dynamic Line Rating] on the Susquehanna-Harwood path along with terminal equipment upgrades resolved the congestion on the Susquehanna-Harwood #1 & #2 230 kV Transmission Lines."¹⁵ The congestion PPL cited was resolved three years before this project was proposed. The only reliability need requiring the Tomhicken Switchyard is the N-1 deficiency created by this customer's peak load addition.

PPL further confirmed that "[w]hile the lines would be considered heavily loaded, the emergency ratings of the Susquehanna-Harwood #1 & #2 230 kV Transmission Lines were not exceeded in the 2022 or 2023 RTEP cycles. Therefore, they were not included in the list of violations of which PJM solicited solutions".¹⁶ Most significantly, PPL

¹³ Referring to the "existing Susquehanna-Harwood #1 and #2 230 kV Transmission Lines", Mr. Lookup stated that "[t]hese lines are heavily loaded and have a history of transmission congestion." Line 9-10, Page 3, PPL Statement No. 1.

¹⁴ PPL Response to OCA VI-2(a). SUSQ-HARW #2 peaked at 98.4% of normal Ambient Adjusted Rating during a February 2021 winter storm event; SUSQ-HARW #1 peaked at 95.5% during a May 2022 summer congestion event. Following DLR activation in October 2022, both circuits show zero hours above 80% of normal rating in 2023 and 2025, and only minor events in 2024 peaking at 88.5% with no hours above 90%.

¹⁵ PPL Response to OCA VI-2(d).

¹⁶ PPL Response to OCA VIII-1(a).

confirmed that “[t]here were no planned supplemental or baseline projects involving the Susquehanna-Harwood #1 & #2 230 kV Transmission Lines prior to the Customer’s interconnection request”.¹⁷ No transmission investment on this corridor was in PPL’s capital plan or PJM’s RTEP queue before this customer arrived. In other words, but for this customer’s interconnection request, no transmission investment on the Susquehanna-Harwood corridor would have been required, no reliability violation would exist, and no Tomhicken Switchyard would be proposed.

Q: Did PPL perform the planning analysis that would normally validate this need determination?

A: No. I asked PPL to produce the complete NERC TPL-001-5.1 planning assessment¹⁸ supporting the Tomhicken need determination, including whether the P1 and P4 overloads appear in base case planning studies or only in sensitivity cases, and the results of all P0-P7 contingency analyses performed.¹⁹ PPL confirmed that it performed no NERC TPL-001-5.1 Planning Assessment for the Tomhicken project, stating that TPL-

¹⁷ PPL Response to OCA VIII-1(b)(c).

¹⁸ NERC TPL-001-5.1 is the North American Electric Reliability Corporation’s Transmission System Planning Performance Standard, which governs how transmission planners assess whether the bulk electric system can survive contingencies under various load and operating conditions. Under this standard, a Planning Assessment evaluates the system against a defined set of contingency categories (P0 through P7, ranging from normal conditions to extreme multiple contingency events) and requires the planner to identify violations and develop corrective action plans before selecting a transmission solution. This assessment is the standard analytical framework that would ordinarily precede the selection of a major transmission project like the Tomhicken Switchyard. Available at: <https://www.nerc.com/globalassets/standards/reliability-standards/tpl/tpl-001-5.1.pdf> (Last Accessed on July 6, 2026).

¹⁹ OCA VI-3 (a), (b), (c).

001-5.1 applies to Transmission Planners and Planning Coordinators — roles PJM holds, not PPL.²⁰

PPL's Tomhicken Switchyard need determination rests on FAC-002 facility interconnection studies²¹ and PJM's DNH analysis.²² PPL confirmed the P1 and P4 overloads were identified in the 2027 RTEP and 2027 RTEP “do no harm” (“DNH”)²³ base cases.²⁴ Neither FAC-002 nor the DNH process requires evaluation of demand-side management alternatives or other corrective action alternatives before selecting a transmission solution. No entity produced TPL-001-5.1 sensitivity cases varying controllable loads or demand-side management in this proceeding.

Q: Which specific contingencies did PPL identify as driving the need for Phase 2?

A: PPL confirmed it studied P1, P2, P3, P4, P6, and P7 contingencies under its FERC 715 criteria, and that **HIGHLY CONFIDENTIAL STARTS** [REDACTED]

[REDACTED]

[REDACTED] **HIGHLY CONFIDENTIAL ENDS** No

²⁰ “No Planning Assessment was completed as PPL is not registered as a Transmission Planner or Planning Coordinator. TPL-001-5.1 applies to Transmission Planners and Planning Coordinators. PPL Electric is registered as a Transmission Owner and Distribution Provider.” PPL Response to OCA VI-3(a).

²¹ NERC FAC-002-2 (Facility Interconnection Studies) is the reliability standard governing the studies a Transmission Owner must perform when a new facility requests interconnection to the bulk electric system. Unlike TPL-001-5.1, which requires comprehensive planning assessments including alternatives analysis and corrective action plans, FAC-002-2 is focused on ensuring the interconnecting facility does not adversely affect system reliability — it does not require evaluation of demand-side management alternatives or other corrective action alternatives before selecting a transmission solution. “PPL Electric follows the FAC-002 Facility Interconnection Studies standard for the interconnection of new customers.” PPL Response to OCA VI-3(a).

²² “PPL Electric follows the FAC-002 Facility Interconnection Studies standard for the interconnection of new customers. ...The interconnection of the Customer served by the Tomhicken 230 kV Switchyard passed the PJM DNH analysis and was issued supplemental number S3528.” PPL Response to OCA VI-3(a).

²³ The DNH analysis is discussed in more depth below.

²⁴ “The overloads were identified based on the 2027 RTEP and 2027 RTEP DNH cases.” PPL Response to OCA VI-3(c).

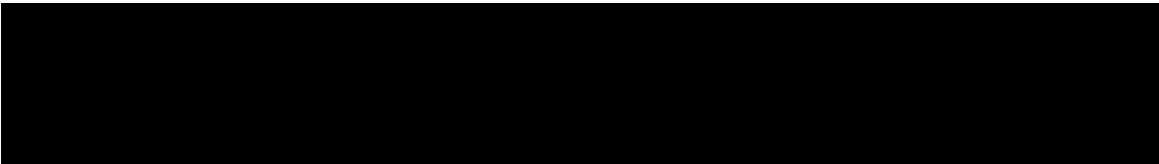
²⁵ PPL Response to **HIGHLY CONFIDENTIAL** OCA VII-3 (a).

1 other contingency category produced violations requiring Phase 2 infrastructure —
 2 confirming that all Phase 2 need is attributable to this customer's load addition. I discuss
 3 the interrelation between Phase 1 – the Tomhicken Switchyard proposal – and Phase 2
 4 below, in Section VII.

5
 6 **Q: Do you agree with PPL regarding this stated need?**

7 **A:** Yes. PPL identified “one new customer”²⁶ as the need driver for this project. Mr. Lookup
 8 further confirmed that “the current Customer is the farthest along the development
 9 process amongst those customers, and is the need driver for this Letter of Notification.”²⁷
 10 This admission is significant — PPL's Mr. Lookup characterizes the project as driven by
 11 this specific Customer, not by an independent system reliability need or by the collective
 12 weight of future queue customers. Furthermore, the load growth on the Susquehanna-
 13 Harwood corridor from PPL's existing customers was not creating any reliability need —
 14 PPL confirmed no planned transmission projects existed on that corridor prior to this
 15 customer's interconnection request.²⁸

16 As discussed throughout this testimony, that admission — that the project exists
 17 to serve this Customer which is farthest along the development process — 

18 
 19
 20

²⁶ Line 18, Page 3, PPL Statement No.1.

²⁷ Lines 7-8, Page 5, PPL Statement No.1.

²⁸ “There were no planned supplemental or baseline projects involving the Susquehanna-Harwood #1 & #2 230 kV Transmission Lines prior to the Customer’s interconnection request.” PPL Response to OCA VIII-1 (b).

1 **Q: What is PJM’s designation for this Tomhicken Switchyard?**

2 **A:** PPL stated that PJM designated this Switchyard as a Supplemental Project – “[t]his
3 Project is part of PJM Supplemental Number S3528, specifically segments S3528.1,
4 S3528.6, and S3528.11.”²⁹

5
6 **Q: What does PJM's definition of Supplemental Project tell you about the Tomhicken
7 Switchyard's relationship to PJM reliability criteria?**

8 **A:** PJM Manual 14B defines Supplemental Projects as transmission expansions or
9 enhancements "not needed to comply with PJM reliability, operational performance,
10 FERC Form No. 715 or economic criteria."³⁰ By definition, the Tomhicken Switchyard
11 — as a Supplemental Project — is not required to meet PJM reliability criteria. It exists
12 solely to serve the Customer's interconnection request. This is consistent with PPL's own
13 acknowledgment that the project's need driver is the Customer's load interconnection and
14 further supports my testimony’s position that the costs of this Customer-driven project
15 should be borne by the Customer rather than existing ratepayers.

16
17 **Q: Are Supplemental Projects approved by PJM Board?**

18 **A:** No. Supplemental Projects are not approved by PJM Board.³¹

²⁹ Page 9, LON.

³⁰ Page 15, PJM Manual 14B, Revision: 59, Effective Date: 04/22/2026 PJM © 2026. Available at <https://www.pjm.com/-/media/DotCom/documents/manuals/m14b.pdf> (Last Accessed on May 26, 2026).

³¹ “Supplemental Projects are not approved by the PJM Board.” Page 15, PJM Manual 14B, Revision: 59, Effective Date: 04/22/2026 PJM © 2026. Available at <https://www.pjm.com/-/media/DotCom/documents/manuals/m14b.pdf> (Last Accessed on May 26, 2026).

1

2 **Q: Does PJM review Supplemental Projects for their need?**

3 **A:** PJM does not independently verify or approve a Transmission Owner's need
 4 determination for Supplemental Projects. While PJM conducts a review process through a
 5 PJM stakeholder committee, the Transmission Expansion Advisory Committee (TEAC),
 6 including Assumptions, Needs, and Solutions meetings with stakeholder comment
 7 periods³² — the need determination itself rests entirely with the Transmission Owner.
 8 PJM's role is to ensure the project meets the definition of a Supplemental Project and can
 9 be associated with the need identified by the Transmission Owner, not to validate whether
 10 that need is correctly identified or whether the proposed solution is the most cost-
 11 effective option for ratepayers.

12

13 **Q: What analysis does PJM conduct for Supplemental Projects?**

14 **A:** PJM conducts a "do no harm" study to evaluate whether the Supplemental Project will
 15 adversely impact transmission system reliability as represented in PJM's planning
 16 models. PJM also reviews the project through TEAC in a three-part process as mentioned
 17 above.³³ Additionally, PJM will inform the Transmission Owner if a baseline upgrade
 18 made pursuant to PJM's regional transmission expansion planning process might alleviate
 19 or partially mitigate the need for the Supplemental Project. However, none of these
 20 reviews constitute an independent validation of the Transmission Owner's need

³² PJM Manual 14B, Section 1, Revision 59, Effective Date 04/22/2026, Page 15, available at <https://www.pjm.com/-/media/DotCom/documents/manuals/m14b.pdf> (Last Accessed on June 2, 2026).

³³ *Id.*

determination or an evaluation of whether the proposed solution is the most cost-effective option for ratepayers.

Q: What is the “do no harm” - DNH case year and load level for the Tomhicken Switchyard?

A: PPL stated that the DNH case year is 2027 with the projected 2028 Summer Load Level.³⁴

Q: Is the load level used for the DNH network upgrade analysis consistent with the load level used to design the Tomhicken Switchyard?

A: No. PPL confirmed that while system network upgrades are based on this DNH 2028 Summer load level³⁵, the Tomhicken Switchyard itself was designed to accommodate the customer's ultimate requested load³⁶ — not just the Phase 1 DNH load level. This distinction between the DNH-based network upgrade scope and the ultimate-load-based substation design is examined further in the Phase 1 and Phase 2 Interdependency section below.

Q: Is the Customer connecting at an existing substation?

³⁴ PPL Response to OCA V-1(a).

³⁵ “The system network upgrades included in the supplemental project are based on the DNH Load Level.” PPL Response to OCA V-1(c).

³⁶ “The substation was designed to accommodate the customer’s ultimate requested load.” PPL Response to OCA V-1(b).

A: No. The Customer is constructing its own 230-34 kV substation on its property.³⁷ PPL is constructing the new Tomhicken 230 kV Switchyard as a separate facility to interconnect the Customer to PPL's transmission system.³⁸

Q: Is there a reason why the Customer would be connecting at a transmission voltage instead of a distribution voltage?

A: The Customer is connecting at the transmission voltage because of the peak load. PPL confirmed that its 12 kV lines have a typical capacity of 11 MVA — meaning serving even the customer's initial 240 MW load request would require at least 22 distribution circuits, with dozens more needed to serve the final 965 MW load.³⁹ The conductor sizes and infrastructure required to serve 965 MW at distribution voltage are not feasible, making transmission-level interconnection the only viable option.

Q: With respect to transmission line capacity, how are normal and emergency ratings defined?

A: Normal ratings represent the maximum continuous capacity (MVA) a line can carry indefinitely under assumed ambient conditions without exceeding the conductor's

³⁷ “The proposed Tomhicken 230 kV Switchyard will be constructed on the same Customer-owned parcel as the Customer’s 230-34 kV substation and facilities.” Page 8, LON.

³⁸ “PPL Electric will acquire the necessary land and right-of-way (“ROW”) from the customer for the new Tomhicken 230 kV Switchyard, Tap Lines, and Connecting Lines.” Page 8, LON.

³⁹ PPL Response to OCA I-8 (c) “PPL Electric’s 12 kV lines have a typical capacity of 11 MVA. At least 22 distribution circuits, plus additional circuits for redundancy, would be required to serve 240 MW of load” and “As explained above, 22 distribution level circuits would be required to serve the Customer’s initial 240 MW load request, and dozens more would be needed to serve the final load request amount of 965 MW.” PPL Response to OCA I-8 (e).

1 maximum allowable temperature. Emergency ratings allow higher capacity for a defined
2 short duration — typically 15 minutes to a few hours — before the conductor reaches a
3 temperature that causes excessive sag, risking ground clearance violations, or causes
4 permanent metallurgical damage to the conductor. Emergency ratings typically apply
5 under N-1 contingency conditions (loss of a single transmission element) when a line
6 outage forces remaining lines to carry higher-than-normal power flows.

7
8 **Q: What are Ambient Adjusted Ratings?**

9 **A:** FERC Order 881 defines Ambient Adjusted Rating as a transmission line rating that “(1)
10 applies to a time period of not greater than one hour; (2) reflects an up-to-date forecast of
11 ambient air temperature across the time period to which the rating applies; and (3) is
12 calculated at least each hour, if not more frequently.”⁴⁰

13
14 **Q: Were the conductor ratings used in PPL's need determination AAR-compliant**
15 **under FERC Order 881?**

16 **A:** Yes. PPL confirmed that the ratings in Table 2-3, Attachment 2 – Engineering Statement
17 of the LON use 35°C for summer and 10°C for winter, consistent with AAR
18 methodology, and were in use in transmission planning prior to Order 881.⁴¹ PPL stated

⁴⁰ FERC Order 881 Managing Transmission Line Ratings issued December 16, 2021, Paragraph 87, available at <https://www.ferc.gov/media/e-1-rm20-16-000> (last accessed May 24, 2026).

⁴¹ PPL Response to OCA V-7(a).

1 that it is in compliance with Order 881 as of March 4, 2026 per FERC-approved
2 extension.⁴²

3
4 **Q: Do you agree with PPL's AAR explanation?**

5 **A:** Yes, I agree with PPL that AAR was already incorporated into its transmission planning
6 analysis prior to FERC Order 881, and that the ratings used in the Tomhicken need
7 determination reflect AAR-compliant values.⁴³ The normal and emergency ratings
8 discussed in the following question are the AAR ratings. I note that PPL's planning AAR
9 uses fixed seasonal ambient temperature assumptions rather than dynamic hourly updates
10 as described in Order 881. For transmission planning purposes, however, this seasonal
11 approach is consistent with standard industry practice, and I accept it as an appropriate
12 planning basis. Therefore, AAR does not provide incremental capacity beyond what PPL
13 already evaluated.

14
15 **Q: What is the normal and emergency ratings of existing Susquehanna – Harwood**
16 **double circuit 230 kV transmission lines?**

17 **A:** PPL stated the normal and emergency ratings of the existing Susquehanna–Harwood
18 double circuit 230 kV lines are 718/843 MVA (summer) and 768/894 MVA (winter) per
19 circuit⁴⁴, with a combined rating of 1,436/1,686 MVA (summer) and 1,536/1,788 MVA
20 (winter).

⁴² PPL Response to OCA V-7(b).

⁴³ PPL Response to OCA V-7(a).

⁴⁴ PPL Response to OCA I-4(b).

Q: Can the Customer load be accommodated under the normal and emergency ratings of the existing Susquehanna – Harwood double circuit 230 kV transmission lines?

A: No. Under normal operating conditions with both circuits in service, the total combined rating is 1,436 MVA (summer normal)⁴⁵. However, the existing lines already serve load at Harwood, East Palmerton, and Siegfried substations.⁴⁶ Under N-1 contingency conditions — which transmission planning requires the system to survive — a single surviving circuit rated at 718 MVA normal and 843 MVA emergency cannot serve the customer's 1,016 MVA peak demand.

PPL confirmed that under the 2027 RTEP case, a P1 single contingency loss of one Susquehanna-Harwood circuit results in thermal overload of the remaining circuit at approximately 858 MVA total path load under summer normal conditions, 997 MVA under summer emergency conditions, 925 MVA under winter normal conditions, and 1,067 MVA under winter emergency conditions.⁴⁷

PPL's supporting power flow study confirms these findings. Under the 2027 Summer case with customer load added at Harwood, loss of either S-H circuit produces contingency flows of **CONFIDENTIAL START** [REDACTED] **CONFIDENTIAL END**, both exceeding the 718 MVA summer normal rating but within the 843 MVA summer emergency rating.⁴⁸ Under the 2027 Winter case, loss of either S-H circuit produces contingency flows of **CONFIDENTIAL START** [REDACTED]

⁴⁵ PPL Response to OCA I-4(d).

⁴⁶ Lines 6-9, Page 3, PPL Statement No. 1.

⁴⁷ PPL Response to OCA VI-1(a).

⁴⁸ PPL Response to OCA VI-1(b) Attachment **CONFIDENTIAL**.

1 [REDACTED] **CONFIDENTIAL END**, both exceeding the 768 MVA winter normal
 2 rating.⁴⁹

3 Critically, PPL confirmed that the customer's initial load of 276 MW — due at
 4 commercial operation — is sufficient to exceed both summer and winter normal ratings
 5 under a P1 contingency on the existing S-H lines.⁵⁰ Emergency ratings are exceeded at
 6 approximately 470 MW of load at Harwood — less than half the customer's 965 MW
 7 peak demand.⁵¹ This means the reliability need arises at the customer's first day of full
 8 initial operation and intensifies with every stage of the customer's load ramp. Without this
 9 customer's load addition, no P1 reliability violation exists on the existing S-H lines.

10
 11 **Q: Where does the new Customer substation connect to the PPL transmission system?**

12 **A:** As shown in Figure 1-2⁵², the new Customer substation connects directly to the new
 13 Tomhicken substation via a dedicated 230 kV interconnection. The Tomhicken substation
 14 is a new substation being constructed as part of this Switchyard.

15
 16 **Q: What is the relationship between the new Tomhicken substation and the new**
 17 **Customer's interconnection?**

⁴⁹ PPL Response to OCA VI-1(b) Attachment **CONFIDENTIAL**.

⁵⁰ “Using the 2027 RTEP (2022 Series) case and applying 276 MW of load to the Harwood 230 kV bus, a P1 single contingency loss of one Susquehanna-Harwood circuit would result in the summer and winter normal rating being exceeded.” PPL Response to OCA VI-1(c).

⁵¹ “The summer and winter emergency ratings would be exceeded with approximately 470MW of load being added at the Harwood Substation.” PPL Response to OCA VI-1(c).

⁵² Attachment I Necessity Statement

A: The new Tomhicken substation is the point of interconnection for the new Customer. Without the new Customer's load, there would be no need to construct the Tomhicken substation or the two new line segments — Susquehanna–Tomhicken and Tomhicken–Harwood — that connect it to the existing transmission network. The entire proposed system configuration in Figure 1-2⁵³, including the new substation and both new line segments, is being built to accommodate the new Customer's interconnection.

Q: What is the normal and emergency ratings of the new Susquehanna – Tomhicken and Tomhicken-Harwood double circuit 230 kV transmission lines?

A: PPL stated that the new Susquehanna–Tomhicken and Tomhicken–Harwood 230 kV lines are double-circuit construction using 1590 kcmil, 54/19 stranding, "Falcon" ACSR conductors⁵⁴ with a per-circuit normal and emergency rating of 3,000/4,000 Amps (summer) and 3,700/4,500 Amps (winter)⁵⁵, based on which I calculate⁵⁶ 2,390/3,187 MVA (summer) and 2,948/3,585 MVA (winter).

Q: What is the increase in capacity compared to the existing Susquehanna – Harwood double circuit 230 kV transmission lines?

⁵³ Attachment I Necessity Statement

⁵⁴ Page 2-4, Attachment 2 – Engineering Statement.

⁵⁵ Table 2-3, Conductor Thermal Rating 1590 kcmil 54/19 Stranding Falcon ACSR – 125°C Normal Maximum Conductor, Attachment 2 – Engineering Statement.

⁵⁶ 2,390 MVA summer normal combined rating calculated from PPL's reported normal current rating of 3,000 amperes per circuit for the new 230 kV lines: $(230,000 \text{ V} \times 3,000 \text{ A} \times \sqrt{3} / 1,000 \times 2) / 1,000 = 2,390 \text{ MVA}$. Source: Table 2-3, Attachment 2 – Engineering Statement.

A: The existing Susquehanna–Harwood double circuit 230 kV line is being replaced by two new double-circuit 230 kV line segments — Susquehanna–Tomhicken and Tomhicken–Harwood, each separately routed through the new Tomhicken substation. Each new segment consists of two circuits, with each individual circuit rated 1,195 MVA normal / 1,594 MVA emergency (summer).⁵⁷ Combining both circuits, each new segment independently provides a combined normal capacity of 2,390 MVA (summer) and 2,948 MVA (winter)⁵⁸ — an increase of 954 MVA (summer normal) and 1,412 MVA (winter normal) over the existing Susquehanna–Harwood combined two-circuit rating⁵⁹ of 1,436 MVA and 1,536 MVA respectively.

Q: Can the new Susquehanna–Tomhicken and Tomhicken–Harwood double circuit 230 kV transmission lines accommodate the Customer's peak demand under an N-1 contingency?

A: Yes, unlike the existing Susquehanna–Harwood line. As discussed above, the existing Susquehanna–Harwood line's combined two-circuit rating is 1,436 MVA normal — but under N-1 contingency, if one circuit trips, only the single surviving circuit remains in service, rated just 718 MVA normal / 843 MVA emergency. That single-circuit rating is below the Customer's 1,016 MVA/965 MW peak demand.

By contrast, each new segment — Susquehanna–Tomhicken and Tomhicken–Harwood — has a combined two-circuit rating of 2,390 MVA normal, but more

⁵⁷ Table 2-3, Attachment 2 – Engineering Statement; $3,000 \text{ A} \times 230,000 \text{ V} \times \sqrt{3} / 1,000,000 = 1,195 \text{ MVA}$ per circuit (summer normal); $1,195 \times 2 \text{ circuits} = 2,390 \text{ MVA}$ combined.

⁵⁸ *Id.*

⁵⁹ PPL Response to OCA I-4(b); $718 \text{ MVA per circuit} \times 2 \text{ circuits} = 1,436 \text{ MVA}$ combined.

1 importantly, each individual circuit within that segment is independently rated 1,195
 2 MVA normal / 1,594 MVA emergency (summer).⁶⁰ So if one circuit within either new
 3 segment trips under N-1, the single surviving circuit on that segment can still carry
 4 approximately 1,195 MVA normal — comfortably above the Customer's 1,016 MVA peak
 5 demand. This demonstrates that the new infrastructure was sized specifically to ensure N-
 6 1 reliability for this Customer's peak load — single-circuit capacity that the existing
 7 Susquehanna-Harwood configuration could not provide.

9 III. Proposed Switchyard

10 **Q: Why did PPL split the Susquehanna-Harwood lines at Tomhicken rather than**
 11 **adopting an alternative routing?**

12 **A:** PPL stated in discovery that "[t]he splitting of the Susquehanna-Harwood #1 & #2 230kV
 13 Transmission Lines was designed to allow the future Phase 2 lines to terminate into the
 14 Tomhicken Switchyard and Harwood Substation without requiring line crossings. The
 15 Tomhicken 230kV Switchyard will have a line termination point for the Phase 2 scope."⁶¹

16 This confirms that the line split configuration was designed around Phase 2
 17 requirements, not Phase 1 necessity alone. As discussed further in the Phase 1 and Phase
 18 2 Interdependency section below, this design choice has direct implications for the
 19 ratepayer cost allocation — ratepayers are being asked to fund a Phase 1 configuration

⁶⁰ Table 2-3, Attachment 2 – Engineering Statement; $3,000 \text{ A} \times 230,000 \text{ V} \times \sqrt{3} / 1,000,000 = 1,195 \text{ MVA}$ per circuit (summer normal); $4,000 \text{ A} \times 230,000 \text{ V} \times \sqrt{3} / 1,000,000 = 1,594 \text{ MVA}$ per circuit (summer emergency).

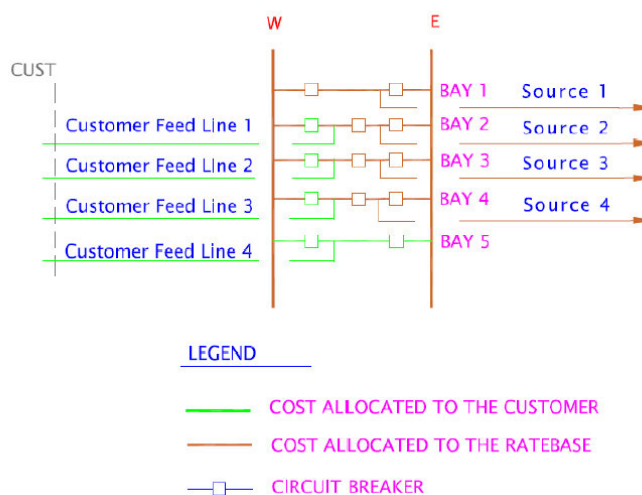
⁶¹ PPL Response to OCA I-10(c).

whose routing and physical layout were determined by Phase 2 considerations that have not yet received Commission approval.

Q: What is a Breaker and a half (BAAH) design and why is it relevant to the ratepayer cost allocation?

A: PPL stated in the LON that the Tomhicken 230 kV Switchyard is built with a “breaker-and-a-half” (“BAAH”) design.⁶² In a breaker-and-a-half configuration, “three circuit breakers are used in a bay for two independent circuits; hence, each circuit shares the common center circuit breaker, so there are 1.5 circuit breakers per circuit.”⁶³ In a discovery response, PPL provided the below Responsibility of Asset Matrix for a Breaker and a Half switchyard design:

Responsibility of Asset Matrix for Breaker and a Half (BAAH) Example 1:



⁶² Page 8, LON.

⁶³ National Academies of Sciences, Engineering, and Medicine. 2012. Terrorism and the Electric Power Delivery System. Washington, DC: The National Academies Press.
<https://www.nationalacademies.org/read/12050/chapter/19#135> (Last Accessed on June 2, 2026).

⁶⁴ OCA I-6 Attachment 1, Page 3 of 8.

1 The Tomhicken Switchyard has 5 bays in this BAAH design, connected between
2 two bus bars (W and E).⁶⁵ [REDACTED]

3 [REDACTED]
4 [REDACTED]
5 [REDACTED]
6 [REDACTED]
7 [REDACTED]
8 [REDACTED]
9 [REDACTED]
10 [REDACTED]
11 [REDACTED]
12 [REDACTED]
13 [REDACTED]
14 [REDACTED]

15 This design choice is directly relevant to the cost allocation question in this
16 proceeding. As discussed below, PPL stated in the LON that the Tomhicken Switchyard is
17 required due to the number of lines needed by the Customer and the size of the requested
18 load.⁶⁹ [REDACTED]

19 [REDACTED]
20 [REDACTED]

⁶⁵ OCA I-6 Attachment 1, Page 3 of 8.

⁶⁹ “The Tomhicken 230 kV Switchyard is required due to the number of lines needed by the Customer and the size of the requested load.” Page 8, LON.

1
2 **Q: Why is PPL proposing a BAAH design, and what alternatives did PJM's standards**
3 **permit?**

4 **A:** PPL stated that BAAH is required by PJM. In Attachment I – Necessity Statement, PPL
5 stated that “Section III of the PJM minimum planning and design standards refers to
6 Substation Bus Configurations and Substation Design Recommendations. Under PJM’s
7 standards, three terminal lines and radial bus station configurations are discouraged for
8 use in new BES substation construction because of the considerable potential for
9 detrimental effects on transmission system reliability. Acceptable standards for
10 substations are noted as ring bus configurations, breaker-and-a-half-arrangements, and
11 double breaker–double bus arrangements. Breaker-and-a-half arrangements are the
12 preferred design because of the balance of operational flexibility and cost that this design
13 affords.”⁷⁰

14 This means PJM requires one of three acceptable configurations — ring bus,
15 BAAH, or double breaker-double bus. The choice among these three options was PPL's.
16 PPL selected BAAH as the preferred design. This choice is relevant to the ratepayer cost
17 allocation because different configurations carry different costs.

18
19 **Q: Did PPL evaluate a ring bus configuration as an alternative to BAAH?**

⁷⁰ Page I-8, Attachment I – Necessity Statement.

1 **A:** No. PPL confirmed in discovery that it did not evaluate a ring bus configuration and
 2 cannot provide the incremental cost difference between ring bus and BAAH.⁷¹ PPL stated
 3 that its own internal System Planning Development Standards prohibit ring buses for new
 4 construction — this is a PPL policy choice, not a PJM requirement.⁷² PJM explicitly
 5 identifies ring bus as an acceptable standard.

6 PPL's ring bus prohibition was adopted on July 1, 2018 through PPL's System
 7 Planning Development Standards Revision #8.⁷³ Since that date, PPL has not evaluated a
 8 ring bus configuration against a BAAH configuration for any transmission project — and
 9 has not granted a single exception to the prohibition.⁷⁴ The prohibition was explicitly in
 10 effect during the planning, development, and engineering of the Tomhicken Switchyard.⁷⁵

11 When asked in this proceeding to provide an engineering cost estimate comparing
 12 ring bus versus BAAH for Phase 1 line terminations only, PPL confirmed that switching
 13 to a ring bus configuration would reduce costs by approximately \$540,000.⁷⁶ This is the
 14 cost premium ratepayers are bearing for a design choice governed by an internal standard
 15 that: (1) was adopted without Commission review or approval; (2) has been applied
 16 categorically to every PPL transmission project for eight years without exception; and (3)
 17 was never subjected to comparative analysis — in this proceeding or any other — to
 18 determine whether the additional reliability benefit justifies the additional cost.

⁷¹ “No, a ring bus was not evaluated for the Tomhicken Switchyard”. PPL Response to OCA V-4 (c).

⁷² “PJM’s standards allow for ring bus substations, but PPL Electric’s System Planning Development Standards do not allow ring buses to be used for new construction.” *Id.*

⁷³ PPL Response to OCA XI-4(a).

⁷⁴ PPL Response to OCA XI-3(a); PPL Response to OCA XI-4(b).

⁷⁵ PPL Response to OCA XI-4(c).

⁷⁶ PPL Response to OCA XI-2(a).

PPL further explained that ring buses present a segmentation risk during planned and unplanned outages — the ring can fragment into multiple isolated sections, increasing the risk of load drop or loss of network flow.⁷⁷ PPL cited PJM's own standards noting that segmentation risk increases with the number of bus positions. This is a legitimate reliability concern that I acknowledge. However, PPL has never demonstrated — quantitatively or otherwise — that the \$540,000 BAAH premium is commensurate with the reliability improvement it provides over a ring bus configuration, particularly given that the nine-line justification for avoiding ring bus segmentation risk is itself premised on Phase 2 lines that have not yet been approved.

Q: Is PPL's justification for selecting BAAH over ring bus dependent on Phase 2?

A: Yes. PPL justified selecting BAAH over a ring bus configuration partly on the basis that nine lines will terminate at Tomhicken.⁷⁸ However, PPL separately confirmed in discovery that the line split configuration was designed to accommodate future Phase 2 line terminations.⁷⁹ This means PPL's nine-line justification for the BAAH design is premised on Phase 2 lines that have not yet been approved by this Commission. Under Phase 1 alone, the number of line terminations is lower. PPL has therefore justified a Phase 1 design decision — and the ratepayer cost allocation that flows from it — using

⁷⁷ "The ring bus arrangement can become segmented during planned and unplanned outages, increasing the risk of load drop or loss of network flow." PPL Response to OCA V-5(c).

⁷⁸ "The proposed Tomhicken Switchyard is to have nine lines connected as part of Phase 1 and Phase 2." PPL Response to OCA V-4(c).

⁷⁹ "The splitting of the Susquehanna-Harwood #1 & #2 230kV Transmission Lines was designed to allow the future Phase 2 lines to terminate into the Tomhicken Switchyard and Harwood Substation without requiring line crossings. The Tomhicken 230kV Switchyard will have a line termination point for the Phase 2 scope." PPL Response to OCA I-10(c).

Phase 2 infrastructure that remains speculative. This is precisely the interdependency problem I address in the Phase 1 and Phase 2 section below.

Q: What benefits does PPL claim for the BAAH design?

A: When asked in Discovery about the benefits of this BAAH design⁸⁰, PPL stated that the BAAH design supports “[s]ectionalization of existing 230kV lines and provide new capacity and alternative route for power flow” and provides “system reliability, increased operational flexibility and additional capacity to area.”⁸¹

Additionally, PPL stated that “[a]ll parties benefit from the use of breaker-and-a-half arrangements as they provide system reliability and the ability to operate the system while not being as expensive as double breaker – double bus designs”.⁸² However, PPL provided no quantitative analysis supporting that claim — consistent with its broader pattern of asserting ratepayer benefits without demonstrating them. An unquantified assertion that all parties benefit is not a sufficient basis for a \$38.4M ratepayer allocation.

Q: Are these benefits realized under Phase 1 alone, or do they depend on Phase 2?

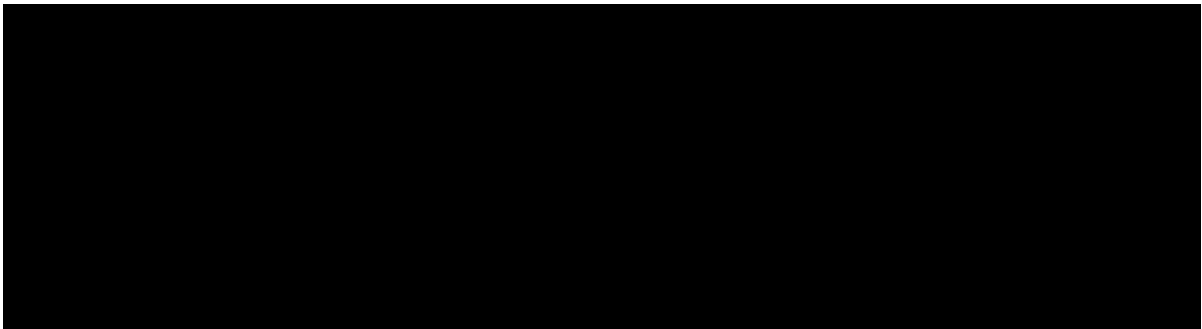
A: These are system-level benefit claims. However, as I will demonstrate in the Phase 1 and Phase 2 Interdependency section below, PPL has not established that these benefits are realized under Phase 1 alone. The network benefits PPL claims for Phase 1 — sectionalization, additional 230 kV paths, increased capacity, and operational flexibility,

⁸⁰ OCA III-3(a).

⁸¹ PPL Response to OCA III-3(a).

⁸² PPL Response to OCA V-4(b). See also PPL Response to OCA V-5(d).

are described in the Network Benefits section below⁸³. PPL confirmed that “[t]he Tomhicken 230 kV Switchyard and additional Phase 2 transmission lines will increase system reliability by adding additional 230 kV paths from the Susquehanna area to the Hazleton area. The proposed phases will increase capacity of the transmission system.”⁸⁴ This shows PPL’s admission that the reliability benefits of Tomhicken 230 kV Switchyard are dependent on Phase 2 construction.



Q: Do you agree with PPL regarding the BAAH design?

A: I agree that BAAH provides greater operational reliability than a ring bus configuration for the reasons discussed above. PPL stated in the LON that “Tomhicken 230 kV Switchyard is required due to the number of lines needed by the Customer and the size of the requested load”⁸⁵ and the BAAH design enables PPL to “extend four 230 kV lines to the Customer’s substation, all located within the Customer-owned parcel”⁸⁶. This is PPL’s own characterization — the switchyard and its BAAH configuration exist to serve this Customer.

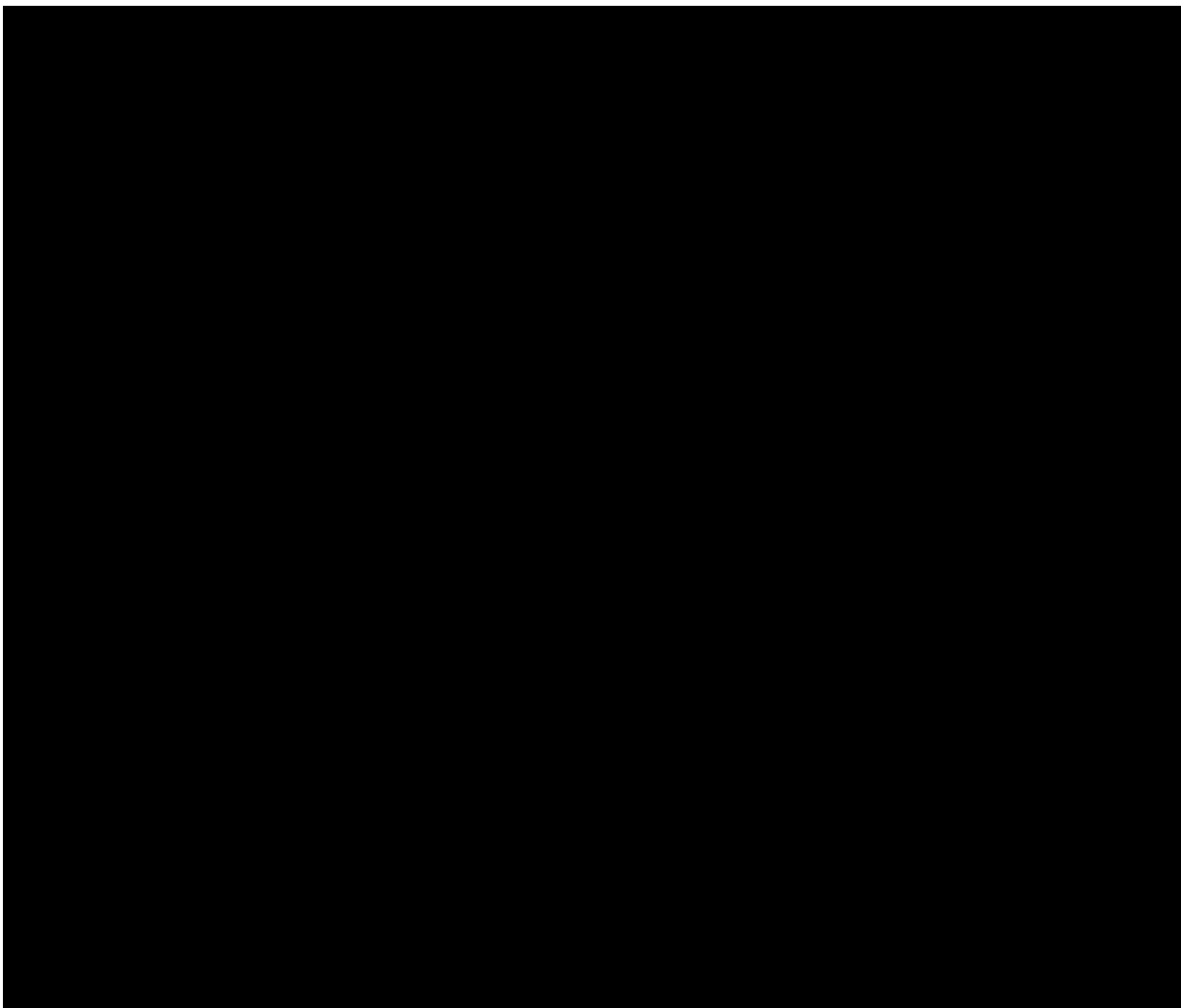
⁸³ Page 11, LON; PPL Response to OCA III-3(a); PPL Response to OCA V-5(b).

⁸⁴ PPL Response to OCA V-5(b).

⁸⁵ Page 8, LON.

⁸⁶ Page 8, LON.

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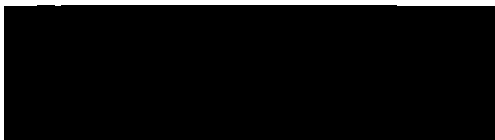
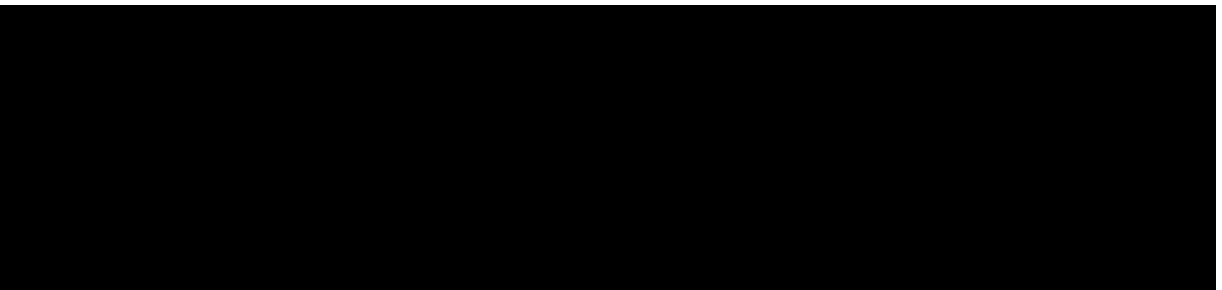


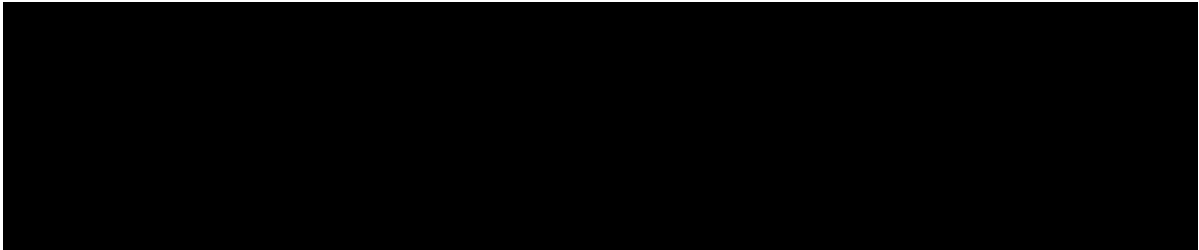
15

16 **Q: What is your recommendation?**

17 **A:**

18
19





IV. Switchyard Alternatives

Q: Did you evaluate alternatives to the proposed Tomhicken Switchyard configuration?

A: Yes. I evaluated four categories of alternatives: Dynamic Line Ratings, Non-Transmission Alternatives, distribution system connection, and direct connection to the Nescopeck Switchyard. As discussed below, none of these alternatives eliminates the need for a physical 230 kV switching facility for this customer's interconnection.

IV.a. Dynamic Line Rating (DLR) Alternative

Q: What are Dynamic Line Ratings (DLRs) and when were they activated on the Susquehanna-Harwood path?

A: Dynamic Line Rating (DLR) is defined as “transmission line rating that applies to a time period of not greater than one hour and reflects up-to-date forecasts of inputs such as (but not limited to) ambient air temperature, wind, solar heating, transmission line tension, or transmission line sag.”⁹²

⁹¹ Page 8, LON.

⁹² FERC Order 881 Managing Transmission Line Ratings issued December 16, 2021, Paragraph 235, available at <https://www.ferc.gov/media/e-1-rm20-16-000> (last accessed May 24, 2026).

⁹² PPL Response to OCA V-7(a).

PPL activated DLR on the Susquehanna-Harwood path on October 6, 2022⁹³ —
 over three years before PPL submitted the Tomhicken need to PJM on December 19,
 2025.⁹⁴

**Q: Did PPL evaluate installing Dynamic Line Ratings on the existing Susquehanna –
 Harwood double circuit 230 kV transmission lines to connect the customer load?**

A: No, PPL explained that “[a]fter the Tomhicken 230 kV Switchyard is placed in service,
 the DLR will remain in service on the Susquehanna-Tomhicken #1 & 2 and Tomhicken-
 Harwood #1 & #2 230 kV Transmission Lines.”⁹⁵ And “DLR does not address the
 planning need for the new Tomhicken 230 kV Switchyard, nor the Phase 2 upgrades.”⁹⁶

Connecting Customer load with DLR alone is not a viable alternative because
 “the Tomhicken 230 kV Switchyard is still required to physically connect the customer to
 the 230 kV network and to serve the requested load. PPL Electric does not allow for taps
 from 230 kV transmission lines. Also, the requested load amounts would not meet the
 NERC TPL-001 or PPL Electric FERC 715 Planning Requirements in a line tapped
 configuration.”⁹⁷

Q: Do you agree with PPL’s DLR explanation?

⁹³ PPL Response to OCA V-9(d).

⁹⁴ LON.

⁹⁵ PPL Response to OCA V-7(c).

⁹⁶ *Id.*

⁹⁷ PPL Response to OCA V-9(b).

1 **A:** Yes, I agree with PPL’s explanation. Specifically, I agree that “requested load amounts
2 would not meet the NERC TPL-001 or PPL Electric FERC 715 Planning Requirements in
3 a line tapped configuration.”⁹⁸ I also note that DLR was active on the Susquehanna-
4 Harwood path for over three years before PPL submitted the Tomhicken need to PJM.⁹⁹
5 However, given that the physical interconnection requirement exists independently of line
6 ratings, this timing observation does not change my conclusion. Finally, I agree with PPL
7 that "DLR is not a valid solution for Transmission Planning load flow analysis" and that
8 "as the ratings from DLR are dynamic, they cannot be used in Transmission Planning
9 load flow analysis."¹⁰⁰.

10 PPL further confirmed that DLR activation on the Susquehanna-Harwood path —
11 combined with terminal equipment upgrades — resolved the congestion PPL's witness
12 cited in direct testimony.¹⁰¹ The congestion was quantifiable — approximately \$20
13 million in 2021 and \$15 million in 2022, for a total of approximately \$35 million over
14 two years.¹⁰² DLR resolved that congestion. The physical switchyard remains necessary
15 for the customer's interconnection, but DLR addressed the operational condition PPL
16 cited as a system justification for this project at a fraction of the \$38.4 million ratepayer
17 allocation now before the Commission.

18
19 **Q:** **What is your recommendation?**

⁹⁸ PPL Response to OCA V-9(b).

⁹⁹ PPL Response to OCA V-9(d).

¹⁰⁰ PPL Response to OCA V-7(c).

¹⁰¹ “The installation of DLR on Susquehanna-Harwood path along with terminal equipment upgrades resolved the congestion on the Susquehanna-Harwood #1 & #2 230 kV Transmission Lines.” PPL Response to OCA VI-2(d).

¹⁰² “The Susquehanna-Harwood #1 & #2 230 kV Transmission Lines had approximately \$20 million in congestion in 2021 and approximately \$15 million in 2022.” PPL Response to OCA VIII-1(a).

A: No, PPL did not evaluate any NTA stating that “[a] 230 kV switchyard is required to connect the customer to the 230 kV network. Demand response, energy storage, or load management would not eliminate the need to connect the customer to the 230 kV network.”¹⁰⁵

Q: Do you agree with PPL’s assessment of non-transmission alternatives?

A: Yes — largely. A 965 MW physical transmission interconnection cannot be replaced by a NTA technology like demand response or energy storage. Furthermore, when asked directly whether any alternative capable of deferring or eliminating the need for the Tomhicken Switchyard was identified, PPL simply referenced the LON without providing any analysis.¹⁰⁶ NTAs may have relevance to Phase 2 scope even if not Phase 1.

As discussed above in connection with PPL's need determination, PPL confirmed that no sensitivity cases varying controllable loads and demand side management were performed for the Tomhicken Switchyard project, stating that TPL-001-5.1 R2.1.3 applies to Transmission Planners and Planning Coordinators — roles held by PJM, not PPL — and that PPL follows FAC-002 Facility Interconnection Studies standards instead.¹⁰⁷ The planning framework applied to this project therefore did not require evaluation of demand-side management as a sensitivity case or as a corrective action alternative before

¹⁰⁵ PPL Response to OCA V-3(c).

¹⁰⁶ PPL Response to OCA V-3(d).

¹⁰⁷ PPL Response to OCA VI-3(b).

1 selecting the Tomhicken Switchyard as the solution. No DSM sensitivity results were
 2 produced in this proceeding by any party.

3
 4 **Q: What is your recommendation?**

5 **A:** No further action is needed to evaluate NTAs for Phase 1. However, as discussed above,
 6 the FAC-002 framework PPL applied to this project does not require evaluation of non-
 7 transmission alternatives, and the TPL-001-5.1 sensitivity case requirements that would
 8 otherwise call for such evaluation do not apply because PPL is not registered as a
 9 Transmission Planner or Planning Coordinator. This is a meaningful gap: a Supplemental
 10 Project of this size and customer-driven nature can proceed with construction without any
 11 documented consideration of whether demand-side management, storage, or other non-
 12 transmission alternatives could defer or reduce the need. The Commission should require
 13 PPL to conduct and produce a documented NTA analysis — addressing demand response,
 14 storage, and load management specifically — as part of any Phase 2 proceeding, rather
 15 than dismissing alternatives in a single sentence without supporting analysis as PPL did
 16 here.

17 18 **IV.c. Distribution System Connection Alternative**

19 **Q: Did PPL evaluate connecting the customer at the distribution system?**

20 **A:** No. PPL identified an existing 12 kV distribution line — the Cando 59-2 — crossing the
 21 project area with approximately 7 MW of capacity.¹⁰⁸ PPL did not evaluate distribution-

¹⁰⁸ PPL Response to OCA I-8(a).

level interconnection as an alternative because the existing line has insufficient capacity to serve the customer's load.¹⁰⁹ PPL stated that its 12 kV lines have a typical capacity of 11 MVA, and that at least 22 distribution circuits plus additional redundancy circuits would be required to serve the customer's initial 240 MW load request¹¹⁰ — with dozens more needed to serve the final 965 MW load¹¹¹.

Q: Do you agree with PPL's explanation?

A: Yes. A 965 MW customer load cannot be served from a 12 kV distribution system. The arithmetic is straightforward — serving even the initial 240 MW load would require approximately 22 distribution circuits at 11 MVA each¹¹², and the final 965 MW load would require nearly 90 circuits¹¹³. Distribution-level interconnection is not a viable alternative for a customer of this size and the distribution connection alternative does not warrant further analysis.

Q: What is your recommendation?

A: No further action is needed on the distribution system connection alternative.

¹⁰⁹ “The existing distribution line was not identified in the alternatives analysis because it does not have sufficient capacity to serve the Customer’s initial load request.” PPL Response to OCA I-8(d).

¹¹⁰ “PPL Electric’s 12 kV lines have a typical capacity of 11 MVA. At least 22 distribution circuits, plus additional circuits for redundancy, would be required to serve 240 MW of load.” PPL Response to OCA I-8(c).

¹¹¹ “22 distribution level circuits would be required to serve the Customer’s initial 240 MW load request, and dozens more would be needed to serve the final load request amount of 965 MW.” PPL Response to OCA I-8 (e).

¹¹² Per PPL Response to OCA I-8(c): “PPL Electric's 12 kV lines have a typical capacity of 11 MVA. At least 22 distribution circuits...would be required to serve 240 MW of load.” 22 distribution circuits times 11 MVA = 242 MVA. Assuming 1 power factor, 242 MVA = 242 MW.

¹¹³ Using PPL's 11 MVA per circuit figure from OCA I-8(c): 965 MW ÷ 11 MVA = approximately 87.7 circuits, rounded to approximately 90. 90 distribution circuits times 11 MVA = 990 MVA. Assuming 1 power factor, 990 MVA = 990 MW.

IV.d. Direct Connection to Phase 2 Nescopeck Switchyard

Q: Did PPL evaluate connecting the customer directly to the Phase 2 - Nescopeck Switchyard instead of splitting the Susquehanna-Harwood lines at Tomhicken?

A: No. PPL stated this alternative was not evaluated because the proposed Nescopeck Switchyard is approximately 9 miles from the customer's location, requiring two sets of double-circuit 230 kV transmission lines to be extended from Nescopeck to the customer's substation, with greater siting and right-of-way impact than the proposed solution.¹¹⁴

Q: What would direct connection at Nescopeck have meant for ratepayers?

A: A direct connection from Nescopeck would have eliminated the Susquehanna-Harwood line split — as PPL confirmed the split would not be required under a Nescopeck configuration, though PPL noted the project would need to be re-evaluated and additional upgrades would be required.¹¹⁵

The 9 miles of new double-circuit 230 kV transmission line required to reach the customer's substation¹¹⁶ would have been customer-specific infrastructure, likely

¹¹⁴ “This alternative was not evaluated as the proposed Nescopeck Switchyard is approximately 9 miles from the customer’s location. Two sets of double-circuit 230kV transmission lines would need to be extended from the Nescopeck Switchyard to the Customer’s substation. This would have greater siting and ROW impact than the proposed solution.” PPL Response to OCA III-8(b) Supplemental.

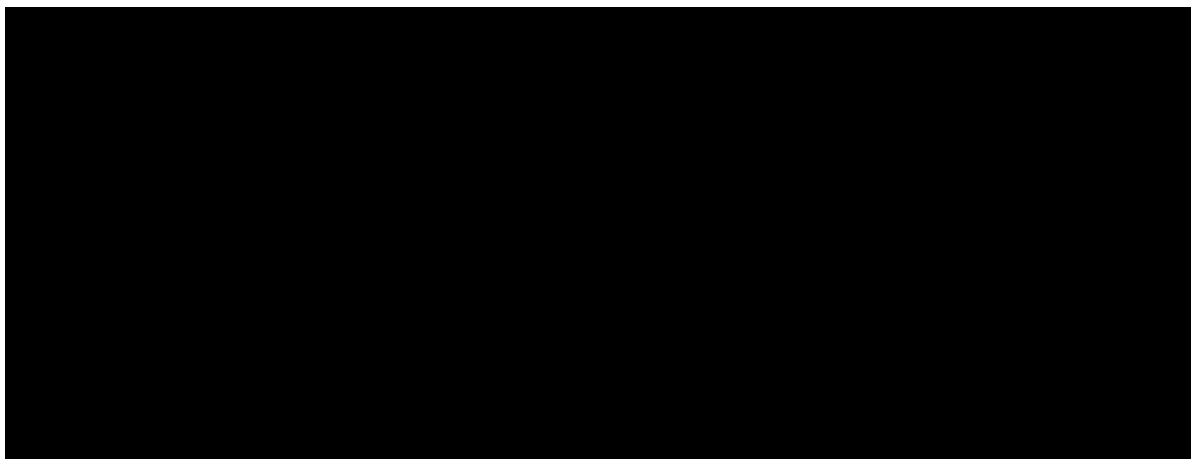
¹¹⁵ OCA III-8 (d) – “If the customer’s substation were connected directly to Nescopeck — the Phase 2 substation — rather than to Tomhicken, would the splitting of the Susquehanna-Harwood #1 & #2 230kV lines still be required? Please answer yes or no and explain”. “No, but if the Customer was served directly from the Nescopeck Switchyard the Project would need to be re-evaluated.” PPL Response to OCA III-8(d) Supplemental.

¹¹⁶ “This alternative was not evaluated as the proposed Nescopeck Switchyard is approximately 9 miles from the customer’s location.” PPL Response to OCA III-8(b) Supplemental.

1 allocated entirely to the customer rather than to ratepayers. Under the Tomhicken
2 approach, ratepayers are allocated \$38.4 million. Under a Nescopeck approach, the
3 customer would bear the cost of approximately 9 miles of new 230 kV line — an amount
4 PPL has not quantified or compared against the Tomhicken ratepayer allocation.
5

6 **Q: Do you agree with PPL's decision not to evaluate the Nescopeck alternative?**

7 **A:** I agree in part and disagree in part. I agree that the 9-mile distance and right-of-way
8 considerations are legitimate engineering factors that may favor the Tomhicken approach
9 from a siting standpoint.¹¹⁷

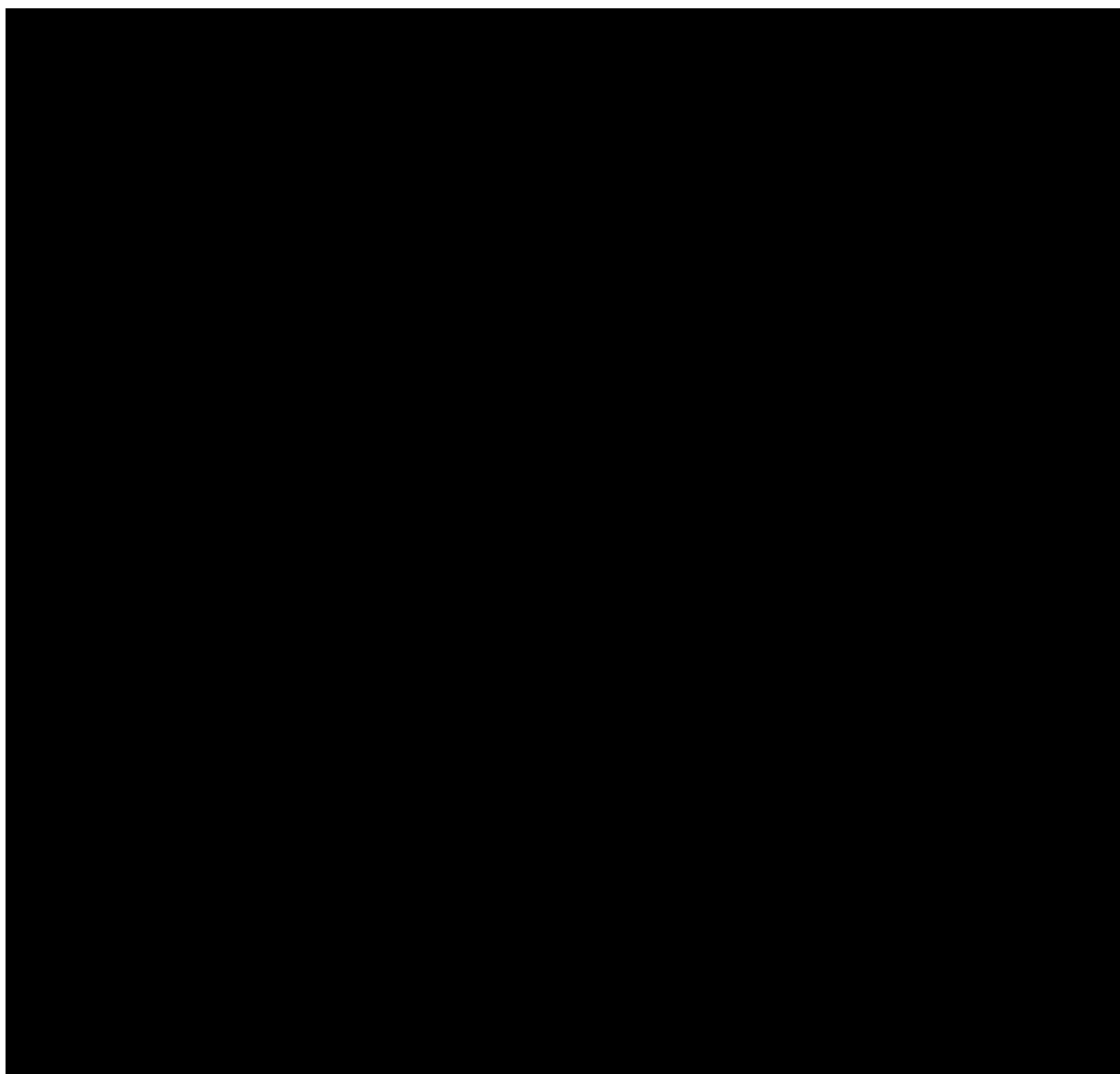


16
17 **Q: Does PPL's failure to evaluate Nescopeck raise a cost allocation problem beyond the**
18 **missing cost comparison?**

¹¹⁷ “This alternative was not evaluated as the proposed Nescopeck Switchyard is approximately 9 miles from the customer’s location. Two sets of double-circuit 230kV transmission lines would need to be extended from the Nescopeck Switchyard to the Customer’s substation. This would have greater siting and ROW impact than the proposed solution.” PPL Response to OCA III-8(b) Supplemental.

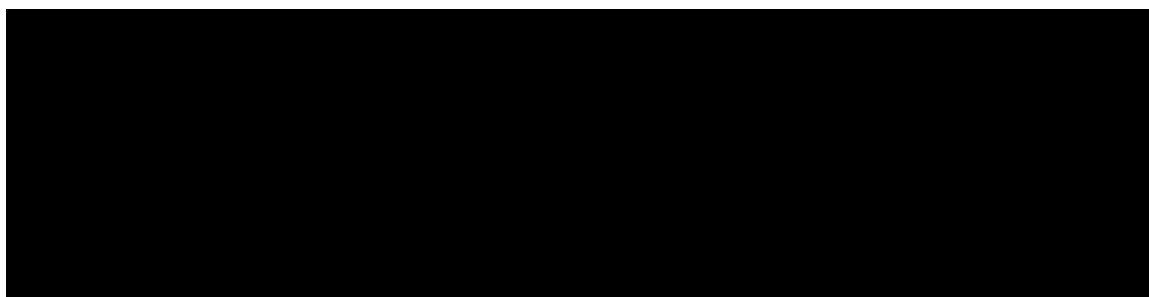
¹¹⁸ “This alternative was not evaluated as the proposed Nescopeck Switchyard is approximately 9 miles from the customer’s location.” PPL Response to OCA III-8(b) Supplemental.

1 A:



17 Q: Does the Tomhicken Switchyard's design support PPL's decision not to evaluate
18 Nescopeck, or does it undermine PPL's ratepayer benefit claims?

19 A:



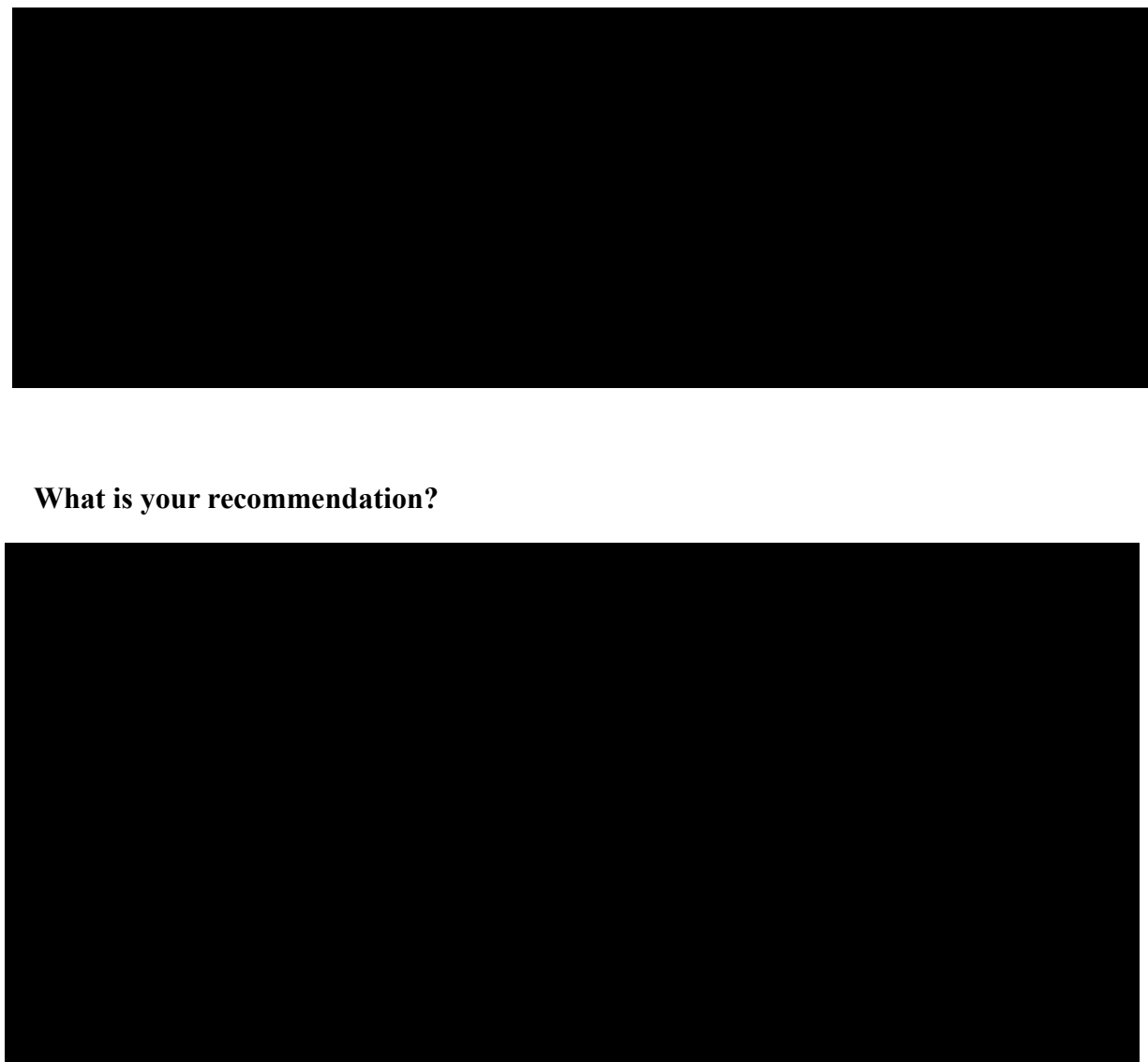
¹¹⁹ PPL Response to OCA VI-5(c).

¹²⁰ PPL Response to OCA I-5(d) Supplemental.

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Q: What is your recommendation?

A:



IV.e. Switchyard Alternatives Summary

Q: Please summarize the Switchyard Alternatives section.

A: I evaluated four categories of alternatives to the Tomhicken Switchyard project:

¹²¹ “The Tomhicken Switchyard allows for multiple future new transmission electrical paths outside of the current proposed Phase 2 transmission line to be interconnected at Tomhicken. It also allows for PPL Electric to provide new customer interconnections directly from transmission or indirectly for future load growth via new distribution facilities.” PPL Response to OCA III-8 (e) Supplemental.

- 1 1. **DLR:** DLR has been operational on the Susquehanna-Harwood lines since October
2 2022. However, DLR is an operational tool used for real-time and day-ahead market
3 efficiency — it is not applicable to transmission planning load flow analysis.
4 Additionally, a physical switchyard is required to connect a 965 MW customer to the
5 230 kV network regardless of line ratings. PPL does not allow 230 kV line taps and
6 NERC TPL-001 requirements preclude a tapped configuration for this load size.
- 7 2. **Non-Transmission Alternatives:** Demand response, energy storage, and load
8 management cannot substitute for a physical 230 kV transmission interconnection for
9 a 965 MW customer.
- 10 3. **Distribution System Connection:** A 12 kV distribution interconnection is not viable
11 — serving even the initial 240 MW load would require approximately 22 distribution
12 circuits, with dozens more needed for the final 965 MW load.
- 13 4. **Nescopeck Direct Connection:** PPL did not evaluate direct connection to the
14 Nescopeck Switchyard. The 9-mile distance and ROW considerations are legitimate
15 engineering factors, but PPL never performed a cost comparison between the
16 Tomhicken approach — which allocates \$38.4 million to ratepayers — and the
17 Nescopeck approach, under which the customer would bear the cost of new
18 transmission line construction.

19
20 **Q: Does FERC or NERC mandate any of the alternatives discussed?**

1 **A:** FERC supports Dynamic Line Ratings as a grid-enhancing technology¹²² but did not
 2 mandate their use in transmission planning load flow analysis. NERC standards —
 3 including FAC-002-2 and TPL-001 — govern facility interconnection studies and
 4 planning reliability standards but do not mandate specific alternatives for customer
 5 interconnection projects.

6 However, NERC's recent work is directly relevant to this proceeding. In August
 7 2024, NERC established the Large Loads Task Force to address reliability risks from
 8 large load interconnections. In July 2025, NERC published a white paper —
 9 "Characteristics and Risks of Emerging Large Loads" — identifying long-term planning
 10 and system stability as high-priority concerns for large load interconnections.¹²³ In
 11 September 2025, NERC issued a Level 2 Alert on Large Load Interconnection, Study,
 12 Commissioning, and Operations, addressing reliability challenges from large load
 13 behavior.¹²⁴ The customer in this proceeding — a 965 MW load — falls squarely within
 14 NERC's definition of a Large Load¹²⁵. NERC's guidance underscores the need for
 15 rigorous planning analysis, including the sensitivity cases required by TPL-001-5.1
 16 R2.1.3 that PPL has been asked to confirm it performed.

¹²² FERC Notice of Inquiry, Use of Dynamic Line Ratings to Promote Grid Efficiency, Docket No. AD22-5 (Feb. 17, 2022), available at <https://www.ferc.gov/news-events/news/ferc-opens-inquiry-use-dynamic-line-ratings-promote-grid-efficiency> (Last Accessed on June 2, 2026).

¹²³ NERC, Characteristics and Risks of Emerging Large Loads (July 2025), available at <https://www.nerc.com/globalassets/who-we-are/standing-committees/rstc/whitepaper-characteristics-and-risks-of-emerging-large-loads.pdf> (Last Accessed on June 2, 2026).

¹²⁴ NERC Level 2 Alert, Large Load Interconnection, Study, Commissioning, and Operations (Sept. 9, 2025), available at <https://www.nerc.com/globalassets/programs/bpsa/alerts/2025/nerc-alert-level-2--large-loads.pdf> (Last Accessed on June 2, 2026).

¹²⁵ “Any commercial or industrial individual load facility or aggregation of load facilities at a single site behind one or more point(s) of interconnection that can pose reliability risks to the BPS due to its demand, operational characteristics, or other factors. Examples include, but are not limited to, data centers, cryptocurrency mining facilities, hydrogen electrolyzers, manufacturing facilities, and arc furnaces.” Source: <https://www.nerc.com/globalassets/programs/bpsa/alerts/2025/nerc-alert-level-2--large-loads.pdf> (Last Accessed on June 2, 2026).

1

2 **Q: Does the alternatives analysis affect your testimony's position on the need for the**
3 **Tomhicken Switchyard or the ratepayer cost allocation?**

4 **A: On project need** — no. The alternatives analysis confirms that no viable alternative
5 exists to a physical transmission switchyard for a 965 MW customer requiring 230 kV
6 interconnection. My testimony does not contest the need for the Tomhicken Switchyard
7 to serve this customer.

8 **On ratepayer cost allocation** — yes. The alternatives analysis strengthens my
9 testimony's position that ratepayers should not bear \$38.4 million for this project. Every
10 alternative examined — DLR, NTAs, distribution connection, and Nescopeck direct
11 connection — confirms that the Tomhicken Switchyard exists solely to serve this
12 customer's physical interconnection requirement. No alternative analysis identified an
13 independent system reliability need that would have required this switchyard absent the
14 customer's request. The project is entirely customer-driven, and the cost allocation should
15 reflect that finding.

16

17 **V. Customer Reliability Benefits**

18 **Q: What are the reliability benefits to the Customer from the Tomhicken Switchyard?**

19 **A:** PPL confirmed the project meets NERC FAC-002-2 facility interconnection standards,
20 PPL's FERC 715 criteria, and PPL's System Planning Development Standards, and that
21 "flow studies performed by the Company and PJM demonstrate that the proposed project

meets these standards."¹²⁶ The BAAH configuration enables PPL to "extend four 230 kV lines to the Customer's substation,"¹²⁷ and PPL stated that breaker-and-a-half arrangements "provide system reliability and the ability to operate the system."¹²⁸ The Tomhicken 230 kV Switchyard is, in PPL's own words, "required due to the number of lines needed by the Customer and the size of the requested load."¹²⁹

These reliability benefits — a dedicated 230 kV interconnection with four circuits designed specifically for this Customer's load requirements — accrue primarily to the Customer, not to existing ratepayers.

Q: Did PPL provide any quantitative analysis of the reliability benefits to the Customer?

A: No. When asked to provide quantitative results demonstrating that the proposed solution meets reliability standards — including specific metrics such as loss of load probability or load delivery reliability — PPL stated that it "does not have any additional quantitative analyses" beyond the flow studies performed for standards compliance.¹³⁰ PPL did not quantify the reliability improvement the Customer receives, the value of N-1 redundancy for a load of this size, or how the reliability benefits compare to the cost of the infrastructure providing them.

¹²⁶ PPL Response to OCA V-5(a).

¹²⁷ Page 8, LON.

¹²⁸ PPL Response to OCA V-4(b).

¹²⁹ Page 8, LON.

¹³⁰ "The flow studies performed by the Company and PJM demonstrate that the proposed project meets these standards. PPL Electric does not have any additional quantitative analyses." PPL Response to OCA V-5(a).

Q: Do you agree with PPL's characterization of Customer reliability benefits?

A: I agree that the Tomhicken Switchyard provides real and substantial reliability benefits to the Customer. A 965 MW load receiving a dedicated BAAH-configured 230 kV interconnection with four redundant circuits is receiving a high level of service reliability that the Customer specifically requested and that the switchyard was designed to provide.

However, this finding cuts against PPL's cost allocation, not for it. The reliability benefits established above — PPL's own record confirms the switchyard provides "system reliability and the ability to operate the system,"¹³¹ meets NERC FAC-002-2 facility interconnection standards,¹³² and extends four 230 kV lines designed specifically for this Customer's load¹³³ — are benefits to the Customer, not to existing ratepayers.

PPL's LON itself states the switchyard "is required due to the number of lines needed by the Customer and the size of the requested load."¹³⁴ [REDACTED]

Q: What is your recommendation?

A: [REDACTED]

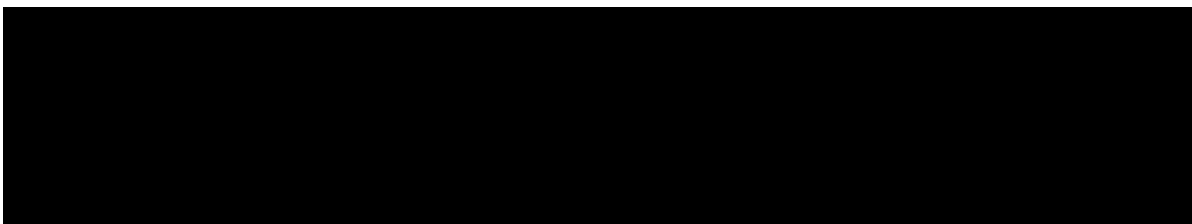
¹³¹ PPL Response to OCA V-4(b).

¹³² PPL Response to OCA V-5(a).

¹³³ Page 8, LON.

¹³⁴ Page 8, LON.

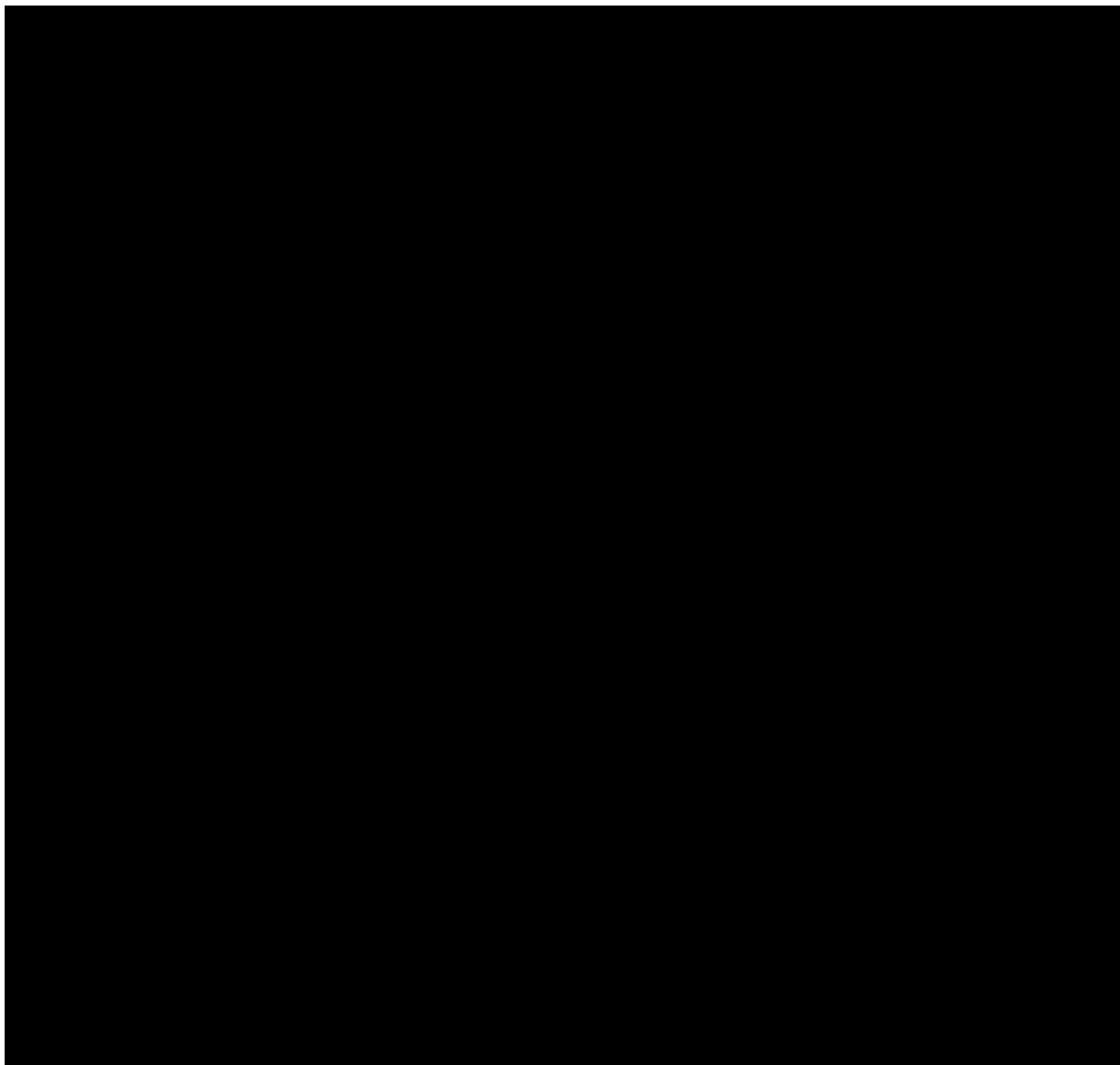
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VI. Network Benefits

Q: According to PPL, what are the network benefits of the Tomhicken Switchyard?

A:



¹³⁶ Page 10, LON.

¹³⁷ Page 10, LON.

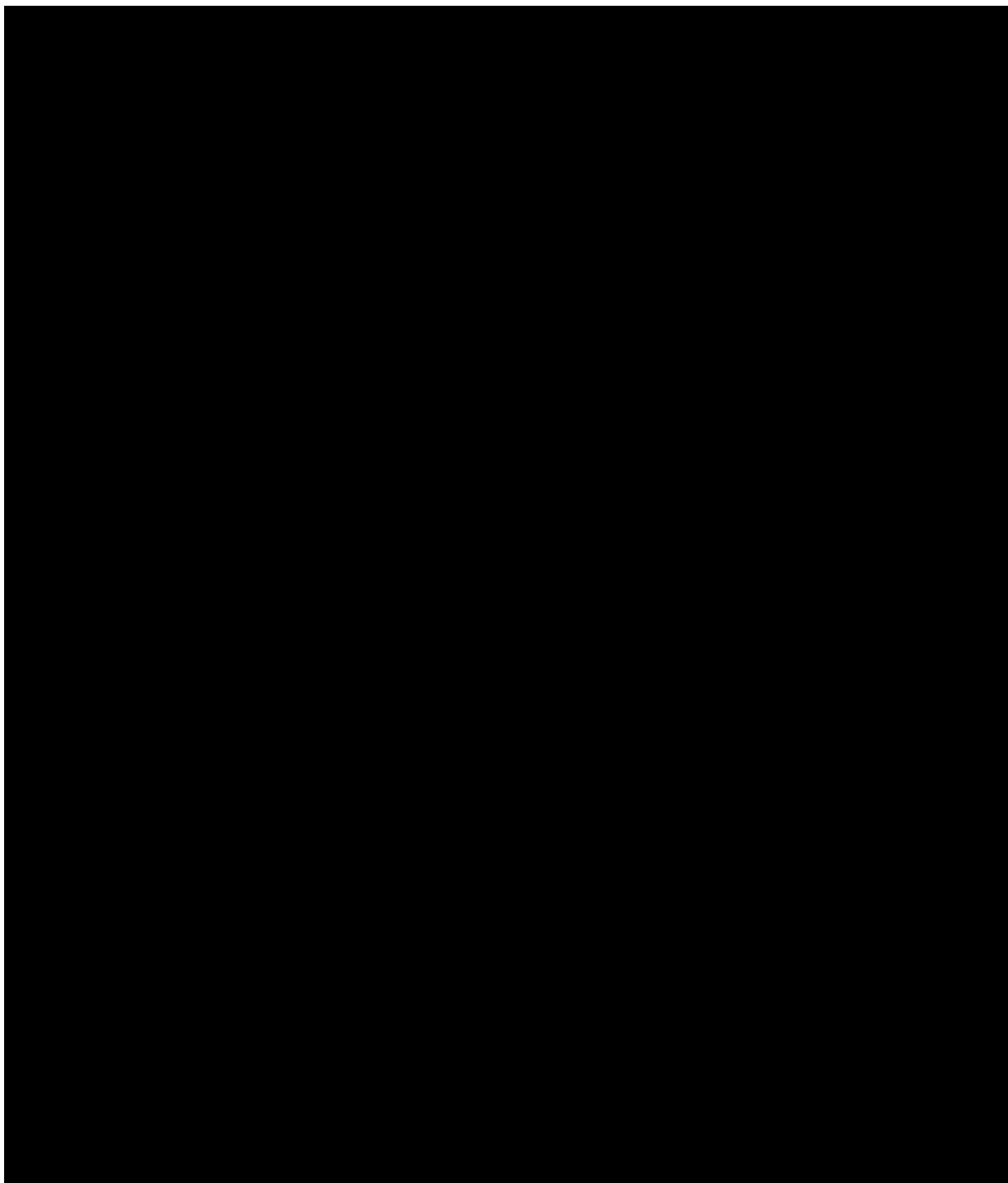
¹³⁸ Page 10, LON.

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Q: Did PPL provide any quantitative analysis of the network benefits?

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20 **Q: Which PJM RTEP model was modeled for justifying the need?**

¹⁴⁴ PPL Response to OCA I-6(c).

¹⁴⁵ PPL Response to OCA I-6(c).

¹⁴⁶ OCA III-4(a).

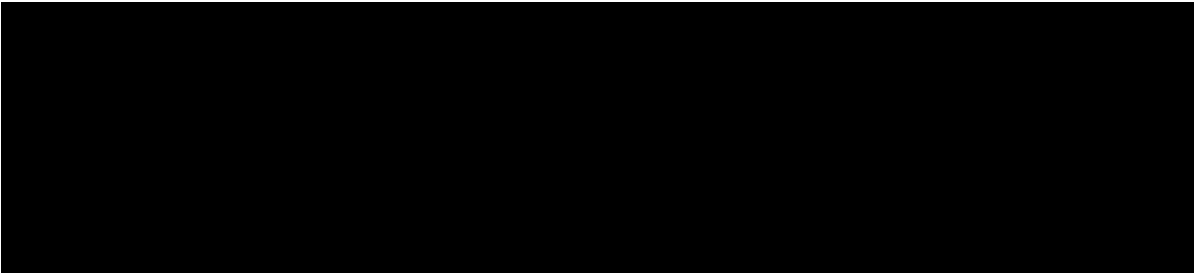
¹⁴⁷ PPL Response to OCA III-4(a).

1 **A:** PPL stated that the “2025 RTEP summer case for 2030 model” was used to justify the
2 need for Tomhicken Switchyard.¹⁴⁸ Based on that model, PPL stated that the Tomhicken
3 Switchyard will have approximately 700 MVA of network flow through the switchyard
4 under normal conditions, and up to 1,200 MVA of network flow under contingency
5 conditions.¹⁴⁹

6
7 **Q:** **What assumptions underly the RTEP 2030 model — specifically, is Phase 2 assumed**
8 **to be in service in that RTEP case?**

9 **A:** Yes, PPL confirmed that “[b]oth Phase 1 and Phase 2 are included in supplemental
10 project S3528 scope of work and are modelled in the 2025 RTEP summer case for
11 2030”¹⁵⁰. The 700 MVA network flow figure PPL cited as evidence of ratepayer benefit
12 therefore assumes Phase 2 is constructed and in service — it does not represent a benefit
13 realized under Phase 1 alone.

14
15 **Q:** **Do you agree with PPL that there are network benefits of the Tomhicken**
16 **Switchyard?**

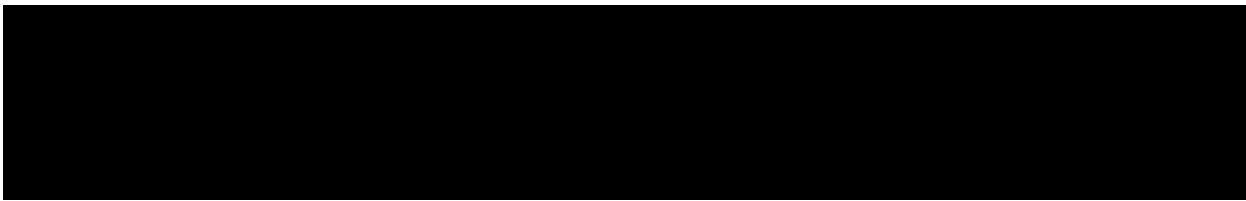
17 **A:** 
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¹⁴⁸ PPL Response to OCA III-4(c).

¹⁴⁹ PPL Response to OCA III-4(c).

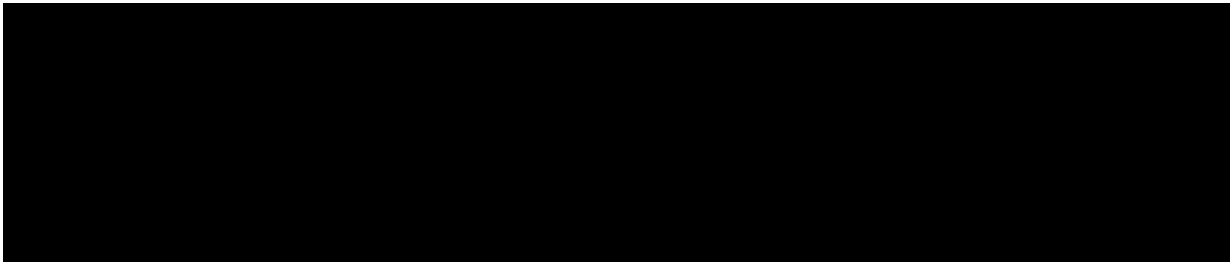
¹⁵⁰ PPL Response to OCA VIII-2(b).

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Q: Can you summarize whether ratepayer benefits exist across the relevant project scenarios?

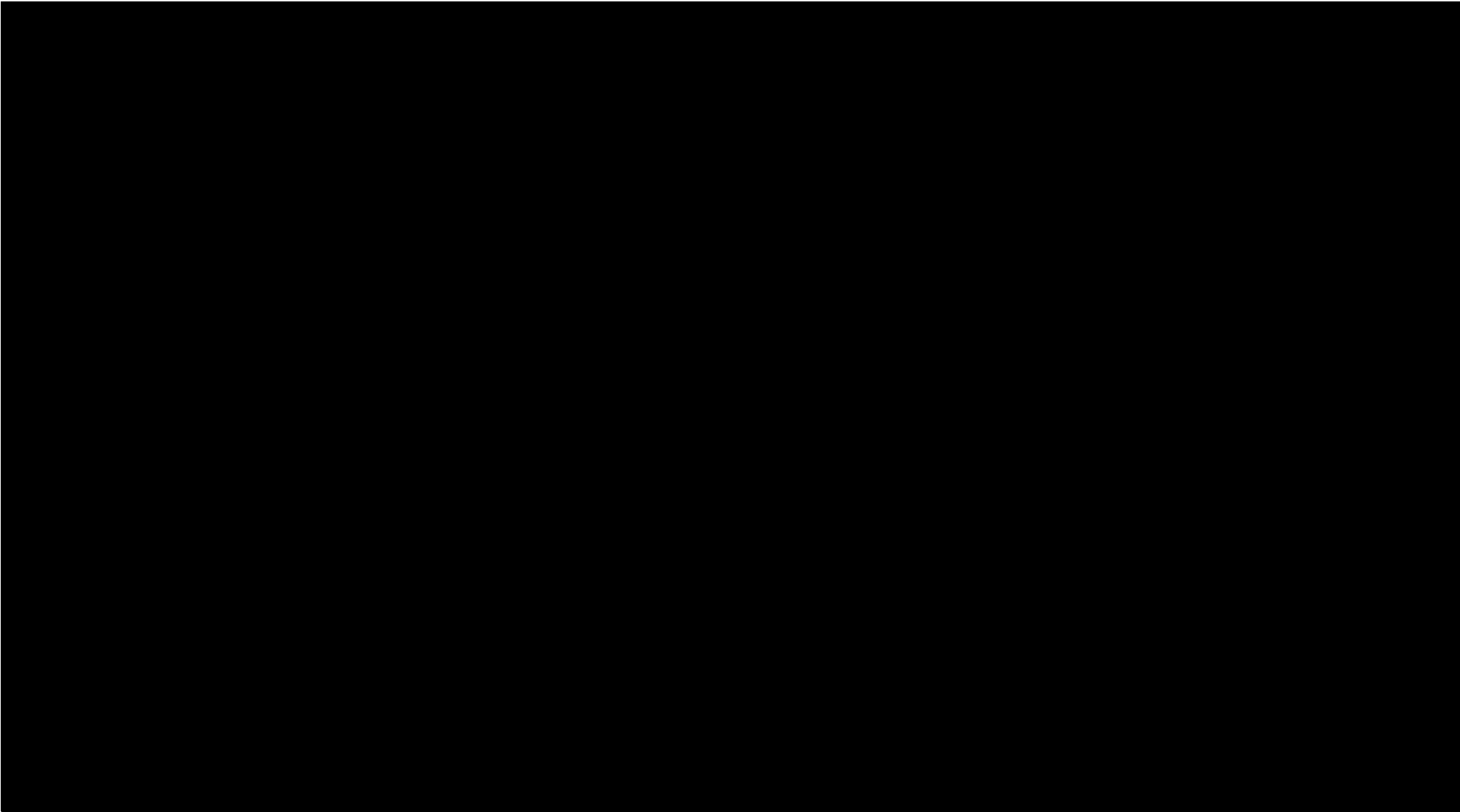
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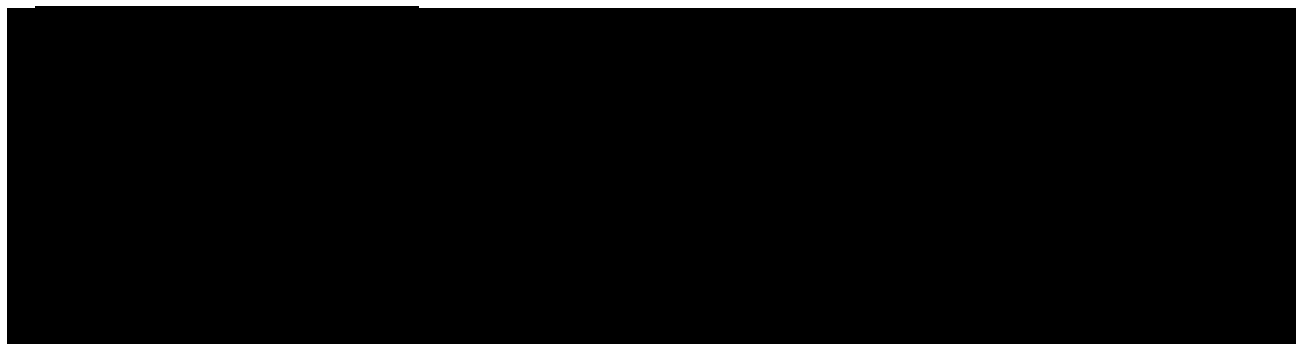
Table 1 - Scenario Analysis Table



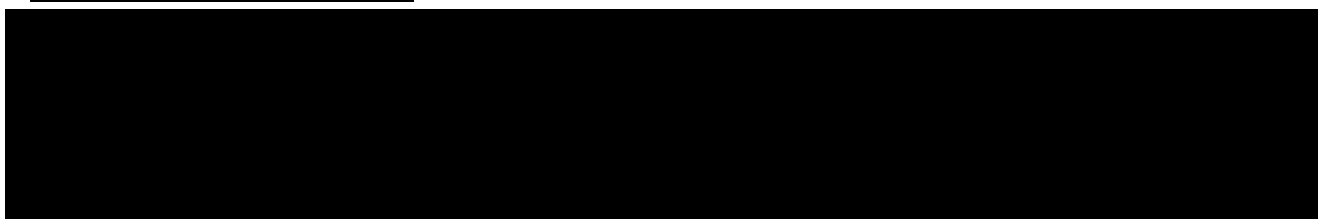
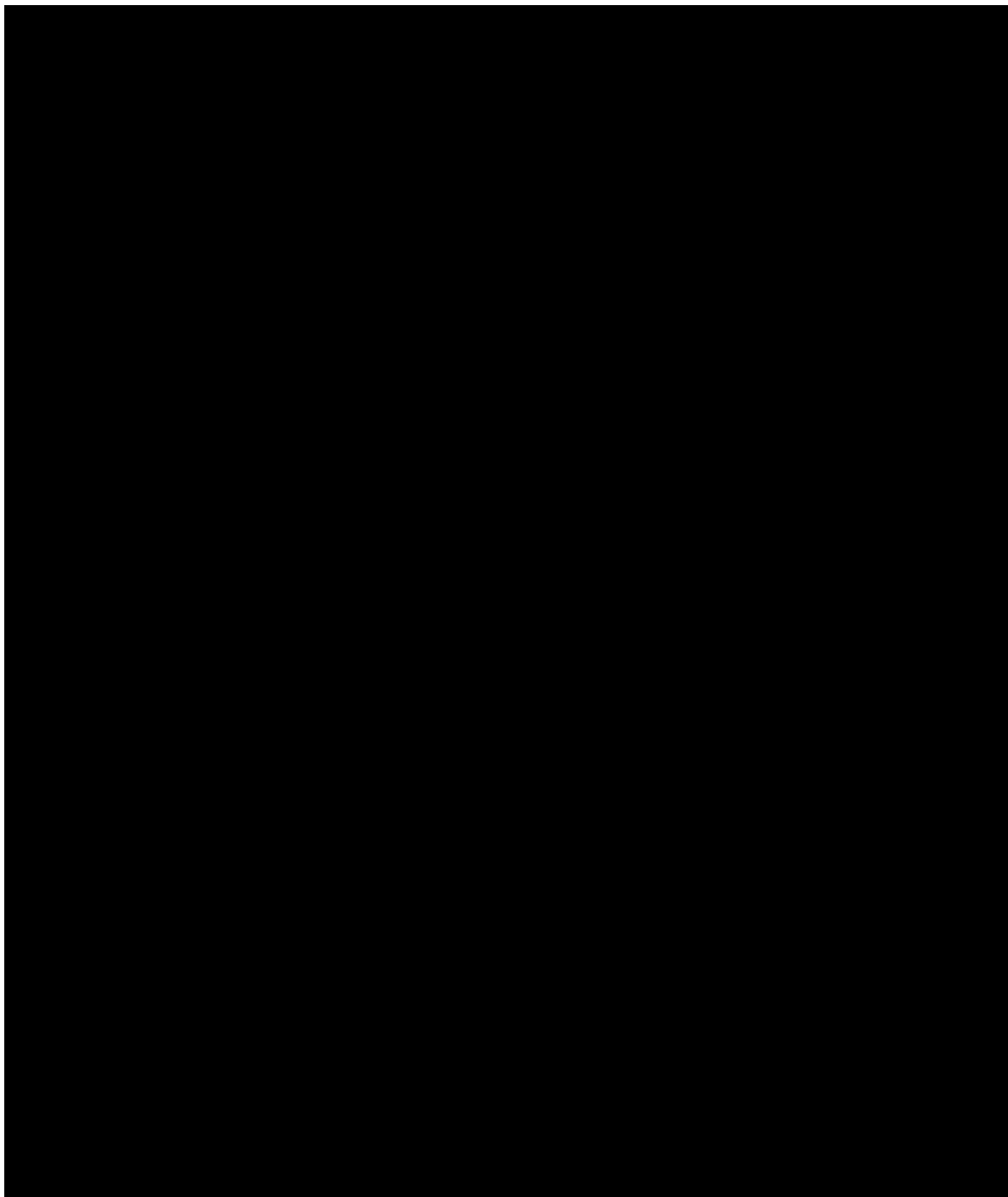
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Q: Do you agree with PPL's explanation for why it did not perform quantitative analysis of network benefits?

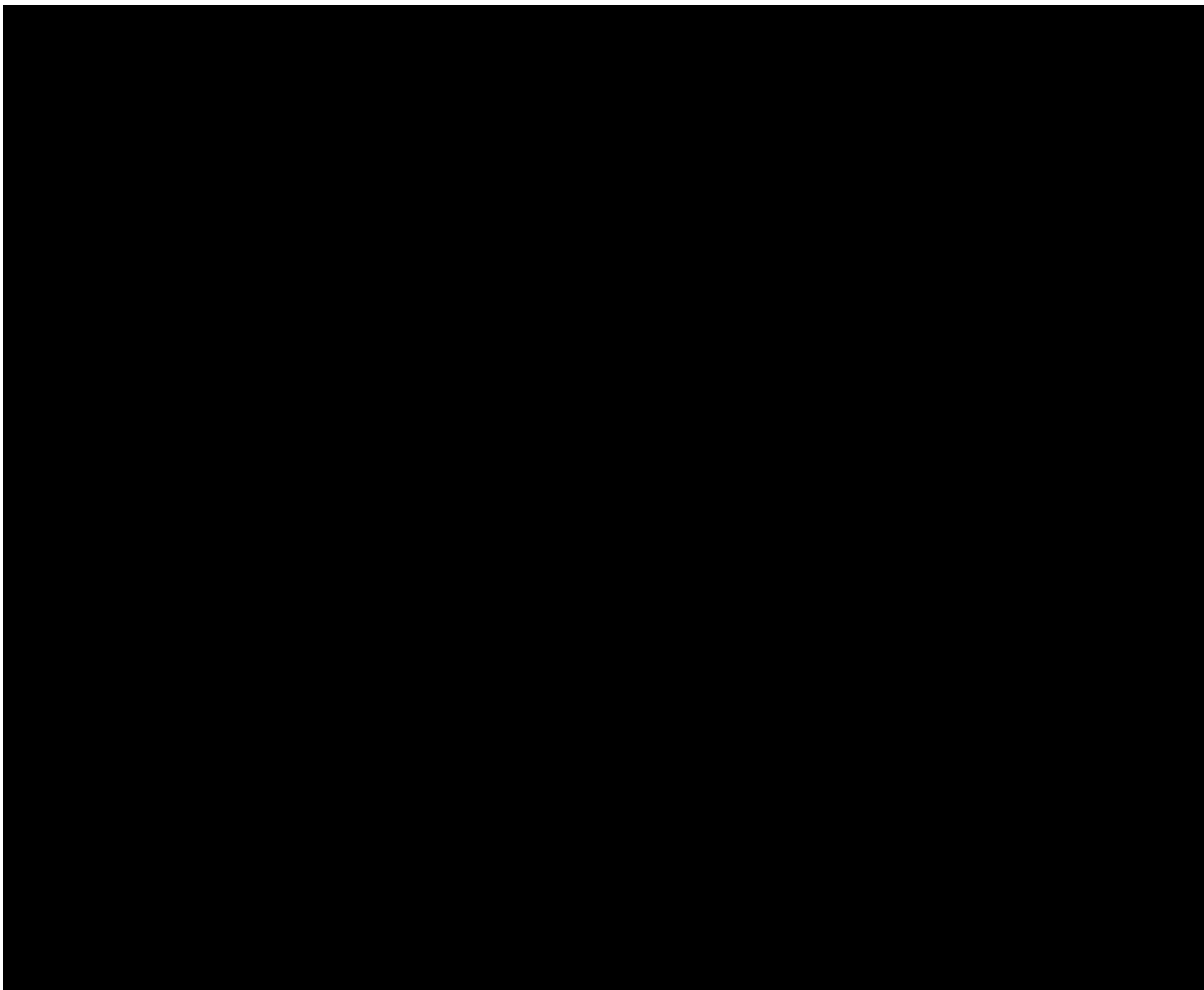
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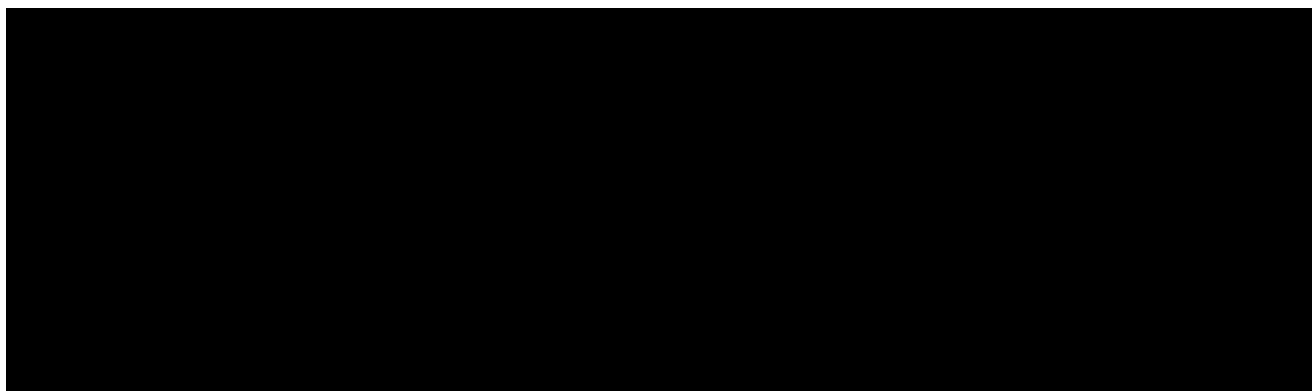
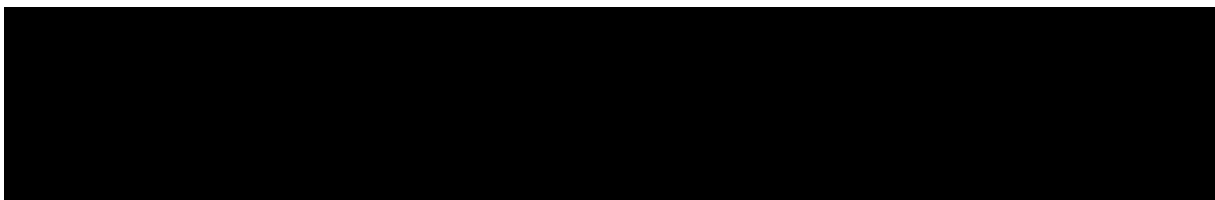


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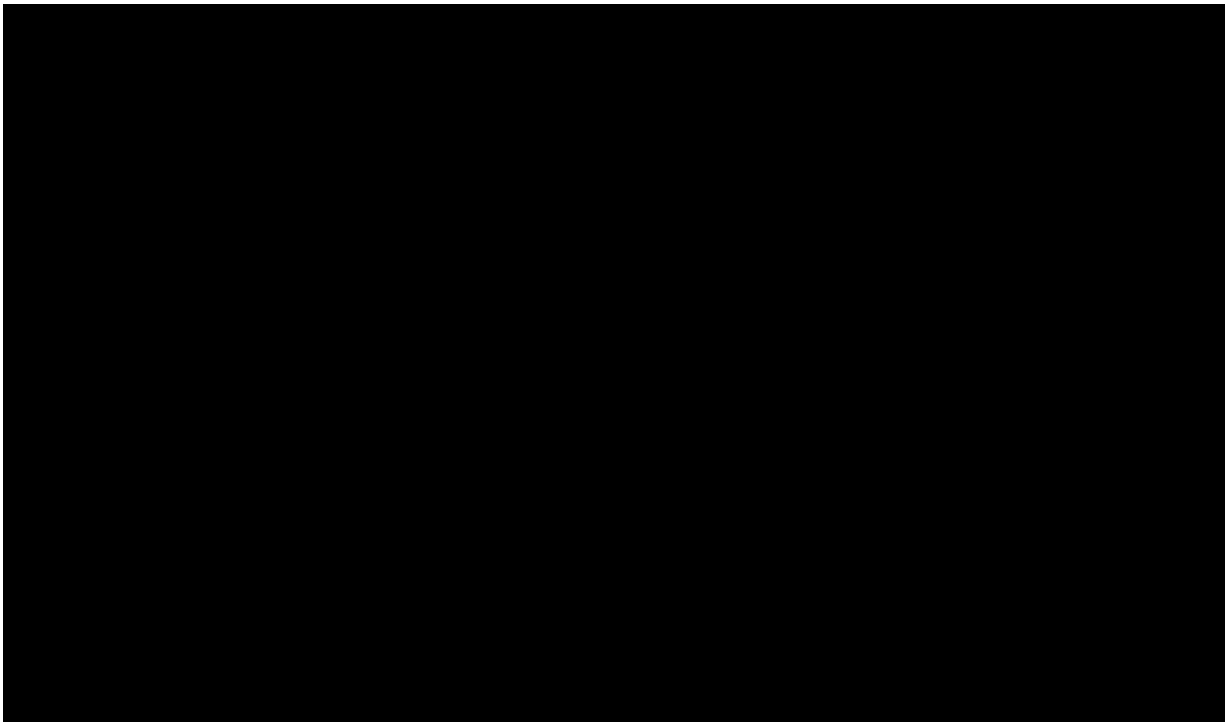


15 **Q: Does City of Anaheim excuse PPL from performing quantitative analysis here?**

16 **A:**
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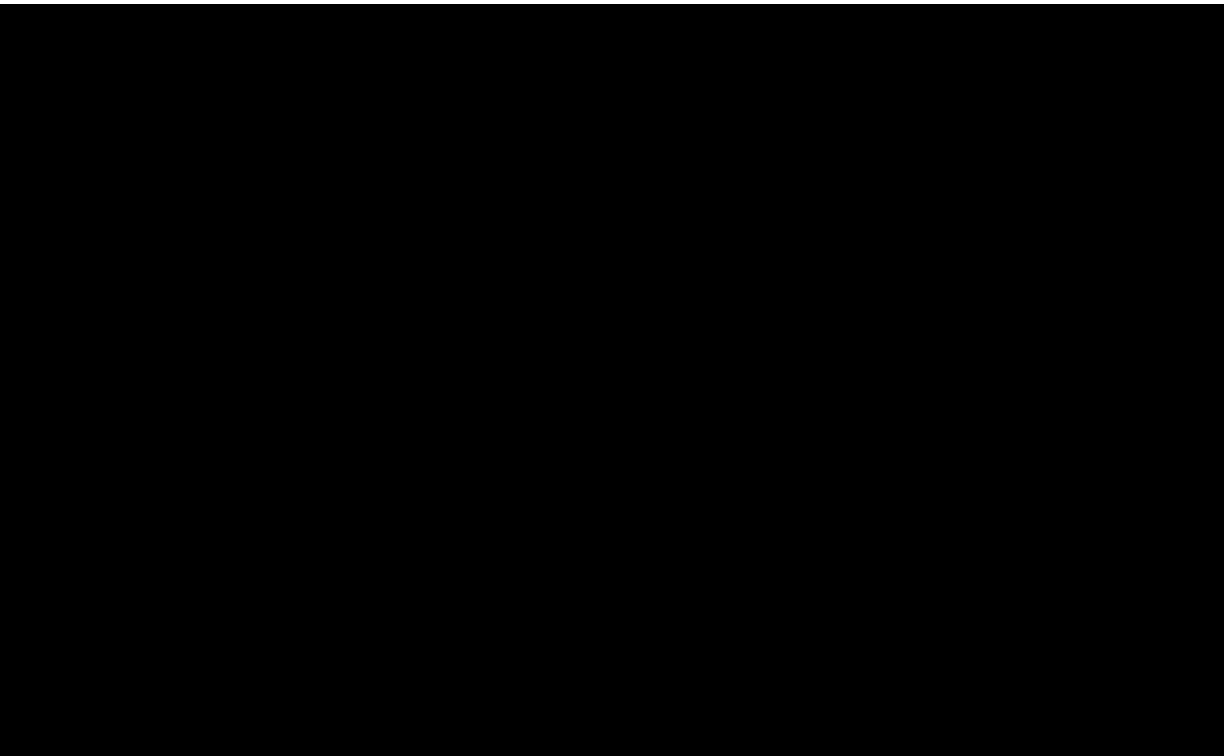


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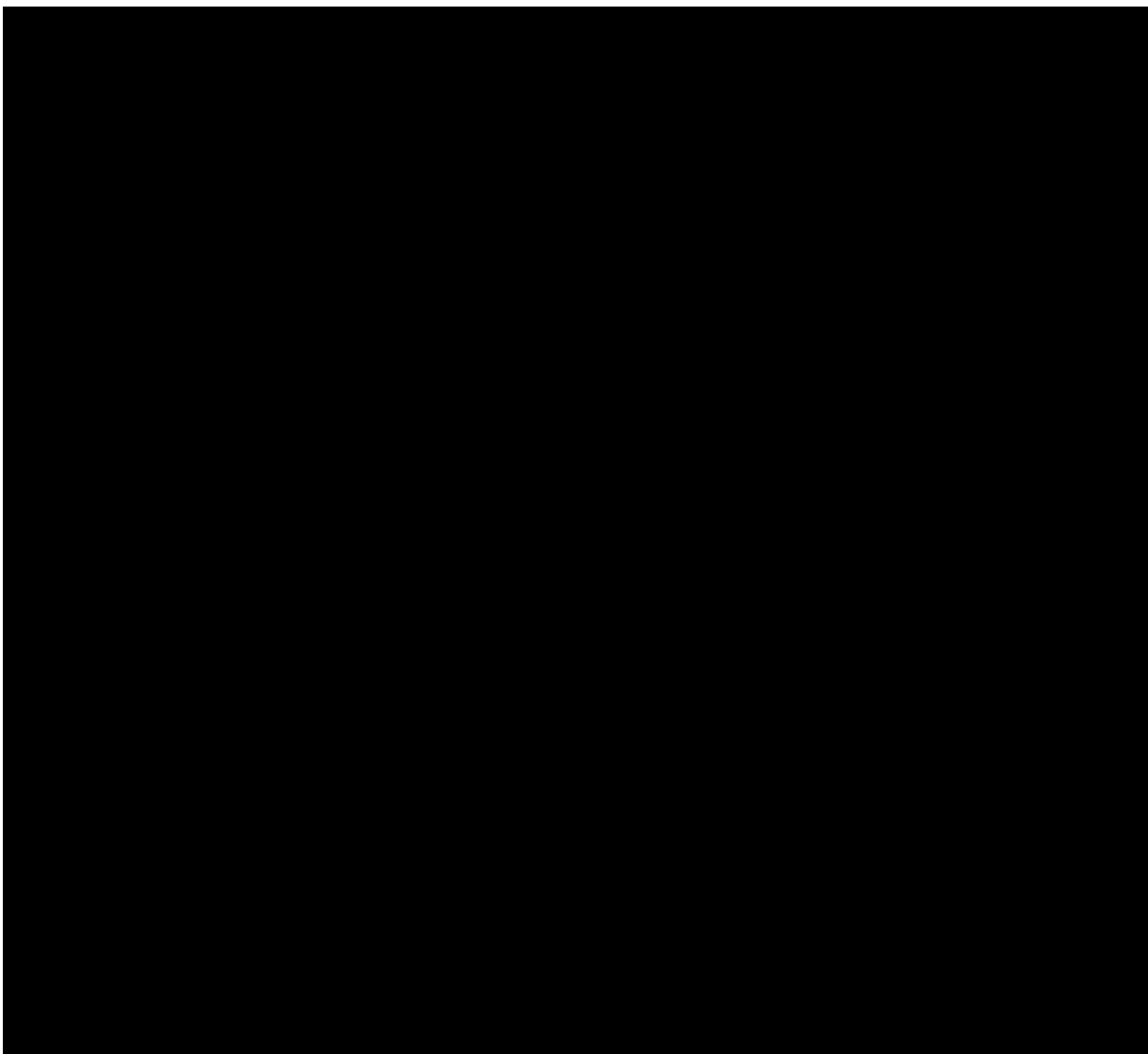


11 **Q: What would a quantitative analysis under Phase 1 alone actually show?**

12 **A:**
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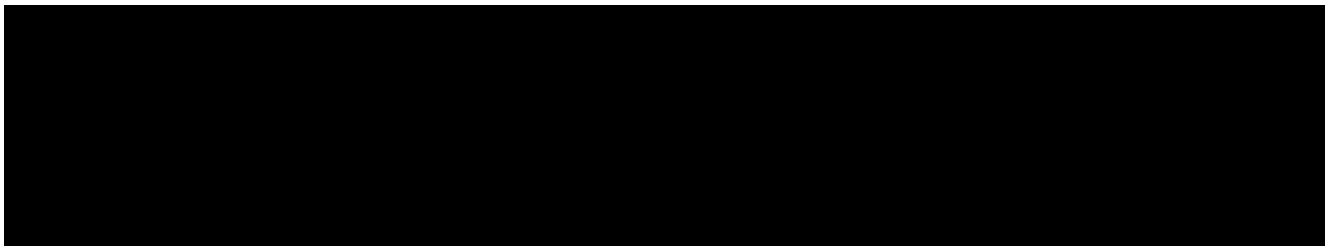
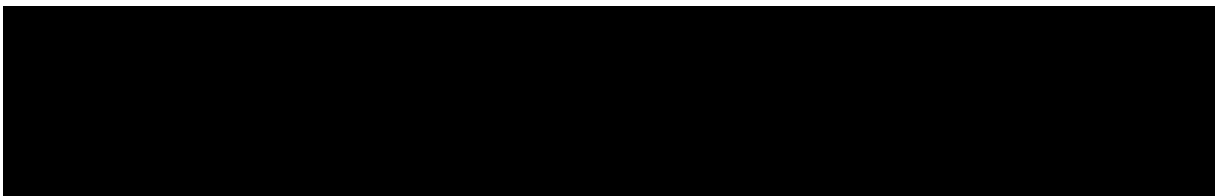


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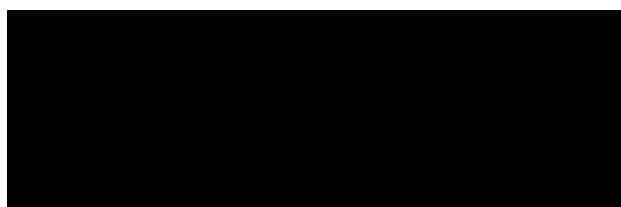
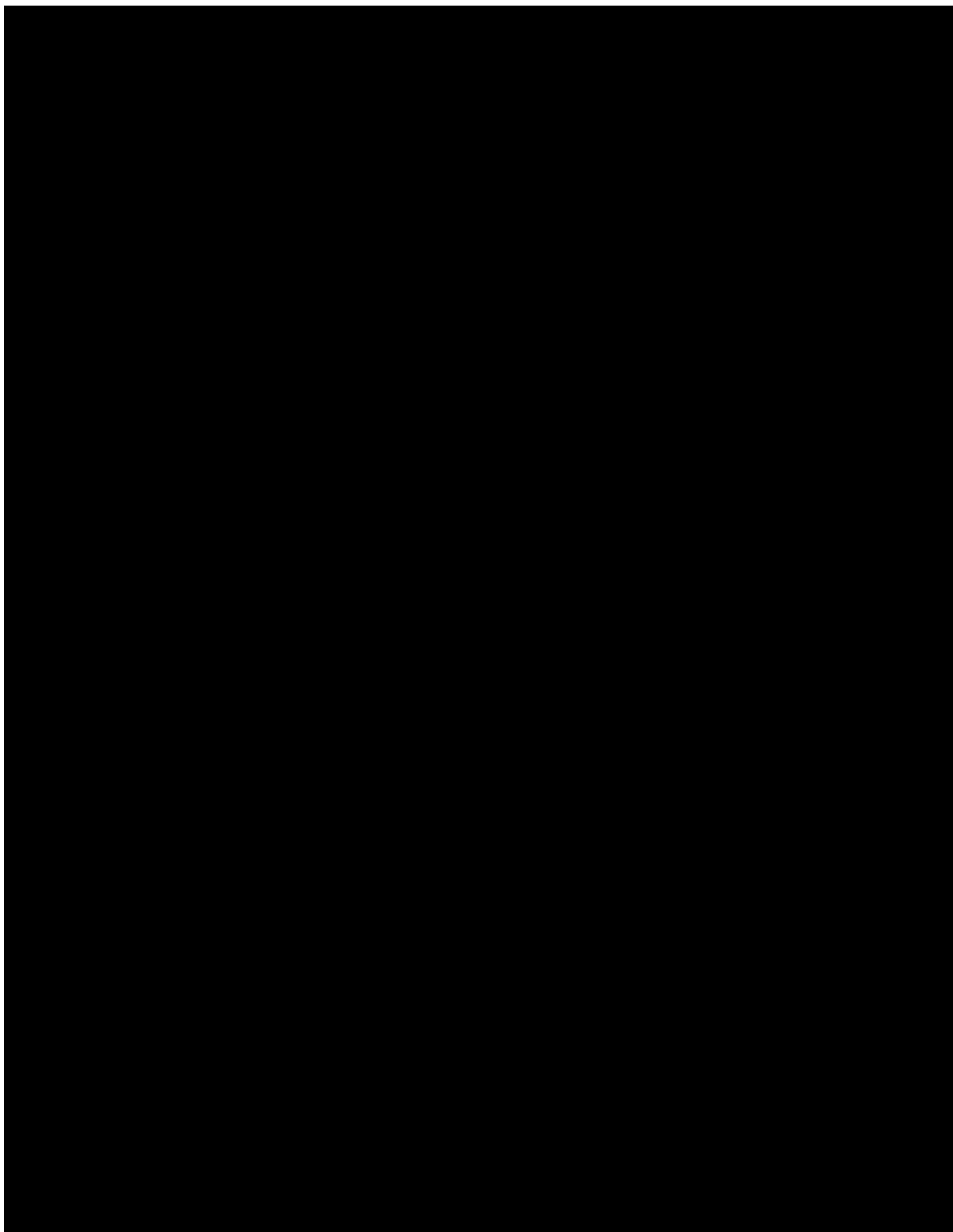


16 **Q: Are the network benefits PPL claims for Phase 1 contingent on Phase 2 being built?**

17 **A:**
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4 **Q: Does the Tomhicken Switchyard's design confirm this Phase 2 dependency?**

5 **A:**

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10 **Q: Has PPL acknowledged any uncertainty about whether the project has independent**
11 **value?**

12 **A:**

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[REDACTED]

Q: According to PPL's witness Mr. Lookup, who is the Tomhicken Switchyard designed to serve?

A:

[REDACTED]

Q: Has PPL's witness characterized this project as customer-driven?

A: Yes. Mr. Lookup confirmed that, “[t]he current Customer is the farthest along the development process amongst those customers, and is the need driver for this Letter of

[REDACTED]

Notification.”¹⁷⁶ PPL's own witness therefore characterizes the project as customer-driven — not as a network upgrade independently justified by system reliability needs.

Q: In your opinion, if the Customer whose interconnection needs are driving the construction of the Switchyard does not interconnect, are the facilities still needed?

A: No. As established throughout this testimony, but for this Customer's interconnection request, no reliability need requiring this switchyard would exist. If the Customer does not interconnect, the need driver for this project disappears, and the Tomhicken Switchyard serves no demonstrated independent system reliability purpose.

Q: If the Customer is ultimately unable to interconnect to the proposed Switchyard, would it be appropriate for the Commission to authorize the construction of the interconnection facilities?

A: No. Authorizing construction before the Customer's ability to interconnect is resolved would expose Pennsylvania ratepayers to \$38.4 million in costs for infrastructure that may never serve its intended purpose. The specific conditions the Commission should impose before authorizing construction — [REDACTED]
[REDACTED]
[REDACTED] — are set forth in the Phase 1 and Phase 2 Interdependency and Switchyard Cost sections of this testimony.

¹⁷⁶ Lines 7-8, Page 5, PPL Statement No.1.

Q: Did PPL identify whether other queue customers contribute to the 400 MW and 700 MW thresholds?

A: PPL stated that the 400 MW and 700 MW thresholds **HIGHLY CONFIDENTIAL**

STARTS [REDACTED]

[REDACTED] **HIGHLY**

CONFIDENTIAL ENDS PPL did not identify any other customer by name, load level, or projected in-service date as the question required. Notably, PPL has stated that it “only has one ESA [Electric Service Agreement] with a customer connecting to the Tomhicken Switchyard.”¹⁷⁸

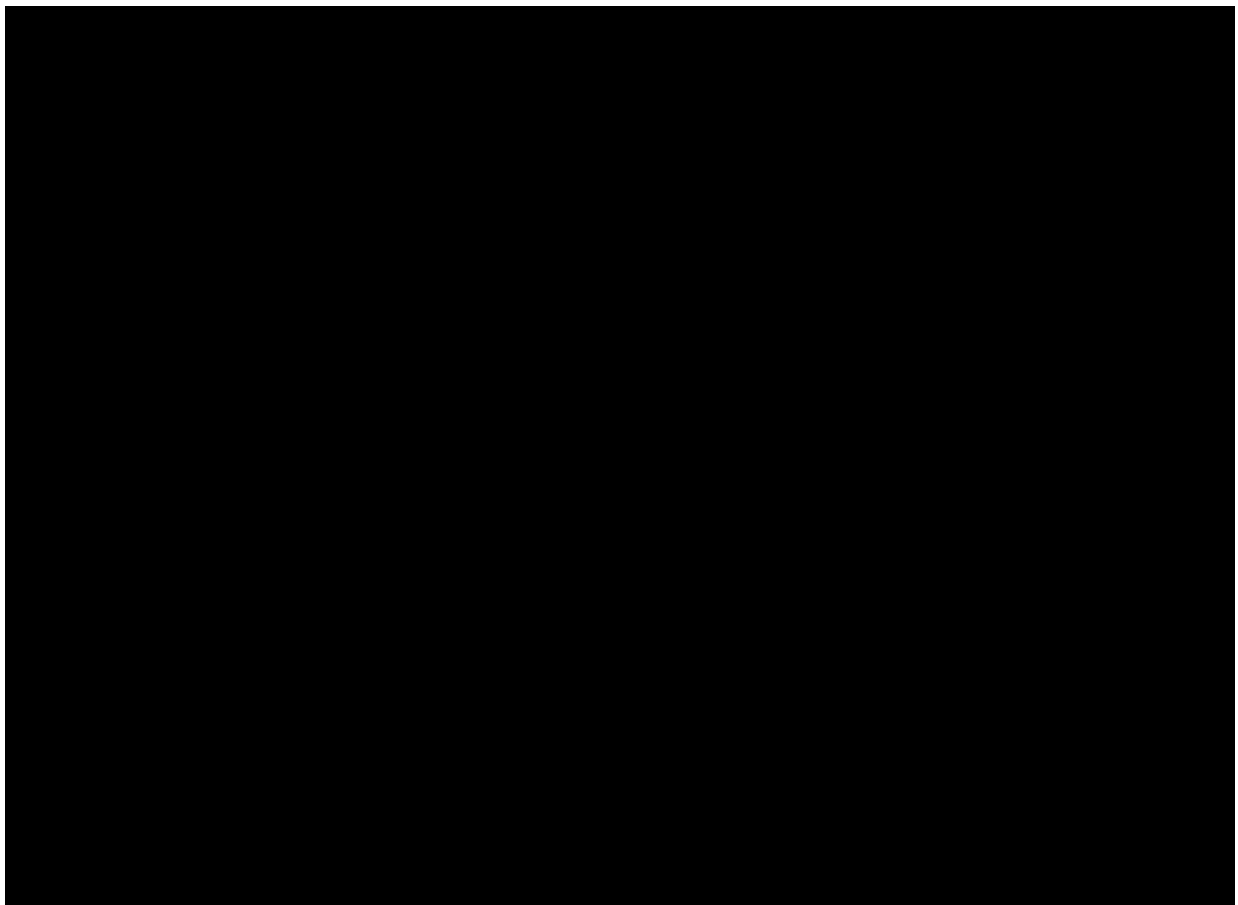
This evasive response is notable: PPL neither confirmed the thresholds are based solely on this customer's load nor identified the specific other customers whose load would contribute. What PPL did confirm is that this customer's maximum demand of 965 MW alone exceeds both the 400 MW and 700 MW thresholds — meaning this customer's load is independently sufficient to trigger both the P1/P4 overloads and the P7 voltage violations that drive Phase 2, regardless of whether other queue customers also contribute. [REDACTED]

¹⁷⁷ PPL Response to **HIGHLY CONFIDENTIAL** OCA VII-2(b).

¹⁷⁸ PPL Response to OCA X-2.

Q: What system function does the Tomhicken Switchyard serve for ratepayers if Phase 2 is never constructed?

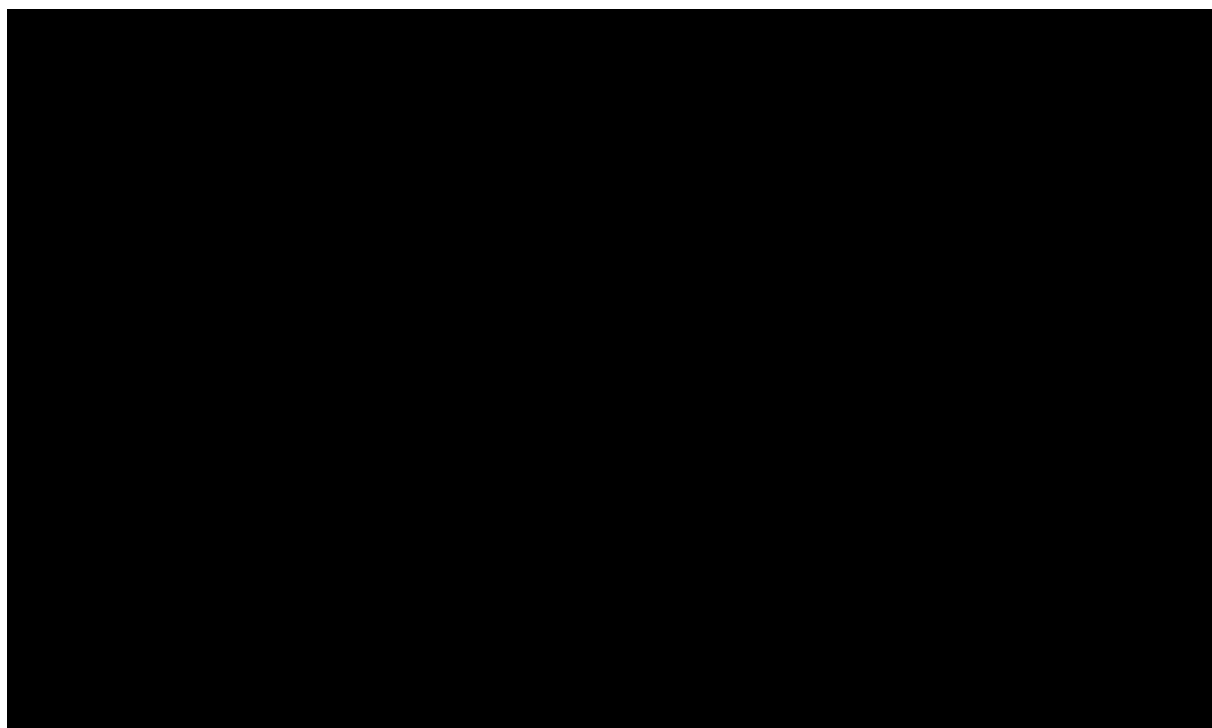
A: PPL stated in Discovery that the “Tomhicken Switchyard allows for multiple future new transmission electrical paths outside of the current proposed Phase 2 transmission line to be interconnected at Tomhicken. It also allows for PPL Electric to provide new customer interconnections directly from transmission or indirectly for future load growth via new distribution facilities.”¹⁷⁹



Q: What is your recommendation?

¹⁷⁹ PPL Response to OCA III-8 (e) Supplemental.

1 A:



11 **VII. Phase 1 and Phase 2 Interdependency**

12 **VII.a. Establishing the two-phase structure**

13 **Q: What is Phase 1 of the Tomhicken Switchyard and what does it include?**

14 **A:** Phase 1 is the subject of this proceeding at Docket No. A-2025-3059443. As described in
 15 the Tomhicken Switchyard Description section above, it consists of approximately 1.1
 16 miles of new Tap Lines, the new Tomhicken 230 kV Switchyard, and 0.1-mile
 17 Connecting Lines to the customer-owned substation, all located in Hazle Township,
 18 Luzerne County, Pennsylvania.

¹⁸⁰ “PPL Electric did not perform a forward-looking quantitative analysis which is consistent with FERC policy.”
 PPL Response to OCA III-4(a).

1 The Tomhicken 230 kV Switchyard itself is a breaker-and-a-half¹⁸¹ configured
 2 switchyard with five bays.¹⁸² The total estimated cost of Phase 1 is \$59.9 million, with
 3 \$21.5 million allocated to the customer.¹⁸³ PPL's direct testimony states the ratepayer
 4 allocation is approximately \$38.4 million.¹⁸⁴ However, PPL confirmed in discovery that
 5 the primary ratepayer-allocated asset, **HIGHLY CONFIDENTIAL STARTS** [REDACTED]
 6 [REDACTED]
 7 [REDACTED]
 8 [REDACTED] [REDACTED]
 9 [REDACTED]
 10 [REDACTED] **HIGHLY**
 11 **CONFIDENTIAL ENDS** The Commission should require PPL to confirm the current
 12 authoritative Phase 1 ratepayer allocation before approving any cost recovery.

14 **Q: What is Phase 2 of the Tomhicken Switchyard and what does it include?**

15 **A:**Phase 2 is a separate but related project filed at Docket No. A-2026-3061547, currently
 16 pending before this Commission.

17 In Phase 2, PPL is seeking Commission's approval to:

18 “(1) Bifurcate and Rebuild 4.4 Miles of the Existing Sunbury-Susquehanna #1 230
 19 kV Transmission Line;

¹⁸¹ Page 8, LON.

¹⁸² Responsibility of Asset Matrix for Breaker and a Half (BAAH) Example 1, Page 3 of 8, OCA I-6 Attachment 1.

¹⁸³ Lines 12-14, Page 7, PPL Statement No. 1.

¹⁸⁴ *Id.*

¹⁸⁵ PPL Response to **HIGHLY CONFIDENTIAL** OCA XIII-1(a).

(2) Construct 0.9 Miles of New Transmission Line Tap for Future 230 kV Double-Circuit Operation;

(3) Raise Approximately 0.5 Miles of the Sunbury-Susquehanna 500 kV Transmission Line; and

(4) Construct 11.2 Miles of New Double-Circuit 230 kV Transmission Line for Future Double-Circuit 500 kV Capacity, Located in Black Creek, Hazle, Hollenback, Nescopeck, and Sugarloaf Townships in Luzerne County, Pennsylvania.”¹⁸⁶

Phase 2 is needed because, as PPL acknowledged in the LON, “[a]s the Customer’s load continues to ramp up, additional improvements to the 230 kV network in this area will be required to continue to provide reliable service to the area”¹⁸⁷ and Phase 2 is required “to prevent the thermal overload of the Susquehanna-Tomhicken #1 & #2 230 kV and Tomhicken-Harwood #1 & #2 230 kV lines”¹⁸⁸ constructed in Phase 1. In other words, the transmission lines built in Phase 1 will themselves become thermally overloaded as the customer’s load grows — making Phase 2 a direct consequence of Phase 1.

Q: What is the total cost of Phase 2, and what is the cumulative ratepayer exposure across both phases?

A: The total estimated cost of Phase 2 covered by the application at Docket No. A-2026-3061547 is approximately **HIGHLY CONFIDENTIAL STARTS** [REDACTED]

¹⁸⁶ Application for Transmission Line - PPL Electric, available at <https://www.puc.pa.gov/pcdocs/1921888.pdf> (Last Accessed on May 27, 2026).

¹⁸⁷ Page 5, LON.

¹⁸⁸ Page I-9, Attachment I – Necessity Statement.

1 **HIGHLY CONFIDENTIAL ENDS** — reduced from the \$118.5 million stated in the
 2 original application.¹⁸⁹ PPL stated that "the cost for the Project will be allocated to PPL
 3 Electric customers"¹⁹⁰ — meaning ratepayers are expected to bear the full Phase 2 cost
 4 with no customer contribution. However, PPL confirmed in discovery that the **HIGHLY**
 5 **CONFIDENTIAL STARTS** [REDACTED]
 6 [REDACTED]
 7 [REDACTED]
 8 [REDACTED] [REDACTED]
 9 [REDACTED]
 10 [REDACTED] **HIGHLY CONFIDENTIAL**
 11 **ENDS** The Commission should require PPL to identify that proceeding before approving
 12 any cost allocation in this docket.

13 The combined ratepayer exposure across all identified components is therefore:

- 14 • Phase 1 ratepayer allocation: **HIGHLY CONFIDENTIAL STARTS** [REDACTED]
 15 [REDACTED] **HIGHLY CONFIDENTIAL ENDS** and \$38.4 million¹⁹² Phase 2 ratepayer
 16 allocation **HIGHLY CONFIDENTIAL STARTS** [REDACTED]
 17 **HIGHLY CONFIDENTIAL ENDS**
- 18 • Item 7 **HIGHLY CONFIDENTIAL STARTS** [REDACTED]
 19 [REDACTED] **HIGHLY CONFIDENTIAL ENDS**

¹⁸⁹ PPL Response to **HIGHLY CONFIDENTIAL** OCA XIII-1(b).

¹⁹⁰ Page ES-3, Phase 2 application.

¹⁹¹ PPL Response to **HIGHLY CONFIDENTIAL** OCA XIII-1(b).

¹⁹² PPL Response to **HIGHLY CONFIDENTIAL** OCA XIII-1(a); Lines 12-14, Page 7, PPL Statement No. 1.

¹⁹³ PPL Response to **HIGHLY CONFIDENTIAL** OCA XIII-1(b).

¹⁹⁴ OCA I-6 Attachment 2 **HIGHLY CONFIDENTIAL**

- Total ratepayer exposure: **HIGHLY CONFIDENTIAL STARTS** [REDACTED]
[REDACTED] **HIGHLY CONFIDENTIAL**
ENDS

This figure is significantly greater than the \$156.9 million this testimony originally estimated based on PPL's application figures. The progression from 36% customer responsibility in Phase 1 to 0% in Phase 2 — for a project whose Phase 2 is a direct consequence of Phase 1 customer load growth — is not supported by any quantitative benefit analysis in either proceeding. Furthermore, **HIGHLY CONFIDENTIAL STARTS** [REDACTED]
[REDACTED] **HIGHLY CONFIDENTIAL ENDS** in which this Commission will have the opportunity to review the cost allocation methodology.

Q: What is reactive compensation and did PPL evaluate it as a lower-cost alternative to the Phase 2 transmission solution?

A: Reactive compensation refers to electrical devices — such as capacitor banks, STATCOMs (Static Synchronous Compensators), or Static VAR Compensators — that supply or absorb reactive power to maintain voltage levels within acceptable limits on the transmission system. Unlike active power (measured in megawatts), reactive power (measured in megavars, or MVAR) does not perform useful work but is essential for maintaining voltage stability. As NERC has recognized, reactive power should be supplied locally near the point of deficiency¹⁹⁵, and in some situations static shunt

¹⁹⁵ “Reactive power should be supplied locally because of its dependence on voltage difference. Unlike real power, reactive power cannot be transferred long distances across the BPS. It is usually necessary to site reactive power

1 compensation is adequate to alleviate low-voltage conditions¹⁹⁶. When voltage violations
 2 occur — as PPL identified at the Tomhicken Switchyard and Harwood Substation under
 3 P7 contingency conditions — reactive compensation devices can often address those
 4 violations at significantly lower cost than constructing new transmission lines.

5 No. PPL confirmed that P7 planning events permit non-consequential load loss as
 6 an acceptable system response under its own FERC 715 Criteria.¹⁹⁷ PPL also confirmed
 7 that the P7 voltage violations are voltage change violations — 9.17% at Tomhicken and
 8 8.78% at Harwood, both exceeding PPL's 8% change limit — while the voltage
 9 magnitude at both buses (0.925 pu and 0.927 pu) approaches without exceeding the 0.92
 10 pu limit.¹⁹⁸

11 Reactive compensation already exists in the project area — 125 MVAR at
 12 Tomhicken and 80 MVAR at Harwood — and PPL confirmed that "[a]dditional
 13 capacitance would increase the amount of load that could be added into the area before
 14 the P7 Tower contingency caused Voltage Violations."¹⁹⁹ PPL did not provide any cost
 15 comparison between additional reactive compensation and Phase 2's \$118.5 million
 16 transmission solution.

17 Instead, PPL stated that a Remedial Action Scheme for load shedding would
 18 constitute only a "temporary measure until a permanent transmission facility upgrade can

devices very near to or at the location that is deficient." Reliability Guideline Reactive Power Planning, December 2016. <https://www.nerc.com/globalassets/who-we-are/standing-committees/rstc/sams/reliability-guideline---reactive-power-planning.pdf> (Last Accessed on July 6, 2026).

¹⁹⁶ "The type of resource selected to mitigate any reactive power deficiency is driven by the system characteristics. In some situations, static shunt compensation is adequate to alleviate low-voltage conditions. In other situations, dynamic reactive support is necessary to ensure reliable pre- and post-contingency voltage levels and a robust response in voltage following a disturbance." *Id.*

¹⁹⁷ PPL Response to OCA VI-4(a).

¹⁹⁸ PPL Response to OCA VI-4(b).

¹⁹⁹ PPL Response to OCA VI-4(e).

be implemented"²⁰⁰ — applying a standard stricter than NERC TPL-001-5.1 requires for P7 events, which expressly permits non-consequential load loss as a compliant system response, which PPL agreed is acceptable under its own FERC 715 Criteria²⁰¹.

The need for Phase 2 as a \$118.5 million transmission solution — rather than a potential lower-cost reactive compensation alternative — has not been demonstrated by cost comparison in this record.

Q: Were Phase 1 and Phase 2 designed concurrently?

A: PPL did not explicitly state that Phase 1 and Phase 2 were designed concurrently. However, the record establishes that Phase 1's physical design was determined by Phase 2 requirements — which is functionally equivalent to concurrent design.

Four admissions from PPL's own discovery responses establish this:

First, PPL confirmed that the splitting of the Susquehanna-Harwood lines "was designed to allow the future Phase 2 lines to terminate into the Tomhicken Switchyard and Harwood Substation without requiring line crossings"²⁰² and that "the Tomhicken 230 kV Switchyard will have a line termination point for the Phase 2 scope."²⁰³ The Phase 1 line routing was determined by Phase 2 termination requirements.

²⁰⁰ PPL Response to OCA VI-4(d).

²⁰¹ "Yes, PPL Electric's consequential and non-consequential load loss limits are defined in Table 4.5-1 of PPL Electric FERC 715 Criteria." PPL Response to OCA VI-4(a).

²⁰² PPL Response to OCA I-10(c).

²⁰³ *Id.*

1 **Second**, PPL confirmed a critical design distinction — while the system network
 2 upgrades are based on the Phase 1 DNH load level²⁰⁴, the Tomhicken Switchyard itself
 3 was designed to accommodate the customer's ultimate requested load²⁰⁵, not just the
 4 Phase 1 DNH load level. This means the switchyard's physical configuration — including
 5 its BAAH design, five bays, and line termination points — was sized beyond what Phase
 6 1 alone requires. The Tomhicken switchyard itself was sized to scale Phase 2 even though
 7 Phase 2, filed at Docket No. A-2026-3061547, has not yet been scheduled for hearing by
 8 this Commission.

9 **Third**, PPL justified its BAAH configuration over a ring bus by citing nine line
 10 terminations — a number that includes Phase 2 lines.²⁰⁶ The switchyard's configuration
 11 was determined by Phase 2 line count at the time of Phase 1 design.

12 **Fourth**, PPL's own cost allocation document labels the **HIGHLY**
 13 **CONFIDENTIAL STARTS** [REDACTED]
 14 [REDACTED]
 15 [REDACTED] **HIGHLY CONFIDENTIAL ENDS** However, when asked to
 16 reconcile this characterization with the ratepayer allocation figure in direct testimony,
 17 PPL stated that **HIGHLY CONFIDENTIAL STARTS** [REDACTED]
 18 [REDACTED] **HIGHLY CONFIDENTIAL ENDS** These two PPL responses are irreconcilable

²⁰⁴ “The system network upgrades included in the supplemental project are based on the DNH Load Level.” PPL Response to OCA V-1(c).

²⁰⁵ “The substation was designed to accommodate the customer’s ultimate requested load.” PPL Response to OCA V-1(c).

²⁰⁶ “The proposed Tomhicken Switchyard is to have nine lines connected as part of Phase 1 and Phase 2.” PPL Response to OCA V-4(c).

²⁰⁷ PPL Response to **HIGHLY CONFIDENTIAL** OCA IX-1.

²⁰⁸ PPL Response to **HIGHLY CONFIDENTIAL** OCA XIII-1(a).

1 — and the inconsistency itself confirms that PPL has not maintained a clear, consistent
2 account of which costs in Phase 1 are attributable to Phase 2-driven design requirements.

3 Taken together, these four admissions demonstrate that Phase 1 was designed with
4 Phase 2 requirements embedded in its physical configuration from the outset —
5 regardless of whether the two phases were formally designated as concurrent.
6

7 **Q: What is the current regulatory status of Phase 2?**

8 **A:** Phase 2 is filed as a separate Full Siting Application at Docket No. A-2026-3061547,
9 currently pending before this Commission. As of the date of this testimony, no hearing
10 has been scheduled in that proceeding. Phase 2 has not been reviewed on the merits, no
11 evidentiary record has been developed, and no Commission decision on Phase 2's need,
12 design, cost, or cost allocation has been issued.

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²⁰⁹ Page 11, LON.

²¹⁰ PPL Response to OCA V-5(b).

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2 **Q: Has the Pennsylvania PUC approved Phase 2?**

3 **A:** No.

4

5 **Q: Is Phase 2 approval guaranteed?**

6 **A:** No.

7

8 **VII.b. Establishing Phase 1's design dependence on Phase 2**

9 **Q: Was the location of the Tomhicken Switchyard determined by system reliability**
 10 **needs independent of this customer's interconnection request, or was it determined**
 11 **by the customer's development location and site layout?**

12 **A:** PPL confirmed in discovery that the Tomhicken Switchyard is located on the customer's
 13 property, and that this location was chosen because it decreases line distance and new
 14 right-of-way requirements and minimizes the time and cost for the customer to
 15 interconnect.²¹¹ This is a customer-driven location decision. PPL also claims the
 16 switchyard provides sectionalizing and network upgrade benefits²¹², but those benefits
 17 are a consequence of placing the switchyard at the customer's chosen site — they did not
 18 independently determine the location. No evidence in the record suggests the Tomhicken

²¹¹ “The location of the Tomhicken 230kV Switchyard was determined by the Customer’s development location and site layout.” PPL Response to OCA I-10(c). See also “By locating the Switchyard on the Customer property’s, it decreases line distance and new right-of-way required, and minimizes the time and cost for a customer to interconnect.” PPL Response to OCA III-8(a) Supplemental.

²¹² “The Tomhicken Switchyard provides sectionalizing and network upgrades benefits outside of the single Customer interconnection request.” PPL Response to OCA III-8(a) Supplemental.

location was identified through a system-needs analysis independent of this customer's interconnection request. The switchyard exists at this location because the customer is here — not because transmission system reliability independently required a new switching facility at this specific site.

Q: Was the splitting of the Susquehanna-Harwood #1 and #2 230 kV Transmission Lines required to serve the customer's initial load request, or was it designed to accommodate Phase 2 line terminations?

A: PPL confirmed in discovery that the splitting of the Susquehanna-Harwood lines was designed to allow future Phase 2 lines to terminate into the Tomhicken Switchyard without requiring line crossings.²¹³ The split was not driven by Phase 1 necessity — it was a Phase 2 design decision embedded in the Phase 1 project. PPL further confirmed that the substation was designed to accommodate the customer's ultimate requested load, not the DNH case year load level that governs Phase 1 network upgrades.²¹⁴

When asked to quantify the cost savings if the S-H line split had not been required to accommodate Phase 2 terminations, PPL stated only that the cost estimate would be the same as the Phase 1-only switchyard design — approximately \$33.97 million.²¹⁵ PPL did not separately identify or quantify the line split cost, despite it being a physically distinct design choice affecting 1.1 miles of new transmission line routing. The Commission cannot fully evaluate the cost impact of the Phase 2-driven line split on

²¹³ “The splitting of the Susquehanna-Harwood #1 & #2 230kV Transmission Lines was designed to allow the future Phase 2 lines to terminate into the Tomhicken Switchyard and Harwood Substation without requiring line crossings.” PPL Response to OCA I-10(c).

²¹⁴ PPL Response to OCA V-1(b), and (c).

²¹⁵ PPL Response to OCA XI-6(b).

1 ratepayers because PPL has not disaggregated that cost from the broader switchyard
 2 figure.

3
 4 **Q: If Phase 2 is never built, would the splitting of the Susquehanna-Harwood lines still**
 5 **have been necessary?**

6 **A:** No. PPL confirmed in discovery that the S-H line split is not required if the customer is
 7 served from an alternative configuration.²¹⁶ This admission establishes that the line split
 8 — and the entire physical routing of the new Susquehanna-Tomhicken and Tomhicken-
 9 Harwood lines — was not independently required to serve this customer under Phase 1
 10 alone. It was a design choice made to accommodate Phase 2 line terminations. If Phase 2
 11 is never built, ratepayers will have funded a line split configuration whose primary
 12 purpose — enabling Phase 2 terminations without line crossings — is never realized.

13
 14 **Q: Does the Tomhicken Switchyard have physical design features — including bay**
 15 **count, bus configuration, and line termination points — that serve no function**
 16 **under Phase 1 alone and exist solely to accommodate Phase 2?**

17 **A:** PPL confirmed in discovery that the Tomhicken Switchyard was designed to
 18 accommodate the customer's ultimate requested load rather than the Phase 1 DNH load
 19 level²¹⁷, and that nine lines will terminate at Tomhicken as part of Phase 1 and Phase 2
 20 combined.²¹⁸ The line split configuration was designed to allow Phase 2 lines to

²¹⁶ “No, but if the Customer was served directly from the Nescopeck Switchyard the Project would need to be re-evaluated.” PPL Response to OCA III-8(d).

²¹⁷ PPL Response to OCA V-1(b) and (c).

²¹⁸ PPL Response to OCA V-4(c).

1 terminate without line crossings.²¹⁹ These admissions establish that Phase 2-driven design
2 features are embedded in the Phase 1 switchyard.

3 PPL's cost allocation document confirms this, **HIGHLY CONFIDENTIAL**
4 **STARTS** [REDACTED]
5 [REDACTED]
6 [REDACTED] **HIGHLY CONFIDENTIAL ENDS** However, PPL did not separately identify
7 which **HIGHLY CONFIDENTIAL STARTS** [REDACTED]
8 [REDACTED] **HIGHLY CONFIDENTIAL ENDS** are Phase 2-specific
9 —bundling the Phase 2-driven features into a single combined asset without itemization.
10 The inability to separate Phase 2-specific physical features and their associated costs
11 from Phase 1 infrastructure is a direct consequence of PPL designing Phase 1 as a
12 combined Phase 1 and Phase 2 asset from the outset.

13 When asked in this proceeding to identify specific Phase 1 components that were
14 sized or configured to accommodate Phase 2 requirements, PPL stated that "no
15 components in Phase 1 would have been sized differently to accommodate Phase 2
16 electrical ratings" — but simultaneously confirmed that the Tomhicken Switchyard is
17 "space-proved for the additional equipment to connect the new line upgrades in Phase
18 2."²²¹ PPL further confirmed that the electrical bus length could potentially be reduced by
19 one bay if Phase 2 were not contemplated, saving approximately \$120,000 — but stated
20 this reduction would not conform to PPL's standard configuration.²²² The term "space-

²¹⁹ PPL Response to OCA I-10(c).

²²⁰ PPL Response to **HIGHLY CONFIDENTIAL** OCA IX-1.

²²¹ PPL Response to OCA XI-5(a).

²²² PPL Response to OCA XI-5(b).

proved" is an engineering admission that Phase 1's physical layout was deliberately configured to accommodate Phase 2 equipment without requiring reconstruction. This confirms the concurrent design argument: PPL did not merely design Phase 1 to meet Phase 1 needs and happen to leave room for Phase 2 — it affirmatively designed Phase 1's physical layout around Phase 2 requirements.

Q: What is the cost attributable to those Phase 2-ready design features that is currently allocated to ratepayers under Phase 1?

A: PPL's cost allocation document confirms that the primary ratepayer-allocated asset,

HIGHLY CONFIDENTIAL STARTS [REDACTED]

HIGHLY CONFIDENTIAL ENDS However, when asked directly to reconcile the

HIGHLY CONFIDENTIAL STARTS [REDACTED]

HIGHLY CONFIDENTIAL ENDS PPL has not explained this inconsistency.

PPL further confirmed that **HIGHLY CONFIDENTIAL STARTS** [REDACTED]

²²³ PPL Response to **HIGHLY CONFIDENTIAL** OCA IX-1.

²²⁴ PPL Response to **HIGHLY CONFIDENTIAL** OCA XIII-1(a).

1 [REDACTED] [REDACTED] [REDACTED] [REDACTED]

2 [REDACTED]

3 [REDACTED]

4 [REDACTED] HIGHLY

5 CONFIDENTIAL ENDS

6 PPL confirmed that under a hypothetical Phase 1-only design — with the
 7 substation sized for the DNH load level rather than ultimate load, and without Phase 2
 8 line termination accommodation — the estimated switchyard cost would be
 9 approximately \$33.97 million.²²⁶ Compared to the current HIGHLY CONFIDENTIAL
 10 STARTS [REDACTED] HIGHLY CONFIDENTIAL ENDS million, this represents a difference
 11 of approximately HIGHLY CONFIDENTIAL STARTS [REDACTED] HIGHLY
 12 CONFIDENTIAL ENDS million attributable to Phase 2-driven design features within the
 13 switchyard itself.

14 PPL further stated that eliminating the Susquehanna-Harwood line split
 15 requirement would cost approximately \$33.97 million.²²⁷ PPL did not separately identify
 16 or quantify the cost of the line split configuration itself, despite it being a physically
 17 distinct design choice affecting 1.1 miles of new transmission line routing. The \$1.56
 18 million figure therefore represents PPL's own narrow quantification of Phase 2-driven
 19 switchyard costs — it does not capture Phase 2-driven costs embedded in the line
 20 segment routing, which PPL failed to disaggregate.

²²⁵ PPL Response to HIGHLY CONFIDENTIAL OCA XIII-1(a).

²²⁶ PPL Response to OCA XI-6(a).

²²⁷ PPL Response to OCA XI-6(b).

PPL's responses are also internally inconsistent on this point. PPL's response to OCA XI-5 identified only a \$120,000 bus-length reduction as the cost attributable to Phase 2 accommodation within the switchyard, while PPL's response to OCA XI-6 implies a \$1.56 million difference between the current design and a Phase 1-only design. PPL has not explained the approximately \$1.44 million gap between these two figures.²²⁸ This internal inconsistency in PPL's own discovery responses further confirms that PPL has not conducted the rigorous cost segregation analysis this Commission would need to evaluate whether the \$38.4 million ratepayer allocation is appropriately calibrated to the benefits ratepayers actually receive.

Taken together, PPL's discovery responses reveal three unresolved inconsistencies: whether Item 5 spans both phases or Phase 1 only; whether the authoritative ratepayer allocation is \$38.4 million or \$35.53 million; and whether the Phase 2-driven cost premium within the switchyard is \$120,000 or \$1.56 million. The Commission should require PPL to provide a single, consistent, fully reconciled cost accounting before approving any ratepayer allocation.

VII.c. Establishing the reliability benefit dependency

Q: What network reliability benefits does PPL attribute to the Tomhicken Switchyard for transmission ratepayers?

A: PPL attributes the following network reliability benefits to the Tomhicken Switchyard for transmission ratepayers:

²²⁸ PPL Response to OCA XI-5(b); PPL Response to OCA XI-6(a).

1 PPL stated that the switchyard "will increase system reliability by adding
 2 additional 230 kV paths from the Susquehanna area to the Hazleton area,"²²⁹ will
 3 "increase capacity of the transmission system,"²³⁰ will provide "additional system
 4 resiliency and greater operational flexibility to take outages,"²³¹ and will allow
 5 "additional 230 kV transmission lines to supply other customers or add system
 6 capacity."²³²

7 PPL's Mr. Lookup further testified that based on the 2025 RTEP summer case for
 8 2030, the Tomhicken Switchyard will have approximately 700 MVA of network flow
 9 through the switchyard under normal conditions, and up to 1,200 MVA of network flow
 10 under contingency conditions.²³³

11 The full list of benefit categories PPL invokes to justify ratepayer allocation is set
 12 forth in the Network Benefits section above.

13
 14 **Q: Are those network reliability benefits fully realized under Phase 1 alone, or do they**
 15 **depend on Phase 2?**

16 **A:** The network reliability benefits PPL attributes to the Tomhicken Switchyard are not fully
 17 realized under Phase 1 alone, they depend on Phase 2 being constructed. PPL's own
 18 discovery responses establish this.

²²⁹ PPL Response to OCA V-5(b).

²³⁰ *Id.*

²³¹ *Id.*

²³² *Id.*

²³³ PPL Response to OCA III-4(c).

1 **First** and most directly, PPL stated that "[t]he Tomhicken 230 kV Switchyard and
 2 additional Phase 2 transmission lines will increase system reliability by adding additional
 3 230 kV paths from the Susquehanna area to the Hazleton area."²³⁴ The conjunction is
 4 telling — PPL linked the reliability benefit explicitly to both the switchyard and Phase 2
 5 transmission lines together. The additional 230 kV paths PPL describes do not exist under
 6 Phase 1 alone. The Tomhicken Switchyard under Phase 1 is connected to the same
 7 Susquehanna-Harwood corridor it replaces — split into two segments but not adding new
 8 paths to the network until Phase 2 lines are constructed.

9 **Second**, PPL confirmed that the Tomhicken Switchyard "allows for multiple
 10 future new transmission electrical paths outside of the current proposed Phase 2
 11 transmission line to be interconnected at Tomhicken"²³⁵ and "allows for PPL Electric to
 12 provide new customer interconnections directly from transmission or indirectly for future
 13 load growth via new distribution facilities."²³⁶ Every system function PPL identifies is
 14 forward-looking and contingent on future construction — none is realized under Phase 1
 15 alone.

16 **Third**, whether the 700 MVA²³⁷ network flow PPL's Mr. Lookup cited as a
 17 ratepayer benefit is attributable to Phase 1 infrastructure alone or assumes Phase 2 is in
 18 service in the 2030 RTEP case is examined in the following question. That answer is
 19 critical to evaluating whether PPL's primary quantitative reliability benefit claim survives
 20 Phase 1 scrutiny.

²³⁴ PPL Response to OCA V-5(b).

²³⁵ PPL Response to OCA III-8(e) Supplemental.

²³⁶ *Id.*

²³⁷ PPL Response to OCA III-4(c).

1 **Fourth**, PPL's Mr. Lookup identified a 400 MW load threshold at which the new
 2 Susquehanna-Tomhicken lines become overloaded under P1/P4 contingency
 3 conditions.²³⁸ When asked to explain how this 400 MW threshold compares to the P1
 4 overload threshold on the existing Susquehanna-Harwood lines and to identify the
 5 specific engineering differences between the two line segments accounting for any
 6 difference, PPL did not provide that comparison. Instead PPL responded that
 7 interconnecting at the existing Harwood Substation rather than at the proposed
 8 Tomhicken location would allow approximately 70 MW more load before summer
 9 emergency ratings are exceeded, due to three additional miles of line impedance at
 10 Harwood reducing power flow from Susquehanna.²³⁹ PPL provided no engineering
 11 explanation for why the new S-T lines have a 400 MW P1 normal rating threshold or how
 12 that threshold relates to the existing S-H line configuration. The absence of this
 13 explanation means the record contains no basis for evaluating whether the 400 MW Phase
 14 2 trigger is a consequence of Phase 1 design choices or an independent system reliability
 15 constraint — a distinction directly relevant to whether Phase 2 costs should ultimately be
 16 attributed to this customer's load growth or to an independent system need.

17
 18 **Q: Was Phase 2 a foreseeable, near-certain consequence of Phase 1's design, or a**
 19 **speculative future contingency?**

²³⁸ “Specifically, the Susquehanna-Tomhicken #1 and #2 230 kV Transmission Lines become overloaded when the load increases by approximately 400 MW in the Hazleton area. The loss of one of the Susquehanna-Tomhicken 230 kV lines in a single contingency (P1) or multiple contingency with a fault plus stuck breaker (P4) category overloads the remaining in-service line.” Lines 14-18, Page 4, PPL Statement No.1.

²³⁹ “Interconnecting the load at the Harwood bus results in the system being able to serve an additional ~70MW before the summer emergency ratings of the Susquehanna-Harwood #1 & #2 Transmission Lines are exceeded.” PPL Response to OCA VI-1(d).

1 A: It was foreseeable and near-certain — not speculative. PPL confirmed that the
 2 Susquehanna-Tomhicken lines are projected to first exceed their normal thermal rating
 3 under P1 contingency in **HIGHLY CONFIDENTIAL STARTS** [REDACTED]
 4 [REDACTED] [REDACTED]
 5 [REDACTED] **HIGHLY CONFIDENTIAL ENDS** That leaves only 12 to 15
 6 months between Phase 1's commercial operation and the first overload. **HIGHLY**
 7 **CONFIDENTIAL STARTS** [REDACTED]
 8 [REDACTED]
 9 [REDACTED] **HIGHLY**
 10 **CONFIDENTIAL ENDS** This timing holds regardless of which load ramp figure is used,
 11 since **HIGHLY CONFIDENTIAL STARTS** [REDACTED]
 12 [REDACTED] **HIGHLY CONFIDENTIAL ENDS** —
 13 not 2033 as PPL's direct testimony states.

14 More importantly, this was not a contingency PPL discovered after Phase 1 was
 15 already built — it was known at the time Phase 1 was designed. PPL confirmed that
 16 **HIGHLY CONFIDENTIAL STARTS** [REDACTED]
 17 [REDACTED] **HIGHLY CONFIDENTIAL ENDS** an explicit
 18 admission that Phase 2 exists to serve this customer, not to provide independent benefits
 19 to existing ratepayers. PPL confirmed the **HIGHLY CONFIDENTIAL STARTS** [REDACTED]
 20 [REDACTED]

²⁴⁰ PPL Response to **HIGHLY CONFIDENTIAL** OCA VII-1(d).

²⁴¹ PPL Response to **HIGHLY CONFIDENTIAL** OCA VII-2(a)(c).

²⁴² PPL Response to **HIGHLY CONFIDENTIAL** OCA VII-1(a).

²⁴³ PPL Response to **HIGHLY CONFIDENTIAL** OCA VII-2(d).

²⁴⁴ PPL Response to **HIGHLY CONFIDENTIAL** OCA VII-2(d).

1 [REDACTED] **HIGHLY CONFIDENTIAL ENDS** In other words, the
 2 very load level PPL used to design Phase 1 already exceeded the thresholds that trigger
 3 Phase 2. PPL also stated that Phase 2 "resolves the thermal overloads on the
 4 Susquehanna-Tomhicken #1 & #2 230 kV Transmission Lines as well as voltage
 5 violations at the Tomhicken Switchyard and Harwood Substation"²⁴⁵ and "allows for
 6 planned and unplanned outages, and to serve additional load growth in the area."²⁴⁶ Every
 7 function PPL identifies for Phase 2 exists solely because of this customer's load.
 8

9 **Q: If Phase 2 is not in service, what is the projected network flow through the**
 10 **Tomhicken Switchyard attributable to loads and sources other than this customer?**

11 **A:** PPL confirmed that the customer's load is not included in the 700 MVA figure — the 700
 12 MVA represents flow passing southward through the Tomhicken Switchyard toward the
 13 Harwood Substation from other network sources.²⁴⁷ Without Phase 2 in service but with
 14 Phase 1 built, PPL confirmed that approximately 1,400 MVA flows through the
 15 Tomhicken Switchyard under normal conditions — representing the existing
 16 Susquehanna-Harwood corridor load rerouted through the new switching point created
 17 for this customer's interconnection.²⁴⁸

²⁴⁵ PPL Response to **HIGHLY CONFIDENTIAL** OCA VII-2(d).

²⁴⁶ *Id.*

²⁴⁷ "The 700 MVA of flow was the amount of load passing through the Tomhicken 230 kV Switchyard south towards the Harwood 230-69kV Substation. The customer's load was not included in the 700 MVA. As the 230 kV system is a network, the flow through the substation will vary with generation and system conditions." PPL Response to OCA VIII-2(d).

²⁴⁸ "Without the Phase 2 Nescopeck-Tomhicken and Nescopeck-Harwood 230 kV Transmission Lines and the customer's load at the Tomhicken Switchyard, the Tomhicken 230 kV Switchyard will have approximately 1,400 MVA of network flow through the switchyard under normal conditions. Under contingency conditions, there could be up to 1,500 MVA of network flow through the Tomhicken 230 kV switchyard." PPL Response to OCA VIII-2(a).

1 This 1,400 MVA does not represent new capacity or new benefits to ratepayers —
 2 it is the same network flow that previously traveled directly on the Susquehanna-
 3 Harwood lines, now routed through a new switchyard that exists solely because of this
 4 customer's interconnection request. With Phase 2 in service but without the customer, the
 5 flow through Tomhicken drops to 1,100 MVA under normal conditions²⁴⁹ — because
 6 Phase 2 creates alternative paths that divert some flow away from the Tomhicken routing.

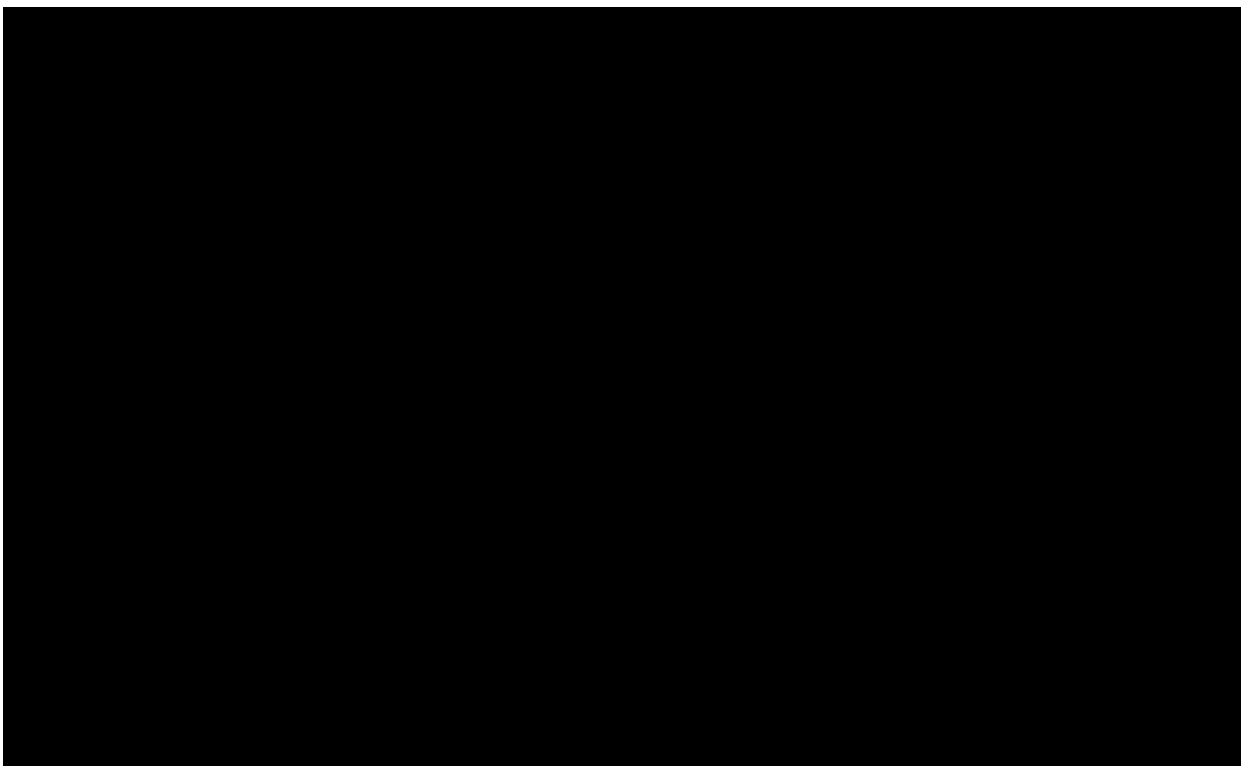
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 8 **Q: What system function does the Tomhicken Switchyard serve for transmission**
 9 **ratepayers if Phase 2 is never constructed?**

10 **A:**

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²⁴⁹ “With the Phase 2 Nescopeck-Tomhicken and Nescopeck-Harwood 230 kV Transmission Lines and without the customer’s load at the Tomhicken Switchyard, the Tomhicken 230 kV Switchyard will have approximately 1,100 MVA of network flow through the switchyard under normal conditions. Under contingency conditions, there could be a loss of flow through the Tomhicken 230 kV Switchyard.” PPL Response to OCA VIII-2(c).

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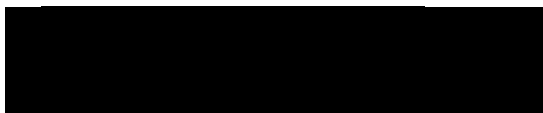
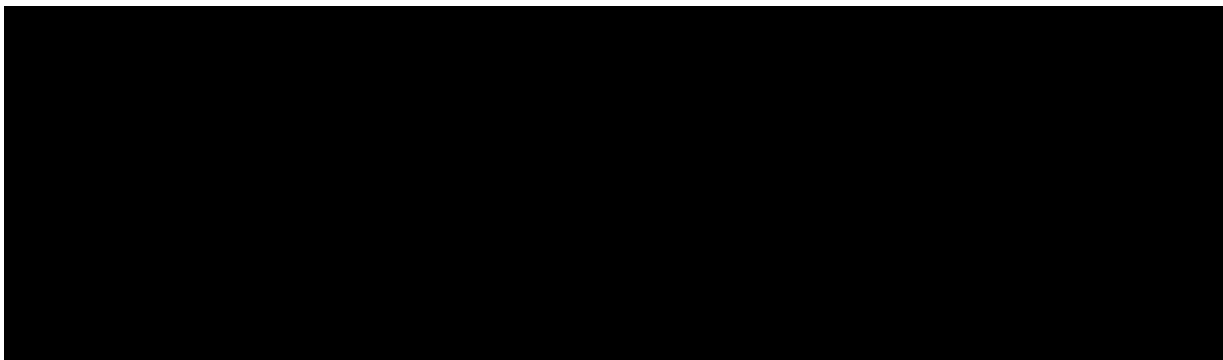
VII.d. Establishing the cost allocation consequence

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Q: Under PPL's current proposal, ratepayers are being asked to pay approximately \$38.4 million for Phase 1. What is the basis for that allocation?

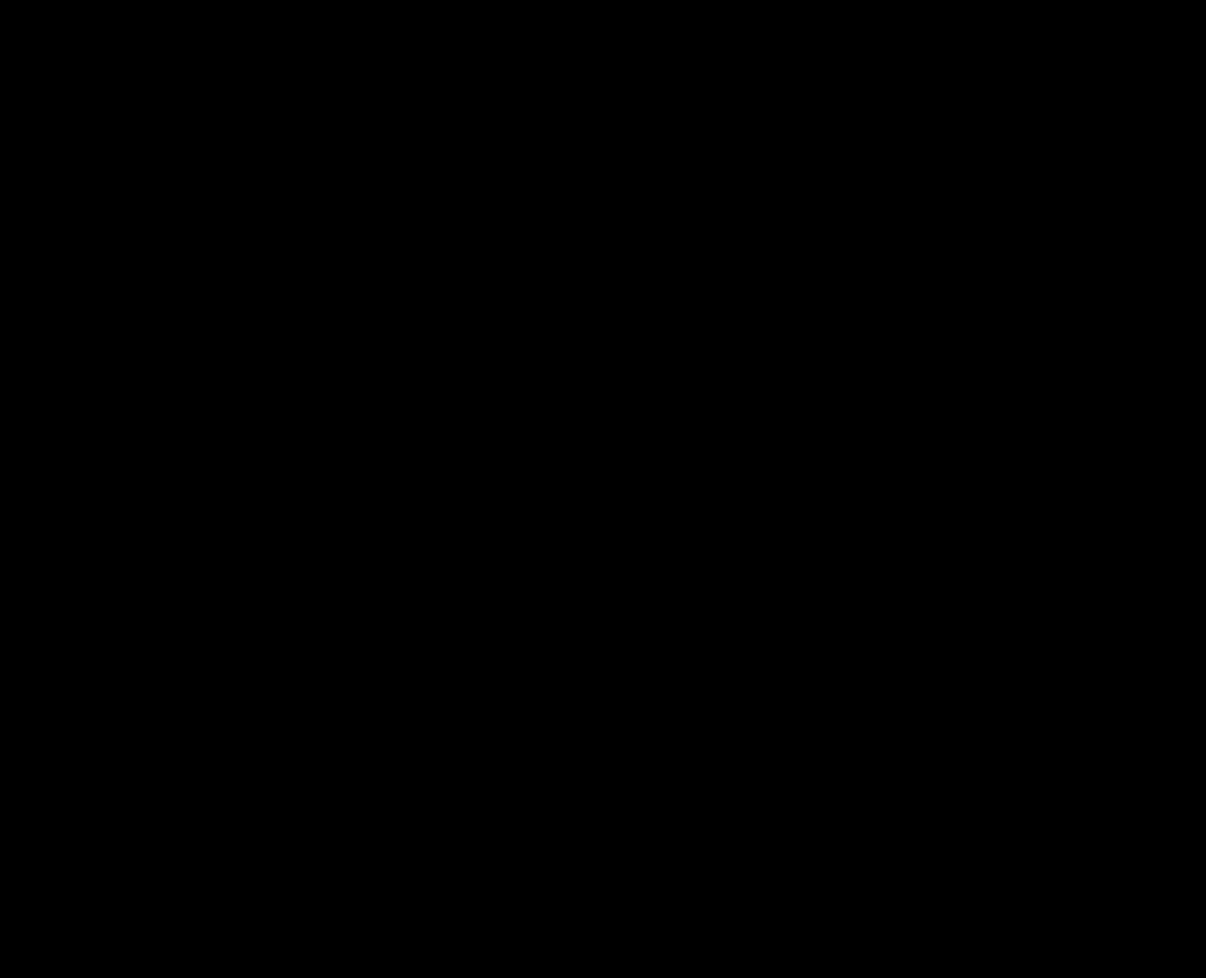
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A:



1 **Q:** Is the ratepayer benefit that justifies the \$38.4M allocation present today, or does it
2 depend on future events — specifically Phase 2 construction — that have not yet
3 been approved?

4 **A:**



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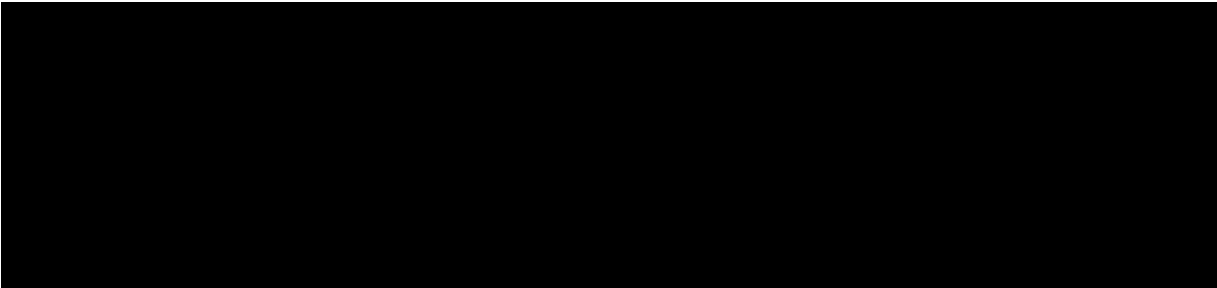
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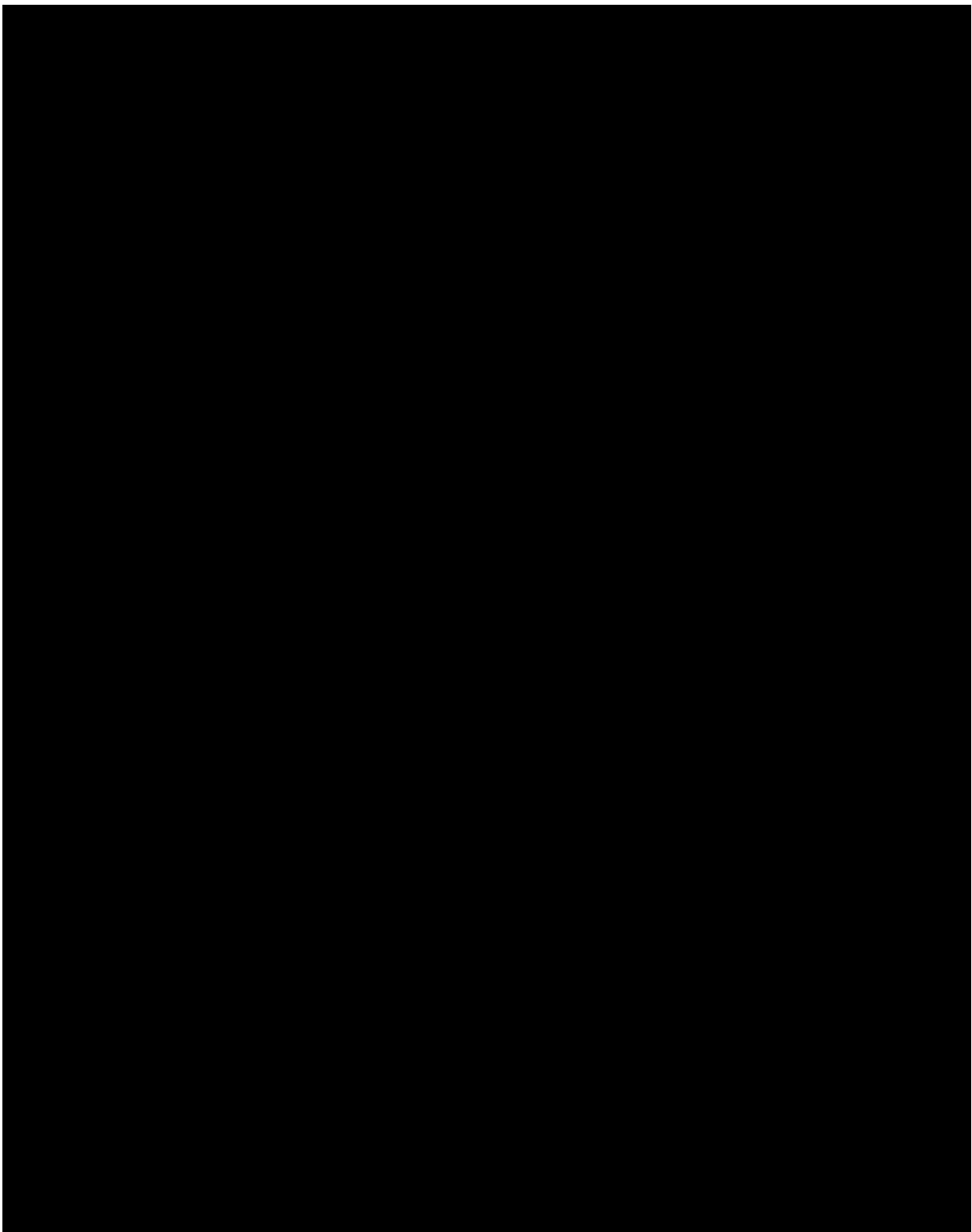
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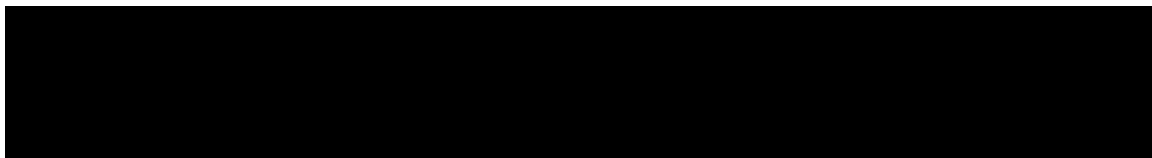
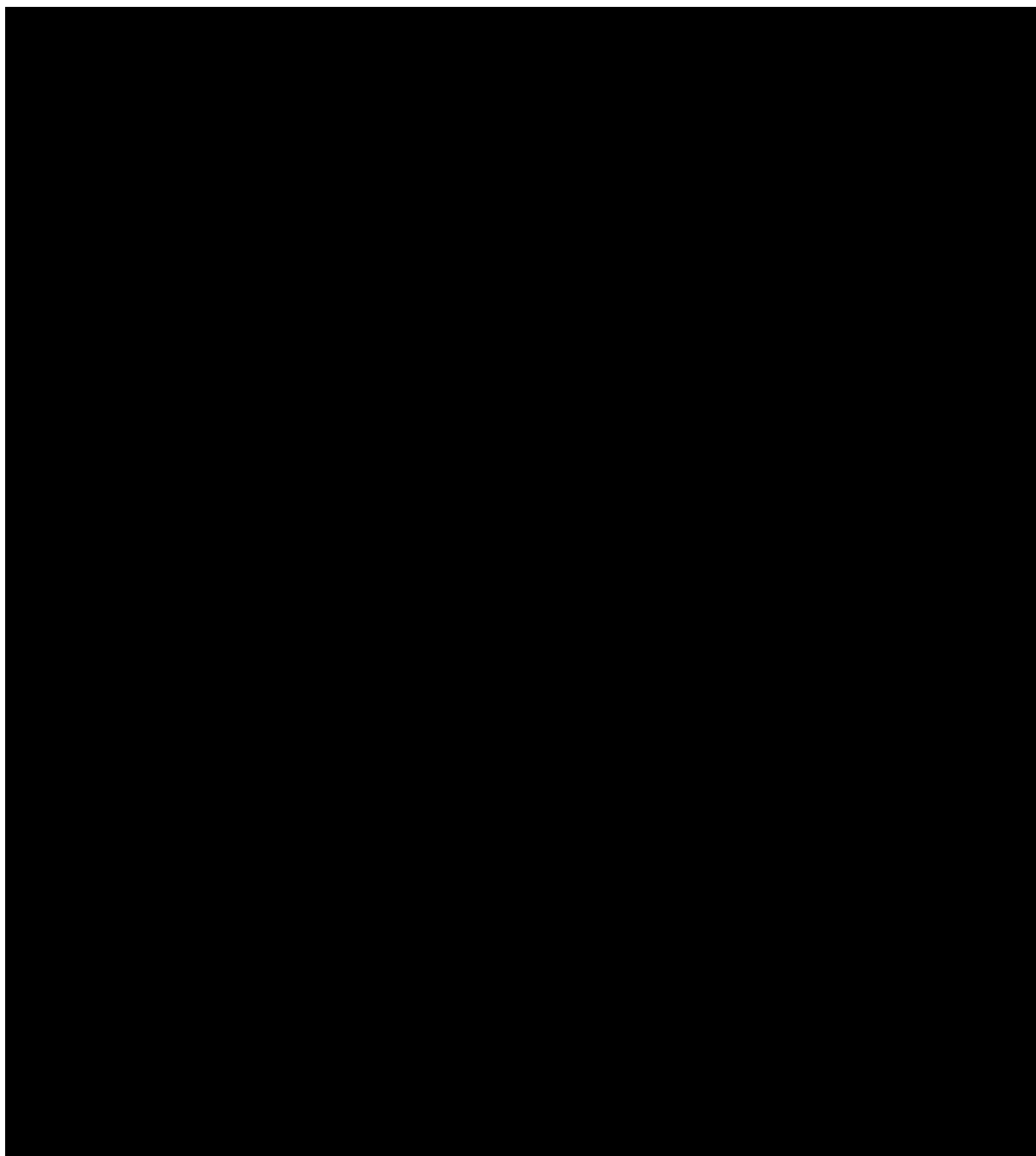
Q: If the ratepayer benefit of Phase 1 is contingent on Phase 2 being built, is it appropriate for ratepayers to bear that cost allocation now, in a proceeding that does not include Phase 2?

A:



Q: What is the total ratepayer exposure across Phase 1 and Phase 2 combined if both phases are approved?

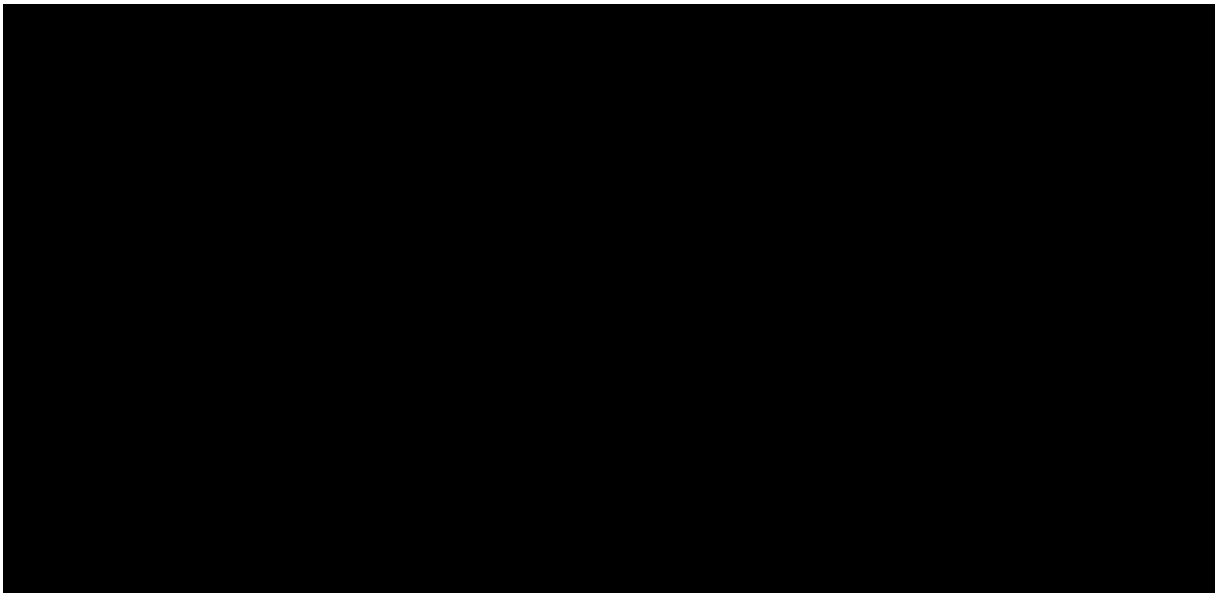
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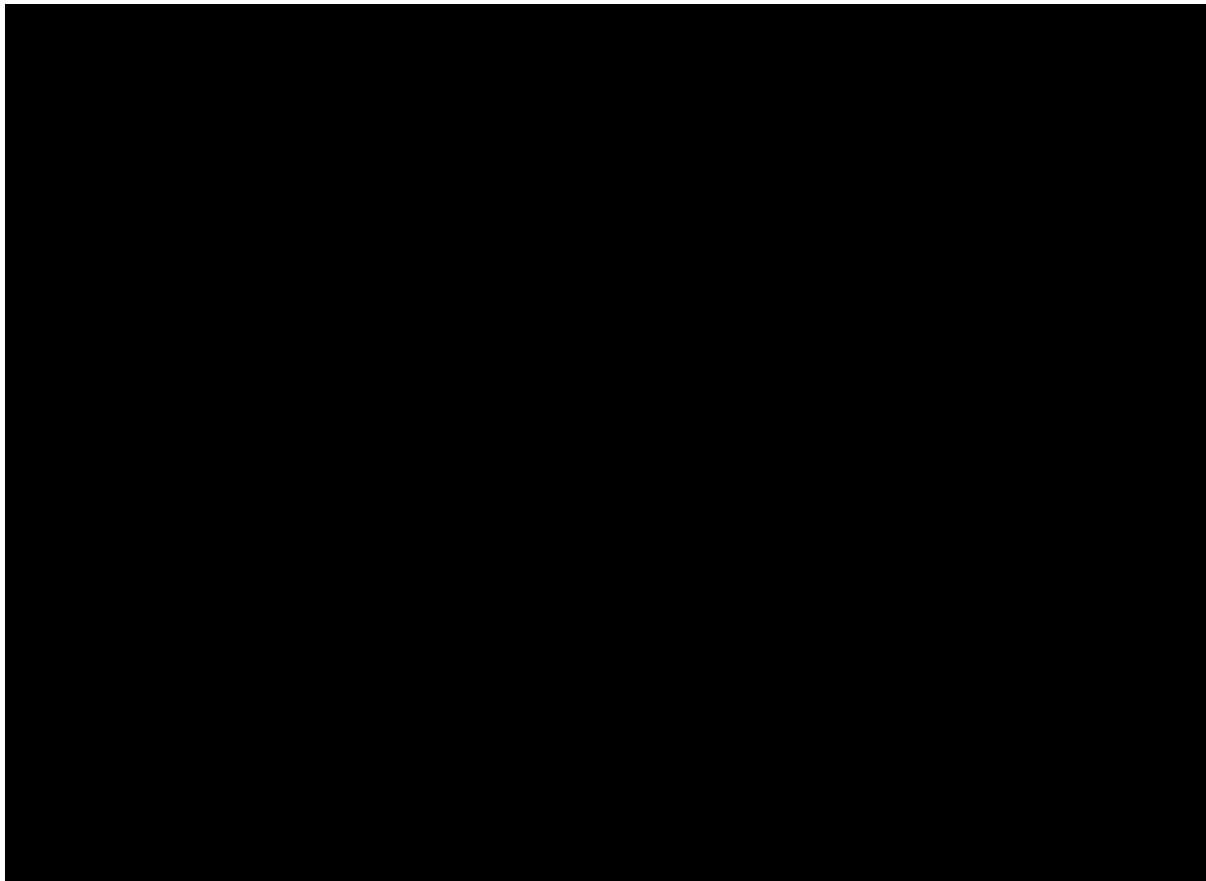
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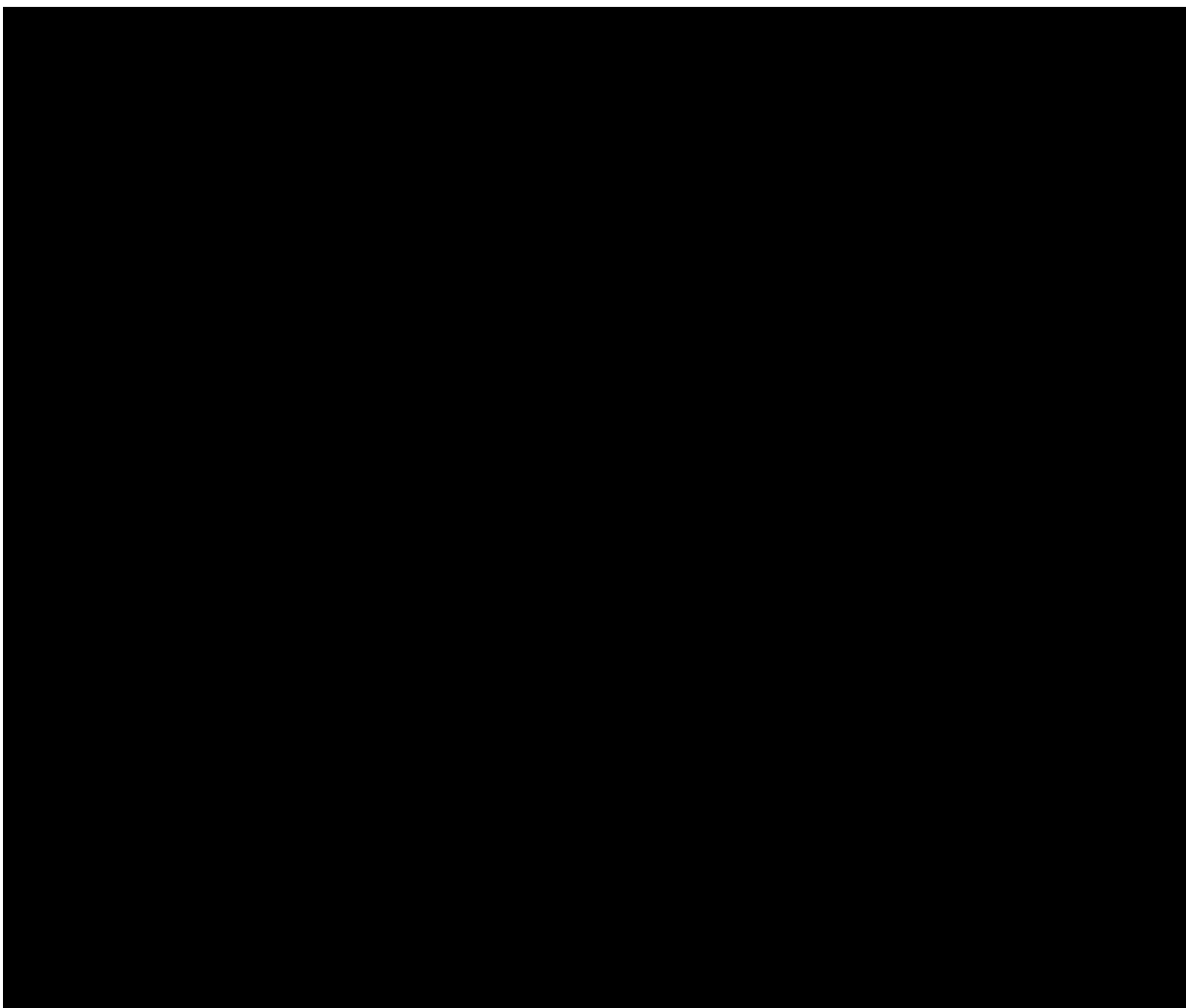


Q: Is it possible to evaluate the appropriateness of the Phase 1 ratepayer cost allocation without knowing whether Phase 2 will be approved, and at what cost?

A:



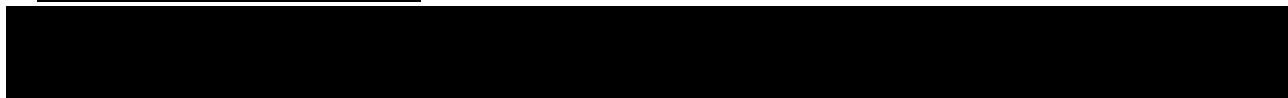
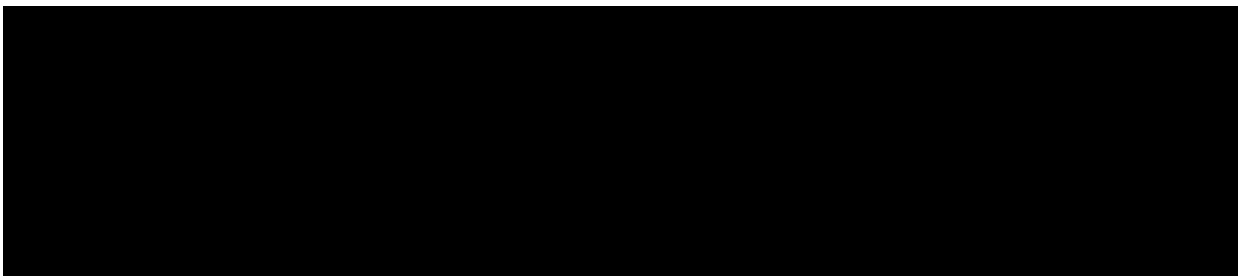
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VII.e. Recommendation

Q: What is your recommendation to the Commission regarding the Phase 1 ratepayer cost allocation given the Phase 1 and Phase 2 interdependency?

A:



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[REDACTED]

My testimony does not contest the need for the Tomhicken Switchyard to serve the customer's physical interconnection requirements, nor does it seek to delay construction or service. PPL’s responsibilities to new customers and existing customers under Pennsylvania law will be addressed by OCA counsel. [REDACTED]

[REDACTED]

Q: Specifically, do you recommend that the Commission approve the \$38.4M ratepayer allocation for Phase 1 unconditionally, conditionally, or not at all?

1 A:

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6 Q: If conditionally, what condition do you recommend?

7 A:

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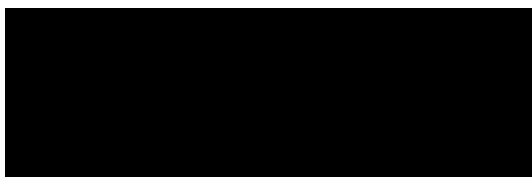
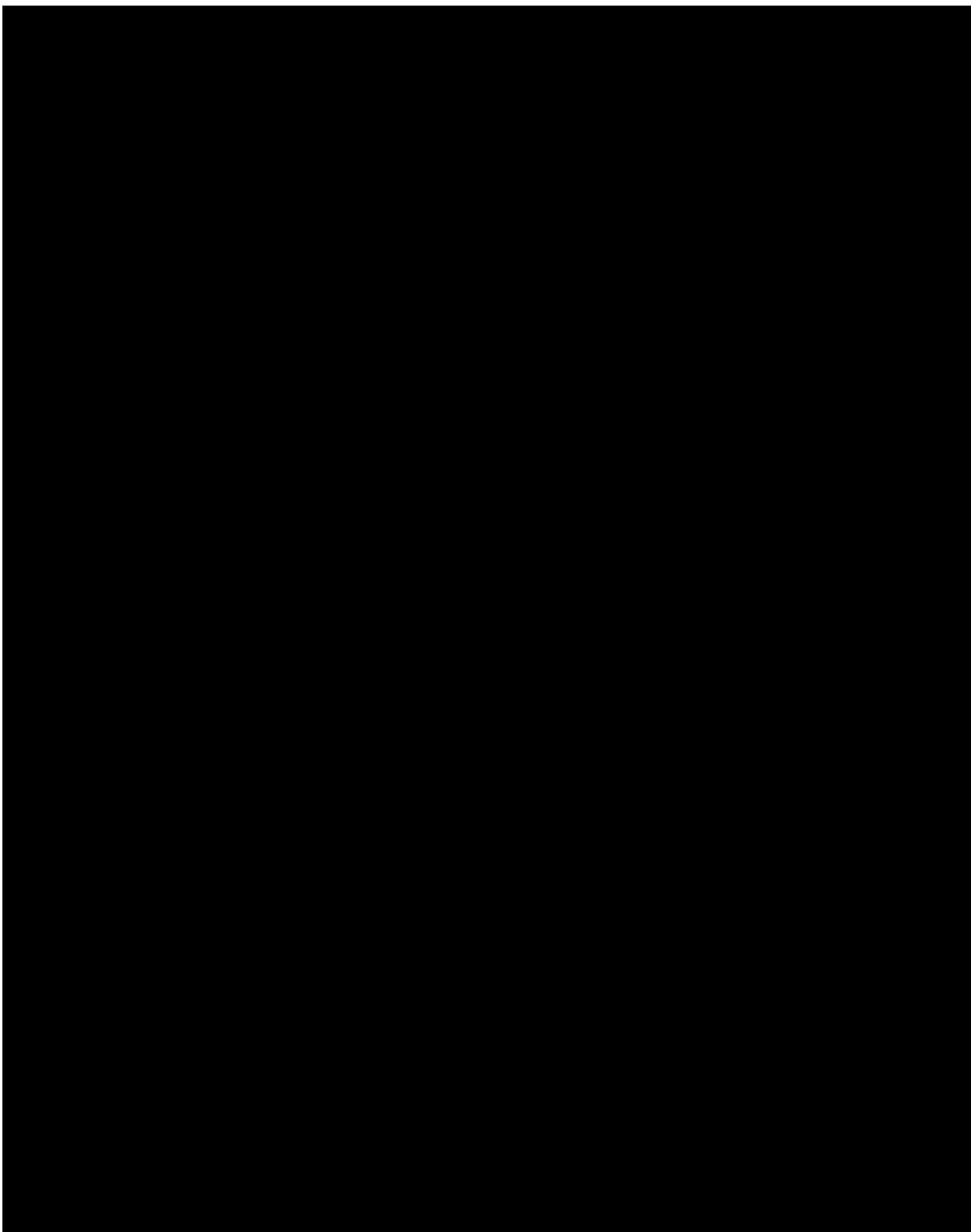
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VIII. Switchyard Cost

Q: What is the total cost of Tomhicken Switchyard?

A: PPL's Mr. Lookup stated in direct testimony that the total estimated cost of the proposed project is \$59.9 million, with the customer responsible for approximately \$21.5 million and PPL Electric responsible for approximately \$38.4 million.²⁶⁹ The LON states a slightly different customer allocation of approximately \$21.8 million, with PPL's share of \$38.4 million remaining the same in both documents.²⁷⁰ The \$300K difference in the customer's stated responsibility — and the corresponding difference in total project cost between the two documents — is addressed in the following question.

A further reconciliation question revealed an additional discrepancy. PPL

confirmed that **HIGHLY CONFIDENTIAL STARTS** [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] **HIGHLY CONFIDENTIAL ENDS** [REDACTED]

[REDACTED]

²⁶⁹ Lines 12-14, Page 7, PPL Statement No. 1.

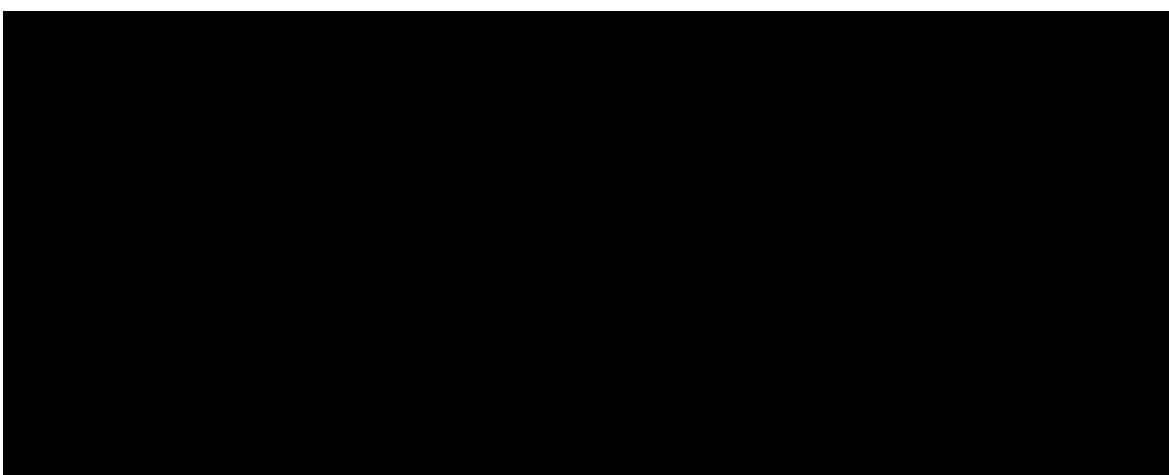
²⁷⁰ Page 11, LON.

Q: How did you reconcile the cost discrepancy between the LON (\$21.8M customer) and Direct Testimony (\$21.5M customer)?

A: PPL confirmed that “[t]he current estimate for the customer’s cost responsibility is \$21.5 million”²⁷². Hence the value in Mr. Lookup’s Direct Testimony is accurate.

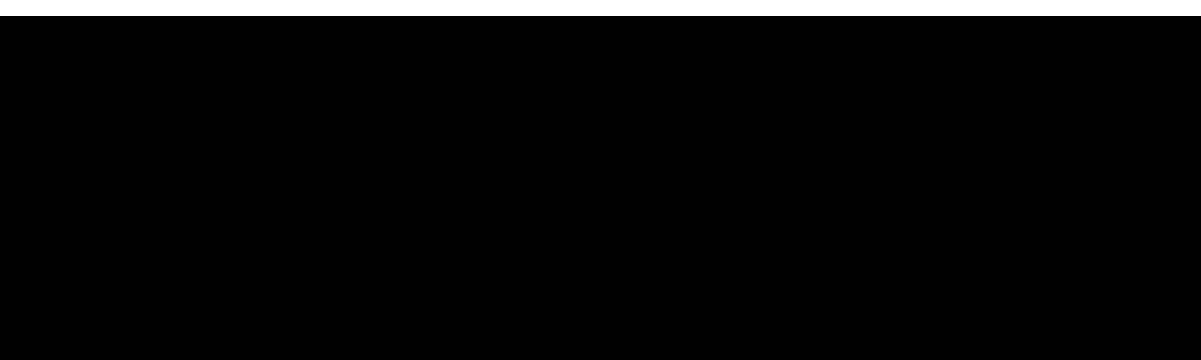
Q: Out of the total cost of the Tomhicken Switchyard, how much does the Pennsylvania ratepayer pay?

A:



Q: What is PPL’s reason for this ratepayer cost?

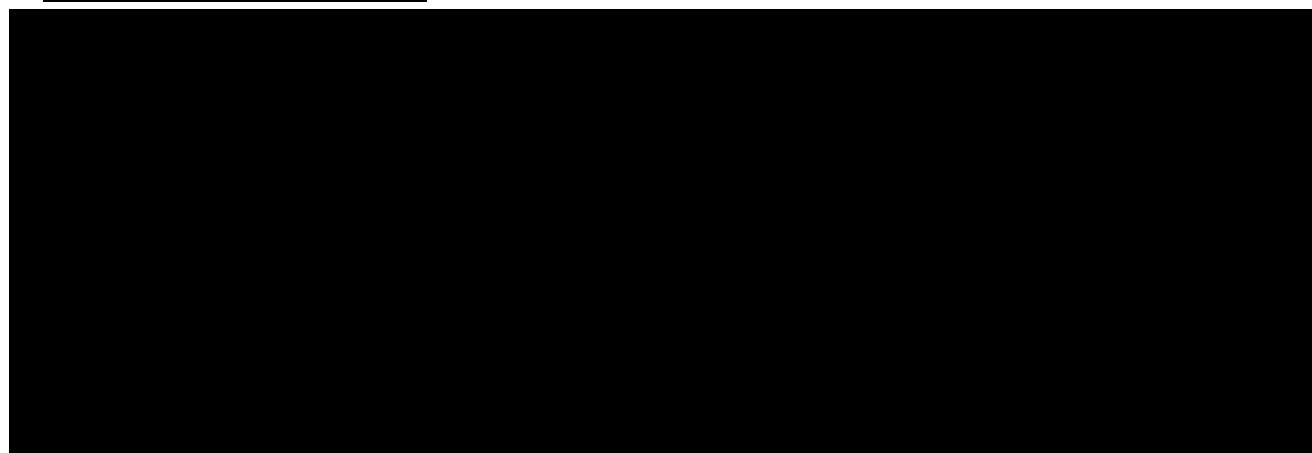
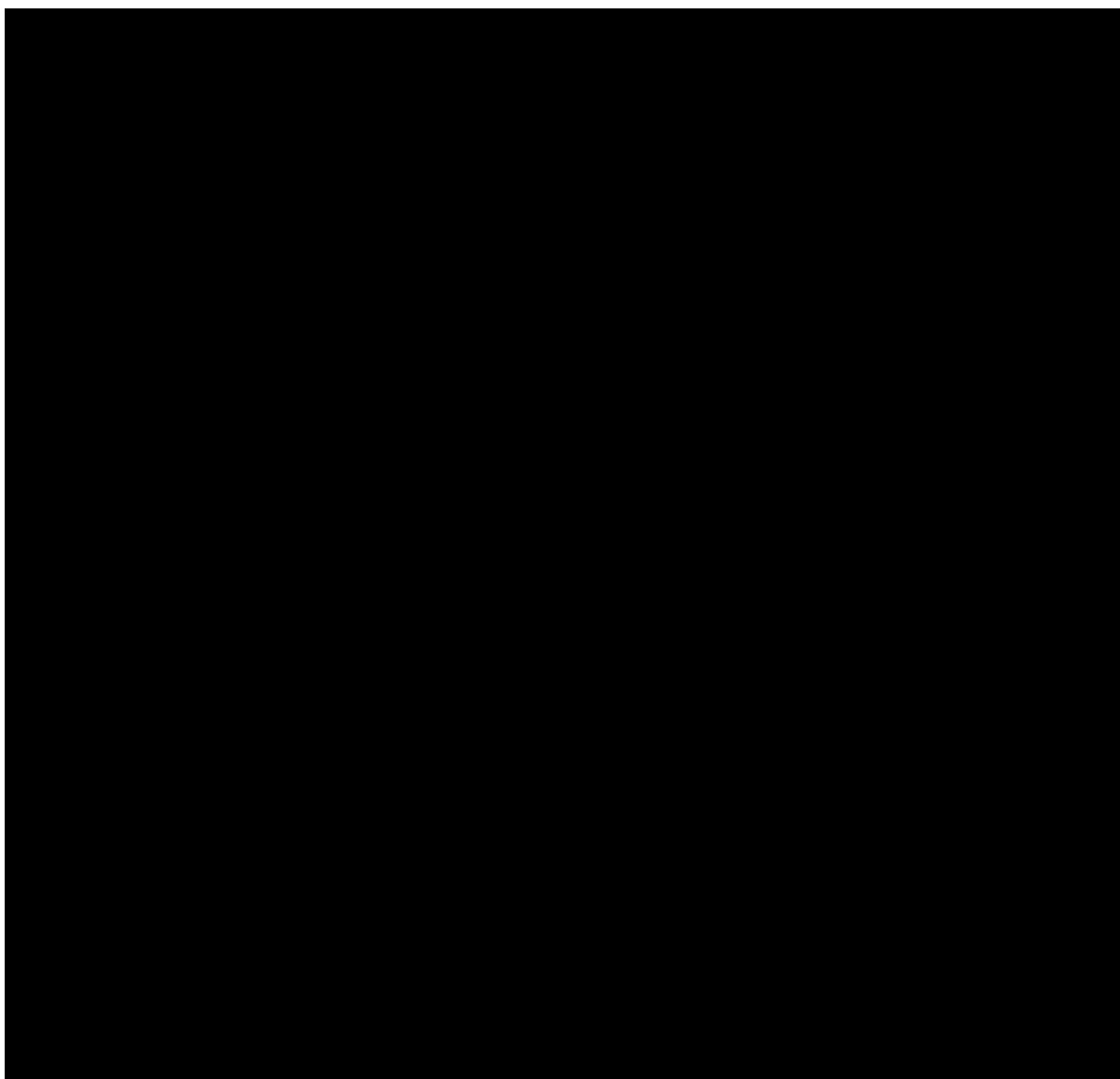
A:



²⁷² PPL Response to OCA VI-5(a).

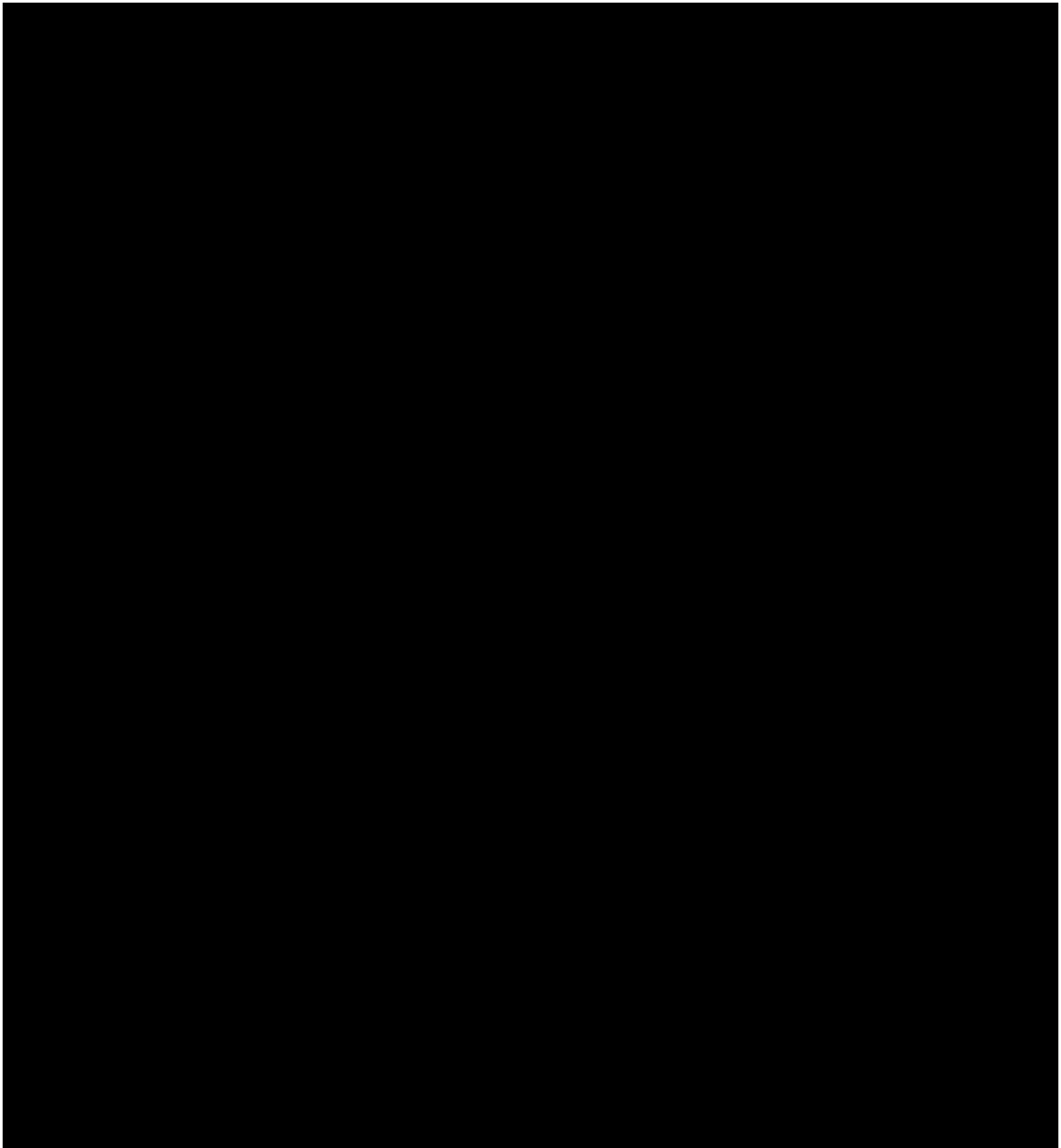


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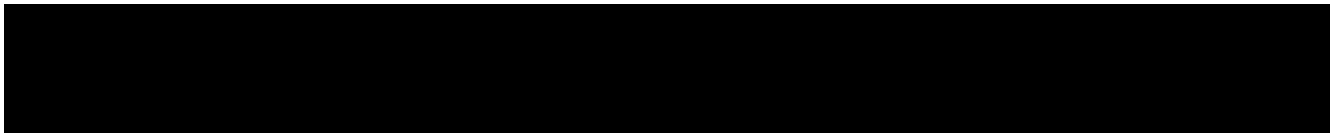


1 **Q: Has PPL allocated costs for comparable large load 230 kV interconnections**
2 **differently than it is proposing for the Tomhicken customer?**

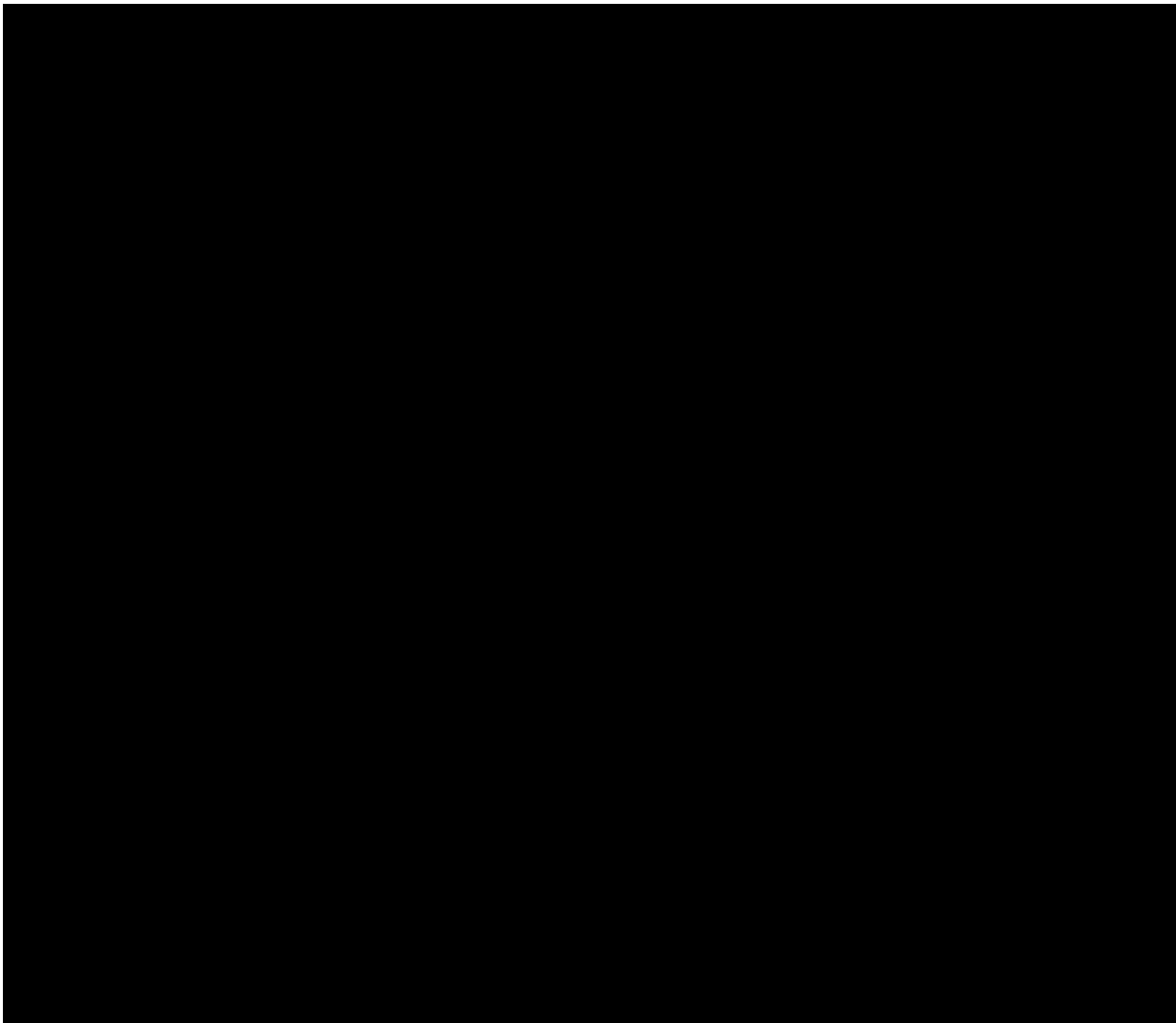
3 **A:**



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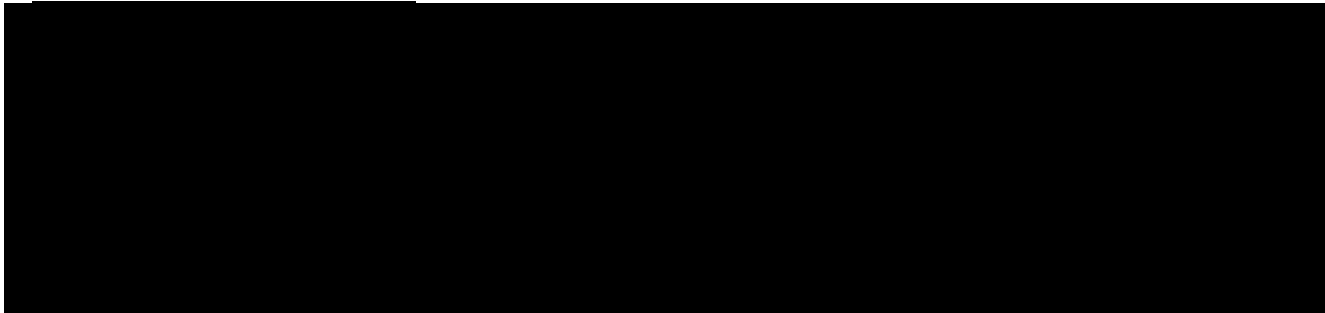
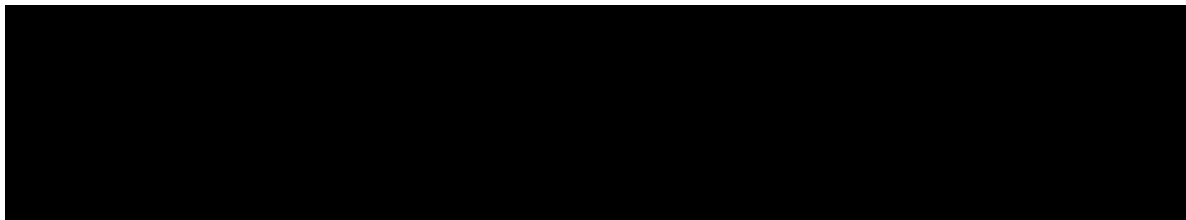


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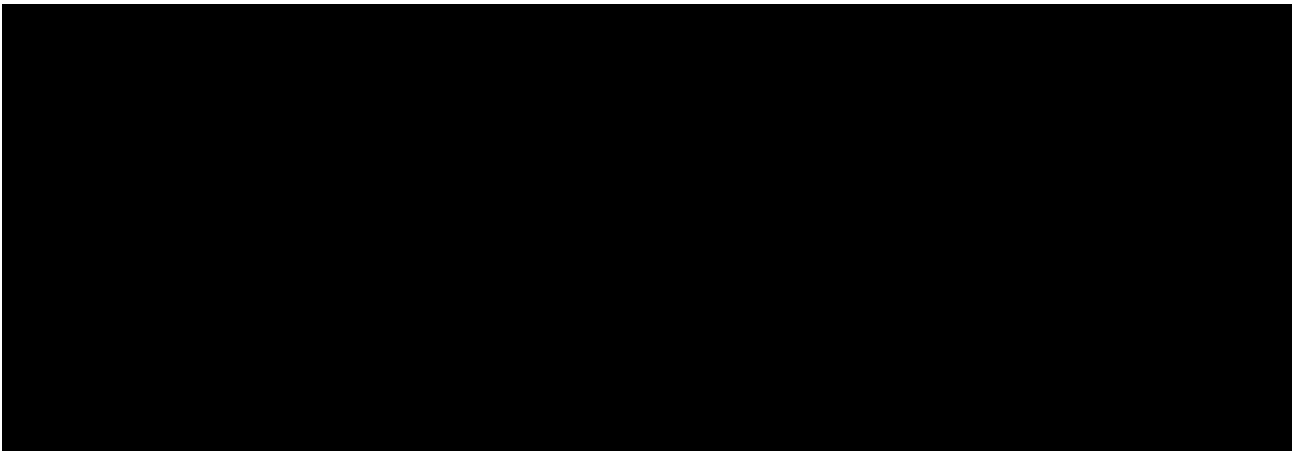
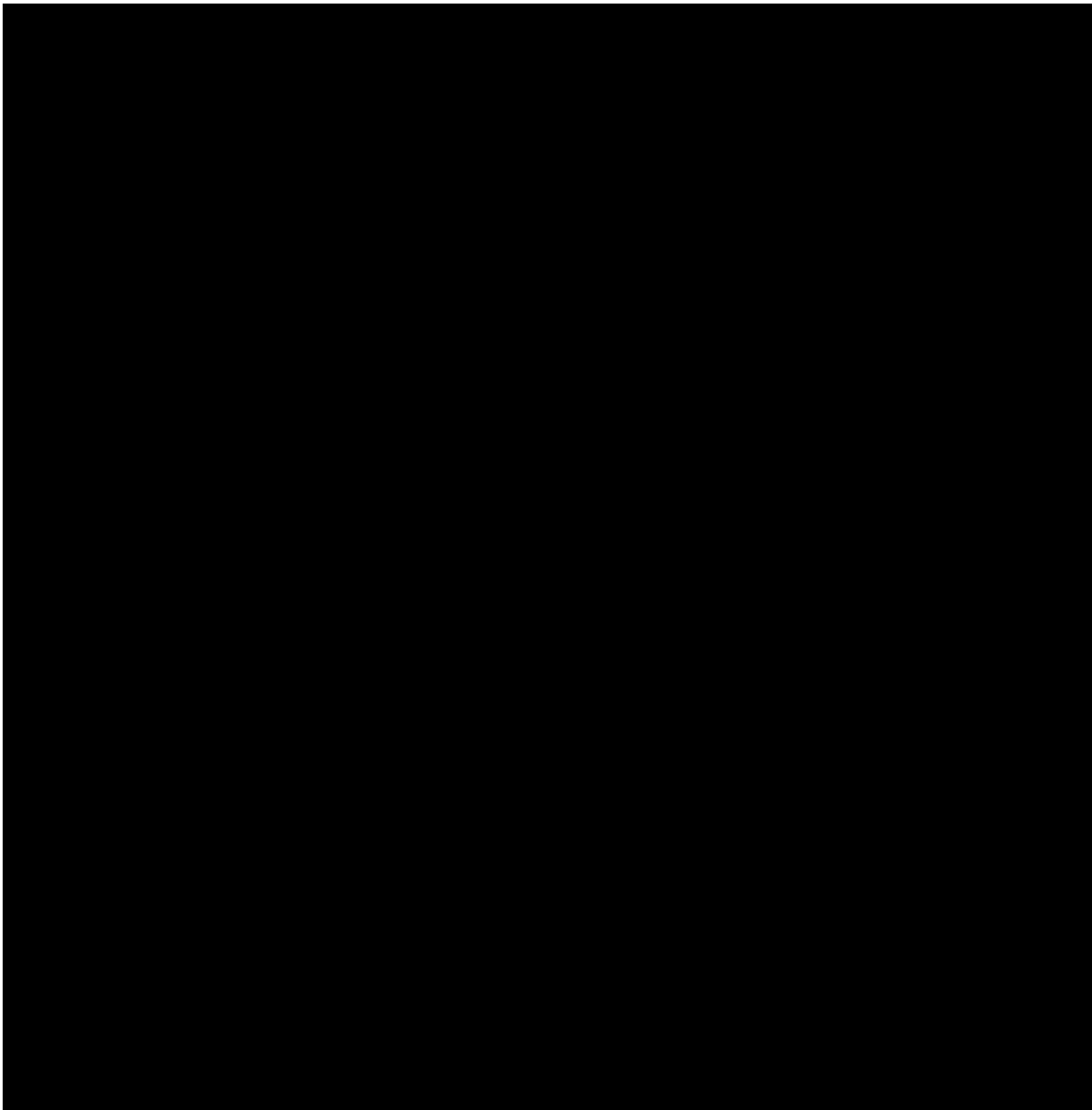


16 **Q:** What happens to the ratepayer-allocated \$38.4M if Phase 2 is never built?

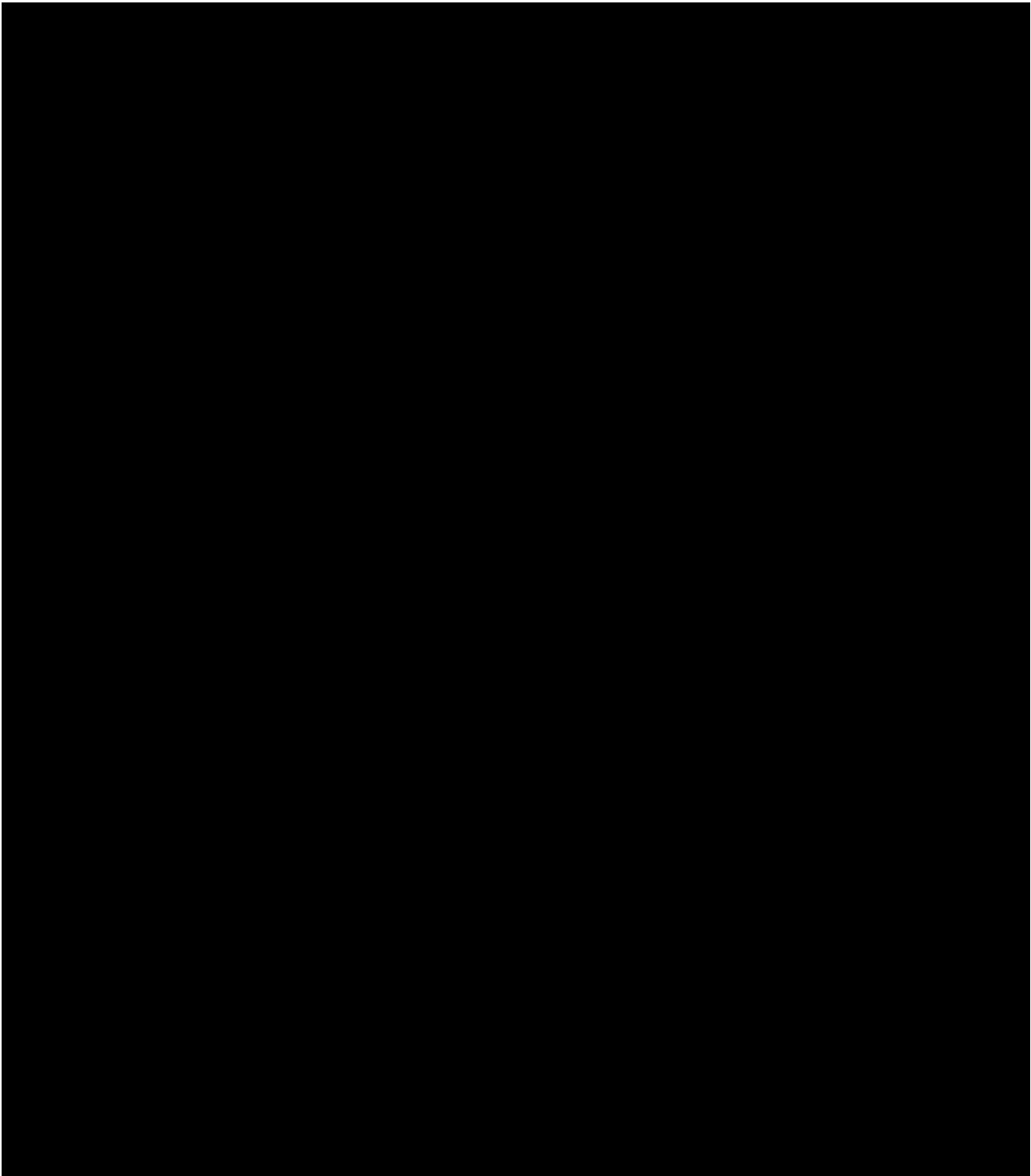
17 **A:**
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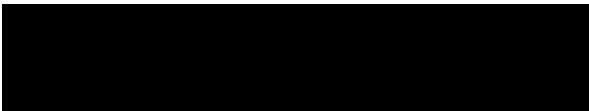
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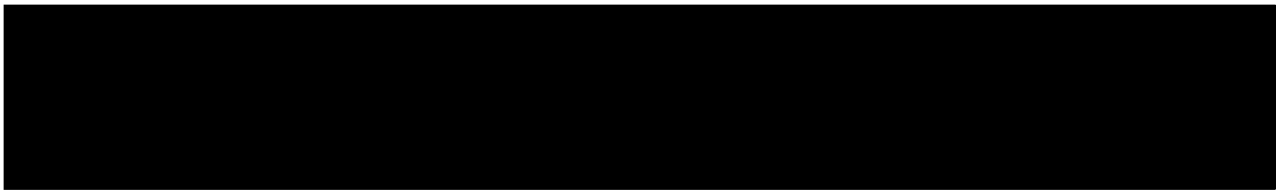
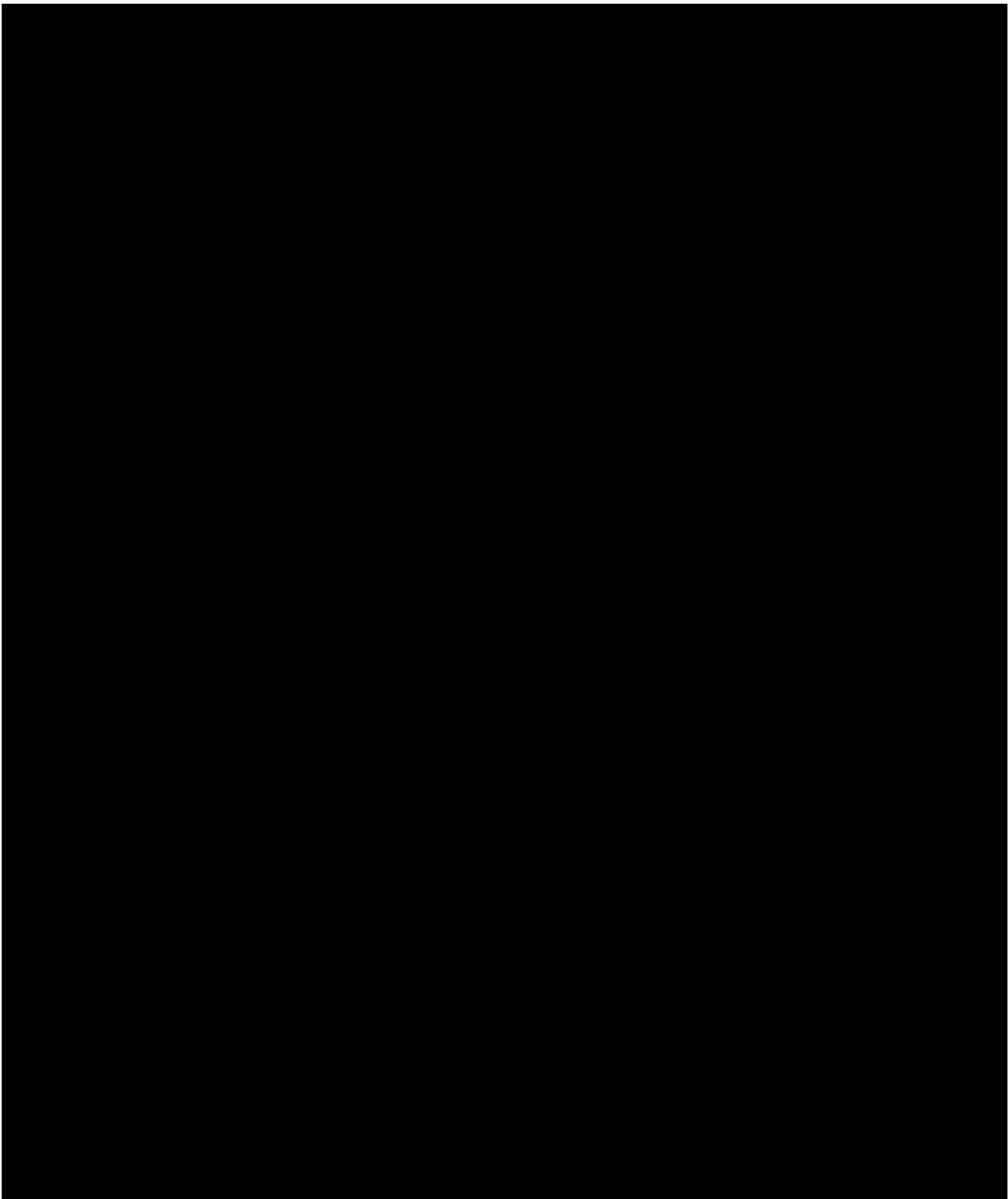
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21 **Q:** **Do you agree with PPL that ratepayers should pay this cost?**



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[REDACTED]

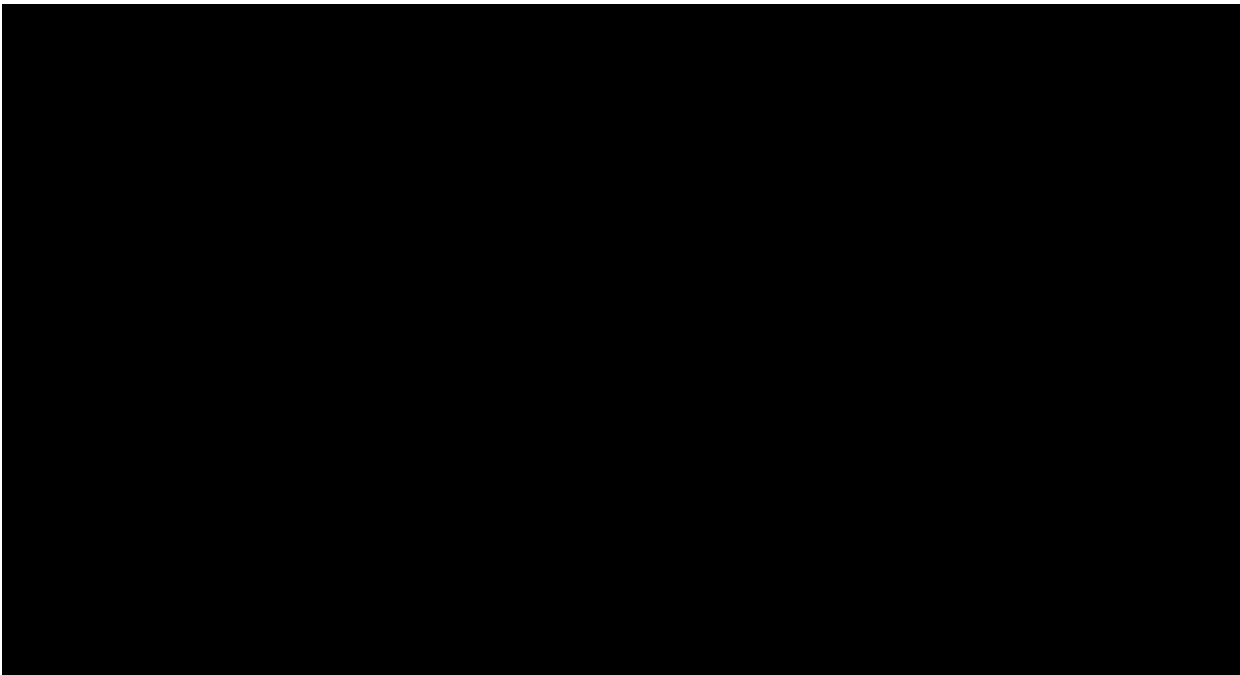
[REDACTED]

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[REDACTED]

[REDACTED]

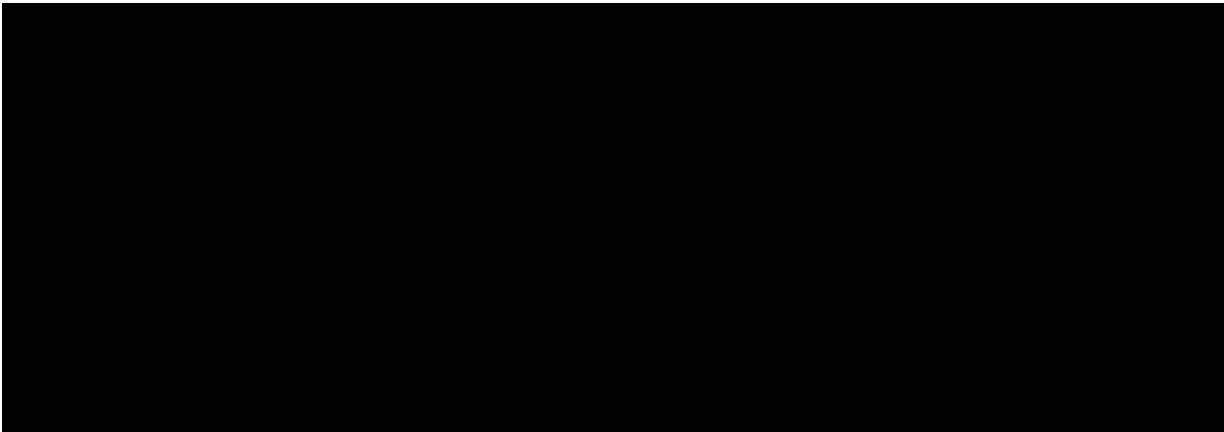
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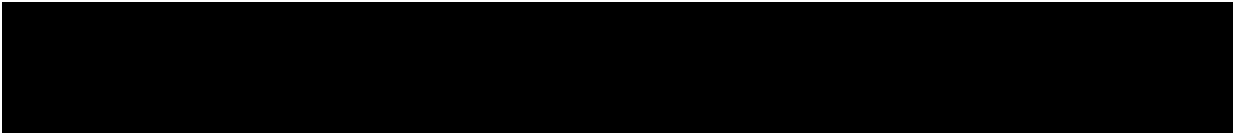
10 **Q: What is the ratepayer exposure if PPL applies the same cost allocation methodology**
11 **to other large load interconnections in its queue?**

12 **A:**

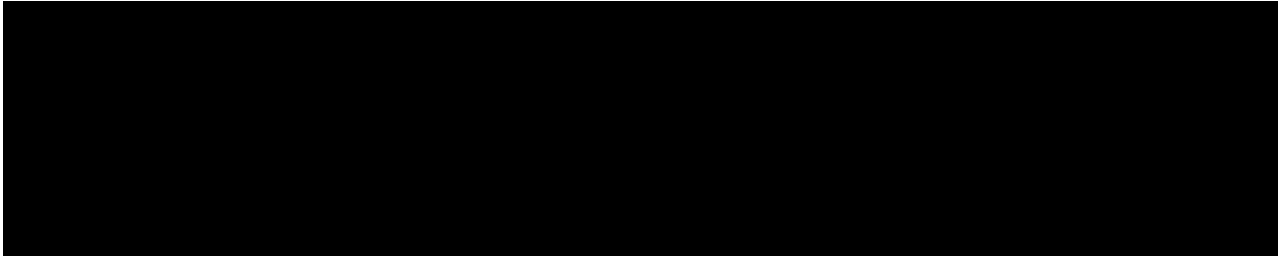
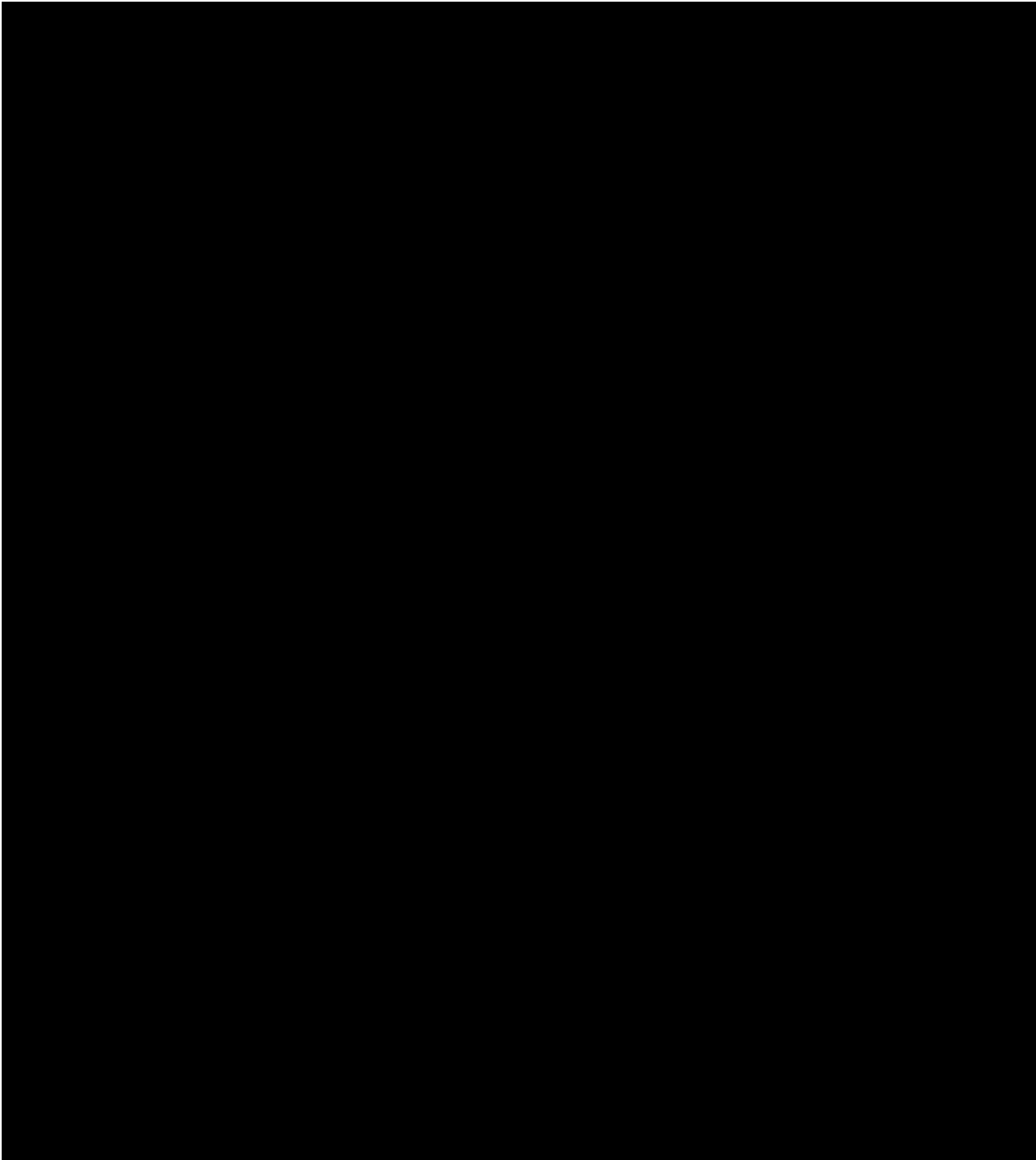
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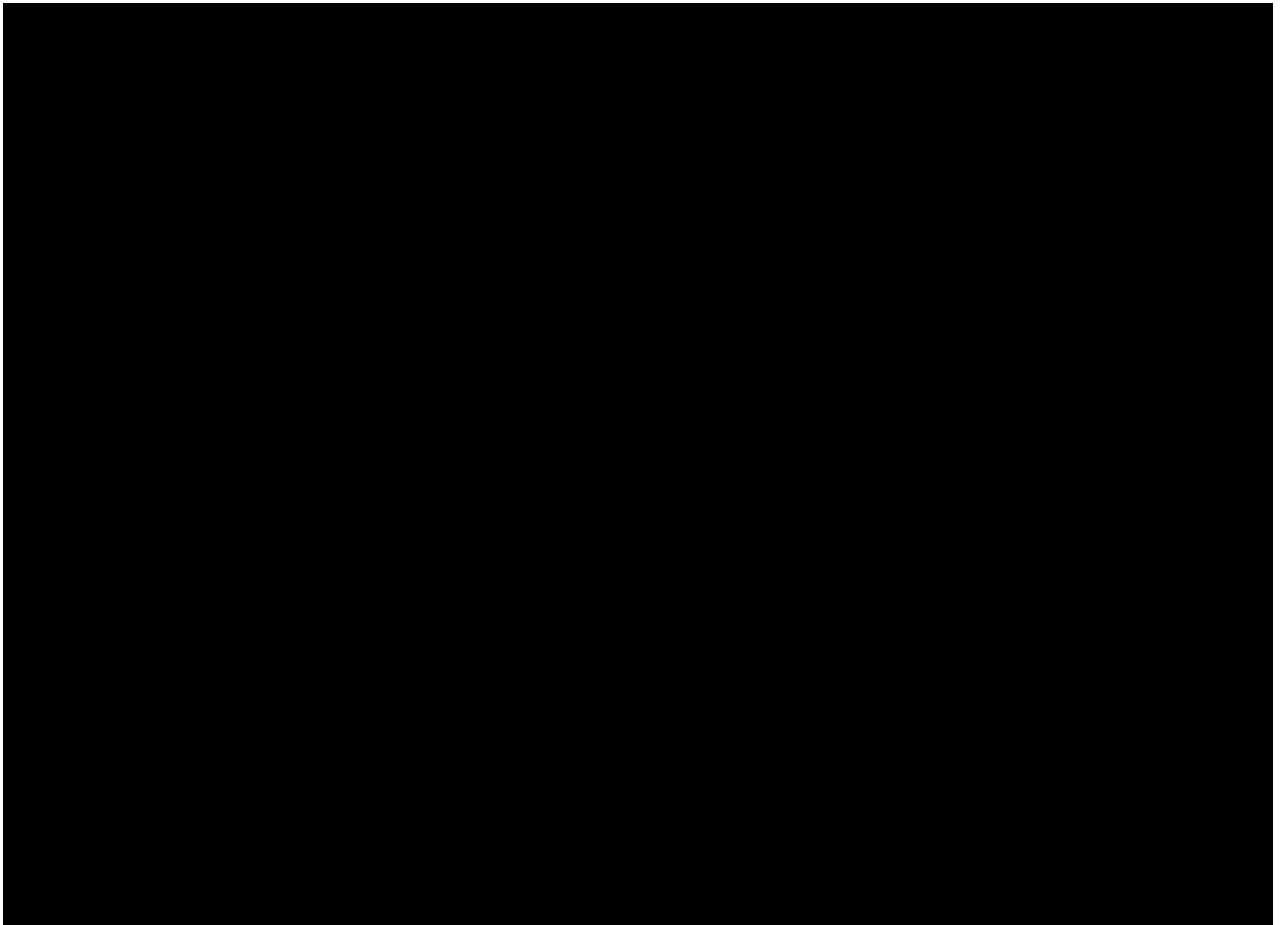


18 **Q: What is your recommendation?**



A:





IX. Overall Summary

Q: Please summarize your overall concerns.

A: My testimony identifies six independent concerns with PPL's proposed \$38.4 million ratepayer allocation.

First, the Tomhicken Switchyard is entirely customer driven. But for this customer's interconnection request, no transmission investment on the Susquehanna-Harwood corridor would have been required, no reliability violation would exist, and no Tomhicken Switchyard would be proposed. PPL confirmed no planned transmission

■ [REDACTED]

1 projects existed on that corridor prior to the customer's request, emergency ratings were
2 never violated, and DLR resolved the operational congestion three years before the
3 project was proposed.

4 **Second**, Phase 1's physical design was determined by Phase 2 requirements. The
5 line split configuration, the BAAH design sized for nine lines including Phase 2
6 terminations, and the substation designed for the customer's ultimate load rather than the
7 Phase 1 DNH load level all reflect Phase 2 requirements embedded in Phase 1
8 infrastructure. [REDACTED]

9 [REDACTED]

10 [REDACTED]

11 [REDACTED]

12 [REDACTED]

13 [REDACTED]

14 [REDACTED]

15 [REDACTED]

16 [REDACTED]

17 [REDACTED]

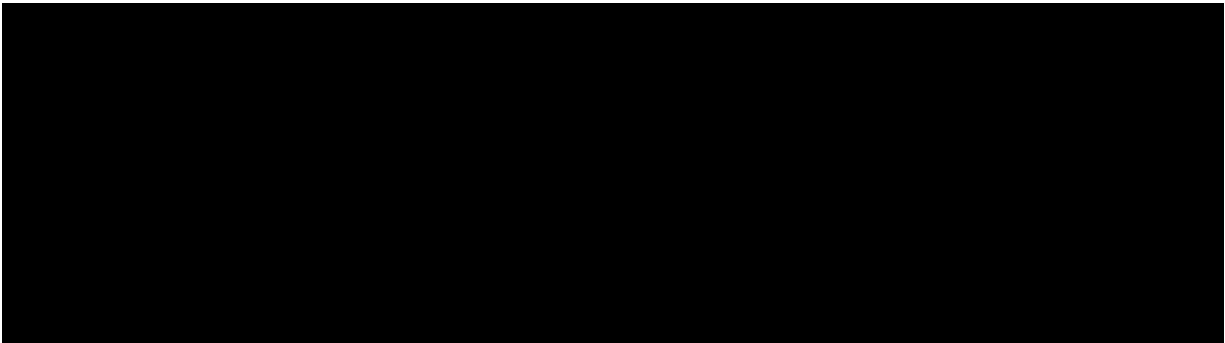
18 [REDACTED]

19 [REDACTED]

20 [REDACTED]

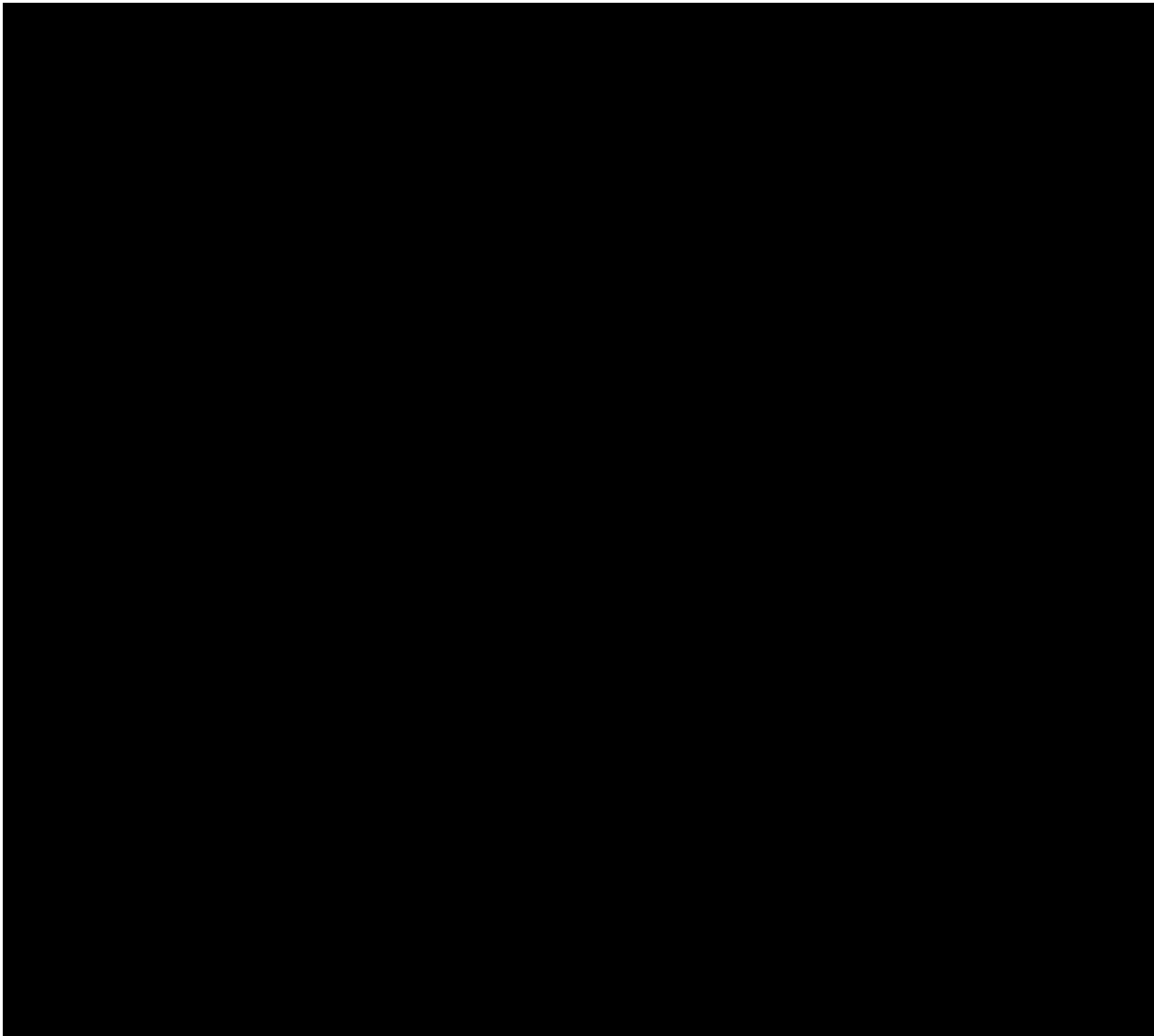
21 [REDACTED]

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Q: Please summarize your overall recommendations to the Commission.

A: My testimony makes the following recommendations.



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X. Conclusion

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7 **Q: Does this conclude your testimony?**

8 **A:** Yes, it does.

RAO KONIDENA

Energy Market Expert • Transmission Planning, Wholesale Markets & Distributed Energy Resources

Roseville, MN 55113 • 612-594-9257 • rkonidena76@gmail.com • rakonenergy.com

Professional Summary

Independent energy regulatory consultant and expert witness with 20+ years of experience spanning transmission planning, wholesale electricity market design, and distributed energy resource integration. Has filed testimony and affidavits before **state commissions in 10+ jurisdictions and the Federal Energy Regulatory Commission**, primarily on behalf of consumer advocates, environmental intervenors, and market participants. Former MISO Principal Advisor who led demand-side potential and grid-scale energy storage studies. Co-author of a Wiley graduate textbook on modern electricity systems.

Areas of Expertise

- Transmission Planning & CPCN Review
- Distributed Energy Resources (DER)
- Demand Response & FERC Order 2222
- Non-Wires Alternatives & Grid-Enhancing Tech
- Cost Allocation & Cost Causation
- Energy Storage Tariffs & Deployment
- Resource Adequacy & Capacity Markets
- Generator Interconnection (MISO/PJM)

Analytical Capabilities: Builds Python-based analytical tools for multi-ISO LMP analysis, benefit-cost modeling, and RTO market-data extraction across PJM, MISO, NYISO, SPP, CAISO, and ISO-NE.

Expert Testimony & Regulatory Engagements

Testimony, affidavits, and regulatory analysis filed through Rakon Energy LLC (2018–present), organized by jurisdiction.

Federal Energy Regulatory Commission (FERC)

- **Voltus, Inc** — Affidavit on SPP's multi-nodal aggregation. Docket No. ER22-1697.
- **Kentucky Public Service Commission (via Engleman Fallon, PLLC)** — Expert testimony in a transmission cost allocation complaint. Docket No. EL25-67-000. [\[eLibrary\]](#)
- **Office of the People's Counsel of D.C. (OPC-DC)** — Affidavit on PJM's Reserves Pricing Proposal. [\[filing\]](#)
- **Municipal utilities (Wisconsin & Missouri)** — Affidavit on MISO's Resource Adequacy construct.
- **Missouri Joint Municipal Electric Utilities Commission, Missouri River Energy Services & WPPI Energy** — Affidavit on MISO's External Resource Zone proposal. Docket No. ER18-1173-001. [\[eLibrary\]](#)

Pennsylvania Public Utility Commission

- **PA Office of Consumer Advocate** — PPL Electric Utilities – LON Susquehanna-Harwood. Docket No. A-2025-3059443.
- **PA Office of Consumer Advocate** — Utility rate case. Docket No. R-2024-3047068. [\[filing\]](#)
- **PA Office of Consumer Advocate** — Transmission line rebuild CPCN. Docket No. A-2022-3037374 (begins p. 198). [\[filing\]](#)
- **PA Office of Consumer Advocate** — Policy proceeding — Utilization of Storage Resources as Electric Distribution Assets. Docket No. M-2020-3022877 (begins p. 18). [\[filing\]](#)
- **PA Office of Consumer Advocate** — Ongoing generic electrical engineering support on transmission, distribution, and miscellaneous electric issues.

Maryland Public Service Commission

- **MD Office of People's Counsel** — NextEra Energy Transmission MidAtlantic — CPCN for 500 kV line, MidAtlantic Resiliency Link Project (Allegany & Garrett Counties). PSC Case No. 9857.
- **MD Office of People's Counsel** — Carroll-Germantown 230 kV line and Potomac Edison Messick Road-Ridgeley 138 kV rebuild CPCNs. PSC Case Nos. 9803 & 9818.
- **MD Office of People's Counsel** — Transmission line rebuild CPCN. PSC Case No. 9698 (filed Sept. 13, 2023). [\[case\]](#)

Massachusetts Department of Public Utilities

- **MA Attorney General's Office, Office of Ratepayer Advocacy (via Center for Renewables Integration)** — Energy storage tariffs — Eversource (DPU 23-126), National Grid (DPU 23-115), Unitil (DPU 23-117). [\[dockets\]](#)

Illinois Commerce Commission

- **Citizens Utility Board & Environmental Defense Fund** — Ameren Transmission Co. of Illinois / Ameren Illinois — transmission line CPCN. Docket No. 24-0088. [\[docket\]](#)
- **Environmental Law & Policy Center & Citizens Utility Board** — Ameren Illinois / Ameren Transmission Co. — transmission line CPCN. Docket No. P2023-0658. [\[docket\]](#)

California Public Utilities Commission

- **San Luis Obispo Mothers for Peace** — PG&E recovery of Diablo Canyon extended-operation costs (Sept. 2023–Dec. 2025) and 2025 Volumetric Performance Fees. Proceeding A.24-03-018. [\[filing\]](#)
- **San Luis Obispo Mothers for Peace** — Proposed extension of Diablo Canyon Power Plant. Proceeding R.23-01-007. [\[filing\]](#)

North Carolina Utilities Commission

- **NC WARN** — Duke Energy Carolinas Biennial Consolidated Carbon Plan & IRP. Docket No. E-100, SUB 190. [\[filing\]](#)
- **NC WARN** — Duke Energy Carolinas rate case. Docket No. E-7, SUB 1276. [\[filing\]](#)

Colorado Public Utilities Commission

- **CO Office of the Utility Consumer Advocate** — Expert testimony on a utility distribution system plan. Proceeding No. 24A-0547E.

Minnesota PUC & Kansas Corporation Commission

- **Voltus, Inc (demand response aggregator)** — Aggregator of Retail Customers — MN PUC Docket No. E999/CI-22-600; Demand Response Aggregator — KS Docket No. 23-EKCE-588-TAR. [\[KS filing\]](#)
- **Vote Solar** — Xcel/IOU IRP filing. MN PUC Docket No. E002/RP-19-368. [\[filing\]](#)

Public Utilities Commission of Nevada

- **Vote Solar** — IOU IRP filings. Docket Nos. 21-06001 and 21-06002. [\[filing\]](#)

Public Service Commission of Wisconsin

- **Environmental Law & Policy Center** — MISO Multi-Value Project (MVP) transmission line CPCN. Docket No. 5-CE-146. [\[filing\]](#)

Georgia Public Service Commission

- **Georgia Public Service Commission** — Engaged as Battery Energy Storage System (BESS) consultant.

Consulting & Advisory Engagements

Litigation, Agency & Policy Support

- Earthjustice — Technical analysis on anticipated DOE action regarding the Campbell plant (MI) and Schahfer and Culley plants (IN).
- Earthjustice, Sierra Club, NRDC & EDF — Opinion on DOE/Energy Secretary Chris Wright's August 20, 2025 order to MISO and Consumers Energy.
- Earthjustice — Technical analysis of the NYISO reliability planning process.
- Environmental Defense Center (for Mothers for Peace) — Report on the need for Diablo Canyon, submitted to the California Coastal Commission.
- Advanced Energy United (via Center for Renewables Integration) — Report on opportunities for DERs in organized markets.
- Advanced Energy Economy & NRDC Sustainable FERC Project — Monitoring of MISO's FERC Order 2222 implementation.
- Voltus, Inc — Representation at RTO stakeholder committees on FERC Order 2222.
- Energy Storage Association — Advocacy support at MISO on FERC Order 841 compliance.

Developer & Market-Participant Advisory

- Commercial real estate firm's renewable division — Impact of RTO market reforms on existing PPAs and interconnection agreements.
- Spanish renewable developer (via CRI) — MISO/PJM interconnection queue evaluation for solar/storage sites.
- Minnesota solar developer — DER and BESS development opportunities in MISO.
- Community Solar Garden developer — MISO DER Affected Systems Study process.
- Independent Power Producer — MISO seasonal resource adequacy construct and its PPA impacts.
- Renewable developer — MISO Generator Interconnection Queue and seasonal capacity-credit impacts across study cycles.
- Technology companies — Representation at PJM and navigation of MISO market rules for data center interconnection.

Training & International

- USEA workshop — US energy, capacity, and retail markets for the Independent Electricity Market Operator Philippines (IEMOP).
- NARUC International Peer Review — DER and Demand Side Management plan review for Central American regulators.
- USEA / USAID / Power Africa — Ancillary services best practices, Eastern Africa regional workshop.
- Tuatara team — DER training for Colombia's grid operator XM; ESTA International — energy storage benefits for Mexican regulator CRE.

Professional Experience

Midcontinent Independent System Operator (MISO) • Eagan, MN

Aug 2015 – May 2018

Principal Advisor, Policy Studies

- Recognized as an expert on energy storage and DERs from an economic transmission planning perspective.
- Project manager for the long-term independent load forecast and demand response / energy efficiency / distributed generation potential study.

- MISO representative on the DOE US DRIVE Grid Interaction Technical Team.

Senior Manager, Transmission Asset Management Operations

Feb 2013 – July 2015

- Partnered with the division lead on strategic initiatives and operating plans.
- Chaired the Economic Modeling Framework Working Group of international grid operators (GO-15).

Manager, Resource Forecasting (started as Engineer II)

Sep 2003 – Jan 2013

- Directed MISO's Demand Response & Energy Efficiency potential study (with Global Energy Partners).
- Directed the MISO Energy Storage Study identifying economic potential for grid-scale storage, advising utilities, asset owners, and investors.
- Owned analytical assessments meeting MISO's FERC compliance obligations (e.g., market-based rates).
- Supported state regulators and the MISO Board with technical analysis of policy drivers.

PwrSolutions, Inc. • Dallas, TX

May 2001 – Aug 2003

Student Intern & Electrical Engineer (Consulting)

- Executed generator interconnection studies for Independent Power Producer clients.
- Analyzed future generator and transmission needs in the Eastern Interconnection.

Education

MBA, Global Executive Program — University of Minnesota, Carlson School of Management 2011
Emphases: Strategic Management, International Business. Capstone: marketing mobile EV charging services in the Singapore market.

M.S., Electrical Engineering — University of Texas at Arlington, Energy Systems Research Center 2002
Thesis: Economic Analysis of Distributed Generation (Photovoltaics and Fuel Cells).

Publications, Boards & Recognition

- Co-author, *Modern Electricity Systems: Engineering, Operations, and Policy to Address Human and Environmental Needs* (Wiley, 2022) — graduate-level textbook.
- Author of multiple publications in The Electricity Journal, Renewable Energy World, and other industry journals; regular Substack contributor for commissioners and regulatory staff.
- President, Board of Directors, Center for Renewables Integration (Dec 2023 – present).
- Board of Directors, Ever Green Energy (Sep 2019 – present).

Exhibit RK-1

PPL Electric Utilities Corporation's Response to
the Office of Consumer Advocate's (OCA) Interrogatories,
OCA-I-6, Attachment 1

PPL Electric Utilities Corporation – Policy on Cost Allocation for Large Customer Interconnections

PPL Electric serves customers taking service at 69 kV and above at its LP-5 rate class. LP-5 customers are required to pay for the costs of the upgrades necessary to serve their load. PPL Electric Retail Tariff, Rule 4 – (C).4. However, certain upgrades benefit other PPL customers and/or the transmission grid. The costs of these upgrades may be excluded from the interconnecting customer's obligation and added to PPL Electric's transmission rate base.

It is PPL Electric's policy that upgrades to the networked bulk electric system made in connection with LP-5 customer interconnections will generally be excluded from the customer's obligation and included in transmission rate base. This policy is informed by FERC policy, which generally favors charging network customers for the costs of network facilities without an individualized benefit calculation:

“[D]ue to the integrated nature of the transmission network, network facilities benefit all network users,” even if “the facilities were installed to meet a particular customer's request for service.” “[T]here is no need to identify further actual benefits in order to include the costs of network transmission facilities in transmission rates.”

City of Anaheim, Cal., 113 FERC ¶ 61,091, at P 58 (2005), *reh'g denied*, 114 FERC ¶ 61,311 (2006).

At a minimum, the customer's direct connection cost is the sole responsibility of the connecting customer, more specifically, the transmission lines sourced from PPL Electric's substation/switchyard that terminate into the customers substation.

All other upgrades, including PPL Electric substations/switchyards will be evaluated on a case-by-case basis to determine if they provide benefits to other customers and/or the transmission grid. Examples of benefits to other customers that would cause an upgrade to be included in transmission rates includes, but is not limited to:

- Added system reliability;
- Increased capacity/lower congestion;
- Improved asset condition of existing facilities;
- Service to multiple transmission customers and/or retail feeders;
- Increased resiliency and operational flexibility;
- Expanded capacity for new generation flow and interconnections

If the customer's interconnection results in upgrades that will be included in transmission rate base, the Company reserves the right to include revenue guarantee provisions in the customer's Electric Service Agreement.

PPL Electric Utilities Corporation – Cost Allocation Review and Methodology for Large Customer Interconnections

Cost Allocation Review Process:

The Interconnection Affairs PM will pull together the following groups within Transmission Asset Management to review each project for their functional area:

- Interconnection Affairs – Rapid Response (RR) to interconnection request, Project Feasibility Report (PFR), Electrical Service Agreements (ESA), Construction Service Agreement (CSA), and confirmation of project costs.
- Planning – Line and sub equipment review and determination of dedicated vs network benefit.
- Project Development – Lead the development of deliverables for project scope, schedule and budget. Includes but not limited to project cost estimating, construction feasibility, confirmation of CSA scope and one-line, and financial budget.
- VP Planning and Asset Management – Provides approval for final cost allocation decision.

Cost Allocation Methodology is as follows for Direct Connect Transmission Line:

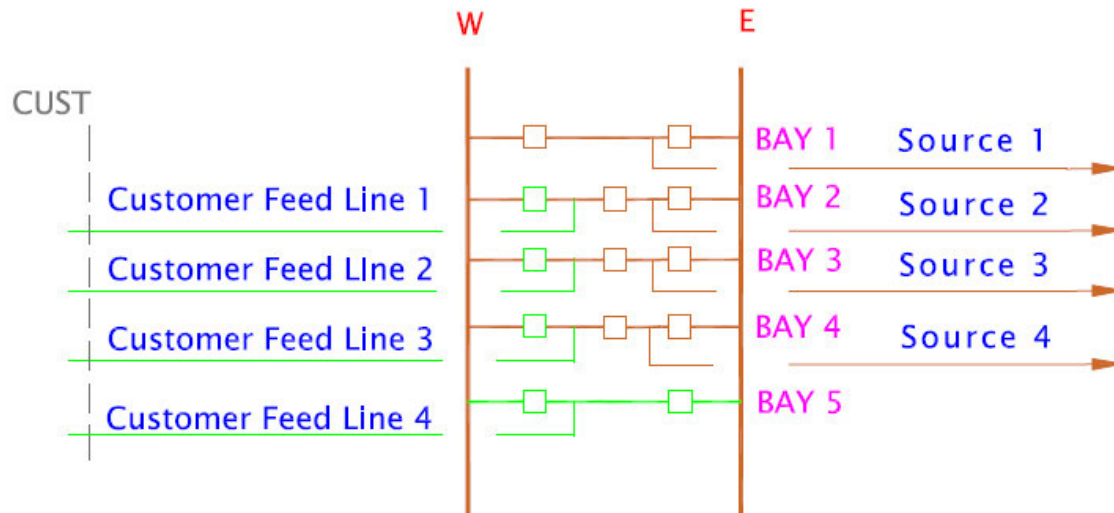
- All direct connection transmission lines that supplies customer substation. Below are typical assets but are not limited to:
 - Transmission Structures
 - Transmission conductor
 - Associated insulation and line hardware
 - Sectionalizing devices (i.e. switches, power circuit breakers, reclosers)
 - Grounding cable and hardware
 - Right of way easements and fee owned land

Cost Allocation Methodology is as follows for Substation equipment reviews:

The determining factor for cost allocation will be illustrated with the circuit breaker assets shown on Examples 1, 2, and 3 for ease of understanding at the highest level.

Interconnection Affairs will keep documented proof of each project site that is reviewed. A one-line will be color coded to denote direct customer costs vs network costs along with a cost spreadsheet.

Responsibility of Asset Matrix for Breaker and a Half (BAAH) Example 1:



LEGEND

- COST ALLOCATED TO THE CUSTOMER
- COST ALLOCATED TO THE RATEBASE
- CIRCUIT BREAKER

Customer Responsible:

- Bay 1: No assets
- Bay 2:
 - Line: Customer Line 1
 - Sub: 2W down-lead and dead-end structure
 - Sub: CB 2W
 - Sub: Two switches: 2WW & 2WE
 - Sub: Three associated CCVT's
 - Sub: Three associated surge arrestors
- Bay 3:
 - Line: Customer Line 2
 - Sub: 3W down-lead and dead-end structure
 - Sub: CB 3W
 - Sub: Two switches: 3WW & 3WE
 - Sub: Three associated CCVT's

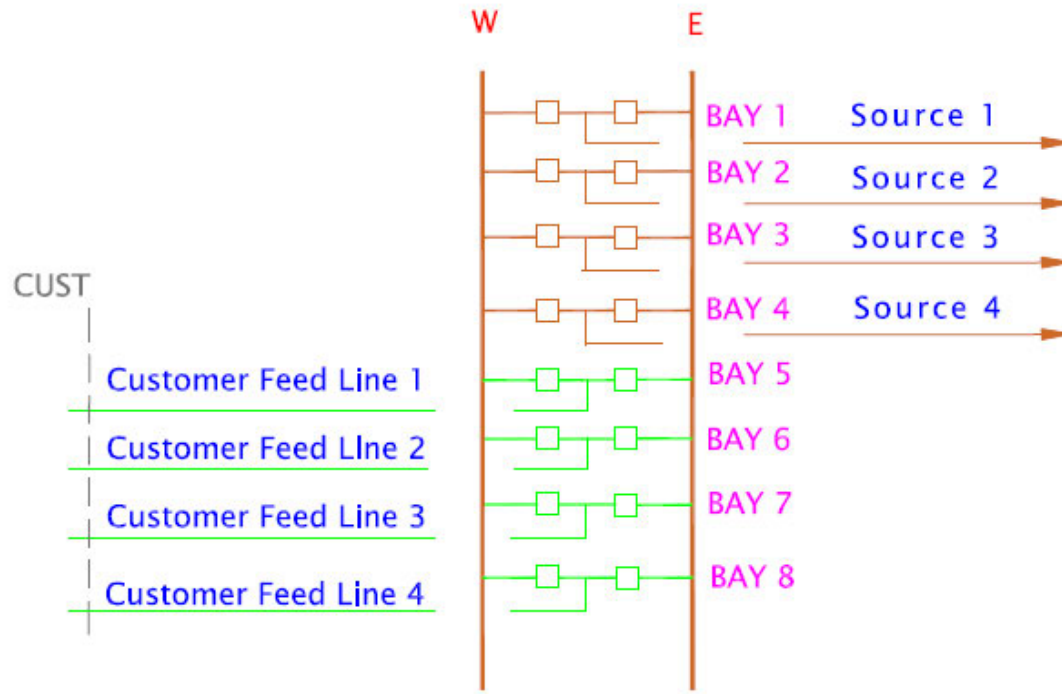
- Sub: Three associated surge arrestors
- Bay 4:
 - Line: Customer Line 3
 - Sub: 4W down-lead and dead-end structure
 - Sub: CB 4W
 - Sub: Two switches: 4WW & 4WE
 - Sub: Three associated CCVT's
 - Sub: Three associated surge arrestors
- Bay 5:
 - Line: Customer Line 4
 - Sub: 5W down-lead, dead-end structure, bay conductor, and bay structures
 - Sub: CBs 5W & 5E
 - Sub: Four switches: 5WW, 5WE, 5TW, & 5EE
 - Sub: Three associated CCVT's
 - Sub: Three associated surge arrestors

All associated wiring, conduit, relays and other minor assets associated with the above equipment.

PPL Responsible:

- All other equipment and associated minor assets.

Responsibility of Asset Matrix for Double Breaker Double Buss (DBDB) Example 2:



LEGEND

- COST ALLOCATED TO THE CUSTOMER
- COST ALLOCATED TO THE RATEBASE
- — CIRCUIT BREAKER

Customer Responsible:

- Bay 1-4: No assets
- Bay 5:
 - Line: Customer Line 1
 - Sub: Bay 5 downloads, dead-end structure, bay conductor, and bay structures
 - Sub: CBs 5W & 5E
 - Sub: Four switches: 5WW, 5WE, 5EW & 5EE
 - Sub: Three associated CCVT's
 - Sub: Three associated surge arrestors

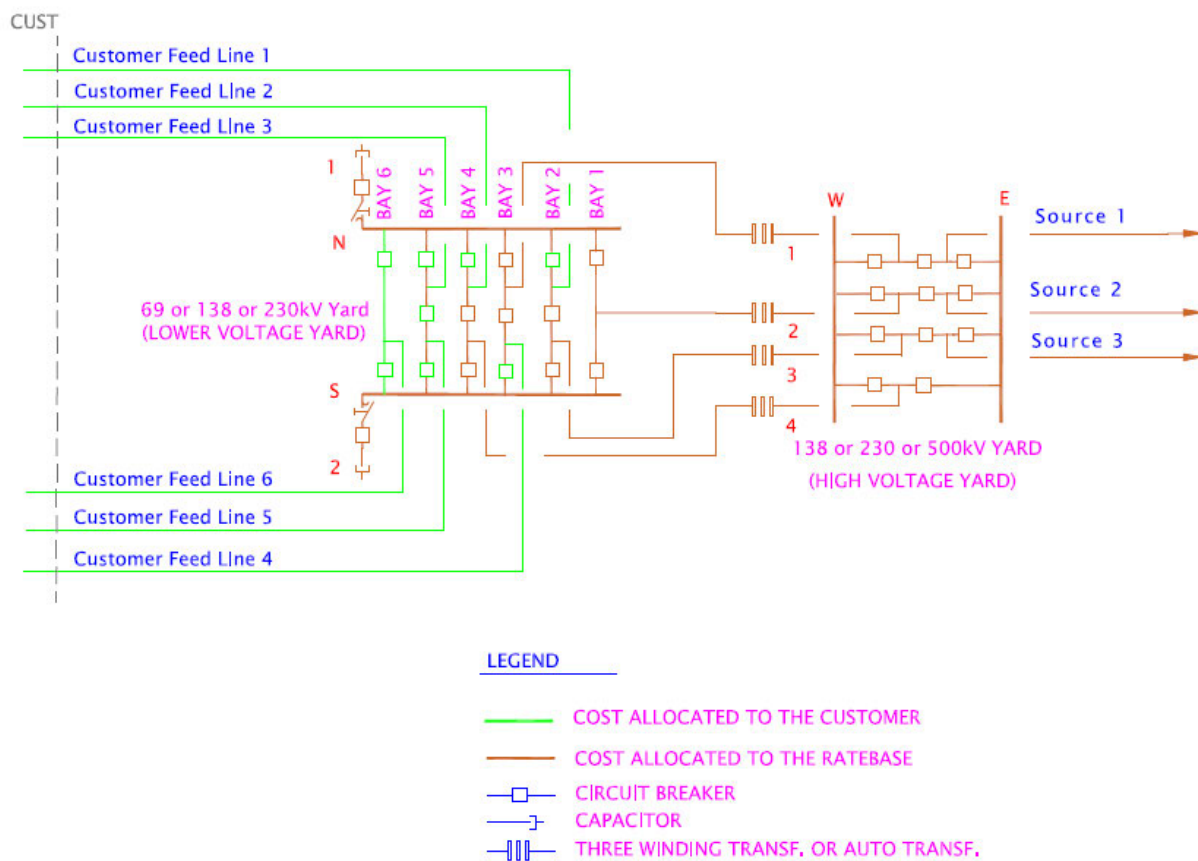
- Bay 6:
 - Line: Customer Line 2
 - Sub: Bay 6 downleads, dead-end structure, bay conductor, and bay structures
 - Sub: CBs 6W & 6E
 - Sub: Four switches: 6WW, 6WE, 6EW & 6EE
 - Sub: Three associated CCVT's
 - Sub: Three associated surge arrestors
- Bay 7:
 - Line: Customer Line 3
 - Sub: Bay 7 downleads, dead-end structure, bay conductor, and bay structures
 - Sub: CBs 7W & 7E
 - Sub: Four switches: 7WW, 7WE, 7EW & 7EE
 - Sub: Three associated CCVT's
 - Sub: Three associated surge arrestors
- Bay 8:
 - Line: Customer Line 4
 - Sub: Bay 8 downleads, dead-end structure, bay conductor, and bay structures
 - Sub: CBs 8W & 8E
 - Sub: Four switches: 8WW, 8WE, 8EW & 8EE
 - Sub: Three associated CCVT's
 - Sub: Three associated surge arrestors

All associated wiring, conduit, relays and other minor assets associated with the above equipment.

PPL Responsible:

- All other equipment.

Responsibility of Asset Matrix for Step Down Substation Example 3:



Customer Responsible:

- Higher voltage yard:
 - No assets
- Lower voltage yard:
- Bay 1: No assets
- Bay 2:
 - Line: Customer Line 1
 - Sub: 2N downleads and dead-end structure
 - Sub: CB 1N

- Sub: Two switches: 2NN & 2NS
 - Sub: Three associated CCVT's
 - Sub: Three associated surge arrestors
- Bay 3:
 - Line: Customer Line 4
 - Sub: 3S downleads and dead-end structure
 - Sub: CB 3S
 - Sub: Four switches: 3SS & 3SN
 - Sub: Three associated CCVT's
 - Sub: Three associated surge arrestors
- Bay 4:
 - Line: Customer Line 2
 - Sub: 4N downleads and dead-end structure
 - Sub: CB 4N
 - Sub: Two switches: 4NN & 4NS
 - Sub: Three associated CCVT's
 - Sub: Three associated surge arrestors
- Bay 5:
 - Line: Customer Line 3 & 5
 - Sub: 5N & 5S downleads, dead-end structures, bay conductors, and bay structures
 - Sub: CBs 5N, 5T, & 5S
 - Sub: Six switches: 5NN, 5NS, 5TN, 5TS, 5SN, & 5SS
 - Sub: Six associated CCVT's
 - Sub: Six associated surge arrestors
- Bay 6:
 - Line: Customer Line 6
 - Sub: 6S downleads, dead-end structure, bay conductors, and bay structures
 - Sub: CBs 6N & 6S
 - Sub: Four switches: 6NN, 6TS, 6SN, & 6SS
 - Sub: Three associated CCVT's
 - Sub: Three associated surge arrestors

All associated wiring, conduit, relays and other minor assets associated with the above equipment.

PPL Responsible:

All other equipment.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of PPL Electric :
Utilities Corporation filed pursuant to 52 :
PA Code Chapter 57 with respect to the :
approval to build approximately 1.1 miles : Docket No. A-2025-3059443
of new parallel double circuit 230 kV :
transmission taps that are needed to :
connect the existing Susquehanna- :
Harwood #1 & #2 transmission lines on the :
New Tomhicken 230 kV switchyard that :
are respectively located in Luzerne County, :
Pennsylvania :

VERIFICATION

I, Rao Konidena, hereby state that the facts above set forth in my Direct Testimony, OCA Statement No. 2, are true and correct to the best of my knowledge, information, and belief and that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa.C.S. Section 4904 (relating to unsworn falsification to authorities).

DATED: July 8, 2026

Signature: *Rao Konidena*
Rao Konidena

Address: Rakon Energy LLC
Roseville, MN 55113

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of PPL Electric :
Utilities Corporation Filed Pursuant to 52 Pa. :
Code Chapter 57 Subchapter G, for Approval :
to Build Approximately 1.1 Miles of New : Docket No.: A-2025-3059443
Parallel Double Circuit 230 kV Transmission :
Taps that are Needed to Connect the Existing :
Susquehanna-Harwood #1 & #2 :
Transmission Lines on the New Tomhicken :
230 kV Switchyard that are Respectively :
Located in Luzerne County, Pennsylvania :
:

SURREBUTTAL TESTIMONY

OF

Frank A. Felder, Ph.D.

On behalf of the

PENNSYLVANIA OFFICE OF CONSUMER ADVOCATE

Date Served: September 4, 2026

Table of Contents

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Introduction

Q. Please state your name and business address.

A. My name is Frank A. Felder, and my business address is 1855 Saint Francis Street, #1612, Reston, VA, 20190.

Q. By whom are you employed and in what capacity?

A. I am a Principal at Independent Electricity Consultants LLC.¹

Q. Are you the Frank A. Felder who submitted direct testimony in this matter?

A. Yes.²

Q. What is the purpose of your surrebuttal testimony in this case?

A. The purpose of my surrebuttal testimony is to respond to the rebuttal testimony of John D. Taylor (Witness Taylor).³ I am providing surrebuttal testimony at the request of the Pennsylvania Office of Consumer Advocate (“OCA”).

Q. Have you prepared Exhibits to accompany your testimony?

A. No.

Q. Please summarize PPL’s proposed project (Project).

A. As I stated in my direct testimony, PPL submits that the proposed Project is needed immediately to serve one new customer (“Customer”), a data center, based on its request for 230 kV electrical service by March 2027 (“Project”). According to PPL’s direct

¹ <https://www.independentelectricityconsultants.com/>.

² Before the Pennsylvania Public Utility Commission, Letter of Notification of PPL Electric Utilities Corporation Filed Pursuant to 52 Pa. Code Chapter 57 Subchapter G, for Approval to Build Approximately 1.1 Miles of New Parallel Double Circuit 230 kV Transmission Taps that are Needed to Connect the Existing Susquehanna-Harwood #1 & #2 Transmission Lines on the New Tomhicken 230 kV Switchyard that are Respectively Located in Luzerne County, Pennsylvania, Docket No. A-20253059443, Statement NO. 1-R, Direct Testimony of Frank A. Felder, July 8, 2026, hereafter “Felder Direct”.

³ Before the Pennsylvania Public Utility Commission, Letter of Notification of PPL Electric Utilities Corporation Filed Pursuant to 52 Pa. Code Chapter 57 Subchapter G, for Approval to Build Approximately 1.1 Miles of New Parallel Double Circuit 230 kV Transmission Taps that are Needed to Connect the Existing Susquehanna-Harwood #1 & #2 Transmission Lines on the New Tomhicken 230 kV Switchyard that are Respectively Located in Luzerne County, Pennsylvania, Docket No. A-20253059443, Statement NO. 5-R, Rebuttal Testimony of John D. Taylor, August 7, 2026, hereafter “Taylor Rebuttal”.

1 testimony, the Customer's load ramping schedule will increase in stages from an initial
 2 load of 12 megawatts ("MW") to approximately 276 MW by December 2027, and
 3 approximately 965 MW by 2033.⁴

4 **I. PPL Rebuttal Testimony Related to Frank A. Felder's Direct Testimony**

5 **Q. Please summarize PPL's rebuttal testimony responding to your direct testimony.**

6 A. I am responding to the following claims from the Rebuttal testimony of John D.
 7 Taylor: 1) there is no policy gap; 2) the tariff issues I raise are out of scope; 3) large loads
 8 should not be curtailed before the loads of ordinary ratepayers; 4) PPL does not have
 9 extensive discretion in its arrangements with large loads; 5) Federal Energy Regulatory
 10 Commission ("FERC") and PJM are addressing resource adequacy; 6) requiring PPL to
 11 have a large load registry is premature and potentially duplicative; 7) Reliability Backstop
 12 Procurement ("RBP") costs should not be assigned in this proceeding; and 8) the PPL tariff
 13 provision LP-6 addresses the stranded cost issues that I raise.

14 **Q. Please summarize your rebuttal.**

15 A. I rebut each of the points that Witness Taylor raises. First, Witness Taylor
 16 misconstrues ongoing FERC, PJM, and Pennsylvania Public Utility Commission
 17 (Commission or PUC) activity as resolving the policy gap, when it instead shows that a
 18 policy gap needs to be addressed. Further developments since my Direct Testimony on July
 19 8, 2026, some before and some after the date of Witness Taylor's Rebuttal, make it crystal
 20 clear that this policy gap exists and that the Commission needs to act. If the Commission
 21 does not act to address these policy gaps regarding this Project, whether in this proceeding

⁴ Felder Direct, p. 5, lines 4-12.

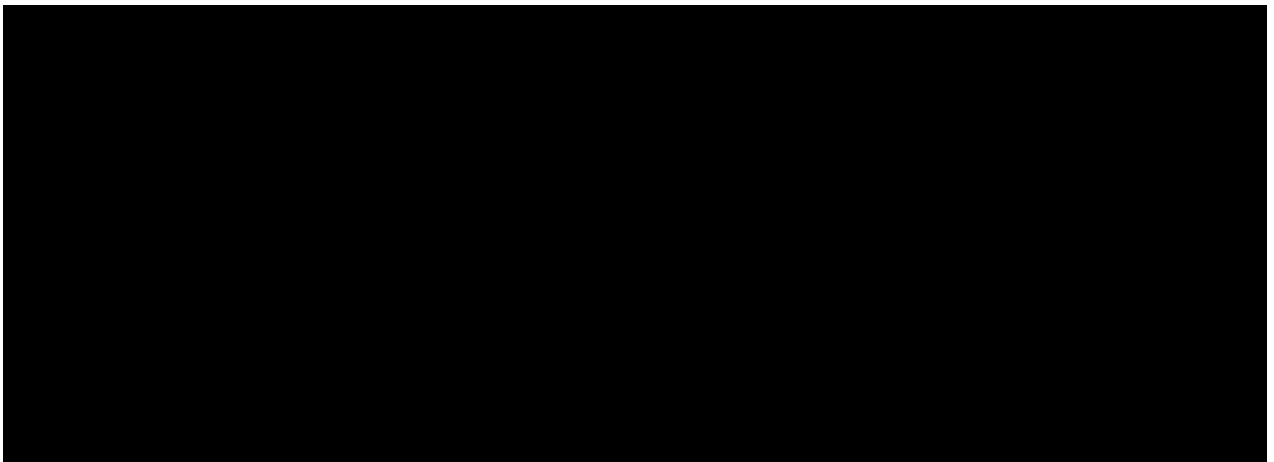
1 or another proceeding, it will not be maintaining reliability and protecting ordinary
2 ratepayers from unwarranted cost increases.

3 Second, Witness Taylor ignores that PPL, not the OCA, raised its obligation to serve
4 customers in this proceeding to justify the Project. Witness Taylor also ignores that, on July
5 23, 2026, PPL signed the Ratepayer Protection Pledge, which commits PPL to preventing
6 ordinary ratepayers from negative reliability and cost impacts due to large loads. Thus, it
7 is PPL, not the OCA, that opened the door regarding the need for tariff provisions to protect
8 consumers from the reliability and cost impacts of this project.

9 Third, Witness Taylor does not dispute any of the evidence I presented in my Direct
10 Testimony regarding the reliability reductions, specifically resource adequacy reductions,
11 due to large loads or their potential cost impacts on ordinary ratepayers. He does not
12 question the underlying logic and evidence I presented in my Direct Testimony to show
13 that if large loads are connected to PPL's distribution system without sufficient tariff
14 protections, they will reduce reliability and raise costs and risks for ordinary ratepayers.

15 **Q. Given the importance of recent developments, please provide a timeline of key dates**
16 **and their importance.**

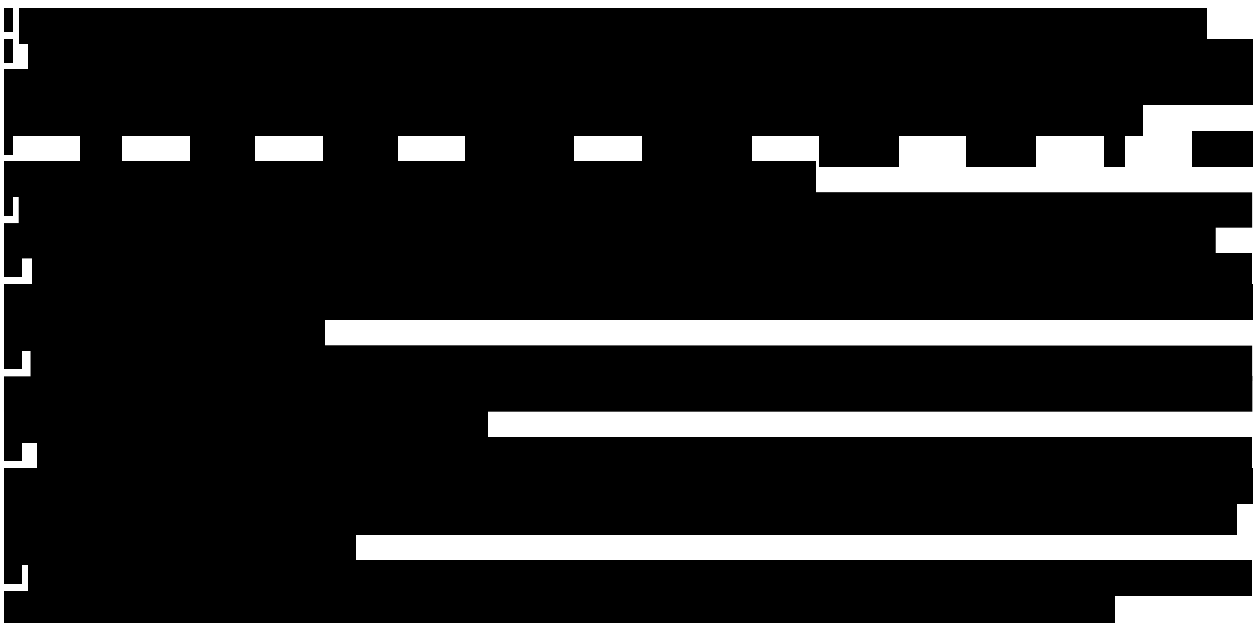
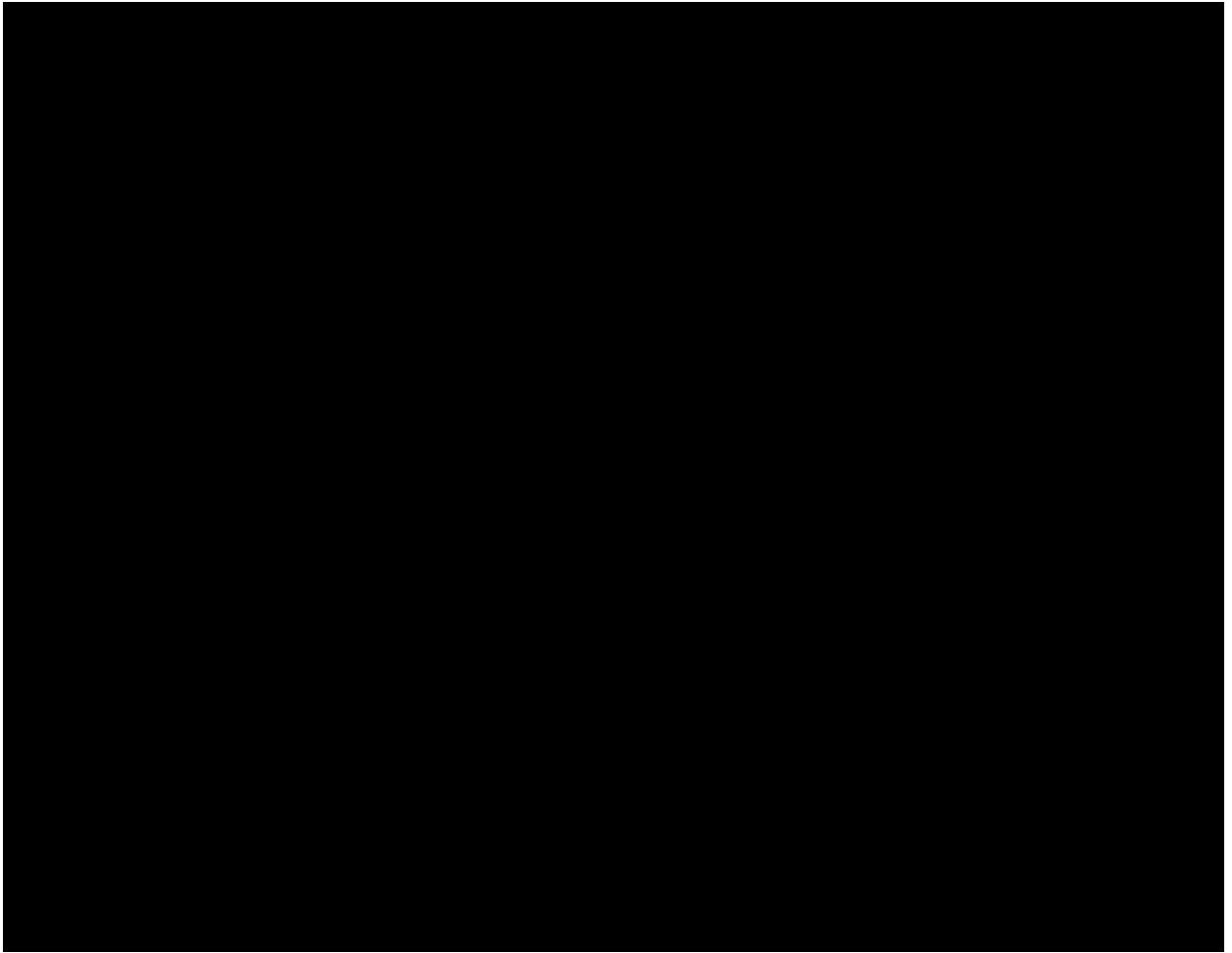
17 **A.** Table SR1 lists the key dates relevant to my Rebuttal.



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II. There is a Policy Gap Requiring Commission Action

Q. What reasons does Mr. Talyor provide to support his claim that there is no policy gap?

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[REDACTED]

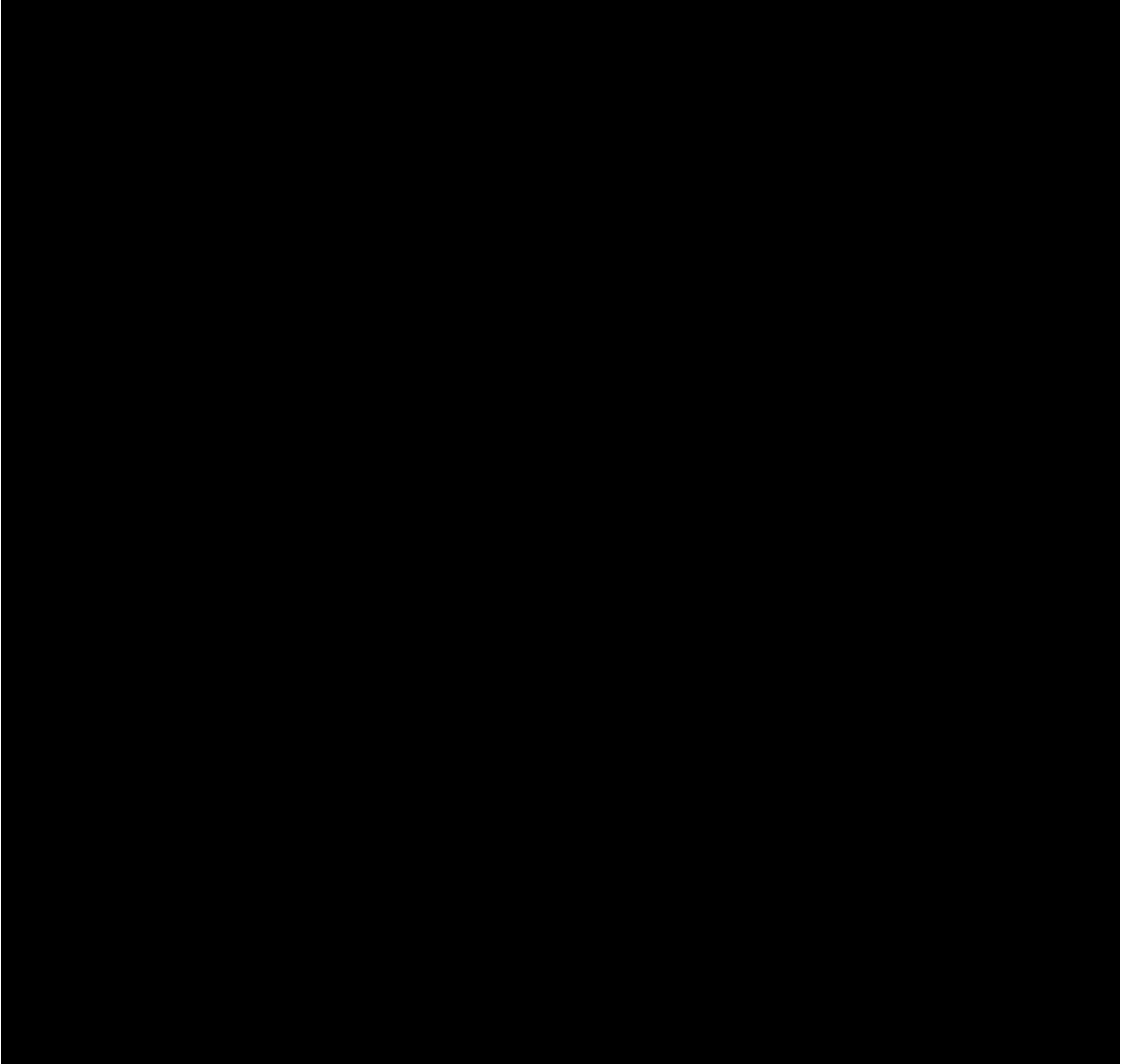
Q. What is your response to these reasons offered by Witness Taylor?

A.

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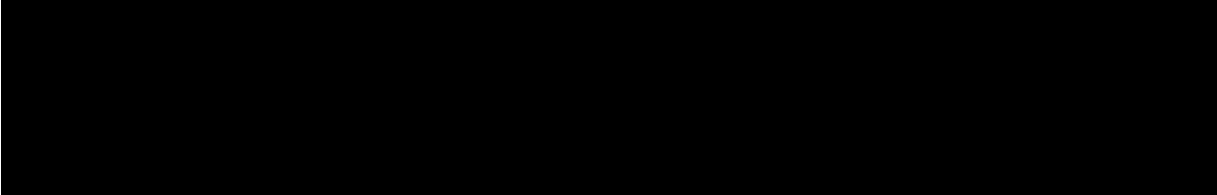
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Q. Is Chairman DeFrank the only one who believes that the Commission needs to act?

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33 A.
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12 **Q. What is your response to Witness Taylor's reason that ongoing FERC and PJM**
13 **activities demonstrate that the policy gap has been addressed?**

14 A.

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[REDACTED]

22 **Q. What major PJM developments have occurred since you filed your direct testimony**
23 **on July 8, 2026?**

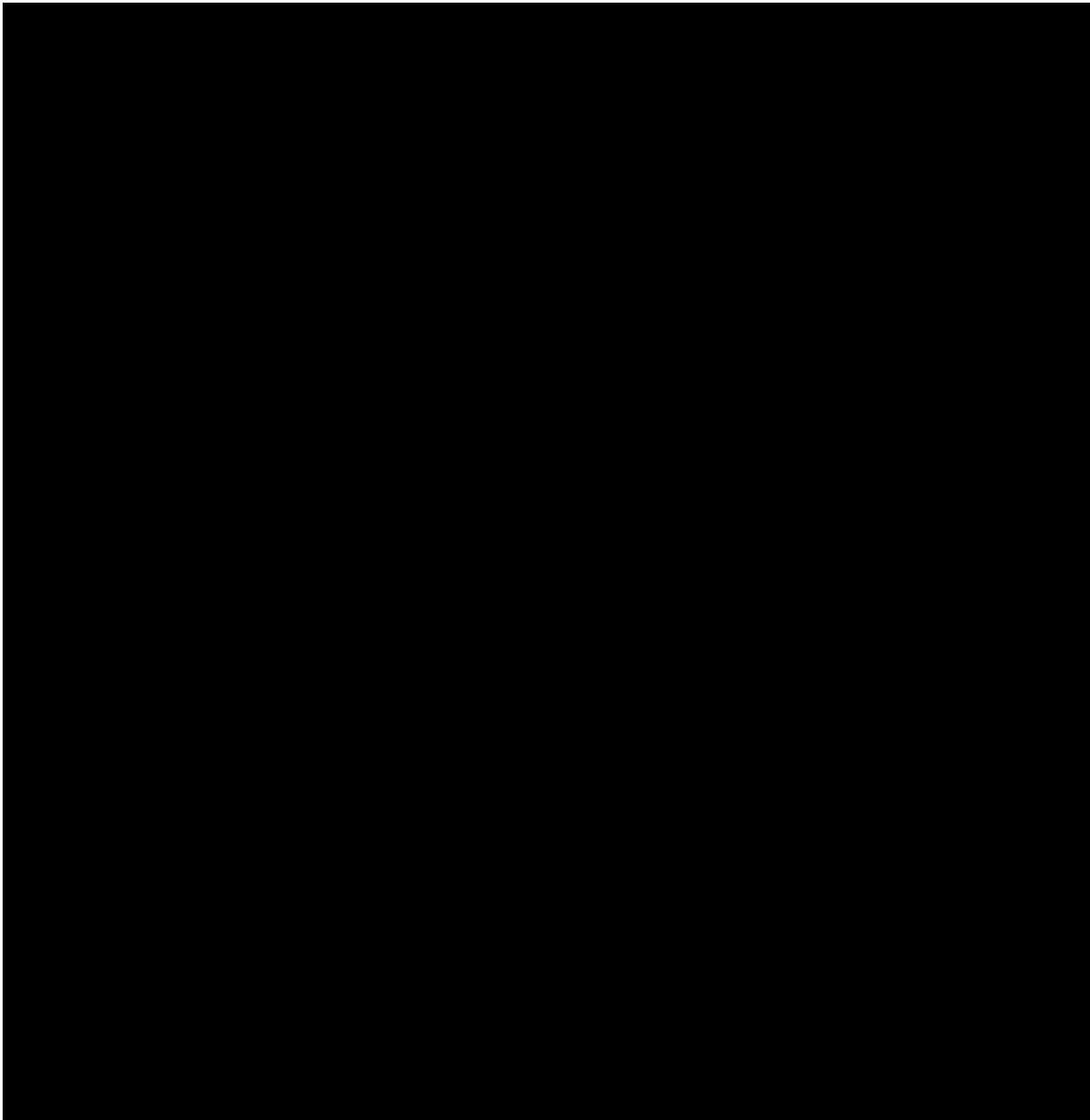
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III. Tariff Issues Raised by Witness Felder Are in Scope

Q. Witness Taylor claims that tariff issues you raised are out of scope. What reasons does he give to support his claim?

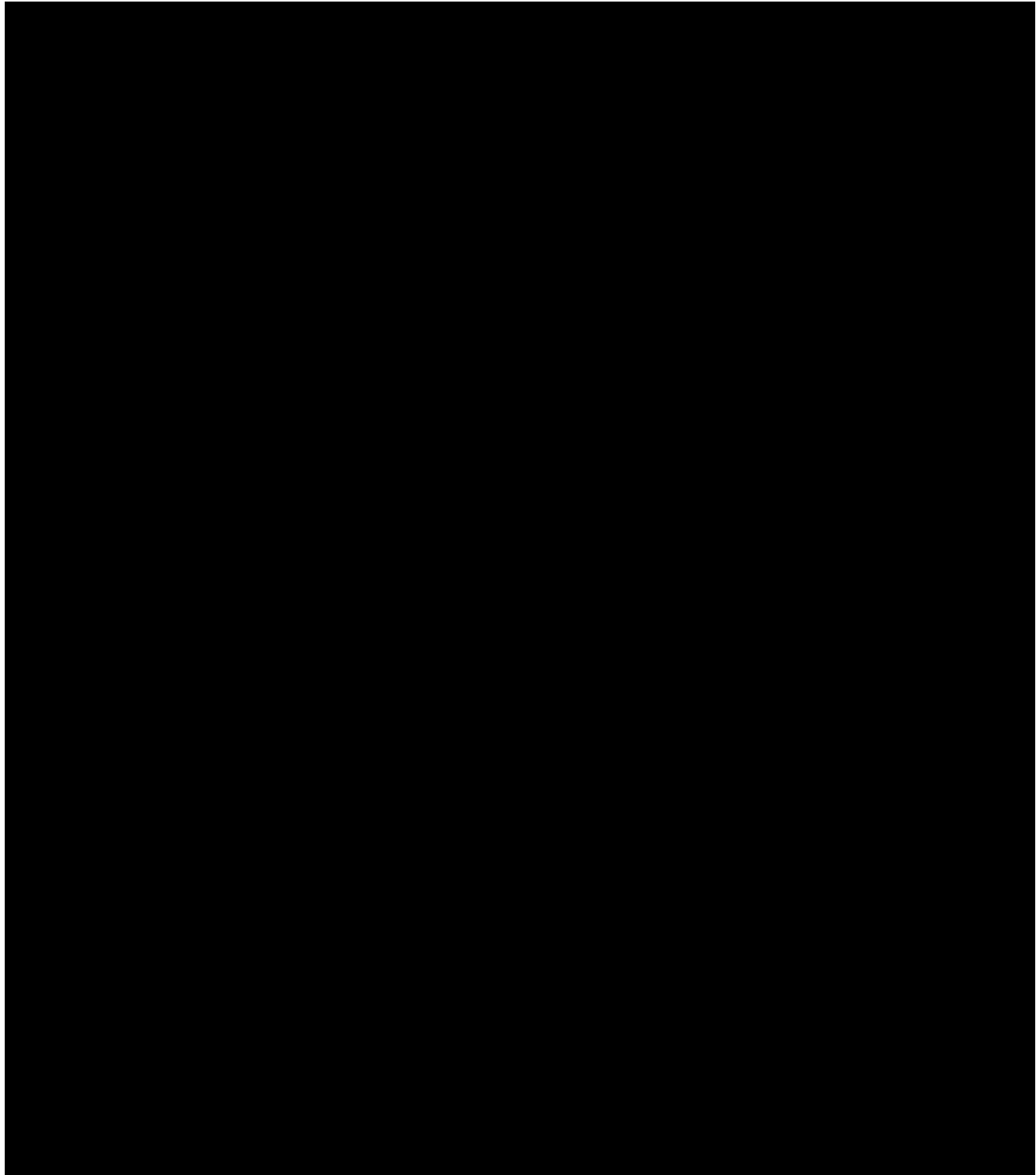
A. [REDACTED]

Q. Do you agree with Witness Taylor that the tariff-related issues you raised are out of scope?

A. [REDACTED]

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Fourth, on August 27, 2026, Chairman DeFrank highlighted as an “exemplary” transaction the example of the Mid-Atlantic Interstate Transmission, LLC project using a LON process to maintain reliability and protect ordinary ratepayers (emphasis added):⁵⁰

Our electrical grid is facing an unprecedented challenge from the growth of data centers and other large loads on our system. My main priority is allowing these customers to interconnect to our system in an orderly fashion while maintaining reliability and protecting ordinary ratepayers from unwarranted cost increases. **Transactions like this one are exemplary of what such a process should look like.** This shows all the relevant parties - generators, transmission owners, and large load customers - working together responsibly to achieve that deployment. I appreciate all the entities involved for working towards a good outcome and urge others to look to this example going forward.

Thus, according to the Chairman of the Commission, it is not only appropriate to use a LON process to maintain reliability and protect ordinary ratepayers from unwarranted cost increases, but it is also a model process.

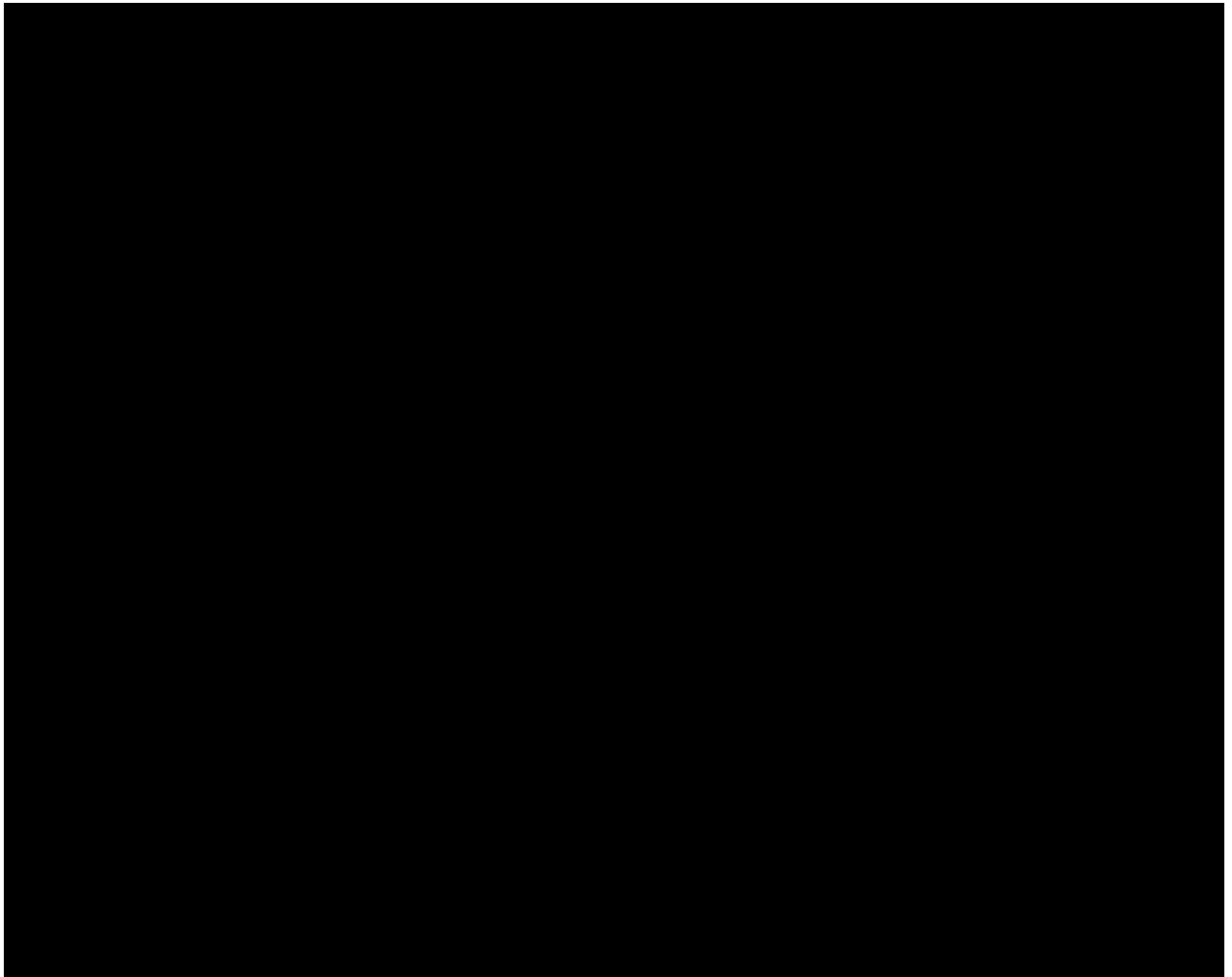
Q. Witness Taylor raises the issue of resource adequacy as an example of tariff-related issues that are out of scope. What reasons does he provide for this claim?

A.

⁵⁰ Statement of Chairman Stephen M. DeFrank, Letter of Notification of Mid-Atlantic Interstate Transmission, LLC (MAIT), Public Meeting of August 27, 2026, Agenda No. 3063643-TUS, Docket No. A-2026-3063643.

Q. What is your assessment of Witness Taylor’s reasons for resource adequacy being out of scope in this proceeding?

A.



Third, Chairman’s DeFrank’s August 27, 2026, statement makes it clear that having customers bring their own generation via a LON process is commendable:⁵⁸

I would like to commend the parties involved in this project, because this is a perfect example of how transmission buildout to serve new large loads should be planned and paid for. In this instance, we have a tech company Microsoft bringing new capacity onto our system. Restarting the reactor at the Crane Clean Energy Center will add 859 MW of highly reliable power to a system in serious need of new generation. Importantly, this new power being commissioned by Constellation will be funded entirely by Microsoft.

⁵⁶ PJM RBP FERC Filing, p. 99.

⁵⁷ Felder Direct, p. 18, lines 1-7.

⁵⁸ Statement of Chairman Stephen M. DeFrank, Letter of Notification of Mid-Atlantic Interstate Transmission, LLC (MAIT), Public Meeting of August 27, 2026, Agenda No. 3063643-TUS, Docket No. A-2026-3063643.

Fourth, Witness Taylor takes issue with my use of the terms ‘reliability’ and ‘resource adequacy.’ As my direct testimony and interrogatory response to PPL make clear, I use the term ‘reliability’ broadly to include resource (generation) adequacy.⁵⁹ Reliability also includes operational security, that is, the ability of the transmission system to withstand outages and maintain service to customers while operating within transmission limits, such as thermal, stability, contingency, and other restrictions. My general use of the term is also consistent with its use in the broader public policy discussions, such as the Ratepayer Protection Pledge, the Governor’s Executive Order, and the two statements of Chairman DeFrank. The Public Utility Code also defines “reliability” to include resource adequacy.⁶⁰ Witness Taylor’s underlying point, I believe, is to try to restrict this proceeding to the transmission reliability issues that the PPL Project is intended to address, which I have already covered.

Q. Witness Taylor states that stranded costs are out of scope for this proceeding. What are the reasons he gives for making this claim?

A. Witness Taylor acknowledges that “customer nonperformance and stranded cost risk are legitimate issues.”⁶¹ He states, however, that stranded-cost protections such as minimum load commitments and credit support provisions, among others, were recently considered by the Commission in the PPL Electric distribution rate case and in the Commission’s broader large-load proceedings.⁶²

⁵⁹ Felder Direct, p. 8, lines 1-4 and associated footnote 16, which notes that reliability consists of resource adequacy and operational security and cites PPL Witness Lookup’s statement that resource adequacy is required for EDUs. Also, see OCA Response to Interrogatories of PPL Electric Utilities Corporation Set I to OCA, PPL to OCA-I-7.

⁶⁰ 66 Pa. C.S. § 2803 (“‘Reliability.’ Includes adequacy and security. As used in this definition, ‘adequacy’ means the provision of sufficient generation, transmission and distribution capacity so as to supply the aggregate electric power and energy requirements of consumers, taking into account scheduled and unscheduled outages of system facilities...”).

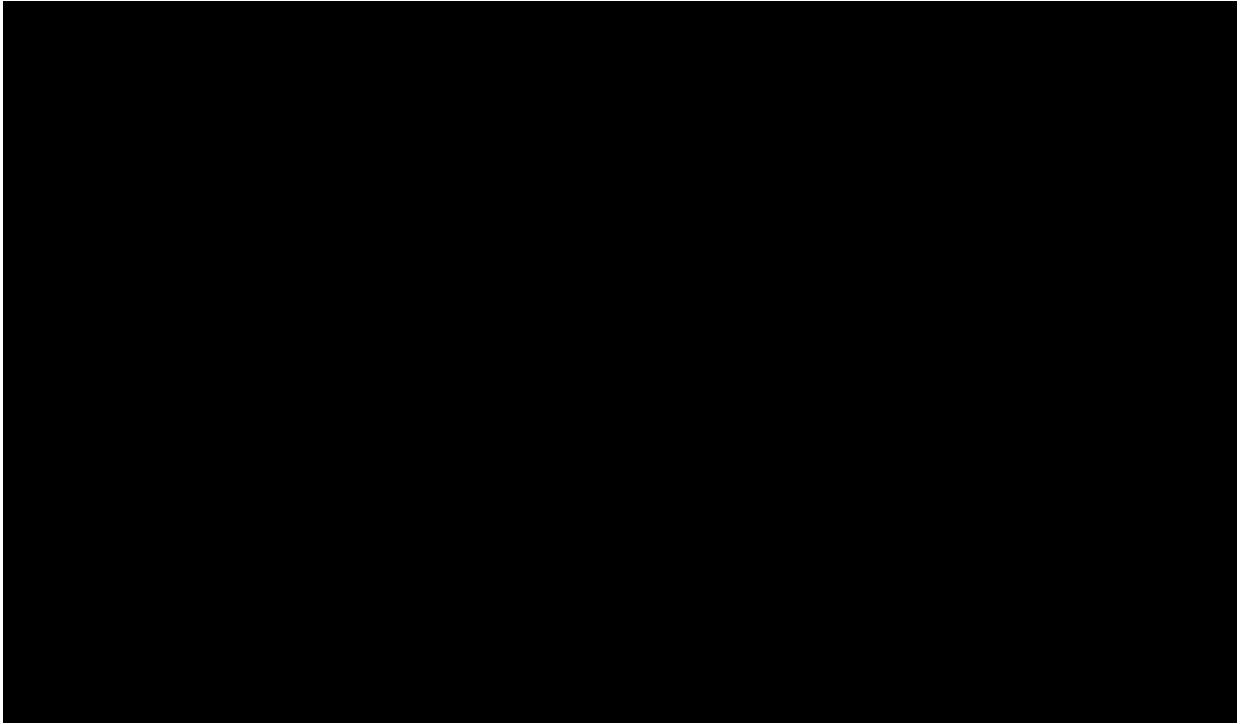
⁶¹ Taylor Rebuttal, p. 42, lines 11-13.

⁶² Taylor Rebuttal, p. 39, lines 6-10. See also p. 42, line 1 through p.44, line 16.

1 **Q. What is your assessment of Witness Taylor's reasons that the issue of stranded costs**
2 **being out of scope in this proceeding?**

3 A.

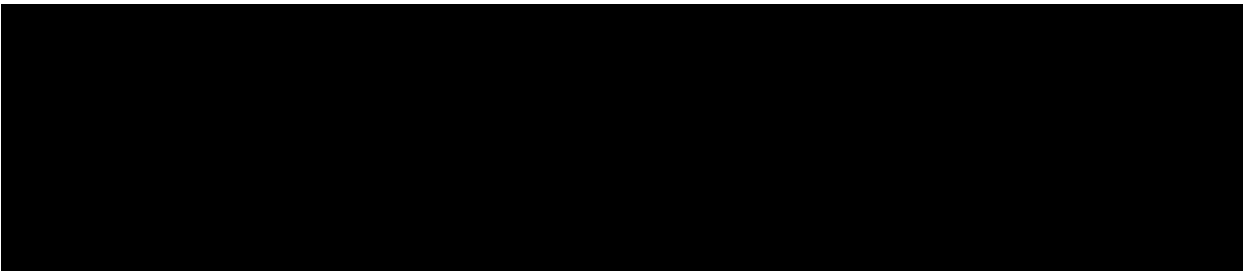
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13 **Q. Witness Taylor states that transmission cost allocation is out of scope for this**
14 **proceeding. What are the reasons he gives for making this claim?**

15 A.

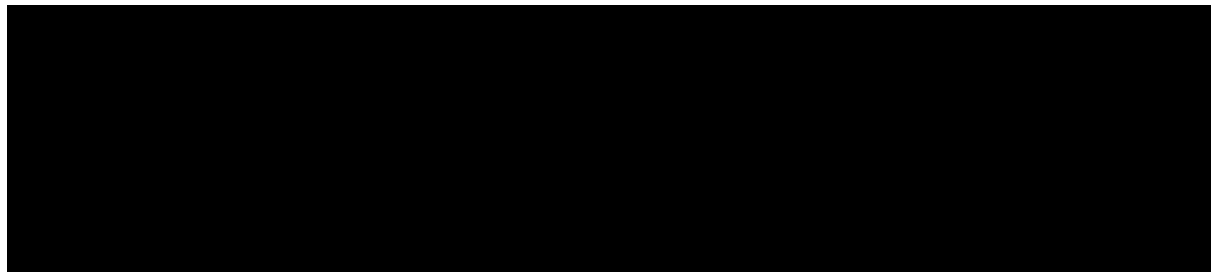
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19 **Q. What is your assessment of Witness Taylor's reasons that transmission cost allocation**
20 **is out of scope in this proceeding?**

21 A.

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IV. Tariff Recommendations by Witness Felder to Protect Ordinary Consumers

Q. Witness Taylor critiques your tariff-related recommendations? What is your response?

A.

[REDACTED]

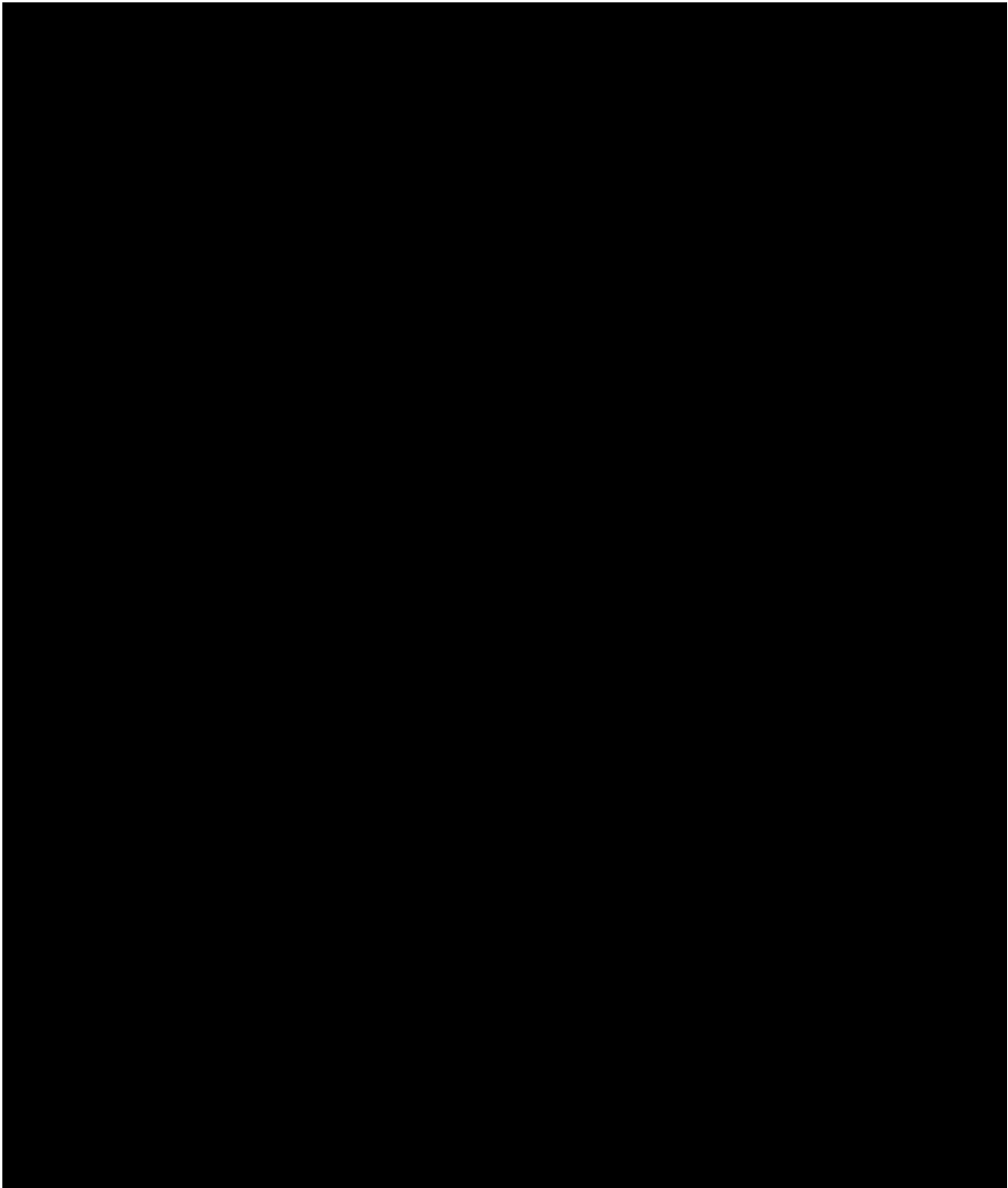
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[REDACTED]

V. Conclusion

Q. Does this conclude your testimony?

A. Yes. I reserve the right to update any portion of my testimony as needed if additional relevant information is made available during this proceeding.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

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PA Code Chapter 57 with respect to the :
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connect the existing Susquehanna- :
Harwood #1 & #2 transmission lines on the :
New Tomhicken 230 kV switchyard that :
are respectively located in Luzerne County, :
Pennsylvania :

VERIFICATION

I, Frank A. Felder, Ph.D., hereby state that the facts above set forth in my Surrebuttal Testimony, OCA Statement No. 1SR, are true and correct to the best of my knowledge, information, and belief and that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa.C.S. Section 4904 (relating to unsworn falsification to authorities).

DATED: September 4, 2026

Signature:



Frank A. Felder, Ph.D.

Address:

Independent Electricity
Consultants LLC
1855 Saint Francis Street
#1612
Reston, VA 20190

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of PPL Electric	:	
Utilities Corporation Filed Pursuant to 52	:	
Pa. Code Chapter 57 Subchapter G, for	:	
Approval to Build Approximately 1.1 Miles	:	Docket No.: A-2025-3059443
of New Parallel Double Circuit 230 kV	:	
Transmission Taps that are Needed to	:	
Connect the Existing Susquehanna-	:	
Harwood #1 & #2 Transmission Lines on	:	
the New Tomhicken 230 kV Switchyard	:	
that are Respectively Located in Luzerne	:	
County, Pennsylvania	:	

SURREBUTTAL TESTIMONY

OF

Rao Konidena

On behalf of the

PENNSYLVANIA OFFICE OF CONSUMER ADVOCATE

Date Served: September 4, 2026

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Introduction

Q: Please state your name and business address.

A: My name is Rao Konidena. My business address is Rakon Energy LLC, Roseville, MN 55113.

Q: Have you previously submitted testimony in this proceeding?

A: Yes. I submitted my Direct Testimony on July 8, 2026, which was marked as OCA Statement No. 2. My qualifications and experience are attached to my Direct Testimony.

Q: What is the purpose of your surrebuttal testimony?

A: The purpose of my surrebuttal testimony is to address the issues raised by PPL Electric Utilities Company (“PPL”) witnesses Mr. Lookup (PPL Statement No. 1-R), Mr. Taylor (PPL Statement No. 5-R), and Mr. Swartzentruber (PPL Statement No. 2-R) in their rebuttal testimonies.

Q: How is your surrebuttal testimony organized?

A: My surrebuttal testimony is organized by topics as follows:

- I. Scope / Separability of Design and Cost Allocation
- II. Breaker-and-a-Half Design as a Cost-Allocation-Driven Choice
- III. Phase 1 and Phase 2 Interdependency

IV. Bay 1 — Function and Cost Allocation Are the Same Question

V. Customer-Triggered vs. Customer-Specific

VI. Nescopeck Alternative

VII. Cost Allocation Comparator

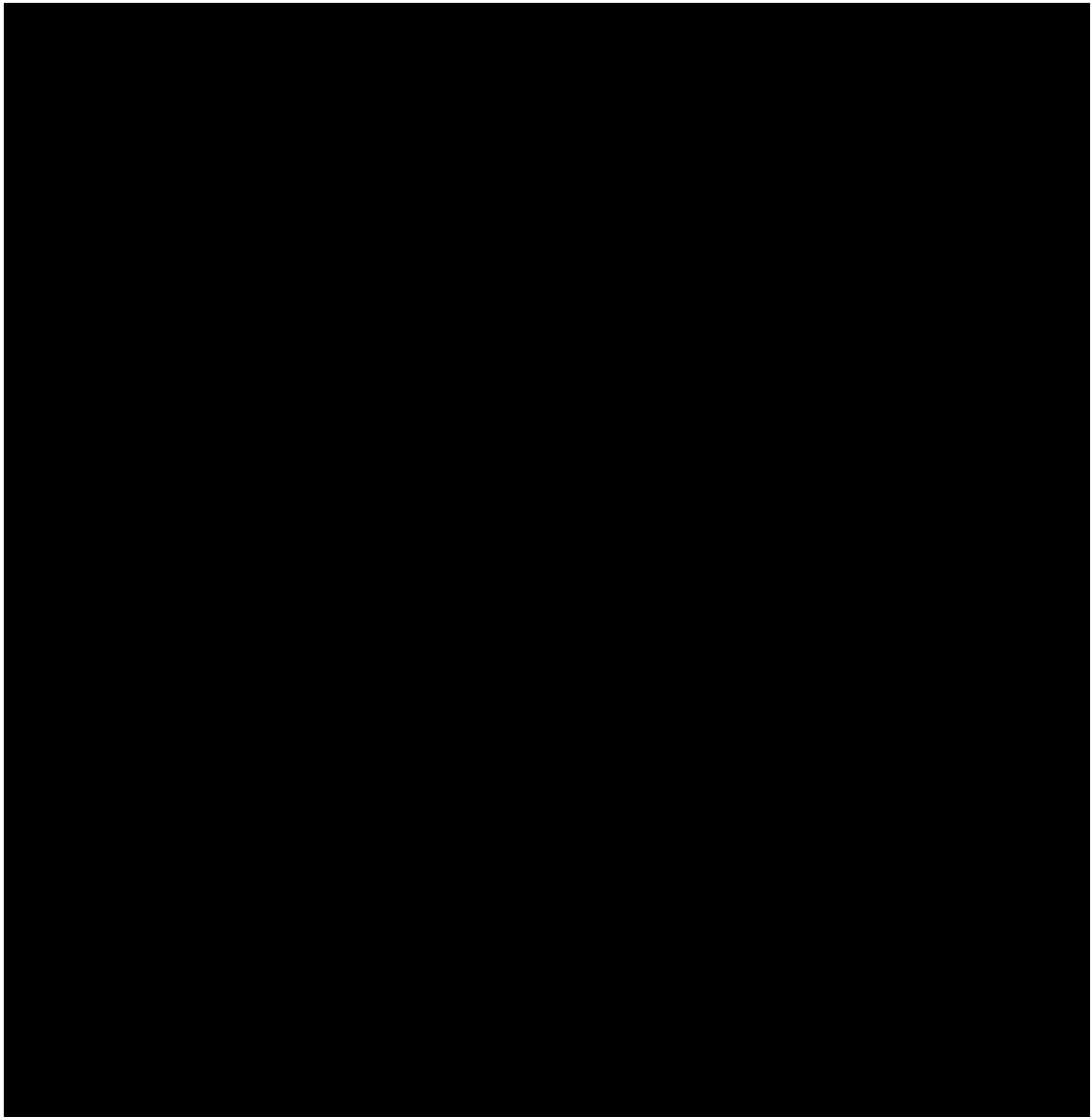
VIII. Conclusion.

Q: Please summarize your testimony.

A: My testimony shows that PPL has not justified allocating \$38.4 million of the Tomhicken Project's costs to ratepayers, and that the record contains multiple unresolved inconsistencies in PPL's own testimony and discovery responses that the Commission should require PPL to address before approving the construction of the Project. My testimony is summarized as follows:

- The Commission cannot rely on a design description that keeps shifting, or on a rebuttal that misstates the record it claims to respond to. PPL's own descriptions of the Tomhicken Switchyard keep changing. PPL's discovery response confirms

1 the physical facility has not changed, yet PPL's rebuttal testimony conflicts with
2 responses provided in discovery regarding the number of bays in the switchyard.

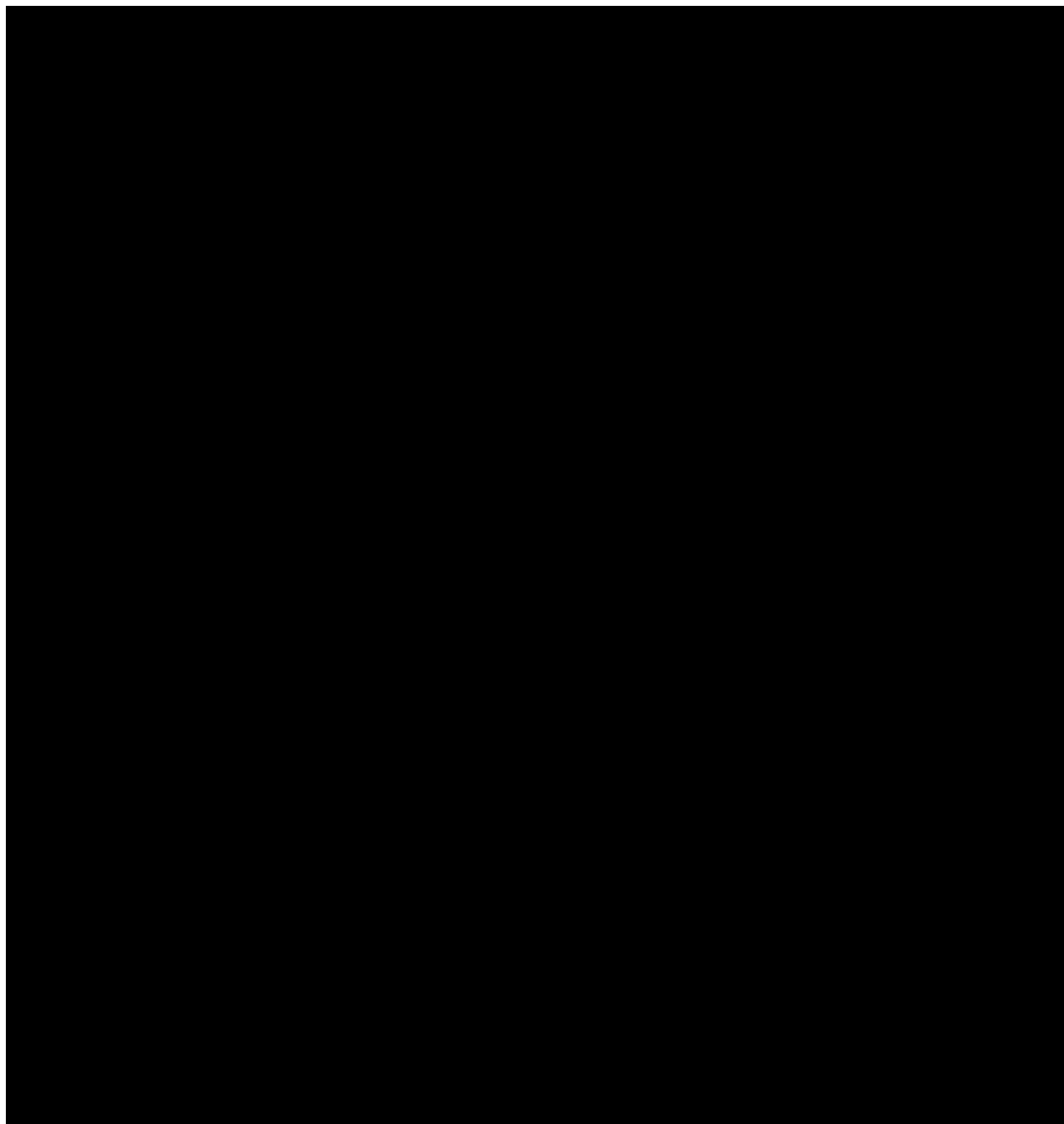


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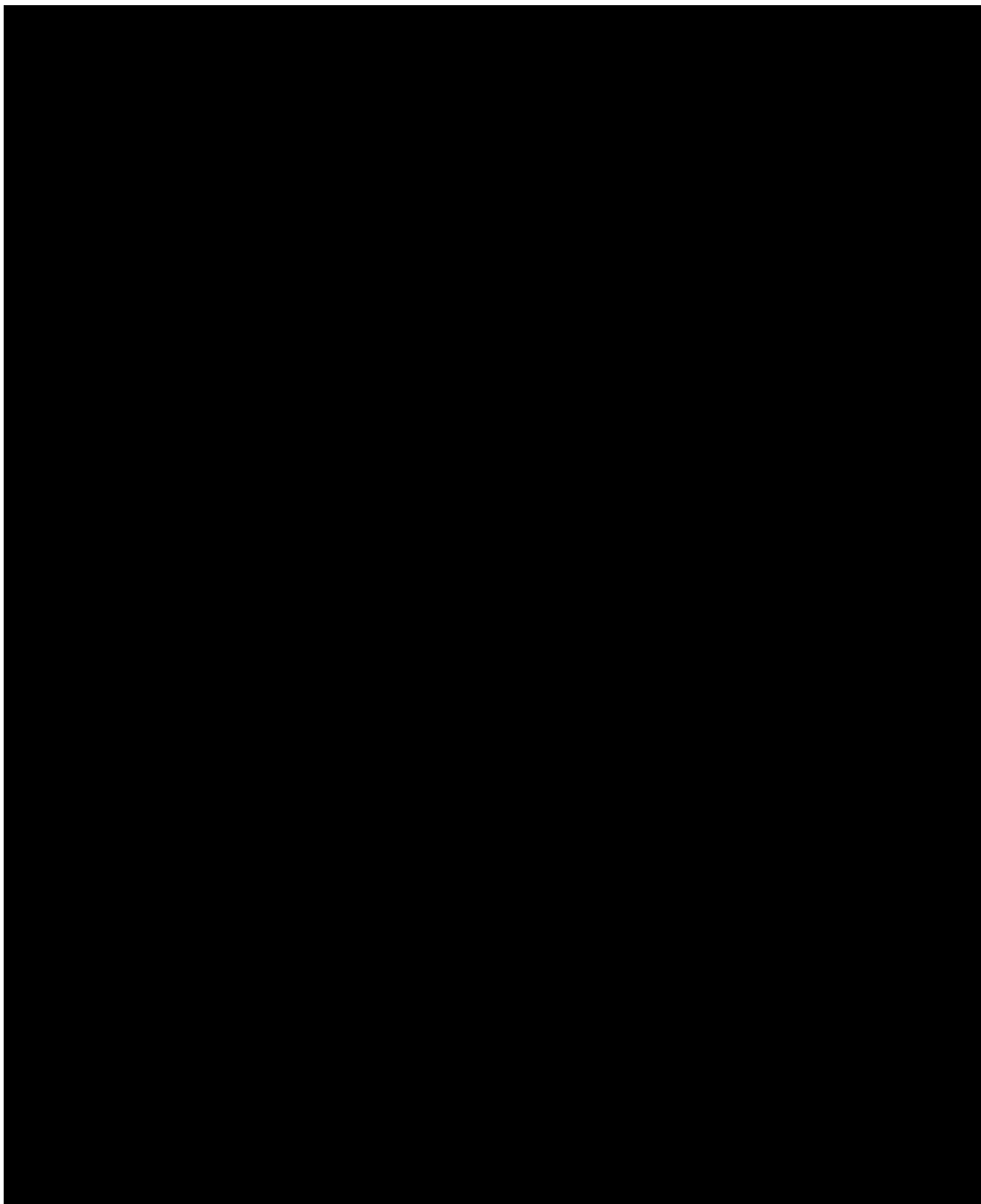
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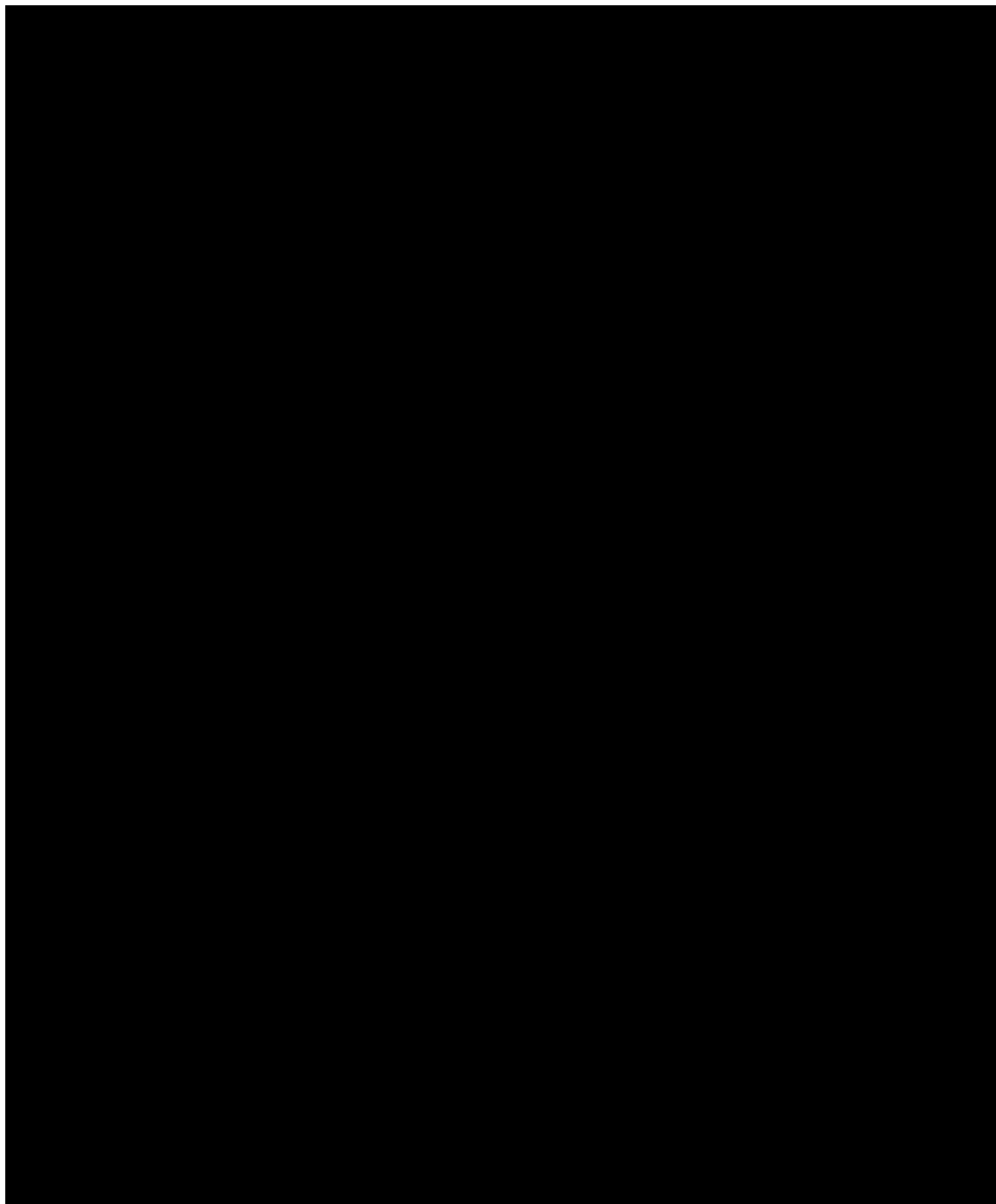
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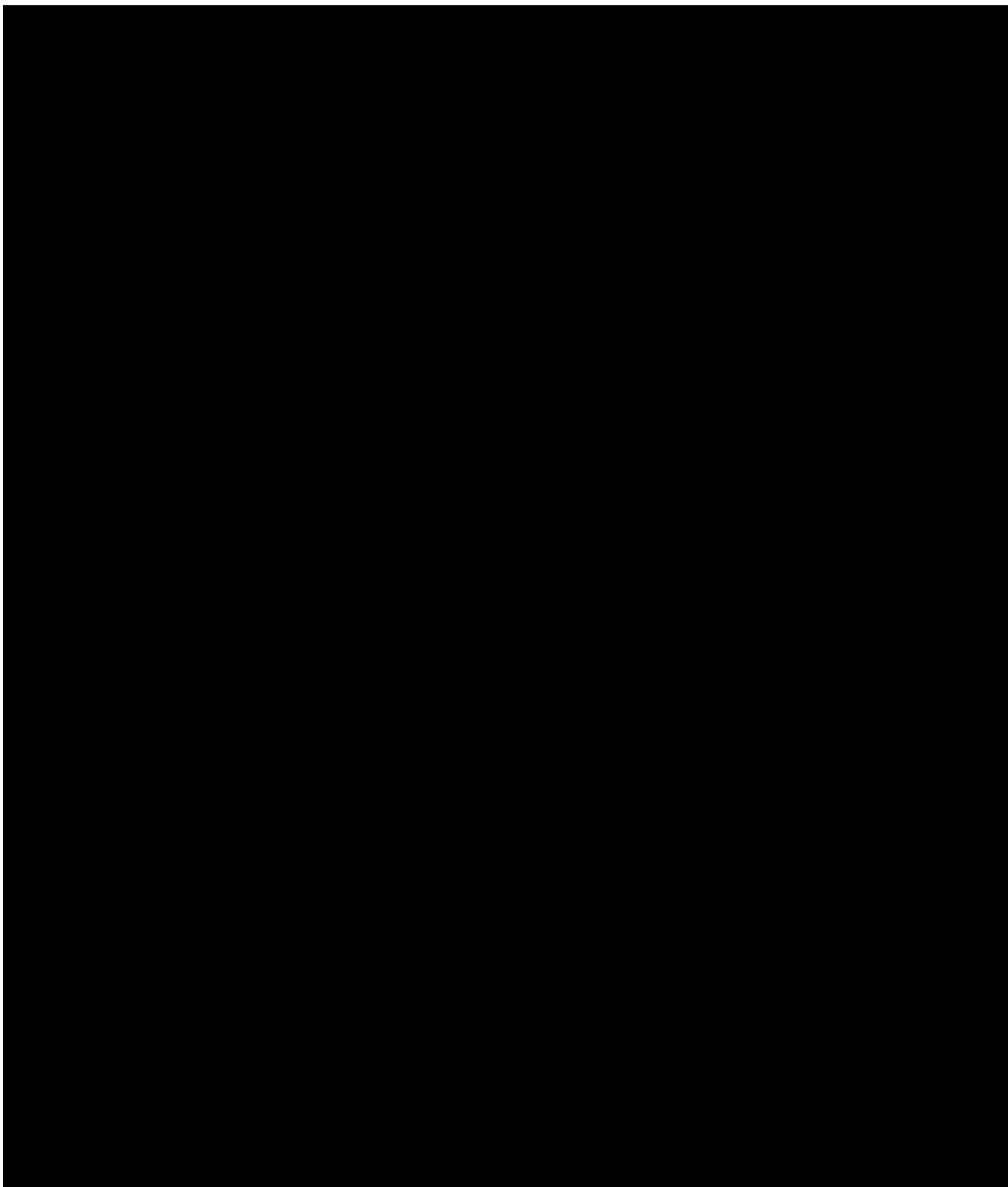
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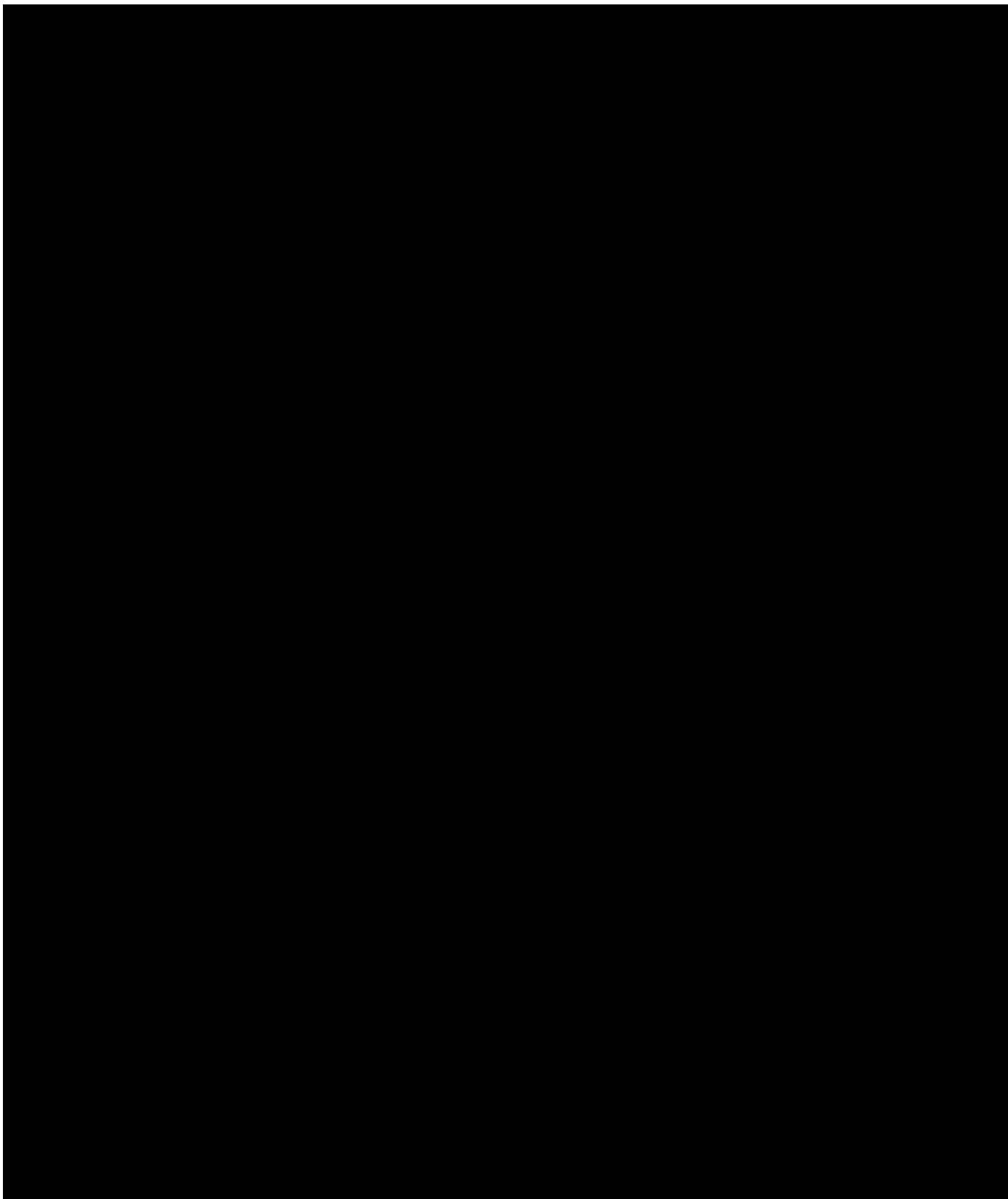
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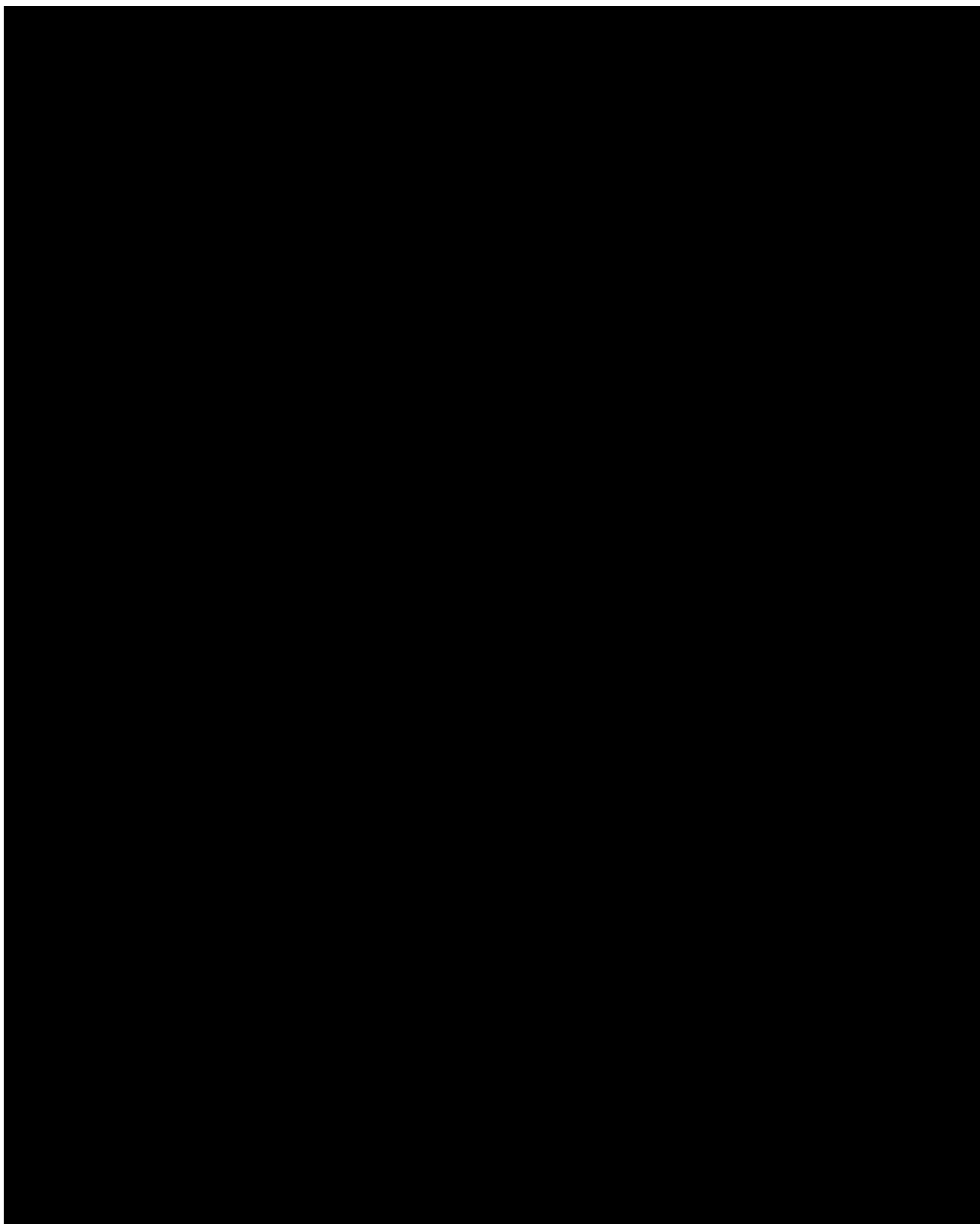
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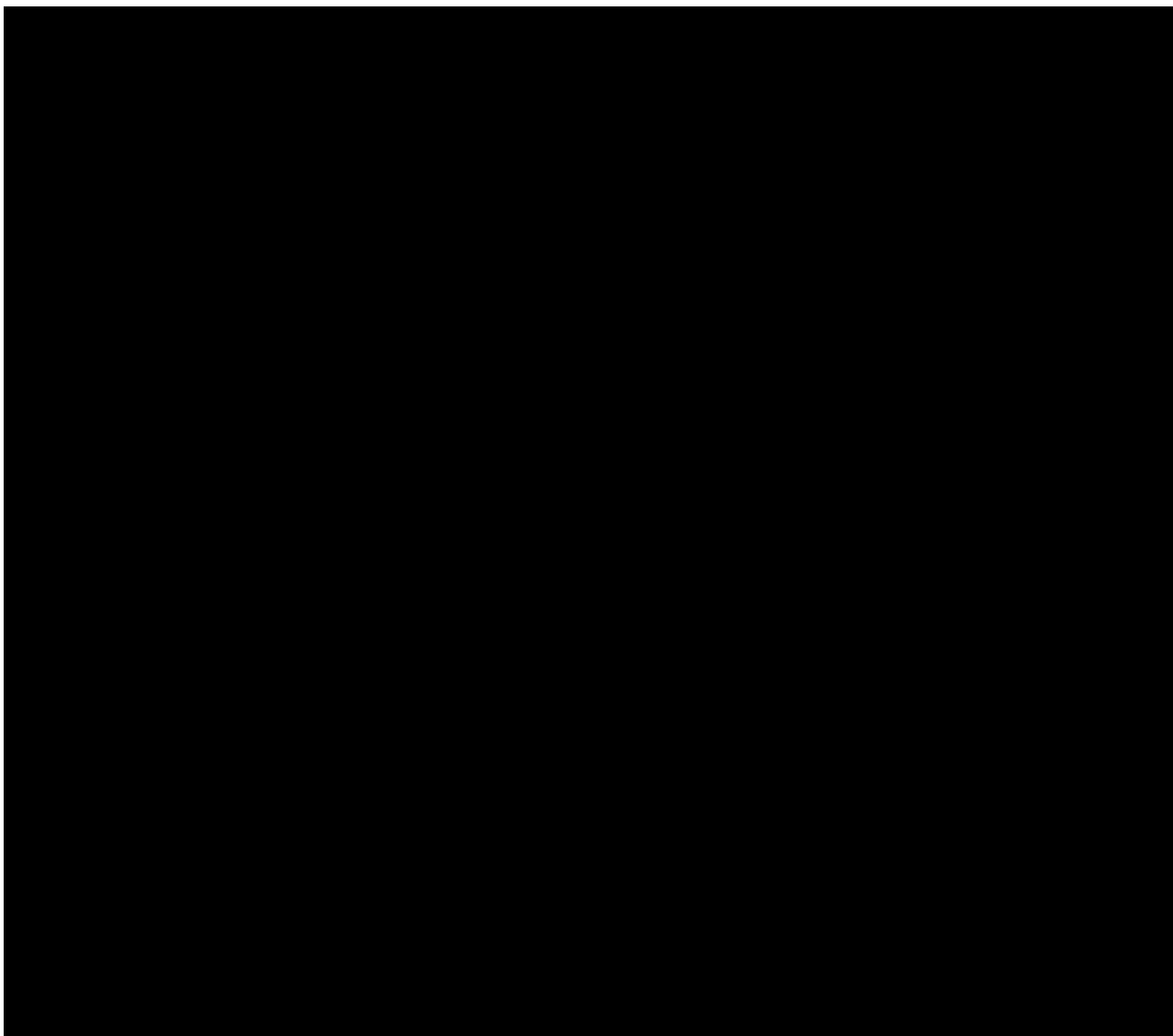
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III. Phase 1 and Phase 2 Interdependency (Lookup & Taylor)

Q: Do you agree with Mr. Lookup’s response that the benefits of the Tomhicken 230 kV Switchyard are not contingent upon the Sugarloaf 500/230 kV Transmission Line Project (Statement No. 1-R, pp. 20-21)?

A: No, I disagree, and I note that Mr. Lookup’s own rebuttal testimony concedes the central point of my direct testimony on this issue. Mr. Lookup states: “the initial Phase 1 scope does not directly increase the capacity of the Susquehanna–Harwood corridor.”⁵⁸ This is consistent with my direct testimony’s position that “PPL has not established that these benefits are realized under Phase 1 alone.”⁵⁹

Mr. Lookup’s rebuttal testimony then asserts that the Tomhicken Switchyard nonetheless “provides the benefit of the expansion of the 230 kV network,” “will allow for additional transmission lines,” “will increase system reliability,” and “provide[s] additional system resiliency and greater operational flexibility. . . .”⁶⁰ As with the other benefit claims addressed elsewhere in this testimony, none of these assertions is supported by a quantitative analysis specific to this Project, and none identifies which of these claimed benefits, if any, are realized under Phase 1 alone as opposed to depending on the future, unapproved Phase 2 construction.⁶¹ Mr. Lookup’s own concession that Phase 1 does not increase corridor capacity supports rather than undermines my direct

⁵⁸ Lines 10-11, Page 20, PPL Statement No. 1-R.

⁵⁹ Lines 18-19, Page 29, OCA Statement No. 2.

⁶⁰ Lines 11-19, Page 27, PPL Statement No. 1-R.

⁶¹ Lines 7-8, Page 99, OCA Statement No. 2.

testimony's conclusion that the network benefits PPL claims for the Tomhicken Switchyard remain contingent upon Phase 2.

Q: Do you agree with Witness Lookup that “the Tomhicken 230kV Switchyard would have been designed in a breaker-and-a-half arrangement regardless of the Phase 2 scope” (Statement No. 1-R, p. 26)?

A: No, I disagree with the conclusion Mr. Lookup draws, though I agree with a narrower point underlying it. As I stated in my direct testimony, “BAAH provides greater operational reliability than a ring bus configuration,”⁶² and I do not dispute that PPL would likely have selected a BAAH configuration type independent of Phase 2. I disagree, however, that this resolves the question Mr. Lookup's rebuttal testimony actually addresses — whether the Tomhicken Switchyard as designed and sized is independent of Phase 2. The choice of configuration type is a different question from how that configuration was sized and built.

As I explained in my direct testimony, PPL confirmed that “[t]he splitting of the Susquehanna-Harwood #1 & #2 230kV Transmission Lines was designed to allow the future Phase 2 lines to terminate into the Tomhicken Switchyard and Harwood Substation without requiring line crossings,”⁶³ and that “[t]he Tomhicken 230kV Switchyard will have a line termination point for the Phase 2 scope.”⁶⁴ As addressed further below, Mr. Lookup's rebuttal testimony confirms this same point in his own words.⁶⁵ Mr. Lookup's

⁶² Line 13, Page 30, OCA Statement No. 2.

⁶³ Lines 5-7, Page 60, OCA Statement No. 2.

⁶⁴ Lines 15-16, Page 71, OCA Statement No. 2.

⁶⁵ Lines 15-16, Page 18, PPL Statement No. 1-R.

1 rebuttal testimony also relies on a line count — described variously as “eight lines”⁶⁶
 2 and, elsewhere in PPL’s discovery responses, as “nine lines connected as part of Phase 1
 3 and Phase 2”⁶⁷ — to justify the specific bay configuration and termination capacity of the
 4 switchyard as built. Regardless of which configuration type PPL would have chosen, the
 5 specific design PPL is asking ratepayers to fund — its bay count, its line-split routing,
 6 and its termination capacity — was, by PPL’s own admission, shaped by accommodating
 7 Phase 2. Agreeing that BAAH is generally the more reliable configuration does not mean
 8 I agree that the Tomhicken Switchyard as designed and costed in this proceeding is
 9 independent of Phase 2.

10 PPL’s discovery response confirms this same conclusion, and also confirms that
 11 PPL has not answered the specific question presented. When asked to state whether the
 12 number of bays, the bus bar configuration, and the overall footprint of the Tomhicken
 13 Switchyard would be identical under a Phase-1-only scenario, PPL did not answer that
 14 question. PPL responded only that “[t]he use of a BAAH arrangement would still be
 15 required,” and further stated that “Phase 2 is required to reliably serve the customer’s
 16 requested load and therefore the switchyard is designed to accommodate the future
 17 Nescopeck – Tomhicken 230 kV line.”⁶⁸ That response confirms, in PPL’s own words,
 18 that the switchyard’s design accommodates Phase 2 requirements. It leaves unanswered
 19 whether the bay count, configuration, or footprint of the Tomhicken Switchyard as
 20 actually built would be identical absent Phase 2. PPL has had the opportunity to state

⁶⁶ “Under Phase 1, PPL Electric proposes building the Tomhicken 230 kV switchyard as a breaker-and-a-half configuration due to the total of **eight lines** to be terminated at the switchyard.” Lines 13-15, Page 16, PPL Statement No. 1-R (emphasis added).

⁶⁷ “The proposed Tomhicken Switchyard is to have **nine lines** connected as part of Phase 1 and Phase 2.” PPL Response to OCA V-4(c) (emphasis added).

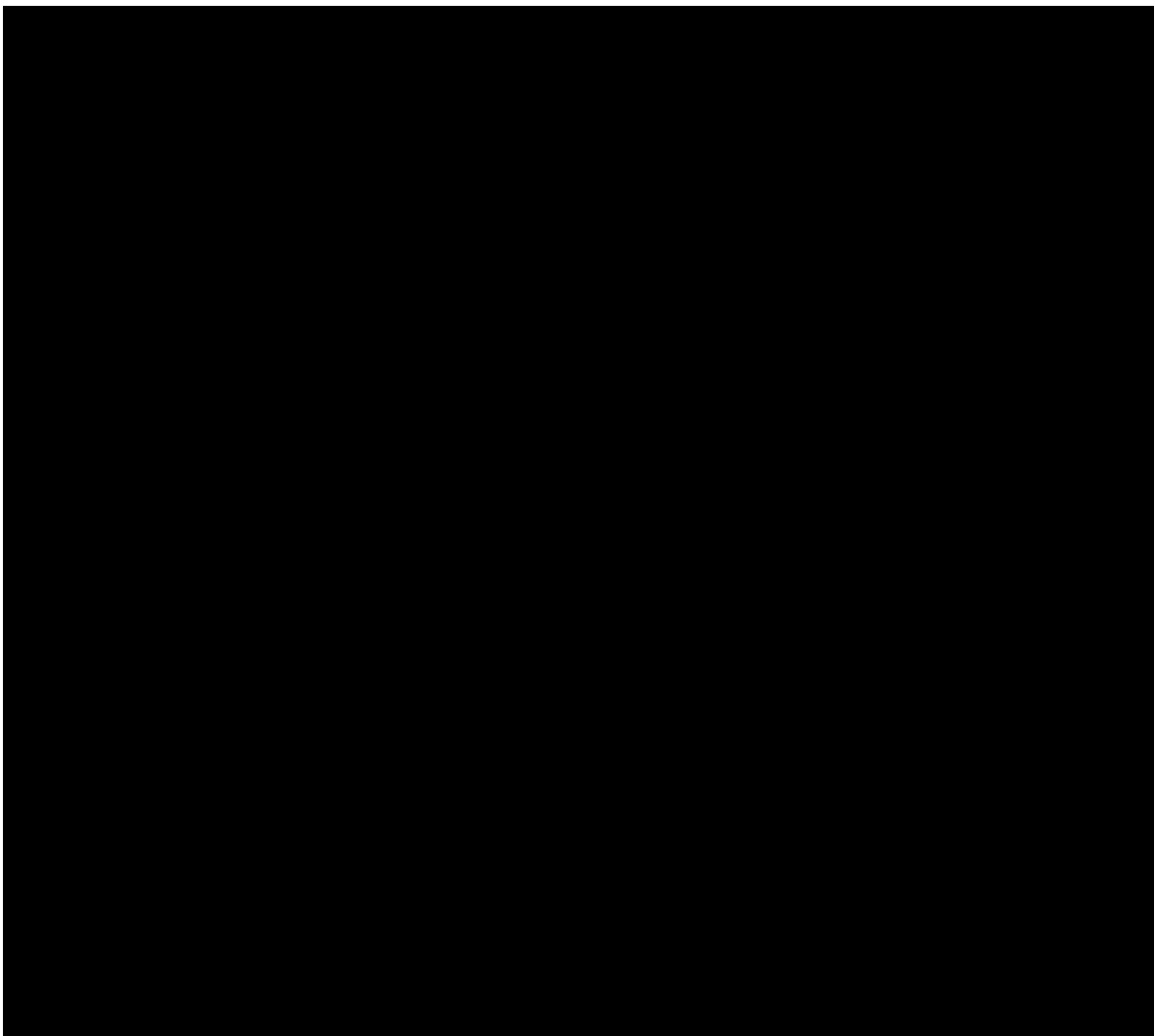
⁶⁸ PPL Response to OCA XIV-5(a), (b).

1 affirmatively that the design as built would be unchanged without Phase 2, and it has not
2 done so.

3
4 **Q: Do you agree with one of Witness Taylor’s conclusions that “forward-looking design**
5 **does not make a facility customer-specific”⁶⁹ as applied to the Tomhicken**
6 **Switchyard?**

7 **A:**

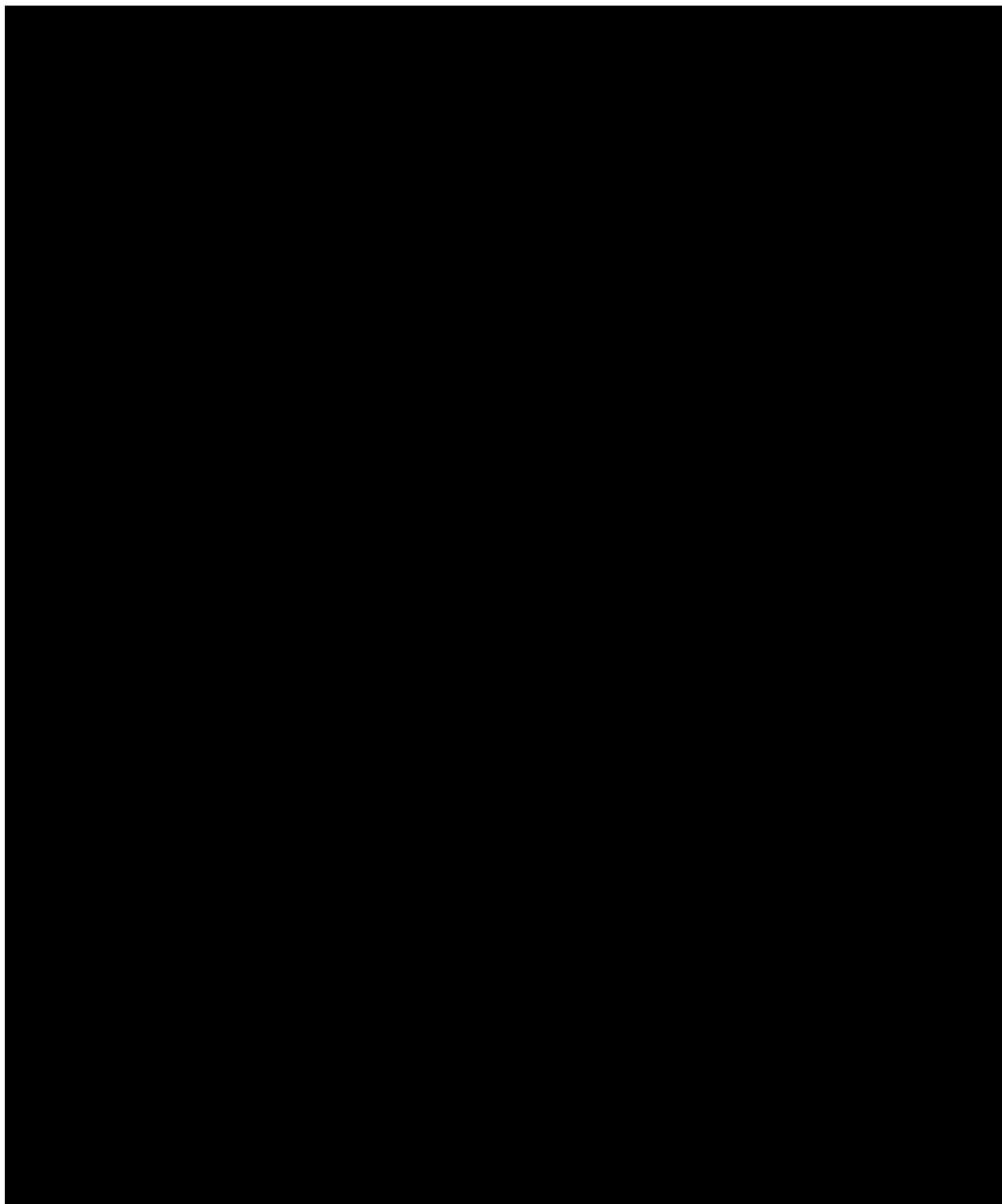
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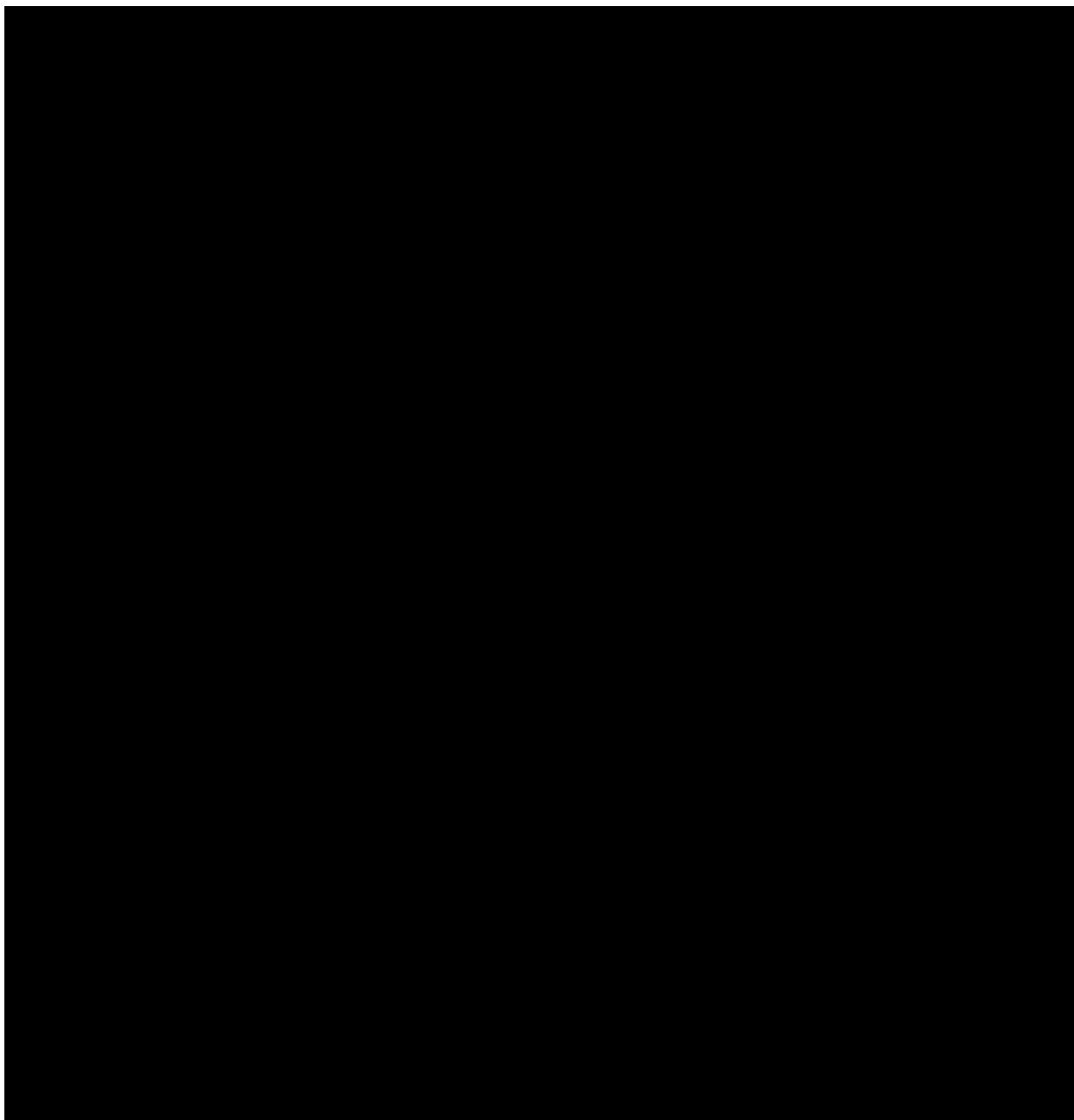
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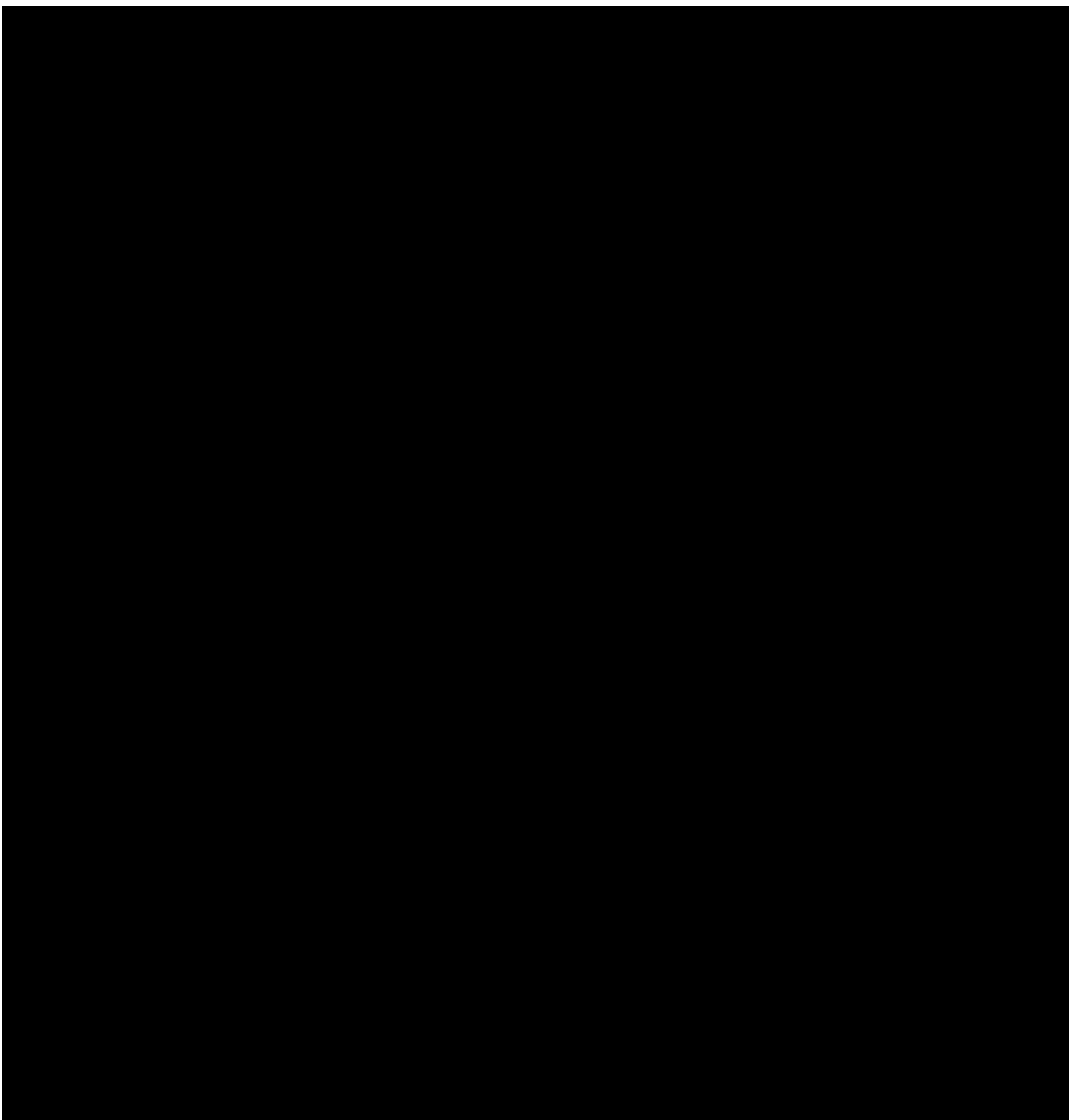
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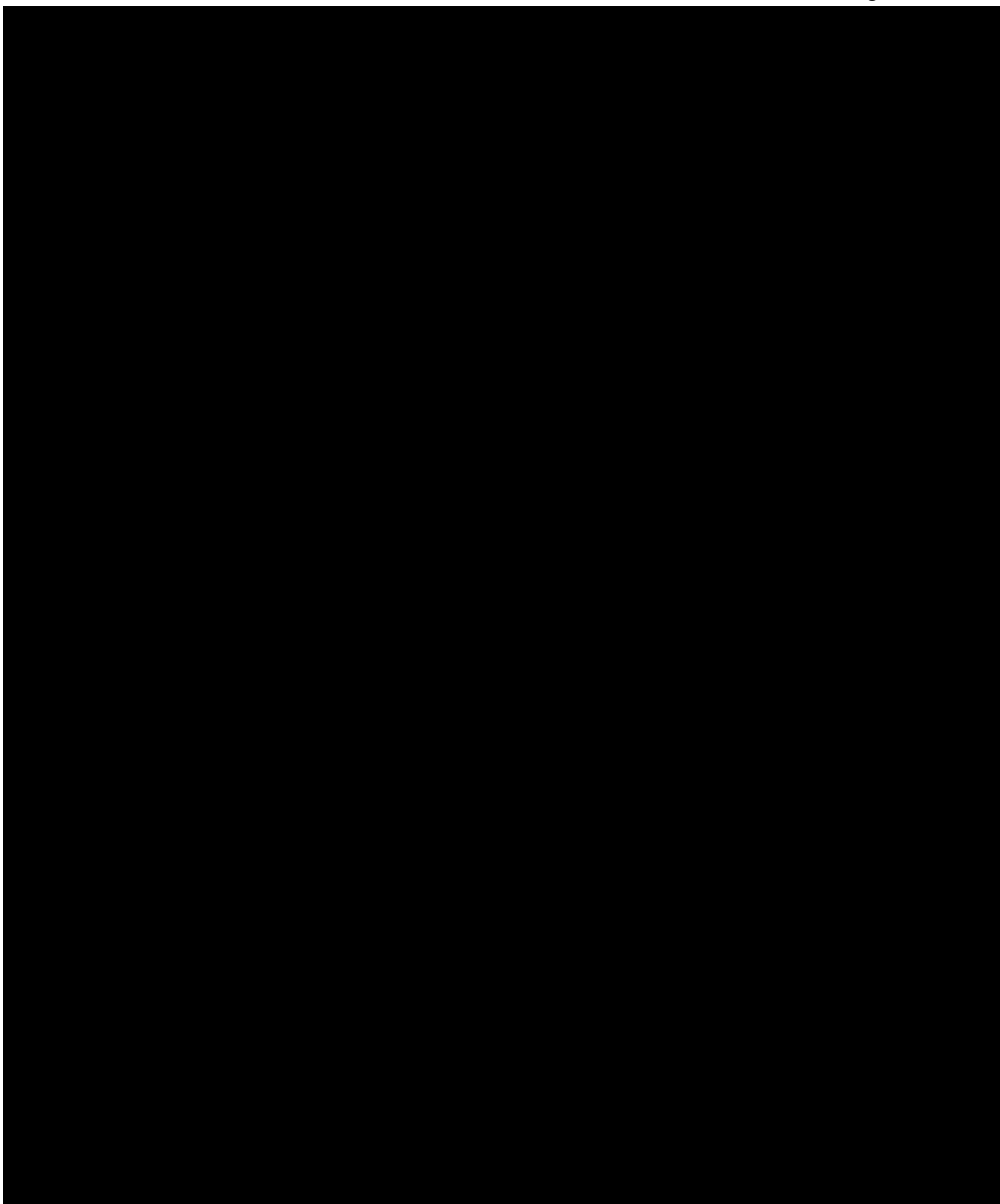
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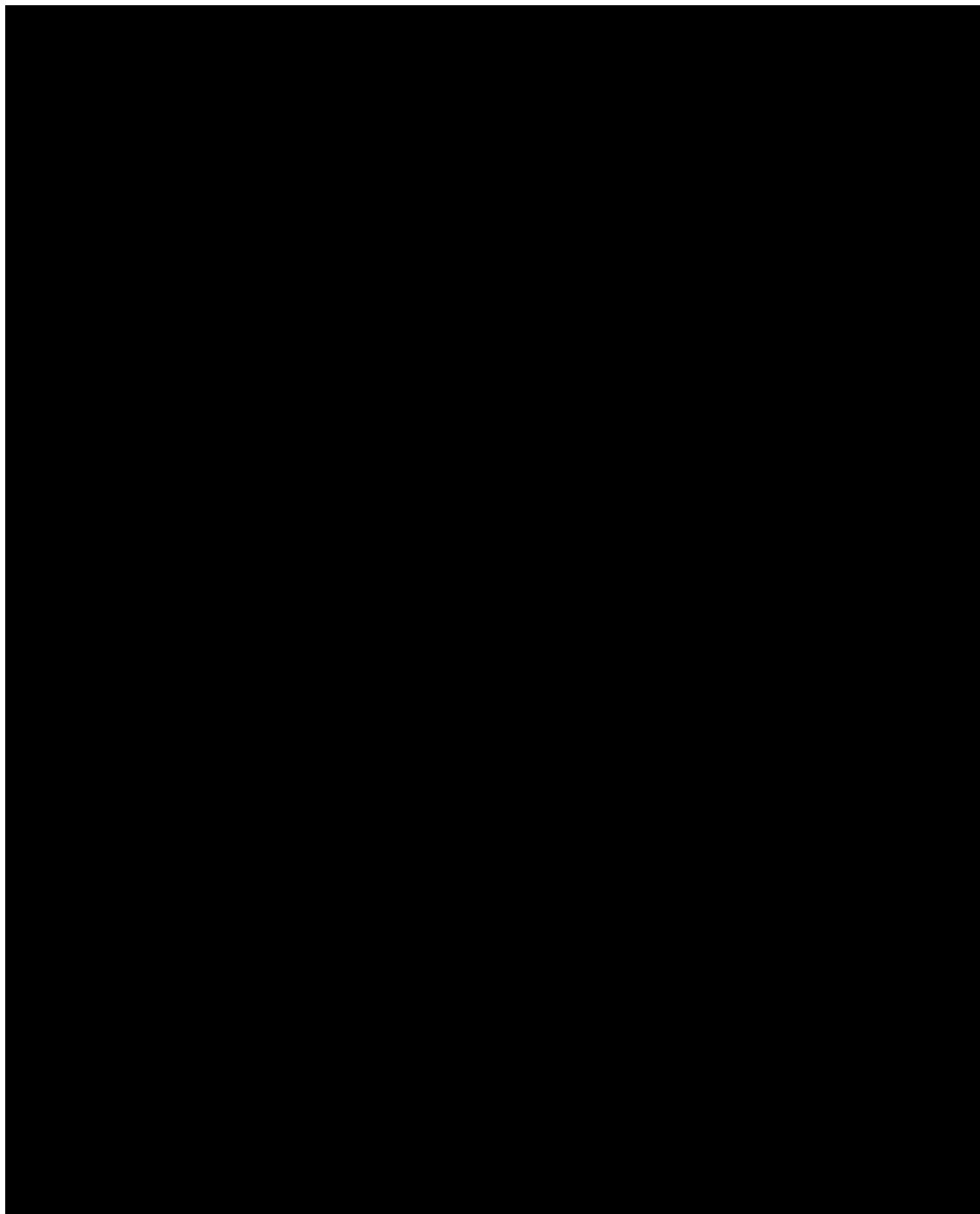
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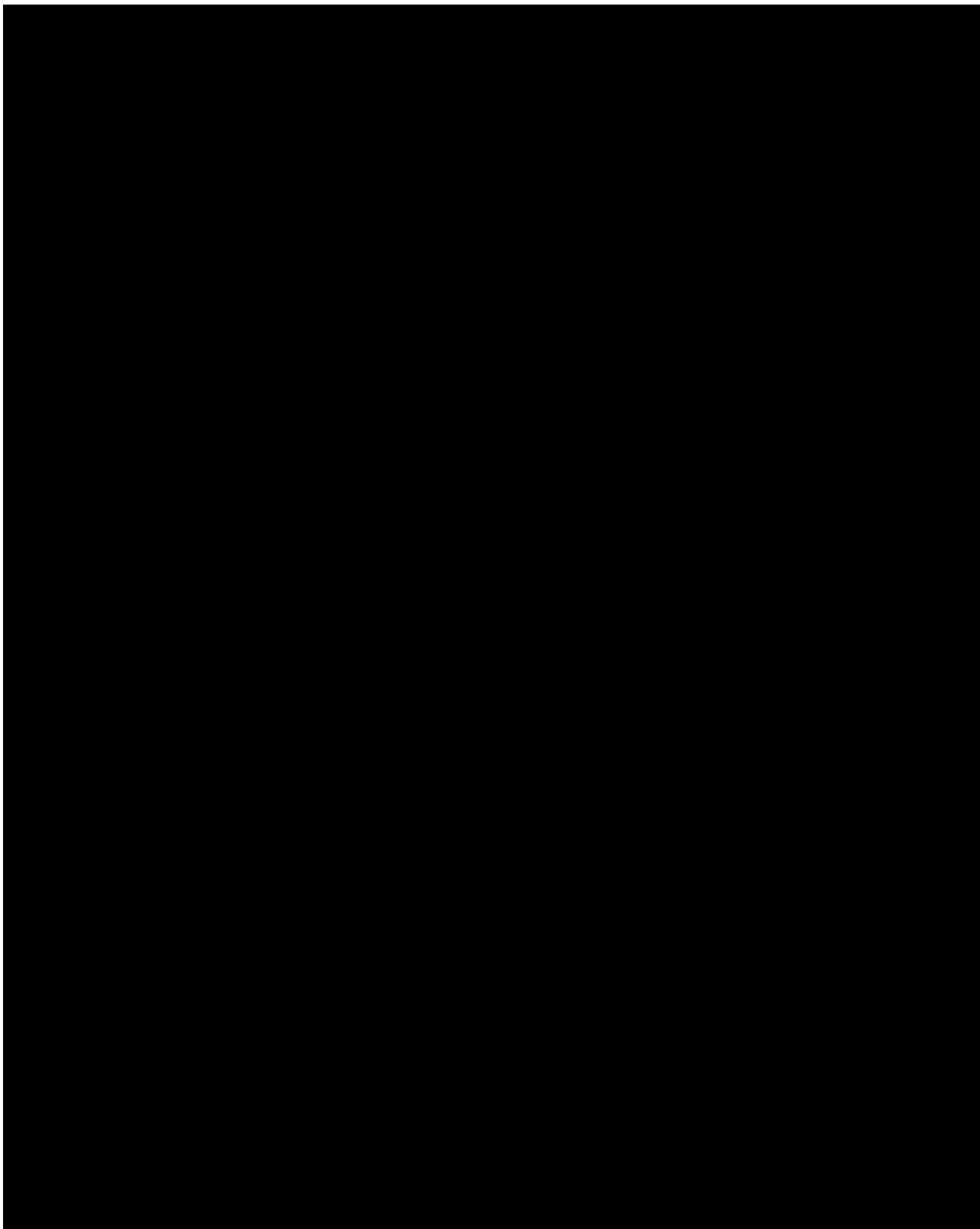
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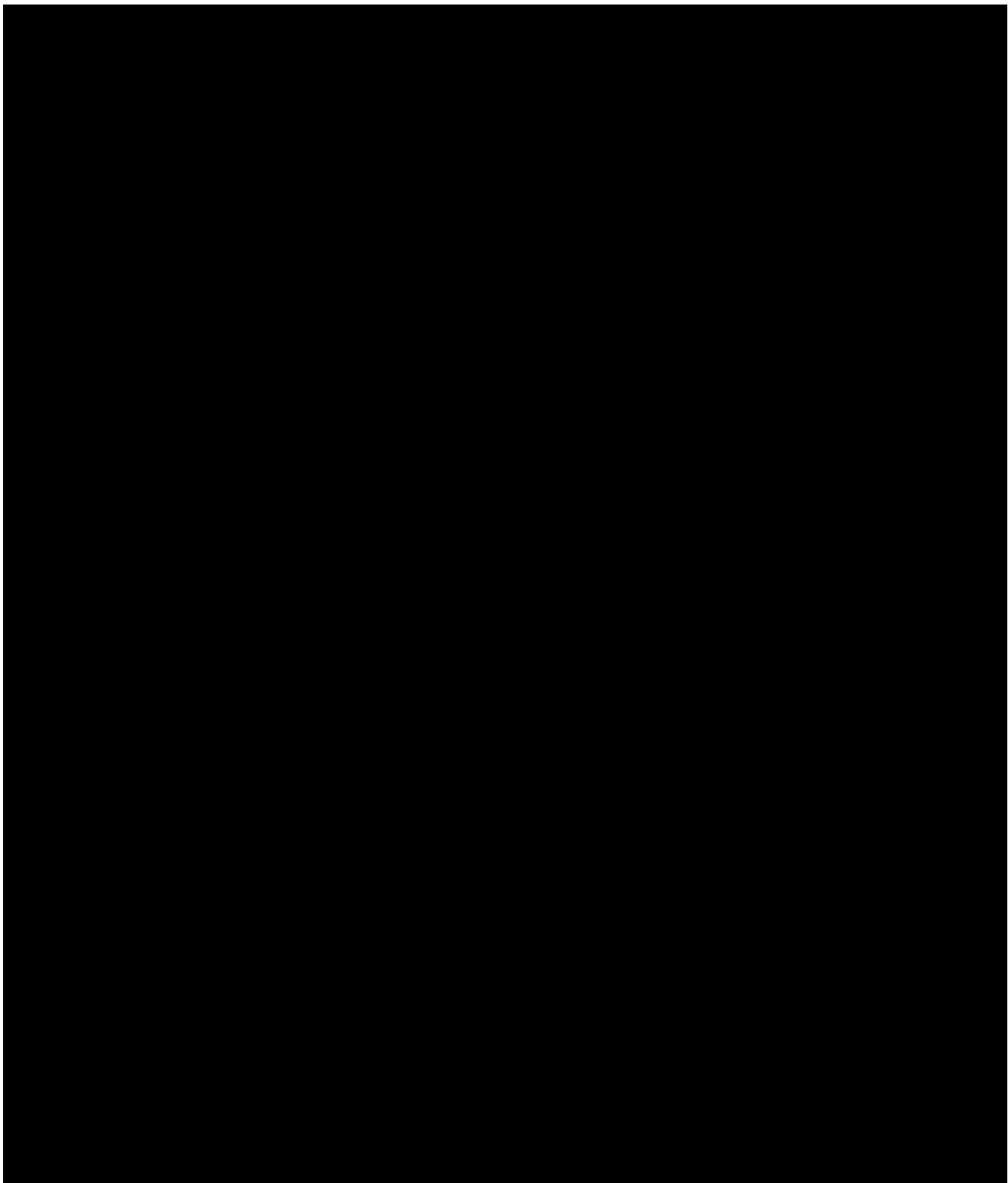
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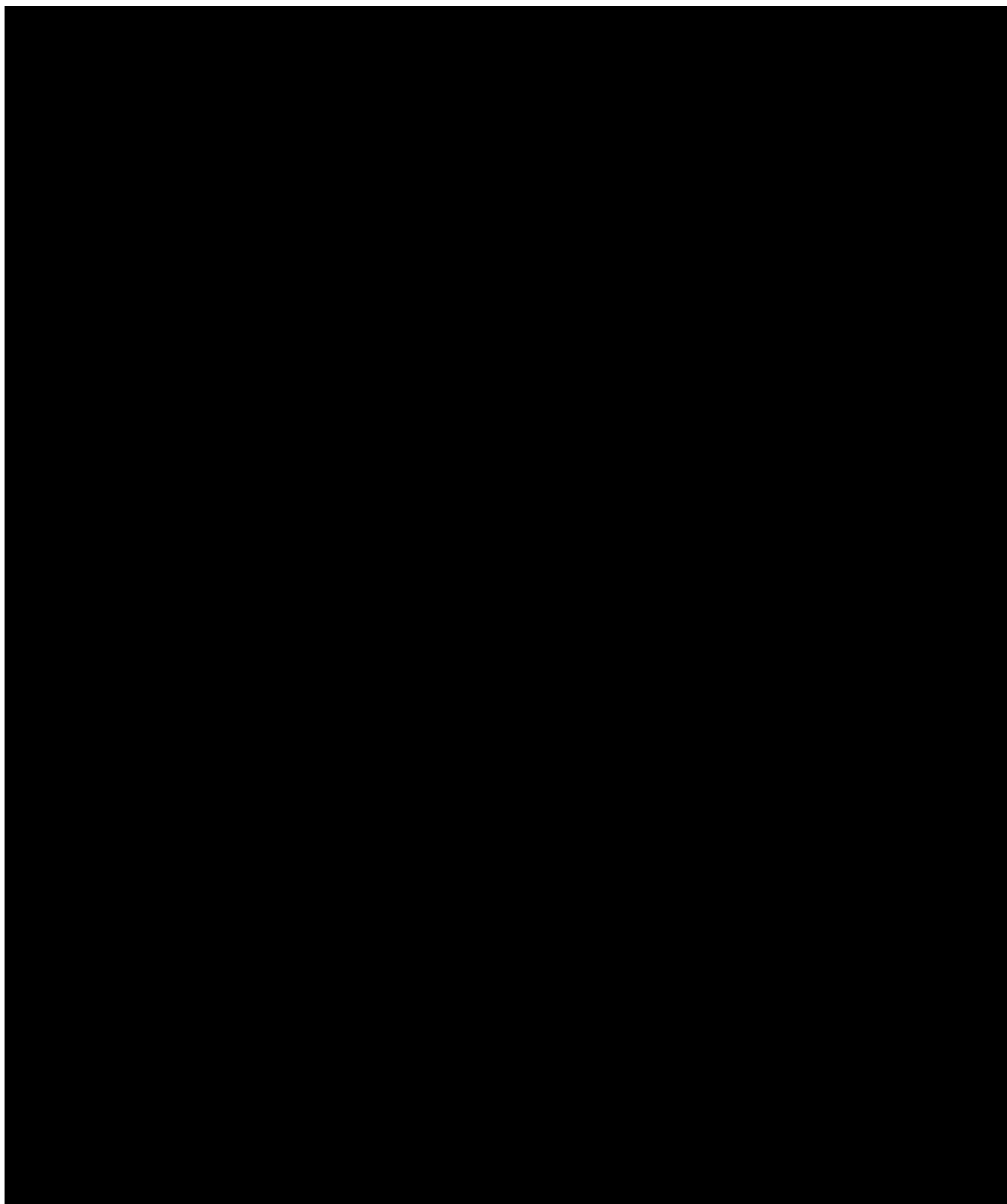
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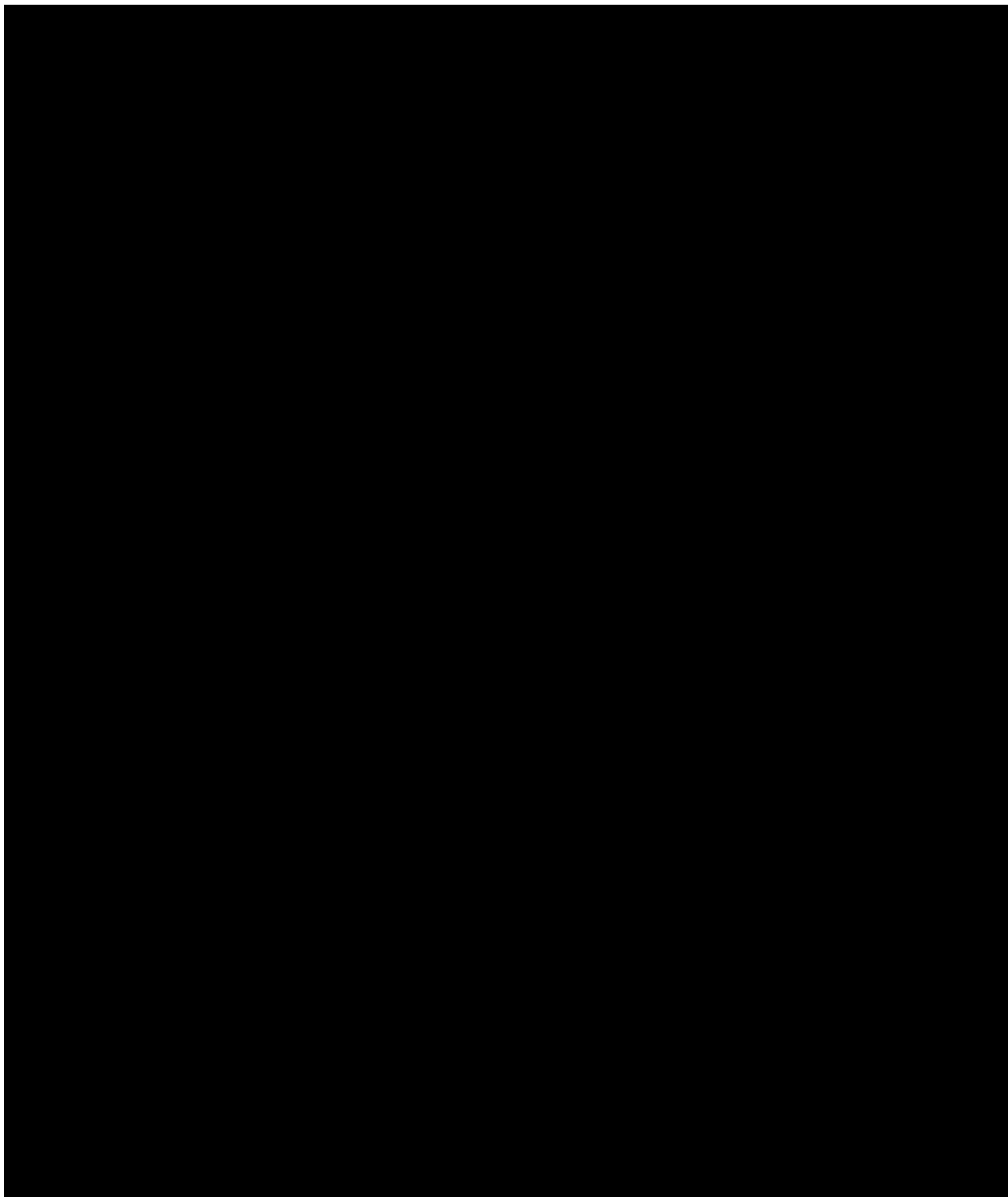
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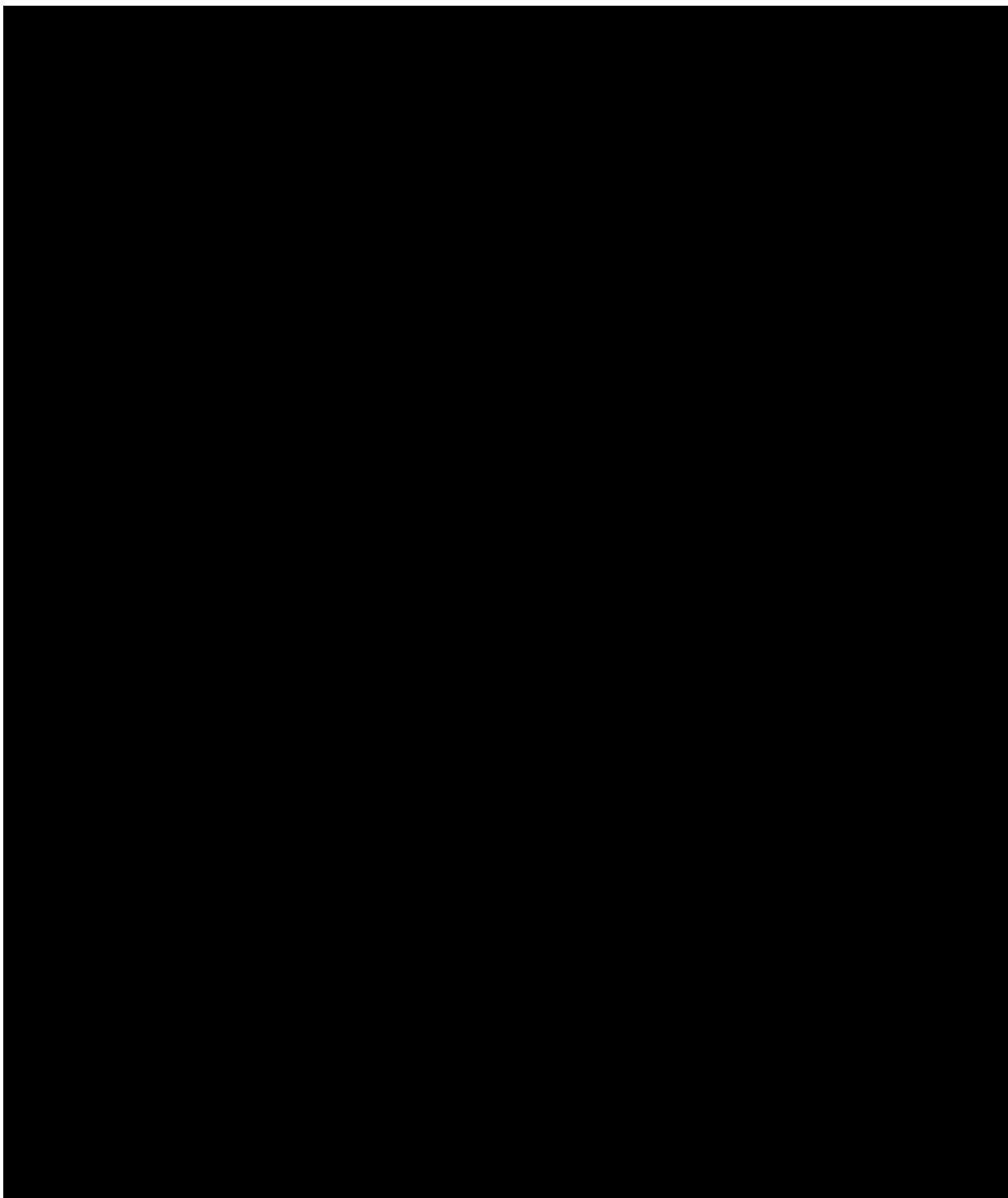
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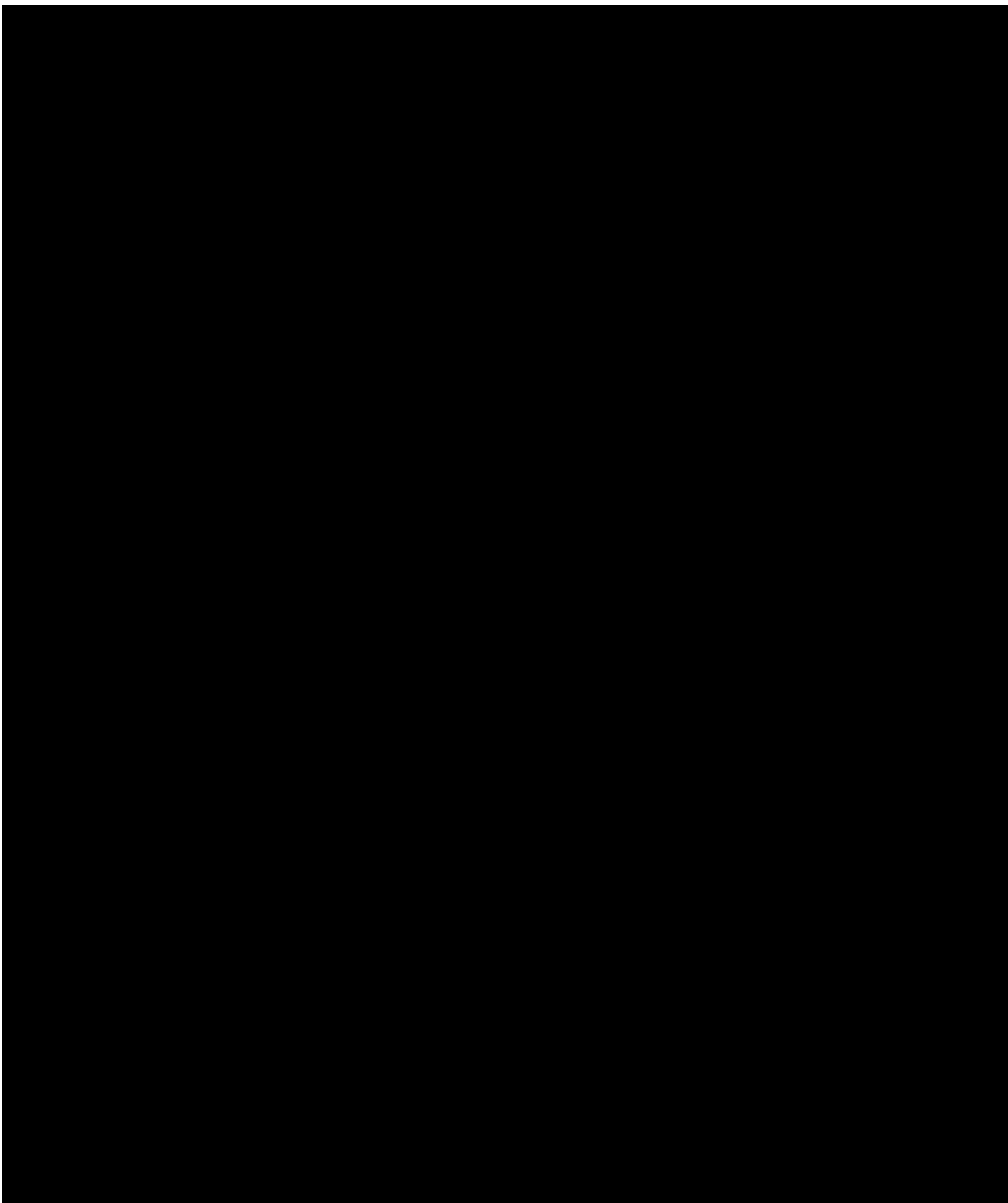
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VI. Nescopeck Alternative (Swartzentruber)

Q: Do you agree with Witness Swartzentruber that the Nescopeck Alternative “would almost certainly result in a cost increase of some degree” (PPL Statement No. 2-R, p. 7)?

A: I disagree. The main point that I raised in my direct testimony when discussing the Nescopeck Alternative was that “[a] direct connection from Nescopeck would have eliminated the Susquehanna-Harwood line split — as PPL confirmed the split would not be required under a Nescopeck configuration, though PPL noted the project would need to be re-evaluated and additional upgrades would be required.”¹²⁸

Mr. Swartzentruber’s rebuttal testimony does not engage with my main point. His rebuttal testimony lists several engineering factors such as 1) “landowner and right-of-way (‘ROW’) considerations,” 2) “additional Erosion and Sediment controls for roads, construction pads, or other structures,” 3) “the potential for more significant terrain challenges resulting from [Nescopeck] alternative because of the topography between the proposed Nescopeck and Tomhicken sites ... would raise costs and could require additional structures ... from 13 to approximately 60,” 4) “additional permitting risk associated with [Nescopeck] alternative, as the Company would be required to obtain more permits and agency approvals for things like railroads, highways, streams, and airports,” 5) “additional consideration of viewsheds, landowner impacts, and electrical and ground clearances,” and 6) “the exposure resulting from the line length ... longer

¹²⁸ Lines 12-15, Page 39, OCA Statement No. 2.

1 transmission lines result in more exposure to elements and therefore a higher risk of
 2 outages.”¹²⁹

3 More importantly, Mr. Swartzentruber’s list of cost-increasing factors does not
 4 account for the cost PPL’s own discovery response confirms the Nescopeck Alternative
 5 would avoid. In response to OCA III-8(f), PPL confirmed that approximately \$9 million
 6 is budgeted for the line work associated with the splitting of the Susquehanna-Harwood
 7 #1 & #2 230kV lines.¹³⁰ In response to OCA III-8(d), PPL confirmed that this line-split
 8 work would not be required if the Customer were served directly from the Nescopeck
 9 Switchyard, though PPL noted that the Project “would need to be re-evaluated” and that
 10 “additional upgrades would be required to serve the Customer’s requested load” under
 11 that configuration.¹³¹ Mr. Swartzentruber’s rebuttal testimony does not quantify those
 12 additional upgrades, does not net the avoided \$9 million line-split cost against the ROW,
 13 permitting, terrain, or structure-count factors he identifies, and does not state whether
 14 PPL ever performed that comparison internally. Without that analysis, Mr.
 15 Swartzentruber’s list of cost-increasing factors describes only one side of a ledger PPL
 16 itself has never completed.

17 Discovery confirms this ledger has never been completed on either side. PPL
 18 confirmed it has performed no quantified, dollar-figure cost estimate — even preliminary
 19 — comparing the Tomhicken solution to the Nescopeck Alternative, and that its cost-

¹²⁹ Lines 1-19, Page 6, PPL Statement No. 2-R.

¹³⁰ “Approximately \$9 million is budgeted for the line work to interconnect into the new PPL EU Tomhicken Switchyard. PPL Electric did not design the Project with line crossings and therefore does not have an estimate of the costs incurred to avoid line crossings.” PPL Response to OCA III-8 (Supplemental)(f).

¹³¹ “No, but if the Customer was served directly from the Nescopeck Switchyard the Project would need to be re-evaluated. Based on the proposed Nescopeck 230kV Switchyard and line arrangement, additional upgrades would be required to serve the Customer’s requested load.” PPL Response to OCA III-8 (Supplemental)(d).

1 increase conclusion rests on “substantial, general experience evaluating engineering
 2 solutions,” not a formal analysis specific to this alternative.¹³² The specific figures Mr.
 3 Swartzentruber’s rebuttal testimony does provide are similarly unquantified: PPL
 4 confirmed the “approximately 60” structure estimate was derived by dividing 9 miles by
 5 an assumed 800-foot average span — not from any route-specific engineering study¹³³ —
 6 and that the underlying 9-mile distance is itself “a generalization of the minimum route
 7 length,” not a surveyed or engineered route.¹³⁴ PPL further confirmed it has not identified
 8 or contacted any specific landowners along a potential Nescopeck route and could not
 9 state the number of additional parcels or easements the alternative would actually
 10 require.¹³⁵

11 In my direct testimony I had already agreed that “the 9-mile distance and right-of-
 12 way considerations are legitimate engineering factors that may favor the Tomhicken
 13 approach from a siting standpoint,”¹³⁶ and Mr. Swartzentruber acknowledged that I have
 14 identified those two engineering factors.¹³⁷

15 My concern remains that the Commission does not have in the record a cost
 16 comparison of the direct connection from Nescopeck because PPL admitted that such a
 17 connection would have eliminated the Susquehanna-Harwood line split. Hence, I disagree

¹³² PPL Response to OCA XIV-11(a), (b).

¹³³ PPL Response to OCA XIV-13(a), (c).

¹³⁴ PPL Response to OCA XIV-14(a).

¹³⁵ PPL Response to OCA XIV-15(a), (b).

¹³⁶ Lines 7-9, Page 40, OCA Statement No. 2.

¹³⁷ “At the outset, this alternative is based upon the build-out of 9 miles of additional HV transmission lines that carry other, significant engineering factors, some of which were readily identified by Mr. Konidena.” Lines 15-17, Page 5, PPL Statement No. 2-R.

1 with Mr. Swartzentruber that the Nescopeck Alternative “would almost certainly result in
2 a cost increase of some degree.”¹³⁸

3
4 **Q: Do you agree that PPL adequately evaluated the Nescopeck Alternative before**
5 **rejecting it?**

6 **A:** No, I disagree. Mr. Swartzentruber’s own rebuttal testimony confirms the inadequacy of
7 PPL’s evaluation. He states that “[e]valuation of the purported Nescopeck Alternative was
8 not warranted for the engineering reasons stated above, even setting aside any cost
9 discrepancy.”¹³⁹ By PPL’s own admission, the Nescopeck Alternative was rejected on
10 engineering grounds alone, without any cost evaluation — a conclusion consistent with
11 PPL’s response to OCA III-8(f), confirming it does not have an estimate of the costs
12 incurred to avoid line crossings,¹⁴⁰ and OCA III-8(b), confirming no engineering analysis
13 of a direct Nescopeck interconnection was ever performed.¹⁴¹

14 An adequate evaluation of an alternative requires, at minimum, some basis for
15 comparing its costs and benefits to the proposed solution. PPL has not done so here.

16 Discovery confirms this inadequate evaluation was not a recent or reactive
17 position. PPL confirmed that the engineering factors cited in Statement No. 2-R were
18 identified “early in the project development process,” and specifically “[p]rior to the
19 filing of PPL Statement No. 1” on May 13, 2026.¹⁴² If PPL had identified these

¹³⁸ Lines 6-7, Page 7, PPL Statement No. 2-R.

¹³⁹ Lines 3-4, Page 7, PPL Statement No. 2-R.

¹⁴⁰ PPL Response to OCA III-8 (Supplemental) (f).

¹⁴¹ PPL Response to OCA III-8 (Supplemental) (b).

¹⁴² PPL Response to OCA XIV-16(a), (b).

1 engineering factors before filing its own direct testimony, it does not explain why neither
2 the original LON application nor Mr. Lookup's direct testimony disclosed those factors or
3 PPL's basis for rejecting the Nescopeck Alternative.

4 Those reasons first appeared in this record in Mr. Swartzentruber's rebuttal
5 testimony, filed August 7, 2026 — nearly three months after PPL confirmed it already
6 had them.

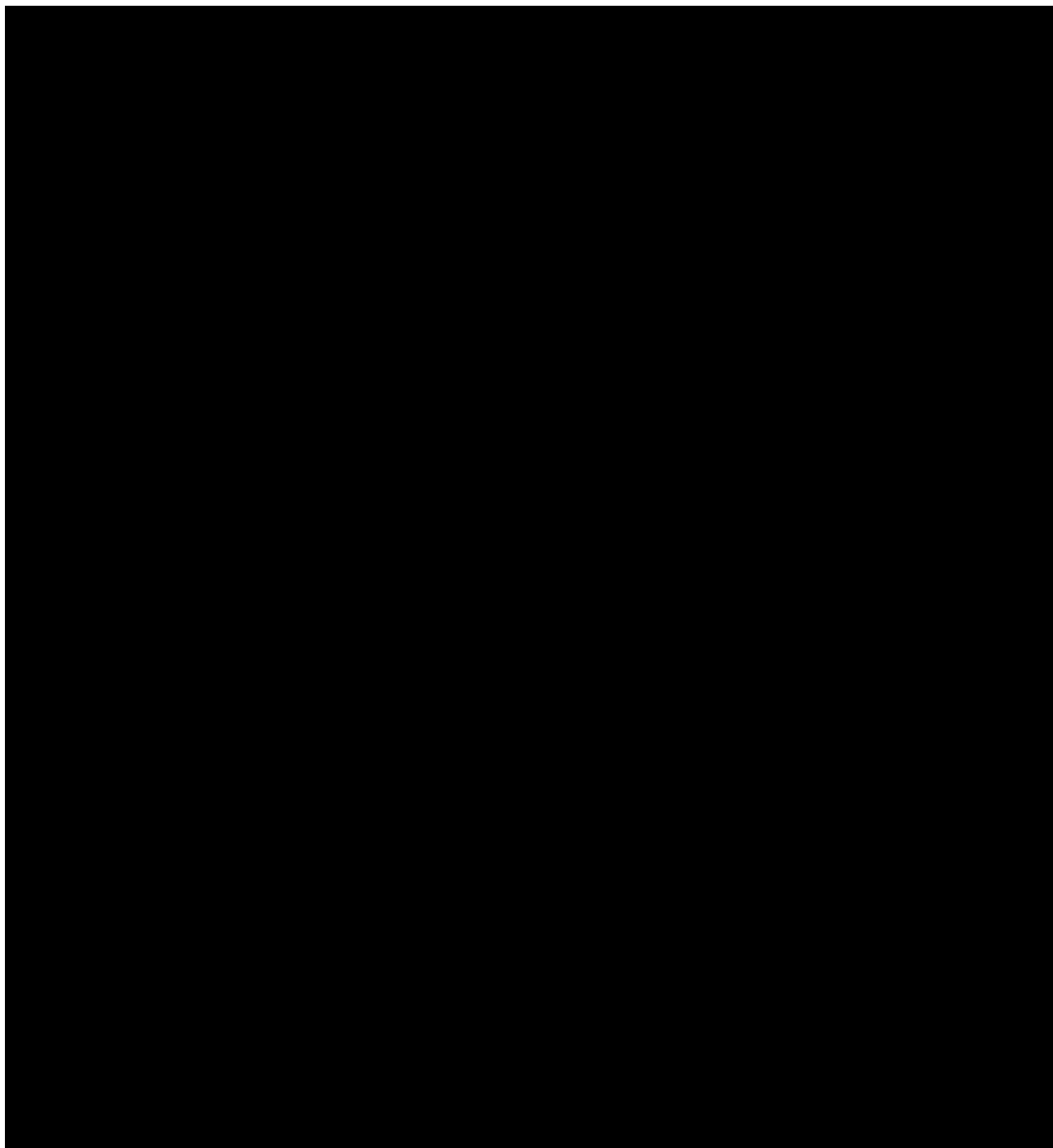
7 Taken together, PPL's discovery responses describe an unquantified, unstudied,
8 and largely undocumented set of justifications for rejecting the Nescopeck Alternative —
9 general experience in place of a cost estimate, a rough mileage-by-span calculation in
10 place of a route survey, and an undated internal judgment in place of a documented
11 engineering evaluation. This is not the record of an adequate evaluation; it is a set of
12 reasons developed to support a decision already made.

13 I reiterate my concern that “the Commission should require PPL to provide a
14 documented cost comparison between the Tomhicken approach and direct connection to
15 the Nescopeck Switchyard.”¹⁴³

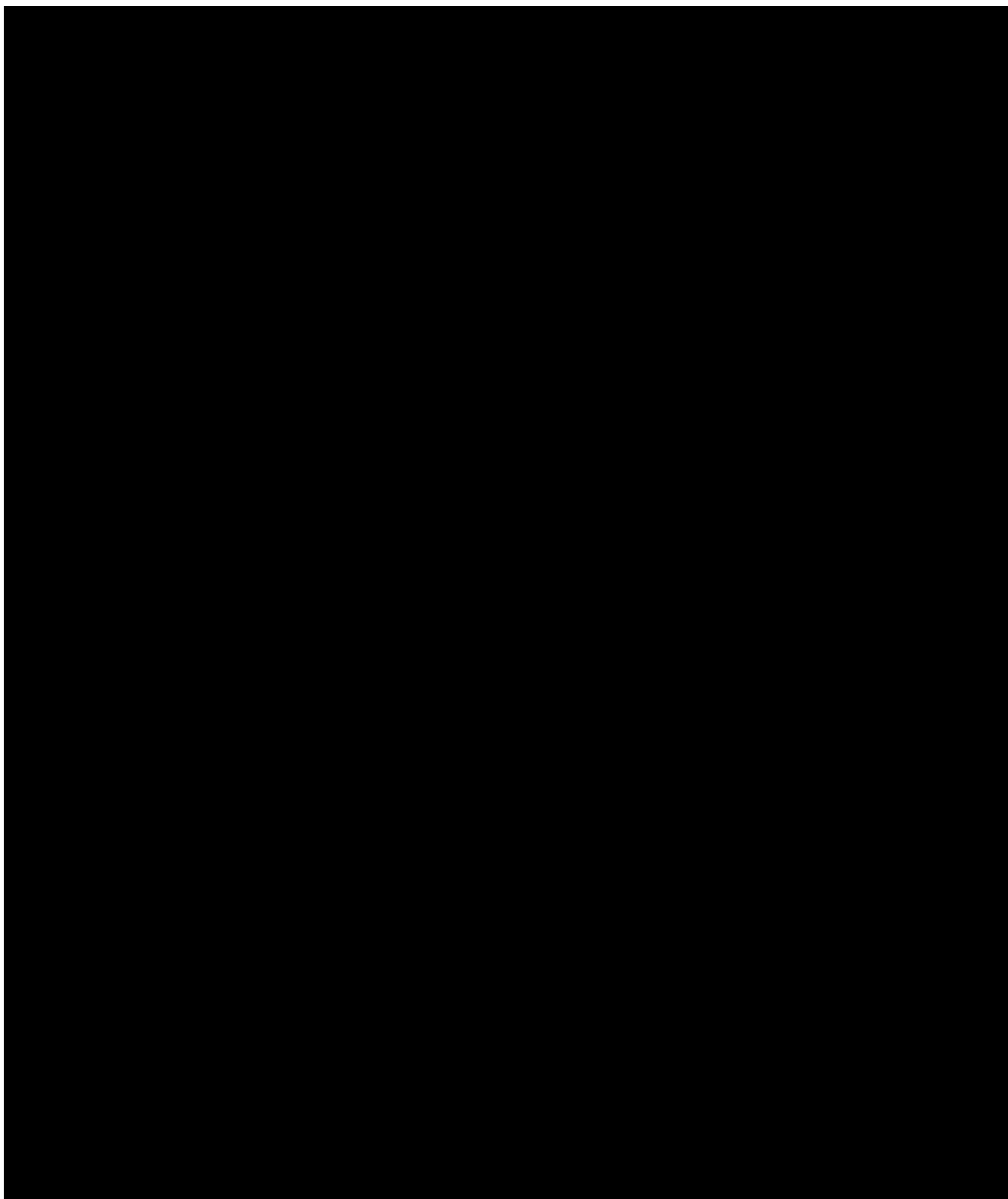
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¹⁴³ Lines 1-3, Page 112, OCA Statement No. 2.

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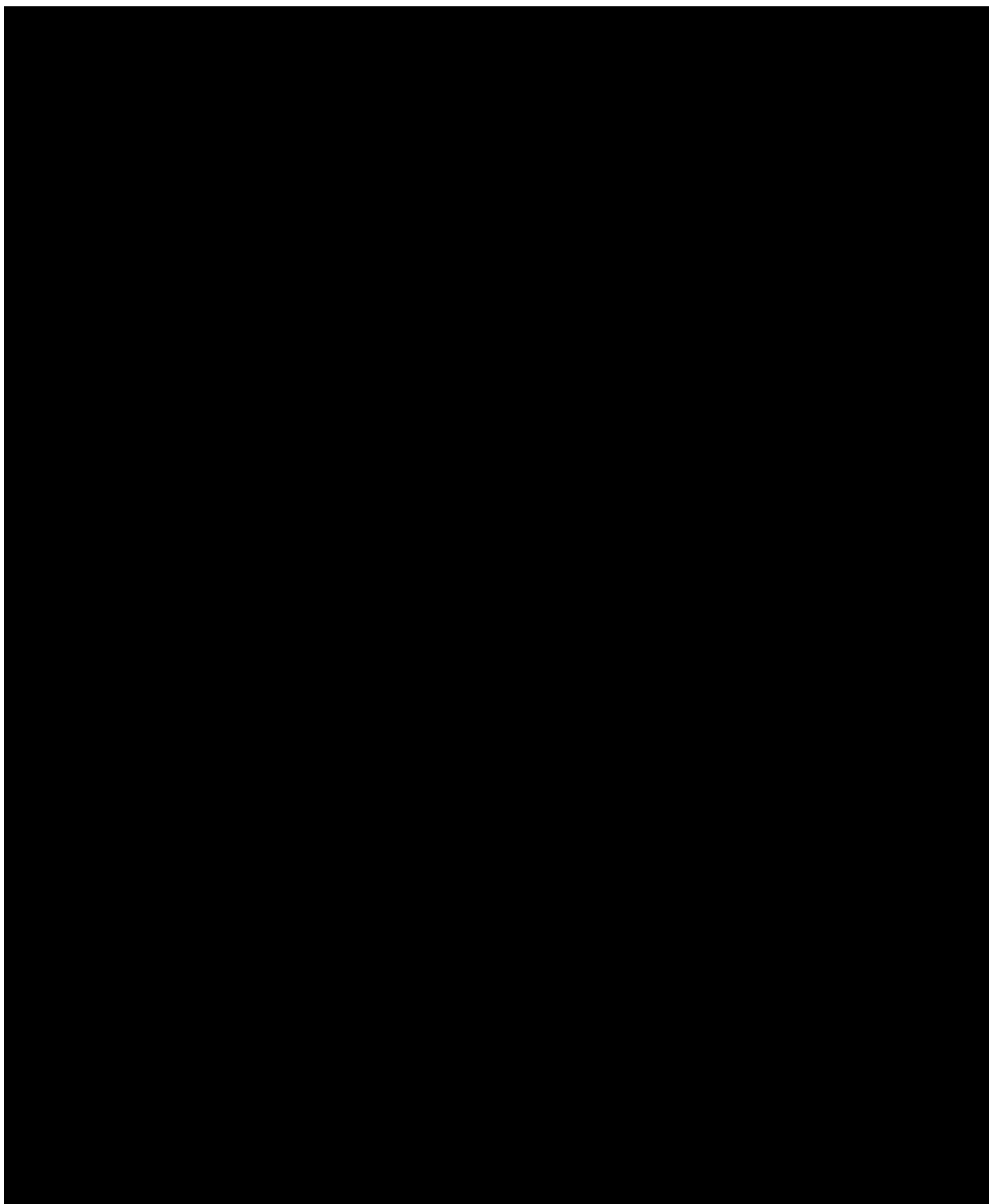
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10 **VIII. Conclusion**

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12 **Q: Does this conclude your testimony?**

13 **A: Yes.**

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BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Letter of Notification of PPL Electric :
Utilities Corporation filed pursuant to 52 :
PA Code Chapter 57 with respect to the :
approval to build approximately 1.1 miles : Docket No. A-2025-3059443
of new parallel double circuit 230 kV :
transmission taps that are needed to :
connect the existing Susquehanna- :
Harwood #1 & #2 transmission lines on the :
New Tomhicken 230 kV switchyard that :
are respectively located in Luzerne County, :
Pennsylvania :

VERIFICATION

I, Rao Konidena, hereby state that the facts above set forth in my Surrebuttal Testimony, OCA Statement No. 2SR, are true and correct to the best of my knowledge, information, and belief and that I expect to be able to prove the same at a hearing held in this matter. I understand that the statements herein are made subject to the penalties of 18 Pa.C.S. Section 4904 (relating to unsworn falsification to authorities).

DATED: September 4, 2026

Signature: *Rao Konidena*
Rao Konidena

Address: Rakon Energy LLC
Roseville, MN 55113

Exhibit B

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Letter of Notification of PPL Electric	:	
Utilities Corporation, Filed Pursuant to	:	
52 Pa. Code Chapter 57 Subchapter G,	:	Docket No. A-2025-3059443
For Approval To Build Approximately	:	
1.1 Miles of New Parallel Double Circuit	:	
230 kV Transmission Taps That Are	:	
Needed to Connect the Existing	:	
Susquehanna-Harwood #1 & #2	:	
Transmission Lines to the New	:	
Tomhicken 230 kV Switchyard That Are	:	
Respectively Located in Luzerne County,	:	
Pennsylvania	:	

PPL ELECTRIC UTILITIES CORPORATION

STATEMENT NO. 1-R

REBUTTAL TESTIMONY OF JOSEPH LOOKUP

TOPICS ADDRESSED:	OVERVIEW OF COMPANY REBUTTAL
	SCOPE OF THE PROCEEDING
	NECESSITY OF THE PROJECT
	COST ALLOCATION AND RELATION TO PHASE 2
	PUBLIC OUTREACH AND NOTICE

DATE: AUGUST 7, 2026

1 **I. INTRODUCTION**

2 **Q. Please state your full name and business address.**

3 A. My name is Joseph Lookup, and my business address is 827 Hausman Road, Allentown,
4 Pennsylvania 18104.

5
6 **Q. Did you previously submit testimony in this proceeding on behalf of PPL Electric**
7 **Utilities Corporation (“PPL Electric” or the “Company”)?**

8 A. Yes. On May 13, 2026, I submitted my direct testimony, PPL Electric Statement No. 1,
9 relative to the “Letter of Notification of PPL Electric Utilities Corporation, Filed Pursuant
10 to 52 Pa. Code Chapter 57 Subchapter G, For Approval To Build Approximately 1.1 Miles
11 of New Parallel Double Circuit 230 kV Transmission Taps That Are Needed to Connect
12 the Existing Susquehanna-Harwood #1 & #2 Transmission Lines to the New Tomhicken
13 230 kV Switchyard That Are Respectively Located in Luzerne County, Pennsylvania” at
14 Docket No. A-2025-3059443 (“Tomhicken 230 kV Switchyard Project”).

15
16 **Q. What is the purpose of your rebuttal testimony?**

17 A. The purpose of my rebuttal testimony is to provide an overview of the Company’s rebuttal
18 testimony submitted in this proceeding by myself and other witnesses in support of PPL
19 Electric’s proposed Tomhicken 230 kV Switchyard Project. In addition, I will respond to

20 [REDACTED]

21 [REDACTED]

22 by Protestants Cook and Zola and public input hearing testimony related to the need for
23 the Project and public notice.

1 **Q. Are you sponsoring any exhibits associated with your rebuttal testimony?**

2 **A. Yes. I am sponsoring PPL Electric Exhibit JBL-1R.**

3

4 **II. OVERVIEW OF REBUTTAL TESTIMONY**

5 **Q. Could you please provide an overview of the rebuttal testimony being submitted by**
6 **witnesses on behalf of PPL Electric in this proceeding?**

7 **A. Yes. Below is a list of the rebuttal testimony being submitted in support of the proposed**
8 **Tomhicken 230 kV Switchyard Project:**

- 9 • PPL Electric Statement No. 2-R – Kyle Swartzentruber – Project Engineering and
10 Design; Health and Safety
- 11 • PPL Electric Statement No. 3-R – Peter Sparhawk – Environmental Impact
- 12 • PPL Electric Statement No. 4-R – Chad Huber – Right-of-Way (“ROW”)
- 13 • PPL Electric Statement No. 5-R – John Taylor – FERC and Commission Jurisdiction,
14 Transmission Rates and Cost Allocation, Customer-Specific Investments, Tariff Issues,
15 and Resource Adequacy
- 16 • PPL Electric Statement No. 6-R – Bethany Johnson – FERC Transmission Rates

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18 **III. SCOPE OF PROCEEDING**

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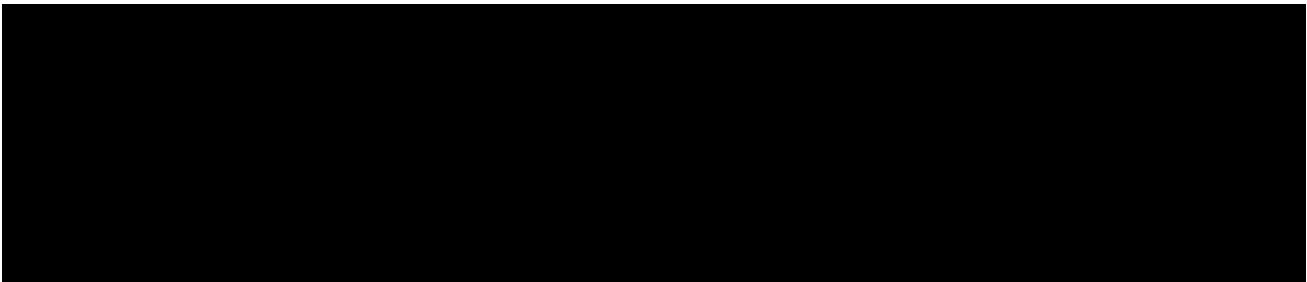
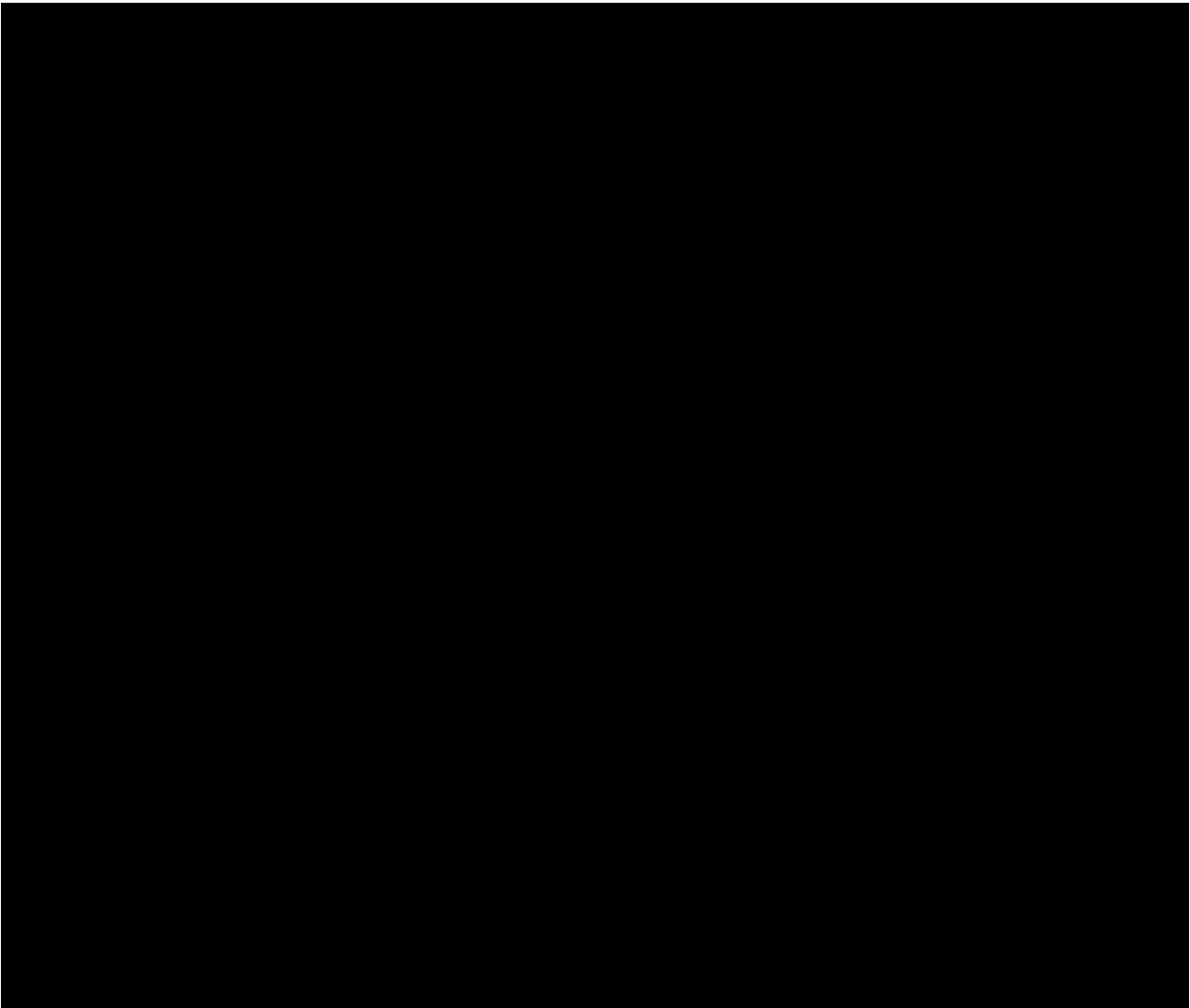
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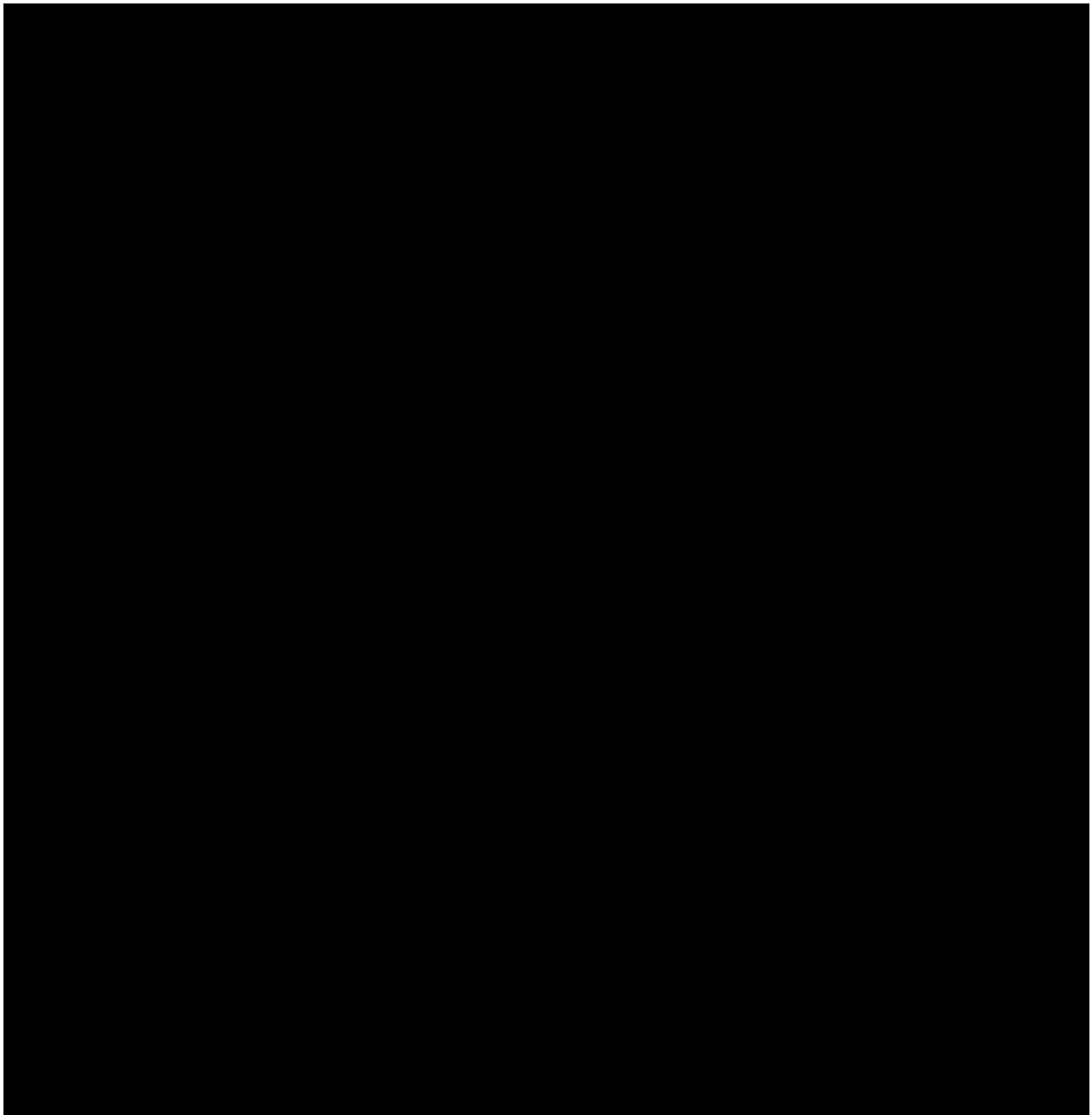
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19 **Q. What exactly is the approval sought in this proceeding?**

20 A. The Company is seeking approval to build approximately 1.1 miles of new double-circuit
21 230 kV transmission tap lines, two new 0.1-mile-long 230 kV connecting lines, to
22 interconnect the new Tomhicken 230 kV Switchyard and a Customer-owned substation.
23 The Company is seeking this approval by way of an LON because: the Project is proposed

1 to be located entirely within PPL Electric's existing transmission line ROW and the
2 property of the sole customer to be served by the line and will not substantially alter the
3 ROW; and the proposed route is less than 2 miles. I am advised by counsel that this is
4 consistent with the Commission's regulations at 52 Pa. Code § 57.72(d)(1)(iii) and (vi).

5
6 **Q. Please describe your involvement and experience with HV transmission line siting**
7 **matters before the Commission.**

8 A. In my current role as Vice President – Transmission and Distribution Planning and Asset
9 Management, I oversee the Transmission Planning, Asset Strategy, Portfolio Management,
10 Project Development, Real Estate, Project Management and Construction Management
11 Groups. This includes responsibility of Transmission system reliability, investment
12 strategy and project execution.

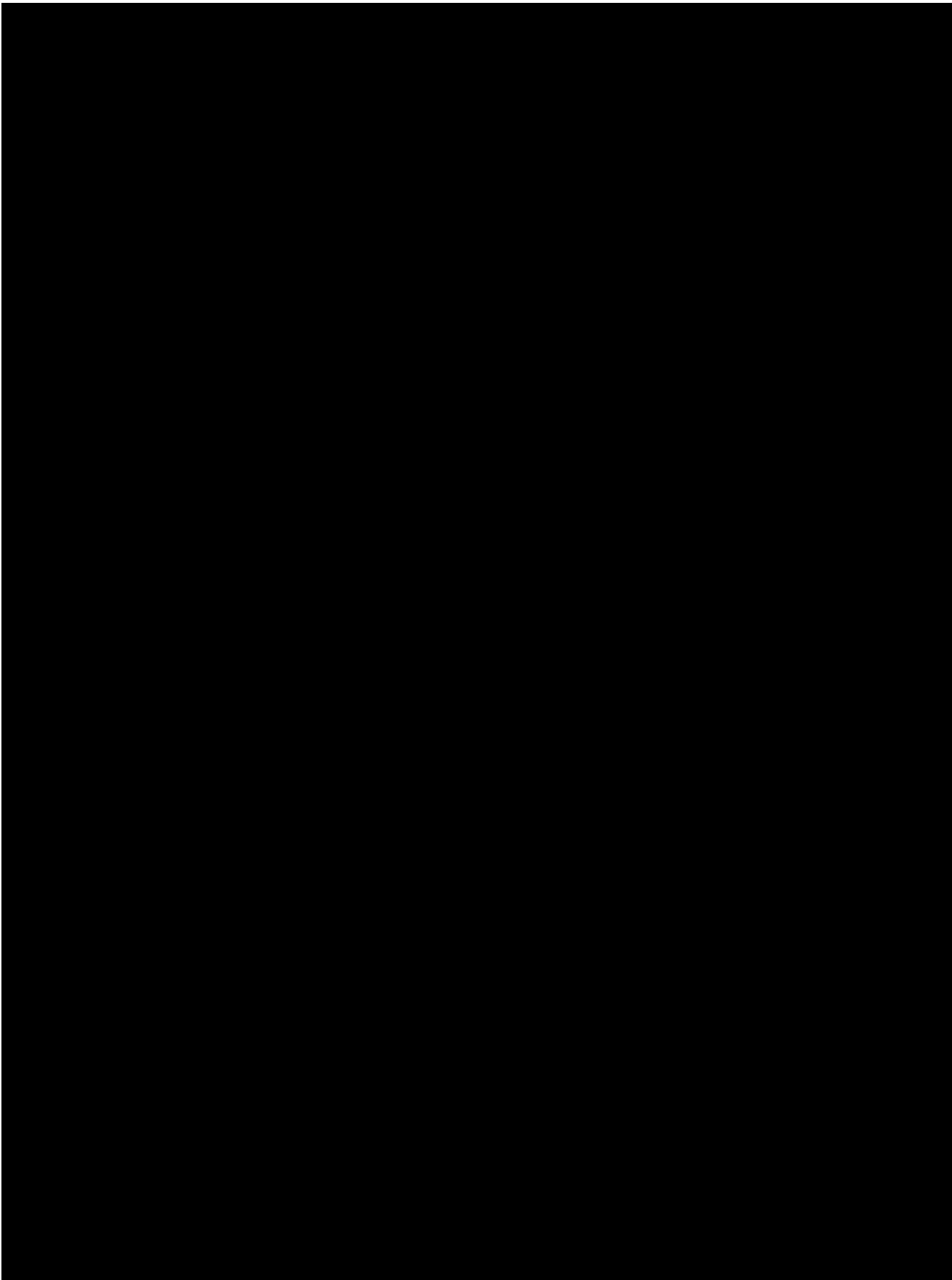
13 Specifically, my responsibilities include overseeing the development, evaluation,
14 routing, siting, permitting, and execution of transmission infrastructure projects throughout
15 PPL Electric's service territory. The groups under my direction are responsible for
16 identifying transmission reliability and load-serving needs, evaluating potential solutions,
17 developing transmission projects, securing the real estate rights necessary for construction,
18 and managing the design and construction of those facilities. As part of these
19 responsibilities, I oversee and provide strategic direction for projects that require approval
20 from the Pennsylvania Public Utility Commission through either Letters of Notification
21 ("LONs") or formal transmission line siting applications. My involvement includes
22 reviewing the need for proposed facilities, evaluating routing and siting considerations,
23 assessing project alternatives, coordinating with engineering, environmental, real estate,

1 and project development personnel, and supporting the preparation of regulatory filings
2 submitted to the Commission. Through these responsibilities, I have participated in and
3 overseen numerous proceedings involving the siting, relocation, reconstruction, and
4 construction of high-voltage transmission facilities in Pennsylvania. My experience
5 includes projects subject to both the Commission's LON process and formal siting
6 application requirements.

7
8 **Q. Based upon your experience overseeing PPL Electric's requests for approval to site**
9 **and construct HV transmission line facilities in Pennsylvania, what is your**
10 **understanding of the elements of the Project that the Commission will accept evidence**
11 **upon?**

12 A. It is my understanding that the Commission accepts evidence on four items when
13 considering whether to grant or deny LONs and other siting applications: (1) the need for
14 the proposed line; (2) the safety of the proposed line; (3) the impact of the line on
15 environmental factors including land use, habitats, terrain, landscape, and waterways; and
16 (4) the availability of reasonable alternative routes. I am advised by counsel that these
17 factors are set forth in the Commission's regulations at 52 Pa. Code § 57.75(e). Ultimately,
18 in every HV transmission line siting matter that I have participated in as a witness or
19 overseen on behalf of PPL Electric, it is my experience and understanding that the
20 Commission issues an order that makes the four specific and required findings and
21 determinations set forth in 52 Pa. Code § 57.76(a).

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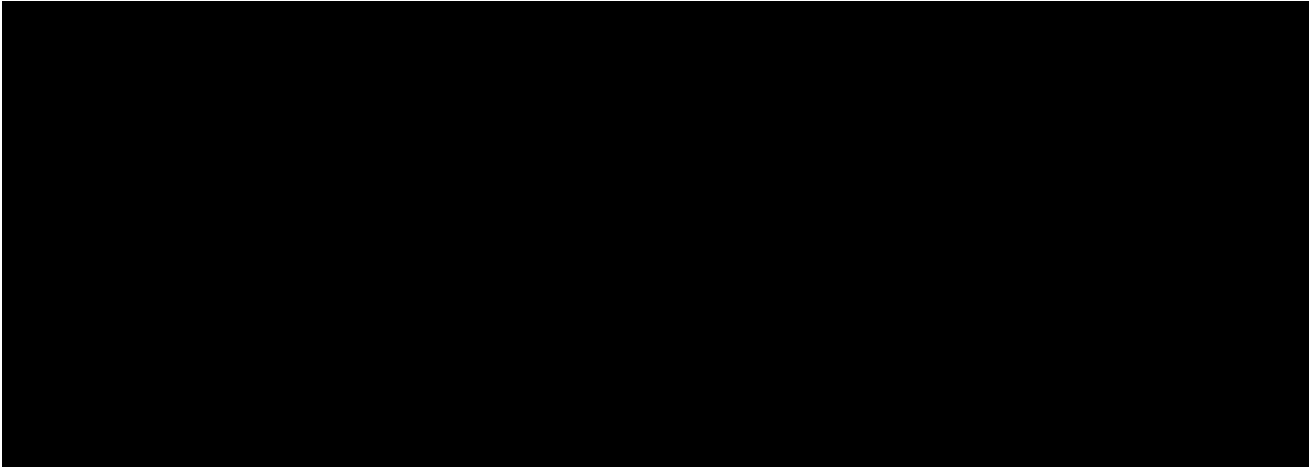
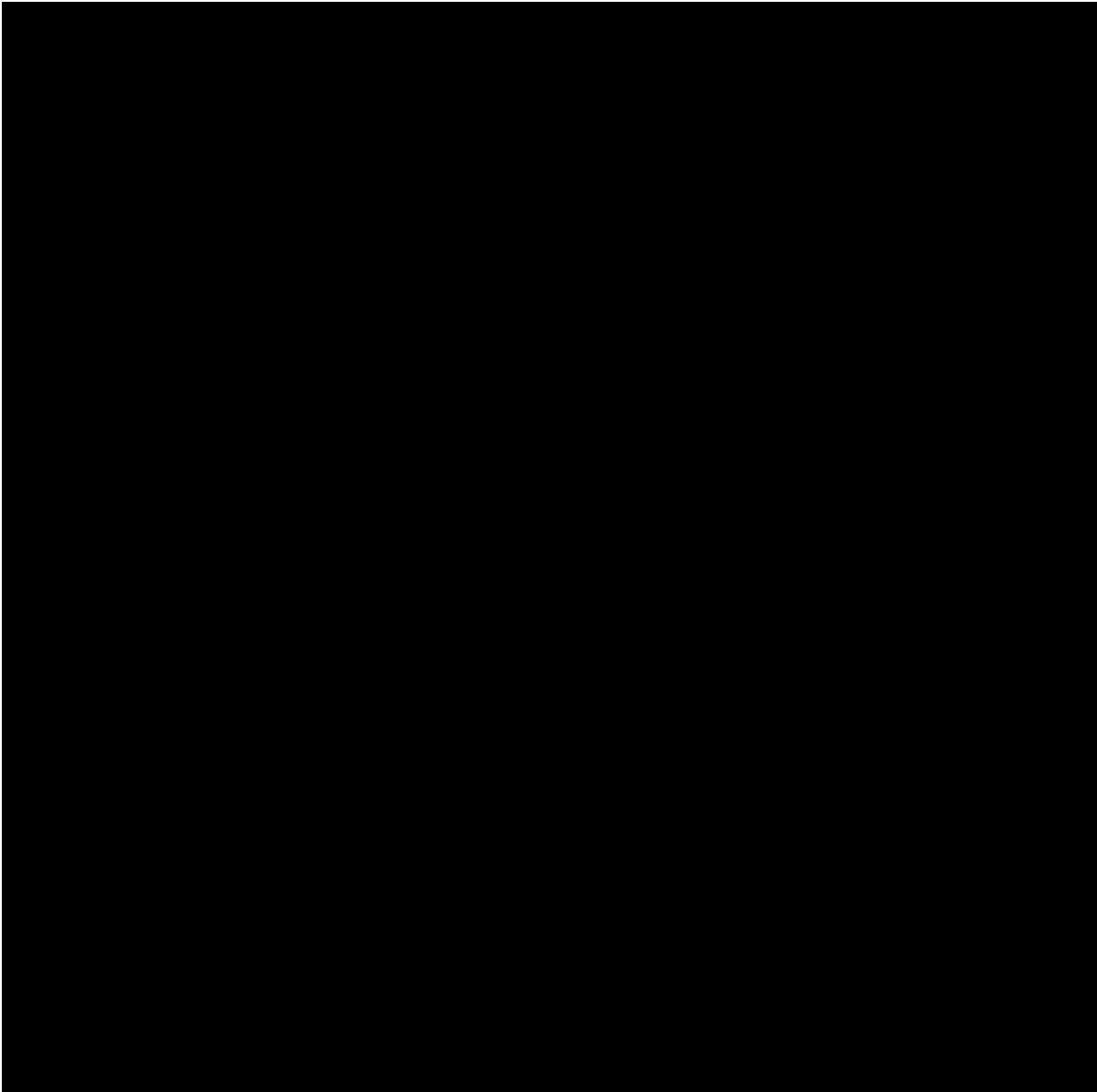
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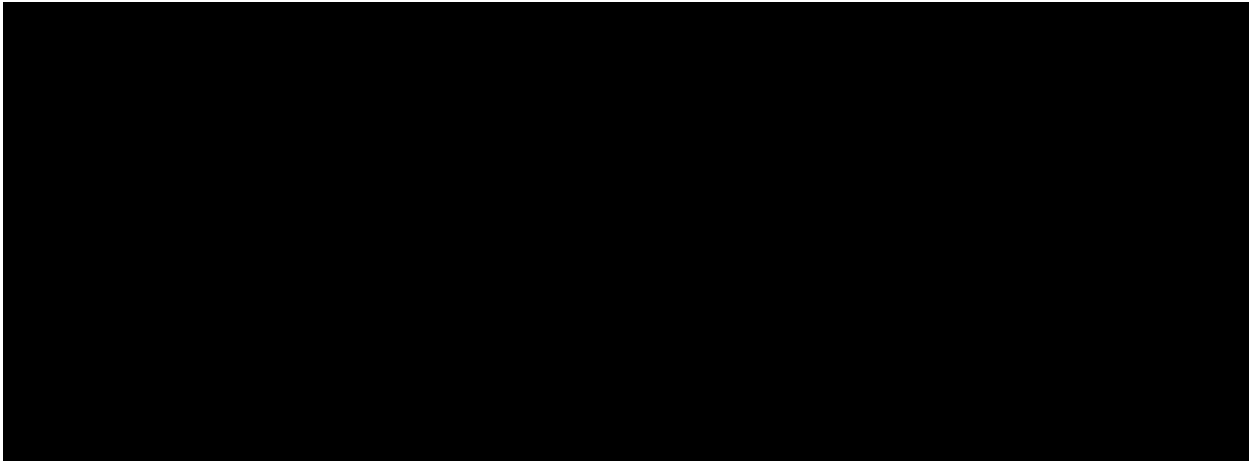
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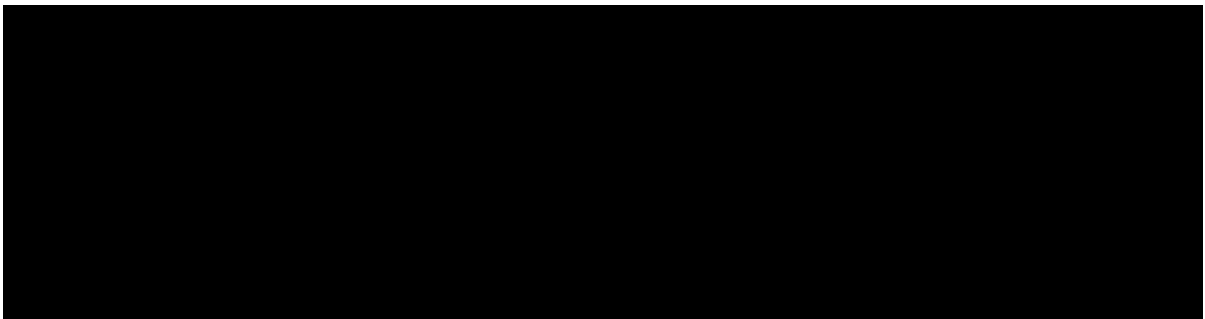
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Q. Outside of OCA's recommendations regarding transmission costs and transmission cost allocation, do you have any other observations about OCA's testimony?

A. Yes, I do. OCA has made several concessions in its direct testimony which support the LON; Mr. Konidena explicitly does not contest the need for the Project, and he also spends several pages of his direct testimony affirming that the engineering and design specifications of the Project are reasonable and acceptable. (OCA Statement 2, pp. 17-30, 45.) Moreover, OCA does not offer testimony that suggests PPL Electric has not complied with applicable statutes and regulations related to the protection of environmental resources, nor does it offer testimony that suggests PPL Electric has failed to minimize adverse environmental impacts associated with the proposed HV transmission lines. As



1 **IV. NECESSITY OF THE TOMHICKEN 230 KV SWITCHYARD PROJECT**

2 **Q. Do any parties dispute that a need for the Tomhicken 230 kV Switchyard Project**
3 **exists?**

4 A. Yes. Mr. Felder and Mr. Konidena do not dispute that a need for the Project exists.
5 However, Ms. Cook, Mr. Zola, and several other individuals who testified at the public
6 input hearings in this matter do contest the necessity of the Project.

7
8 **Q. Please summarize those individuals' testimony as it relates to the need for the Project.**

9 A. Ms. Cook, Mr. Zola, and the public input hearing participants largely argue that the need
10 for the Project is speculative or uncertain, and that ratepayers may be harmed if the Project
11 does not come to fruition. Specifically, Ms. Cook testifies that there is not a need for the
12 Project because of ongoing land use and zoning-related litigation. (Cook Direct at 6.)
13 Additionally, Mr. Zola testifies that "[t]he evidence available . . . does not demonstrate a
14 proven need for this [P]roject." (Tr. at 202.) He argues that the LON itself is premature,
15 and that the Project should not proceed until "an actual demonstrated need exists." (Tr. at
16 203.) Individuals at the public input hearings argued that there is not a need for the Project
17 based on very similar grounds. (*See, e.g.*, Tr. at 99, 130-131, 202-203, 268, 275.)

18
19 **Q. What is PPL Electric's obligation to customers who request service?**

20 A. PPL Electric has an obligation to serve. When a customer requests service from PPL
21 Electric, it is required to extend service under the terms and conditions of its Commission-
22 approved tariff.

1 **Q. Did any parties dispute PPL Electric’s obligation to serve customers who request**
2 **electric service?**

3 A. No. Specifically, no party disputed that the Customer made a request for transmission-level
4 service, and no party asserted that PPL Electric is not in compliance with its tariff
5 requirements for purposes of extending service to a requesting customer.
6

7 **Q. Which rate schedules within the Company’s Commission-approved tariff are**
8 **applicable to customers requesting service at “large” loads?**

9 A. Rates LP-5 and LP-6. Rate LP-5 is applicable to customers taking service at 69 kV or
10 higher. However, Rate LP-6 is specifically applicable to large load (e.g., data center)
11 customers that commenced service on or after October 1, 2025, and who have a peak
12 electric demand of 50 megawatts (“MW”) or greater at a single facility, or at least equal to
13 75 MW in the aggregate among facilities within a 10-mile radius. Rate LP-6 would be
14 applicable to the Customer, based upon its anticipated peak electric demand and the
15 anticipated in-service date.
16

17 **Q. Are there specific protections in place that are applicable to large load customers**
18 **served under Rate LP-6 that directly address other parties’ concerns regarding the**
19 **materialization of the Customer’s demand?**

20 A. Yes.
21

22 **Q. What are those protections?**

1 A. Below, I highlight the major protections that the Company already includes as a component
2 of its Electric Service Agreement (“ESA”) as well as under its newly approved Rate LP-
3 6.¹ A copy of the form ESA that PPL Electric intends to use to implement the requirements
4 of Rate LP-6 is attached hereto as PPL Electric Exhibit JBL-1R. PPL Electric witness Mr.
5 Taylor provides a further discussion and analysis of the protections already in place in these
6 documents in his rebuttal testimony (PPL Electric Statement No. 5-R), and in particular
7 how those protections proactively address the policy concerns raised by OCA. One major
8 protection that is in place for the Company’s customers is the ESA that the Company has
9 executed with the Customer. ESAs contain provisions that bind the customer and protect
10 ratepayers in the event that the Customer’s load does not materialize in the amount that
11 was requested. In addition, the Company's LP-6 rate schedule establishes minimum
12 requirements that must be incorporated into the ESA and are specifically designed to
13 mitigate the risk that transmission investments made to serve a large load customer could
14 otherwise be shifted to existing customers. PPL Electric is in the process of renegotiating
15 the ESA with the Customer in order to bring the ESA’s terms into alignment with the LP-
16 6 rate schedule.

17 Among other protections, the LP-6 rate schedule requires a minimum contractual
18 term of ten years and includes minimum load commitments that obligate the Customer to
19 utilize service at specified levels throughout the term of the agreement. For firm service,
20 the Customer is required to maintain a minimum load guarantee equal to 80 percent of its
21 committed load during the first five years of service and 50 percent during the second five

¹ PPL Electric is in the process of renegotiating the ESA to align with the requirements of the new LP-6 rate schedule.

1 years. These requirements help ensure that transmission facilities constructed to serve the
2 Customer generate the anticipated revenues used to support the investment.

3 The ESA also requires the Customer to provide financial security associated with
4 transmission system upgrades that are necessary to serve the Customer and would not have
5 been required absent the Customer's interconnection request. This Rate Base Security
6 Obligation is equal to the amount of transmission upgrade costs that are being included in
7 the Company's FERC Transmission Formula Rate and must be secured through an
8 acceptable financial instrument and provides protection to customers if the Customer fails
9 to meet its contractual obligations.

10 In addition, the ESA contains termination and exit-fee provisions that apply if the
11 Customer voluntarily terminates service before completion of the contractual term. Under
12 the LP-6 framework, the exit fee is based upon the greater of the Customer's remaining
13 minimum load guarantee obligation or the remaining Rate Base Security Obligation. These
14 provisions are intended to ensure that customers who cause significant transmission
15 investments to be made remain financially responsible for those commitments even if their
16 project does not proceed as originally planned. The LP-6 rate schedule further provides
17 that amounts recovered through such exit fees are applied first to reduce the Company's
18 transmission rate base associated with the project and then credited to the Company's
19 transmission revenue requirement.

20 Finally, the LP-6 framework includes ongoing monitoring mechanisms. The ESA
21 requires the Customer to provide load ramp schedules, and the Company periodically
22 evaluates the Customer's actual and forecasted load levels against its contractual
23 commitments. In addition, the Company submits annual load forecast information to the

1 Commission that includes information regarding customers operating under ESAs. These
2 provisions provide transparency and allow the Company to monitor whether projected
3 customer load growth is materializing as anticipated. OCA's concerns and
4 recommendations to the contrary are, therefore, unfounded.

5
6 **Q. How do you respond to Ms. Cook's and Mr. Zola's concerns related to ongoing**
7 **litigation for zoning matters?**

8 A. The zoning matter which is proceeding before the Commonwealth Court is an entirely
9 separate proceeding from the LON proceeding at hand, and the decision in one matter
10 should have no bearing on the decision in another. I have been advised by counsel that it
11 is not unusual for other regulatory approvals to be in a "pending" status at the time a LON
12 is filed. This is consistent with my extensive experience in the siting of HV transmission
13 lines. Moreover, I have also been advised by counsel that PPL Electric will fully brief the
14 inaccurate characterization of this pending appeal and the actions that can be taken with
15 respect to the zoning and land use approvals sought by the Customer.

16 I have also been advised by counsel that the Commission may impose conditions
17 on its approval of the LON. Such a condition may be PPL Electric's acquisition of all
18 necessary permits and approvals before initiating construction of the facilities that are the
19 subject of the Project, or more specific to the instant concerns, that the Customer or other
20 customers to be served by the Tomhicken Switchyard will have received necessary
21 approvals have been obtained prior to initiating construction of the facilities.

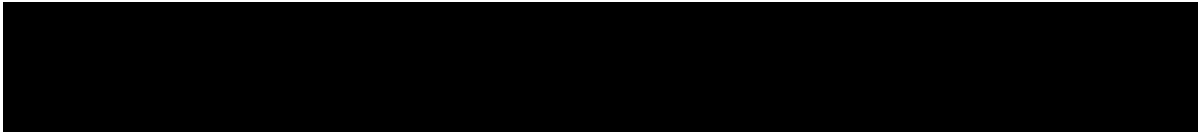
22 Finally, I note that the Company was clear in my direct testimony that it is not in
23 the business of building transmission lines to nowhere that serve no purpose. PPL Electric

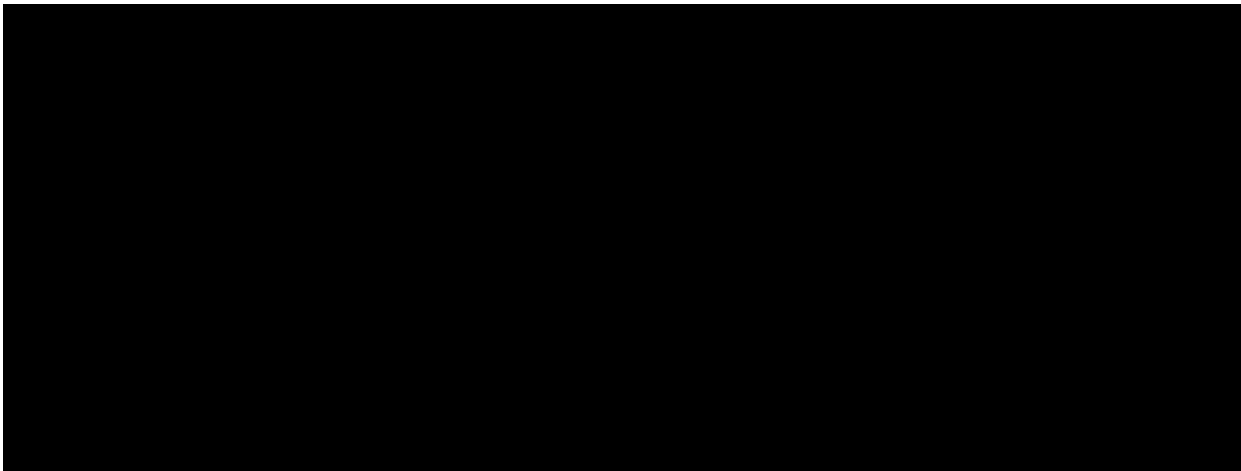
1 will continue to coordinate with the Customer regarding its development progress to align
2 its construction activities; however, the Company will only proceed with construction if a
3 need persists.

4
5 
6 **Q. Please summarize Mr. Konidena's direct testimony and recommendations.**

7 A. Mr. Konidena repeatedly emphasizes the same points, which are: (1) the relationship
8 between Phase 1, which is the Tomhicken 230 kV Switchyard Project and Phase 2, which
9 is the Sugarloaf 500/230 kV Transmission Line Project, as he sees it; and (2) the notion
10 that the Project is a customer-driven Project, for a variety of different reasons and to come
11 to various conclusions and recommendations.

12 For example, he argues that network benefits and the benefits of PPL Electric's
13 proposed breaker-and-a-half configuration for the Tomhicken 230 kV Switchyard are
14 dependent on Phase 2 construction, and cannot be realized under Phase 1 alone. (OCA
15 Statement 2, pp. 29-30, 51, 59-60.) Mr. Konidena also argues that the customer-driven

16 
17
18 reliability needs. (OCA Statement 2, pp. 13, 61-62.) He even dedicates thirty-one pages to
19 argument and recommendations regarding his perception of "Phase 1 and Phase 2
20 Interdependency." (OCA Statement 2, pp. 65-96.)



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8 **Q. Do you agree with Mr. Konidena’s arguments and recommendations?**

9 A. No. I will respond to each of Mr. Konidena’s arguments and recommendations in turn.
10

11 **Q. Please address Mr. Konidena’s arguments with respect to the design of the**
12 **Tomhicken 230 kV Switchyard as a breaker-and-a-half configuration.**

13 A. Under Phase 1, PPL Electric proposes building the Tomhicken 230 kV switchyard as a
14 breaker-and-a-half configuration due to the total of eight lines to be terminated at the
15 switchyard. Ring buses do not provide the same level of reliability as breaker-and-a-half
16 arrangements. The ring bus arrangement can become segmented during planned and
17 unplanned outages, increasing the risk of load drop or loss of network flow. PJMs
18 Substation Bus Configurations & Substation Design Recommendations state “Reasons for
19 changing from a ring bus to a breaker-and-a-half arrangement might include the criticality
20 or size of the load or generation to be interconnected, or the number of bus positions in
21 existence or planned for the future. The larger the ring bus the greater the probability
22 becomes during normal operations, multi-system events, and maintenance that the
23 substation could become fragmented into multiple pieces thereby losing its level of

1 reliability.” By Mr. Konidena’s own admission the breaker-and-a-half operation is
2 justified when a total of nine transmission lines will be terminated at the Tomhicken after
3 the future Phase 2 is completed. Building the new Tomhicken switchyard as an eight-
4 terminal ring bus to only rebuild the switchyard to breaker-and-a-half shortly after
5 commissioning is not a prudent use of capital. The breaker-and-half arrangement of the
6 Tomhicken 230 kV switchyard allows the ability to add additional 230 kV transmission
7 lines to supply other customers or add system capacity.

8
9 **Q. Please address Mr. Konidena’s argument that the network benefits of the Project are**
10 **customer-driven and not justified by system reliability needs.**

11 A. Mr. Konidena argues that network benefits are not justified by system reliability needs
12 because of the customer-driven nature of the project. What Mr. Konidena misses is that
13 load growth is a well-established transmission planning need recognized by PJM. PJM
14 develops long-term load forecasts that are incorporated into its Regional Transmission
15 Expansion Plan ("RTEP") and used to evaluate the need for future transmission system
16 enhancements. PJM has expressly stated that planners factor long-term load forecasts into
17 RTEP to evaluate transmission upgrades needed to reliably serve future customer demand.
18 Consistent with that planning process, increases in customer load are incorporated into
19 PJM's load forecasts and transmission planning models to identify and resolve any resulting
20 reliability criteria violations. Projects that are needed to address load growth may involve
21 network upgrades, and under current FERC policy network upgrades should be recovered
22 through rates.

1 **Q. Is Mr. Konidena correct that Phase 1 is interdependent on Phase 2?**

2 A. No. While it is true that the Project as proposed under PJM supplemental number S3528
3 includes both the Phase 1 and Phase 2 scopes, this does not mean that Phase 1 depends
4 upon Phase 2.

5 Phase 1 includes the installation of the new Tomhicken 230kV switchyard,
6 bifurcation of the Susquehanna – Harwood #1 & #2 230 kV lines, and 230 kV customer
7 connecting lines. Phase 1 is required to connect the Tomhicken 230 kV switchyard to the
8 230 kV network, connect the Customer to the Tomhicken 230 kV switchyard, and to have
9 the ability to add additional 230 kV lines to support the 230kV network or serve additional
10 customers. Phase 1 will serve the Customer’s initial load.

11 However, as the Customer increases the facility load additional 230kV upgrades
12 are required. Phase 2 includes the 230 kV network upgrades required to ensure reliable
13 operation of the 230 kV network. Phase 2 is needed to serve the Customer’s projected load
14 of 965 MW as well as support other proposed load growth in the Hazleton Area.

15 I acknowledge that bifurcation of the Susquehanna – Harwood #1 & #2 lines did
16 take in account the future Phase 2, Nescopeck – Tomhicken 230 kV line. However, this is
17 simply good transmission planning practice to account for the separate needs associated
18 for Phase 1 and Phase 2 that are being addressed under the same PJM supplemental project.
19 The proposed routing eliminates future 230 kV line crossings or the need to make
20 modifications to or reroute newly built transmission facilities. The bifurcation of the
21 Susquehanna – Harwood #1 & #2 230 kV lines is required to energize the Tomhicken 230
22 kV switchyard and the proposed routing of the lines to accommodate the Phase 2 network
23 upgrades was a prudent decision as part of the entire project under S3528.

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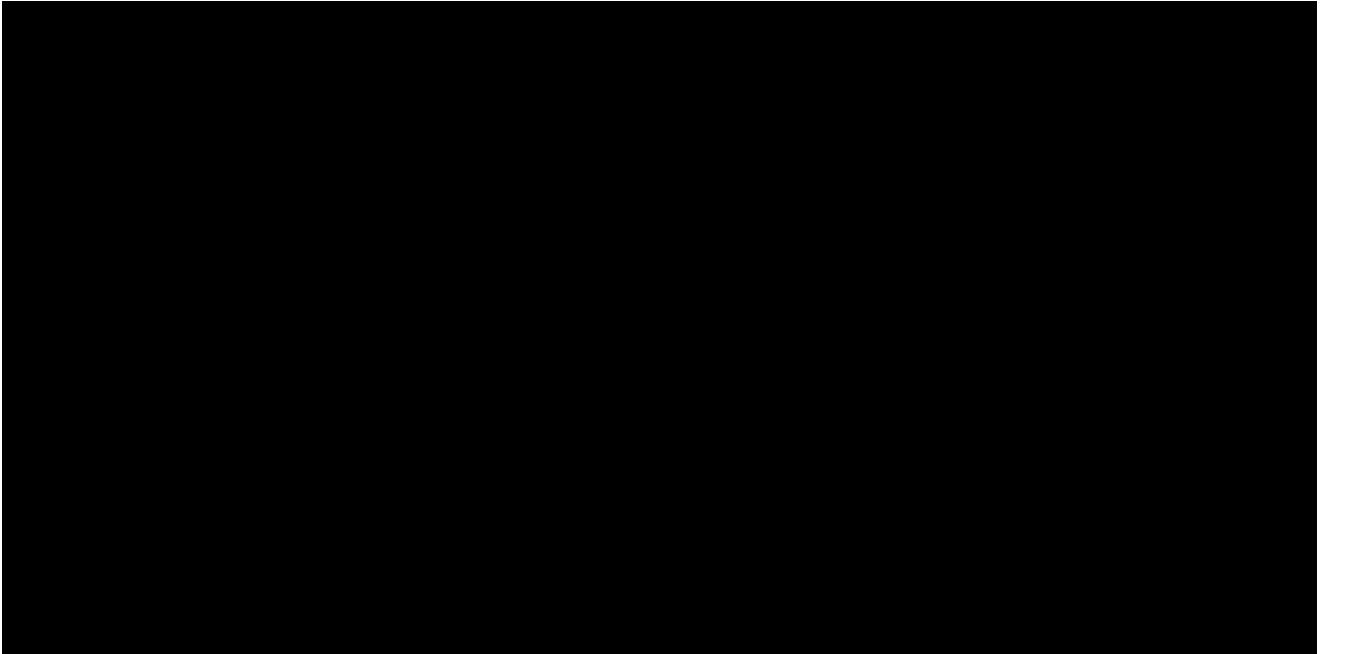
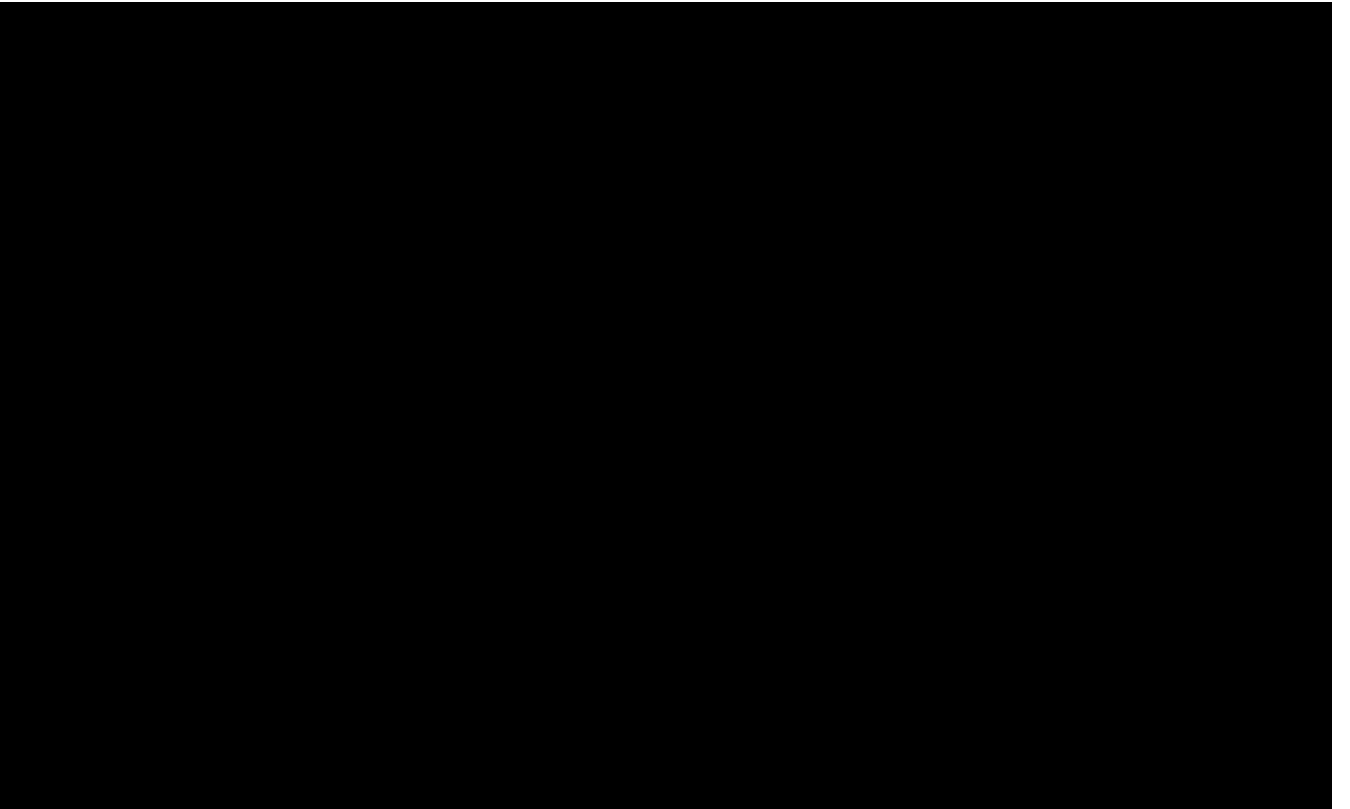
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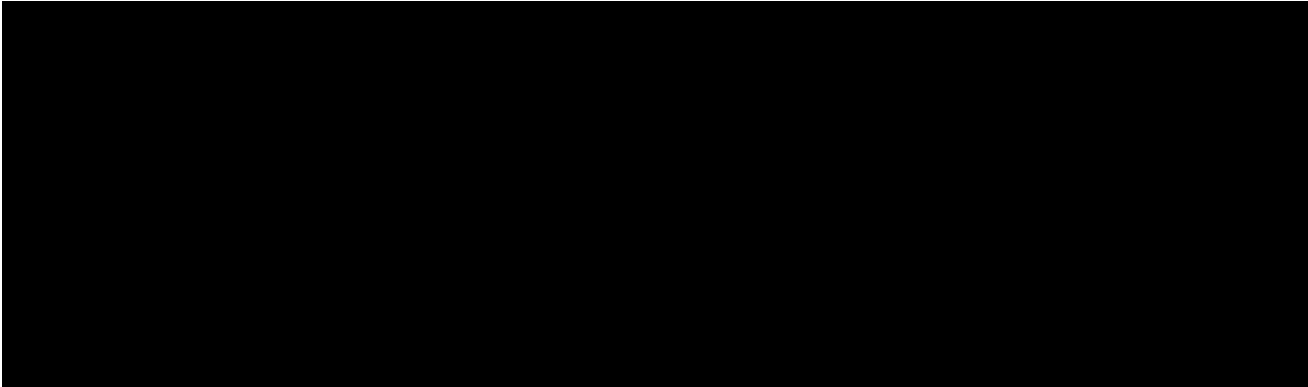


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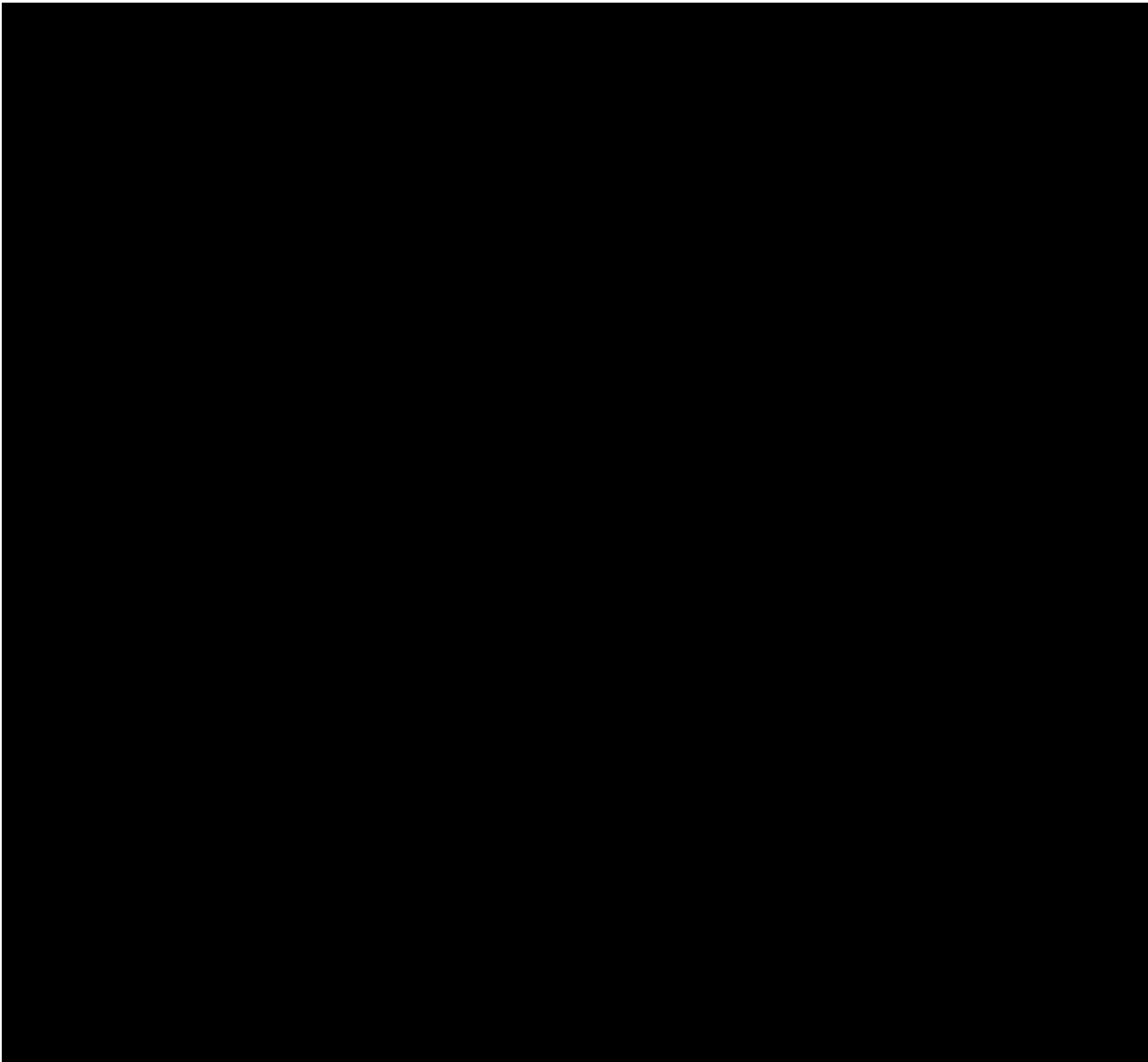
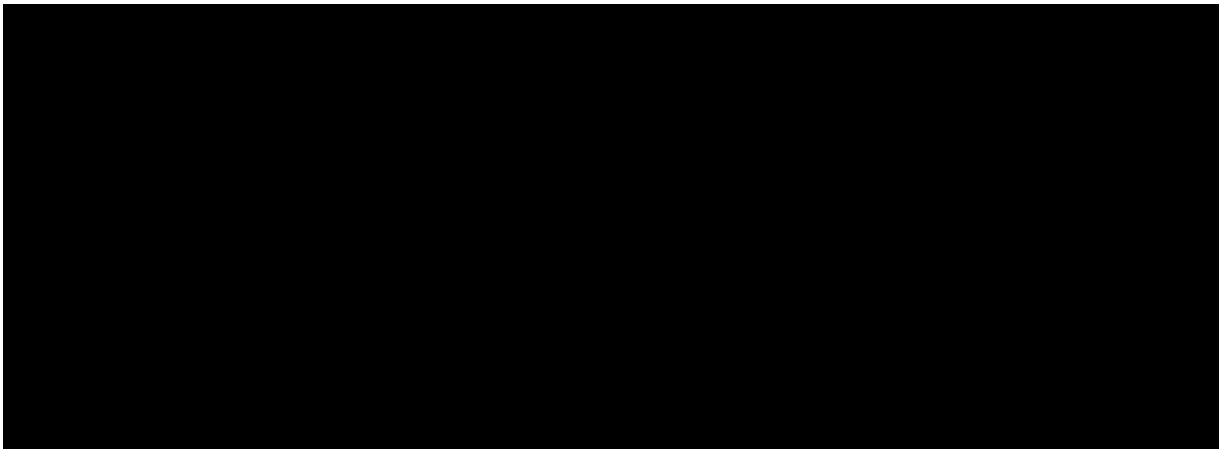


Q. Is Mr. Konidena’s testimony that the Tomhicken 230 kV Switchyard Project exists for the sole benefit of the Customer a fair characterization of the benefit provided by and necessity of the Project? (OCA Statement 2, pp. 13, 25, 45.)

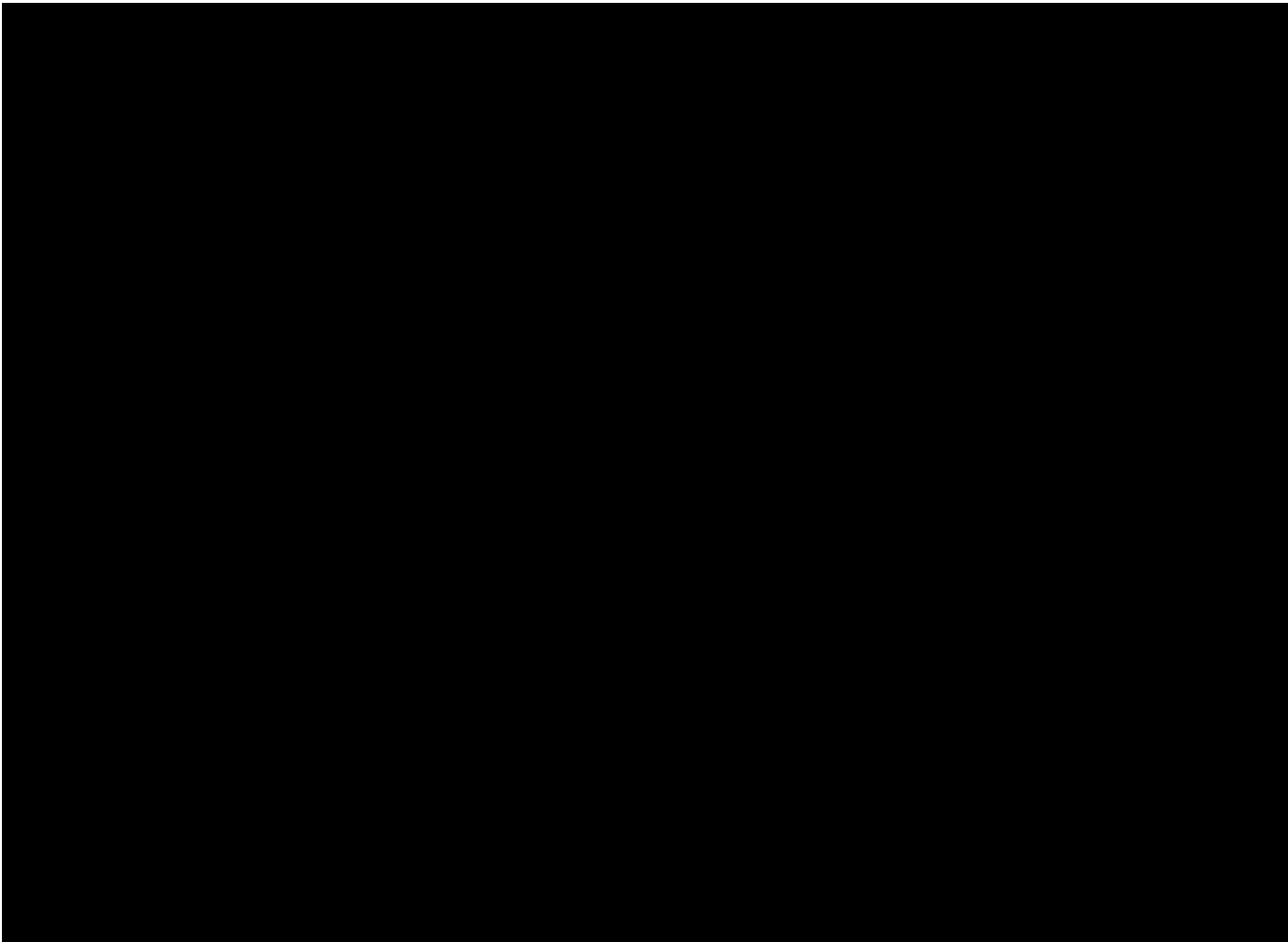
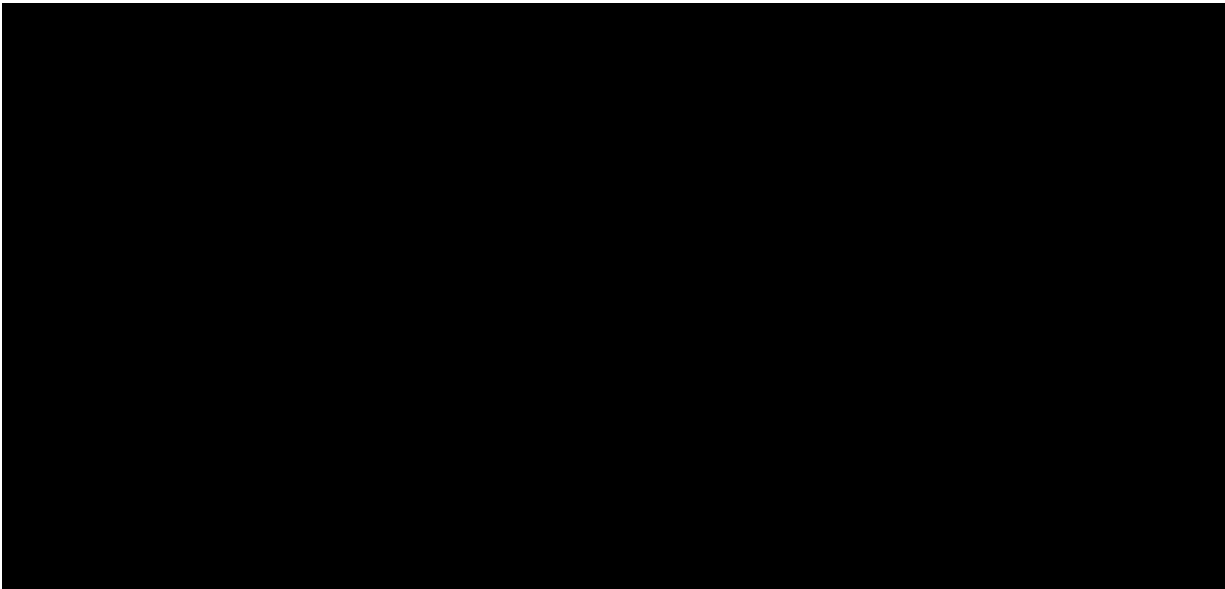
A. No. Simply because the Customer’s requested interconnection initiated the need for the Project does not mean that the transmission upgrades associated with that interconnection will only serve the Customer after they are placed in service. Sections VII and VIII of PPL Electric Witness Taylor’s rebuttal testimony provide a thorough explanation of the differences between customer-driven and customer-specific investments, and the reasons that forward-looking transmission design features are incorporated in this Project.



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1 that provide network benefits to transmission rate base — to the actual Tomhicken
2 Switchyard arrangement.

3 Applied to the real facility, Bay 1 at the Tomhicken Switchyard serves two
4 functions:

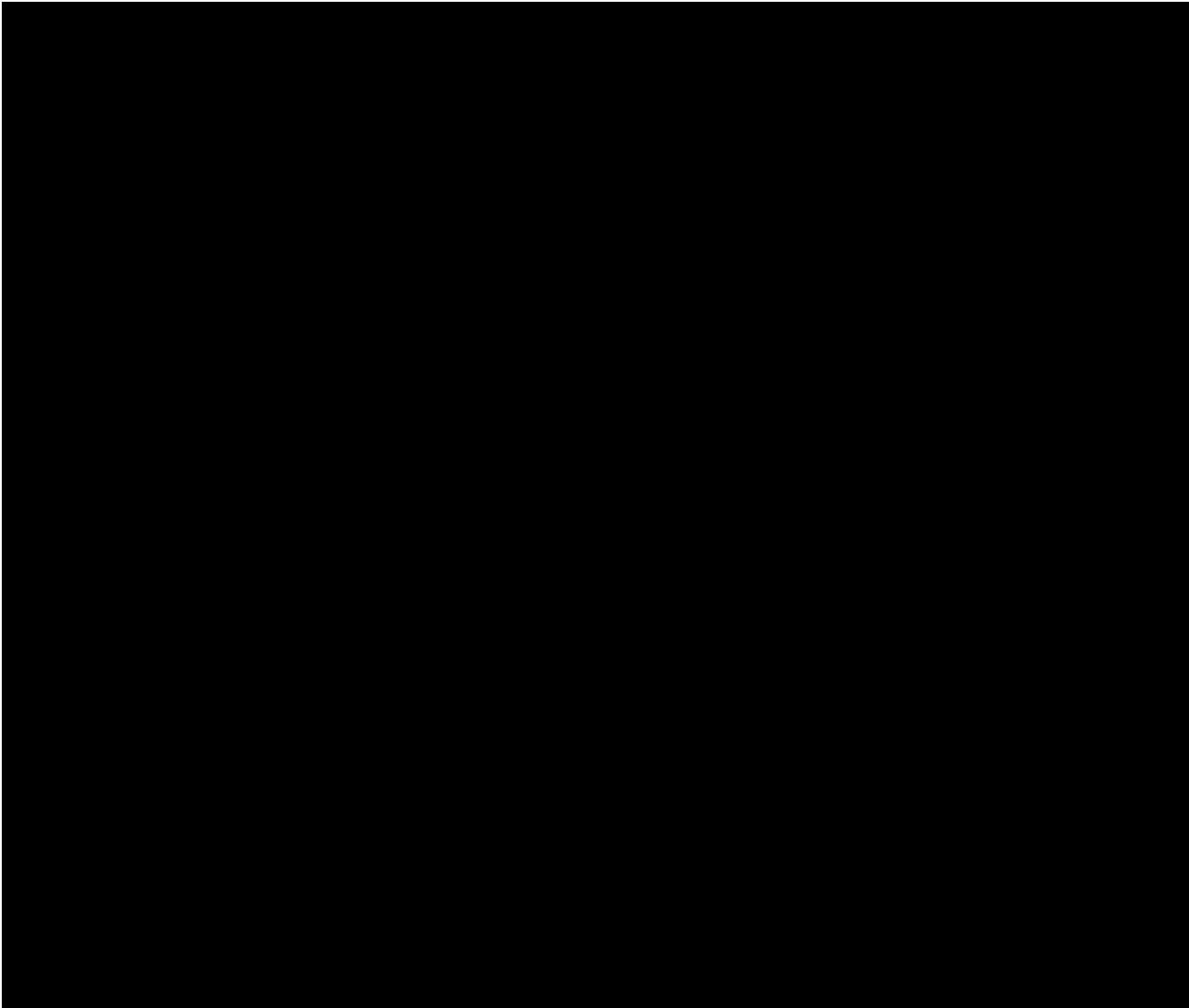
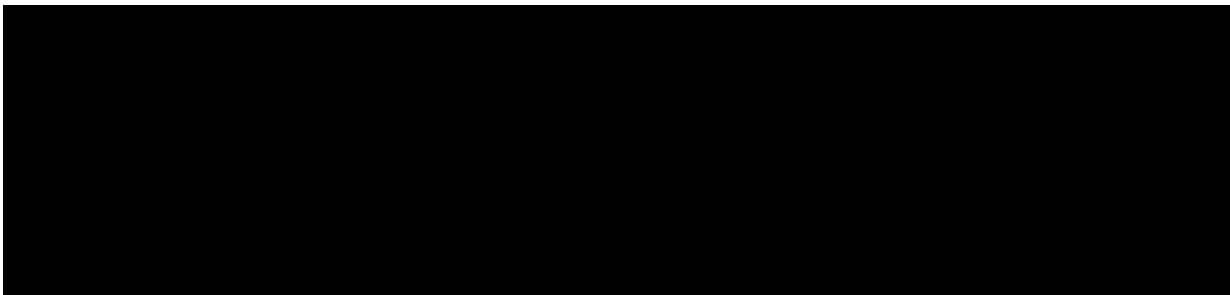
- 5 • **Function 1 — Customer feed.** Bay 1 provides the customer's feed. The direct-
6 connection facilities that serve only the customer have been directly assigned to the
7 customer, consistent with the Matrix. The customer is responsible for its direct
8 connection facilities, including the associated 230 kV breaker and the direct-
9 connection transmission line substation equipment that supplies the customer's
10 substation.
- 11 • **Function 2 — Network source.** Bay 1 also terminates the network source from
12 Susquehanna #1. It is this network source connection that integrates the switchyard
13 into the bulk transmission system and makes the Tomhicken Switchyard a network
14 facility rather than a facility dedicated solely to the customer.

15 Because the Tomhicken Switchyard is a network facility, it provides benefits
16 beyond the interconnecting customer that, under the Company's policy, are properly
17 included in transmission rate base, including:

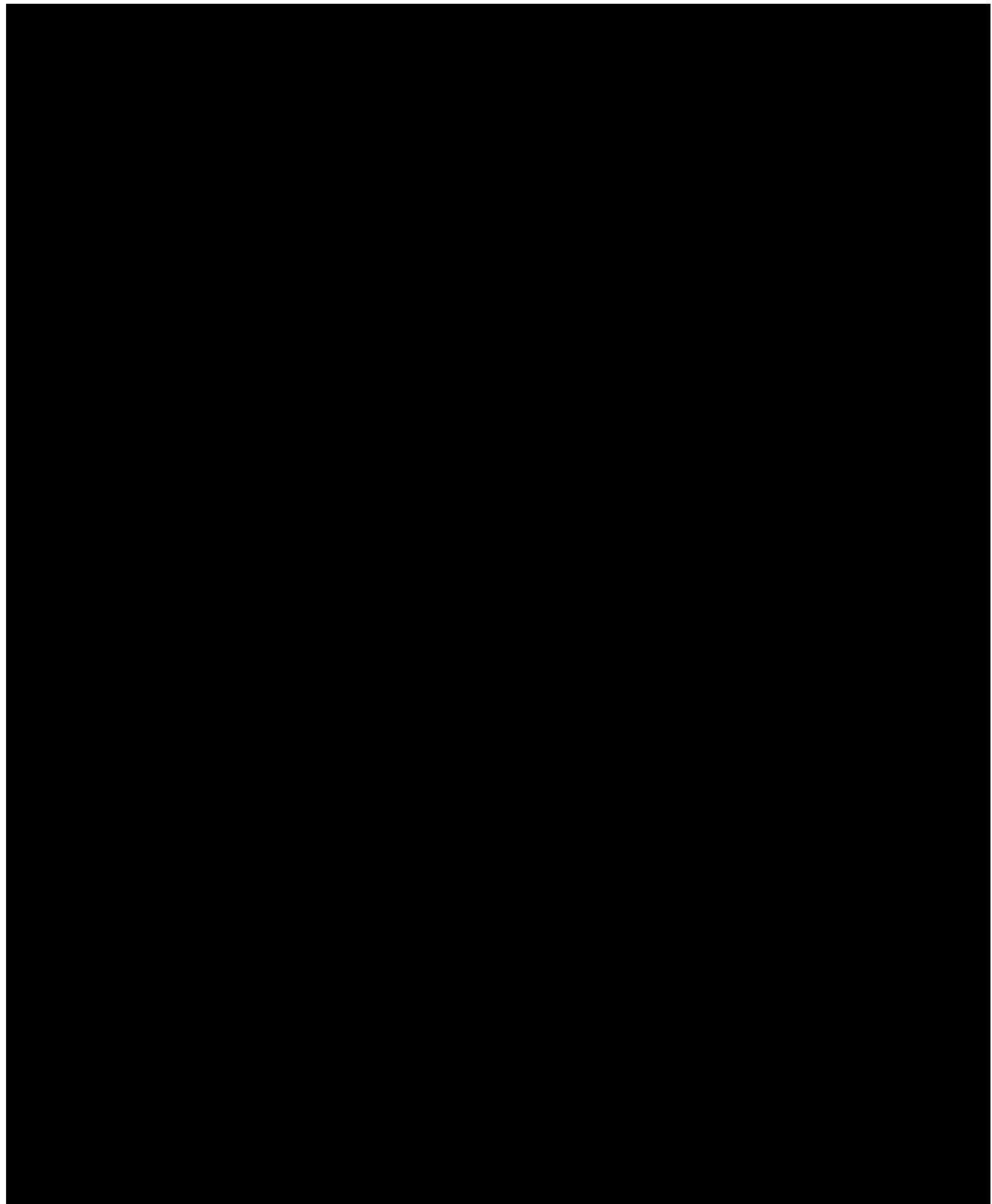
- 18 • Service to multiple transmission customers and/or retail feeders;
- 19 • Increased resiliency and operational flexibility; and
- 20 • Expanded capacity for new generation flow and interconnections.

21 In short, the Company applied its standard correctly. Mr. Konidena's "misapplied its
22 own standard" argument depends on equating the generic Bay 1 in an illustrative example
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6 **Q. Please respond to Mr. Konidena’s repeated assertions that the design of the**
7 **Tomhicken 230 kV Switchyard was driven by the Sugarloaf 500/230 kV Transmission**
8 **Line Project. (OCA Statement 2, pp. 25, 28.)**

9 A. The Tomhicken 230kV Switchyard would have been designed in a breaker-and-a-half
10 arrangement regardless of the Phase 2 scope. The Tomhicken 230 kV Switchyard design
11 incorporates the Phase 2 “Sugarloaf 500/230 kV Transmission Line Project” scope but is
12 not the driver for the breaker-and-a-half arrangement. With eight lines to be terminated at
13 Tomhicken 230 kV Switchyard under Phase 1, a breaker-and-a-half arrangement was the
14 preferred alternative. Per PPL Electric System Planning Development Standards, ring
15 buses are not utilized for new construction. Breaker-and-a-half arrangements are the design
16 basis because of the balance of operational flexibility and cost, which this design affords.
17 A double breaker – double bus arrangement was not selected as it would have required a
18 longer 230 kV switchyard, additional terminal equipment, and additional 230 kV breakers.
19 PJM’s Substation Bus Configurations & Substation Design Recommendations state
20 “Reasons for changing from a ring bus to a breaker-and-a-half arrangement might include
21 the criticality or size of the load or generation to be interconnected, or the number of bus
22 positions in existence or planned for the future. The larger the ring bus, the greater the
23 probability becomes during normal operations, multi-system events and maintenance that

1 the substation could become fragmented into multiple pieces thereby losing its level of
2 Reliability”. The Tomhicken 230 kV Switchyard is designed for six initial bays with space
3 for two additional bays for a total of eight bays, allowing for the termination of sixteen 230
4 kV lines. A ring bus of this size would be very large and would present operational risk
5 during planned and unplanned outages.

6
7 **Q. Is Mr. Konidena’s testimony that the benefits of the Tomhicken 230 kV Switchyard**
8 **are contingent upon the Sugarloaf 500/230 kV Transmission Line Project accurate?**
9 **(OCA Statement 2, pp. 29-30, 51, 59-60.)**

10 A. No. While the initial Phase 1 scope does not directly increase the capacity of the
11 Susquehanna – Harwood corridor, the Tomhicken 230 kV switchyard provides the benefit
12 of the expansion of the 230 kV network as well as serving the new customer. The
13 Tomhicken 230 kV Switchyard will allow for additional transmission lines which will
14 increase system reliability by adding additional 230 kV paths from the Susquehanna area
15 to the Hazleton area. The proposed phases will increase capacity of the transmission
16 system. The new Tomhicken Switchyard will have ability to add additional 230 kV
17 transmission lines to supply other customers or add system capacity. The new 230 kV
18 transmission lines and Tomhicken 230 kV Switchyard provide additional system resiliency
19 and greater operational flexibility to take outages. The Tomhicken 230kV switchyard is
20 part of the 230 kV network, will have additional network line terminations, and can serve
21 additional 230kV customers. The Tomhicken 230 kV Switchyard is not solely dedicated to
22 serving the customer and provides system benefit as the switchyard is built out over time
23 to its final configuration.

1
2 **VI. PUBLIC OUTREACH AND NOTICE**

3 **Q. Do any of the parties provide testimony about the notice provided for the Tomhicken**
4 **230 kV Switchyard Project?**

5 A. Yes. Ms. Cook testified that the Company “did not properly notify the public that is directly
6 affected by Phase 1 of the Project.” (Cook Direct, p. 15.) She bases this averment on the
7 newspapers selected by the Company to originally publish notice within Luzerne County,
8 PA, and on an issue experienced by PPL Electric with a newspaper when it published notice
9 of the public input hearings. (Cook Direct, p. 15.) Other individuals at the public input
10 hearings also testified about concern with public input hearing notice. (Tr. at 299, 334.)
11

12 **Q. What parties must be provided with notice of the filing of an LON?**

13 A. The parties that must be provided with notice are: the Secretary of the Department of
14 Transportation; the Chairman of the Historical and Museum Commission; local, state, and
15 federal governmental agencies which have requirements to be met in connection with the
16 construction or maintenance of the proposed HV line; and known persons, corporations,
17 and other entities of record owning property within the proposed ROW.
18

19 **Q. Was notice provided to the parties you listed in the above question?**

20 A. Yes.
21

22 **Q. Was any other notice provided to affected landowners or to the general public within**
23 **the Project area?**

1 A. Yes. Consistent with the direction that the Company received, it published notice of the
2 LON and the prehearing conference, and of the public input hearings. The Company's
3 proofs of publication associated with those notices are publicly available on the docket for
4 this matter.

5
6 **Q. Did the Company experience any issues with publication of notice of the public input**
7 **hearings?**

8 A. Yes. PPL Electric was informed that the Wilkes Barre Citizens' Voice failed to publish
9 notice on June 9, 2026, as it had been agreed upon between PPL Electric and Wilkes Barre
10 Citizens' Voice. The omission was the result of an error by the publication, and only
11 impacted one of the dates when the notice was scheduled to be published. PPL Electric
12 informed the ALJs and parties, and filed a letter explaining the discovery on the same day
13 that it was informed of the omission, June 29, 2026. PPL Electric also took the most
14 reasonable action possible to remedy the situation, which was to direct the Wilkes Barre
15 Citizens' Voice to publish the notice on the very next day, which was June 30, 2026.

16
17 **Q. Would you like to provide any other comment regarding the parties' concerns about**
18 **public notice?**

19 A. Yes. I would like to note once again that Ms. Cook specifically took issue with the fact that
20 notice of the public input hearings was not published in the Wilkes Barre Citizens' Voice
21 on June 9, 2026. (Cook Direct, p. 15.) However, Ms. Cook testified at the prehearing
22 conference in this matter that "most of us here in Hazle Township and Sugarloaf Township
23 do not have subscriptions to [the Wilkes Barre Citizens' Voice and Wilkes Barre Times

1 Leader],” and that “anything up north is really not going to get here.” (Tr. at 41.) Thus, and
2 while PPL Electric does not take the publication issue lightly, I would reiterate that notice
3 of the Public Input Hearings was still provided across two dates and three publications, and
4 within two different areas of Luzerne County, one of which was specifically requested by
5 Ms. Cook.

6
7 **VII. CONCLUSION**

8 **Q. Does this conclude your Rebuttal Testimony at this time?**

9 A. Yes. I reserve the right to supplement my testimony as additional issues arise during the
10 course of this proceeding.

AGREEMENT FOR LARGE LOAD ELECTRIC SERVICE

This **AGREEMENT FOR LARGE LOAD ELECTRIC SERVICE** (this “**Agreement**”) dated [Click here to enter a date](#) (the “**Effective Date**”), is hereby made and entered into by and between PPL Electric Utilities Corporation (“**PPL EU**”), with a business address of 645 Hamilton St., Suite 601, Allentown, Pennsylvania 18101, and [Click here to enter Customer's name](#) (“**Customer**”), with a business address at [Click here to enter Customer's address](#). PPL EU and Customer are sometimes hereinafter referred to individually as a “**Party**” and together as the “**Parties**.”

RECITALS

WHEREAS, PPL EU is a “public utility” and “electric distribution company” as defined in Sections 102 and 2803 of the Pennsylvania Public Utility Code, 66 Pa. C.S.A. §§ 102, 2803, that offers electric service to customers pursuant to its tariff approved by the Pennsylvania Public Utility Commission (“**Commission**”) presently in effect, as the same may be amended from time to time, a copy of which is available at www.pplelectric.com (“**Tariff**”); and

WHEREAS, Customer desires to receive retail electric service at voltages at or above 69,000 volts from PPL EU (“**Electric Service**”) to the Customer’s facility located at [Click here to enter address, county, state, and GPS location for Customer's facility](#) (“**Customer Facility**”); and

WHEREAS, PPL EU is willing to provide such Electric Service to the Customer Facility in accordance with, and pursuant to, the terms and conditions set forth in this Agreement.

NOW THEREFORE, in consideration of the mutual covenants and agreements set forth herein, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged and accepted, and intending to be legally bound, the Parties agree as follows:

AGREEMENT

1. CONSTRUCTION AGREEMENT. The Parties entered into an Agreement for Construction of Large Load Electric Service Facilities with respect to the Customer Facility (as may be amended, modified, or supplemented, the “**Construction Agreement**”). The provision by PPL EU, and receipt by Customer, of Electric Service to the Customer Facility under this Agreement is conditioned upon completion of the Construction Work (as defined in the Construction Agreement) and PPL EU’s receipt of any and all amounts due and owing from Customer to PPL EU under the Construction Agreement. If the Construction Agreement terminates for any reason prior to completion of the Construction Work, this Agreement shall automatically terminate.

2. ELECTRIC SERVICE. Commencing on the In-Service Date and continuing during the Term, PPL EU shall provide to Customer, and Customer shall purchase and receive from PPL EU, Electric Service at the Service Point for the operation of the Customer Facility. PPL EU will provide Electric Service sufficient to meet the Contract Capacity during each applicable period all as set forth in **Schedule A**. The delivery and

receipt of Electric Service shall be in accordance with the rules, terms, conditions, and provisions of this Agreement and the Tariff.

3. TERM. This Agreement commences on the Effective Date and, unless sooner terminated or extended as permitted under this Agreement, expires ten (10) years after the In-Service Date ("**Initial Term**"). Immediately upon expiration of the Initial Term, this Agreement shall automatically renew for consecutive five (5) year periods unless sooner terminated as permitted under this Agreement (each, a "**Renewal Term**"). Customer shall have the right to terminate this Agreement, effective upon expiration of the Initial Term or any Renewal Term, by delivering written notice thereof to PPL EU at least twelve (12) months prior to the expiration of the Initial Term or any applicable Renewal Term. The Initial Term and any Renewal Term are collectively referred to herein as the "**Term**".

4. MINIMUM REVENUE AND ELECTRIC SERVICE COMMITMENTS. The following provisions are a material condition for PPL EU's provision to Customer of Electric Service under this Agreement:

a. Commencing on the In-Service Date and continuing during the Term, Customer's monthly payment for Electric Service under this Agreement shall be equal to the Transmission Service Charge for the greater of (i) the actual amount of Electric Service supplied to Customer during such month, or (ii) the Minimum Contract Capacity, which Minimum Contract Capacity will be utilized to determine the Customer's network integrated transmission service ("**NITS**") value.

b. During the Term, Customer must satisfy the Electric Service Commitment. If this Agreement terminates or expires prior to satisfaction of the Electric Service Commitment, Customer shall pay to PPL EU, within thirty (30) days thereafter, the Unsatisfied Electric Service Commitment.

On the Effective Date, estimated Rate Base Expenses (as defined in the Construction Agreement) were used to establish **Schedule A**, including the Contract Capacity, Minimum Contract Capacity, and Electric Service Commitment. Upon completion of the Rate Base PPL EU System Upgrades (as defined in the Construction Agreement), PPL EU shall revise **Schedule A** using the actual Rate Base Expenses and provide such revised **Schedule A** to Customer. Such revised **Schedule A** shall amend and restate, in its entirety, as of the Effective Date, the original **Schedule A**, and each Party shall update its counterpart of this Agreement by replacing the original **Schedule A** with such revised **Schedule A**.

5. SERVICE RATES. Customer shall pay for Electric Service in accordance with the applicable rate schedules set forth in the Tariff. Customer shall make payments to PPL EU within thirty (30) days after Customer's receipt of each invoice from PPL EU.

6. CREDIT SUPPORT.

a. On or prior to the Effective Date, Customer shall, at its own cost and expense, deliver to PPL EU, and maintain during the Term, Credit Support acceptable to PPL EU to secure Customer's obligations under this Agreement. PPL EU shall have the right, at its option, to draw upon, use, or otherwise enforce the Credit Support (i) to pay any amounts owed by Customer to PPL EU under this Agreement, and (ii) as provided

under the terms of this Agreement, the Credit Support, or any other written agreement between the Parties. Customer hereby grants to PPL EU a present and continuing first-priority security interest in, and lien on (and right of setoff against), and assignment of, all Cash and Cash Equivalent Collateral, whether now or hereafter held by, on behalf of, or for the benefit of PPL EU, and Customer agrees to take such action as may be reasonably requested by PPL EU, at any time, to perfect or maintain the perfection at all times of PPL EU's first priority security interest in, and lien on (and right of setoff against), such Cash and Cash Equivalent Collateral.

b. Customer shall promptly (and, in any event, within five (5) Business Days after PPL EU's demand therefor, or such longer period of time as may be agreed to in writing by PPL EU) deliver to PPL EU replacement Credit Support acceptable to PPL EU (i) at least thirty (30) days prior to the expiration of any Letter of Credit, (ii) whenever there is an adverse change in the credit standing of the Customer (in which event PPL EU may also revise the Credit Support Amount and/or the Minimum Credit Support Amount), (iii) whenever there is an adverse change in the credit standing of any guarantor that provided a Guaranty to PPL EU as part of the Credit Support (in which event PPL EU may also revise the Credit Support Amount and/or the Minimum Credit Support Amount), or (iv) whenever the issuer of any Letter of Credit is no longer a Qualified Institution, becomes Bankrupt, wrongfully dishonors any presentation thereunder, fails to timely perform or comply with any of its obligations thereunder, repudiates, disaffirms, disclaims, or rejects, in whole or in part, or challenges the validity of the Letter of Credit or any of its obligations thereunder, or provides notice that it will not be renewing any Letter of Credit. If PPL EU does not timely receive such replacement Credit Support, then PPL EU shall have the right, at its option, and in addition to any other remedies under this Agreement, at law, or in equity, to draw upon any Letter of Credit, in whole or in part, and hold such cash as all or part of the Credit Support required under this Agreement.

7. CUSTOMER OBLIGATIONS.

a. As a condition to receiving Electric Service Customer shall (a) perform and complete the Customer Scope of Work, (b) comply with all duties, responsibilities, and obligations set forth in the Tariff, (c) provide the Disconnection Facilities at the Service Point, (d) maintain the Customer Facility up to the Service Point, (e) operate according to the Operating Instruction, (f) deliver and maintain the Credit Support as required under this Agreement, and (g) grant to PPL EU all real property rights and access to the Customer Facility necessary for PPL EU to perform its rights and obligations under this Agreement, including, without limitation, such rights to any applicable system(s) at or pertaining to the Customer Facility (collectively, the "**Electric Service Conditions**"). Whether Customer has successfully fulfilled the Electric Service Conditions shall be determined by PPL EU. Customer shall be obligated to pay for Electric Service under this Agreement notwithstanding that Customer may not receive Electric Service due to Customer's failure to fulfill or comply with the Electric Service Conditions.

b. Any changes to the Customer's Interconnection Relaying or Disconnection Facilities (as defined in PPL EU Standards located at [PPL EU Standards](#)) must be approved by PPL EU in writing prior to implementation. If the Customer Facility includes generation equipment owned by the Customer, the Customer Scope of Work must include protections to prevent the Customer's generation equipment from backflowing onto PPL EU's grid. This Agreement does not permit Customer to be

compensated for excess generation. If Customer desires to be compensated for excess generation, Customer must apply and receive approval through the applicable interconnection processes of PPL EU and/or PJM.

8. PPL EU OBLIGATIONS. Subject to Customer fulfilling the Electric Service Conditions and otherwise complying with Customer's obligations under this Agreement and the Tariff, commencing on the In-Service Date and continuing during the Term PPL EU shall (a) operate and maintain Electric Service of 69 kV or higher to Customer, (b) provide facilities in the form of three-phase Electric Service, at approximately **Choose an item.** Volts at the Service Point (see **Schedule D** of this Agreement), and (c) operate according to the Operating Instruction. Customer acknowledges and agrees that this Agreement does not provide for, and that PPL EU is not responsible for and makes no representation or warranty regarding the availability of, electric generation to supply the Customer Facility.

9. PPL EU MAINTENANCE OUTAGES. PPL EU will make commercially reasonable efforts to notify Customer upon knowledge of impending maintenance, repair or replacement activities at least five (5) Business Days in advance of a scheduled outage for periodic maintenance or repair. Customer shall cooperate fully with PPL EU when PPL EU notifies Customer that an outage to the Electric Service or any other electric service is necessary for PPL EU to perform periodic or emergency maintenance, repair and/or replacement. If Customer does not cooperate when notified by PPL EU of a necessary outage for periodic or emergency maintenance, repair and/or replacement, PPL EU may, pursuant to the Tariff, temporarily suspend service to Customer to perform necessary maintenance, repair and/or replacement. PPL EU shall not, in any event, be required to provide advance notice to Customer of an outage to Electric Service or any other electric service if such outage is necessary for any emergency maintenance, repair and/or replacement, provided PPL EU will make commercially reasonable efforts to notify Customer at least one (1) hour in advance of any emergency maintenance, repair and/or replacement.

10. OBSERVATION OF DEFICIENCIES. If PPL EU observes a violation of Good Utility Practice, Applicable Laws, any abnormal condition in connection with the Customer Facility, or becomes aware of a lack of scheduled maintenance or testing with respect to the Customer Facility and/or Customer equipment that may affect PPL EU's facilities or services, PPL EU shall provide prompt notice under the circumstances to Customer. PPL EU's review, inspection, and approval related to the Customer Facility shall be limited to the purpose of assessing the safety, reliability, protection and control of PPL EU's facilities and shall not be construed as confirming or endorsing the design of any portion of the Customer Facility, or as a warranty of any type, including the safety, durability or reliability of the Customer Facility. Customer acknowledges that Customer is fully liable for the Customer Facility, and Customer hereby (i) waives, releases, indemnifies, defends, and holds harmless PPL EU from and against any and all third-party Claims related to or arising from the Customer Facility, including, without limitation, any deficiency in the Customer Facility, and/or any outages in the Electric Service, and (ii) waives, releases, and holds harmless PPL EU from and against any and all Claims related to or arising from any outages, disruptions, or terminations in Electric Service excluding only those Claims that may be generally available to customers against PPL EU under the Tariff.

11. ALTERNATE OR REDUNDANT SUPPLY. Customer requests alternate and/or redundant supply, in addition to the Service Point, as follows:

Alternate Supply (check one):

- ☐ Standard three-phase service at approximately **Choose an item.** volts at the point where PPL EU's overhead service conductors terminate on the line side terminals of Customer's alternate service disconnecting facilities ("**Alternate Service Point**").
- ☐ No alternate supply.

Redundant Supply (check one):

- ☐ Redundant supply/multiple primary feeds.
- ☐ No redundant supply/no multiple primary feeds.

If a box is not checked above for either alternate supply or redundant supply, Customer has not requested any such supply. If Customer has not requested alternate supply or redundant supply as of the Effective Date, (i) Customer may request alternate supply or redundant supply at any time during the Term by providing written notice thereof to PPL EU, (ii) the provision of any such alternate or redundant supply shall be subject to additional (x) terms and conditions, and (y) costs and expenses to be paid by Customer to reflect additional costs and expenses incurred by PPL EU with respect to development of PPL EU's system to accommodate such supply, and (iii) PPL EU shall have no obligation to provide alternate supply or redundant supply, as applicable, unless and until the Parties enter into a written agreement incorporating such additional terms, conditions, costs, and expenses.

12. CUSTOMER POWER QUALITY AND HARMONIC DISTORTION, VOLTAGE FLICKER OR REVERSE FLOW.

a. Customer must comply with the following minimum requirements to ensure grid stability, power quality, and reliability under normal and contingency conditions:

- Voltage Flicker: Maintain within IEEE 1453 limits.
- Reactive Support: Provide adequate VAR control to avoid voltage instability
- Power Factor: Maintain ≥ 0.98 pf lagging
- Provide detailed load models to PPL EU when any electrical system modification or operational changes are initiated (including UPS, cooling systems, and backup generation) for stability studies.
- Customer electrical equipment shall allow utility protection schemes to provide timing for up to three (3) transmission line reclose attempts before backup generators are initiated (230kV).

b. To prevent sudden large changes in demand that could destabilize voltage, frequency, or thermal limits on the transmission system, Customer must comply with the following load change limitations:

- Maximum changes: ≤ 50 MW per minute
- May have to utilize UPS to buffer demand

c. If the Customer Facility or any Customer electric equipment at any time introduces harmonic distortion or voltage flicker on PPL EU's electric transmission system which adversely affects the operation of PPL EU's electric transmission system or PPL EU's electric service to PPL EU's other customers, in each case as determined by PPL EU, PPL EU will notify Customer and Customer shall, at its sole cost and expense and in accordance with PPL EU specifications, perform all corrective measures to reduce the magnitude and frequency of the voltage flicker, install harmonic filter(s) designed to limit individual harmonics to those levels acceptable to PPL EU, or take such other steps, as determined by PPL EU, necessary to reduce voltage flicker or harmonic distortion to the levels acceptable to PPL EU. If Customer does not take such corrective measures, or if the corrective actions are insufficient in the opinion of PPL EU, Customer may be required by PPL EU to curtail operation until such corrective measures are implemented. The provisions of this Section apply to the Service Points.

Maximum Allowable Harmonic Voltage Distortion		
Voltage Level	Distortion Factor (% System Voltage)	Individual Harmonic (% System Voltage)
69 kV through 138 kV	1.25	1.0
230 kV through 500 kV	1.0	0.75

d. Due to the large size of Customer's motors, Customer-installed Point of Contact relaying is required to have the reverse power function as an available function in the relay chosen from the PPL EU Approved Customer Point of Contact and Generator Intertie Protective Devices. The reverse power function must be implemented in the design of the Point of Contact relaying.

13. CONVERSION TO Choose an item. VOLTS. The Parties agree that should PPL EU increase its service voltage to Choose an item. Volts, Customer shall, at Customer's sole cost and expense, make any changes necessary to Customer's substation equipment, and shall reimburse PPL EU for any costs and expenses incurred by PPL EU to accommodate the changes to Customer's substation equipment to accept electric service from PPL EU at Choose an item. Volts. PPL EU shall notify Customer of PPL EU's intent to change the service voltage to Choose an item. Volts as soon as reasonably practicable, but in no event less than two (2) years in advance.

14. REGULATORY RESTRICTIONS. PPL EU's obligations under this Agreement are subject to all Applicable Laws and the Tariff.

15. FORCE MAJEURE. Neither Party shall be responsible or liable to the other Party for any loss or damage for failure or delay in the performance of such Party's obligations under this Agreement to the extent the failure or delay is caused by a Force Majeure Event. For the avoidance of doubt, a Force Majeure Event shall not waive, reduce, or otherwise modify Customer's obligation to satisfy the Electric Service Commitment pursuant to the terms of this Agreement during the continuance of any Force Majeure Event or otherwise.

16. PERMITS AND LICENSES. Each Party shall use commercially reasonable efforts to obtain and maintain any Permits required in connection with the provision and/or receipt, as applicable, of Electric Service under this Agreement including, without limitation, any scope of work required to be performed by either Party hereunder. If a Party is unable to obtain or maintain any Permit, such Party shall notify the other Party in writing together with details thereof, and the Parties shall, for a period of at least ninety (90) days thereafter (or such other period of time as mutually agreed to by the Parties in writing), use good faith and diligent efforts to endeavor to resolve such matter. If the Parties are unable to resolve such matter and, as a result of such matter, Electric Service cannot be provided to or received by Customer in accordance with Good Utility Practice and the terms of this Agreement and the Tariff, then either Party shall have the right to terminate this Agreement.

17. REPRESENTATIONS AND WARRANTIES. Customer hereby represents and warrants as follows:

a. Customer is duly incorporated, validly existing and in good standing under the laws of the state of its incorporation, and has all requisite power and authority to execute, deliver, and perform its obligations under this Agreement.

b. Customer's execution and delivery of this Agreement and the performance of its obligations under this Agreement, have been duly authorized by all necessary actions and do not and, under existing facts and law, shall not: (i) contravene its certificate of incorporation or any other governing documents; (ii) conflict with, result in a breach of, or constitute a default under any agreement to which it is a party; or (iii) violate any Applicable Law.

c. This Agreement has been duly executed and delivered on behalf of Customer and, assuming the due execution hereof and performance hereunder by PPL EU, constitutes a legal, valid, and binding obligation of Customer, enforceable against it in accordance with its terms, except as such enforceability may be limited by law or principles of equity.

d. As of the Effective Date, there are no actions, suits or other proceedings, at law or in equity, by or before any governmental entity or agency or any other body pending or, to the best of its knowledge, threatened against or affecting Customer which relate in any manner to this Agreement or any transaction contemplated hereby, or which Customer reasonably expects to lead to a material adverse effect on the validity or enforceability of this Agreement or Customer's ability to perform its obligations under this Agreement.

e. The execution, delivery and performance by Customer of its obligations under this Agreement do not and, under existing facts and law, shall not, require any Authorizations by any individual, business entity, governmental authority, or otherwise which has not been duly obtained, made or taken or that shall be duly obtained, made or taken on or prior to the date required, and all such Authorizations are in full force and effect, final and non-appealable as required under Applicable Law (including, without limitation, any such Authorizations that Customer may require from the record owner of the Customer Facility and the real property on which the Customer Facility is located).

f. There are no Bankruptcy proceedings pending against or being contemplated by Customer, or, to Customer's knowledge, threatened against it.

18. LIMITATION OF LIABILITY. NEITHER PARTY SHALL BE LIABLE TO THE OTHER PARTY FOR ANY SPECIAL, INDIRECT, INCIDENTAL, PUNITIVE, OR CONSEQUENTIAL LOSSES, DAMAGES, JUDGMENTS, FINES, PENALTIES, COSTS OR EXPENSES WHATSOEVER INCLUDING, BUT NOT LIMITED TO: (I) DELAYED, LOST OR REDUCED PROFITS, REVENUES, EFFICIENCY, PRODUCTIVITY, BONDING CAPACITY, BUSINESS OPPORTUNITIES; OR (II) INCREASED OR EXTENDED OVERHEADS, OPERATING, MAINTENANCE, DEPRECIATION, FINANCING COSTS OR EXPENSES ARISING OUT OF, RELATED TO, OR IN CONNECTION WITH THE PERFORMANCE OR BREACH OF THIS AGREEMENT WHETHER BASED UPON CONTRACT, TORT (INCLUDING NEGLIGENCE), WARRANTY, STRICT LIABILITY OR UNDER ANY OTHER LEGAL OR EQUITABLE THEORY.

19. TERMINATION; TERMINATION PAYMENT. This Agreement may be terminated (i) as expressly permitted under this Agreement, or (ii) upon the mutual written agreement of the Parties. Additionally, PPL EU shall have the right to terminate this Agreement as provided for in the Tariff or Applicable Law, or if Customer fails to complete the Customer Scope of Work prior to the In-Service Date. If this Agreement terminates for any reason except as the sole result of PPL EU's gross negligence or intentional misconduct, Customer shall pay to PPL EU, within thirty (30) days after such termination, the Termination Payment in addition to any other costs and expenses Customer is required to pay to PPL EU under this Agreement.

20. ASSIGNMENT; TRANSFER OF CUSTOMER FACILITY. Customer shall not assign or otherwise transfer this Agreement, in whole or in part, without the prior written consent of PPL EU, in PPL EU's sole discretion. Prior to Customer selling, transferring, terminating, or otherwise ceasing to operate the Customer Facility, Customer shall provide PPL EU with written notice thereof. Customer acknowledges that Customer shall not be released from any of its obligations under this Agreement in the event of any such assignment, sale, transfer, termination, or cessation of operations, unless expressly agreed to by PPL EU in writing. Any assignment or other transfer of this Agreement by Customer in violation of the terms of this Agreement shall be null and void and of no force or effect.

21. BINDING EFFECT. The provisions of this Agreement shall inure to the benefit of, and be binding upon, the heirs, executors, administrators, successors, and permitted assigns of the respective Parties.

22. AMENDMENTS. This Agreement may only be amended, modified or supplemented by an agreement in writing signed by each Party. No waiver by any Party of any of the provisions hereof shall be effective unless explicitly set forth in writing and signed by the Party so waiving. Except as otherwise set forth in this Agreement, no failure to exercise, or delay in exercising, any rights, remedy, power or privilege arising from this Agreement shall operate as, or be construed as, a waiver thereof; nor shall any single or partial exercise of any right, remedy, power or privilege hereunder preclude any other or further exercise thereof or the exercise of any other right, remedy, power or privilege.

23. CONFLICTS. In the event of a conflict between the terms, conditions, provisions, or rules in this Agreement, any Schedule attached to this Agreement, and/or the Tariff, such conflict shall be resolved in the following order of precedence: (a) first, the terms, conditions, provisions, and rules of the Tariff which shall prevail and control over all other agreements between the Parties relating to the subject matter of this Agreement, (b) second, the terms, conditions, and provisions of this Agreement, and (c) third, the terms, conditions, and provisions of any Schedules.

24. GOVERNING LAW AND VENUE. This Agreement shall be governed by the laws of the Commonwealth of Pennsylvania. The Parties shall bring any legal action or proceeding arising out of or relating to this Agreement in the Commission or in any federal court sitting in the Eastern District of the Commonwealth of Pennsylvania; provided, however, that if the Commission or such federal court does not have jurisdiction over such action or proceeding, such action or proceeding shall be heard and determined exclusively in any Pennsylvania state court sitting in Northampton County or Lehigh County or other applicable regulatory agency. The Parties consent to the exclusive jurisdiction of the Commission and/or such courts for the purpose of all regulatory or legal actions and proceedings arising out of or relating to this Agreement. EACH PARTY WAIVES, TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, ANY OBJECTION THAT IT MAY NOW OR LATER HAVE TO THE LAYING OF VENUE AS PROVIDED IN THIS SECTION AND ANY CLAIM THAT ANY ACTION OR PROCEEDING BROUGHT IN THE COMMISSION OR ANY SUCH COURT HAS BEEN BROUGHT IN AN INCONVENIENT FORUM.

25. WAIVER OF JURY TRIAL. EACH PARTY, TO THE EXTENT PERMITTED BY APPLICABLE LAW, KNOWINGLY, VOLUNTARILY, AND INTENTIONALLY WAIVES ITS RIGHT TO A TRIAL BY JURY IN ANY ACTION OR OTHER LEGAL PROCEEDING ARISING OUT OF, UNDER, OR RELATING TO THIS AGREEMENT, OR ANY TRANSACTION CONTEMPLATED HEREBY. THIS WAIVER APPLIES TO ANY ACTION OR LEGAL PROCEEDING, WHETHER IN CONTRACT, TORT OR OTHERWISE.

26. CAPTIONS. The captions in this Agreement are for reference purposes only and shall not affect the interpretation of the provisions hereof.

27. ENFORCEABILITY. The Parties desire that the rights and obligations set forth herein be enforced to the maximum extent permitted by Applicable Law. If any provision of this Agreement or its application to either Party or circumstance is held invalid, illegal or unenforceable to any extent, the remainder of this Agreement and the application of that provision to the other Party or to other circumstances is not affected and is to be enforced to the fullest extent permitted by Applicable Law, provided that such enforcement does not materially change the underlying business arrangement.

28. NO WAIVER. It is understood and agreed that any delay, waiver, or omission by a Party to exercise any right arising from any breach or default by the other Party of any of the terms of this Agreement, shall not be construed to be a waiver by such Party of any subsequent breach or default by the other Party.

29. ENTIRE AGREEMENT. This Agreement including the Schedules (each of which is incorporated into and made a part of this Agreement), constitutes the entire agreement between the Parties hereto with respect to the provision of Electric Service to

Customer, and all prior agreements with respect to the same are hereby superseded including, without limitation, any letter(s) of agreement or term sheet(s). The Construction Agreement is a separate, independent agreement that shall not be superseded by this Agreement.

30. NOTICES. All notices pertaining to this Agreement shall be in writing and directed to the following individuals for their respective organizations, provided however that any Party may change the individuals designated to receive written notice by providing written notice of such change to the other Party:

For Customer:	With a copy to:
Name: Click here to enter Customer's Name	Name: Click here to enter Customer's Name
Address: Click here to enter Customer's address	Address: Click here to enter Customer's address
Email: Click here to enter Customer's email address	Email: Click here to enter Customer's email address
For PPL EU:	With a copy to:
Name: Interconnection Affairs	Name: Office of General Counsel
Address: PPL Electric Utilities 827 Hausman Road Allentown, PA 18104	Address: PPL Services Corporation 645 Hamilton St. Suite 700 Allentown, PA 18101
Email: jlookup@pplweb.com	Email: irjankowski@pplweb.com

All notices under this Section shall be delivered in person to the receiving Party or shall be sent via email and reputable next business day express courier service. Any notice so given personally shall be deemed to have been served on delivery, and any notice so given by email and express courier service shall be deemed to have been served the next Business Day after the same shall have been delivered by email and express courier.

31. SURVIVAL. All terms, conditions, and obligations under this Agreement that, by their terms, would reasonably be expected to be performed after expiration or termination of this Agreement, shall survive such expiration or termination, whether or not expressly stated, including, without limitation, any terms, conditions, or obligations for or relating to indemnification(s), waiver(s), release(s), payment(s), construction obligations to be performed after this Agreement terminates or expires, Credit Support rights, and any applicable Tariff provisions.

32. COUNTERPARTS; ELECTRONIC SIGNATURES. This Agreement may be executed in one or more counterparts, with the same effect as if the Parties had signed the same document. Each counterpart so executed shall be deemed to be an original, and all such counterparts shall be construed together and shall constitute one Agreement. Each Party agrees that the electronic signatures of the Parties included in this Agreement are intended to authenticate this writing and to have the same force and effect as manual signatures. An electronic signature means any electronic sound, symbol, or process attached to or logically associated with a record and executed and adopted by a party

with the intent to sign such record pursuant to the Pennsylvania Uniform Electronic Transactions Act (73 Pa. Stat. Ann. § 2260.101 et seq.), as amended from time to time.

33. DISPUTES. If at any time any question, dispute, or difference shall arise between the Parties in relation to, or in connection with, this Agreement, the Parties shall endeavor to resolve the same amicably through negotiations undertaken in good faith, with representatives with decision-making authority regarding such question, dispute, or difference, for a period of ten (10) days after the aggrieved Party notifies the other Party of such dispute. In the event such question, dispute, or difference is not resolved within such ten (10) day period, the Parties shall have the right to exercise any remedies available under this Agreement, at law, or in equity. In no event shall this Section be construed to waive either Party's right to take, or omit to take, any action or to exercise any rights or remedies under, or arising out of, this Agreement, at law, or in equity.

34. CUSTOMER ON-SITE GENERATION AND STORAGE. If elected, Customer may deploy on-site generation and storage methods to serve its electric service needs, which may include, but are not limited to, arrangements for behind the meter generation and battery storage; provided such arrangements are in accordance with the Tariff and all Applicable Laws.

35. TAXES. PPL EU may charge, and Customer shall pay, applicable Taxes in connection with this Agreement.

36. DEFINITIONS. Capitalized terms used in this Agreement but not otherwise defined shall have the following meanings:

a. **"Applicable Laws"** means applicable federal, state, county, and municipal laws, statutes, ordinances, resolutions, rules, and regulations relating to the Parties or this Agreement, including the supply of electric service hereunder and the use of equipment and materials required therefor.

b. **"Authorizations"** means approvals, consents, licenses, Permits, filings, registrations, waivers, actions, or other authorizations.

c. **"Bankrupt" or "Bankruptcy"** means, with respect to any entity, such entity: (i) voluntarily files a petition or otherwise commences, authorizes, or acquiesces in the commencement of a proceeding or cause of action under any bankruptcy, insolvency, reorganization, or similar law, or has any such petition filed or commenced against it by its creditors and such petition is not dismissed within sixty (60) calendar days of the filing or commencement, (ii) makes an assignment or any general arrangement for the benefit of creditors, (iii) otherwise becomes insolvent, however evidenced, (iv) has a liquidator, administrator, receiver, trustee, conservator, or similar official appointed with respect to it or any substantial portion of its property or assets, or (v) is generally unable to pay its debts as they fall due.

d. **"Business Day"** shall mean any day on which PPL EU's corporate offices are open for business and commercial banks are not authorized or required to close in New York, New York.

e. **"Cash and Cash Equivalent Collateral"** means all cash and cash equivalents received by PPL EU as Credit Support under this Agreement, and all interest

and other payments and distributions of cash or other property with respect thereto, and any and all proceeds resulting therefrom or from the disposition or liquidation thereof.

f. **“Claims”** mean any and all liability, claims, demands, suits, allegations, or causes of action, whether at law or in equity, and whether based on statute, regulation, rule, ordinance, code, standard or common law, or theories of contract, tort, strict liability, or otherwise, and any losses, costs, damages, injuries, liabilities, penalties, and interest, including reasonable legal fees and expenses, suffered or incurred as a result thereof.

g. **“Contract Capacity”** means the aggregate load set forth in **Schedule A**.

h. **“Contract Year”** means each successive twelve (12) month period commencing on the In-Service Date.

i. **“Credit Rating”** means, with respect to any entity, the rating then assigned to such entity's unsecured, senior long-term debt obligations (not supported by third party credit enhancements) or, if such entity does not have a rating for its senior unsecured long-term debt obligations, then the “Credit Rating” will be the entity's issuer credit rating assigned by S&P or Moody's.

j. **“Credit Support”** means either cash or Letter(s) of Credit in the Credit Support Amount and/or, subject to PPL EU's prior written approval, a Guaranty.

k. **“Credit Support Amount”** means the aggregate dollar amount set forth in **Schedule B-1**.

l. **“Customer Scope of Work”** means the work to be performed by the Customer as described in **Schedule C**.

m. **“Disconnection Facilities”** means the disconnection facilities shown in the One Line Diagram in **Schedule D**.

n. **“Electric Service Commitment”** means Customer's obligation to pay to PPL EU during the Term, in exchange for Electric Service, aggregate Transmission Service Charges that are at least equal to the total Rate Base Expenses.

o. **“Force Majeure Event”** means a cause or event that is beyond the affected Party's reasonable control including, without limitation: acts of civil or military authority (including courts and regulatory agencies), acts of nature or weather, war, riot, terrorism, insurrection, blockades, embargoes, sabotage, epidemics, floods, or the acts or omissions of PJM or other unaffiliated third parties. Notwithstanding the foregoing, a Party's economic hardship, including any inability or failure to pay money or raise financing, or changes in market conditions, including costs, prices, or wage rates shall not be a Force Majeure Event.

p. **“Good Utility Practice”** means any of the practices, methods, and acts engaged in or approved by a significant portion of the electric utility industry during the relevant time period, or any of the practices, methods, and acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made,

could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety, and expedition. "Good Utility Practice" is not intended to be limited to the optimum practice, method, or act to the exclusion of all others, but rather is intended to include acceptable practices, methods, or acts generally accepted in the region and the electric utility industry.

q. **"Guaranty"** means a written guarantee, issued by a U.S. guarantor or foreign guarantor that agrees to additional U.S.-based provisions, in each case, as acceptable to PPL EU, in the form provided for in **Schedule E**, pursuant to which such guarantor unconditionally and irrevocably guarantees the due and punctual performance of all obligations, covenants, and liabilities of Customer under this Agreement.

r. **"In-Service Date"** means the date that PPL EU has completed the PPL EU Scope of Work (as defined in the Construction Agreement) and PPL EU is otherwise ready to place the Customer Facility in service at approximately **Choose an item.** Volts.

s. **"Letter of Credit"** means an irrevocable standby letter of credit issued and maintained by a Qualified Institution in the form provided for in **Schedule B**.

t. **"Minimum Contract Capacity"** means (i) eighty percent (80%) of the monthly Contract Capacity during the period beginning on the In-Service Date and continuing until the later of (x) the date that PPL EU has received payment in full of the Electric Service Commitment, or (y) expiration of the fifth (5th) Contract Year, and (ii) fifty percent (50%) of the monthly Contract Capacity commencing upon expiration of the period described in subsection (i) above and continuing throughout the remainder of the Term.

u. **"Minimum Credit Support Amount"** means two (2) times the monthly amount that the Customer would be required to pay for Electric Service for the full Contract Capacity.

v. **"Operating Instruction"** means a mutually agreed upon operating instruction maintained on file with the PPL EU Transmission Control Center.

w. **"Permit"** means permits, licenses, rights of way, easements, or other authorizations required from any applicable governmental authority or other third party.

x. **"PJM"** means PJM Interconnection, L.L.C. or any affiliate or successor thereof, including any successor regional transmission organization.

y. **"Qualified Institution"** means a major U.S. commercial bank or foreign bank with a U.S. branch office having an asset base of at least \$10 billion, with such bank having a Credit Rating of at least "A-" by S&P and "A3" by Moody's (which Qualified Institution shall not be the Customer or any affiliate of the Customer).

z. **"Service Point"** means the point where PPL EU's overhead service conductors (cable-to-flat terminal connector) terminate on the line side terminals of Customer's primary disconnect switch.

aa. **"Taxes"** means national, state, or local sales or use taxes, or value added taxes that PPL EU is legally obligated to charge.

bb. **“Tax Gross-Up”** means the income tax liability associated with the taxation of contributions in aid of construction (**“CIAC”**) offset by a credit for the present value of the future tax reduction expected due to tax depreciation of the CIAC.

cc. **“Termination Payment”** means an amount equal to (i) any and all costs and expenses incurred by PPL EU in connection with the termination of Electric Service, the removal and/or relocation of PPL EU’s facilities, the safety of persons and property, and the integrity of the electric system, including, without limitation, costs and expenses relating to all labor, engineering, labor additives, right-of-way, supervision, overhead, administration, installation, transportation, employee’s, materials, removal and/or relocation, and the like, and (ii) if termination occurs prior to Customer satisfying its Electric Service Commitment, the Unsatisfied Electric Service Commitment.

dd. **“Transmission Service Charge”** means (as applicable) either (i) the Transmission Service Charge defined in the Tariff when Customer is purchasing energy via the Basic Utility Supply Service, or (ii) the applicable PJM NITS Rate when Customer is purchasing energy via a competitive electric generation supplier.

ee. **“Unsatisfied Electric Service Commitment”** means (i) the difference between the total Rate Base Expenses and the aggregate Transmission Service Charges received by PPL EU from Customer under this Agreement (**“Remaining Rate Base Expenses”**), and (ii) the Tax Gross-Up applicable to the Remaining Rate Base Expenses as calculated under subsection (i) above.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS HEREOF, the Parties have executed this Agreement for Large Load Electric Service, as of the date first above written, by their duly authorized representatives.

Click here to enter Customer's name

By: _____

Name: _____

Title: _____

Date: _____

PPL ELECTRIC UTILITIES CORPORATION

By: _____

Name: _____

Title: _____

Date: _____

SCHEDULE A
TO AGREEMENT FOR LARGE LOAD ELECTRIC SERVICE

ELECTRIC SERVICE COMMITMENT AND CONTRACT CAPACITY

[Attach Schedule* showing:

1. Electric Service Commitment: required monthly and aggregate load/Contract Capacity required for Customer to pay to PPL EU aggregate Transmission Service Charges that are at least equal to the total Rate Base Expenses (i.e., all expenses incurred by PPL EU for construction work under the CSA that will be included in the rate base) during the Initial Term
2. "Minimum Contract Capacity" for minimum revenue commitment: column showing eighty percent (80%) of the required monthly and aggregate load/Contract Capacity.

*schedule will initially include estimated Rate Base Expenses, and Schedule will be updated upon determination of actual Rate Base Expenses]

SCHEDULE B
TO AGREEMENT FOR LARGE LOAD ELECTRIC SERVICE

LETTER OF CREDIT FORM

CREDIT SUPPORT FORM (EVERGREEN)
(ELECTRONIC “eUCP CREDIT”)

{TO BE ISSUED ON THE LETTERHEAD OF THE ISSUING BANK}

IRREVOCABLE STANDBY LETTER OF CREDIT NO.

ISSUE DATE _____

EXPIRY DATE: _____

APPLICANT

[NAME]

[ADDRESS]

BENEFICIARY

PPL ELECTRIC UTILITIES CORPORATION
C/O PPL SERVICES CORPORATION
2701 EASTPOINT PARKWAY
LOUISVILLE, KY 40223
ATTN: MANAGER, CREDIT AND CONTRACT ADMINISTRATION

ELECTRONIC ISSUE ADDRESS: PPLMARGINCALL2@PPLWEB.COM

CURRENCY AMOUNT

USD *****\$ _____

WE (THE “ISSUER”) HEREBY ISSUE IN YOUR FAVOR OUR IRREVOCABLE STANDBY LETTER OF CREDIT NO: _____ (THE “LETTER OF CREDIT,” WHICH SHALL BE AN “eUCP CREDIT”) FOR THE ACCOUNT OF APPLICANT FOR AN AMOUNT OR AMOUNTS NOT TO EXCEED IN THE AGGREGATE US DOLLARS _____ AVAILABLE BY YOUR DRAFT(S) AT SIGHT AT OUR COUNTERS LOCATED AT [INSERT ISSUER’S PLACE FOR PRESENTATION], EFFECTIVE _____ AND EXPIRING ON _____ AT 5:00 PM NEW YORK, NEW YORK TIME OR ANY AUTOMATICALLY EXTENDED EXPIRY DATE, AS PROVIDED HEREIN. THIS LETTER OF CREDIT IS AVAILABLE IN ONE OR MORE DRAFTS UP TO THE AGGREGATE AMOUNT SET FORTH HEREIN.

THIS LETTER OF CREDIT IS PRESENTABLE AND PAYABLE AT OUR COUNTERS AS AN eUCP CREDIT, AND WE HEREBY ENGAGE WITH YOU THAT DRAFTS DRAWN UNDER AND IN COMPLIANCE WITH THE TERMS OF THIS LETTER OF CREDIT WILL BE HONORED ON PRESENTATION, IF ACCOMPANIED BY THE REQUIRED DOCUMENTS PURSUANT TO THE TERMS OF THIS LETTER OF CREDIT.

THIS ORIGINAL LETTER OF CREDIT HAS BEEN ISSUED VIA ELECTRONIC MEANS ONLY TO PPLMARGINCALL2@PPLWEB.COM. WE CONFIRM THAT THE ELECTRONIC PDF FILE OF THIS LETTER OF CREDIT (TOGETHER WITH ELECTRONIC PDF FILES OF SUBSEQUENT AMENDMENTS, IF ANY) SERVES AS THE OPERATIVE INSTRUMENT, AND THAT THE BENEFICIARY MAY USE THE ELECTRONIC PDF FILE OF THE LETTER OF CREDIT (TOGETHER WITH ELECTRONIC PDF FILES OF

SUBSEQUENT AMENDMENTS, IF ANY) AS IT WOULD A HARD COPY ORIGINAL.

DRAFTS, DOCUMENTS AND OTHER COMMUNICATIONS HEREUNDER MAY BE PRESENTED OR DELIVERED TO US BY EMAIL OR BY ANY OTHER ELECTRONIC MEANS. PRESENTATION OR DELIVERY BY EMAIL MUST BE MADE FROM YOUR EMAIL ADDRESS: PPLMARGINCALL2@PPLWEB.COM TO THE FOLLOWING ISSUER EMAIL ADDRESS: [INSERT ISSUER EMAIL ADDRESS], AND CONFIRMED BY TELEPHONE TO US AT ONE OF THE FOLLOWING NUMBER(S): _____ OR _____ [INSERT PHONE NUMBERS FOR CONFIRMATION]. IN THE EVENT OF A PRESENTATION BY EMAIL OR BY OTHER ELECTRONIC MEANS, NO REGULAR MAIL PRESENTATION OR DELIVERY IS NECESSARY, AND THE TRANSMISSION BY EMAIL OR BY OTHER ELECTRONIC MEANS WILL CONSTITUTE CONFORMING PRESENTATION OR DELIVERY.

THE BELOW MENTIONED DOCUMENT(S) MUST BE PRESENTED ON OR BEFORE THE EXPIRY DATE OR ANY AUTOMATICALLY EXTENDED EXPIRY DATE, AS PROVIDED HEREIN, OF THIS INSTRUMENT IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF THIS LETTER OF CREDIT.

REFERENCES MADE HEREIN, OR IN ANY DRAWING OR CORRESPONDENCE DOCUMENTS HEREUNDER, TO THE [INSERT NAME OF AGREEMENT] DATED [INSERT DATE OF SUCH AGREEMENT] BETWEEN PPL ELECTRIC UTILITIES CORPORATION AND APPLICANT, OR AN AFFILIATE OF APPLICANT, SHALL INCLUDE SUCH RELATED EXHIBITS, ATTACHMENTS, SCHEDULES, TARIFFS, PROCEDURES AND OTHER CONTRACTS ENTERED INTO PURSUANT TO OR IN CONNECTION WITH THE AFOREMENTIONED AGREEMENT, ALL AS SUCH ITEMS MAY AMENDED, SUPPLEMENTED, REPLACED OR SUBSTITUTED FROM TIME TO TIME

1. YOUR SIGNED STATEMENT, READING AS FOLLOWS (WITH BLANKS APPROPRIATELY COMPLETED AND BRACKETED INSTRUCTIONS DELETED):

“THE AMOUNT FOR THIS DRAWING, USD [INSERT AMOUNT], BEING MADE UNDER THE [INSERT NAME OF BANK] IRREVOCABLE STANDBY LETTER OF CREDIT NO. [INSERT LETTER OF CREDIT REFERENCE NUMBER], REPRESENTS AN AMOUNT DUE AND PAYABLE TO BENEFICIARY FROM APPLICANT OR AN AFFILIATE OF APPLICANT UNDER THE PPL ELECTRIC UTILITIES CORPORATION [INSERT NAME OF AGREEMENT] DATED [INSERT DATE OF SUCH AGREEMENT] BETWEEN APPLICANT OR AN AFFILIATE OF APPLICANT AND BENEFICIARY, AND THIS STATEMENT SHALL BE THE NOTICE OF COMPLETENESS FOR THIS PRESENTATION UNDER THE ABOVE-REFERENCED LETTER OF CREDIT.”; OR

“AN EVENT OF DEFAULT UNDER THE PPL ELECTRIC UTILITIES CORPORATION [INSERT NAME OF AGREEMENT] DATED [INSERT DATE OF SUCH AGREEMENT] BETWEEN APPLICANT OR AN AFFILIATE OF APPLICANT AND BENEFICIARY HAS OCCURRED AND THAT BENEFICIARY DEMANDS PAYMENT IN THE AMOUNT OF [INSERT AMOUNT UP TO ENTIRE REMAINING UNDRAWN AMOUNT] PURSUANT TO SUCH AGREEMENT, AND THIS STATEMENT SHALL BE THE NOTICE OF COMPLETENESS FOR THIS PRESENTATION UNDER THE ABOVE-REFERENCED LETTER OF CREDIT.”;

“THE EXPIRY DATE OF IRREVOCABLE STANDBY LETTER OF CREDIT NO. [INSERT LETTER OF CREDIT REFERENCE NUMBER] IS LESS THAN THIRTY (30) DAYS FROM THE DATE OF THIS STATEMENT AND THAT THE APPLICANT UNDER SUCH LETTER OF CREDIT HAS FAILED TO PROVIDE A REPLACEMENT LETTER OF CREDIT THAT SATISFIES THE REQUIREMENTS UNDER THE PPL ELECTRIC UTILITIES CORPORATION [INSERT NAME OF AGREEMENT] DATED _____ BETWEEN APPLICANT OR AN AFFILIATE OF APPLICANT AND BENEFICIARY. WE THEREFORE DEMAND PAYMENT IN THE AMOUNT OF [INSERT AMOUNT UP TO ENTIRE REMAINING

UNDRAWN AMOUNT] PURSUANT TO SUCH AGREEMENT, AND THIS STATEMENT SHALL BE THE NOTICE OF COMPLETENESS FOR THIS PRESENTATION UNDER THE ABOVE-REFERENCED LETTER OF CREDIT.”; OR

“WE HAVE PROVIDED WRITTEN NOTICE TO THE APPLICANT OR AN AFFILIATE OF APPLICANT THAT THE ISSUER OF IRREVOCABLE STANDBY LETTER OF CREDIT NO. [INSERT LETTER OF CREDIT REFERENCE NUMBER] HAS OR HAS HAD ASSETS BELOW TEN BILLION U.S. DOLLARS OR A CREDIT RATING BELOW A- BY S&P OR A3 BY MOODYS OR OTHERWISE FAILS TO MEET REQUIREMENTS UNDER THE PPL ELECTRIC UTILITIES CORPORATION [INSERT NAME OF AGREEMENT] AND THE APPLICANT OR AN AFFILIATE OF APPLICANT HAS FAILED TO PROVIDE A REPLACEMENT LETTER OF CREDIT OR OTHER SECURITY ACCEPTABLE TO BENEFICIARY. WE THEREFORE DEMAND PAYMENT IN THE AMOUNT OF [INSERT AMOUNT UP TO ENTIRE REMAINING UNDRAWN AMOUNT], AND THIS STATEMENT SHALL BE THE NOTICE OF COMPLETENESS FOR THIS PRESENTATION UNDER THE ABOVE-REFERENCED LETTER OF CREDIT.”

2. A COPY OR ORIGINAL OF THIS LETTER OF CREDIT AND ANY AMENDMENT(S).

AT THE BENEFICIARY’S REQUEST PRIOR TO THE EXPIRY DATE, THE ISSUER WILL ISSUE TO THE BENEFICIARY A REPLACEMENT LETTER OF CREDIT (HAVING THE SAME TERMS AND CONDITIONS AS THIS LETTER OF CREDIT AND ANY AMENDMENTS HERETO) IF THE BENEFICIARY CERTIFIES TO THE ISSUER THAT THE ORIGINAL LETTER OF CREDIT HAS BEEN LOST, STOLEN, DESTROYED OR MUTILATED AND PROVIDES THE ISSUER WITH A REASONABLY ACCEPTABLE INDEMNITY.

PARTIAL AND MULTIPLE DRAWINGS ARE PERMITTED. IN THE EVENT OF ANY PARTIAL DRAWING WE WILL, PROMPTLY FOLLOWING PRESENTATION THEREOF, RETURN THE ORIGINAL LETTER OF CREDIT AND ALL AMENDMENTS TO YOU. ALL AMOUNTS PAID BY US TO BENEFICIARY IN COMPLIANCE WITH THIS LETTER OF CREDIT SHALL CONSTITUTE A PRO TANTO REDUCTION IN THE STATED AMOUNT OF THIS LETTER OF CREDIT.

IF PRESENTATION OF ANY DRAWING IS MADE ON A BUSINESS DAY (AS HEREIN DEFINED) AND SUCH PRESENTATION IS MADE ON OR BEFORE 11:00 A.M. NEW YORK TIME, ISSUER SHALL SATISFY SUCH DRAWING REQUEST ON THE NEXT BUSINESS DAY. IF THE DRAWING IS RECEIVED AFTER 11:00 A.M. NEW YORK TIME, ISSUER WILL SATISFY SUCH DRAWING REQUEST ON THE SECOND FOLLOWING BUSINESS DAY. ALL PAYMENTS MADE UNDER THIS LETTER OF CREDIT SHALL BE MADE BY MEANS OF WIRE TRANSFER IN IMMEDIATELY AVAILABLE UNITED STATES DOLLARS TO YOUR BANK ACCOUNT INDICATED BY BENEFICIARY.

WE HEREBY ENGAGE WITH YOU THAT ALL DOCUMENTS PRESENTED IN COMPLIANCE WITH THE TERMS OF THIS LETTER OF CREDIT WILL BE DULY HONORED IF PRESENTED FOR PAYMENT ON OR BEFORE THE EXPIRY DATE, AS EXTENDED FROM TIME TO TIME IN ACCORDANCE WITH THE TERMS OF THIS LETTER OF CREDIT.

IN THE EVENT OF ANY NON-CONFORMING PRESENTATION, WE SHALL IMMEDIATELY NOTIFY BENEFICIARY BY EMAIL TO PPLMARGINCALL2@PPLWEB.COM THAT THE PRESENTATION HAS BEEN REJECTED, WHICH NOTICE SHALL INDICATE THE REASONS FOR DISHONORING SUCH PRESENTATION AND SHALL PLACE AT THE DISPOSAL OF BENEFICIARY THE DOCUMENTS PRESENTED BY BENEFICIARY IN SUPPORT OF ITS DEMAND FOR PAYMENT. BENEFICIARY MAY THEREAFTER PRESENT DOCUMENTS AND RECEIVE PAYMENT HEREUNDER IN THE EVENT A CONFORMING PRESENTATION IS MADE IN ACCORDANCE WITH THE TERMS OF THIS LETTER OF CREDIT.

IT IS A CONDITION OF THIS LETTER OF CREDIT THAT IT WILL BE AUTOMATICALLY EXTENDED WITHOUT AMENDMENT FOR ONE YEAR FROM THE EXPIRY DATE HEREOF, OR ANY FUTURE

EXPIRY DATE, UNLESS AT LEAST 90 DAYS PRIOR TO ANY EXPIRY DATE WE NOTIFY YOU BY EMAIL TO PPLMARGINCALL2@PPLWEB.COM THAT WE ELECT NOT TO CONSIDER THIS LETTER OF CREDIT RENEWED FOR ANY SUCH PERIOD.

THE TERM "BUSINESS DAY" AS USED HEREIN MEANS ANY DAY OTHER THAN (I) A SATURDAY, (II) A SUNDAY, OR (III) A DAY ON WHICH BANKING INSTITUTIONS LOCATED IN THE CITY OF NEW YORK, NEW YORK ARE REQUIRED OR AUTHORIZED BY LAW TO BE CLOSED.

ADDITIONAL TERMS AND CONDITIONS:

1. ALL COMMISSIONS, FEES, COSTS, AND OTHER BANKING CHARGES WILL BE BORNE BY THE APPLICANT.
2. THIS LETTER OF CREDIT IS SUBJECT TO THE UNIFORM CUSTOMS AND PRACTICE FOR DOCUMENTARY CREDITS, 2007 REVISION - ICC PUBLICATION NO. 600, AS SUPPLEMENTED BY THE eUCP VERSION 2.0, OR ANY SUCCESSOR PUBLICATION THERETO (THE "UCP"). AS TO MATTERS NOT GOVERNED BY THE UCP, THIS LETTER OF CREDIT SHALL BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE [COMMONWEALTH OF PENNSYLVANIA; STATE OF NEW YORK], INCLUDING, TO THE EXTENT NOT INCONSISTENT WITH THE UCP, THE UNIFORM COMMERCIAL CODE AS IN EFFECT IN THE [COMMONWEALTH OF PENNSYLVANIA; STATE OF NEW YORK].
3. ARTICLE 36 OF THE UCP AS IT APPLIES TO THIS LETTER OF CREDIT IS MODIFIED AS FOLLOWS: IF, ON THE LAST BUSINESS DAY FOR PRESENTATION THE PLACE FOR PRESENTATION STATED IN THIS LETTER OF CREDIT IS CLOSED FOR ANY REASON, THEN THE LAST DAY FOR PRESENTATION IS AUTOMATICALLY EXTENDED TO THE DAY THAT IS TEN (10) CALENDAR DAYS AFTER THE PLACE FOR PRESENTATION RE-OPENS OR THE ISSUER NOTIFIES THE BENEFICIARY OF AN ALTERNATIVE PLACE FOR PRESENTATION, WHICH ALTERNATIVE MUST BE IN THE UNITED STATES.
4. EXCEPT FOR AN INCREASE IN AMOUNT AND/OR AN EXTENSION OF EXPIRY, THIS LETTER OF CREDIT MAY NOT BE AMENDED, CHANGED OR MODIFIED WITHOUT THE EXPRESS WRITTEN CONSENT OF THE BENEFICIARY AND THE ISSUER.
5. THE BENEFICIARY SHALL NOT BE DEEMED TO HAVE WAIVED ANY RIGHTS UNDER THIS LETTER OF CREDIT, UNLESS, AND THEN ONLY TO THE EXTENT THAT, THE BENEFICIARY OR AN AUTHORIZED AGENT OF THE BENEFICIARY SHALL HAVE SIGNED A DATED WRITTEN WAIVER EXPRESSLY WAIVING SUCH RIGHT OR RIGHTS. NO SUCH WAIVER, UNLESS EXPRESSLY SO STATED THEREIN, SHALL BE EFFECTIVE AS TO ANY TRANSACTION THAT OCCURS SUBSEQUENT TO THE DATE OF THE WAIVER, NOR AS TO ANY CONTINUANCE OF ANY BREACH OR NON-COMPLIANCE AFTER THE WAIVER.
6. A FAILURE TO MAKE ANY DRAWINGS AT ANY TIME SHALL NOT IMPAIR OR REDUCE THE AVAILABILITY OF THIS LETTER OF CREDIT IN ANY SUBSEQUENT PERIOD OR OUR OBLIGATION TO HONOR ANY SUBSEQUENT DEMAND OR DEMANDS FOR PAYMENT MADE IN ACCORDANCE WITH THE TERMS OF THIS LETTER OF CREDIT.

AUTHORIZED SIGNATURE: _____

TITLE: _____

PLEASE DIRECT ANY CORRESPONDENCE (OTHER THAN DRAFTS, DOCUMENTS OR OTHER COMMUNICATIONS REGARDING PRESENTMENT OR NOTICES REGARDING REJECTION OR NON-RENEWAL) TO:

[BANK NAME, EMAIL ADDRESS AND PHONE NUMBER]

SCHEDULE B-1
TO AGREEMENT FOR LARGE LOAD ELECTRIC SERVICE

CREDIT SUPPORT AMOUNT

The required Credit Support Amount as of the Effective Date is
\$_____.*

Commencing as of the second (2nd) Contract Year, Customer may reduce the Credit Support Amount to the then current amount of the Electric Service Commitment provided, however that (i) Customer is not, and has not been, in breach or default under this Agreement, and (ii) the Credit Support Amount shall not, in any event, be reduced below the Minimum Credit Support Amount.

The required Credit Support Amount is subject to modification, at PPL EU's written request, if **Schedule A is revised pursuant to **Section 4** of this Agreement.*

SCHEDULE C
TO AGREEMENT FOR LARGE LOAD ELECTRIC SERVICE

CUSTOMER SCOPE OF WORK

The Customer Scope of Work includes the following:

[Note: Describe all work to be performed by Customer, at Customer's cost, under Section 7(a) of this Agreement as required for PPL EU to provide Electric Service to Customer; if there is none, do not remove this Schedule but insert "None"]

SCHEDULE D
TO AGREEMENT FOR LARGE LOAD ELECTRIC SERVICE

ONE LINE DIAGRAM

[Note: Diagram must include:

1. Service Point (i.e. point where PPL EU's overhead service conductors [cable-to-flat terminal connector] terminate on the line side terminals of Customer's primary disconnect switch;
2. Disconnection facilities; and
3. Any required Method of Supply Letter requirements (Method of Supply Letter will not be attached or included in this Agreement)]

SCHEDULE E
TO AGREEMENT FOR LARGE LOAD ELECTRIC SERVICE

FORM OF GUARANTY¹

UNCONDITIONAL GUARANTY*

THIS GUARANTY AGREEMENT (this “Guaranty”) is made and entered into as of this _____ day of _____, by _____ (the “Guarantor”), with an address at _____, in favor of PPL Electric Utilities Corporation (the “PPL EU”), with an address at 827 Hausman Rd., 1st Floor, Allentown, PA 18104, in consideration of entering into and benefitting from the Agreement for Large Load Electric Service dated on or about _____, 20____ (“ESA”) and the Agreement for Construction of Large Load Electric Service Facilities dated on or about _____, 20____ (“CSA” and, with the ESA, collectively or individually, as the case may be, the “Agreement(s)”) between PPL Electric Utilities Corporation and _____ (the “Customer”).

Unless otherwise defined herein, all capitalized terms used herein shall have the respective meanings assigned thereto in the applicable Agreement(s). References to the Agreement(s) shall include (i) applicable tariffs, procedures or contracts relating to the Agreement(s), and (ii) exhibits, schedules, and attachments, to such or to the Agreement(s), in each case, as such items or Agreement(s) may be amended, supplemented, replaced or substituted, from time-to-time.

Whereas, Customer is an affiliate of Guarantor, and Guarantor will directly or indirectly benefit from and desires PPL EU to enter into the Agreement(s) with Customer and Guarantor’s provision of this Guaranty is an inducement for PPL EU to be willing to enter into the Agreement(s) with Customer.

Now, therefore, intending to be legally bound hereby, Guarantor covenants and agrees as follows:

1. Guaranty of Obligations.

- (a) The Guarantor hereby irrevocably and unconditionally guarantees as primary obligor and not as a surety, with effect from date hereof, the prompt and complete payment in immediately available funds in the United States when due of all of Customer’s obligations (present or future, direct or indirect, secured or unsecured, fixed or contingent and whenever due, whether on scheduled payment dates, upon demand, breach, default, indemnity, non-performance, termination or otherwise) under the Agreement(s), as well as, all reasonable out-of-pocket costs and expenses incurred by PPL EU in the enforcement of the Guarantor’s obligations or collection under this Guaranty, including reasonable attorney’s fees and expenses (collectively, the “Obligations”) provided only, solely with respect to costs and expenses of enforcement, that PPL EU is the prevailing party in any judicial suit, action or proceeding arising out of, resulting from, or in any way relating to this Guaranty, or if by mutual agreement by Guarantor and PPL EU. **[Optional provision:** Notwithstanding anything to the contrary herein, the liability of the Guarantor under this Guaranty and PPL EU’s right of recovery hereunder for all Obligations is limited to a total aggregate amount of _____ US Dollars \$_____

¹ Additional provisions and documentation will be required by PPL EU, in its discretion, in cases of a non-U.S. guarantor

("Guaranty Amount"), where Guaranty Amount shall be no less than Five Hundred Thousand US Dollars (\$500,000).]

- (b) The Guarantor shall not be required to pay any consequential, incidental, punitive, exemplary or indirect damages, lost profits or other business interruption damages except in each case to the extent that they constitute Obligations that are required to be paid under the applicable Agreement(s).

2. Nature of Guaranty; Waivers.

- (a) This is a guaranty of payment and not of collection and PPL EU shall not be required, as a condition of the Guarantor's liability, to proceed first against Customer, or any performance assurance or any collateral that Guarantor may hold, or to pursue any rights which may be available to it with respect to any other person or entity who may be liable for the payment of the Obligations. This is not a guaranty of performance (other than of performance of payment obligations).
- (b) This Guaranty is an absolute, unconditional, irrevocable (subject to the provisions of Section 12 of this Guaranty) and continuing guaranty and will remain in full force and effect until all of the Obligations have been indefeasibly paid in full, or until the Agreement(s) have been terminated, whichever comes later. This Guaranty will not be affected by any surrender, exchange, acceptance, compromise or release by PPL EU or any other party, or any other guaranty, performance assurance or other security held by it for any of the Obligations, by any failure of PPL EU to take any steps to perfect or maintain its lien or security interest in or to preserve its rights to any security, performance assurance, or other collateral for any of the Obligations or any guaranty, or by any irregularity, unenforceability or invalidity of any of the Obligations or any part thereof.
- (c) Except as to any claims or defenses, or rights of withholding or set-off, to which Customer is entitled under the Agreement(s) (and exclusive of any claims, defenses, and rights that are based upon (x) the insolvency, bankruptcy, assignment for creditors, reorganization, liquidation or similar of Customer, (y) ultra vires, lack of due formation, existence or good standing of Customer, or (z) the lack of power or authority of Customer to enter into and perform under the Agreement(s), all of which are expressly waived by Guarantor under this Guaranty), the Guarantor's obligations hereunder shall not be affected, discharged, modified or impaired by any counterclaim, set-off, deduction or defense based upon any claim the Guarantor may have against Customer or PPL EU, including: (i) any change in the corporate existence (including its charter or other governing agreement, laws, rules, regulations or powers), structure or ownership of Customer or the Guarantor; or (ii) any insolvency, bankruptcy, reorganization or other similar proceeding affecting Customer or its assets; or (iii) the invalidity or unenforceability in whole or in part of the Agreement(s); or (iv) any provision of applicable law or regulations purporting to prohibit payment by Customer of amounts to be paid by it under the Agreement(s) (other than any law or regulation that eliminates or nullifies the obligations under the Agreement(s) which is not otherwise waived hereunder or in the Agreement(s)).
- (d) Guarantor waives notice of acceptance of this Guaranty, diligence, presentment, notice of dishonor and protest and any requirement that at any time PPL EU or any

other person or entity exhaust any right to take any action against Customer or Customer's assets or any other guarantor, person or entity, and PPL EU shall not be bound or obligated to exhaust its recourse against Customer or any other person or entity or against any performance assurance or other collateral it may hold or take any other action before being entitled to receive payment from Guarantor. Any failure of PPL EU to give notice shall not discharge, alter or diminish in any way Guarantor's obligations under this Guaranty. The Guarantor waives all claims, defenses, and rights of set-off based on suretyship or impairment of collateral or any other defenses that would constitute a legal or equitable discharge of Guarantor's obligations, except any claims, defenses, or rights of set-off of Customer in respect of its obligations under the Agreement(s) that are expressly reserved under Section 2(c) above.

- (e) PPL EU at any time and from time to time, without notice to or the consent of the Guarantor, and without impairing or releasing, discharging or modifying the Guarantor's liabilities hereunder, may (i) to the extent permitted by the Agreement(s), change the manner, place, time or terms of payment or performance of, or other terms relating to, any of the Obligations; (ii) to the extent permitted by the Agreement(s), renew, substitute, modify, amend or alter, or grant consents or waivers relating to any of the Obligations, or any other guaranties for any Obligations; (iii) settle, compromise or deal with any other person, including Customer, with respect to any Obligations in such manner as PPL EU deems appropriate at its reasonable discretion; (iv) substitute, exchange or release any performance assurance or any guaranty; or (v) take such actions and exercise such remedies hereunder or under the Agreement(s) as PPL EU deems appropriate in its reasonable discretion.

3. Representations and Warranties. The Guarantor hereby represents and warrants that:

- (a) it is a [limited liability company, corporation, limited partnership, general partnership] duly organized, validly existing and in good standing under the laws of the jurisdiction of its [formation, organization, incorporation] and has the [corporate power] [power] and authority to conduct the business in which it is currently engaged and enter into and perform its obligations under this Guaranty;
- (b) it has the [corporate power] [power] and authority and the legal right to execute and deliver, and to perform its obligations under, this Guaranty, and has taken all necessary [corporate action] [action] to authorize its execution, delivery and performance of this Guaranty;
- (c) this Guaranty constitutes a legal, valid and binding obligation of the Guarantor enforceable in accordance with its terms, subject to applicable bankruptcy, reorganization, insolvency, moratorium or similar laws affecting creditors' rights generally and subject, as to enforceability, to equitable principles of general application (regardless of whether enforcement is sought in a proceeding in equity or at law);
- (d) the execution, delivery and performance of this Guaranty will not violate any provision of any requirement of law or contractual obligation of the Guarantor;
- (e) no consent or authorization of, filing with, or other act by or in respect of, any

arbitrator or governmental authority and no consent of any other person (including, without limitation, any stockholder or creditor of the Guarantor) is required in connection with the execution, delivery, performance, validity or enforceability of this Guaranty, other than any which have been obtained or made prior to the date hereof and remain in full force and effect; and

- (f) no litigation, investigation or proceeding of or before any arbitrator or governmental authority is pending or, to the knowledge of the Guarantor, threatened by or against the Guarantor that could reasonably be expected to have a material adverse effect on this Guaranty or Guarantor's ability to perform all of its obligations hereunder.
4. Repayments or Recovery from PPL EU. If any demand is made at any time upon PPL EU for the repayment or recovery of any amount received by it in payment or on account of any of the Obligations, including but not limited to upon the bankruptcy, insolvency, dissolution or reorganization of the Customer and if PPL EU repays all or any part of such amount by reason of any judgment, decree or order of any court or administrative body or by reason of any settlement or compromise of any such demand, the Guarantor shall be and remain liable hereunder for the amount so repaid or recovered to the same extent as if such amount had never been received originally by PPL EU. The provisions of this section will be and remain effective notwithstanding any contrary action which may have been taken by the Guarantor in reliance upon such payment, and any such contrary action so taken will be without prejudice to PPL EU's rights hereunder and will be deemed to have been conditioned upon such payment having become final and irrevocable. Furthermore, this Guaranty shall continue to be effective or be reinstated, as the case may be, without any release or discharge of any obligations if at any time any payment of any of the Obligations is rescinded, avoided, recovered or must otherwise be returned by PPL EU upon the insolvency, bankruptcy, or reorganization of Customer, Guarantor or any other guarantor or any other person or entity or otherwise, all as though such payment had not been made.
5. Enforceability of Obligations. No modification, limitation or discharge of the obligations of Customer arising out of or by virtue of any bankruptcy, reorganization or similar proceeding for relief of debtors under federal or state law will affect, modify, limit or discharge the Guarantor's liability in any manner whatsoever and this Guaranty will remain and continue in full force and effect and will be enforceable against the Guarantor to the same extent and with the same force and effect as if any such proceeding had not been instituted. The Guarantor waives all rights and benefits which might accrue to it by reason of any such proceeding and will be liable to the full extent hereunder, irrespective of any modification, limitation or discharge of the liability of Customer that may result from any such proceeding.
6. Postponement of Subrogation. Guarantor shall not be subrogated to any of the rights (or if subrogated by operation of law, such Guarantor hereby waives such rights to the extent permitted by applicable law) of PPL EU as the result of any payment or enforcement of any of the Obligations until all of the Agreement(s) have terminated and all Obligations (other than contingent indemnities not then due) have been paid in full (such date, the "Obligations Full Payment Date"). If any amount shall be paid to Guarantor on account of subrogation at any time prior to the Obligations Full Payment Date, such amount shall be held by Guarantor in trust for PPL EU, segregated from other funds of Guarantor, and shall, forthwith upon receipt by Guarantor, be turned over to PPL EU in the exact form received

by Guarantor (duly endorsed by Guarantor to PPL EU, if required) to be applied against the Obligations, whether due or to become due, in such order as PPL EU may determine. On the Obligations Full Payment Date, PPL EU agrees that Guarantor shall be subrogated to the rights of PPL EU against Customer to the extent of Guarantor's payments to PPL EU hereunder that have not been rescinded, avoided or otherwise required to be returned.

7. Notices. All notices, demands, requests, consents, approvals and other communications required or permitted hereunder must be in writing and will be effective upon receipt. Such notices and other communications may be hand-delivered, sent by email to the address set forth below and confirmed by telephone to the number set forth below, sent by facsimile transmission with confirmation of delivery and a copy sent by first-class mail, or sent by nationally recognized overnight courier service, to the addresses for the PPL EU and the Guarantor set forth below or to such other address as one may give to the other in writing for such purpose:

All communications to PPL EU shall be directed to:

Attn: Interconnection Affairs
Phone: _____
Fax: _____
Email: _____
Address: PPL Electric Utilities Corporation
827 Hausman Road, Allentown PA 18104
With a required copy to:

Attn: Manager, Credit and Contract Administration
Phone: 502-627-4253
Fax: 502-627-3950
Email: jhearly@pplweb.com
Address: 2701 Eastpoint Parkway Louisville, KY 40223

or such other address as PPL EU shall from time to time specify to Guarantor by notice given in accordance with this Section 7.

All communications to Guarantor shall be directed to:

Attn: _____
Phone: _____
Fax: _____
Email: _____
Address: _____

or such other address as the Guarantor shall from time to time specify to PPL EU by notice given in accordance with this Section 7.

8. Preservation of Rights. No delay or omission on PPL EU's part to exercise any right or power arising hereunder will impair any such right or power or be considered a waiver of any such right or power, nor will PPL EU's action or inaction impair any such right or power. PPL EU's rights and remedies hereunder are cumulative and not exclusive of any other rights or remedies which PPL EU may have under other agreements with the Guarantor or in respect of any performance assurance or at law or in equity.

9. Illegality. In case any one or more of the provisions contained in this Guaranty should be invalid, illegal or unenforceable in any respect, the validity, legality and enforceability of the remaining provisions contained herein shall not in any way be affected or impaired thereby.
10. Amendments. No modification, amendment or waiver of any provision of this Guaranty nor consent to any departure by the Guarantor therefrom, will be effective unless made in a writing signed by PPL EU, and then such waiver or consent shall be effective only in the specific instance and for the purpose for which given. No notice to or demand on the Guarantor in any case will entitle the Guarantor to any other or further notice or demand in the same, similar or other circumstance.
11. Entire Agreement. This Guaranty (including the documents and instruments referred to herein) constitutes the entire statement of the terms of this Guaranty and supersedes all other prior agreements and understandings, both written and oral, between the Guarantor and PPL EU with respect to the subject matter hereof.
12. Successors and Assigns. This Guaranty will be binding upon the successors and permitted assigns of Guarantor and inure to the benefit of PPL EU and its successors and assigns. Guarantor shall not assign this Guaranty in whole or in part without PPL EU's prior written consent. Upon any such delegation and assumption of obligations by a successor Guarantor, the Guarantor shall be relieved of and fully discharged from all of its obligations hereunder, whether such obligations arose before or after the date of such delegation and assumption.
13. Interpretation. In this Guaranty, unless PPL EU and the Guarantor otherwise agree in writing, the singular includes the plural and the plural the singular; references to statutes are to be construed as including all statutory provisions consolidating, amending or replacing the statute referred to; the word "or" shall be deemed to include "and/or", the words "including", "includes" and "include" shall be deemed to be followed by the words "without limitation"; and references to sections or exhibits are to those of this Guaranty unless otherwise indicated. Section headings in this Guaranty are included for convenience of reference only and shall not constitute a part of this Guaranty for any other purpose.
14. Governing Law.
 - (a) This Guaranty has been delivered to and accepted by PPL EU. THIS GUARANTY SHALL BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE [COMMONWEALTH OF PENNSYLVANIA][STATE OF NEW YORK], EXCLUDING ITS CONFLICT OF LAWS RULES THAT WOULD APPLY THE LAWS OF ANY OTHER JURISDICTION.
 - (b) The Guarantor hereby irrevocably consents to the non-exclusive jurisdiction of any federal court in the [Commonwealth of Pennsylvania][State of New York], but in the event that the Guarantor and PPL EU jointly determine in good faith that jurisdiction does not lay with such court or that such court refuses to exercise jurisdiction or venue over the Guarantor and PPL EU or any claims made pursuant to this Guaranty, then the Guarantor agrees to submit to the non-exclusive jurisdiction of the [Pennsylvania][New York] State courts; provided that nothing contained in this Guaranty will prevent PPL EU from bringing any action, enforcing

any award or judgment or exercising any rights against the Guarantor individually, against any security or against any property of the Guarantor within any other county, state or other foreign or domestic jurisdiction. The Guarantor acknowledges and agrees that the venue provided above is the most convenient forum for both PPL EU and the Guarantor. The Guarantor waives any objection to venue and any objection based on a more convenient forum in any action instituted under this Guaranty. The Guarantor agrees that a PDF copy of this Guaranty transmitted to PPL EU by electronic means, and maintained by PPL EU in electronic form, shall constitute the original Guaranty and be admissible under the rules of evidence in any regulatory proceeding, or in court or other dispute resolution forum.

15. WAIVER OF JURY TRIAL. THE GUARANTOR AND PPL EU IRREVOCABLY WAIVE ANY AND ALL RIGHT TO A TRIAL BY JURY IN ANY ACTION, PROCEEDING OR CLAIM OF ANY NATURE RELATING TO THIS GUARANTY, ANY DOCUMENTS EXECUTED IN CONNECTION WITH THIS GUARANTY OR ANY TRANSACTION CONTEMPLATED IN ANY OF SUCH DOCUMENTS. THE GUARANTOR AND PPL EU ACKNOWLEDGE THAT THE FOREGOING WAIVER IS KNOWING AND VOLUNTARY.
16. Term. This Guaranty shall survive termination of the Agreement(s) and remain in full force and effect until all amounts due hereunder, including all of the Obligations, have been paid in full.
17. Stay of Acceleration Ineffective with Respect to Guarantor. If acceleration of the time for payment of any amount payable by Customer under the Agreement(s) is stayed upon the insolvency, bankruptcy or reorganization of Customer, all such amounts otherwise subject to acceleration or required to be paid upon an early termination pursuant to the terms of the Agreement(s) shall nonetheless be payable by the Guarantor hereunder on written demand by PPL EU.
18. Severability. Any provision contained in this Guaranty which is prohibited or severability in any jurisdiction shall, as to such jurisdiction, be ineffective to the extent of such prohibition or unenforceability without invalidating the remaining provisions hereof, and any such prohibition or unenforceability in any jurisdiction shall not invalidate or render unenforceable such provision in any other jurisdiction.
19. Electronic Signatures. The electronic signature of Guarantor shall be valid as an original signature of Guarantor and shall be effective to bind Guarantor.

The Guarantor acknowledges that it has read and understood all the provisions of this Guaranty, and has been advised by counsel as necessary or appropriate.

[Guarantor]

By: _____

Name: _____

Title: _____

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Letter of Notification of PPL Electric :
Utilities Corporation, Filed Pursuant to :
52 Pa. Code Chapter 57 Subchapter G, : Docket No. A-2025-3059443
For Approval To Build Approximately :
1.1 Miles of New Parallel Double Circuit :
230 kV Transmission Taps That Are :
Needed to Connect the Existing :
Susquehanna-Harwood #1 & #2 :
Transmission Lines to the New :
Tomhicken 230 kV Switchyard That Are :
Respectively Located in Luzerne County, :
Pennsylvania :

PPL ELECTRIC UTILITIES CORPORATION

STATEMENT NO. 5-R

REBUTTAL TESTIMONY OF JOHN D. TAYLOR

TOPICS ADDRESSED: FERC AND COMMISSION JURISDICTION
TRANSMISSION RATES AND COST ALLOCATION
CUSTOMER-SPECIFIC INVESTMENTS
TARIFF ISSUES
RESOURCE ADEQUACY

DATE: AUGUST 7, 2026

1 **I. INTRODUCTION**

2 **Q. Please state your full name and business address.**

3 A. My name is John D. Taylor, and my business address is 10 Hospital Center Commons,
4 Suite 400, Hilton Head Island, South Carolina 29926.

6 **Q. On whose behalf are you appearing in this proceeding?**

7 A. I am appearing on behalf of PPL Electric Utilities Corporation (“PPL Electric” or the
8 “Company”).

10 **Q. By whom are you employed and in what capacity?**

11 A. I am the Co-Founder and Chief Executive Officer (“CEO”) of Atrium Economics
12 (“Atrium”), a regulatory economics and energy consulting firm that advises electric,
13 natural gas, transmission, pipeline, and infrastructure clients in regulatory, ratemaking, cost
14 allocation, and rate design matters

16 **Q. Please summarize your professional background.**

17 A. I am a regulatory economist with more than twenty years of experience advising utilities
18 and infrastructure companies in the United States and Canada. My work has focused on
19 revenue requirements, class cost of service, marginal and embedded cost allocation, rate
20 design, capital recovery, revenue stabilization mechanisms, affiliate and shared-services
21 cost allocation, infrastructure cost recovery, demand forecasting, lead-lag studies, return
22 on equity, and regulatory strategy. I have served as a lead expert witness in rate and
23 regulatory proceedings across more than twenty jurisdictions, including proceedings before
24 the Federal Energy Regulatory Commission (“FERC”), state public utility commissions,

1 provincial utility regulators, and courts. My testimony experience includes matters before
2 the Pennsylvania Public Utility Commission (“Commission” or “PUC”).

3 While a substantial portion of my work has involved electric and gas revenue
4 requirements, class cost of service, and rate design, my experience extends to the broader
5 economic and regulatory principles that apply when utilities recover the costs of shared
6 infrastructure. That includes analysis of how costs are functionalized, classified, and
7 allocated; how common and overhead costs should be recovered; how rate structures affect
8 customers and other users of utility infrastructure; and how regulators balance cost
9 causation, fairness, rate stability, and public policy objectives.

10 I also have substantial experience with large loads and data center-related tariff
11 issues. I have provided testimony addressing large load and data center tariff matters, and
12 I have advised multiple utilities on large load interconnection requirements, customer-
13 specific contracts, cost assignment, rate design, credit and collateral protections, minimum
14 load commitments, stranded cost protections, and the broader regulatory implications of
15 connecting significant new load to the electric system. That experience includes evaluating
16 how utilities should balance the obligation to serve new customers with the need to protect
17 existing customers from unreasonable cost shifting and stranded cost risk. Additional
18 details on my qualifications and experience are provided within PPL Electric Exhibit JDT-
19 1R.

20
21 **Q. Did you previously submit testimony in this proceeding on behalf of PPL Electric**
22 **Utilities Corporation (“PPL Electric” or the “Company”)?**

1 A. No. However, my rebuttal testimony responds to Office of Consumer Advocate (“OCA”)
2 witnesses Felder and Konidena regarding the scope of this Letter of Notification (“LON”)
3 proceeding, transmission cost allocation, customer-specific investment issues, tariff
4 protections, and resource adequacy. I explain why those issues do not provide a basis to
5 deny PPL Electric’s request for siting approval or impose additional conditions in this
6 proceeding.

7
8 **II. PURPOSE OF TESTIMONY AND SUMMARY OF CONCLUSIONS**

9 **Q. What is the purpose of your rebuttal testimony?**

10 A. My testimony responds to certain policy issues raised by OCA witnesses Felder and
11 Konidena related to the “Letter of Notification of PPL Electric Utilities Corporation, Filed
12 Pursuant to 52 Pa. Code Chapter 57 Subchapter G, For Approval To Build Approximately
13 1.1 Miles of New Parallel Double Circuit 230 kV Transmission Taps That Are Needed to
14 Connect the Existing Susquehanna-Harwood #1 & #2 Transmission Lines to the New
15 Tomhicken 230 kV Switchyard That Are Respectively Located in Luzerne County,
16 Pennsylvania” at Docket No. A-2025-3059443 (“Tomhicken 230 kV Switchyard Project”
17 or the “Project”). My rebuttal testimony is arranged as follows:

- 18 • Section III – PPL Electric’s Request for Approval and Scope of LON Proceeding
- 19 • Section IV - Transmission Rates and Cost Allocation
- 20 • Section V - PPL Electric’s Anticipated Cost Allocation
- 21 • Section VI - Ongoing Customer Contribution and Transmission Rate Impacts
- 22 • Section VII – Customer-Triggered vs. Customer-Specific Investments
- 23 • Section VIII - Phase 1 / Phase 2 and Forward-Looking Facilities

- Section IX - Tariff Issues
- Section X - Resource Adequacy
- Section XI - Conclusion

Q. Are you sponsoring any exhibits associated with your rebuttal testimony?

A. I am sponsoring no additional exhibits outside of my qualifications provided within PPL Electric Exhibit JDT-1R.

Q. Please summarize your principal conclusions.

A. My principal conclusions are as follows:

- **This proceeding should remain focused on the relief actually requested.** PPL Electric seeks Commission approval to site and construct the Tomhicken Project; it does not seek Commission approval of the recovery, allocation, or ratemaking treatment of the Project's transmission costs. FERC-approved tariffs and processes govern those transmission-rate issues and should not be adjudicated indirectly through this project-specific LON proceeding.
- **The Commission should reject OCA's characterization of a jurisdictional or policy "gap."** The respective roles of the Commission and FERC are established: the Commission addresses matters within its state siting and retail-tariff authority, while FERC regulates interstate transmission rates and associated cost recovery. Existing FERC formula-rate protocols also provide transparency, stakeholder review, challenge procedures, and the potential disallowance of costs that are not properly recoverable.

1 Additionally, PJM Interconnection, L.L.C. (“PJM”) and FERC are actively addressing
2 large-load issues that OCA raises throughout its testimony.

- 3 • **PPL Electric’s proposed cost allocation is reasonable because it is based on the**
4 **function of the facilities, not merely on who initiated the Project.** Facilities
5 dedicated to physically connecting and serving the customer requesting to connect (“the
6 Customer”) are appropriately assigned to the Customer, while facilities that become
7 integrated into the transmission network and provide broader reliability, capacity,
8 resiliency, operational flexibility, or future-use benefits may appropriately be treated
9 as network facilities, subject to FERC review.
- 10 • **A customer-triggered facility is not necessarily customer-specific.** The fact that the
11 Customer’s service request necessitated the Project does not mean that the costs for
12 every resulting facility should be assigned exclusively to that Customer. A “but-for”
13 test may identify why construction began. Still, it does not replace the project-specific
14 engineering and functional analysis necessary to distinguish dedicated customer assets
15 from integrated transmission facilities.
- 16 • **The Commission should not use the allocation from another large-load project as**
17 **a benchmark for Tomhicken.** PPL Electric does not apply a fixed customer allocation
18 percentage across projects.¹ Each project involves different facilities, configurations,
19 functions, and system benefits, and therefore requires an individualized analysis.
- 20 • **The Customer’s contribution should be evaluated on a comprehensive, net basis.**
21 In addition to funding approximately \$21.5 million of directly assigned facilities, the
22 Customer will pay ongoing transmission charges based on its contribution to PJM peak

¹ OCA 1-6 Attachment 1 – PPL Electric Utilities Corporation – Policy on Cost Allocation for Large Customer Interconnections.

1 demand. PPL Electric’s analysis indicates that, when the approximately \$38.4 million
2 of incremental transmission investment and the Customer’s incremental load are
3 considered together, estimated transmission service charges decline across the
4 customer classes evaluated. Accordingly, the amount proposed for transmission rate
5 base should not be treated as an equivalent net burden on existing customers.

- 6 • **Existing customers are protected by the recently approved Rate Schedule LP-6**
7 **(“LP-6”) in the Company’s tariff and the Customer’s Electric Service Agreement**
8 **(“ESA”).** Those protections include Contribution in Aid of Construction (“CIAC”) funding for directly assignable facilities, security for certain investments placed in
9 transmission rate base, minimum load commitments, ongoing payment obligations, exit
10 fees, default provisions, and other contractual safeguards. These mechanisms directly
11 address the risks that the projected load fails to materialize, develops more slowly than
12 expected, or terminates prematurely.
- 14 • **Forward-looking design does not make a facility customer-specific.** Transmission
15 facilities may reasonably be designed to accommodate foreseeable expansion, preserve
16 operational flexibility, avoid future reconstruction and outages, and support the
17 efficient long-term development of the integrated transmission system. The relevant
18 question remains how the facility functions and what benefits it provides, not whether
19 it includes capacity or design features that may support future needs.
- 20 • **The Commission should decline to impose OCA’s proposed tariff conditions in**
21 **this LON.** Large load registries, generation-procurement requirements, reliability
22 backstop cost allocation, blanket curtailment mandates, and other statewide policies
23 should not be established through a single transmission line siting case, particularly

where related matters are already addressed through LP-6, the ESA, Commission proceedings, PJM stakeholder processes, and ongoing FERC proceedings.

- **Resource adequacy and transmission reliability are distinct.** Resource adequacy concerns whether sufficient generation exists to meet demand and is principally addressed through PJM market and planning processes. PPL Electric's responsibility in this proceeding is to determine whether the transmission system can safely and reliably serve the requested load without thermal, voltage, stability, or other reliability violations. Broader resource adequacy concerns do not provide a basis to deny the LON or impose requirements that PJM, FERC, or the Commission has not adopted.

- **The Commission should approve the Project without the additional cost-allocation, tariff, resource adequacy, or curtailment conditions proposed by OCA.**

The Commission should evaluate the Project on the project-specific siting record, recognize the functional distinction between dedicated and integrated transmission facilities, account for the Customer's continuing contribution and existing contractual protections, and leave transmission-rate and regional market-design issues to the established proceedings with jurisdiction over those matters.

III. PPL ELECTRIC'S REQUEST FOR APPROVAL AND SCOPE OF THIS LON PROCEEDING

Q. Please describe what PPL Electric requested in its Letter of Notification filing in this proceeding.

A. PPL Electric filed a LON pursuant to the Commission's transmission line siting regulations seeking approval to construct the first phase of the Tomhicken Project in Hazle Township, Luzerne County. Specifically, PPL Electric requested approval to construct approximately

1 1.1 miles of new double-circuit 230 kV transmission tap lines needed to connect the
2 existing Susquehanna-Harwood #1 and #2 230 kV transmission lines to a new Tomhicken
3 230 kV switchyard, together with two short 230 kV connecting lines between the
4 switchyard and a customer-owned substation. These facilities are needed to provide
5 transmission-level service to a new customer, and the facilities would be located entirely
6 on property owned by PPL Electric or the Customer. Consistent with its obligation to
7 serve², PPL Electric evaluated the Customer's request and identified the facilities necessary
8 to safely and reliably provide the requested transmission service. A portion of the proposed
9 additions will become part of the integrated 230 kV transmission network and provide
10 broader system functions beyond the Customer's initial interconnection.

11 The Tomhicken Project is being developed in phases. The facilities included in this
12 proceeding represent only Phase 1, which PPL Electric states is necessary to provide the
13 customer's initial service requirements. Phase 2 is the subject of a separate application,
14 filed in Docket No. A-2026-3061547.

15
16 **Q. What is the purpose of a Letter of Notification proceeding?**

17 A. A Letter of Notification proceeding is a streamlined siting process established by the
18 Commission's transmission line regulations for certain transmission projects that satisfy
19 specified criteria. In an LON proceeding, the Commission reviews whether the proposed
20 transmission facilities should be approved from a siting and construction perspective and
21 whether the filing complies with applicable Commission regulations governing
22 transmission line construction.

² See 66 Pa.C.S. § 1501; see also 66 Pa.C.S. §§ 1103(a) and 2802(12).

1 Consistent with those regulations, PPL Electric requested approval to construct the
2 transmission facilities described in its filing. The focus of the proceeding is therefore
3 whether the proposed facilities and their location satisfy the requirements applicable to an
4 LON filing.

5
6 **Q. Does Commission approval of a LON determine the accounting treatment,**
7 **transmission rate treatment, or ultimate cost recovery associated with a project?**

8 A. No. The Commission has previously recognized that approval of a LON is limited to the
9 transmission line siting approval before it and does not constitute a determination regarding
10 accounting treatment or cost recovery. For example, in approving PPL Electric's
11 Susquehanna 230 kV and 500 kV Transmission Line Project through the LON process, the
12 Commission expressly stated that its approval "does not address the issues of accounting
13 treatment, and cost recovery."³ PPL Electric Witness Joseph Lookup provides additional
14 examples where the Commission did not address these issues in approvals of a LON.

15 Accordingly, the question presented in this proceeding is whether the proposed
16 facilities should be approved under the Commission's transmission siting regulations.
17 Issues concerning the ratemaking treatment of transmission facilities, transmission cost
18 recovery, or the allocation of transmission costs are addressed in other regulatory forums
19 and proceedings. They are not determined by the mere approval of an LON filing.

20

³ Susquehanna 230 kV and 500 kV Transmission Line Project, Docket Nos. A-2025-3056806 and P-2025-3056867,
Order (entered Sept. 25, 2025), pp. 9

1 **Q. If parties disagree with PPL Electric's future treatment of transmission costs**
2 **associated with the Project, are there established regulatory processes available to**
3 **review and challenge those costs?**

4 A. Yes. PPL Electric's FERC-approved transmission formula-rate protocols provide multiple
5 opportunities for review and challenging transmission costs and cost recovery. Those
6 processes include annual formula-rate updates, true-ups, supporting workpapers,
7 information requests, preliminary challenges, and formal challenges before FERC,
8 including challenges to the prudence of projected and actual transmission expenditures and
9 the proper application of the formula. Interested parties retain their rights under Section
10 206 of the Federal Power Act to challenge an existing transmission rate, tariff provision,
11 classification, or practice as unjust or unreasonable. Accordingly, the existence of these
12 established federal review mechanisms further demonstrates that this proceeding need not
13 resolve every potential future question regarding transmission cost recovery. Rather, this
14 proceeding may appropriately focus on the necessity and propriety of constructing the
15 proposed facilities and PPL Electric's compliance with applicable Commission
16 requirements, while questions concerning the ultimate recovery and allocation of
17 transmission costs remain subject to the applicable FERC-jurisdictional processes.

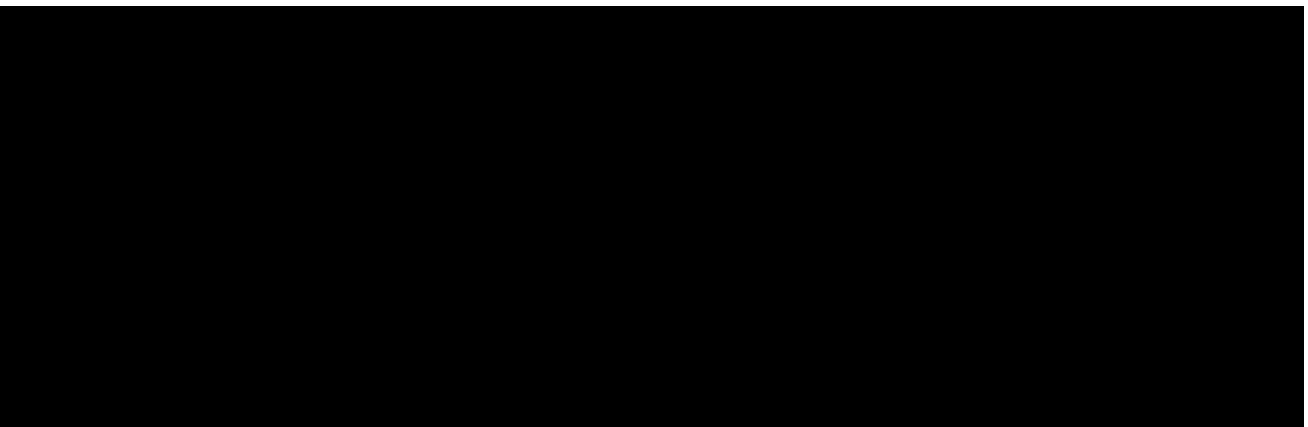
18
19 **Q. Are the issues addressed in OCA's testimony limited to the scope of this LON**
20 **proceeding as you have described it?**

21 A. No. Although OCA's witnesses address the proposed transmission facilities, their
22 testimony extends well beyond the limited siting and construction issues presented in this
23 LON proceeding. Among other things, they raise issues concerning transmission cost

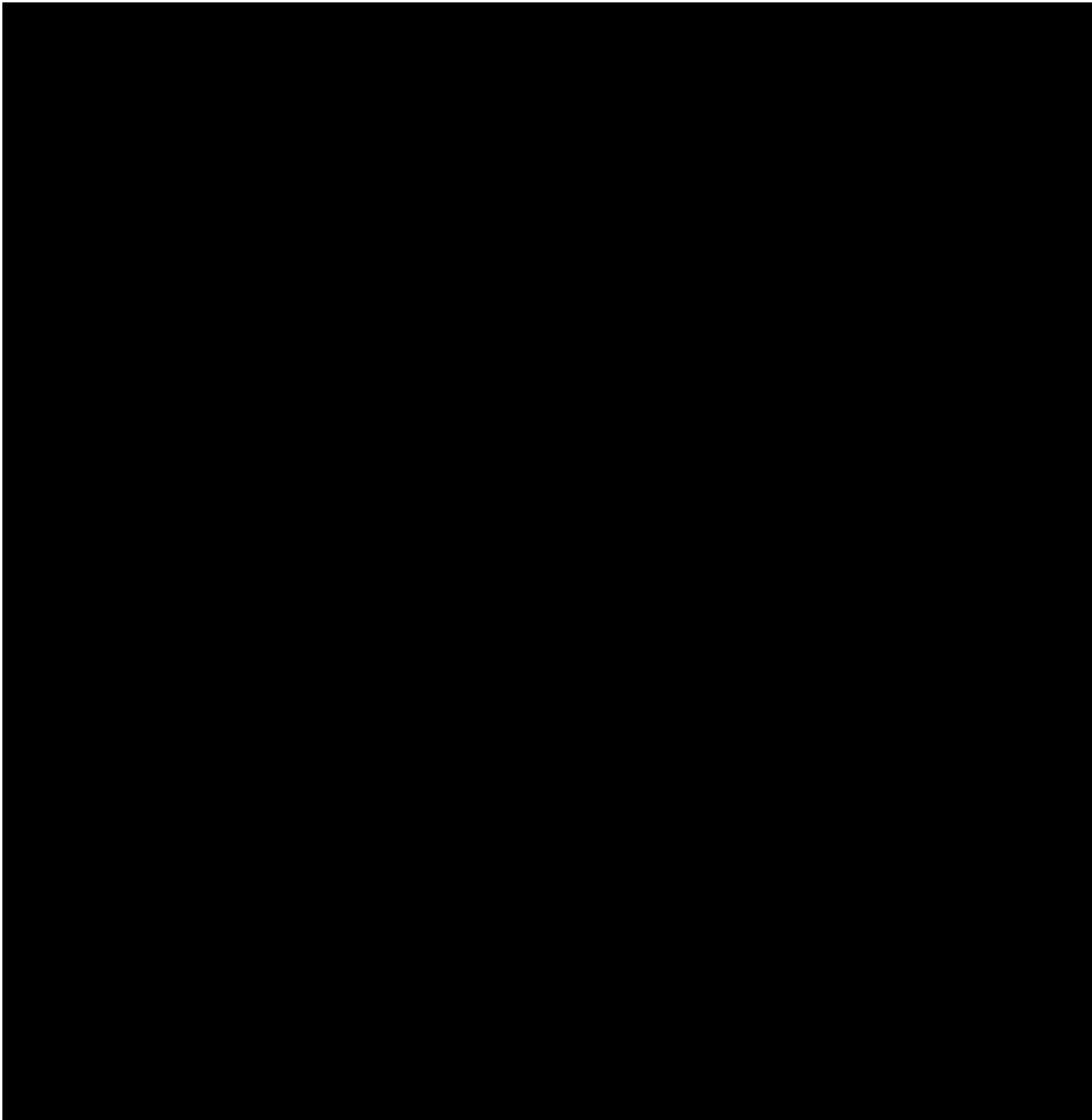
1 allocation and recovery, modifications to PPL Electric's retail tariff, resource adequacy,
2 generation procurement, large-load registries, reliability backstop procurement ("RBP"),
3 customer credit and collateral requirements, stranded-cost protections, and curtailment
4 priorities. Those broader policy and ratemaking matters are not part of the relief requested
5 in this LON and, in many instances, have and are being addressed through separate
6 Commission, PJM, or FERC proceedings and rulemakings. Accordingly, those issues
7 should not be used to expand this project-specific siting proceeding or to impose conditions
8 unrelated to whether the proposed facilities satisfy the Commission's applicable siting
9 requirements.

10
11 **Q. Given these issues are outside the scope of this LON proceeding, please clarify the**
12 **purpose of your remaining testimony.**

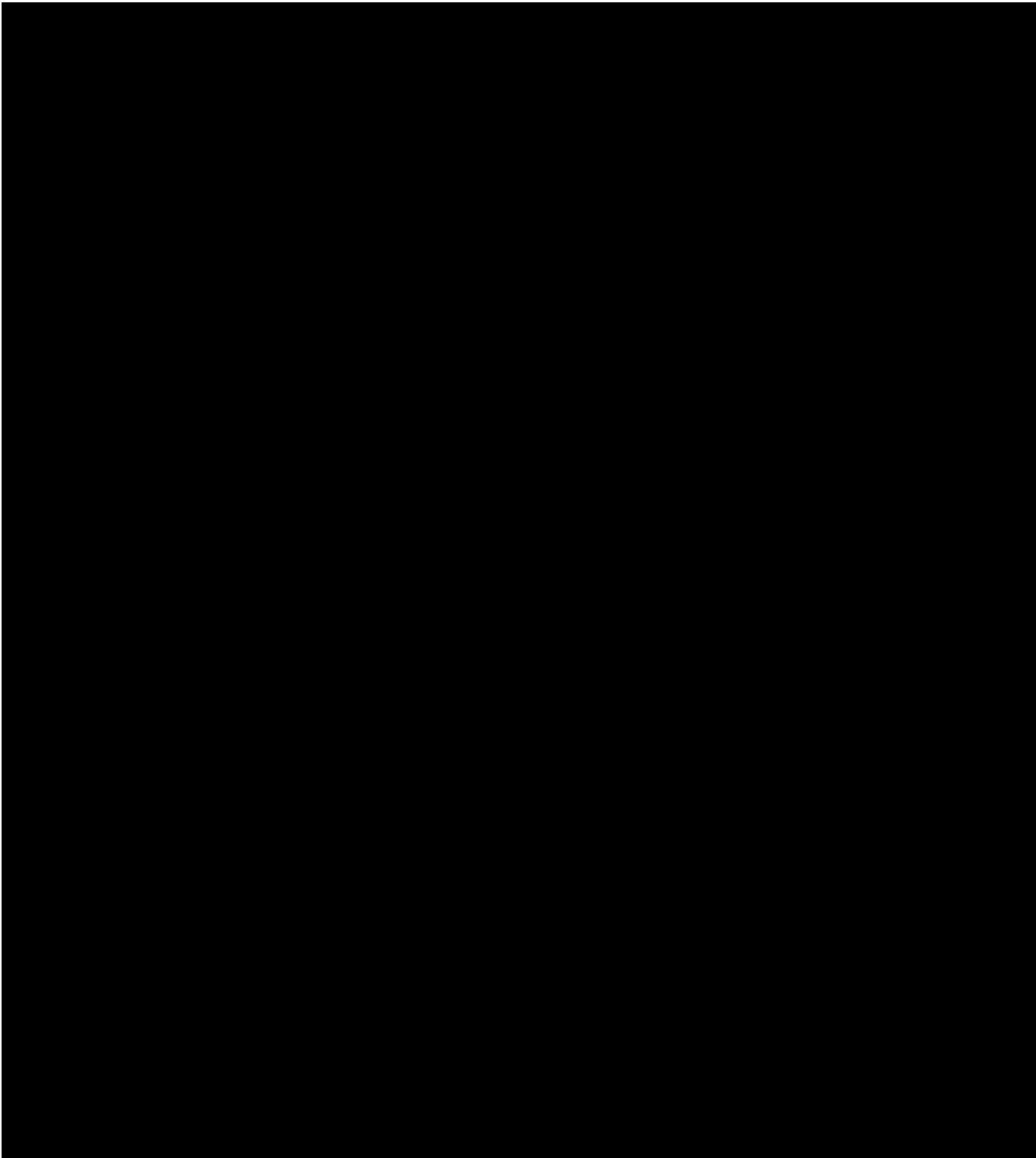
13 A. Sections IV through X of my testimony, below, are solely offered to rebut irrelevant and
14 out of scope testimony offered by OCA. I am advised by counsel that, to the extent that an
15 appropriate objection or motion is made and granted excluding that material from the
16 record, the corresponding sections of my testimony would not be required to be entered
17 into the record.



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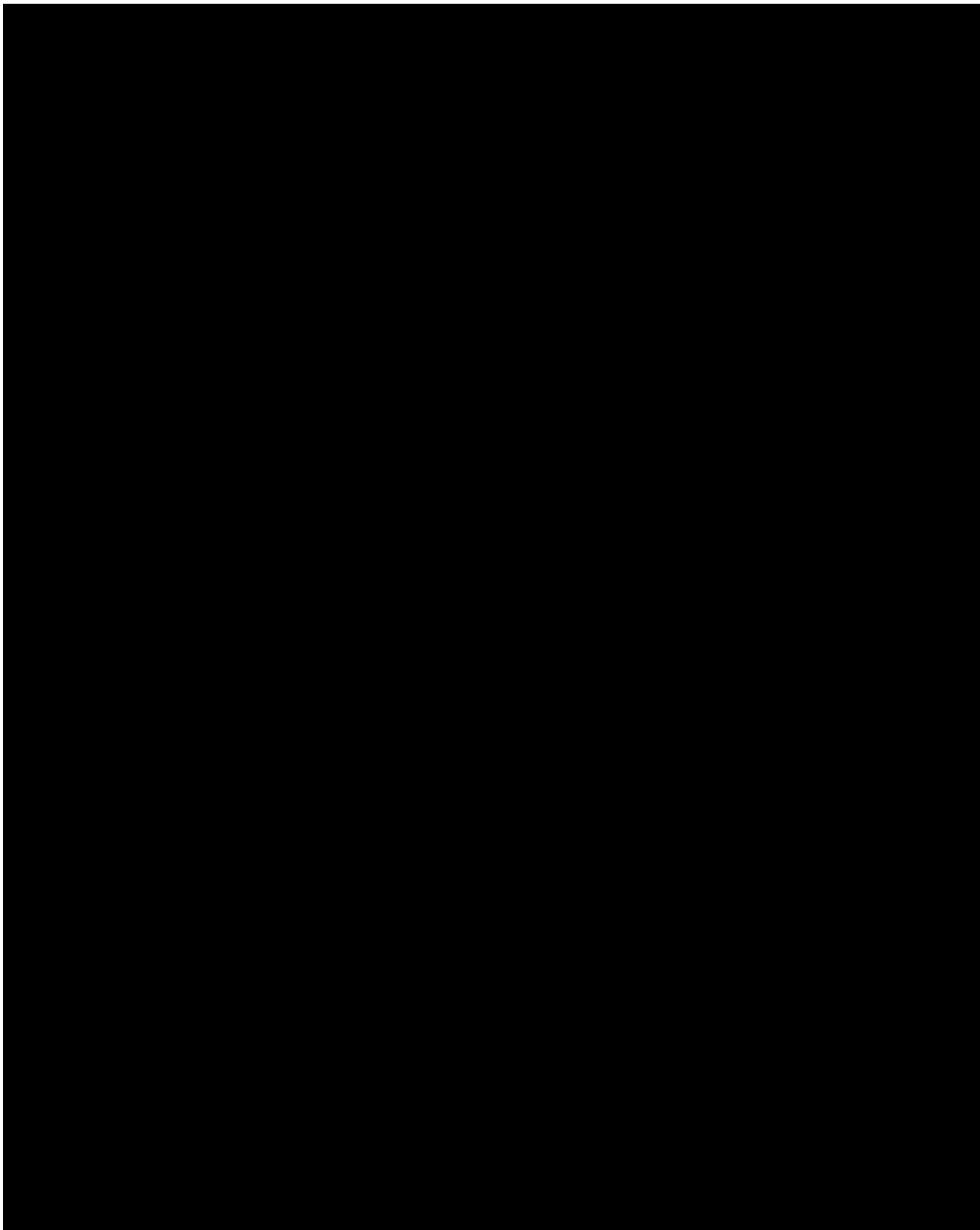
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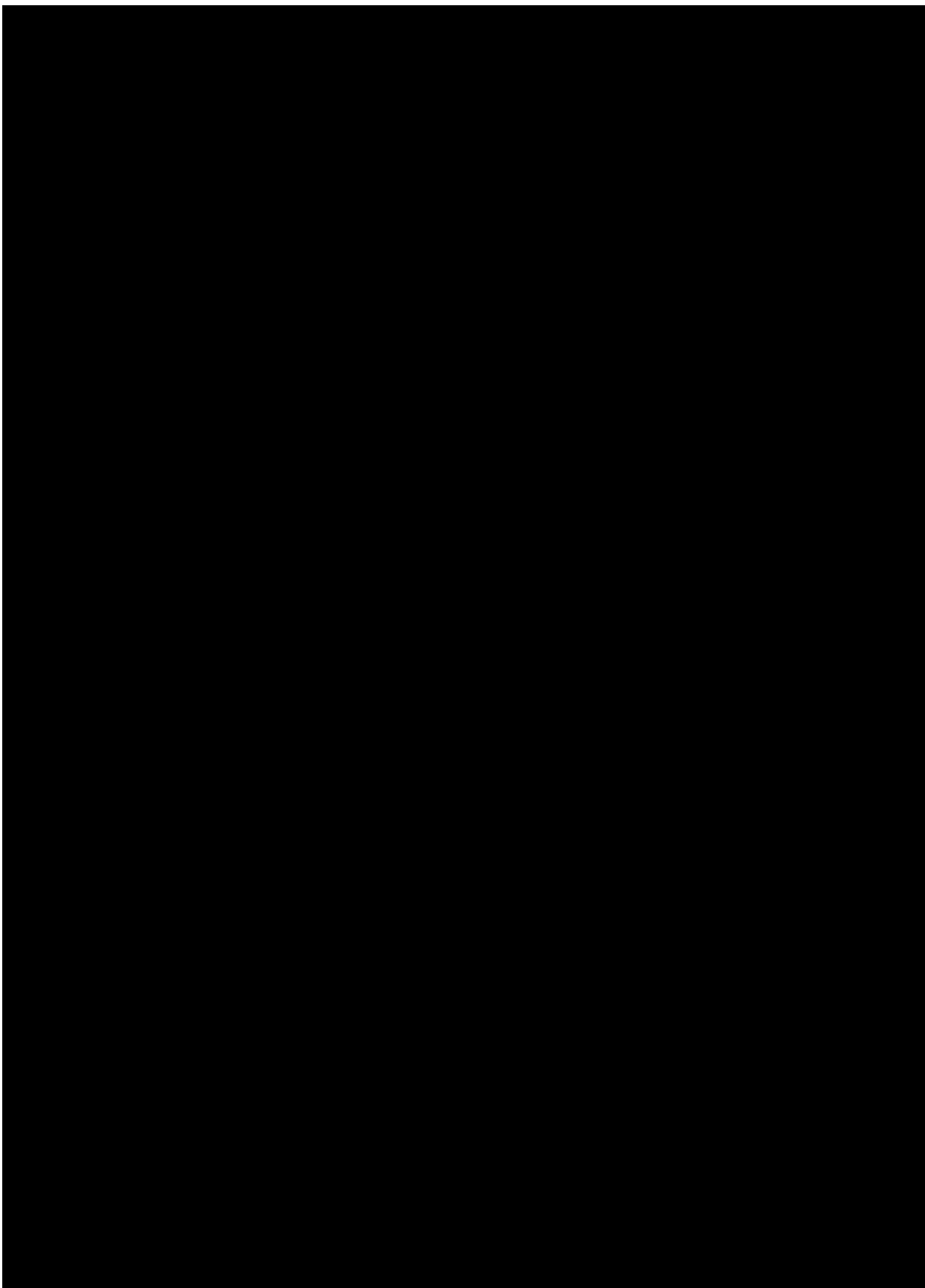
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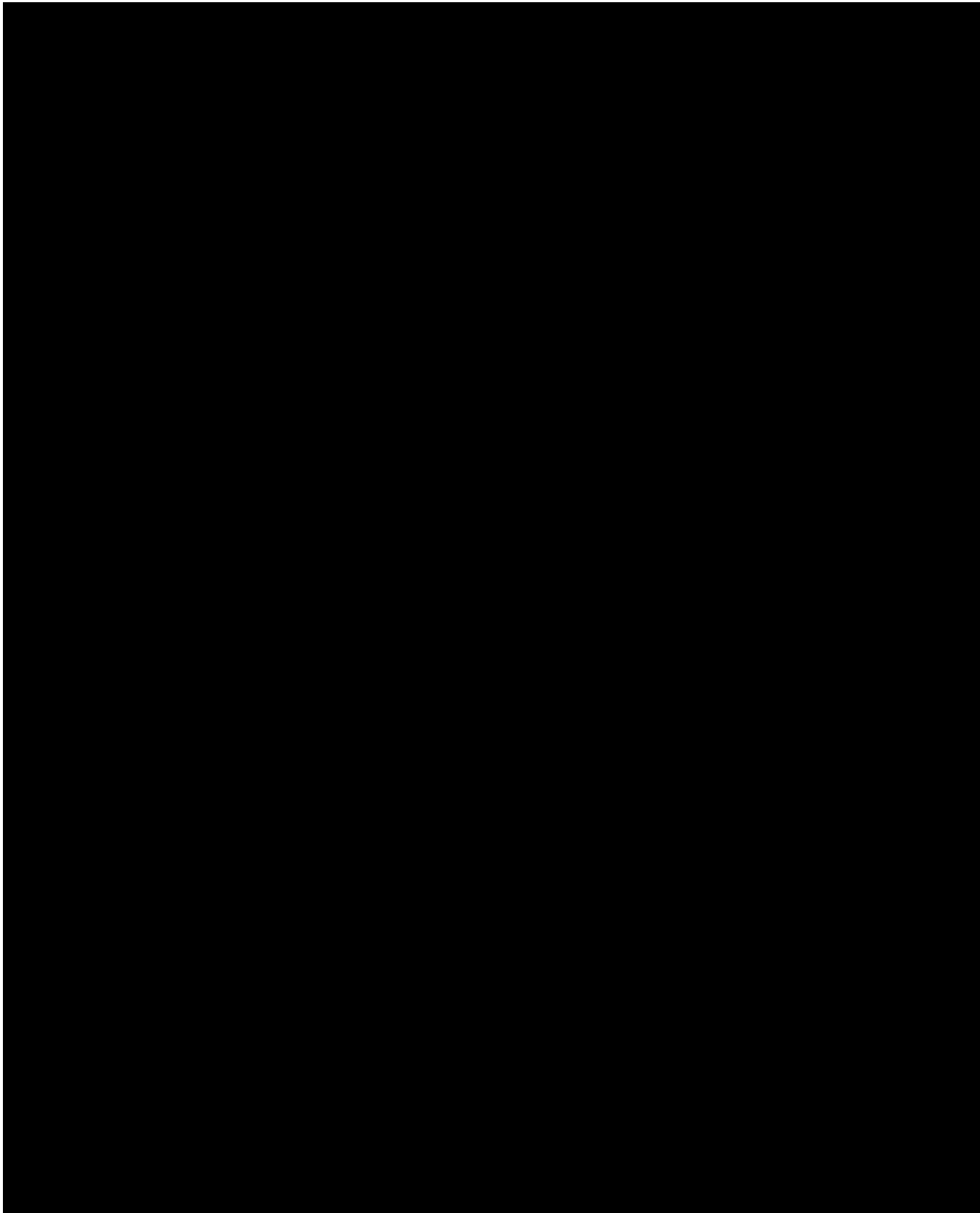
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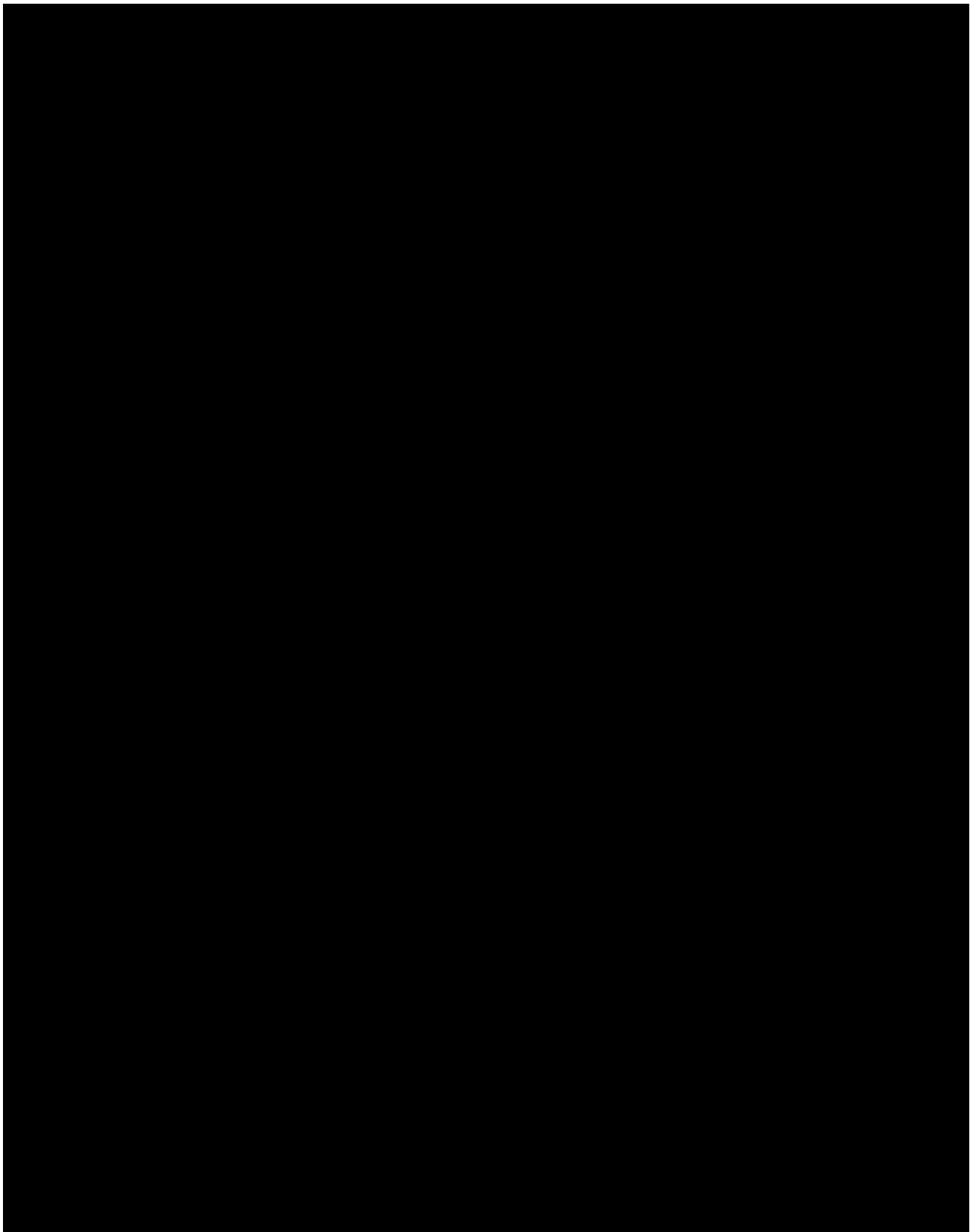
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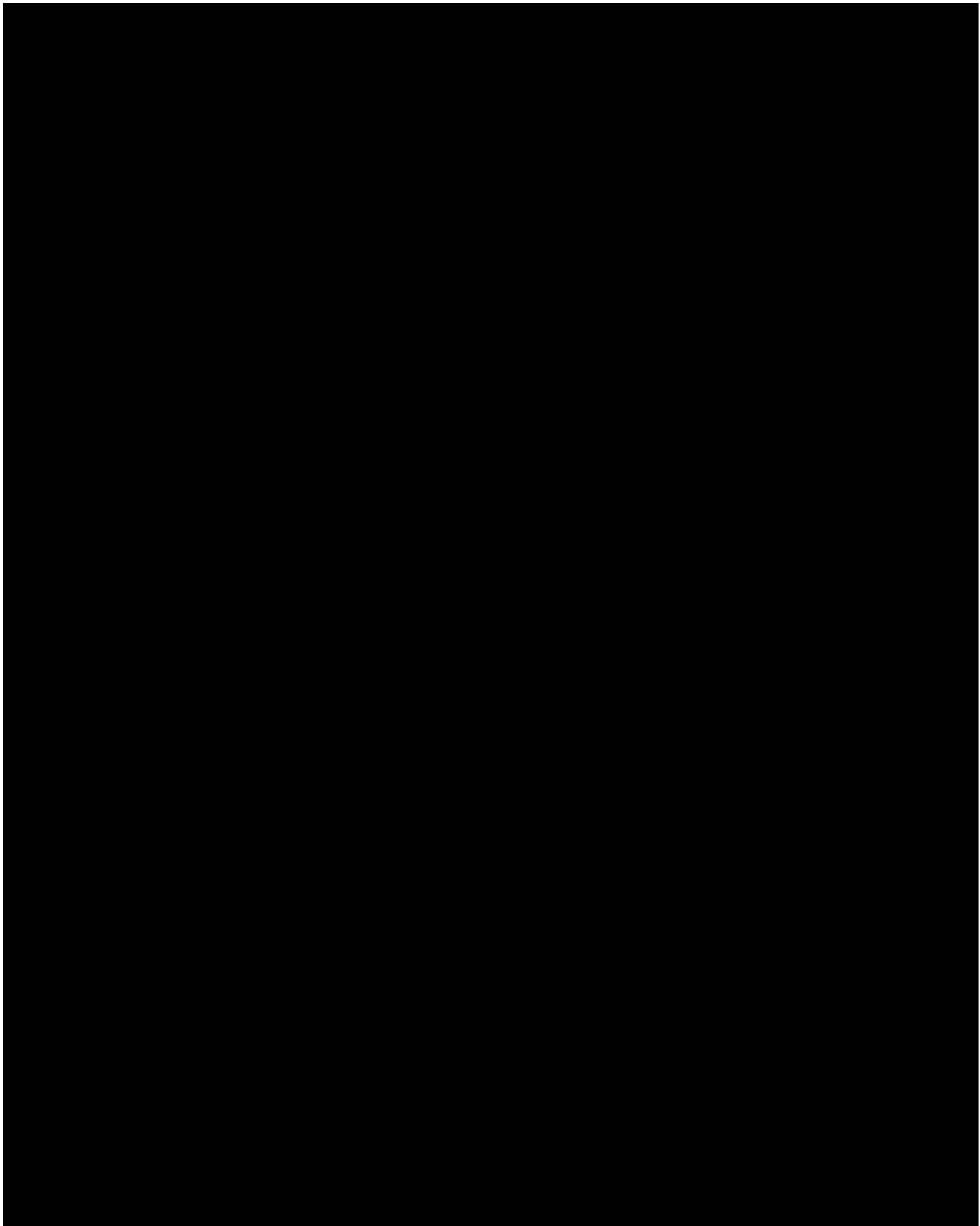


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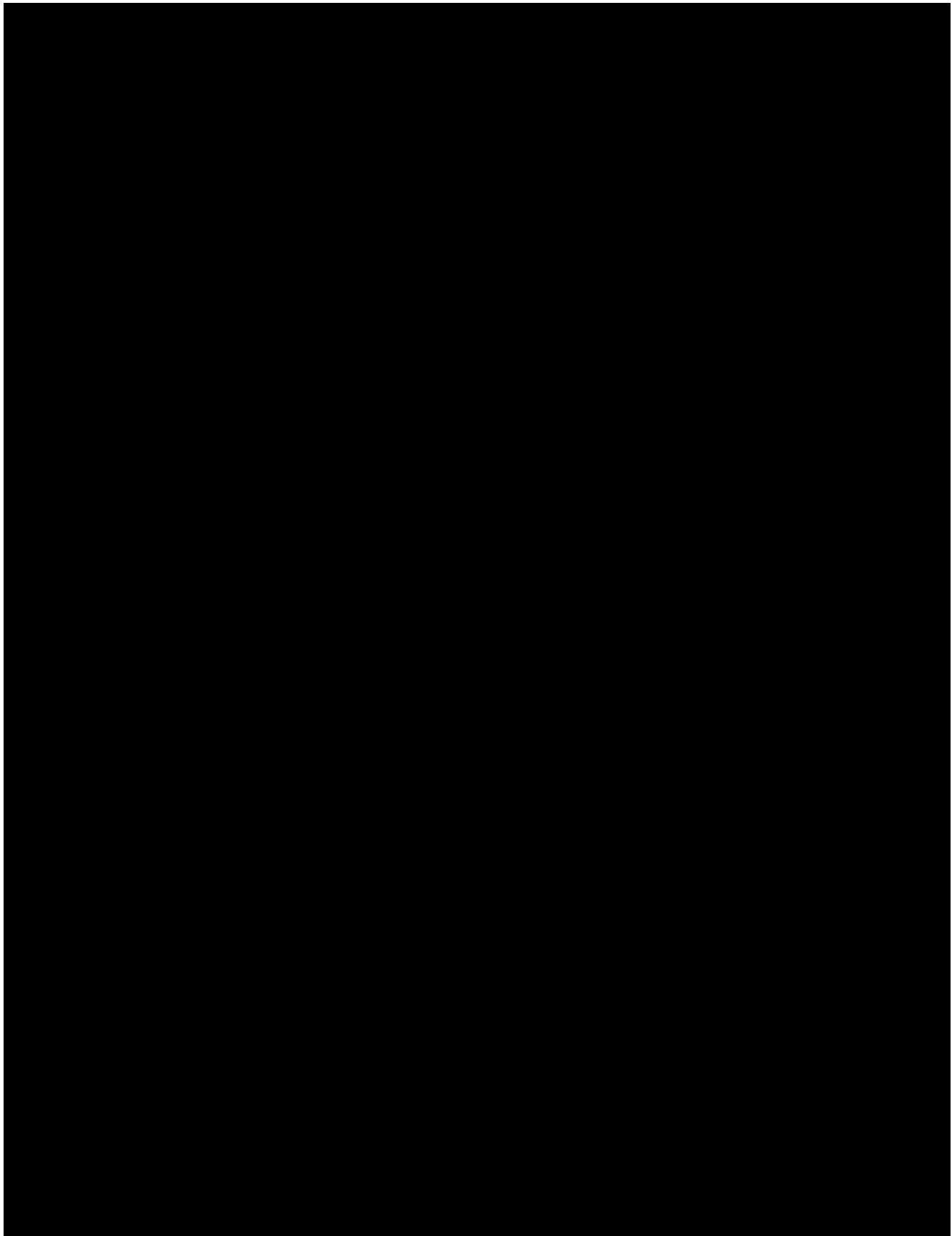


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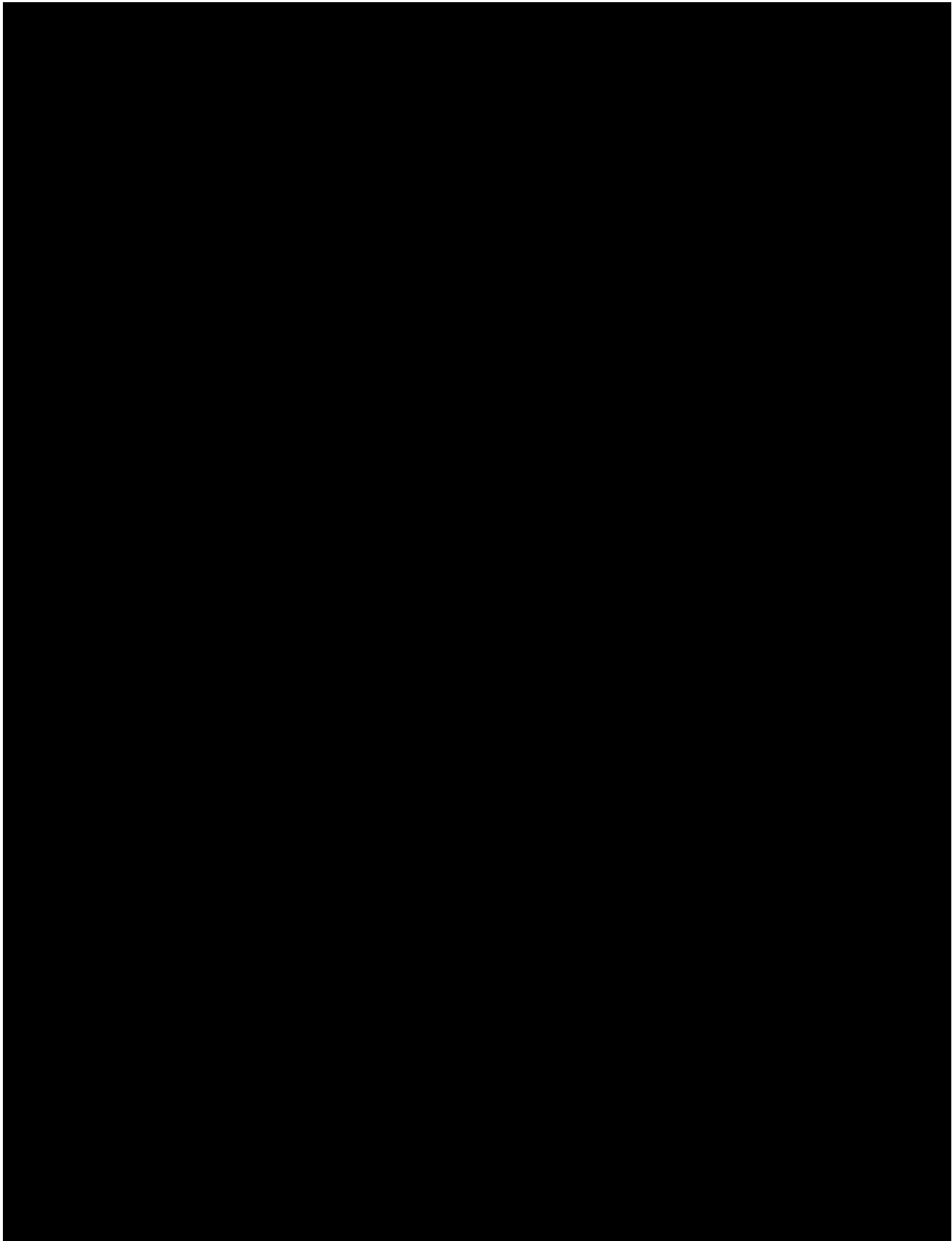
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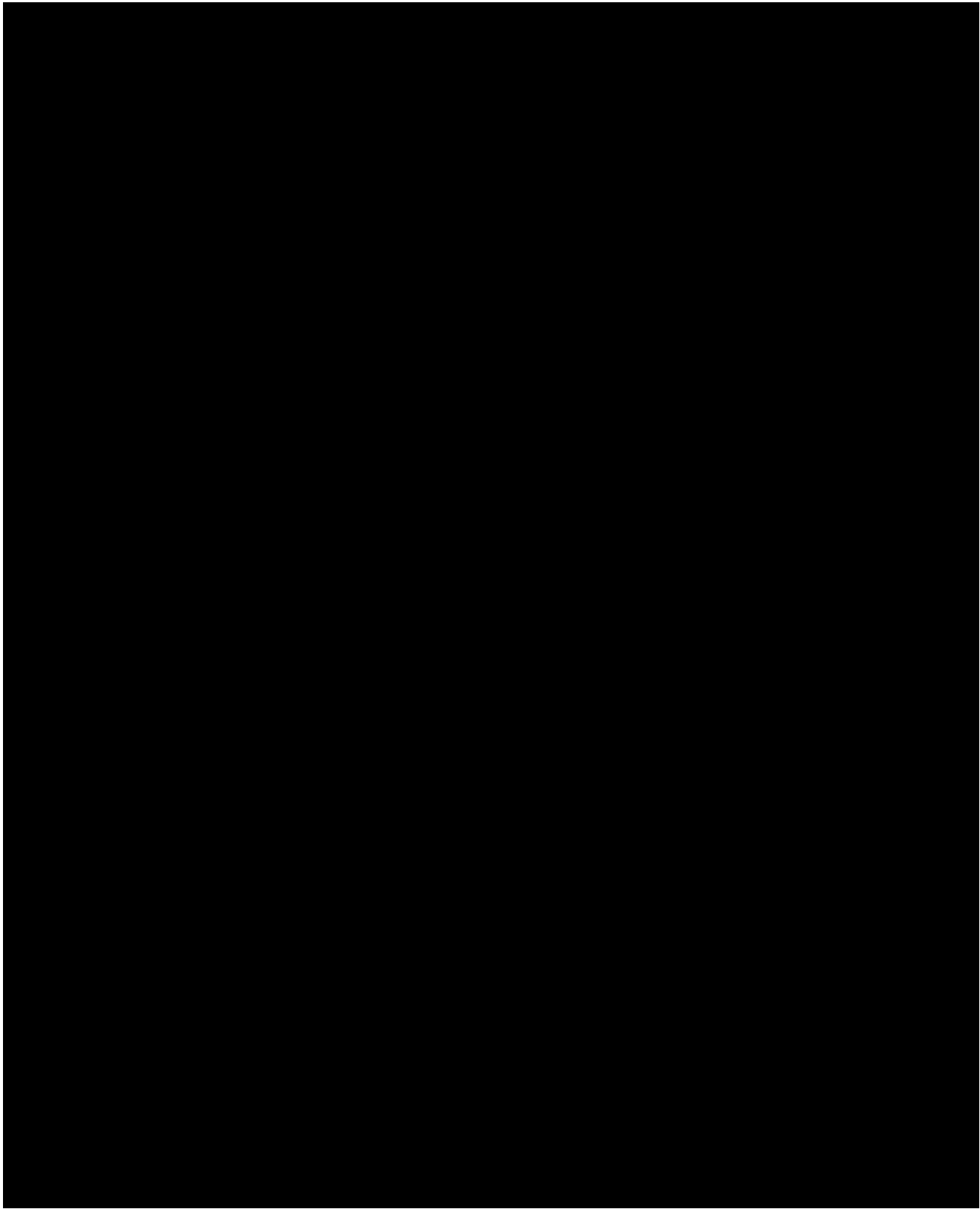
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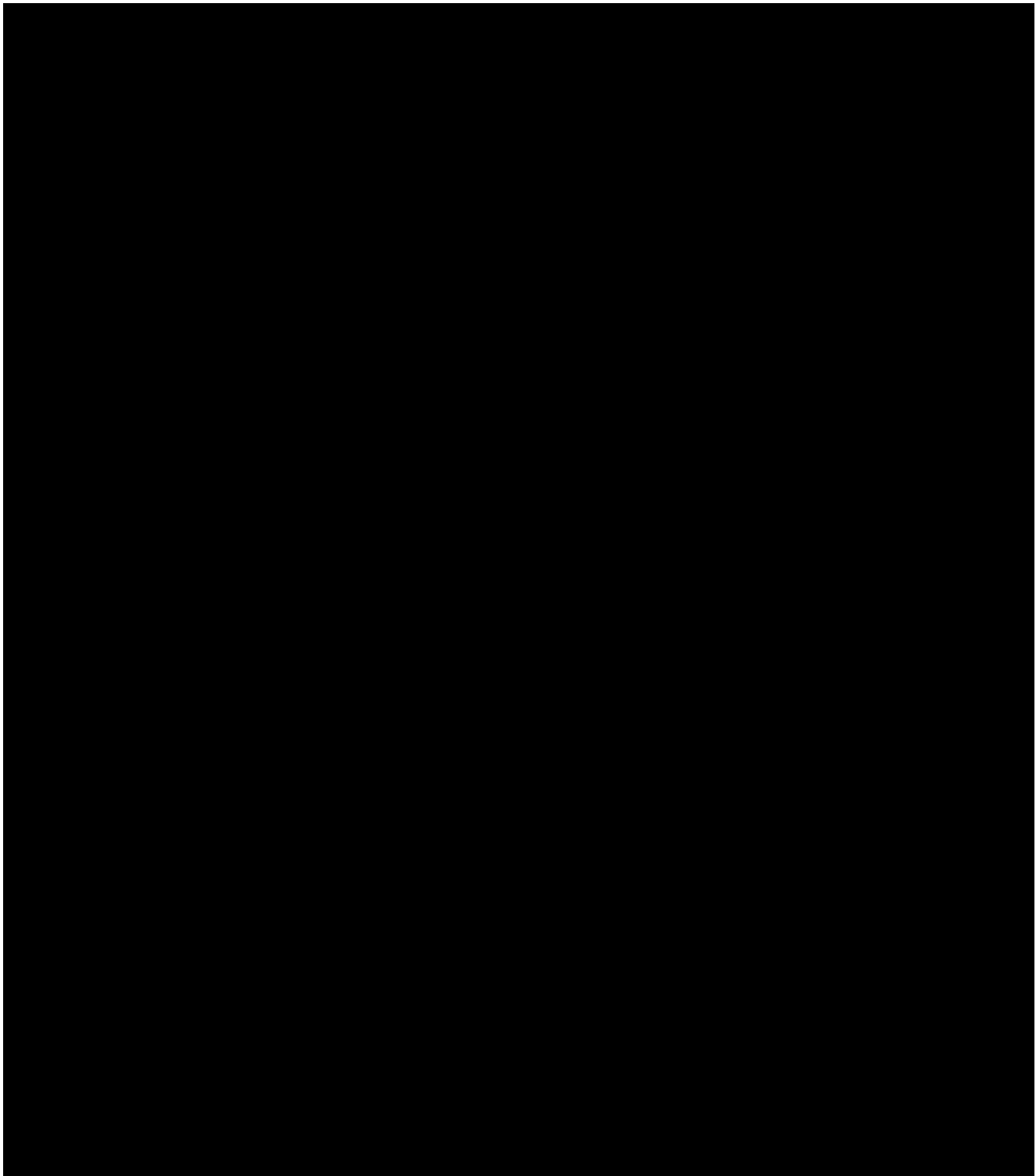


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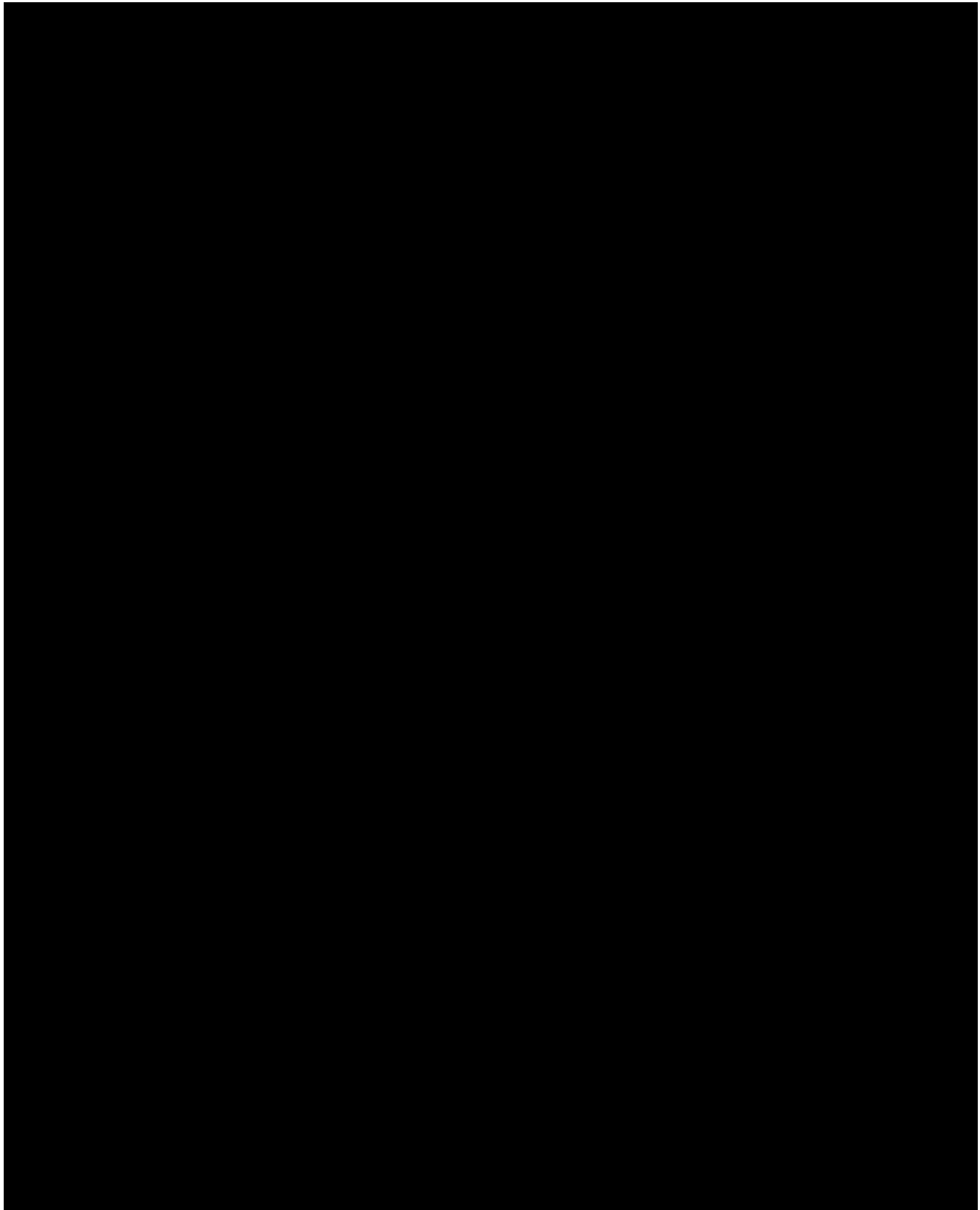




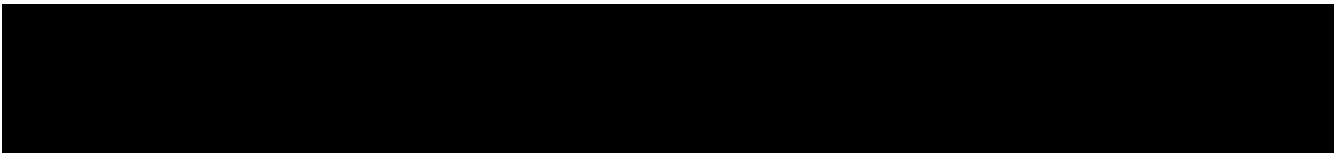
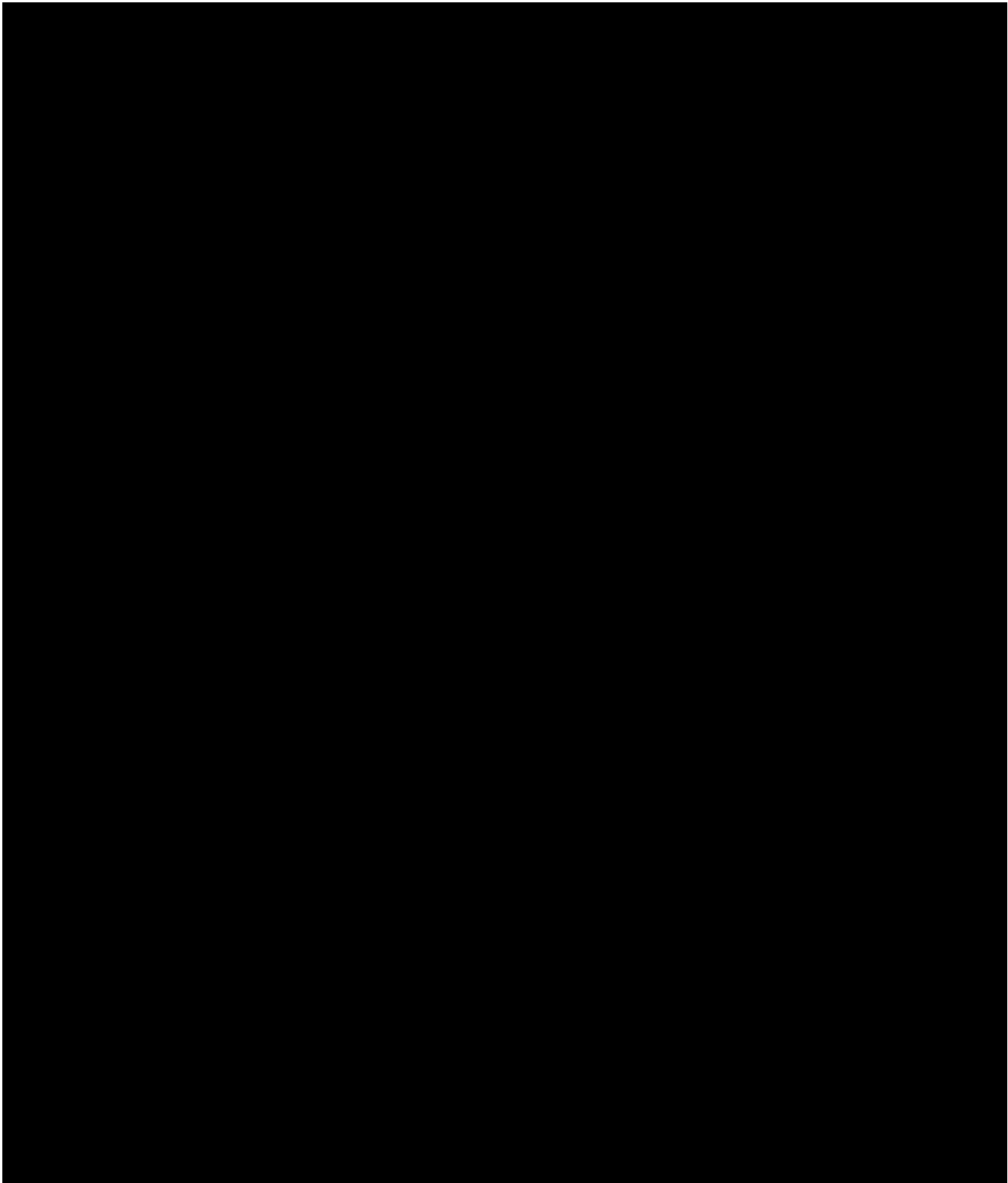
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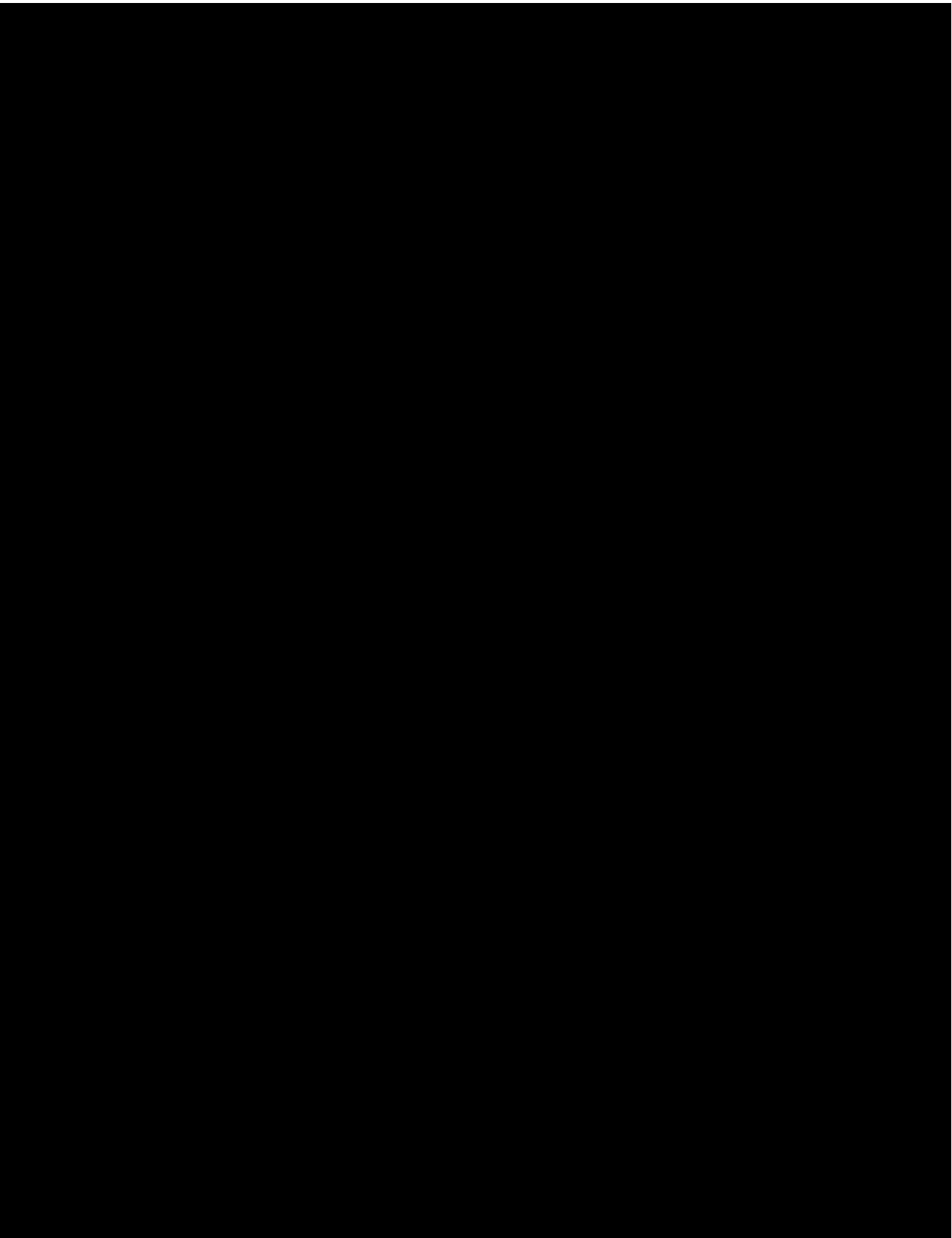
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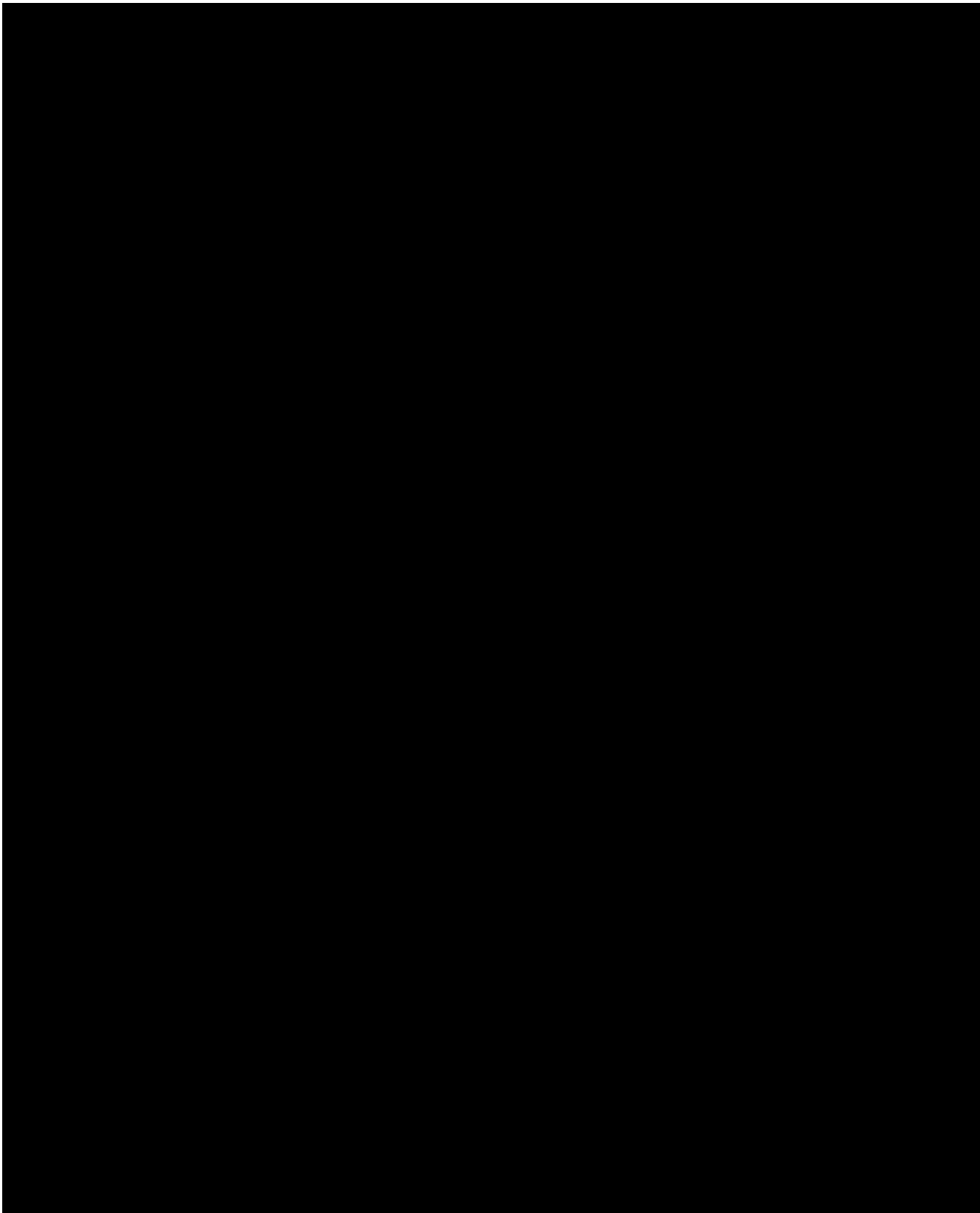
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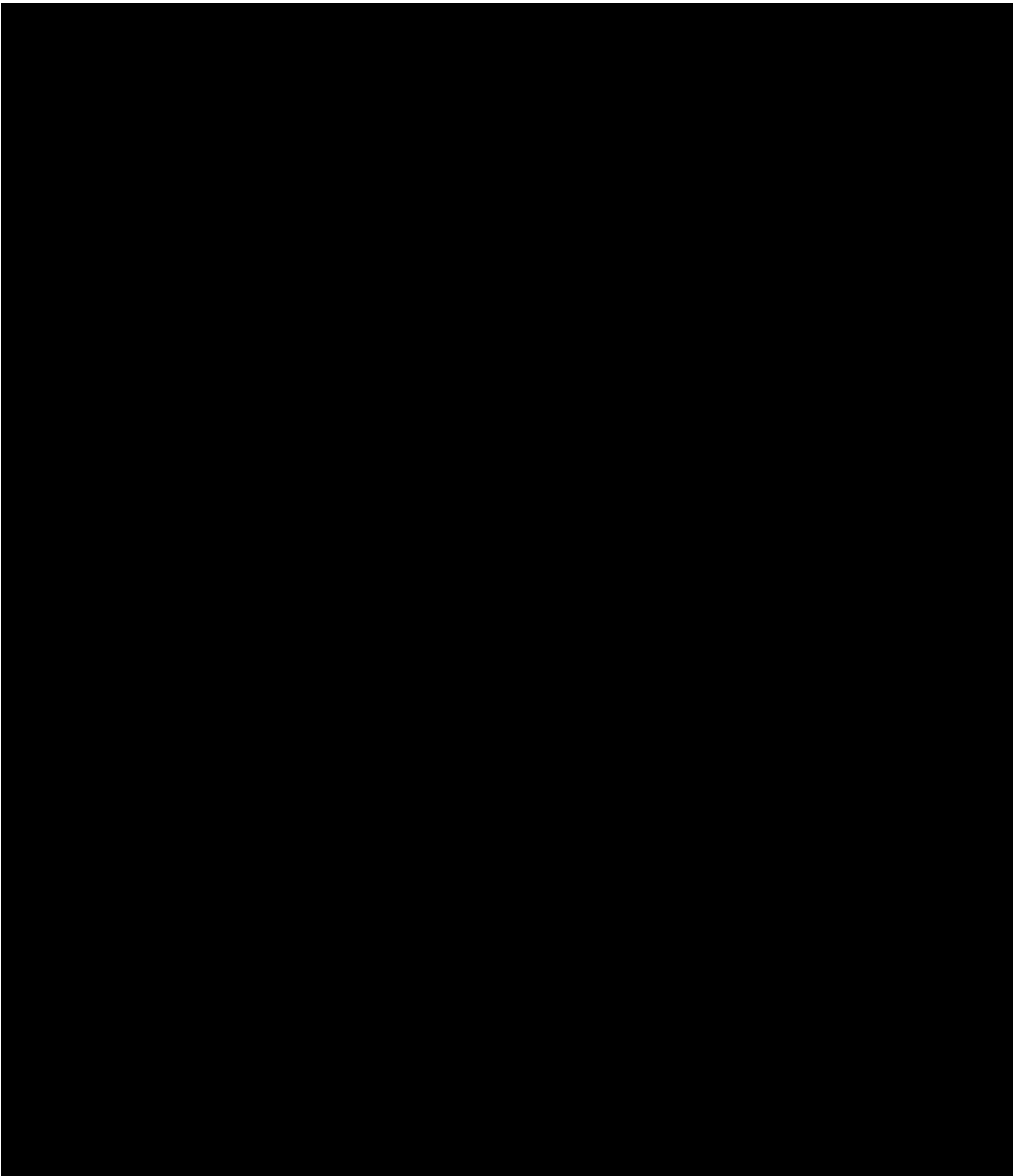
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XI. CONCLUSION

Q. Does this conclude your Rebuttal Testimony at this time?

A. Yes. I reserve the right to supplement my testimony as additional issues arise during the course of this proceeding.

John D. Taylor

CEO

Mr. John D. Taylor is the Co-Founder and Chief Executive Officer of Atrium Economics and a senior regulatory economist with more than twenty years of experience advising electric and natural gas utilities across the United States and Canada. Mr. Taylor has served as a lead expert in rate and regulatory proceedings across more than 20 jurisdictions in the United States and Canada. His testimony has been presented before the Federal Energy Regulatory Commission, numerous state public utility commissions, provincial utility regulators, and trial courts.

He has testified on matters including revenue requirements, class cost of service, advanced rate design, revenue stabilization mechanisms, affiliate transactions, demand forecasts, return on equity, lead lag studies, audit testing, and infrastructure cost recovery. In addition to matters in which he was the lead witness, he has supported over one hundred engagements for other expert witnesses, contributing to the development and defense of analytical models, regulatory strategy, and evidentiary submissions.

Mr. Taylor's experience spans vertically integrated electric utilities, gas distribution utilities, transmission providers, pipeline operators, municipally owned utilities, and multi-state holding companies. He has also served as market monitor for ISO New England's capacity market and has supported wholesale power purchase agreement evaluations and generation feasibility and prudence analyses. He regularly advises executive leadership and boards on regulatory strategy, risk allocation, revenue stability, infrastructure investment, and long-term rate design considerations.

In addition to his consulting leadership, Mr. Taylor served as Chief Executive Officer of a non-destructive testing and industrial inspection firm serving the power generation, petrochemical, and heavy industrial sectors. That role provided direct experience in capital-intensive infrastructure operations, asset integrity management, maintenance planning, safety compliance, and operational risk oversight. This operating perspective informs his work in utility capital planning, infrastructure expansion review, and regulatory cost recovery.

EDUCATION

M.A., Economics, American University

B.A., Environmental Economics, University of North Carolina at Asheville

YEARS EXPERIENCE

20

RELEVANT EXPERTISE

Revenue Requirements & Capital Recovery, Class Cost of Service & Advanced Rate Design, Revenue Stabilization Mechanisms, Demand Forecasting & Resource Planning, Natural Gas & Pipeline Infrastructure Analysis, Return on Equity & Capital Structure, Affiliate Transactions & Operational Audits, Transmission & FERC Matters, Transaction Advisory & Regulatory Due Diligence



EXPERT WITNESS TESTIMONY PRESENTATION

UNITED STATES:

- California Superior Court of California
- Delaware Public Service Commission
- Florida Public Service Commission
- Federal Energy Regulatory Commission
- Illinois Commerce Commission
- Indiana Utility Regulatory Commission
- Maine Public Service Commission
- Maryland Public Service Commission
- Massachusetts Department of Public Utilities
- Minnesota Public Utilities Commission
- Tennessee Public Utility Commission
- New Hampshire Public Utilities Commission
- North Carolina Utilities Commission
- North Carolina – Brunswick Superior Court
- Oregon Public Utility Commission
- Ohio Public Utility Commission
- Pennsylvania Public Utility Commission
- South Carolina Public Service Commission
- Virginia State Corporation Commission
- Washington Utilities and Transportation Commission
- Public Service Commission of West Virginia

CANADA:

- Alberta Utilities Commission
- British Columbia Utilities Commission
- Ontario Energy Board

REPRESENTATIVE EXPERIENCE

RATE DESIGN AND REGULATORY PROCEEDINGS

Mr. Taylor has extensive experience developing and evaluating utility revenue requirements, including review of test year construction, pro forma adjustments, operating expense normalization, capital investment recovery, depreciation and amortization treatment, and cash working capital analyses, including lead-lag studies. He has assessed prudence and regulatory treatment of major capital programs, infrastructure modernization initiatives, and incremental investment proposals. In addition, Mr. Taylor has designed and evaluated revenue stabilization mechanisms, including Weather Normalization Adjustments, Revenue Adjustment Mechanisms, and other forms of decoupling and revenue recovery tools. His work includes back-casting analyses, risk assessment modeling, and evaluation of tradeoffs between customer bill stability and utility revenue certainty. He has testified regarding both the technical design and policy implications of such mechanisms in contested regulatory proceedings.

CLASS COST OF SERVICE AND RATE DESIGN



Mr. Taylor has extensive experience developing and defending embedded and marginal class cost of service studies in contested regulatory proceedings across the United States and Canada. His work includes functionalization, classification, and allocation of utility costs; development of jurisdictional and class revenue requirements; and evaluation of fixed-variable cost recovery methodologies. He has designed and evaluated residential, commercial, and industrial rate structures, including demand-based rates, time-of-use designs, economic development tariffs, and revenue apportionment strategies. Mr. Taylor has also assessed rate stability, equity considerations, and cost causation principles in the context of evolving load patterns, electrification, and policy-driven rate reforms.

DEMAND AND CUSTOMER FORECASTING

Mr. Taylor has extensive experience developing and evaluating demand and customer forecasting models for electric and natural gas utilities. His work includes econometric modeling of customer growth, usage normalization, peak demand forecasting, and weather-sensitive load analysis. He has assessed forecast methodologies for rate proceedings, infrastructure planning, and resource adequacy evaluations, including review of macroeconomic drivers, demographic trends, and end-use consumption patterns. Mr. Taylor has also evaluated forecast inputs used in capital planning, pipeline capacity assessments, LNG resource planning, and revenue requirement development. His experience includes back-casting analyses, scenario modeling, and sensitivity testing to assess forecast risk and regulatory defensibility. He has testified regarding forecast methodology, assumptions, and alignment with regulatory standards in contested proceedings.

RETURN ON EQUITY AND CAPITAL STRUCTURE

Mr. Taylor has provided testimony and advisory analysis regarding return on equity and capital structure for regulated electric and natural gas utilities in both transmission and distribution contexts. His work includes evaluation of regulatory capital structures, cost of capital components, and risk considerations associated with infrastructure investment, revenue stability mechanisms, and business model evolution. He has supported financial modeling in rate proceedings, including assessment of cash flow implications, earnings stability, and alignment between authorized returns and underlying business risk. Mr. Taylor has also evaluated the interaction between capital structure, revenue recovery mechanisms, and regulatory policy objectives, including the treatment of large capital programs and expansion initiatives.

TRANSACTION ADVISORY AND REGULATORY DUE DILIGENCE

Mr. Taylor has advised utilities and infrastructure stakeholders in connection with asset acquisitions, divestitures, and wholesale power supply evaluations. His transaction experience includes regulatory due diligence, evaluation of revenue requirements and rate structures, infrastructure risk assessment, and financial modeling to support investment decisions. Mr.



Taylor has advised on regulated utility and energy infrastructure transactions, including buy-side and sell-side evaluation of utility operations and generation asset divestitures. His work has included assessment of revenue requirements, rate structures, customer forecasts, regulatory risk, operational performance, and capital recovery considerations to support informed investment decisions. His advisory work has also included evaluation of comparable utility transactions, merger activity, and regulatory approval considerations affecting infrastructure investment decisions.

NATURAL GAS INFRASTRUCTURE & RESOURCE PLANNING EXPERIENCE

Mr. Taylor has extensive experience supporting natural gas utilities and pipeline operators in forecasting, peak demand planning, LNG resource evaluation, balancing mechanisms, transportation modeling, and line extension reviews. His work includes demand forecasting for local distribution companies, evaluation of peak day planning standards, LNG peaking facility analyses, storage utilization review, pipeline transport cost allocation, and balancing service design. He has evaluated integrated resource planning approaches, supply portfolio risk assessment, and incremental pipeline capacity expansion proposals. His experience includes review of expansion economics, regulatory treatment of new infrastructure investment, and cost recovery mechanisms associated with large capital programs. Mr. Taylor has also assessed alignment between demand forecasts, contracted capacity, storage strategy, and long-term system reliability objectives, providing analytical support for regulatory filings and board-level capital planning decisions.

AFFILIATE RELATIONSHIPS & PERFORMANCE REVIEWS

Mr. Taylor has led and supported affiliate transaction reviews, shared services cost allocation studies, and operational performance assessments in both U.S. and Canadian jurisdictions. His work includes evaluation of overhead allocation methodologies, overhead capitalization practices, and cost recovery treatment associated with corporate support functions, transmission-related shared assets, and early contractor engagement for major infrastructure projects. He has assessed capitalization rates, allocation between transmission and distribution functions, and cost attribution to regulated versus affiliate activities, ensuring consistency with regulatory standards and precedent. His experience includes shared assets studies, evaluation of contractor cost structures in large capital programs, and review of governance controls supporting regulatory compliance. In addition, Mr. Taylor has conducted operational audits and benchmarking analyses addressing operations and maintenance (O&M) and administrative and general (A&G) expenses. His work includes comparative peer analysis, assessment of cost drivers, and evaluation of organizational efficiency and cost discipline in regulated utility environments.



PROFESSIONAL EXPERIENCE

CO-FOUNDER & CHIEF EXECUTIVE OFFICER | ATRIUM ECONOMICS | 2020 – PRESENT

Leads a regulatory advisory firm serving electric and natural gas utilities across the United States and Canada. Serves as lead expert witness in rate and regulatory proceedings and oversees firm strategy, analytical methodology, and evidentiary quality control. Advises executive leadership and boards on revenue requirements, rate design, infrastructure investment, and regulatory risk.

CHIEF EXECUTIVE OFFICER | NOVA DATA TESTING | 2019 – 2026

Led a non-destructive testing and industrial inspection firm serving power generation and petrochemical facilities. Responsible for strategic planning, capital allocation, regulatory compliance, operational leadership, and risk oversight in asset-intensive, safety-sensitive environments. This operating experience informs his perspective on infrastructure investment and operations.

PRINCIPAL CONSULTANT | BLACK & VEATCH MANAGEMENT CONSULTING | 2015 – 2020

Led regulatory and financial advisory engagements for electric and gas utilities, including revenue requirements, class cost of service, affiliate transactions, and return on equity matters. Filed expert testimony and supported infrastructure transaction advisory and regulatory approval strategy.

SENIOR PROJECT MANAGER & PRINCIPAL | CONCENTRIC ENERGY ADVISORS | 2006 – 2015

Managed regulatory consulting engagements involving revenue requirements, cost allocation, and rate design across multiple jurisdictions. Led project teams, supported expert testimony, and contributed to business development and firm-wide analytical quality control initiatives.

EDUCATION

MASTER OF ARTS, ECONOMICS | AMERICAN UNIVERSITY | 2004 – 2006

Graduate coursework included econometrics, advanced microeconomics and macroeconomics, mathematical economics, monetary policy, and history of economic thought. Served as a teaching assistant for undergraduate microeconomics and macroeconomics courses.

BACHELOR OF ARTS, ENVIRONMENTAL ECONOMICS | UNIVERSITY OF NORTH CAROLINA AT ASHEVILLE | 2000 – 2004

Coursework emphasized the application of economic theory and quantitative analysis to environmental and resource issues, including statistics and applied modeling. Completed independent study examining the intersection of ethics and economic theory.



BOARD AND ADVISORY BOARDS

Treasurer, Board of Directors – The Outside Foundation (2023–Present)

Member – 278 Gateway Corridor Committee, Town of Hilton Head Island (2019–2022)

Richmond Advisory Board – Higher Achievement (2014–2015)



SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
United States				
California - Marin County Superior Court				
Walker (Plaintiff)	2021	Walker v. Marin Municipal Water District	Case No. CIV1501914	Expert report relating to the calculation of bill overcharges used for determining damages.
Delaware Public Service Commission				
Chesapeake Utilities	2015	Chesapeake Utilities Delaware Division	Docket No. 15-1734	Allocated class cost of service study.
Federal Energy Regulatory Commission				
The Central Nebraska Public Power and Irrigation District ("Central")	2017	Southwest Pool Power, Inc. ("SPP") submitted, on Central's behalf.	Docket No. ER17-1741-000	Return on Equity Testimony for Central's Annual Transmission Revenue Requirement
Florida Public Service Commission				
Florida City Gas	2026	Florida City Gas	Docket No. 20260026-GU:	Rate amalgamation allocated cost of service, sales forecast, and rate design.
TECO Energy, Inc.	2025	Peoples Gas System, Inc.	Docket No. 20250029-GU	Allocated cost of service and rate design.
Florida Public Utilities Company	2024	Florida Public Utilities Company - Electric	Docket No. 20240099-EI	Allocated cost of service, sales forecast, and rate design.
Florida Public Utilities Company	2022	Florida Public Utilities Company - Gas	Docket No. 20220067-GU	Rate amalgamation allocated cost of service, sales forecast, and rate design.
Illinois Commerce Commission				
Ameren Utilities Inc.	2008	Central Illinois Light Company d/b/a AmerenCILCO Central Illinois Public Service Company d/b/a AmerenCIPS Illinois Power Company d/b/a AmerenIP	Docket Nos. 07-0585 / 07-0586 / 07-0587 / 07-0588 / 07-0589 / 07-0590 (cons.)	Statistical audit sampling of plant additions documentation in support of the reasonableness of total plant additions added to rate base.

SPONSOR	DATE	CASE/APPLICANT	DOCKET NO.	SUBJECT
Indiana Utility Regulatory Commission				
Northern Indiana Public Service Company LLC & NIPSCO Generation LLC	2026	Northern Indiana Public Service Company LLC & NIPSCO Generation LLC	Cause No. 46120	Large Load (data center) filing and shared system credit allocation.
Northern Indiana Public Service Company, division of Northern Indiana Energy, subsidiary of NiSource, Inc.	2024	Northern Indiana Public Service Company - Electric	Cause No. 46120	Allocated class cost of service and rate design including multifamily rate and low-income usage analysis.
Southern Indiana Gas and Electric Company dba CenterPoint Energy Indiana South (CEI South)	2023	CenterPoint Energy Indiana South (CEI South) - Electric	Cause No. 45990	Allocated class cost of service and rate design.
Northern Indiana Public Service Company, division of Northern Indiana Energy, subsidiary of NiSource, Inc.	2023	Northern Indiana Public Service Company - Gas	Cause No. 45967	Allocated class cost of service, and rate design, and weather normalization adjustment.
Northern Indiana Public Service Company, division of Northern Indiana Energy, subsidiary of NiSource, Inc.	2022	Northern Indiana Public Service Company - Electric	Cause No. 45772	Allocated class cost of service and rate design.
Indianapolis Power and Light, subsidiary of AEP	2015	Indianapolis Power and Light	Cause No. 44576	Allocated class cost of service study.
Northern Indiana Public Service Company, division of Northern Indiana Energy, subsidiary of NiSource, Inc.	2010-11	Northern Indiana Public Service Company	Cause No. 43969	Allocated class cost of service studies.
Maine Public Utilities Commission				
Central Maine Power Company, subsidiary of Iberdrola USA.	2014	Central Maine Power Company	Docket No. 2013-00168	Embedded cost of service study.
Maryland Public Service Commission				
Chesapeake Utilities Corporation	2024	Chesapeake Utilities Corporation, Sandpiper Energy Inc, and Elkton Gas Company	Case No. 9722	Embedded cost of service studies and lead-lag studies.
Massachusetts Department of Public Utilities				

Fitchburg Gas and Electric Light Company d/b/a Unitil Electric Division	2023	Unitil Electric Division	Docket No. DE 23-117	Wholesale distribution access tariff for energy storage systems.
Fitchburg Gas and Electric Light Company d/b/a Unitil Electric Division	2023	Unitil Electric Division	Docket No. DE 23-80	Embedded cost of service study and rate design.
Fitchburg Gas and Electric Light Company d/b/a Unitil Electric Division	2021-2022	Unitil Electric Division	Docket No. DE 20-170	Electric vehicle alternative rate design (demand discount) and residential time-of-use rates.
Fitchburg Gas and Electric Light Company d/b/a Unitil Electric Division	2019	Unitil Electric Division	Docket No. D.P.U. 19-130	Embedded cost of service study and rate design.
Minnesota Public Utilities Commission				
Interstate Power and Light Company, subsidiary of Alliant Energy Corporation	2010-11	Interstate Power and Light Company	Docket No. E001/GR-10-276 OAH Docket No. 4-2500-21392-2	Allocated class cost of service studies and low-income analysis.
New Hampshire Public Utilities Commission				
Unitil Energy Systems – Electric Division	2021-2022	Unitil Energy Systems	Docket No. DE 21-030	Allocated class cost of service study and rate design. Time-of-use rates for residential and commercial customers.
Northern Utilities, Inc.	2021-2022	Northern Utilities, Inc.	Docket No. DG 21-104	Allocated class cost of service study, marginal cost of service study, and rate design.
North Carolina – Brunswick County Superior Court				
Bald Head Island Ferry Transportation	2024	Bald Head Island Transportation, Inc., and Bald Head Island Ferry Transportation, LLC	Case No. 23CVS98	Right of First Refusal and Transfer of Common Carrier Certificate
North Carolina Utilities Commission				
Bald Head Island Ferry Transportation	2022-2023	Bald Head Island Transportation, Inc., and Bald Head Island Ferry Transportation, LLC	Docket No. A-41, SUB 22	Transfer Common Carrier Certificate to operate the passenger ferry transportation services to and from Bald Head Island and the tram services on the island.

Public Service Company of North Carolina	2020-2021	Public Service Company of North Carolina dba Dominion Energy North Carolina	Docket No. G-5, Sub 623	Allocated class cost of service study and rate design.
Ohio - Public Utilities Commission of Ohio				
Suburban Natural Gas Company	2025	Suburban Natural Gas Company	Case No. 25-0553-GA-AIR	Allocated class cost of service study and rate design.
Enbridge Gas Ohio	2025	Enbridge Gas Ohio	Case No. 25-1097-GA-AIR	Allocated class cost of service study and rate design.
Vectren Energy Delivery of Ohio, LLC, D/B/A CenterPoint Energy Ohio	2024	CenterPoint Energy Ohio	Case No. 24-0832-GA-AIR	Allocated class cost of service study, rate design, and rider recovery.
Dominion Ohio Gas/Enbridge Gas Ohio	2023-24	Dominion Ohio Gas/Enbridge Gas Ohio	Case No. 23-0894-GA-AIR	Allocated class cost of service study, rate design, and rider recovery.
Oregon - Public Utility Commission of Oregon				
Northwest Natural Gas Company	2021-22	Northwest Natural Gas Company	UG 435 / UG 411	Line extension policy review.
Pennsylvania Public Utility Commission				
National Fuel Gas Distribution Corporation	2026	National Fuel Gas Distribution Corporation	Docket No. R-2025-3059428	Allocated class cost of service study and WNA.
UGI Utilities – Gas Division	2026	UGI Utilities – Gas Division	Docket No. R-2025-3059523	Allocated class cost of service study, rate design, and WNA.
PECO Energy Company – Gas Division	2026	PECO Energy Company – Gas Division	Docket No. R-2026-3060860	Weather Normalization Adjustment
NiSource - Columbia Gas of Pennsylvania	2025	Columbia Gas of Pennsylvania	Docket No. R-2025-3053499	Rate Design, WNA, and RNA.
UGI Utilities – Gas Division	2025	UGI Utilities – Gas Division	Docket No. R-2024-3052716	Allocated class cost of service study, rate design, and WNA.
UGI Utilities – Electric Division	2022	UGI Utilities – Electric Division	Docket No. R-2022-3037368	Allocated class cost of service study and rate design.
National Fuel Gas Distribution Corporation	2022	National Fuel Gas Distribution Corporation	Docket No. R-2022-3035730	Allocated class cost of service study, rate design, and weather normalization adjustment mechanism

UGI Utilities – Gas Division	2020-2021	UGI Utilities – Gas Division	Docket No. R-2021-3030218	Weather Normalization Adjustment
UGI Utilities – Electric Division	2020-2021	UGI Utilities – Electric Division	Docket No. R-2021-3023618	Allocated class cost of service study, rate design, EV and energy storage program.
UGI Utilities – Electric Division	2017-18	UGI Utilities – Electric Division	Docket No. R-2017-2640058	Allocated class cost of service study and rate design.
PPL Electric Utilities	2015	PPL Electric Utilities Corporation	Docket No. R-2015-2469275	Jurisdictional allocation study, allocated class cost of service study, and rate design.
South Carolina Public Service Commission				
Piedmont Natural Gas Company, Inc.	2026	Piedmont Natural Gas Company, Inc.	Docket No. 2026-61-G	Allocated class cost of service study and lead-lag study.
Dominion Energy South Carolina	2025	Dominion Energy South Carolina – Electric Division	Docket No. 2025-325-E	Allocated class cost of service study, revenue apportionment, lead-lag study.
Dominion Energy South Carolina	2024	Dominion Energy South Carolina – Electric Division	Docket No. 2024-34-E	Allocated class cost of service study and revenue apportionment.
Dominion Energy South Carolina	2023	Dominion Energy South Carolina – Gas Division	Docket No. 2023-70-G	Allocated class cost of service study and rate design.
Tennessee Public Utility Commission				
Spire Tennessee Inc.	2026	Spire Tennessee Inc.	Docket No. 26-00042	Annual ARM Filing - Allocated class cost of service study and revenue apportionment
Virginia State Corporation Commission				
NiSource - Columbia Gas of Virginia	2026	Columbia Gas of Virginia, Inc.	Case No. PUR-2026-00014	Allocated class cost of service study and rate design.
NiSource - Columbia Gas of Virginia	2024	Columbia Gas of Virginia, Inc.	Case No. PUR-2024-00030	Allocated class cost of service study and rate design.
NiSource - Columbia Gas of Virginia	2022	Columbia Gas of Virginia, Inc.	Case No. PUR-2022-00036	Allocated class cost of service study and rate design.
West Virginia – Public Service Commission of West Virginia				

Mountaineer Gas Company	2026	Mountaineer Gas Company	Case No. 26-0079-G-42T	Allocated class cost of service study and rate design.
Hope Gas, Inc.	2025	Hope Gas, Inc.	Case No. 25-0417-G-42T	Allocated class cost of service study and rate design and weather normalization adjustment.
Mountaineer Gas Company	2023	Mountaineer Gas Company	Case No. 23-0280-G-42T	Allocated class cost of service study and rate design and weather normalization adjustment.
Hope Gas, Inc.	2019-2020	Hope Gas Inc. dba Dominion Energy WV	Case No. 20-0746-G-42T	Allocated class cost of service study, rate design, and gathering system cost recovery.

Washington Utilities and Transportation Commission

Puget Sound Energy – Gas Division	2026	Puget Sound Energy	Docket UG-260006	Billing determinants, normalized revenue, allocated class cost of service study, revenue apportionment, rate design, and Gas Decarbonization Depreciation Study – Customer Impact Analysis.
Puget Sound Energy – Gas Division	2024	Puget Sound Energy	Docket UG-240005	Allocated class cost of service study, revenue apportionment, and rate design.
Puget Sound Energy – Gas Division	2023	Puget Sound Energy	Docket UG-210918	Development and rate calculations associated with the Tacoma LNG Tracker.
Puget Sound Energy – Gas Division	2022	Puget Sound Energy	Dockets UE-220066, UG-220067 & UG-210918	Allocated class cost of service study, revenue apportionment, and rate design.
Puget Sound Energy – Gas Division	2019	Puget Sound Energy	Dockets UE-190529 & UG-190530	Allocated class cost of service study, revenue apportionment, and rate design.

Canada

Alberta Utilities Commission

EPCOR Distribution & Transmission Inc.	2019-20	EPCOR Distribution & Transmission Inc.	2020-2022 TFO Tariff Application	Review of the method utilized to allocate costs within the affiliate overhead pool to the distribution and transmission functions of their business.
British Columbia Utilities Commission				
FortisBC Energy, Inc.	2016-18	FortisBC Energy, Inc.	Project No.3698899	Report relating to review of 'Transportation Service Model' - midstream transportation and storage capacity resources used in providing balancing of transportation customers' loads.
Ontario Energy Board				
Alectra Utilities Corporation	2025	Alectra Utilities Corporation	EB-2025-0252	Report relating to updating and evaluating Alectra's affiliate cost allocation methods to ensure that the cost allocation methods distribute costs in a manner that is consistent with regulatory practice and precedent, including Overhead Capitalization and Shared Assets
Milton Hydro Distribution Inc.	2025	Milton Hydro Distribution Inc.	EB-2025-0241	Independent review of Milton Hydro's affiliate cost allocation methodology for common corporate costs and shared assets under the Ontario Energy Board Affiliate Relationships Code.
Alectra Utilities Corporation	2018	Alectra Utilities Corporation	EB-2018-0016	Report relating to updating and evaluating Alectra's affiliate cost allocation methods to ensure that the cost allocation methods distribute costs in a manner that is

				consistent with regulatory practice and precedent.
Hydro One Networks Inc.	2017	Hydro One Transmission Hydro One Distribution	EB-2016-0160 (Transmission) & EB- 2017-0049 (Distribution)	Three reports relating to shared service and overhead cost allocation across Hydro One's business units (1) Review of Allocation of Common Corporate Costs (2) Review of Shared Assets Allocation (3) Review of Overhead Capitalization Rates.

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Letter of Notification of PPL Electric	:	
Utilities Corporation, Filed Pursuant to	:	
52 Pa. Code Chapter 57 Subchapter G,	:	Docket No. A-2025-3059443
For Approval To Build Approximately	:	
1.1 Miles of New Parallel Double Circuit	:	
230 kV Transmission Taps That Are	:	
Needed to Connect the Existing	:	
Susquehanna-Harwood #1 & #2	:	
Transmission Lines to the New	:	
Tomhicken 230 kV Switchyard That Are	:	
Respectively Located in Luzerne County,	:	
Pennsylvania	:	

PPL ELECTRIC UTILITIES CORPORATION

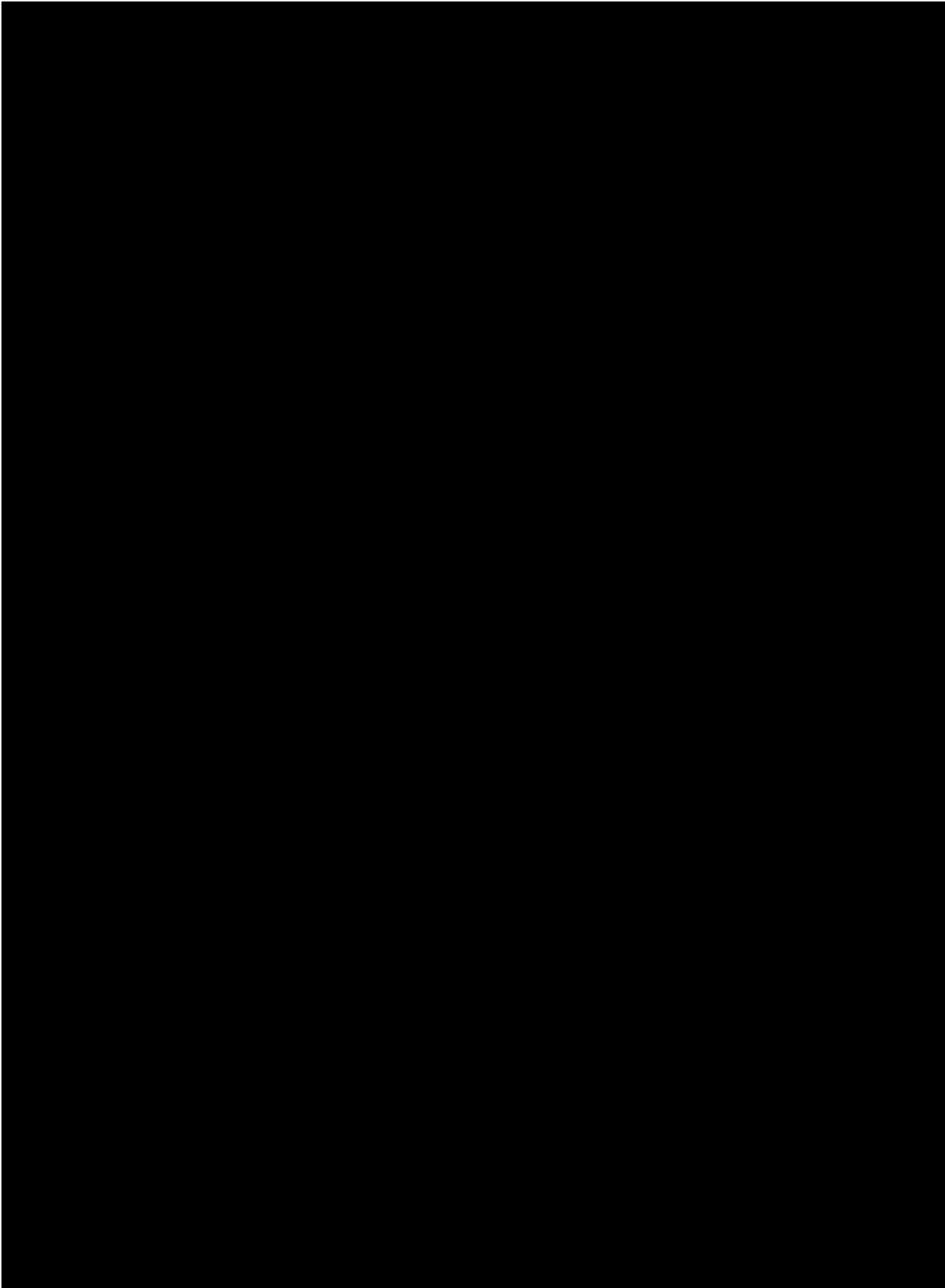
STATEMENT NO. 6-R

REBUTTAL TESTIMONY OF BETHANY L. JOHNSON

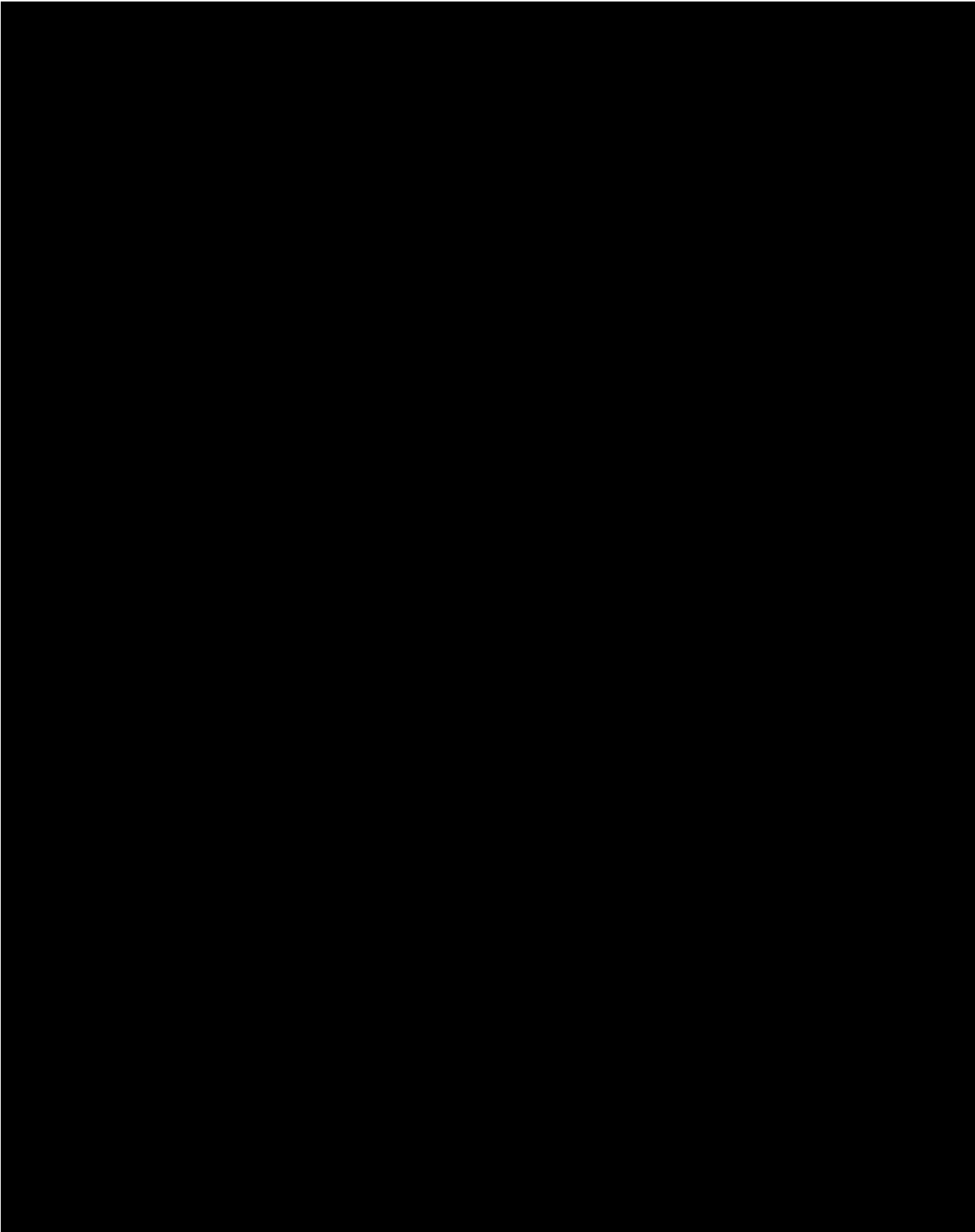
TOPICS ADDRESSED: FERC TRANSMISSION RATES

DATE: AUGUST 7, 2026

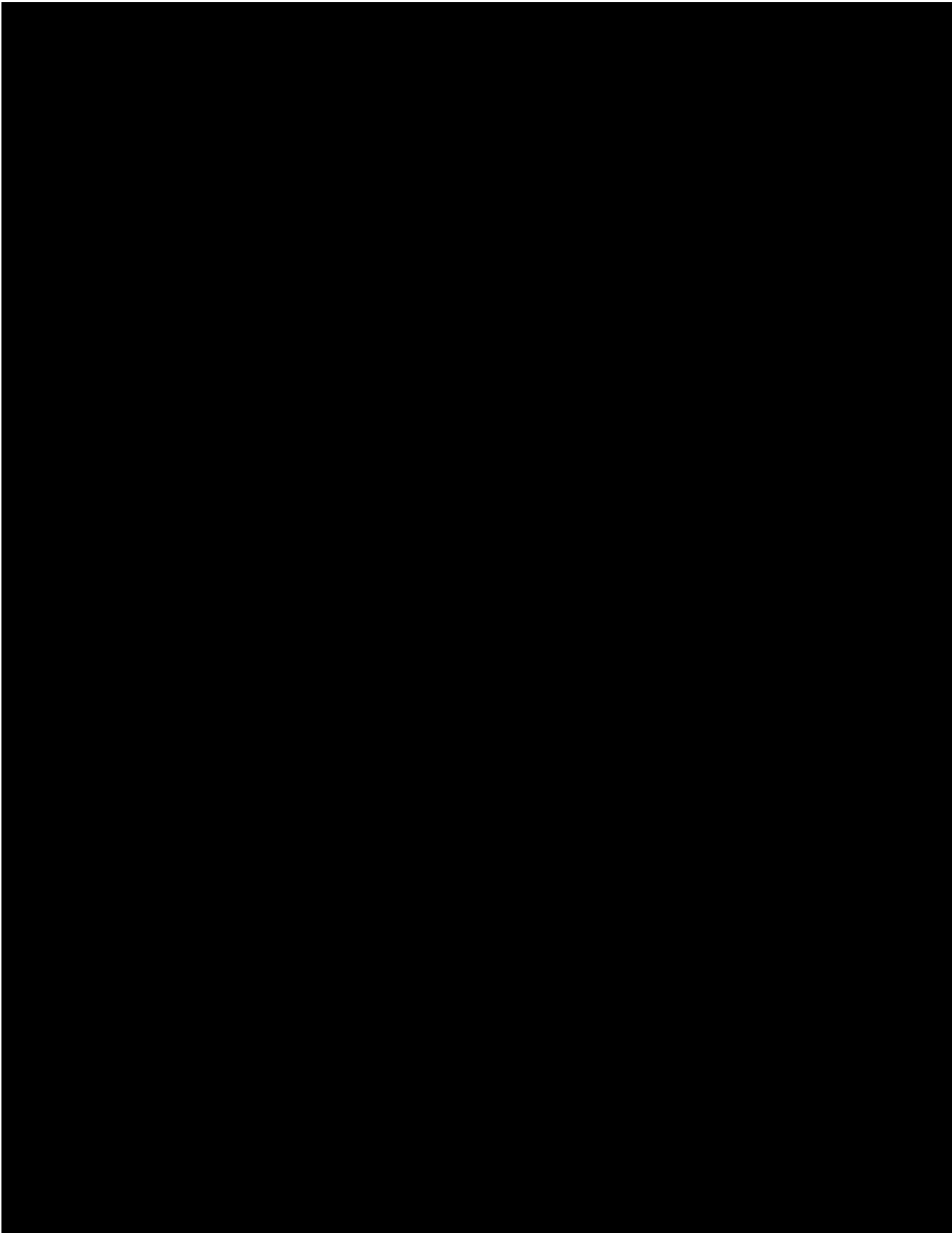
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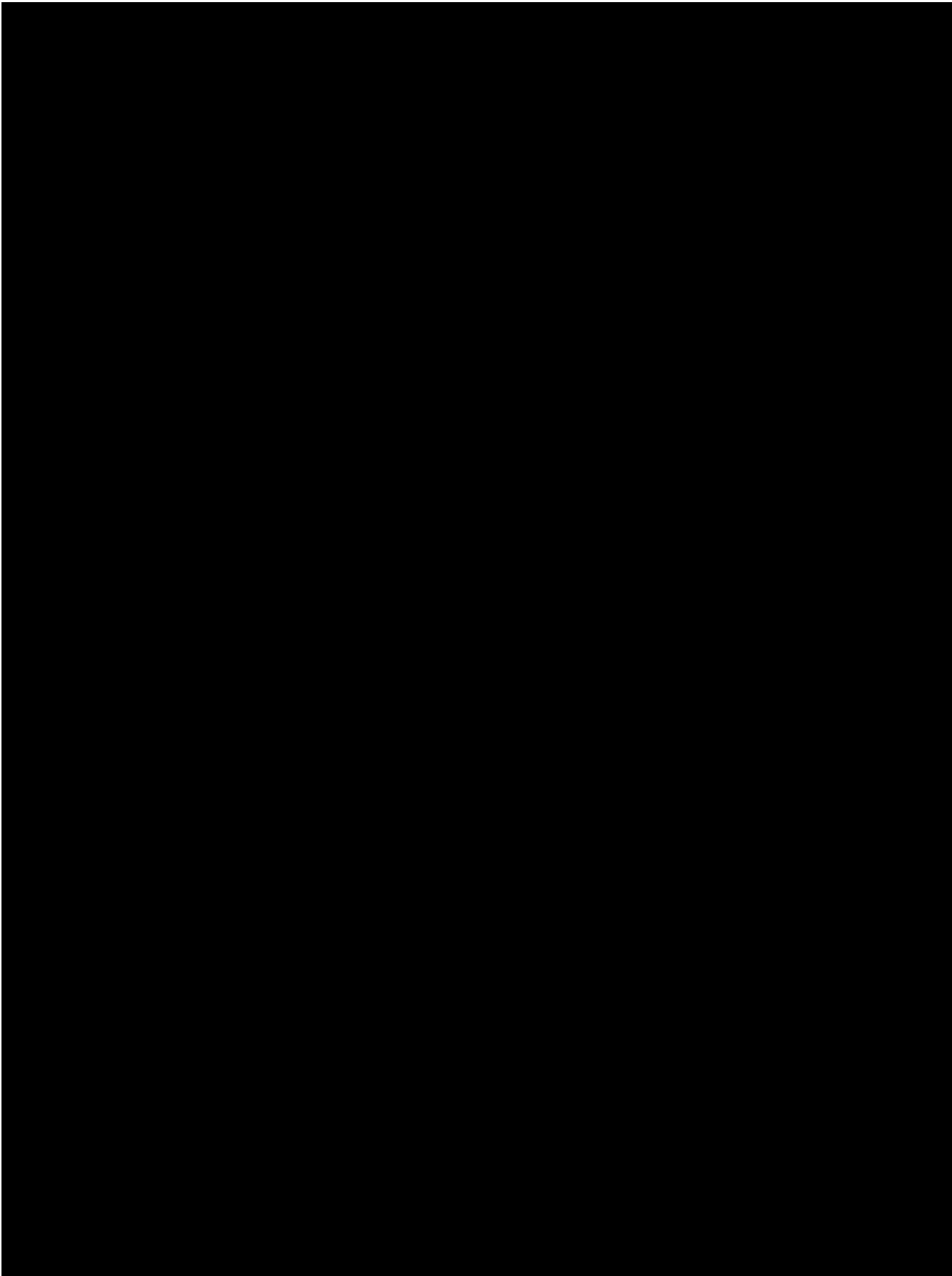
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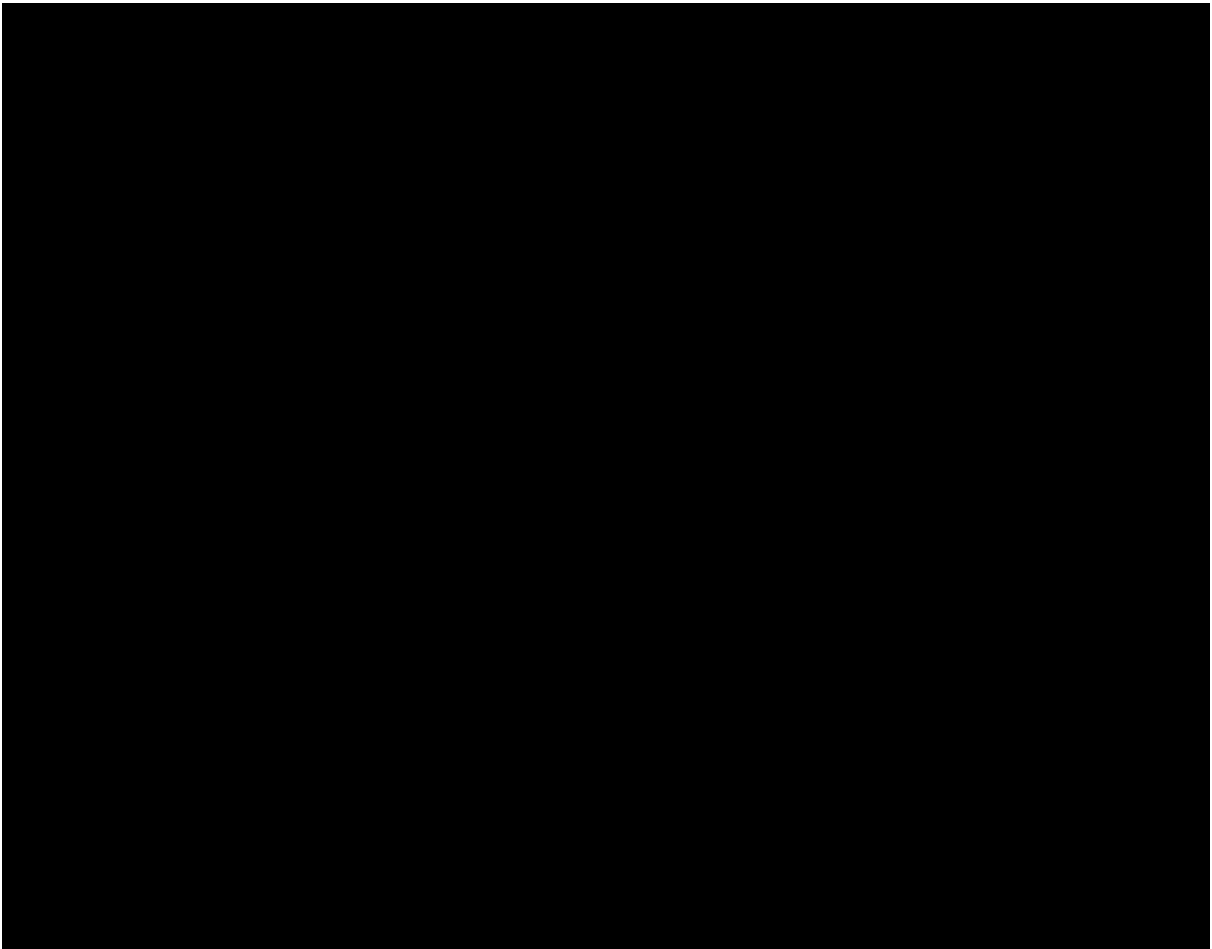
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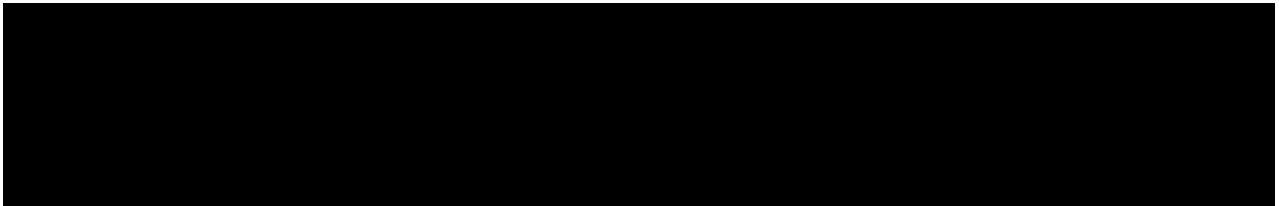
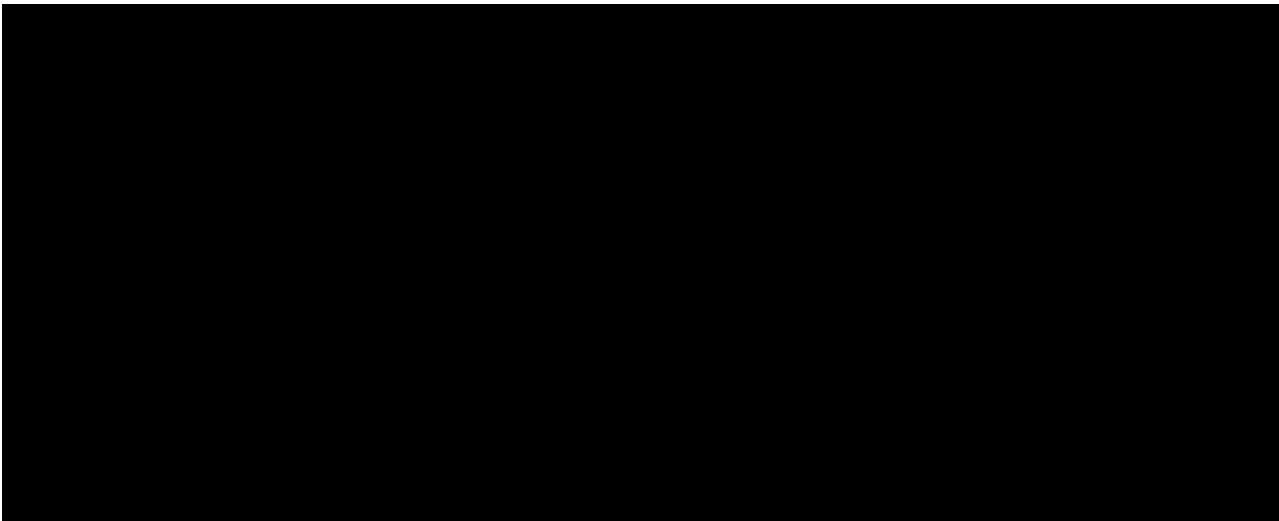
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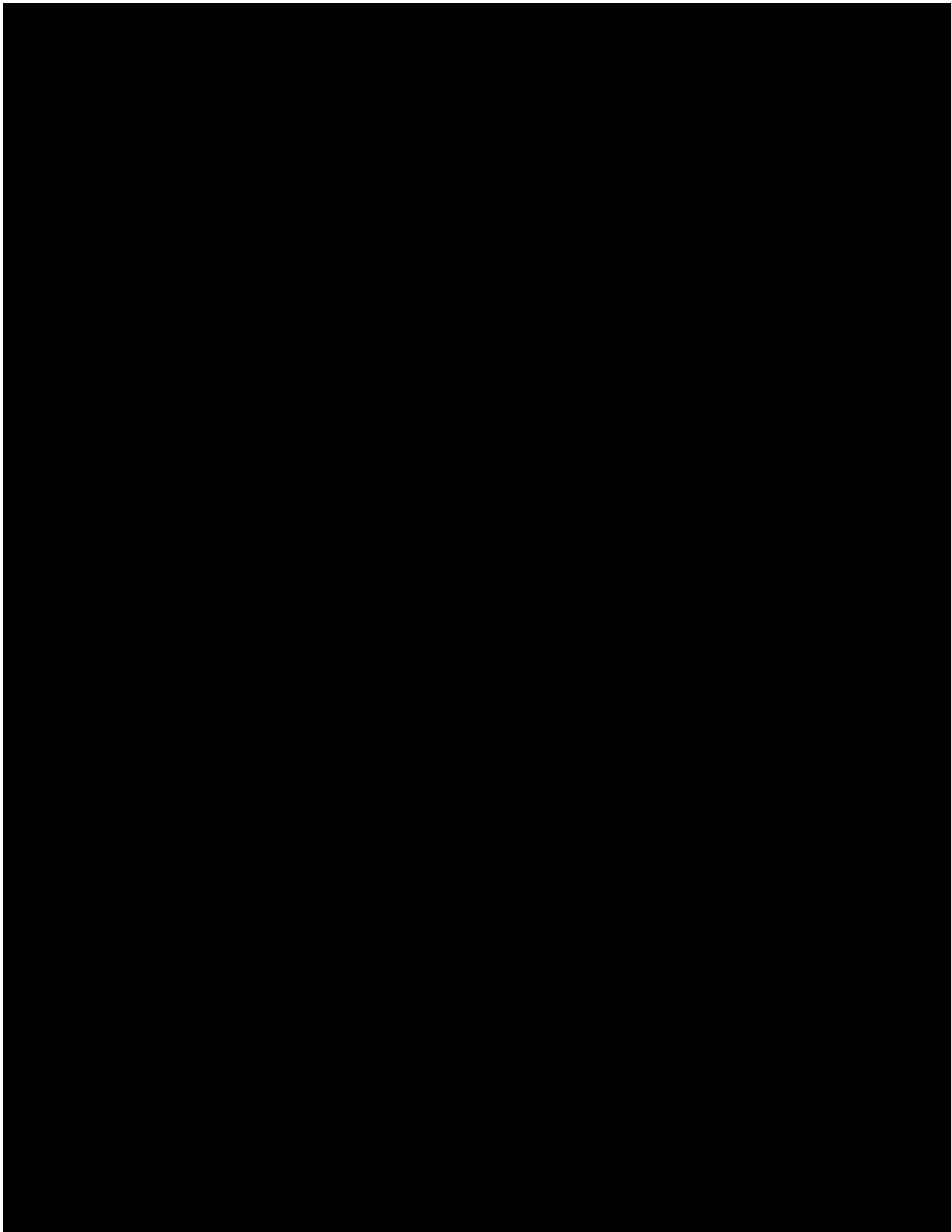
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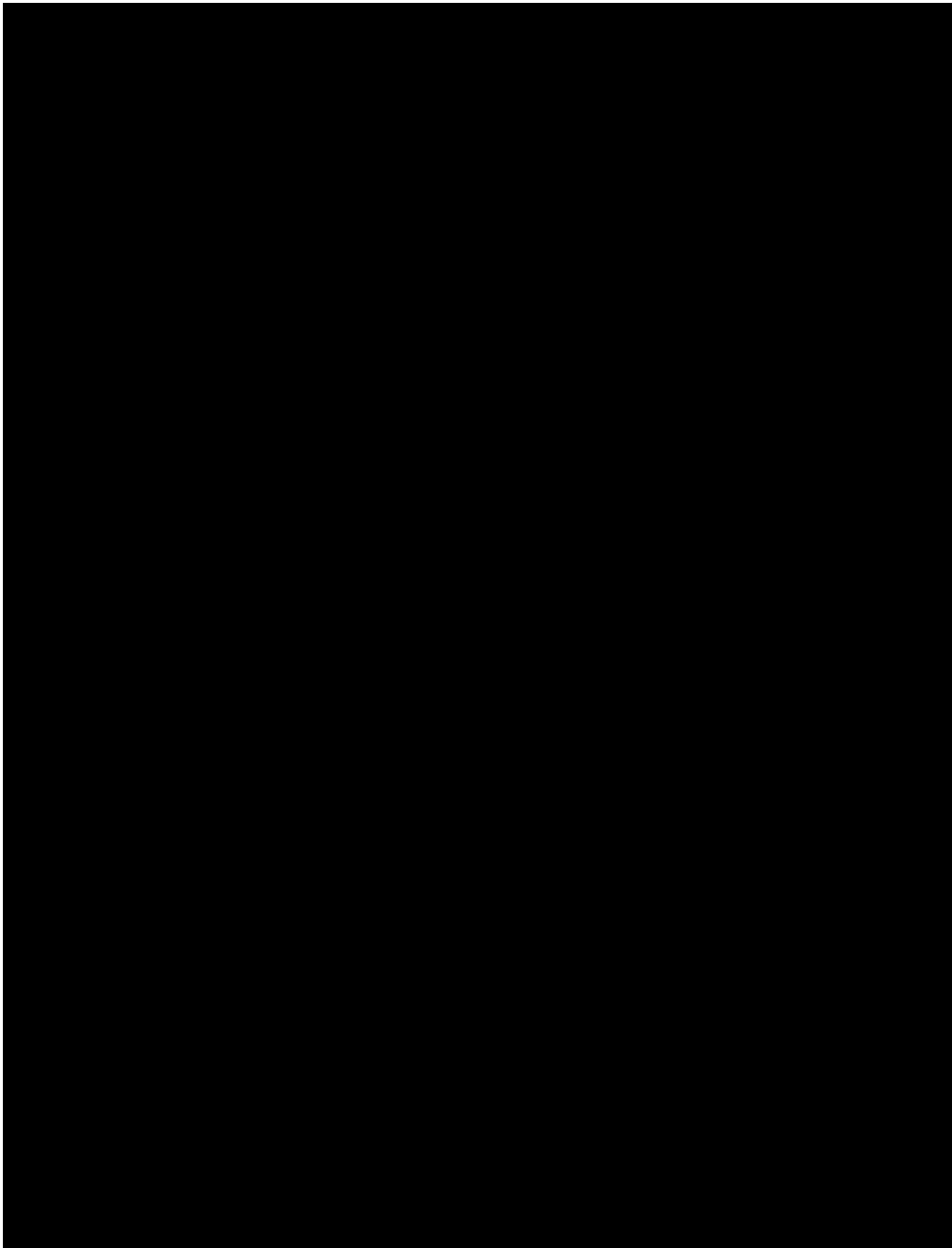
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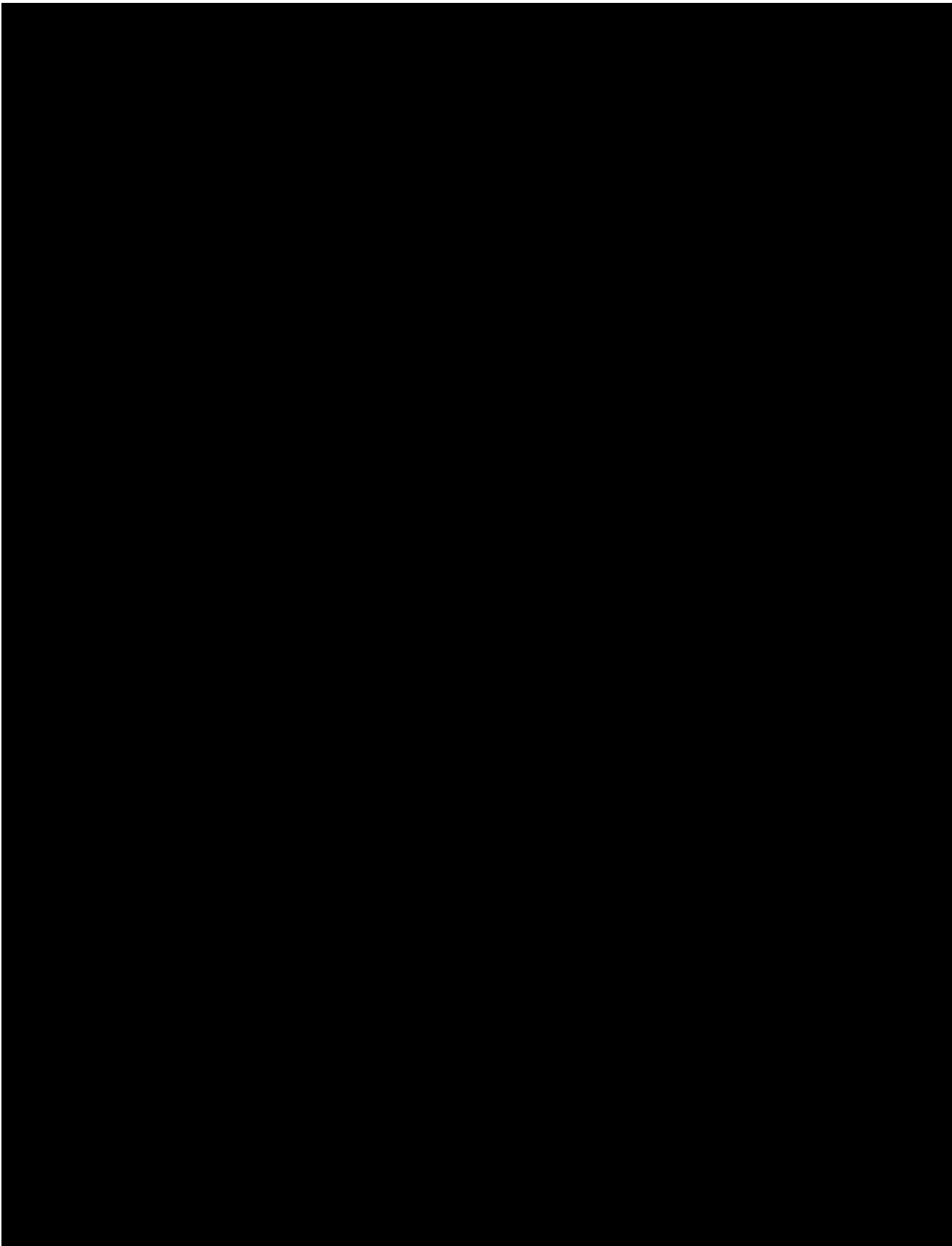


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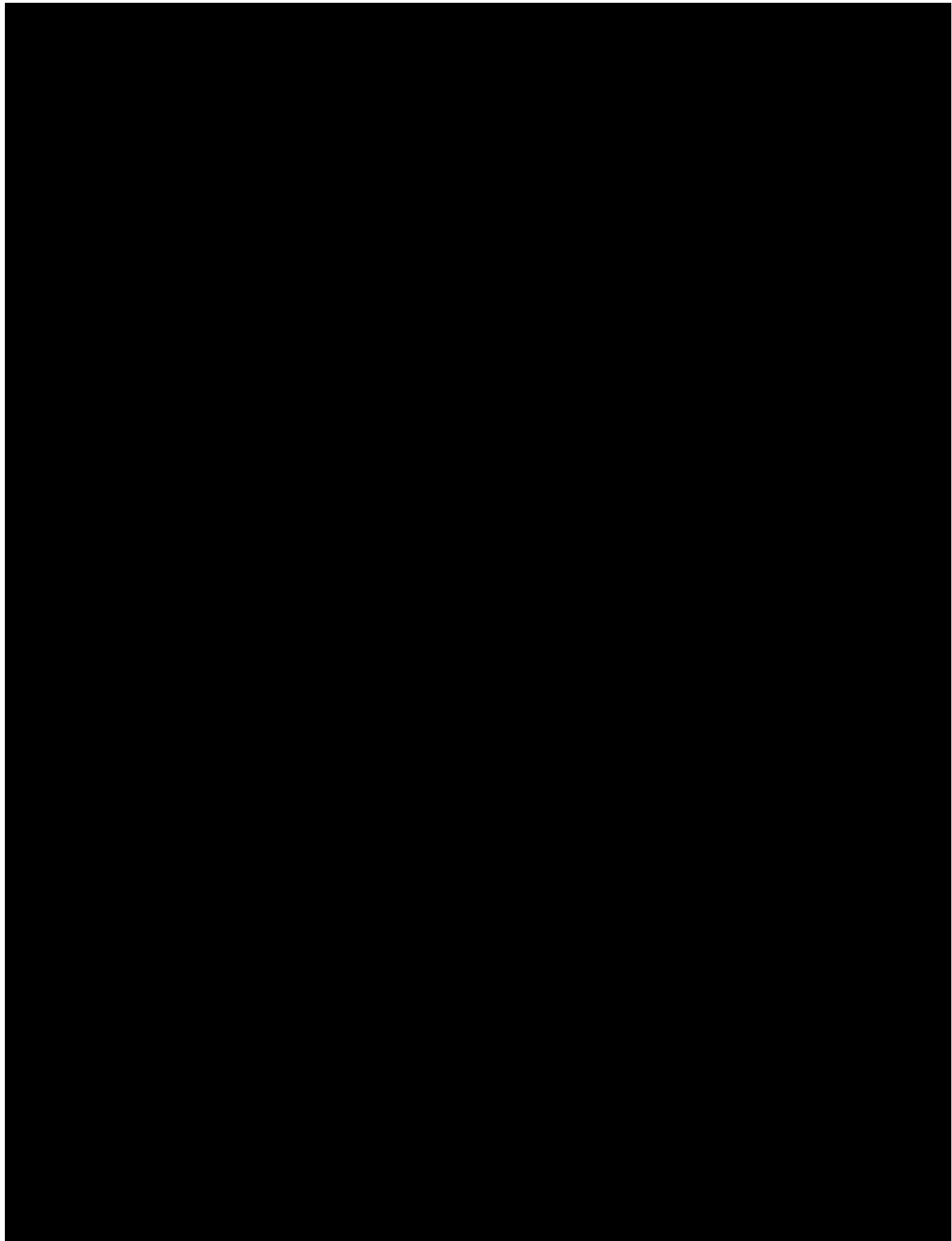
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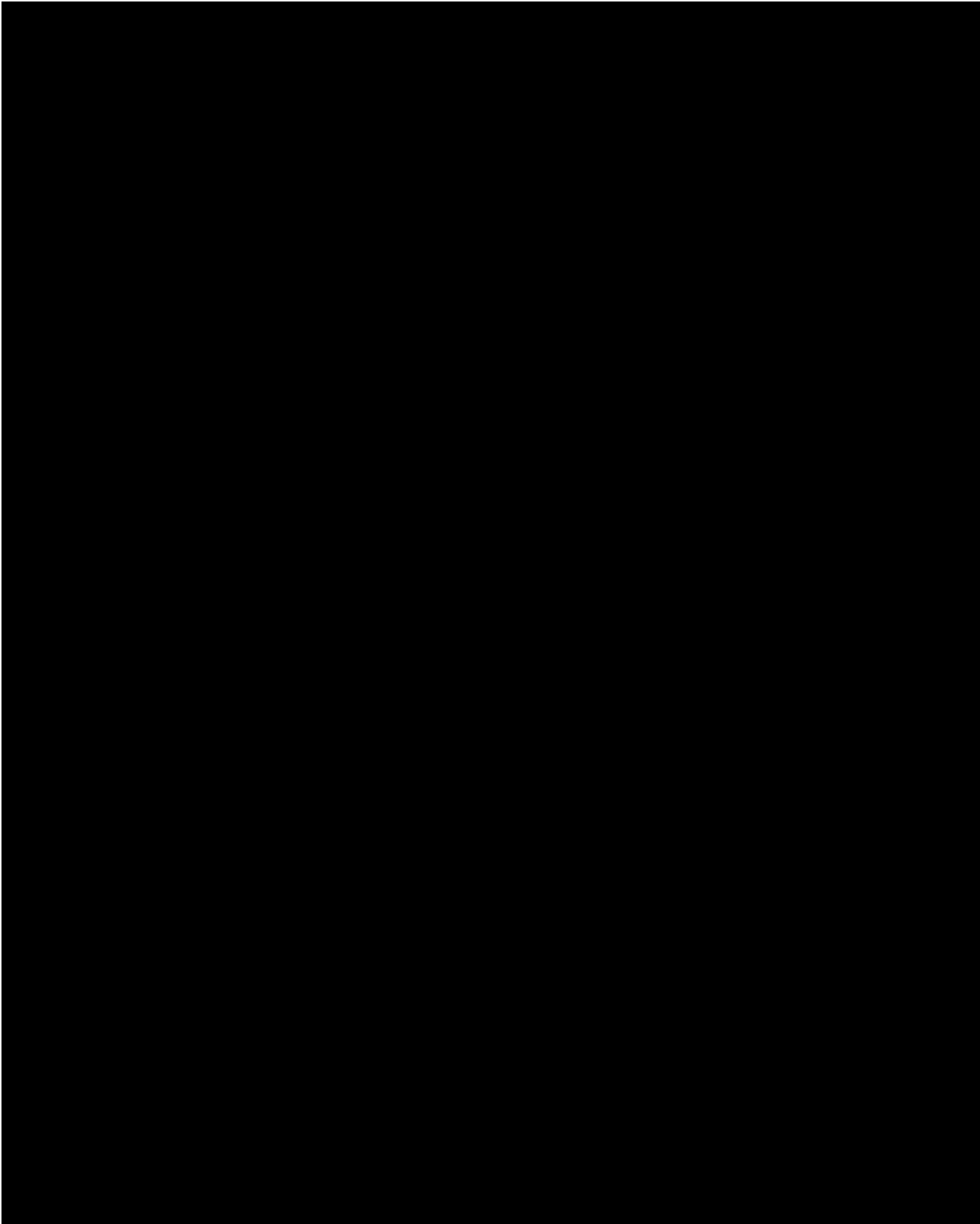


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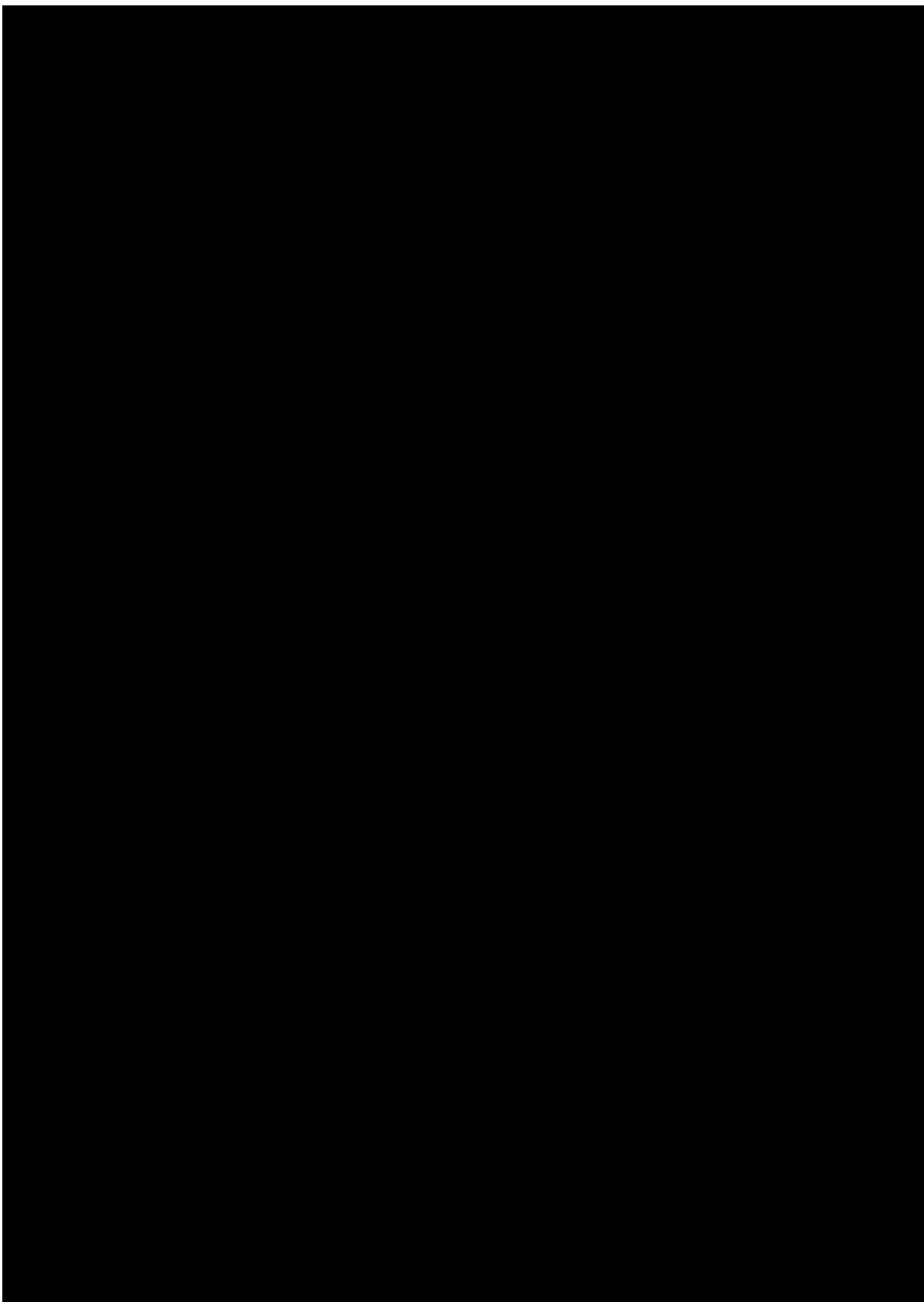
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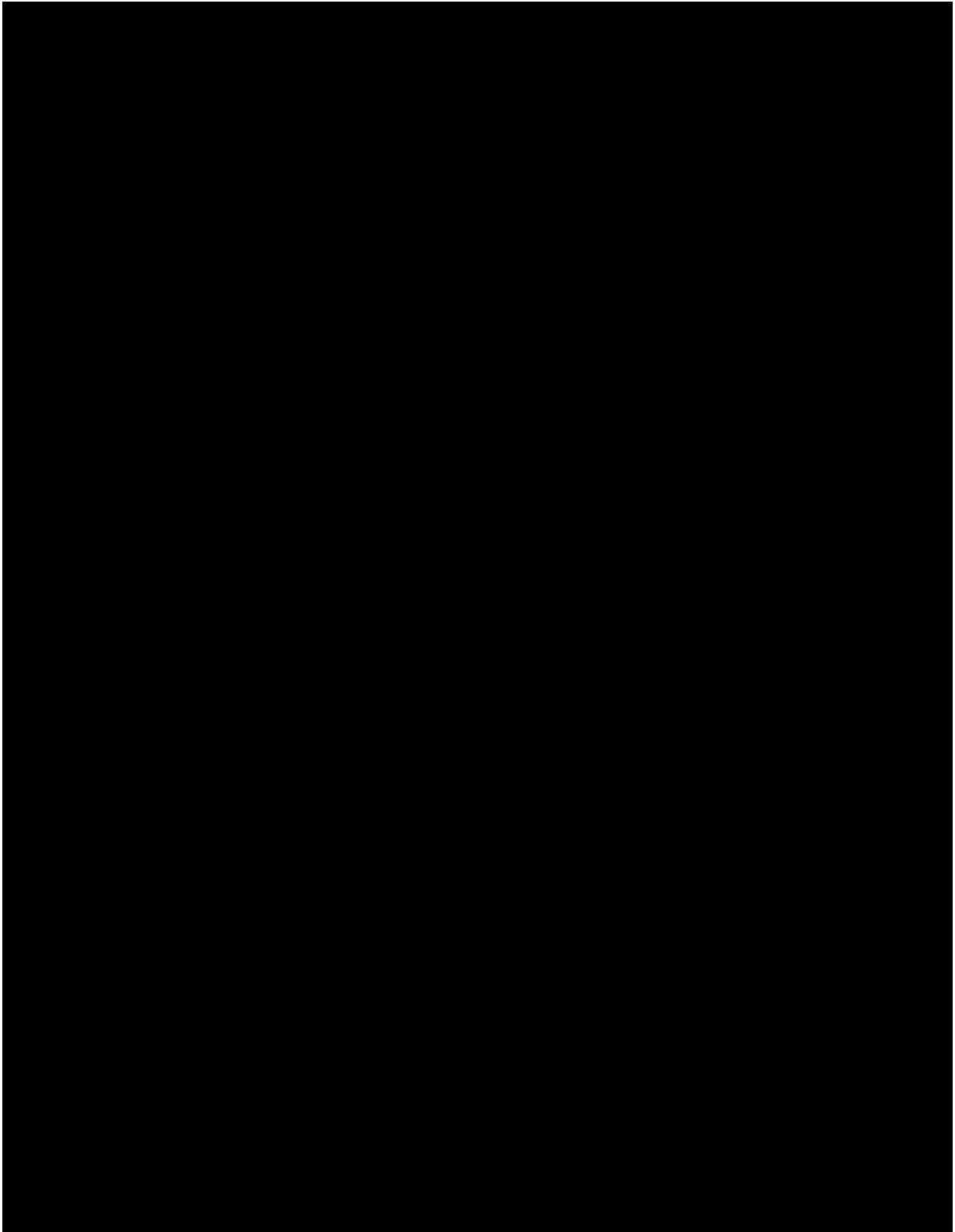
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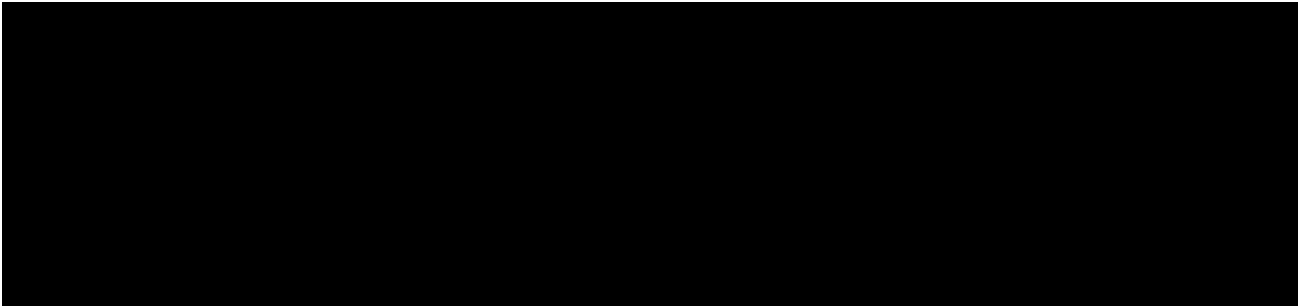
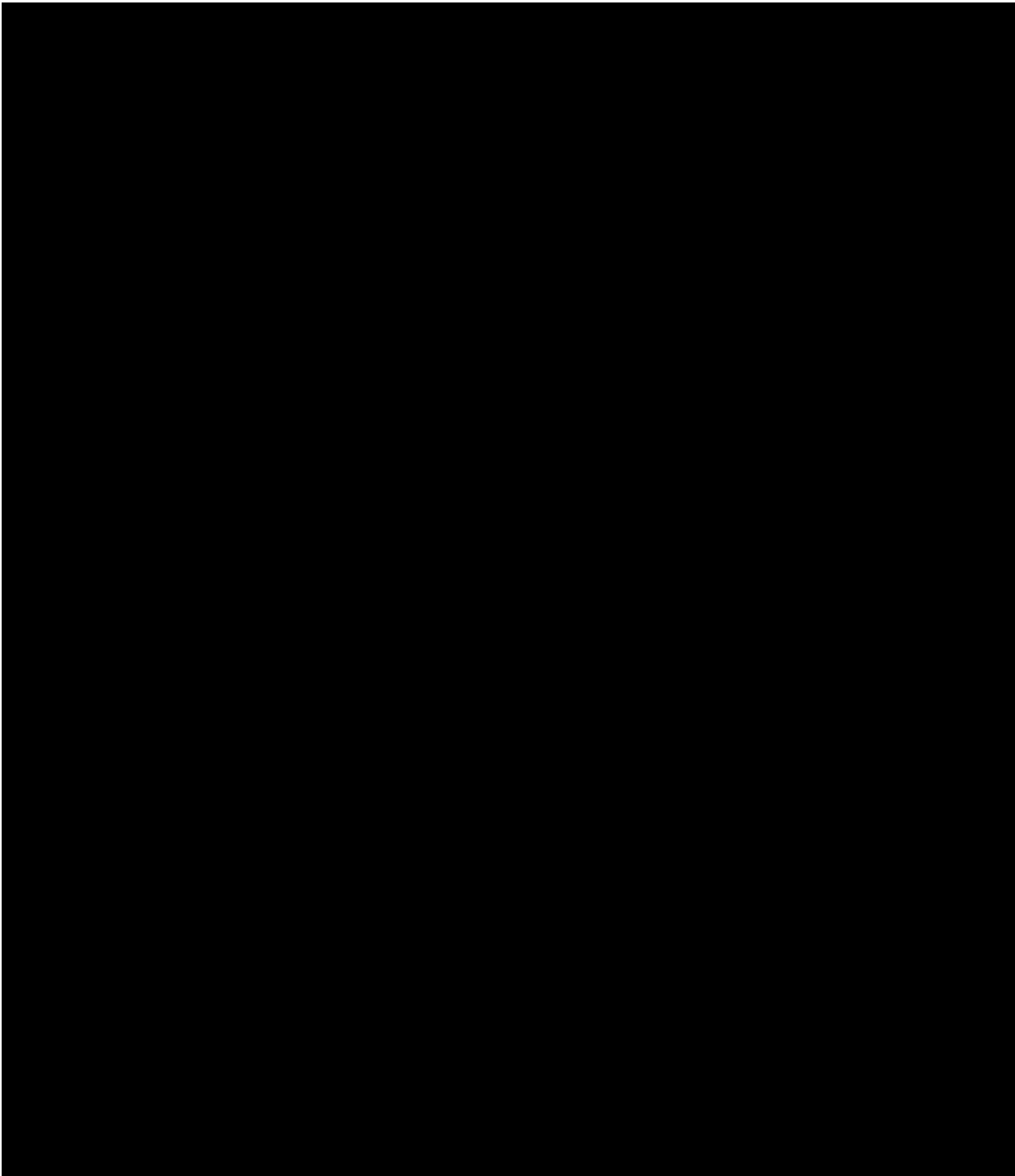
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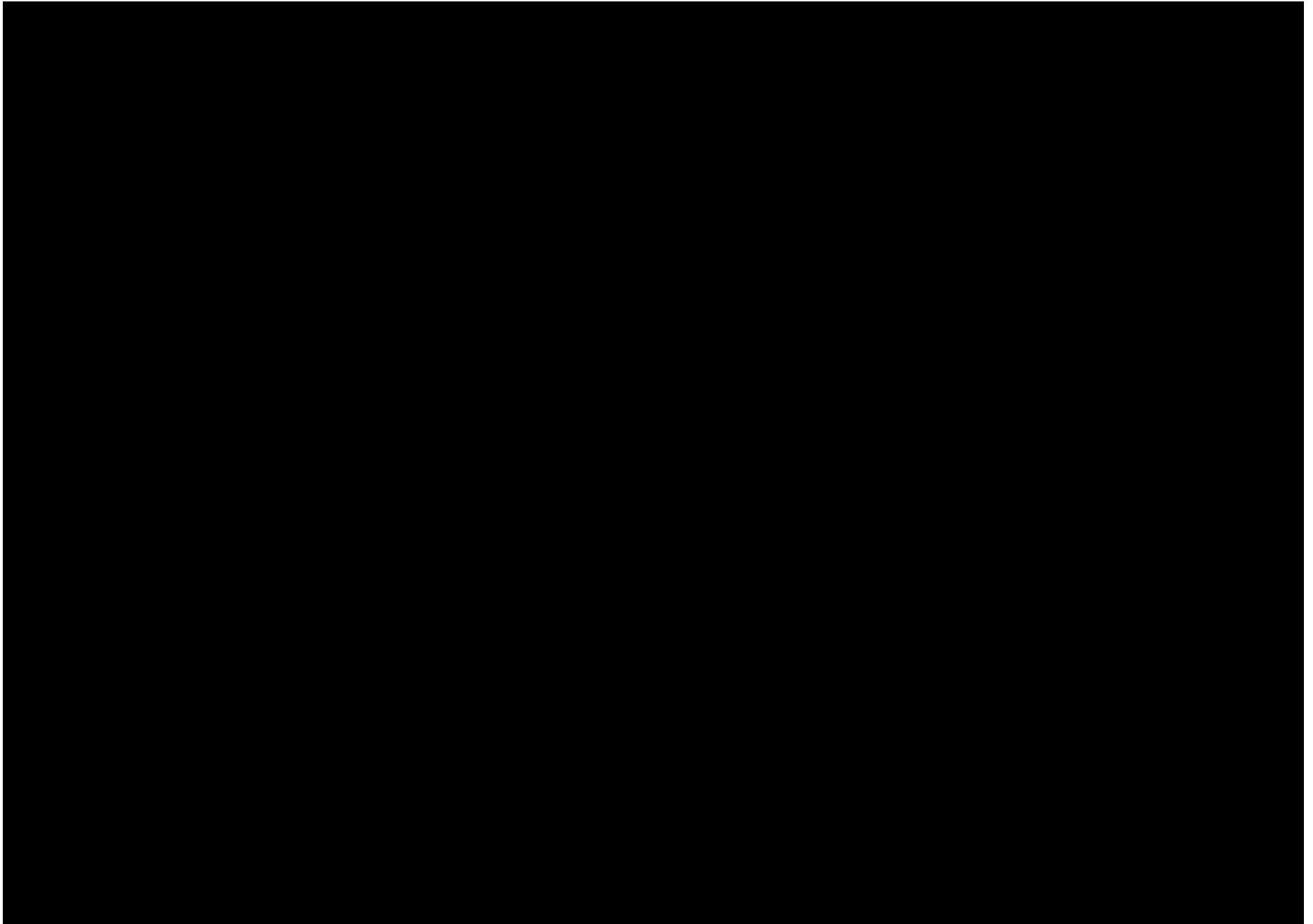


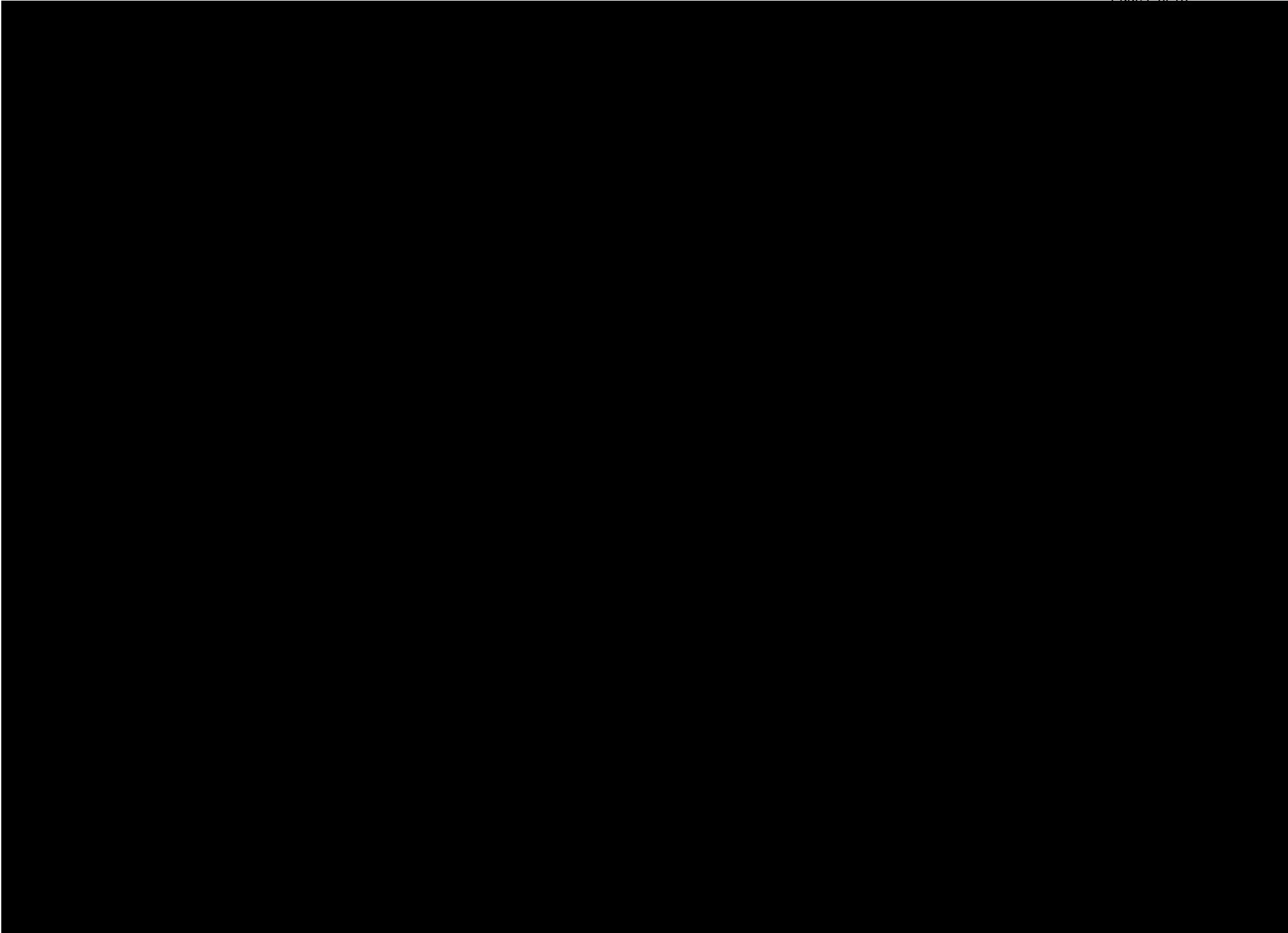
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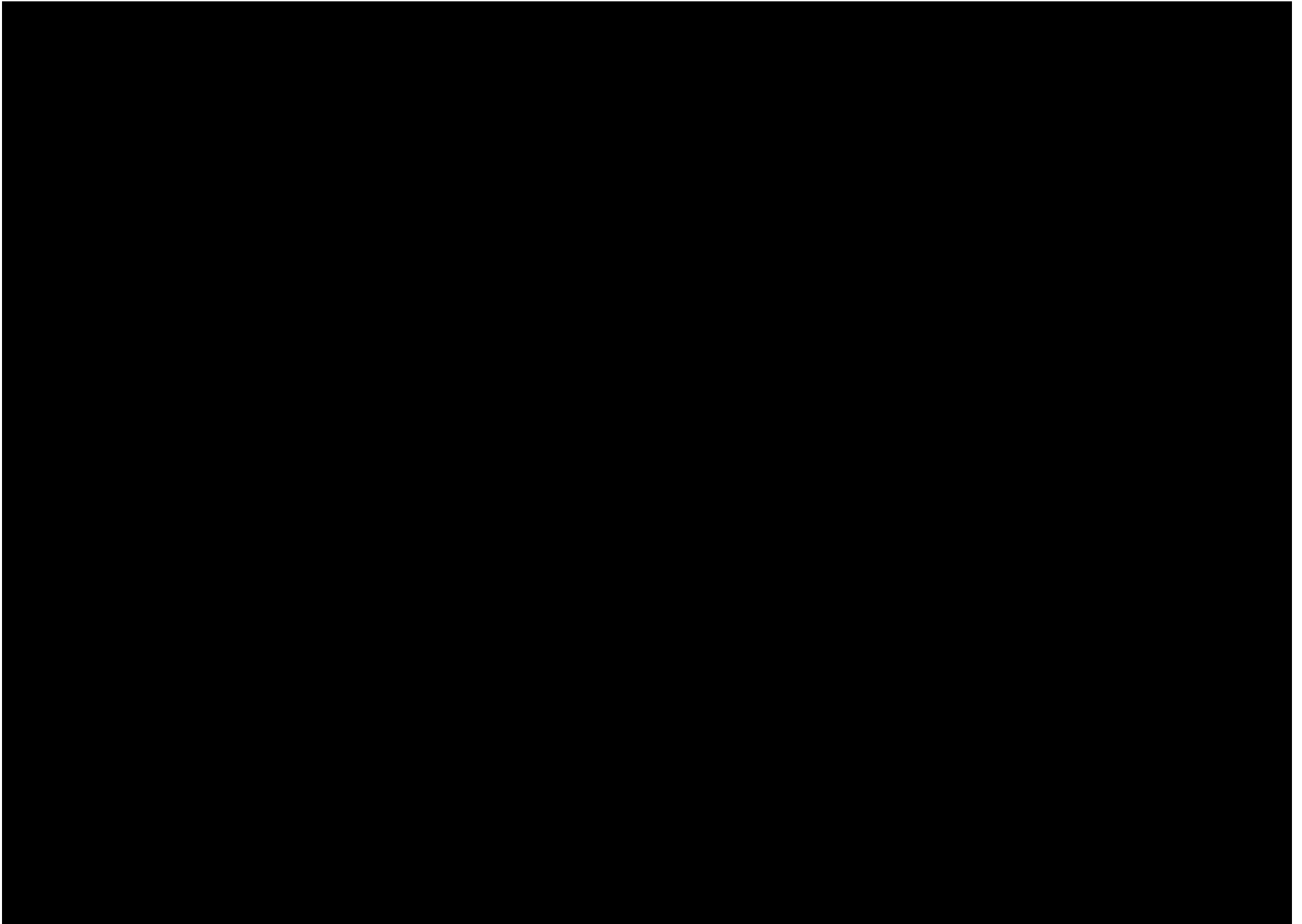


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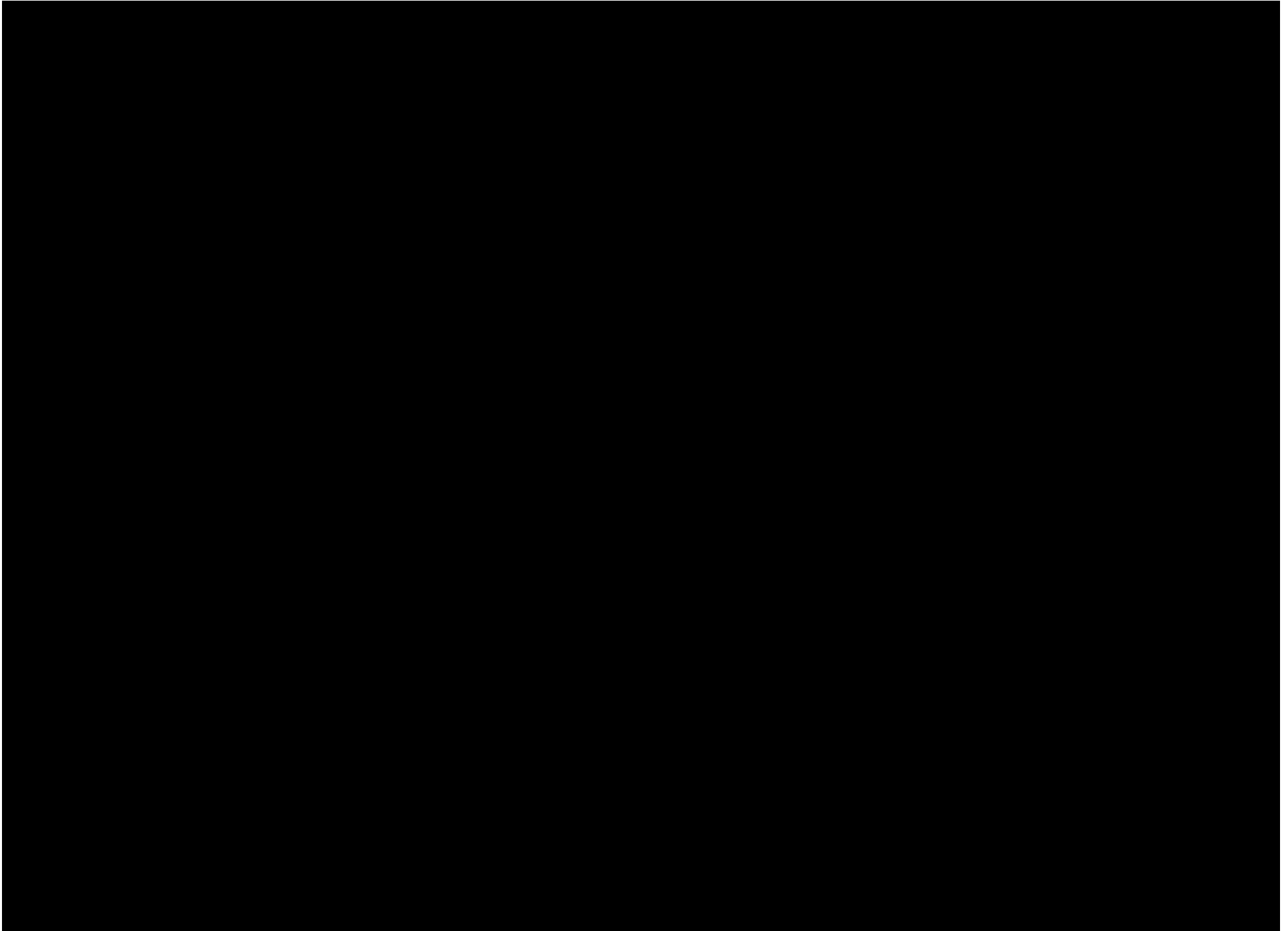


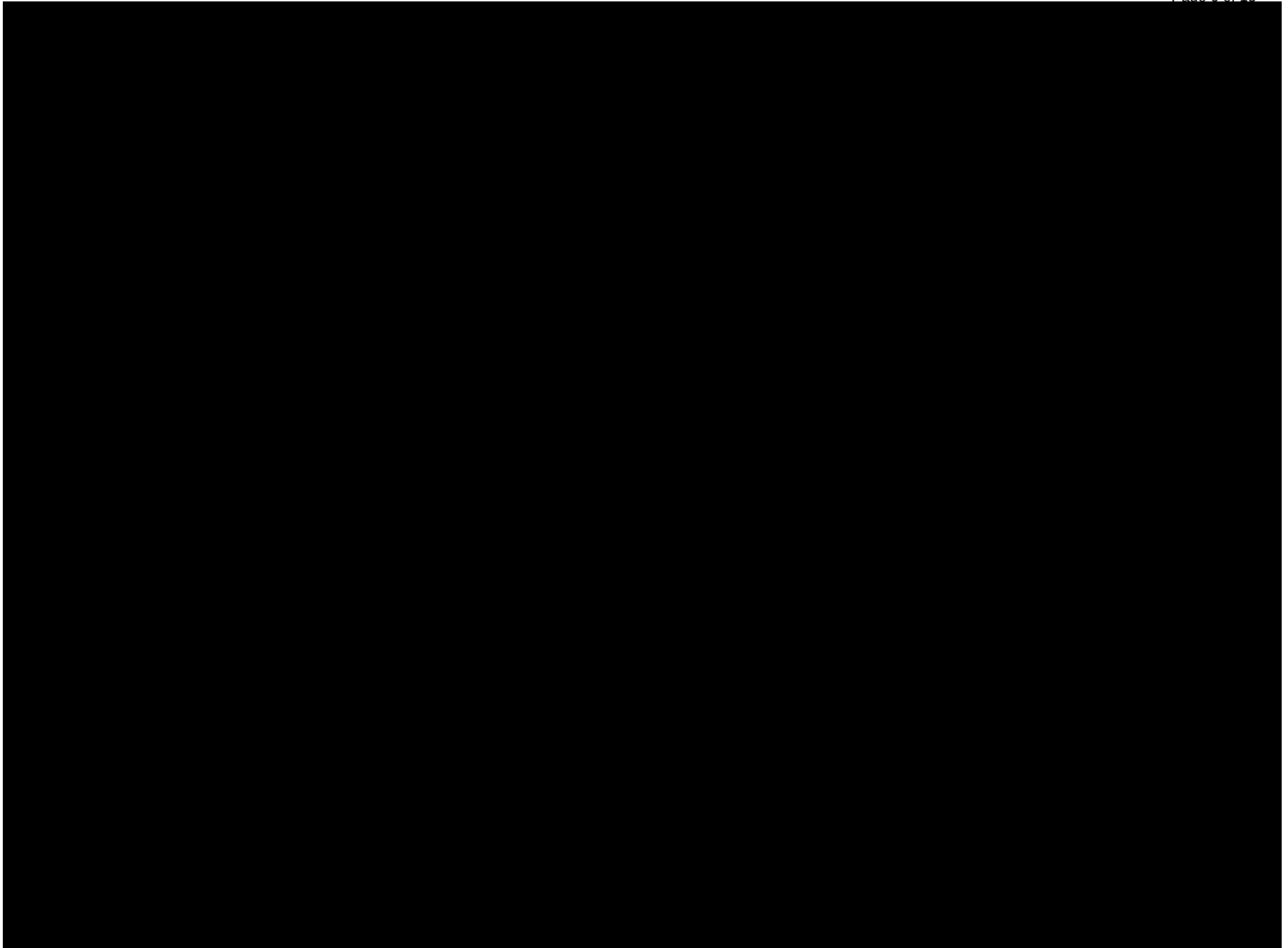


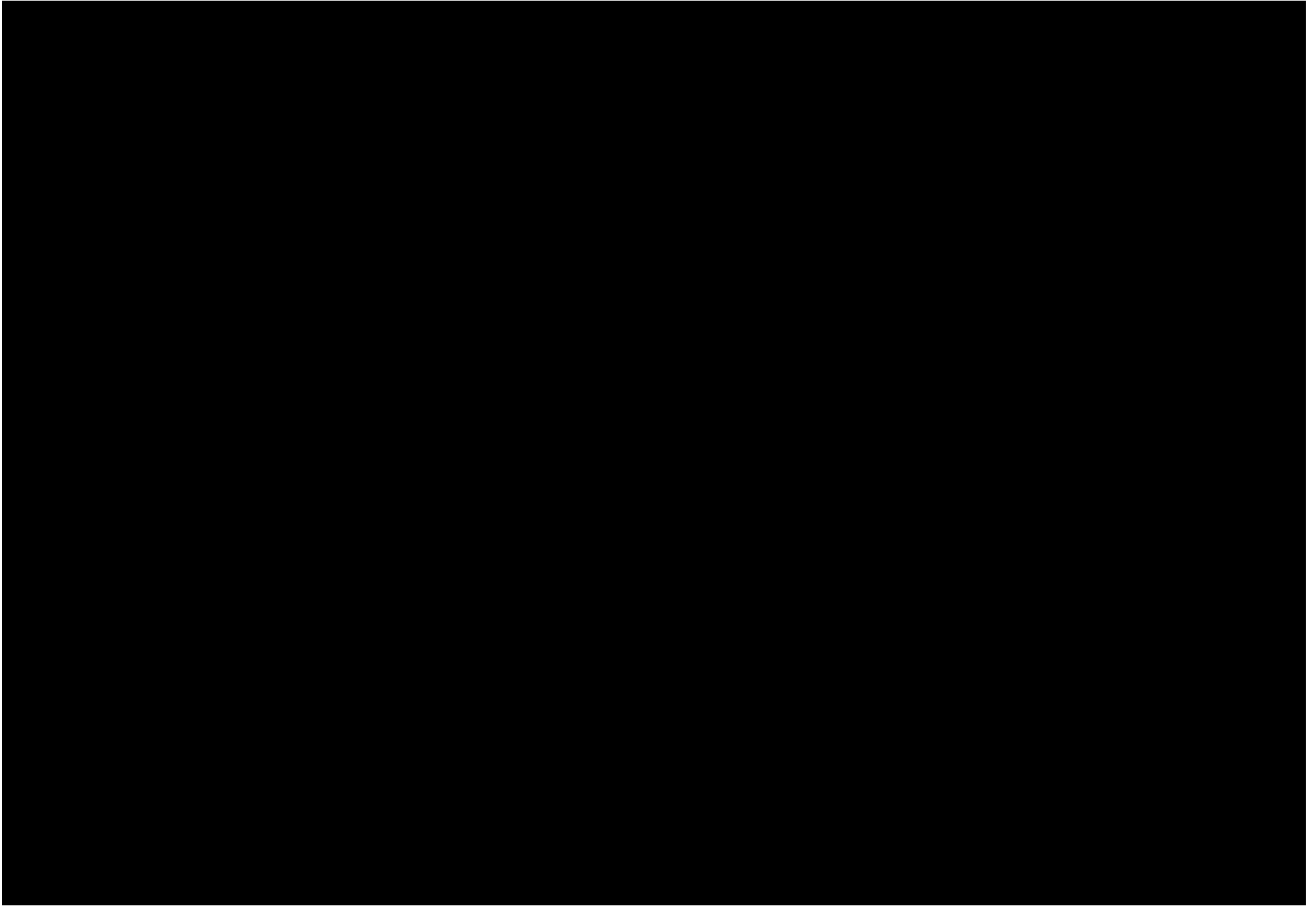


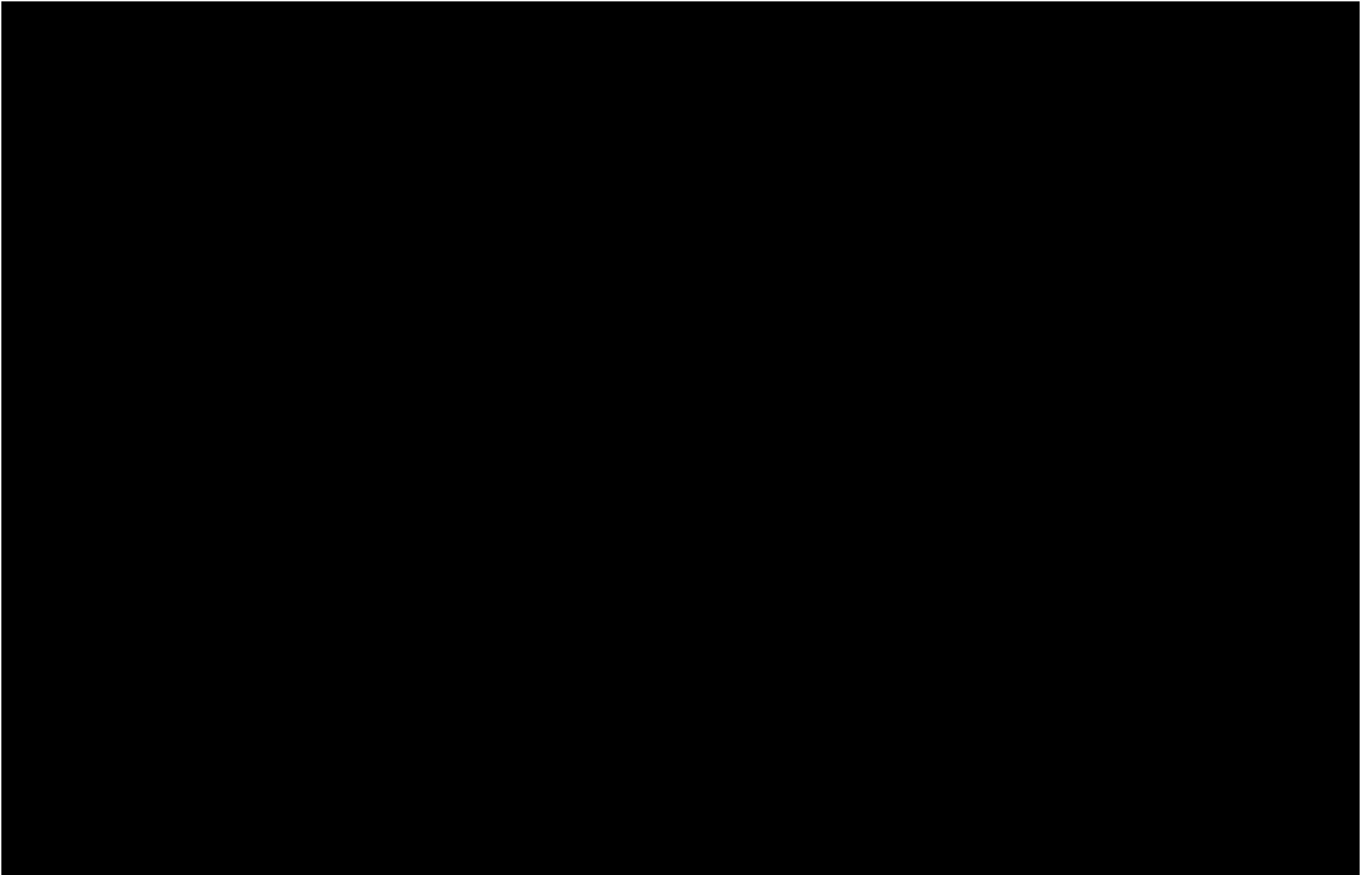


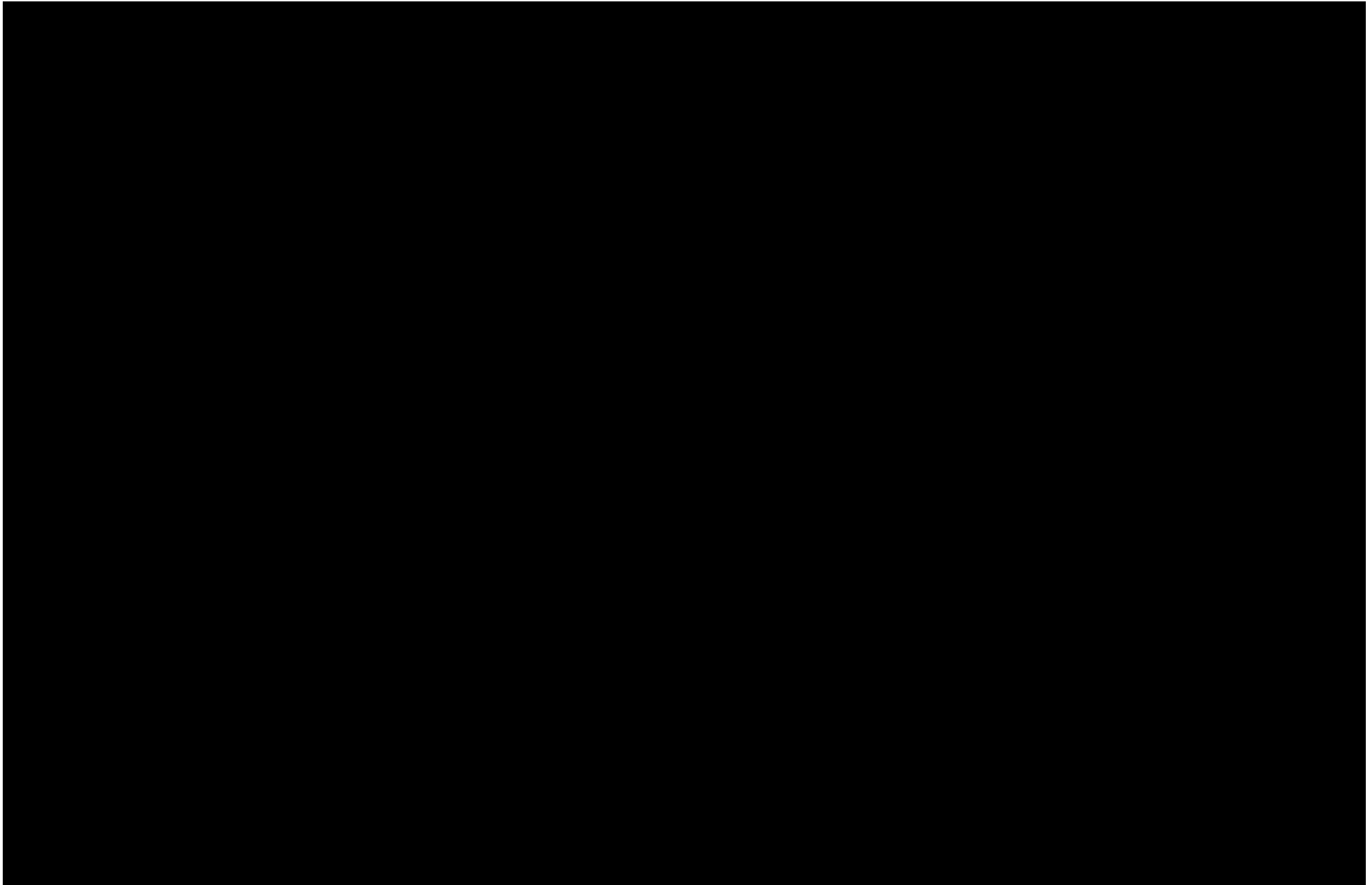
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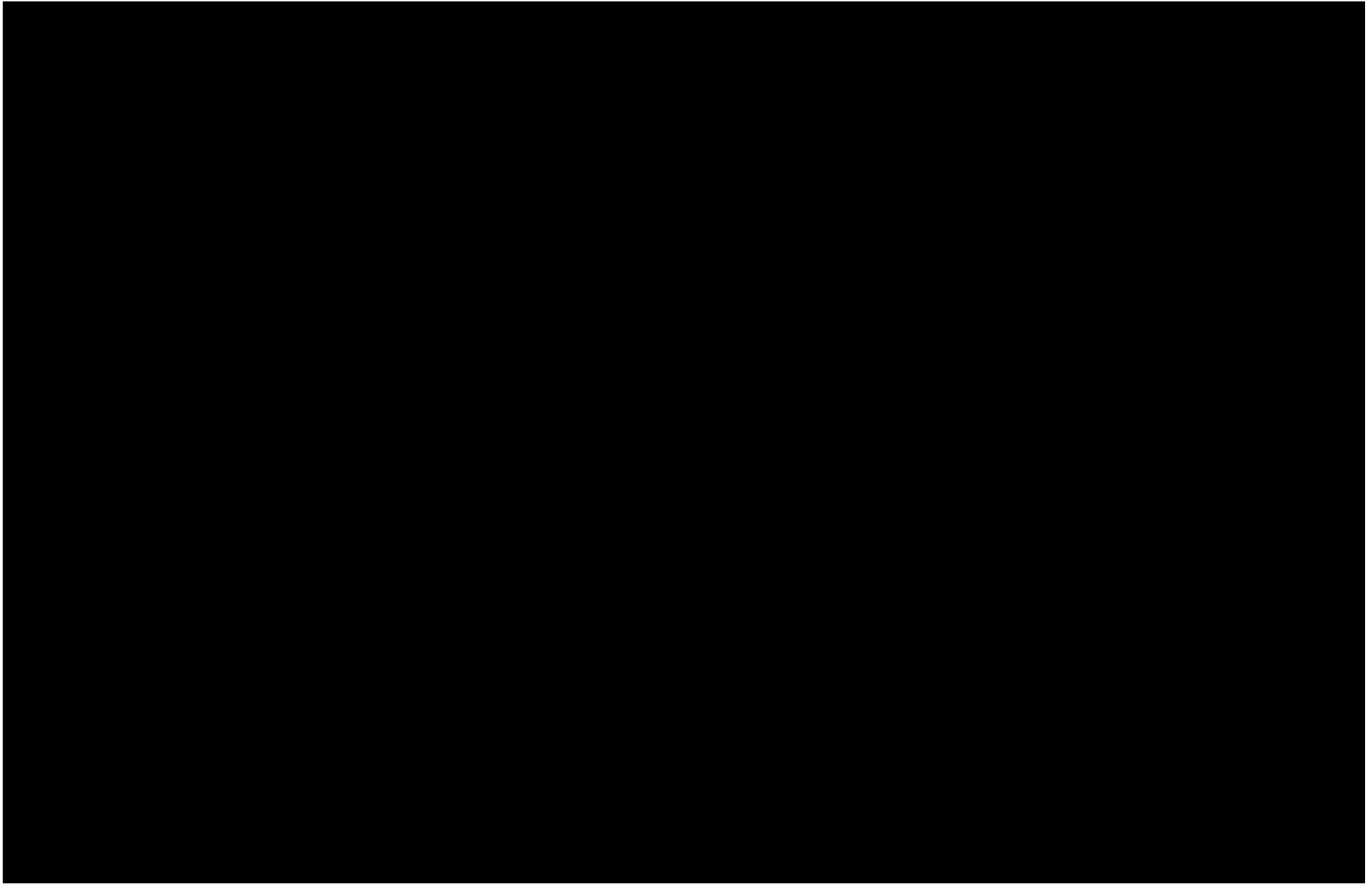


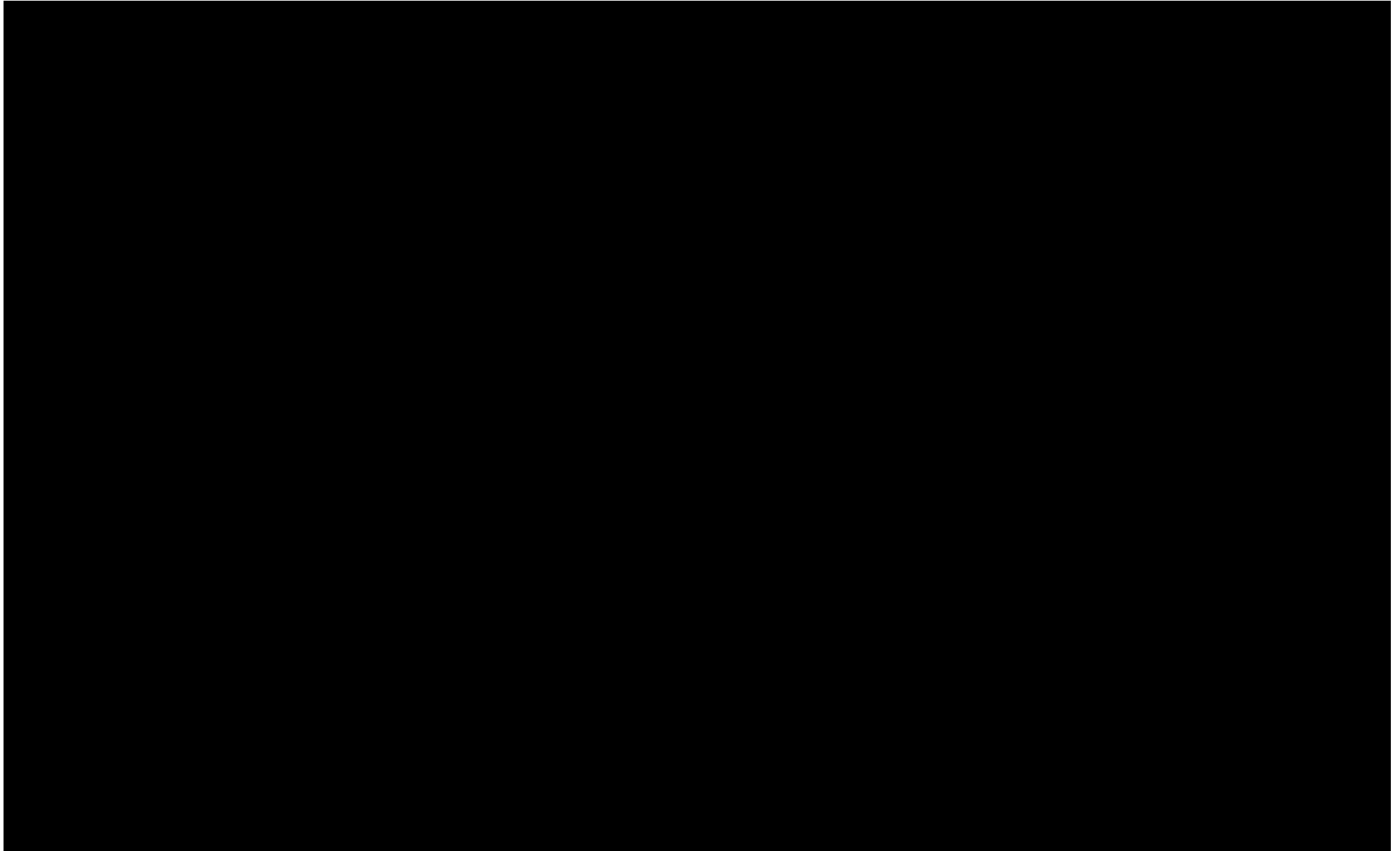


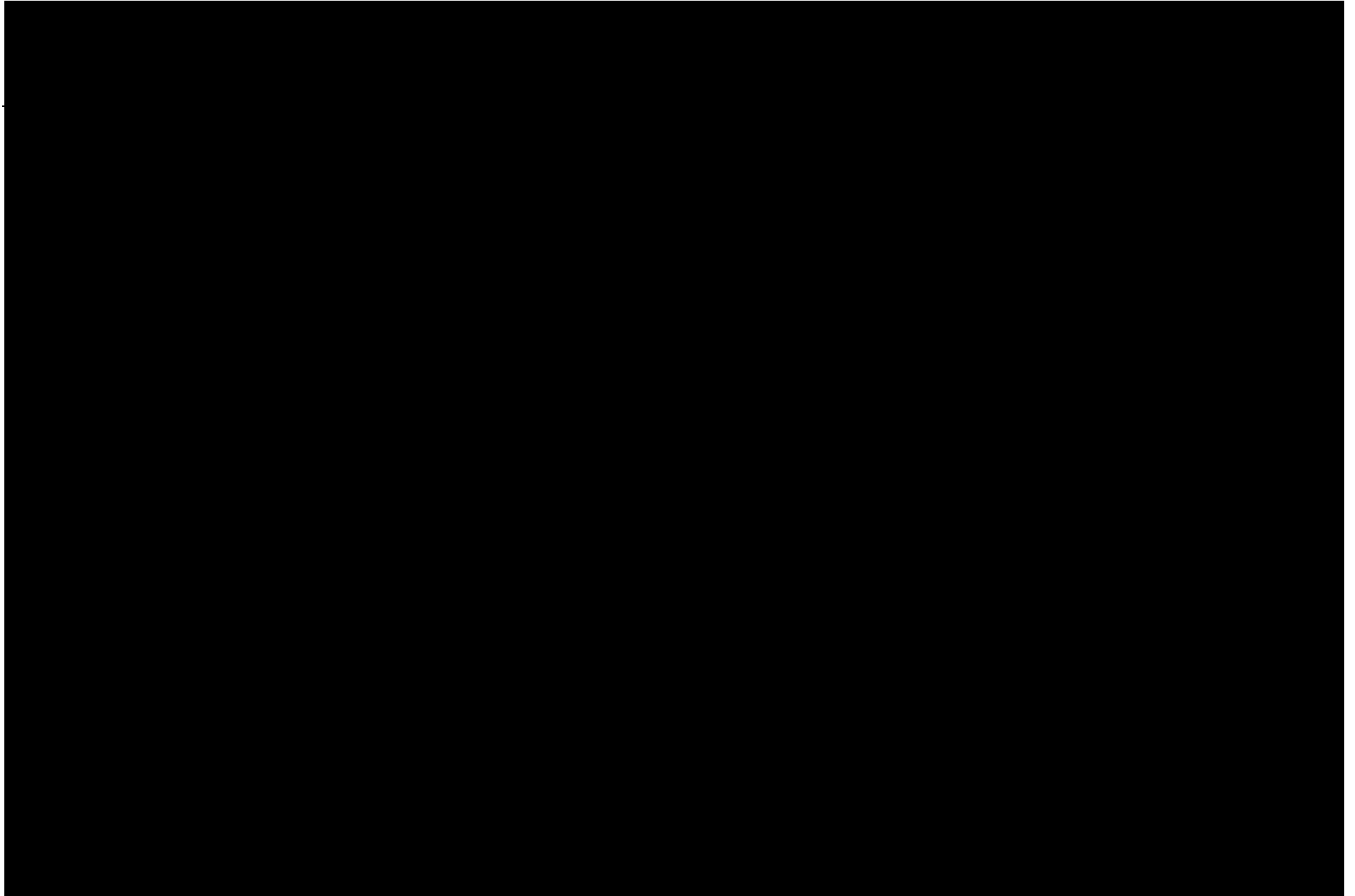


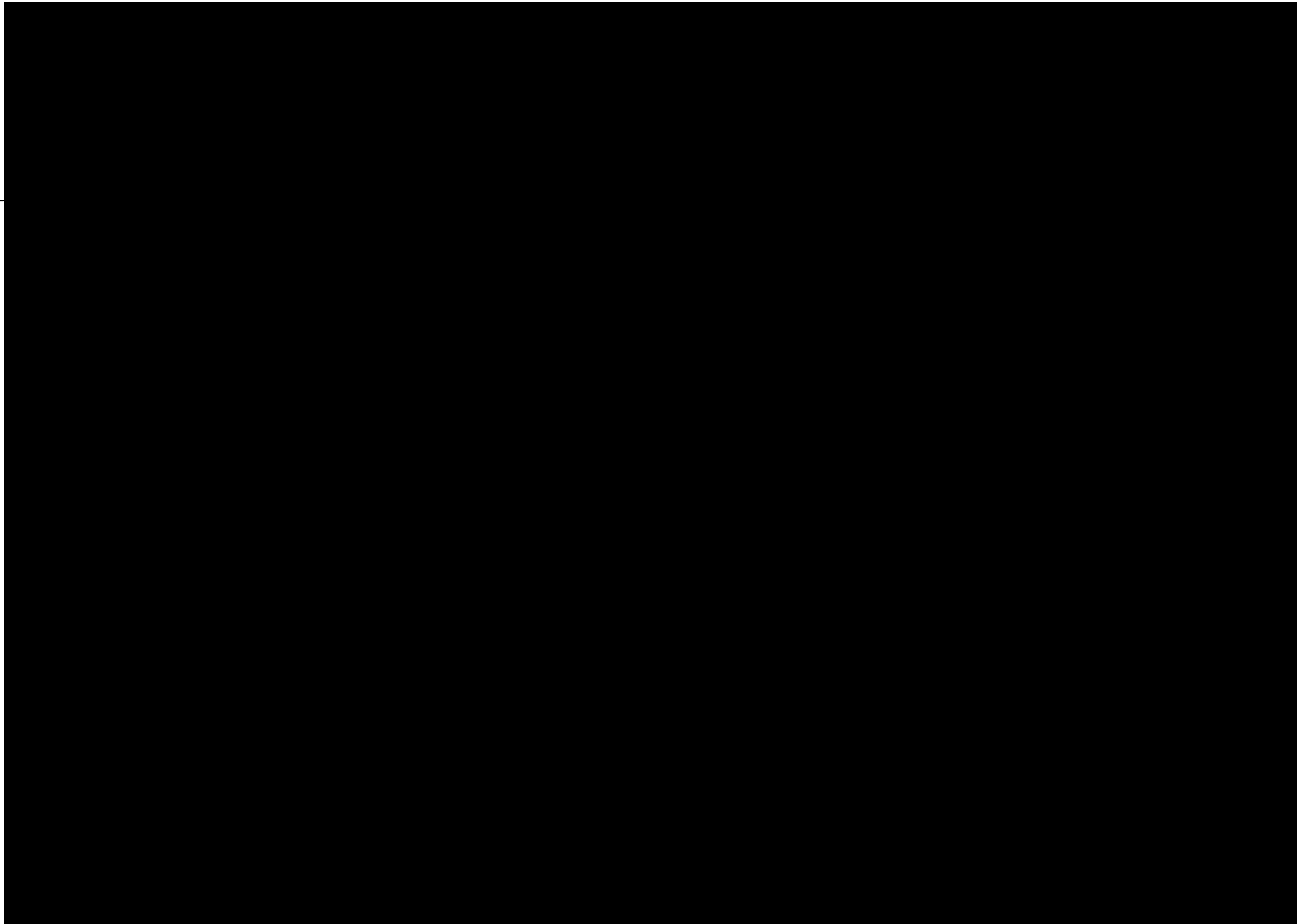


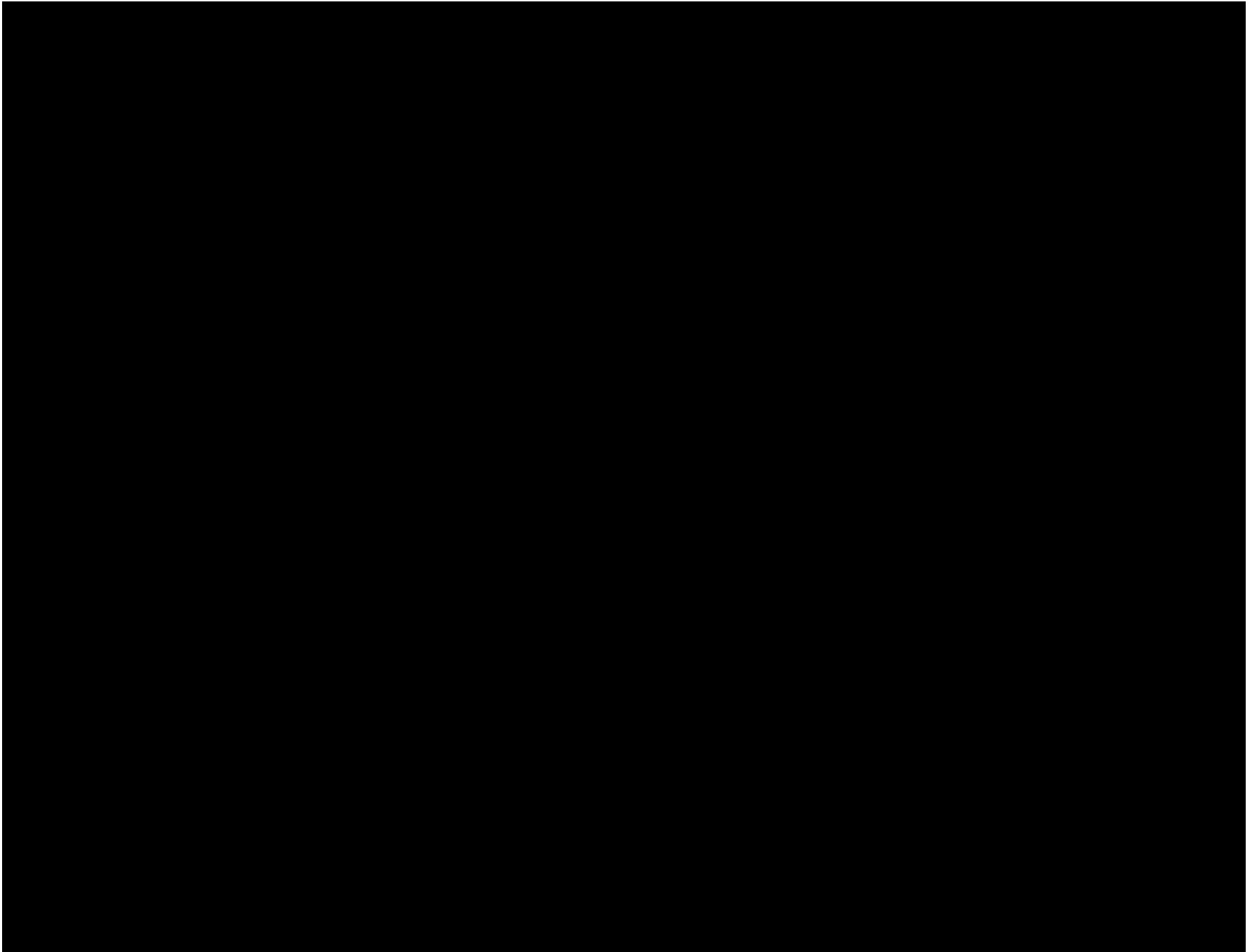


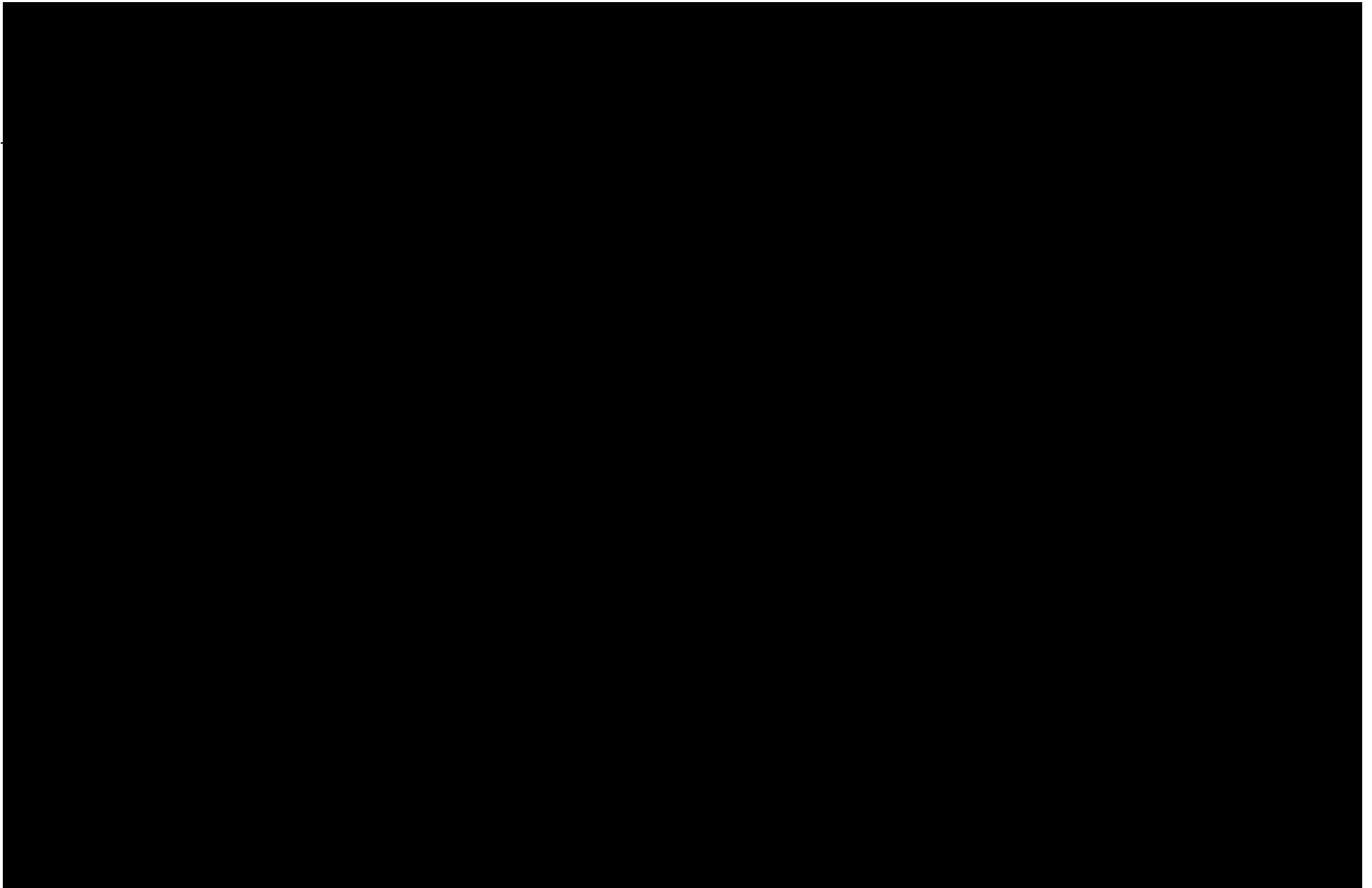


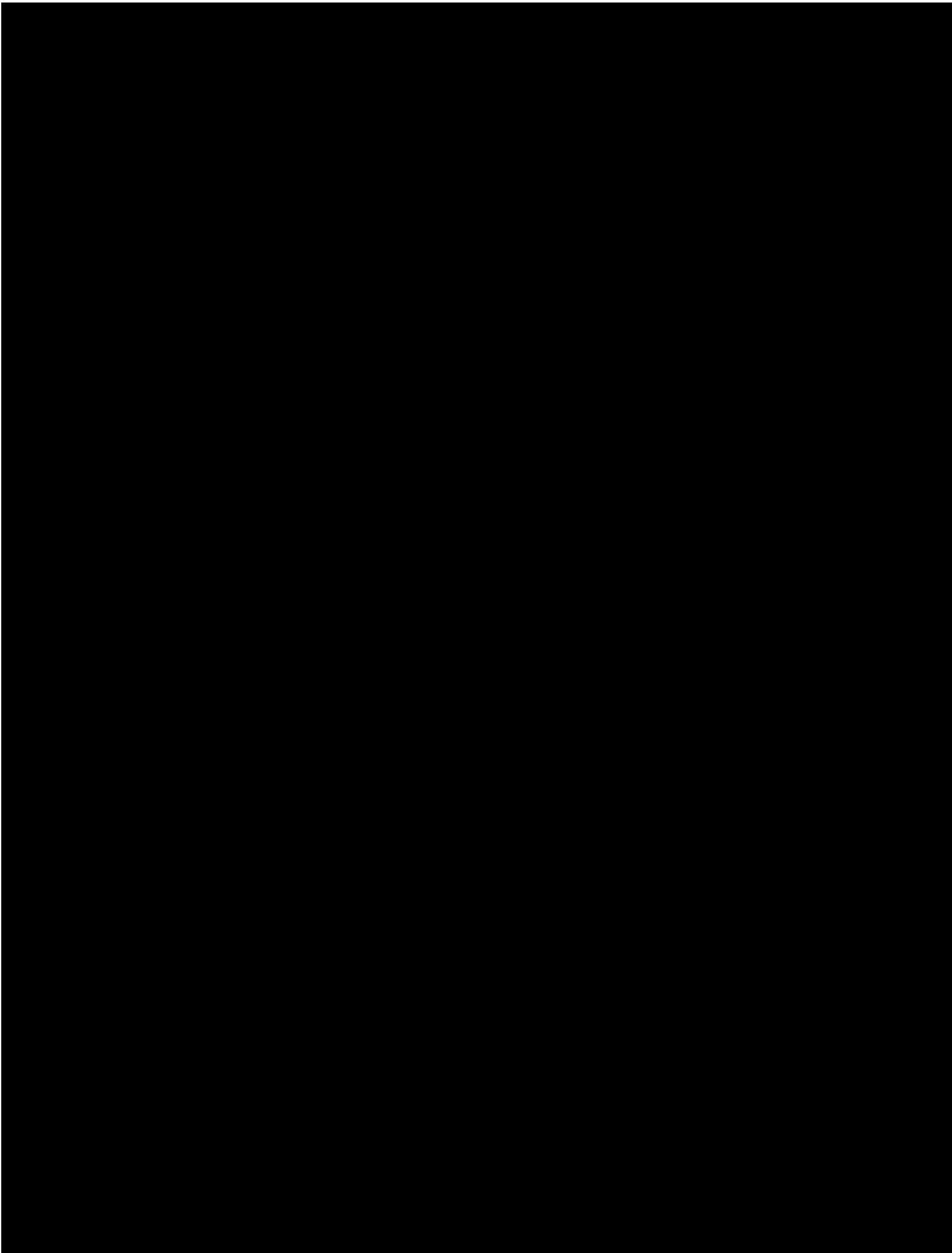


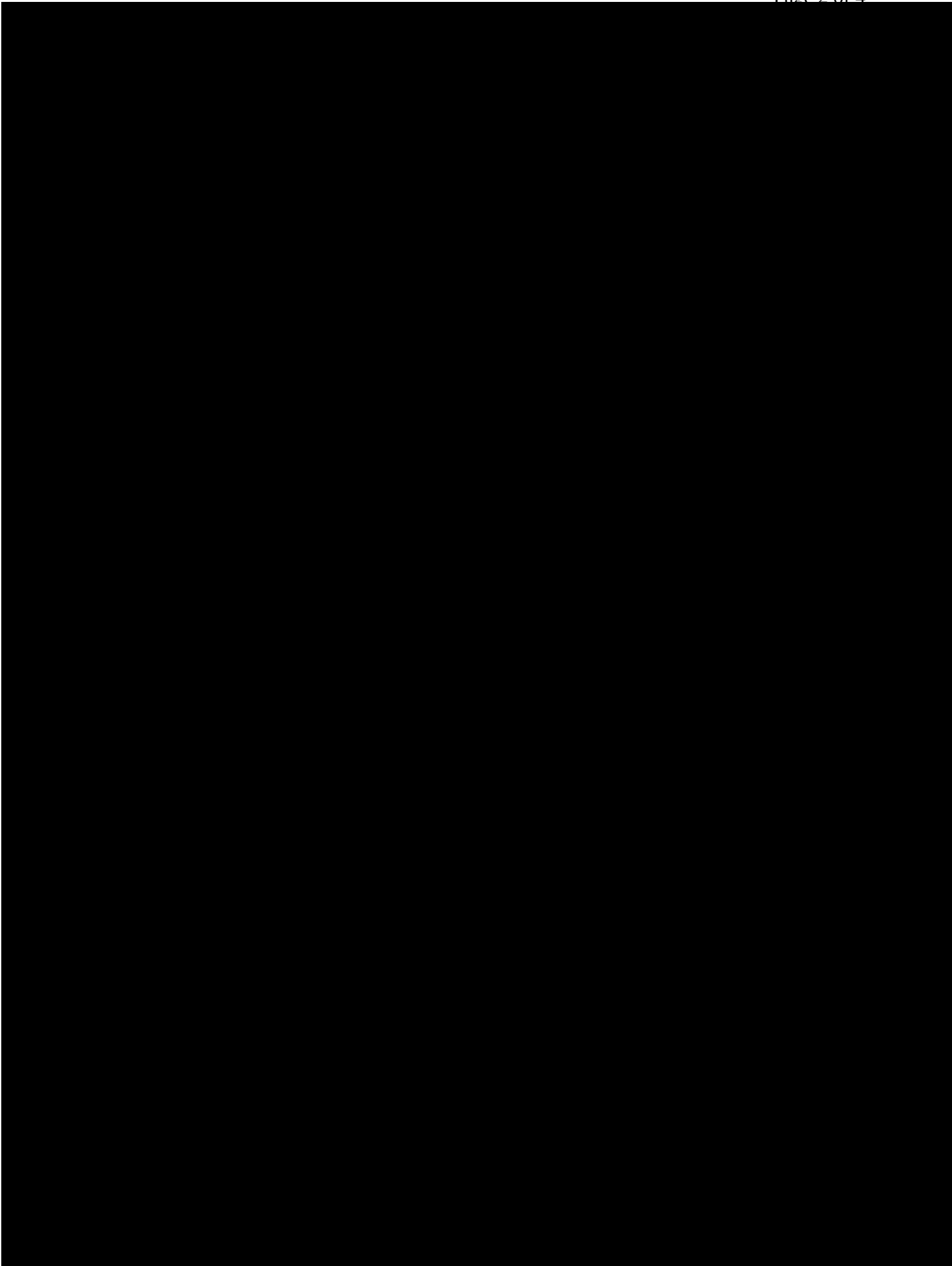


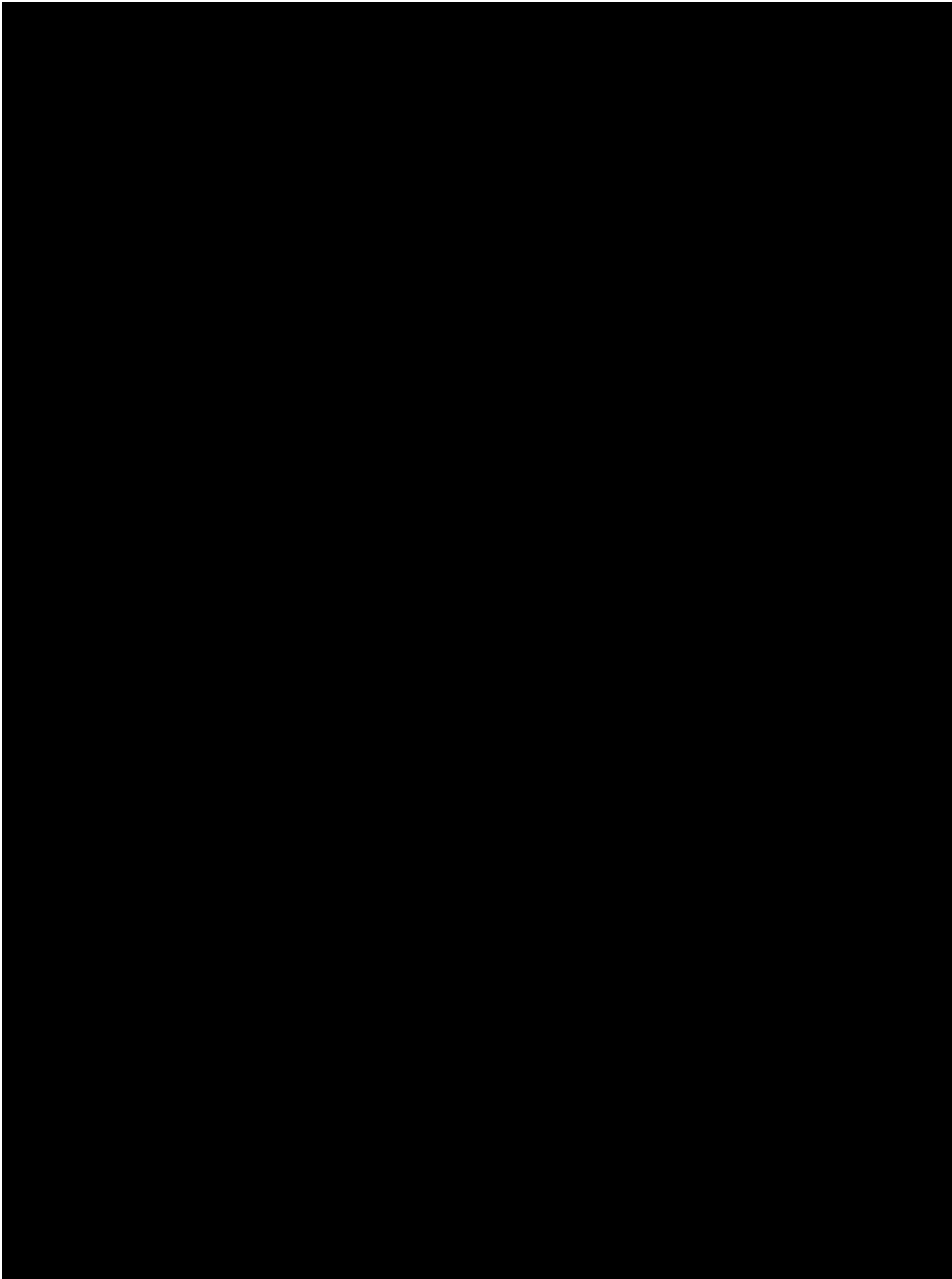


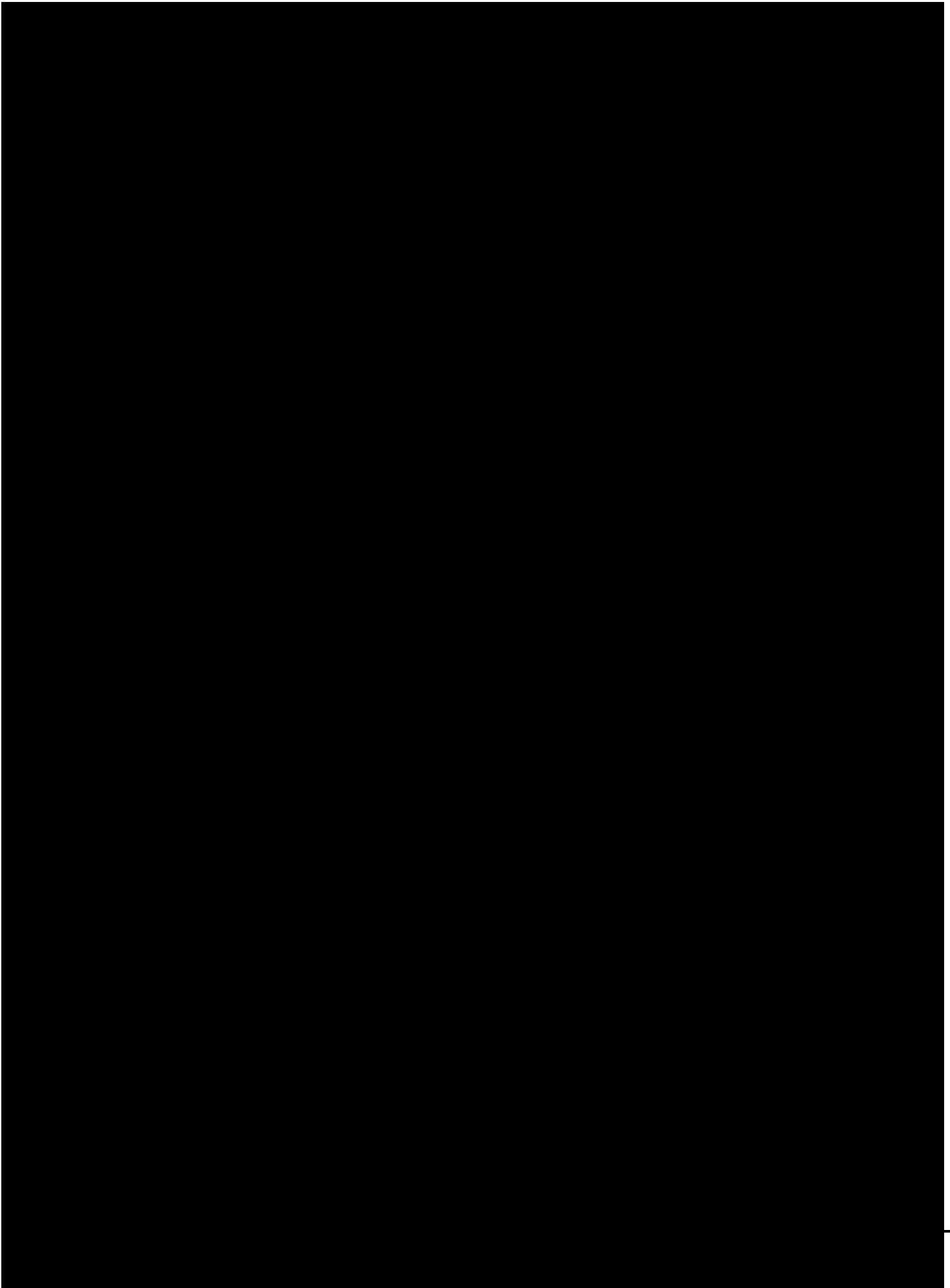


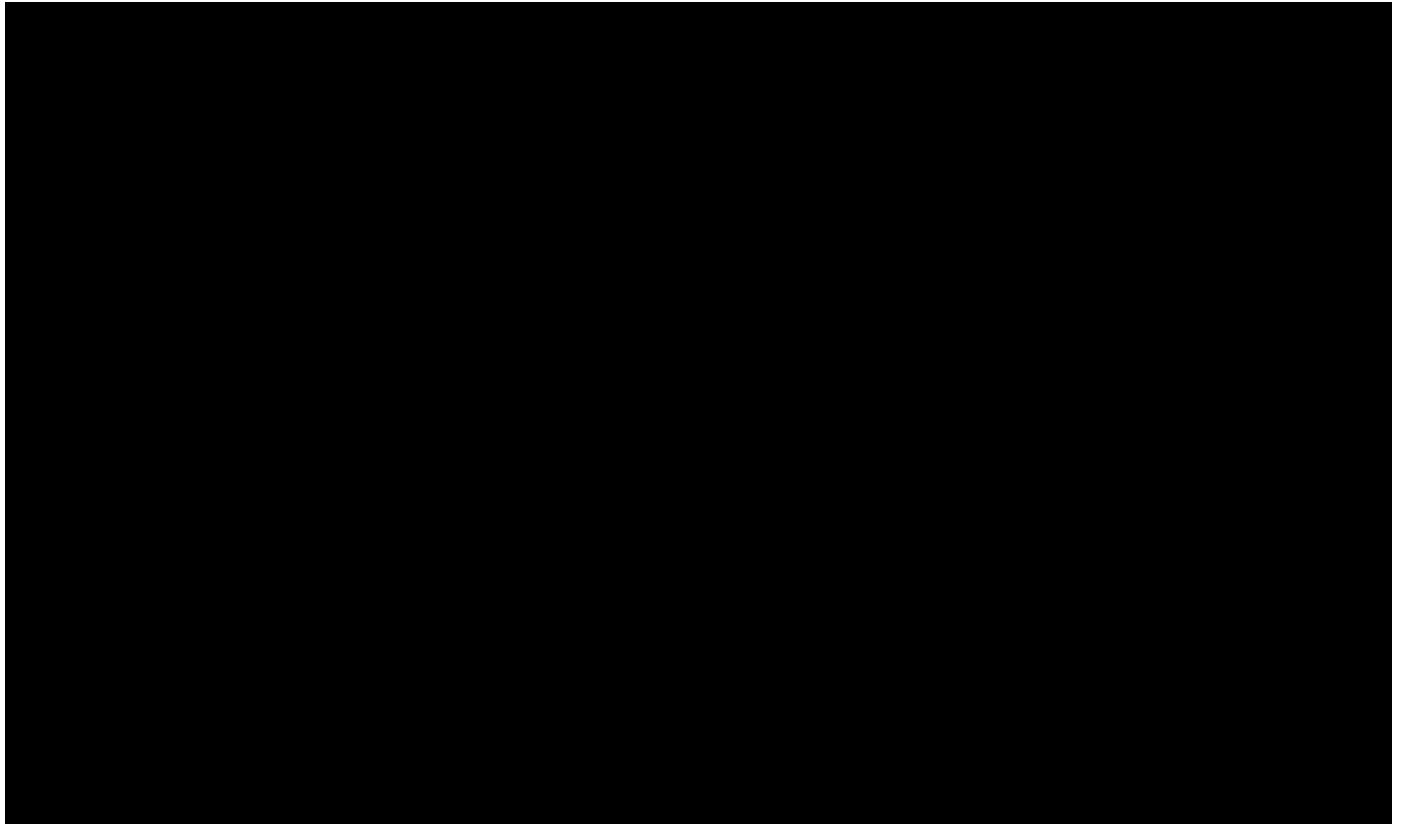


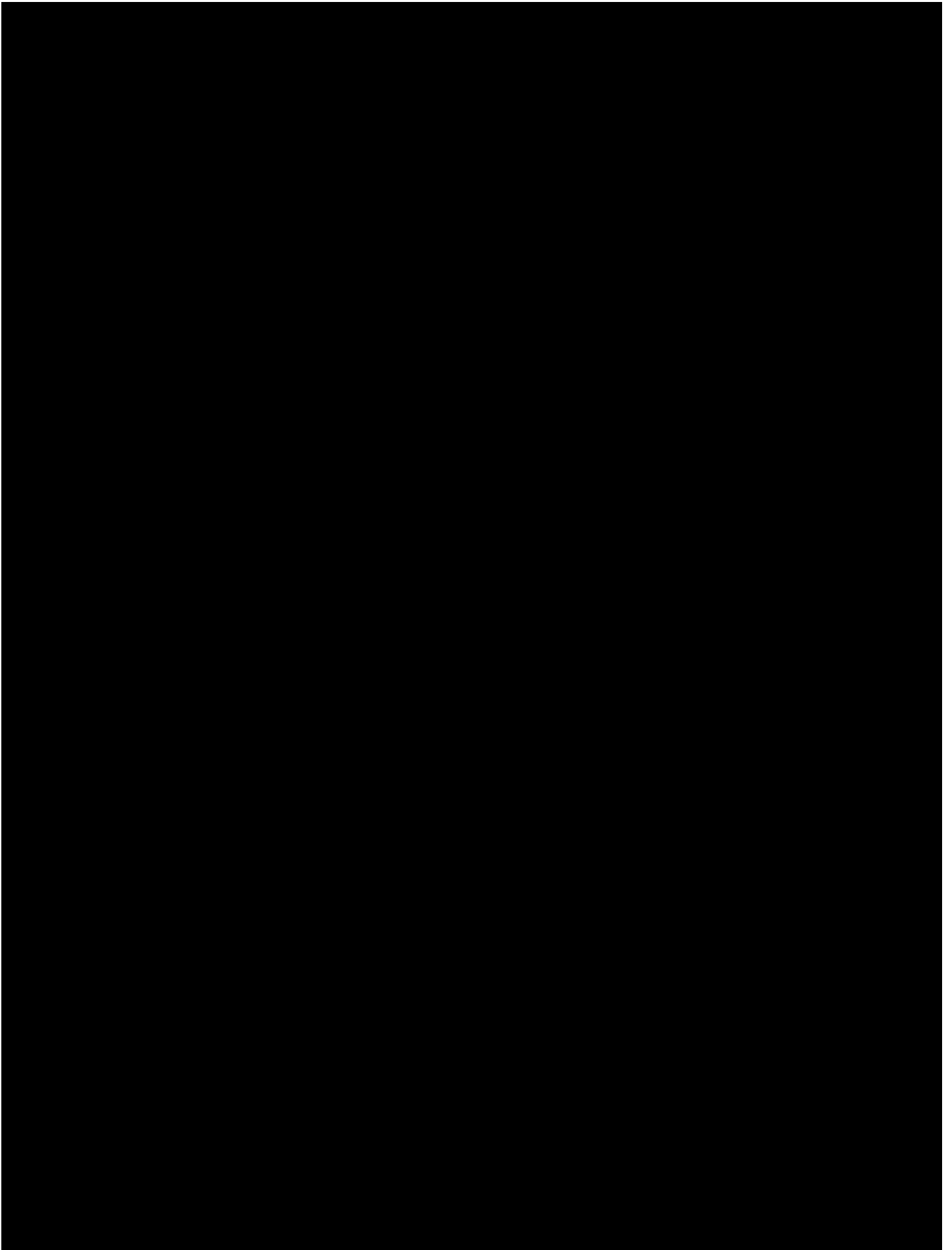


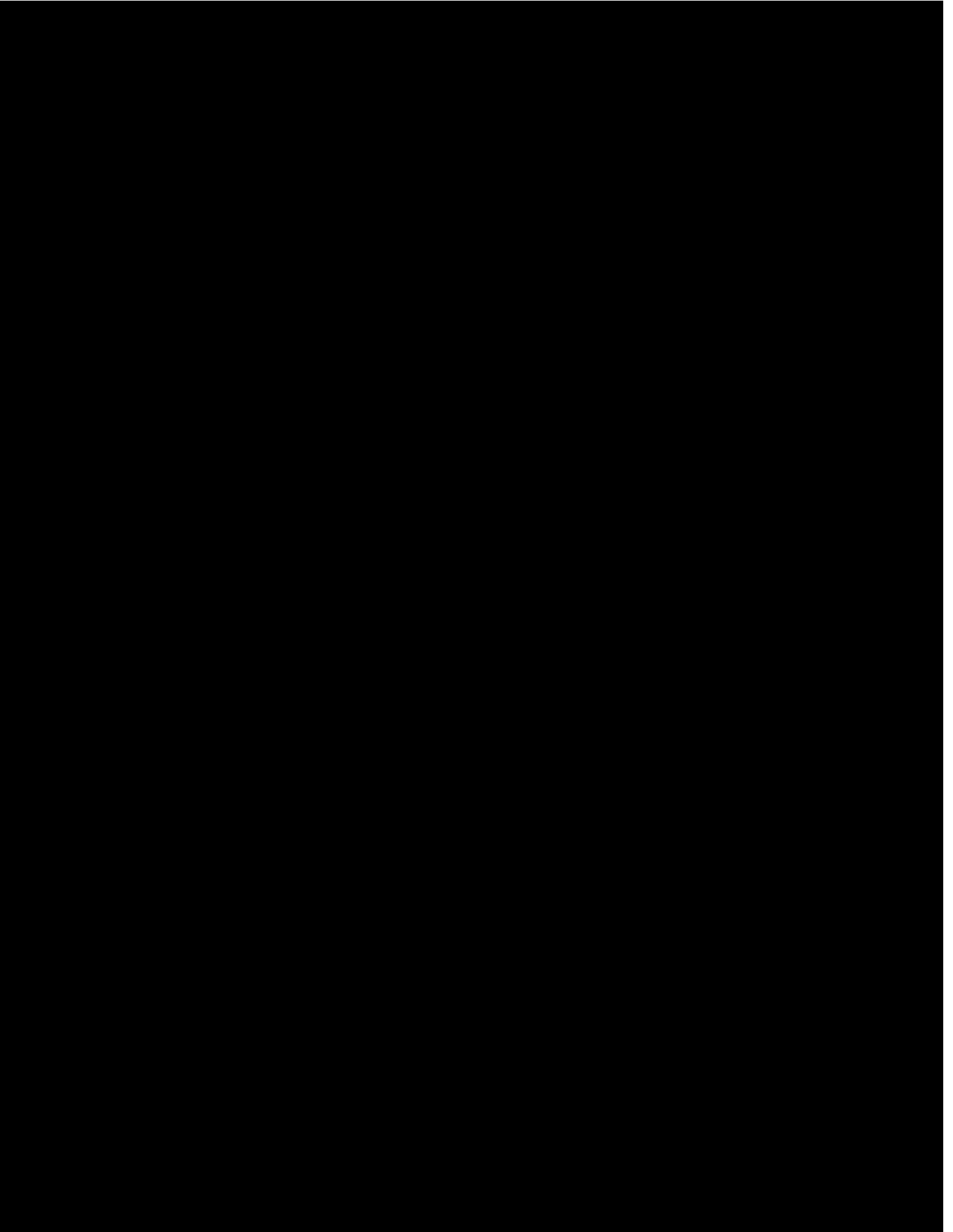


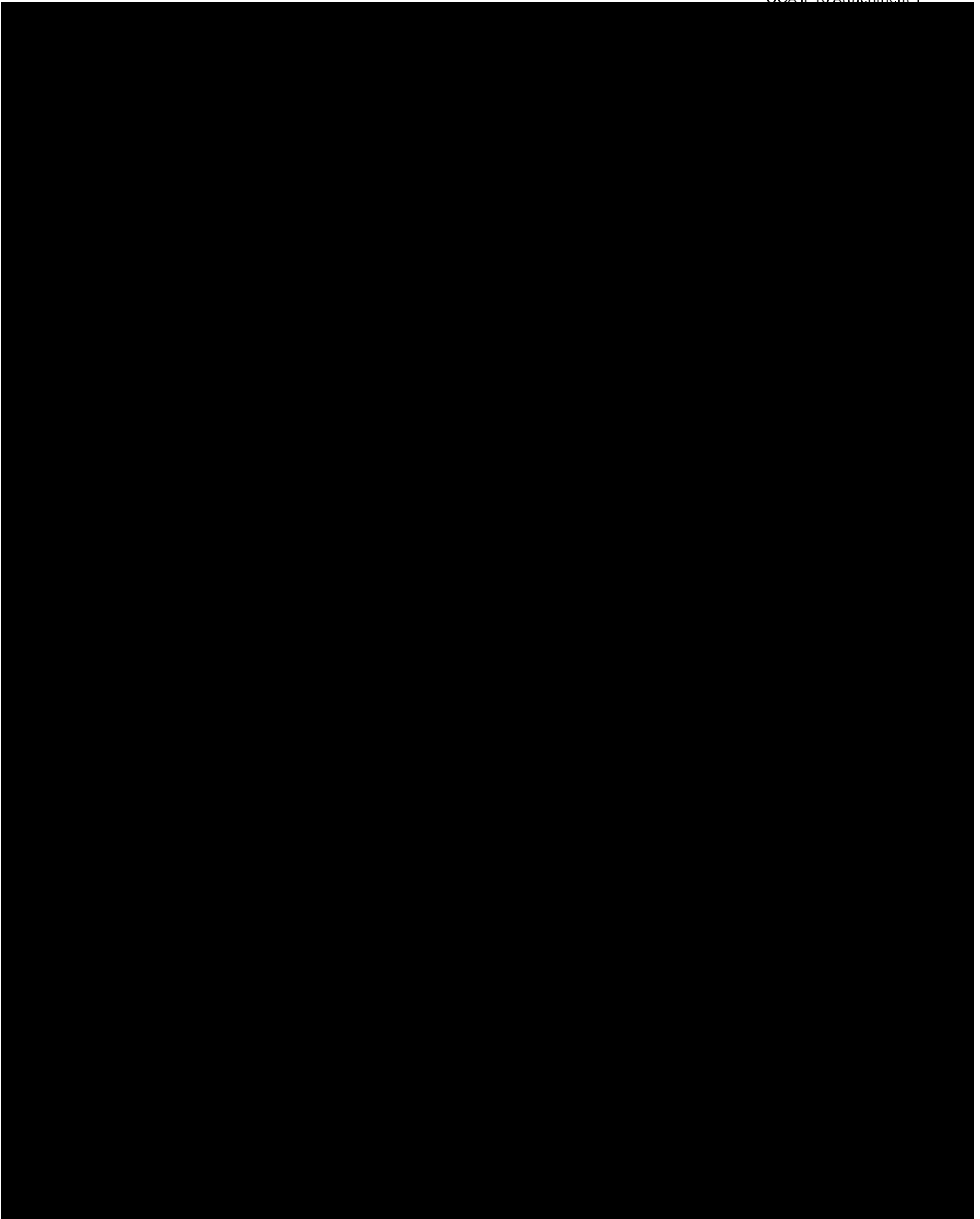


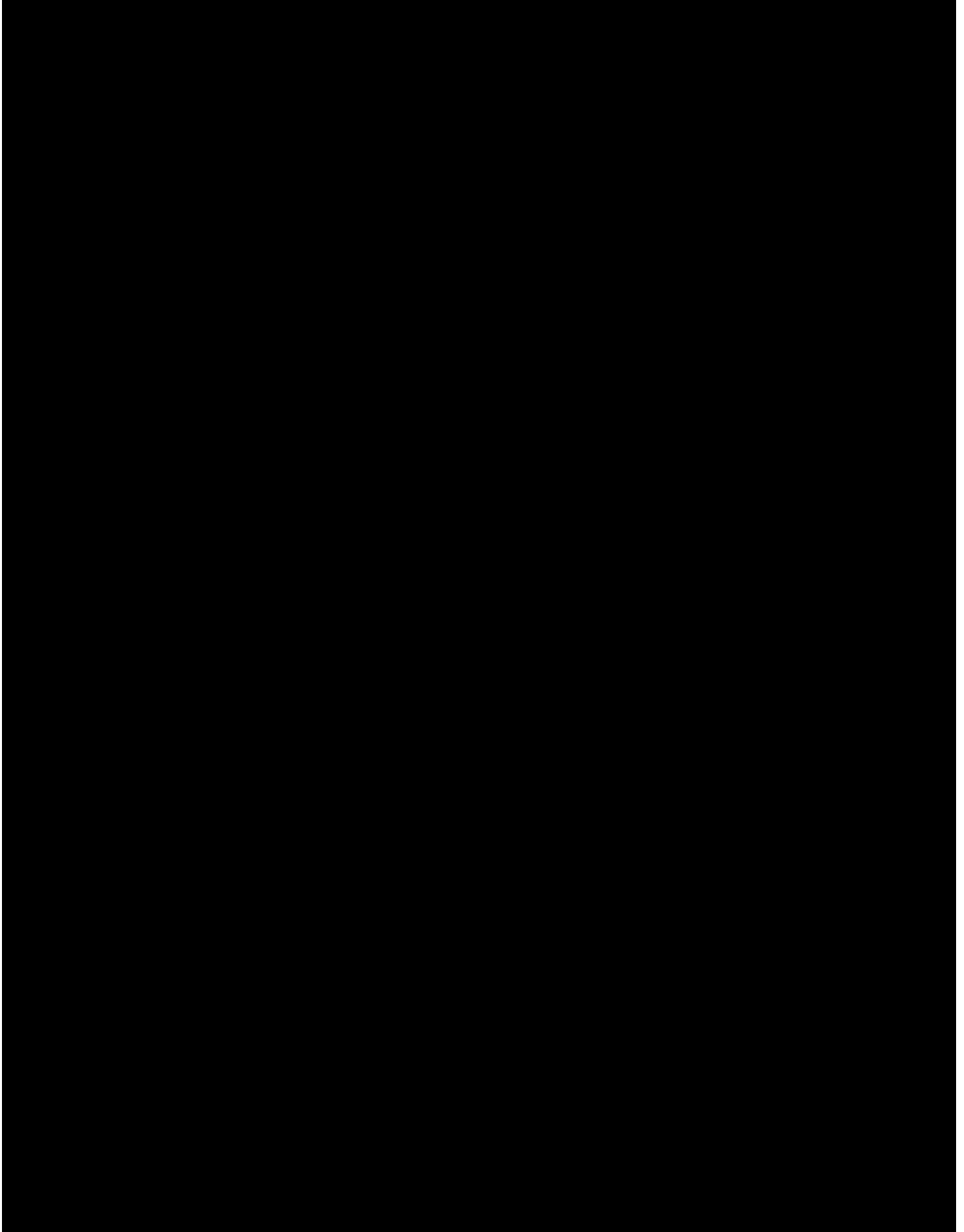












**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Letter of Notification of PPL Electric	:	
Utilities Corporation, Filed Pursuant to	:	
52 Pa. Code Chapter 57 Subchapter G,	:	Docket No. A-2025-3059443
For Approval To Build Approximately	:	
1.1 Miles of New Parallel Double Circuit	:	
230 kV Transmission Taps That Are	:	
Needed to Connect the Existing	:	
Susquehanna-Harwood #1 & #2	:	
Transmission Lines to the New	:	
Tomhicken 230 kV Switchyard That Are	:	
Respectively Located in Luzerne County,	:	
Pennsylvania	:	

PPL ELECTRIC UTILITIES CORPORATION

STATEMENT NO. 1-RJ

REJOINDER TESTIMONY OF JOSEPH LOOKUP

TOPICS ADDRESSED: OVERVIEW OF REJOINDER
SCOPE OF THE PROCEEDING
PROJECT ENGINEERING AND DESIGN
NECESSITY OF THE PROJECT

DATE: SEPTEMBER 14, 2026

1 **I. INTRODUCTION**

2 **Q. Please state your full name and business address.**

3 A. My name is Joseph Lookup, and my business address is 827 Hausman Road, Allentown,
4 Pennsylvania 18104.

5
6 **Q. Did you previously submit testimony in this proceeding on behalf of PPL Electric
7 Utilities Corporation (“PPL Electric” or the “Company”)?**

8 A. Yes. On May 13, 2026, I submitted my direct testimony, PPL Electric Statement No. 1,
9 and on August 7, 2026 I submitted my rebuttal testimony, PPL Electric Statement No. 1-
10 R, in connection with the “Letter of Notification of PPL Electric Utilities Corporation,
11 Filed Pursuant to 52 Pa. Code Chapter 57, Subchapter G, for Approval to Build
12 Approximately 1.1 Miles of New Parallel Double-Circuit 230 kV Transmission Taps
13 Needed to Connect the Existing Susquehanna-Harwood #1 and #2 Transmission Lines to
14 the New Tomhicken 230 kV Switchyard, All Located in Luzerne County, Pennsylvania,”
15 at Docket No. A-2025-3059443 (the “Tomhicken 230 kV Switchyard Project”).

16
17
18 **Q. What is the purpose of your rejoinder testimony?**

19 A. My testimony responds to certain issues raised by the Office of Consumer Advocate’s
20 (“OCA”) witnesses in their surrebuttal testimony: (1) OCA Statement 1SR, the surrebuttal
21 testimony of Dr. Felder; and (2) OCA Statement 2SR, the surrebuttal testimony of Mr.
22 Konidena. Specifically, I provide an overview of the Company’s rejoinder testimony,
23 respond to the ongoing dispute regarding the scope of this proceeding, and address claims

1 related to the project's scope and design, and the need for the Tomhicken 230 kV
2 Switchyard Project.

3
4 **Q. Are you sponsoring any exhibits associated with your rejoinder testimony?**

5 A. No.
6

7 **II. OVERVIEW OF REJOINDER TESTIMONY**

8 **Q. Could you please provide an overview of the rejoinder testimony being submitted by**
9 **witnesses on behalf of PPL Electric in this proceeding?**

10 A. Yes. Below is a list of the rejoinder testimony being submitted in support of the proposed
11 Tomhicken 230 kV Switchyard Project:

- 12 • PPL Electric Statement No. 2-RJ – Kyle Swartzentruber – Mr. Swartzentruber provides
13 rejoinder testimony addressing OCA witness Konidena's claims regarding a
14 "Nescopeck Alternative" to the instant Project.
- 15 • PPL Electric Statement No. 5-RJ – John Taylor – Mr. Taylor responds to: (1) OCA
16 witness Felder's surrebuttal testimony regarding issues of resource adequacy and the
17 alleged "policy gap" that OCA claims exists; (2) OCA witness Felder's continued
18 recommendations regarding a large load registry, load curtailment policies, and tariff
19 modifications; (3) OCA witness Felder's and Konidena's claims regarding the scope
20 of this proceeding; (4) OCA witness Konidena's claims regarding allocation and
21 classification of certain facilities and costs; and (5) OCA witness Konidena's claims
22 regarding the benefits of the work contemplated by the letter of notification versus the
23 work contemplated by a separate siting application.

1 **III. REJOINDER REGARDING THE SCOPE OF THE PROCEEDING**

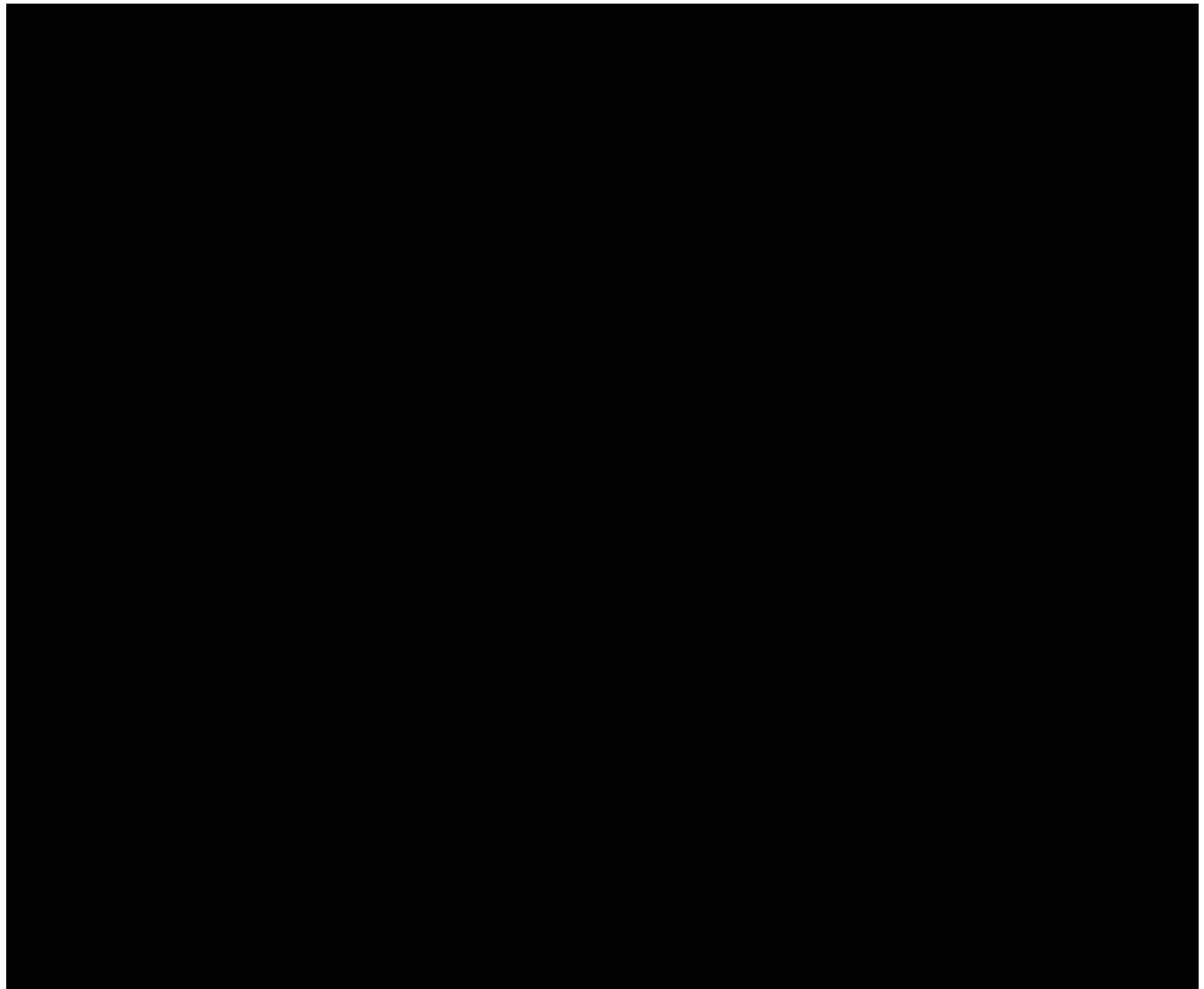
2 **Q. Before responding to the specific points raised by OCA witnesses Felder and**
3 **Konidena regarding the scope of this proceeding, do you have any general comments**
4 **regarding their surrebuttal testimony?**

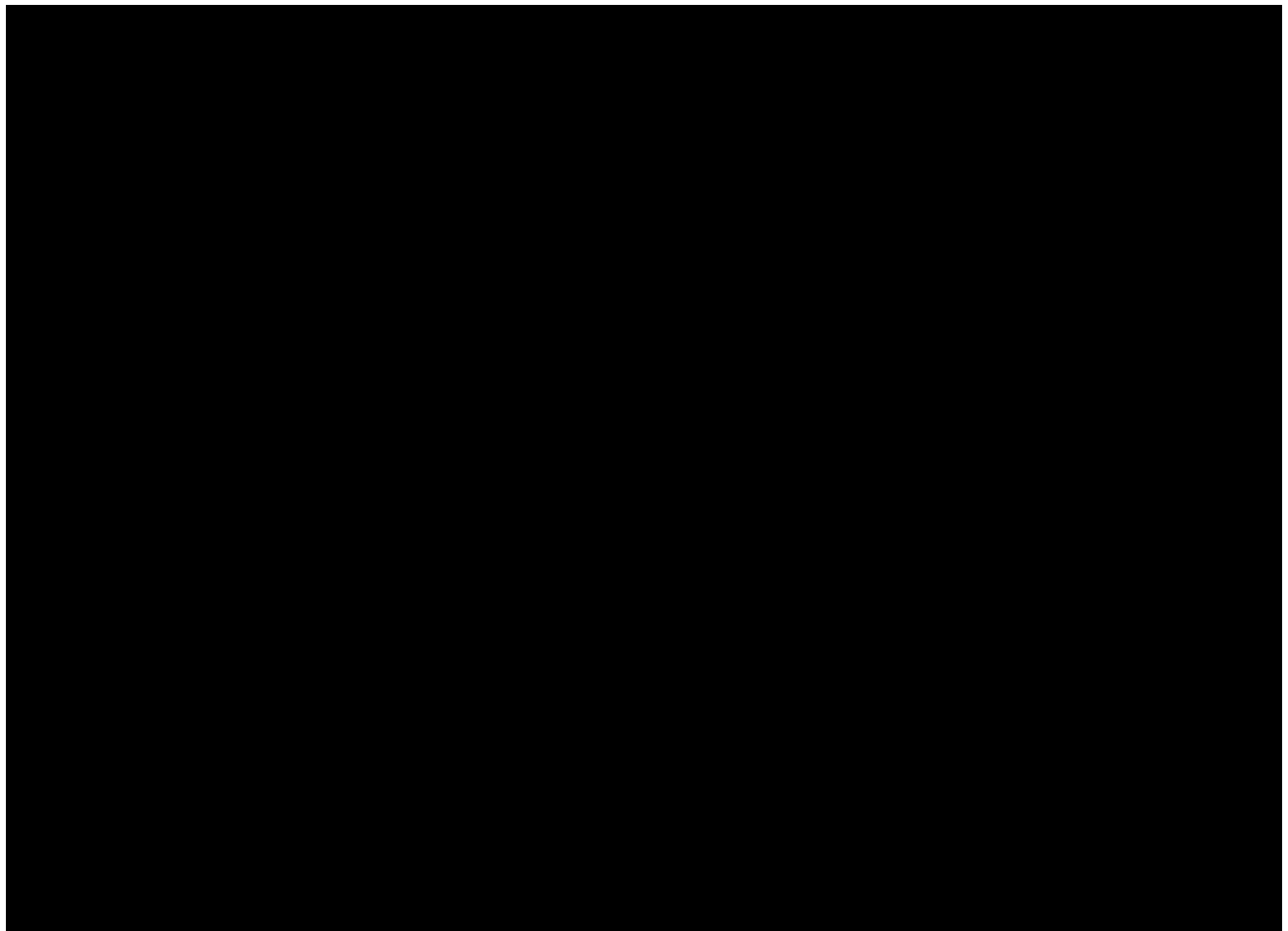
5 A. Yes. Both OCA witnesses take issue with the Company's attempt to clarify the scope of
6 the proceeding, on the one hand, and then also preserve its rights by responding to OCA's
7 out of scope testimony and recommendations on the other hand. (*See, e.g.*, OCA St. 1SR,
8 pp. 11-17; OCA St. 2SR, pp. 4-5, 7-8.) I want to emphasize that the Company's testimony
9 should not be understood to indicate agreement with OCA's position on the proper scope
10 of this case, nor should the Company's attempts to respond to the OCA's out-of-scope
11 testimony and recommendations be interpreted as an affirmative request for relief by the
12 Company. Rather, the Company is endeavoring to make its position on the scope of this
13 proceeding clear, while responding to the merits of OCA's testimony where it is clear the
14 OCA disagrees regarding the scope this case and the determinations that must be reached
15 to dispose of the instant Letter of Notification. I am further advised by counsel that
16 appropriate objections and motions regarding the admissibility of testimony may be made
17 in writing in advance of the hearings in this matter.

18
19 **Q. What is the scope of the Company's requested approvals in this proceeding?**

20 A. The scope of this proceeding involves PPL Electric's request to site and construct a
21 proposed high-voltage ("HV") transmission line under 52 Pa. Code, Ch. 57, Subch. G of
22 the Commission's regulations. The Company is seeking approval to build approximately
23 1.1 miles of new double-circuit 230 kV transmission tap lines, two new 0.1-mile-long 230
24 kV connecting lines, to interconnect the new Tomhicken 230 kV Switchyard and a

1 Customer-owned substation. To that end, the Company is asking the Commission to make
2 the four specific findings and determinations from the Commission set forth in 52 Pa. Code
3 § 57.76(a). The Company is not requesting that the Commission make any finding or
4 determination with respect to the reasonableness or prudence of the transmission costs
5 associated with the Project, nor is it requesting that the Commission make any finding or
6 determination with respect to its proposed allocation of transmission costs between the
7 Customer to be served and PPL Electric's FERC-jurisdictional transmission rate base.





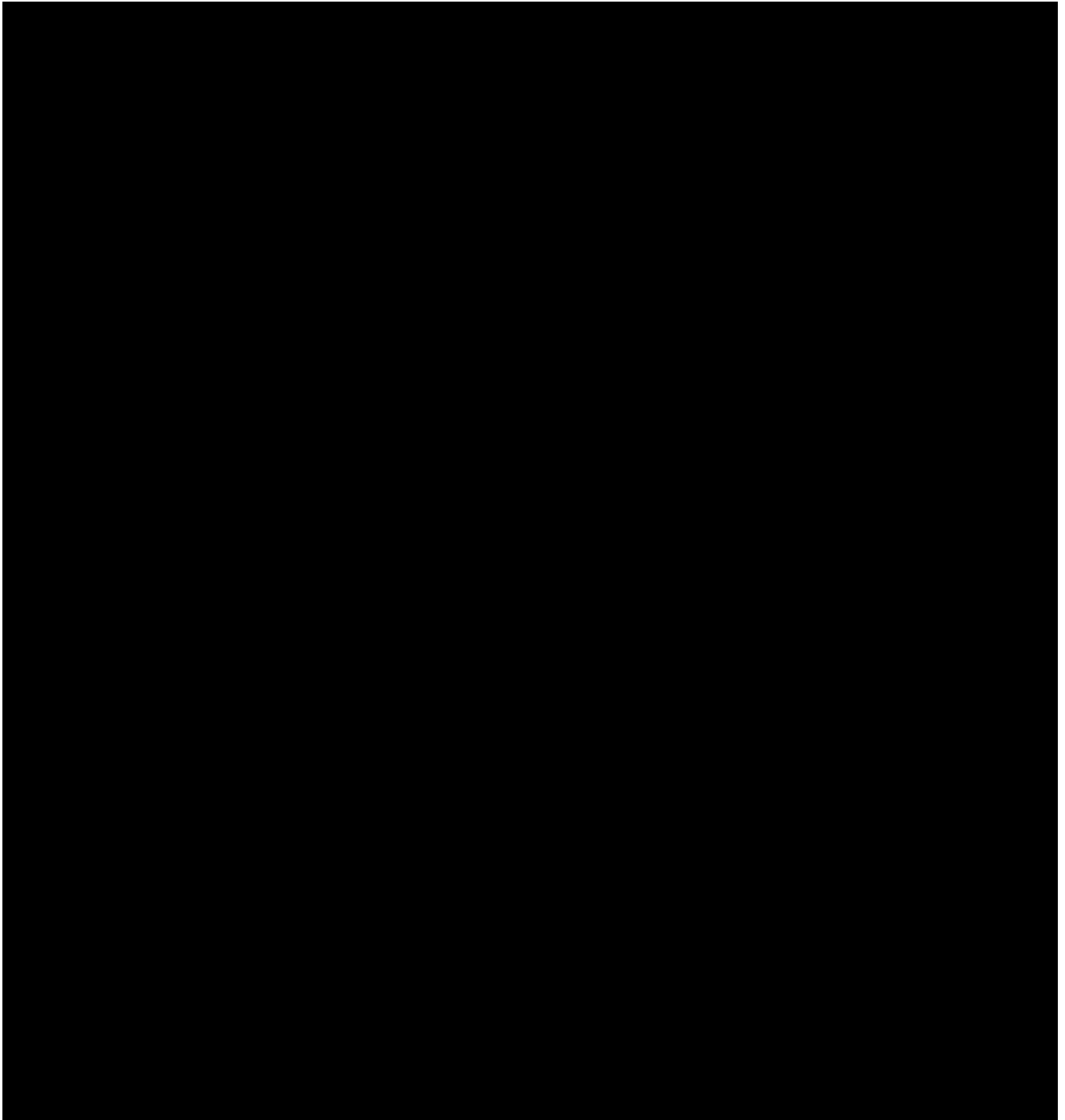
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14 **Q. Please summarize Ms. Cook's testimony as it relates to the cost allocation of the**
15 **Project.**

16 A. Ms. Cook asks whether the transmission cost allocation will be addressed or revised within
17 the instant Letter of Notification proceeding. (Cook Surrebuttal, pp. 5-6.)
18

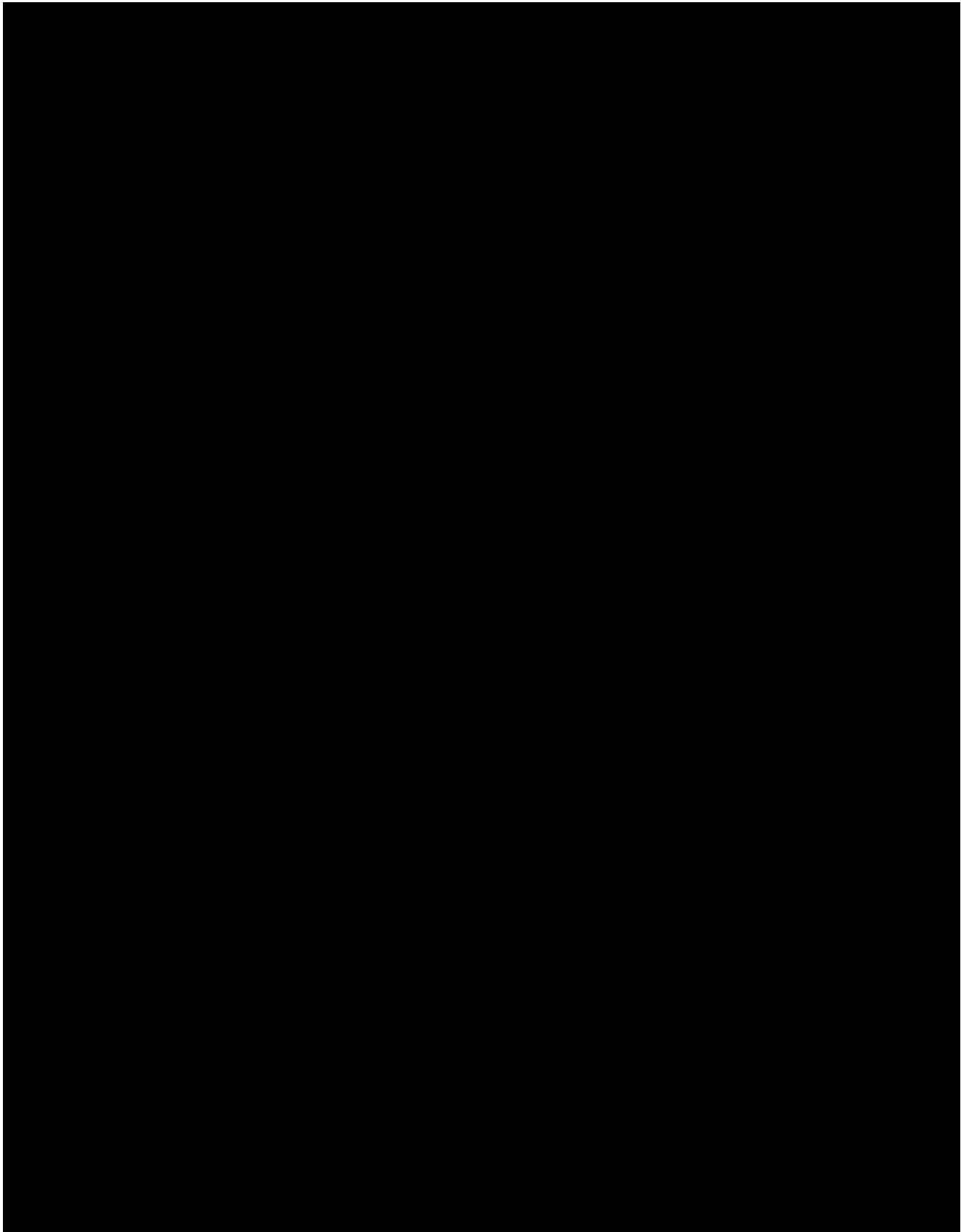
19 **Q. Is the surrebuttal testimony from OCA's witnesses and Ms. Cook regarding**
20 **transmission cost allocation relevant to the scope of the instant proceeding?**

21 A. No. As discussed above and in my rebuttal testimony, PPL Electric Statement No. 1-R, the
22 instant proceeding pertains to PPL Electric's request to site and construct a proposed HV
23 transmission line. It does not seek or involve an evaluation of the reasonableness or

1 prudency of the costs of the Project, or an approval of an allocation of transmission costs
2 between the Customer and other ratepayers.



IV. PROJECT ENGINEERING AND DESIGN



1
2 **Q. Mr. Konidena disputes the number of bays in the Tomhicken 230 kV Switchyard.**
3 **Can you please provide clarification on this matter?**

4 A. Certainly. Mr. Konidena stated in his direct testimony that the Tomhicken 230 kV
5 Switchyard has five bays, and stated in his surrebuttal testimony that the eight-bay figure
6 to which I testified does not reconcile with his five-bay figure. This misunderstanding
7 appears to have come about due to Mr. Konidena's mistaken reliance upon the
8 "Responsibility of Asset Matrix" example applicable to a breaker and a half ("BAAH")
9 configuration that is set forth in the Company's Policy on Cost Allocation for Large
10 Customer Interconnections that was provided in discovery as OCA I-6, Attachment 1.

11 This document was provided in response to a discovery request from OCA that
12 sought a description of the methodology used to quantify or evaluate the benefits to
13 ratepayers that justified allocation of certain equipment and facilities to transmission rate
14 base. The Company explained that it "applied its policy attached as OCA I-6 Attachment
15 1," and provided this document. Importantly, the "Responsibility of Asset Matrix"
16 included in the Company's Policy on Cost Allocation for Large Customer Interconnections
17 that was provided in discovery as OCA I-6, Attachment 1 clearly states that it is an
18 "example" that is provided for ease of understanding at the highest level. However, the
19 Company also supplied OCA I-6, HIGHLY CONFIDENTIAL Attachment 2, which
20 provided description of major asset(s) involved in the Tomhicken Switchyard Project, a
21 justification for those assets, and an identification of whether those assets would be
22 recovered via transmission rate base or a customer contribution.

1 Despite having this information, Mr. Konidena relies upon the “Responsibility of
2 Asset Matrix” example and, in particular, the BAAH configuration example with five bays
3 provided in that example, as if this example is intended to specifically illustrate the
4 configuration of the Tomhicken Switchyard, and how the Company determined to allocate
5 the costs of the equipment and facilities of the Switchyard between the Customer and
6 transmission rate base. (OCA St. 2SR, p. 15.) That is simply not accurate.

7 As I explained in my rebuttal testimony, the Company applied the methodology set
8 forth in the Matrix to the actual arrangement of the Tomhicken Switchyard (which is
9 described in detail in OCA I-6, HIGHLY CONFIDENTIAL Attachment 2, and not to the
10 illustrative arrangement provided in response to OCA I-6. (PPL Electric Statement No. 1-
11 R, pp. 22-23.) Finally, in response to that same discovery request, PPL Electric did provide
12 “Tomhicken-specific documentation” in the form of the actual quantitative analysis and
13 supporting calculations it performed in determining the cost allocation of the Tomhicken
14 230 kV Switchyard.¹ (OCA St. 2SR, p. 27.)
15

16 **Q. Please summarize Mr. Konidena’s testimony that there is a “discrepancy” between**
17 **the Company’s testimony and discovery responses concerning the lines that will**
18 **interconnect to the Tomhicken 230 kV Switchyard, and reconcile the discrepancy.**

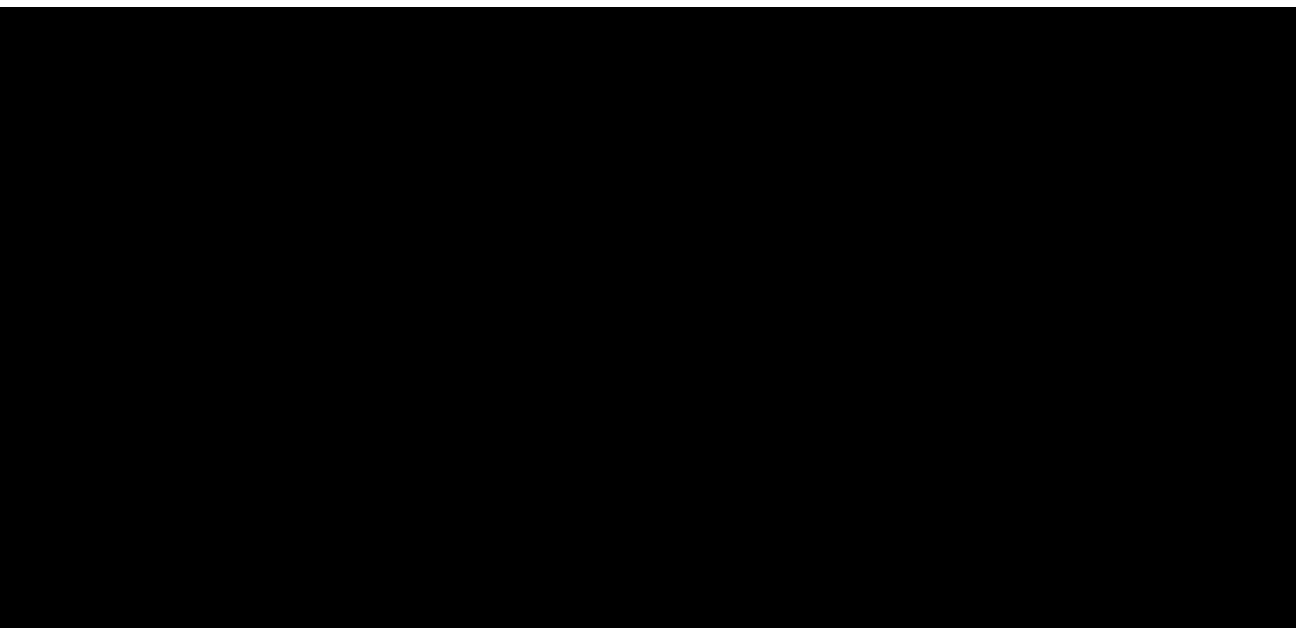
19 A. Mr. Konidena testifies that PPL Electric’s discovery response² confirms that eight lines
20 will be installed at the Tomhicken 230 kV Switchyard as a part of Phase 1, which is this
21 proceeding. (OCA St. 2SR, p. 16.) However, in my direct testimony, PPL Electric
22 Statement No. 1, the description of the scope of Phase 1 is “four double-circuit, 230 kV

¹ PPL Response to OCA I-6, Attachment 2 (**HIGHLY CONFIDENTIAL**).

² PPL Response to OCA XIV-4(a), (b), (d).

1 transmission Tap Lines,” and “two new 0.1-mile-long 230 kV Connecting Lines.” (PPL
2 Electric St. No. 1, p. 8.) The Company also stated in Attachment 1 – Necessity Statement
3 that the two new 0.1-mile-long 230 kV Connecting Lines are double-circuit lines. (*see*
4 Attachment 1 – Necessity Statement, p. 1-7 and Figure 1-2.)

5 To be clear, the Tomhicken Switchyard Project, i.e., Phase 1, only involves the
6 siting and construction of the lines described above, i.e., “four double-circuit, 230 kV
7 transmission Tap Lines,” and “two new 0.1-mile-long 230 kV Connecting Lines.” The
8 Tomhicken Switchyard itself will be designed to accommodate a total of nine transmission
9 lines that will be terminated at the switchyard after the Sugarloaf Project, i.e., Phase 2, is
10 completed. There is no discrepancy regarding the number of lines that will interconnect to
11 the Tomhicken Switchyard. Rather, it appears that Mr. Konidena is confusing the total
12 number of lines that the Tomhicken Switchyard is designed to accommodate, which
13 accounts for both Phase 1 and Phase 2, with the number of lines that are in scope of this
14 letter of notification which is limited to Phase 1.



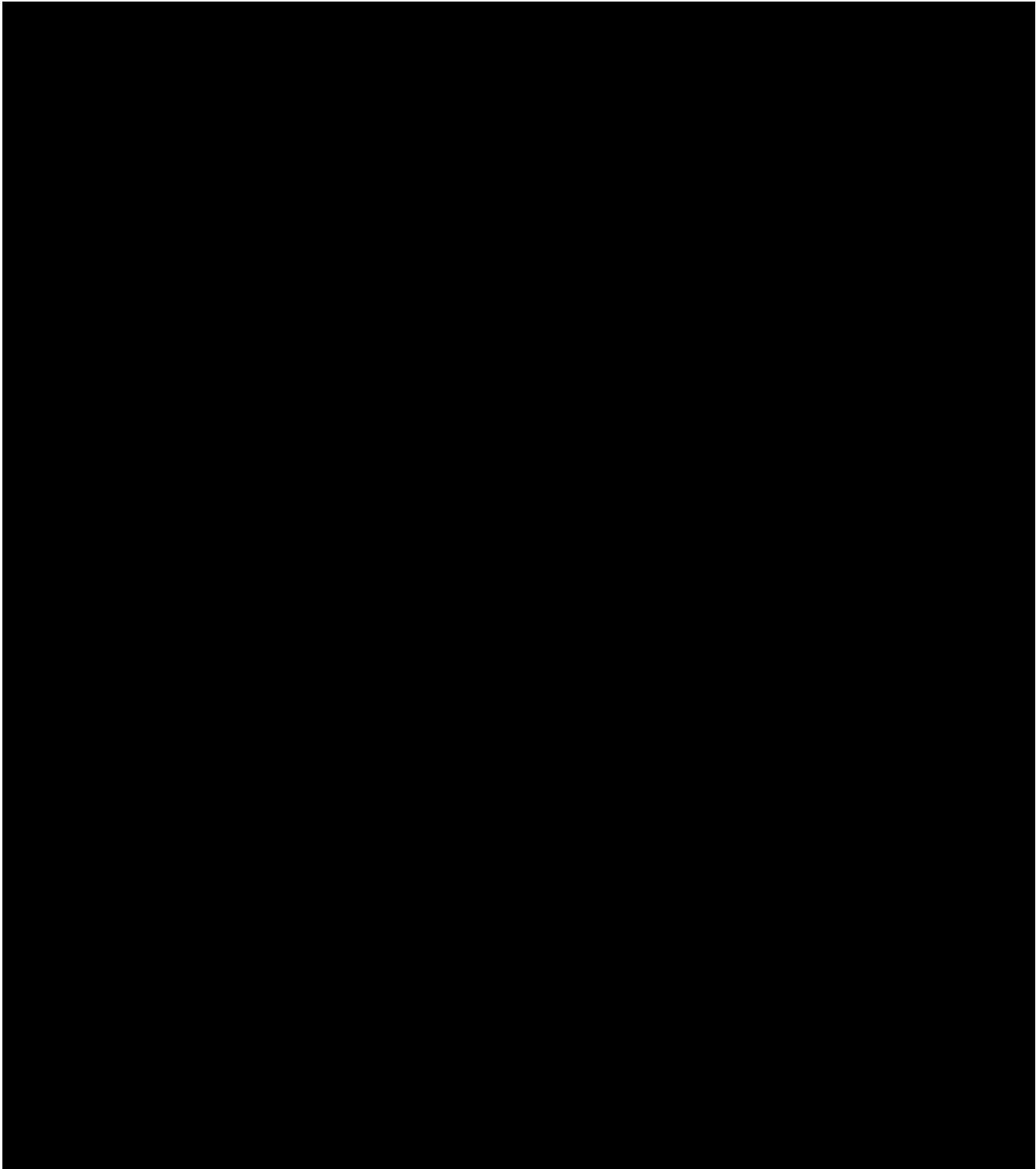
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4 **Q. Please respond to Mr. Konidena's continued dispute of the BAAH design of the**
5 **Tomhicken 230 kV Switchyard, including the claims that the BAAH design is not**
6 **quantitatively supported. (OCA St. 2SR, pp. 18, 20.)**

7 A. First, I would note that Mr. Konidena still concedes, as I stated in my rebuttal testimony,
8 that the BAAH design provides greater operational reliability than a ring bus or other
9 configuration. (OCA St. 2SR, p. 21.) Second, PPL Electric's selection of the BAAH design
10 is pursuant to PPL Electric's design standards, which have not been challenged or
11 questioned thus far in this proceeding. The Company's design standards are not specific to
12 the Tomhicken 230 kV Switchyard Project. The design of the Project is based upon the
13 Company's evaluation of the design and configurations of the facilities, and how best to
14 maintain and improve the safety and reliability of its system.

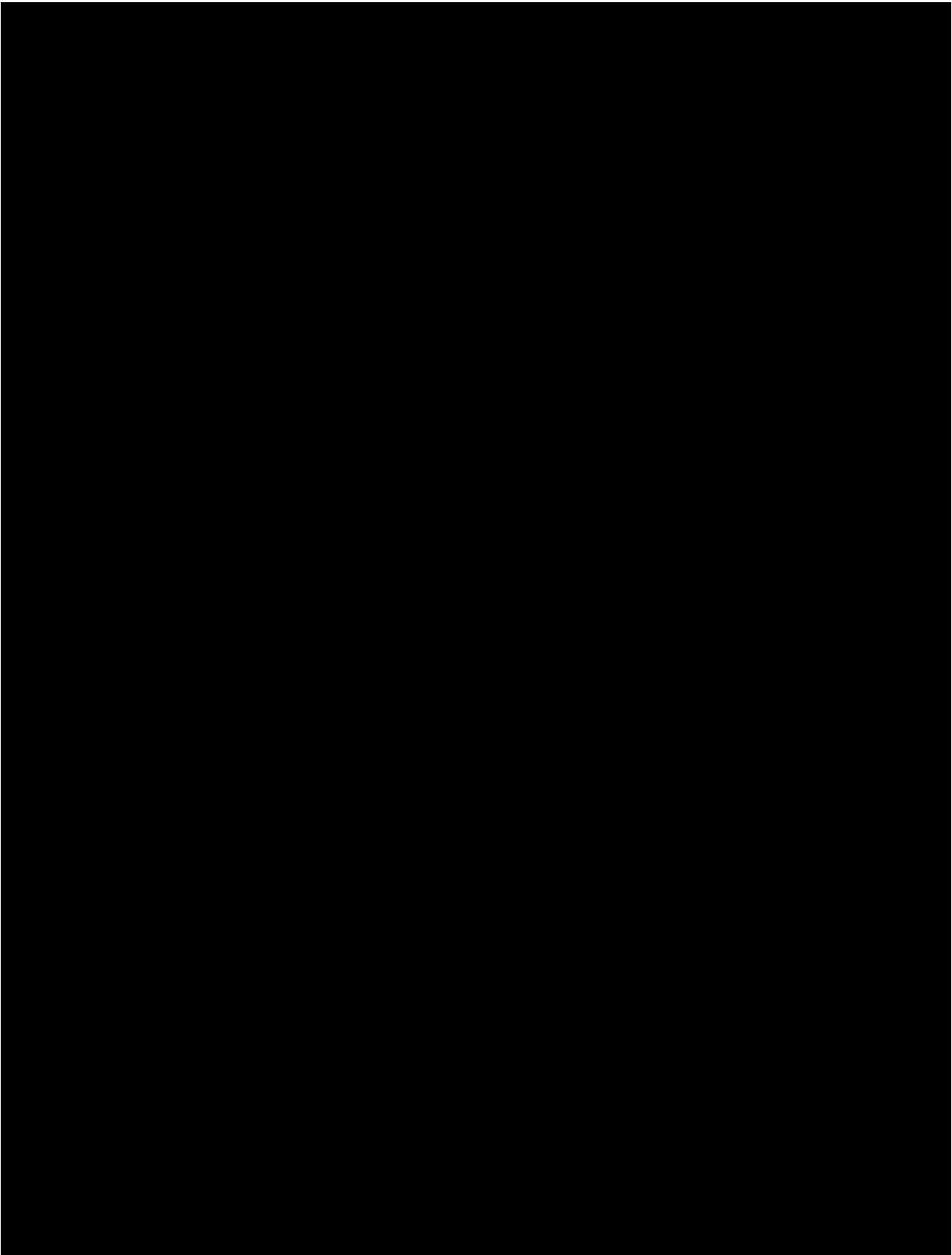
15
16 **Q. Do you wish to respond to Mr. Konidena's assertion that the selection of a BAAH**
17 **design is independent of the size, construction, and configuration of the switchyard?**
18 **(OCA St. 2SR, pp. 21-22.)**

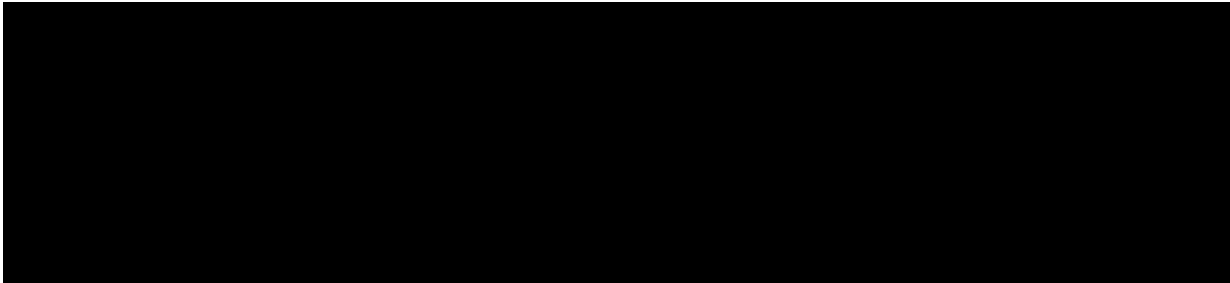
19 A. I do not disagree with Mr. Konidena's assertion, because the selection of this design was
20 done pursuant to the Company's engineering and design standards. As discussed above,
21 these standards have not been questioned or challenged in this proceeding.

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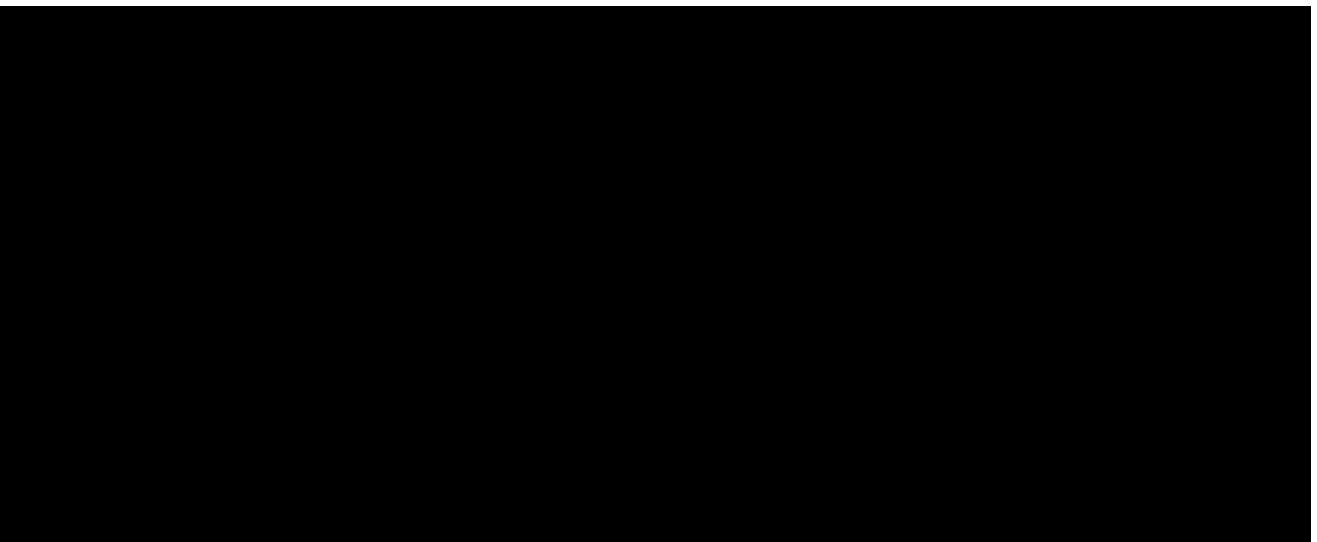
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5 **V. NECESSITY OF THE PROJECT**

6 **Q. OCA witness Konidena testifies that there is an evidentiary “gap” in that the**
7 **Company has not provided a quantitative analysis of the benefits of the Tomhicken**
8 **230 kV Switchyard Project. (OCA St. 2SR, p. 12.) How do you respond to this**
9 **assertion?**

10 **A.** I would disagree. The quantitative effects of the Project were discussed by PPL Electric
11 witness Johnson in her rebuttal testimony. (*See*, PPL Electric St. No. 6-R, pp. 10-13.) To
12 briefly summarize: the Company expects data centers to have little to no impact on its
13 distribution system or distribution rates, because those entities do not utilize the distribution
14 system. In addition, while data centers will have an impact on the transmission system and
15 transmission rates, Ms. Johnson demonstrated through an application of PPL Electric’s
16 Network Service Rate that residential customers may in fact see a decrease in the
17 transmission service charge portion of their bill, which can contribute to an offset of any
18 increases in the generation charge, which PPL Electric has little to no control over. (PPL
19 Electric St. No. 6-R, pp. 11-12.)
20
21
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23

1 **Q. Please respond to Mr. Konidena’s assertion that transmission facility design should**
2 **start with the question of “when an actual need has been demonstrated to the existing**
3 **facility, and whether cost-effective non-transmission alternatives were considered,**
4 **before a transmission solution sized beyond that demonstrated need is selected and**
5 **its cost assigned to ratepayers.” (OCA St. 2SR, p. 23.)**

6 **A. The Company has already demonstrated in this proceeding that it did consider non-**
7 **transmission alternatives (“NTA”), and determined that these were not reasonable or**
8 **feasible to address the need for the instant Project. (PPL Electric St. No. 2-R, pp. 4-5.)**
9 **Specifically, PPL Electric considered Non-Transmission Alternatives (“NTA”), Dynamic**
10 **Line Ratings (“DLR”), and distribution system connection, but determined that none of**
11 **those alternatives were viable because of the physical interconnection requirement, size of**
12 **the load, and Transmission Planning load flow analysis. (PPL Electric St. No. 2-R, pp. 4-**
13 **5.) Mr. Konidena conceded this point in his direct testimony, and has provided no**
14 **explanation for his new pivot on this position. (OCA St. 2, pp. 33-34, 36, 38.)**



1 **VI. CONCLUSION**

2 **Q. Does this conclude your rejoinder testimony at this time?**

3 A. Yes. I reserve the right to supplement my testimony as additional issues arise during the
4 course of this proceeding.

**BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION**

Letter of Notification of PPL Electric	:	
Utilities Corporation, Filed Pursuant to 52	:	
Pa. Code Chapter 57 Subchapter G, For	:	Docket No. A-2025-3059443
Approval To Build Approximately 1.1	:	
Miles of New Parallel Double Circuit 230	:	
kV Transmission Taps That Are Needed to	:	
Connect the Existing Susquehanna-	:	
Harwood #1 & #2 Transmission Lines to the	:	
New Tomhicken 230 kV Switchyard That	:	
Are Respectively Located in Luzerne	:	
County, Pennsylvania	:	
	:	

PPL ELECTRIC UTILITIES CORPORATION

STATEMENT NO. 5-RJ

REJOINDER TESTIMONY OF JOHN D. TAYLOR

TOPICS ADDRESSED:

- FERC AND COMMISSION JURISDICTION**
- RESOURCE ADEQUACY**
- PPL’S REQUEST FOR APPROVAL AND SCOPE**
- CUSTOMER-SPECIFIC INVESTMENTS**
- PROJECT PHASE CONSIDERATIONS**
- TARIFF PROTECTIONS**

DATE: SEPTEMBER 14, 2026

1 **I. INTRODUCTION**

2 **Q. Please state your full name and business address.**

3 A. My name is John D. Taylor, and my business address is 10 Hospital Center Commons,
4 Suite 400, Hilton Head Island, South Carolina 29926.

5
6 **Q. Did you previously submit testimony in this proceeding on behalf of PPL Electric
7 Utilities Corporation (“PPL Electric” or the “Company”)?**

8 A. Yes. On August 7, 2026, I submitted my rebuttal testimony, PPL Electric Statement No.
9 5-R, which responded to certain policy issues raised by Office of Consumer Advocate
10 (“OCA”) Witnesses Felder and Konidena related to the “Letter of Notification of PPL
11 Electric Utilities Corporation, Filed Pursuant to 52 Pa. Code Chapter 57 Subchapter G, For
12 Approval To Build Approximately 1.1 Miles of New Parallel Double Circuit 230 kV
13 Transmission Taps That Are Needed to Connect the Existing Susquehanna-Harwood #1 &
14 #2 Transmission Lines to the New Tomhicken 230 kV Switchyard That Are Respectively
15 Located in Luzerne County, Pennsylvania” at Docket No. A-2025-3059443 (“Tomhicken
16 230 kV Switchyard Project” or the “Project”).

17
18 **Q. Are you sponsoring any exhibits associated with your rejoinder testimony?**

19 A. No.

1 **II. PURPOSE AND SCOPE OF TESTIMONY**

2 **Q. What is the purpose of your rejoinder testimony?**

3 A. My rejoinder testimony responds to certain policy issues raised by OCA witnesses Felder
4 and Konidena related to the Letter of Notification (“LON”) filing. My rejoinder testimony
5 is arranged as follows:

- 6 • Section I – Resource Adequacy, Reliability Backstop Proposal (“RBP”),
7 Interim Resource Adequacy Service (“IRAS”) and the alleged “policy gap.”
- 8 • Section II – Large Load Registry, Load Curtailment, Tariff protections, and
9 Stranded cost.
- 10 • Section III – PPL’s Request for Approval and the Scope of this LON Filing.
- 11 • Section IV – Customer-Triggered vs. Customer Specific Facilities.
- 12 • Section V – Phase 1 and 2 Considerations.
- 13 • Section VI – Conclusion.

14
15 **Q. Does it remain your position that certain of these issues are outside the scope of this**
16 **Letter of Notification proceeding?**

17 A. Yes. In their surrebuttal testimony, Witness Felder and Witness Konidena continue to ask
18 the Public Utility Commission (“Commission”) to make determinations that are outside the
19 scope of this proceeding, which concerns the siting and location of high voltage
20 transmission lines under the streamlined Letter of Notification (“LON”) process outlined
21 in Section 57.72 of the Commission’s regulations.

1 **Q. Does the fact that you are providing testimony responding to the out-of-scope**
2 **arguments made by OCA Witnesses Felder and Konidena mean that you believe or**
3 **concede those issues are properly before the Commission for consideration in this**
4 **proceeding?**

5 A. No. As I explained in my rebuttal testimony, my response to issues raised by OCA
6 Witnesses Felder and Konidena should not be interpreted as an acknowledgment that those
7 issues are properly before the Commission in this proceeding. Rather, my testimony is
8 intended to respond to arguments that OCA has advanced in support of its
9 recommendations regarding the Project. I am further advised by counsel that appropriate
10 objections and motions regarding the admissibility of testimony may be made in writing in
11 advance of the hearings in this matter.

12
13 **Q. Considering the ongoing dispute regarding the appropriate scope of the**
14 **Commission's review of this LON, what is the purpose of your rejoinder testimony?**

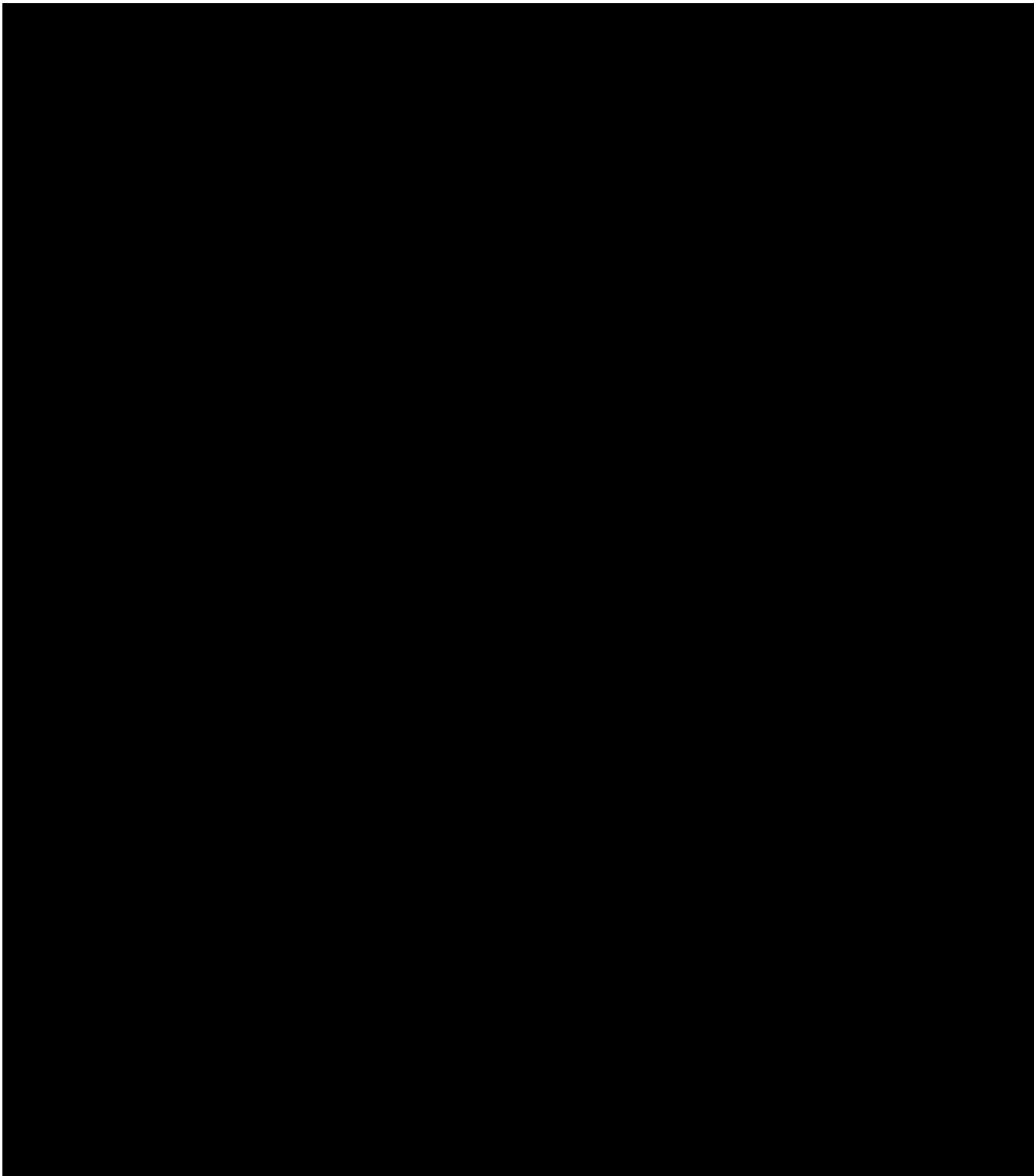
15 A. Like my rebuttal testimony, the purpose of my rejoinder testimony is not to expand the
16 scope of this proceeding or request approval of cost recovery or cost allocation. Rather, it
17 is to respond to arguments presented by OCA Witnesses Felder and Konidena. My
18 testimony does not ask the Commission to resolve issues that are beyond the scope of this
19 LON. It explains why certain OCA recommendations are unnecessary for the Commission
20 to determine whether the specific high voltage (“HV”) transmission lines proposed in this
21 LON satisfy the applicable siting requirements, and why many of the broader policy and
22 cost-allocation issues raised by OCA should be addressed, if at all, through existing
23 regulatory processes that are designed for these issues.

1
2 **Q. Would approval of this LON prevent OCA or other interested parties from**
3 **continuing to pursue the broader cost-allocation, resource-adequacy, or large-load**
4 **policy issues that OCA has raised?**

5 A. No. That is an important distinction. Approval of this LON would not prevent OCA from
6 pursuing, or the Commission, PJM Interconnection, LLC (“PJM”), and the Federal Energy
7 Regulatory Commission (“FERC”) from considering future changes related to
8 transmission cost allocation, cost recovery, resource adequacy, or large-load policy
9 through the proceedings established to address those issues.

10 For example, if OCA believes that transmission costs associated with the Project
11 are ultimately classified or allocated improperly, approval of this LON would not
12 determine that issue or prevent OCA from pursuing the remedies available through the
13 applicable FERC processes. Similarly, approval of this LON would not prevent PJM,
14 FERC, or the Commission from adopting future requirements concerning resource
15 adequacy, capacity-cost responsibility, curtailment, registries, or other large-load policies.
16 Accordingly, the Commission does not need to resolve those broader issues in this LON in
17 order to preserve OCA’s ability to raise them or regulators’ ability to address them in the
18 appropriate proceedings.

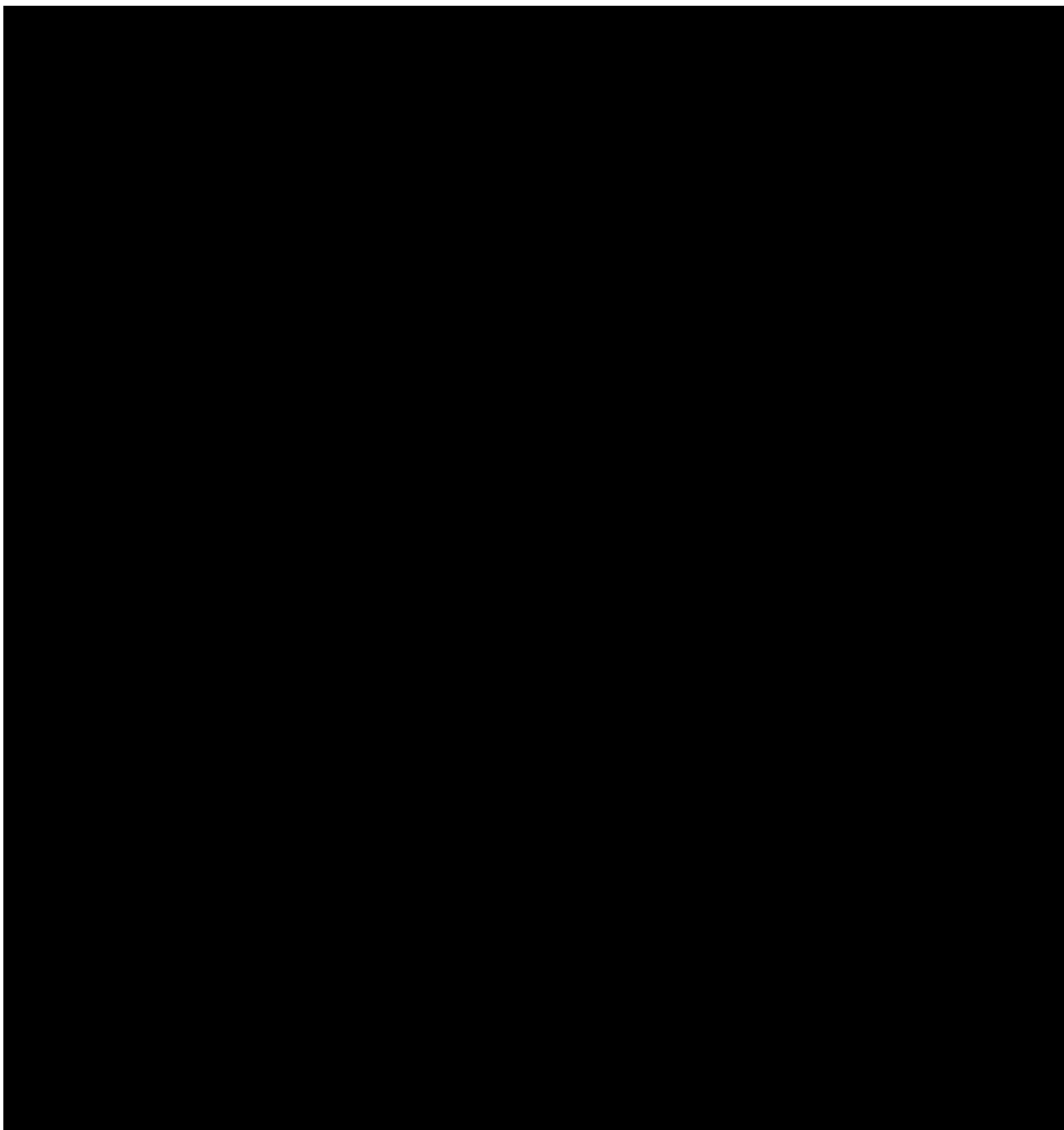
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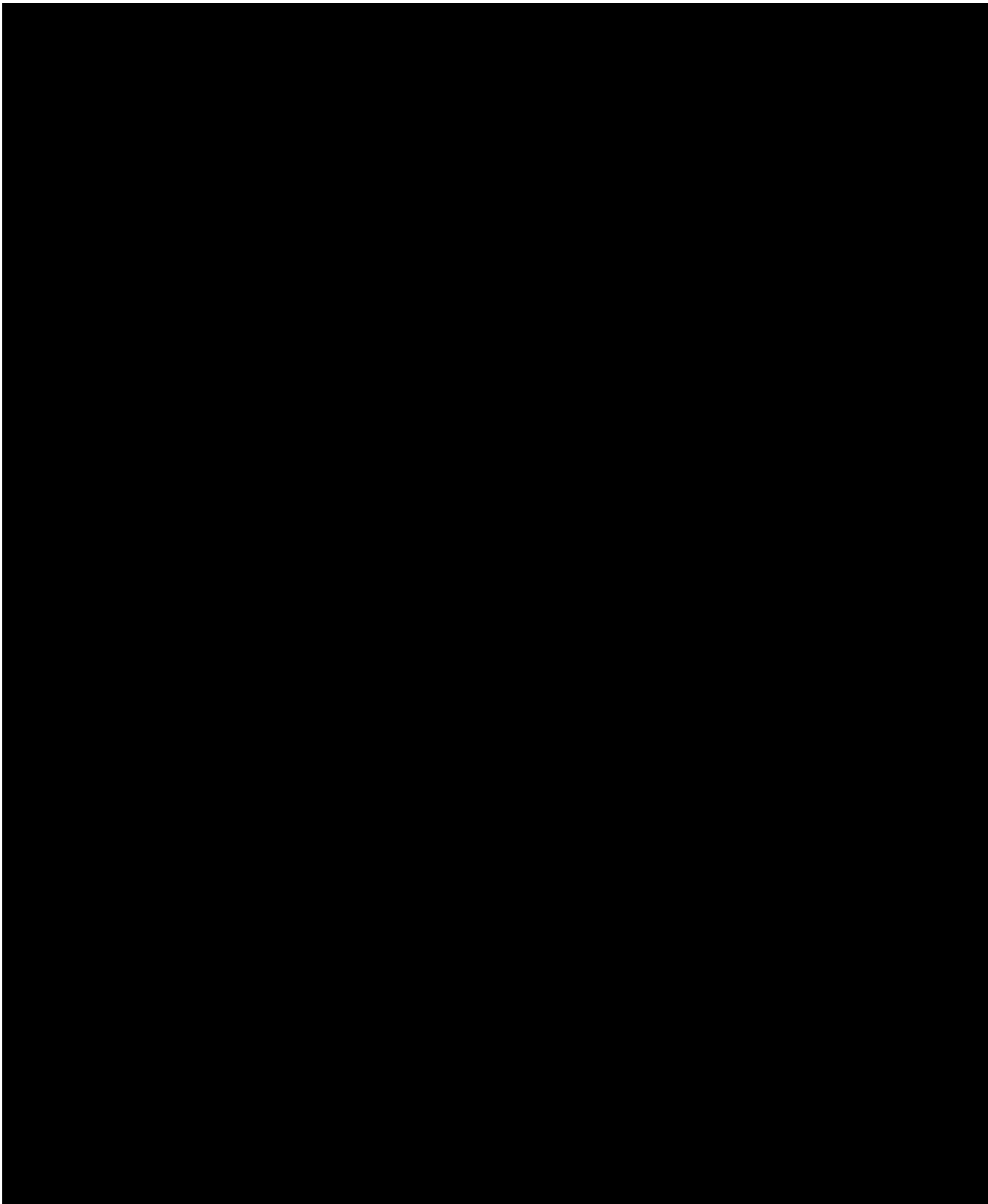
¹ OCA St. 1SR, pp. 5-6.

² Moreover, I note that the Order entered at Docket No. A-2026-3063643 contained the exact same language I, and PPL Electric witness Lookup, referenced in our respective rebuttal testimonies, where the Commission made clear that its approval to site and construct the contemplated HV transmission lines does not address the issues of accounting treatment, and cost recovery, i.e., issues of cost or allocation of costs between a customer and rate base.

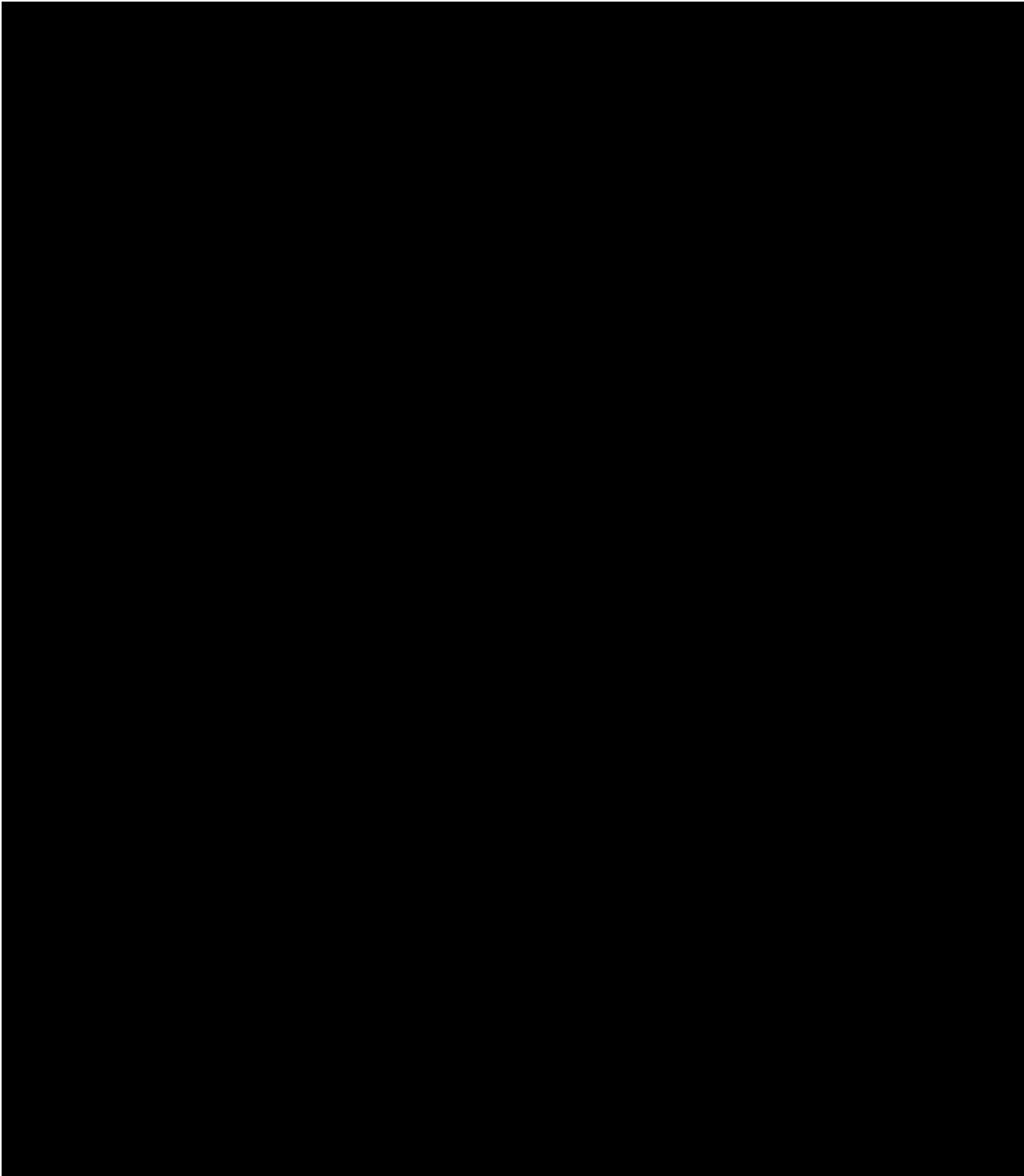
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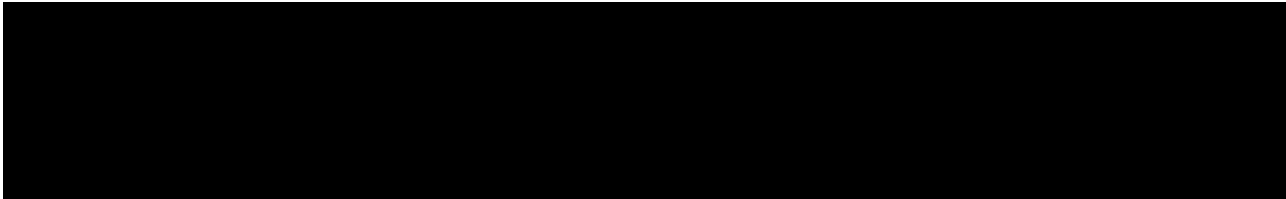


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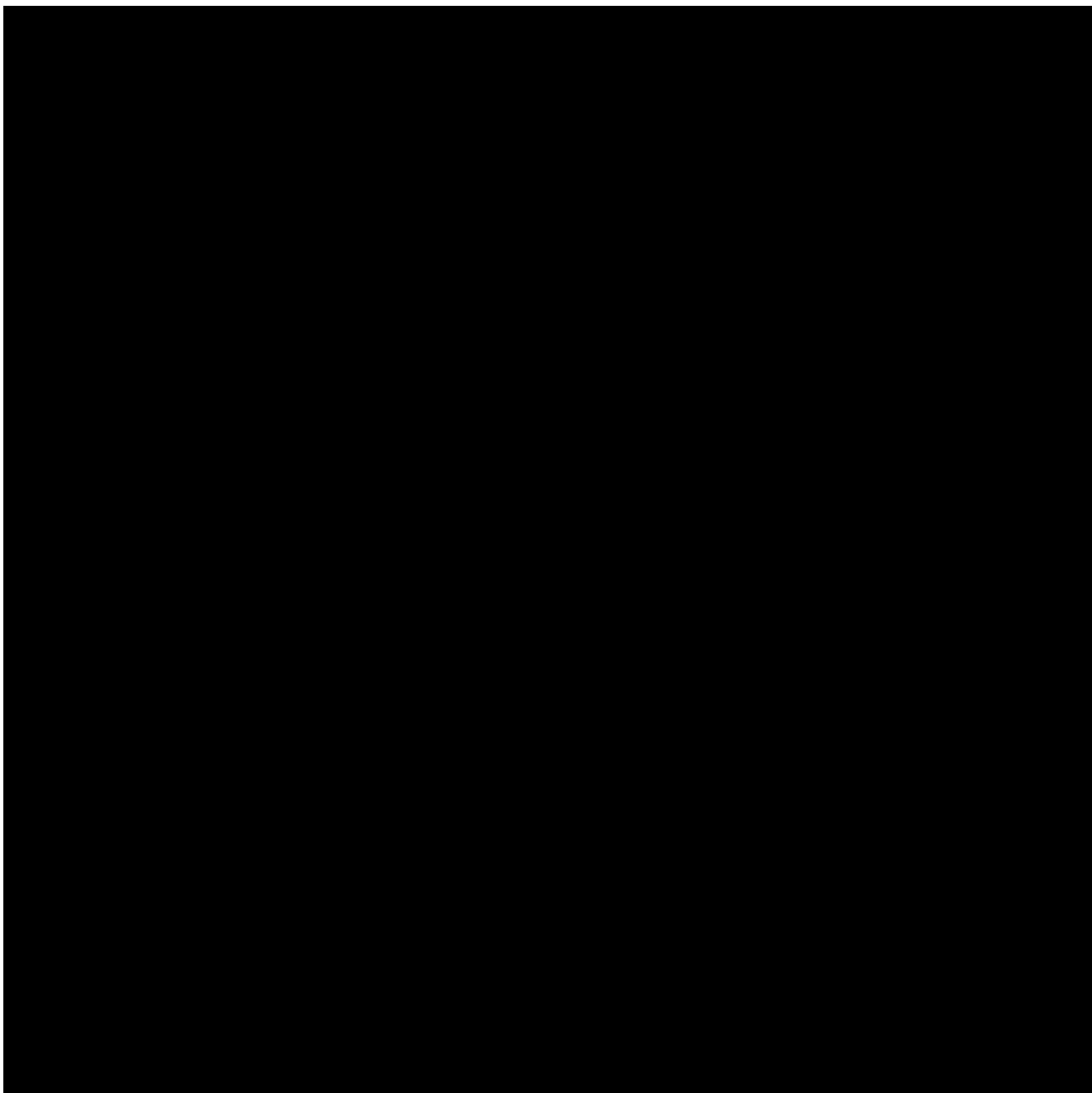


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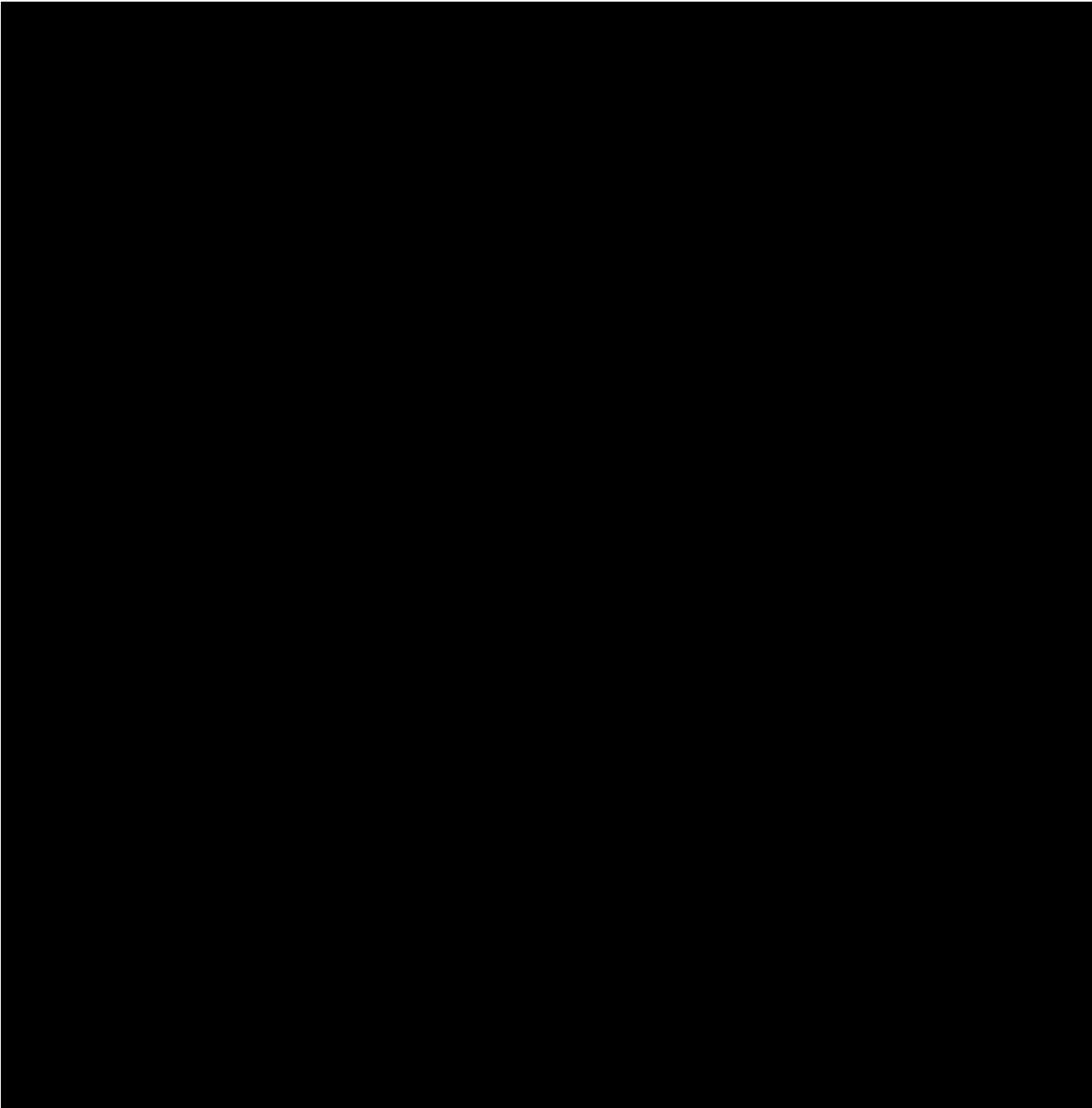
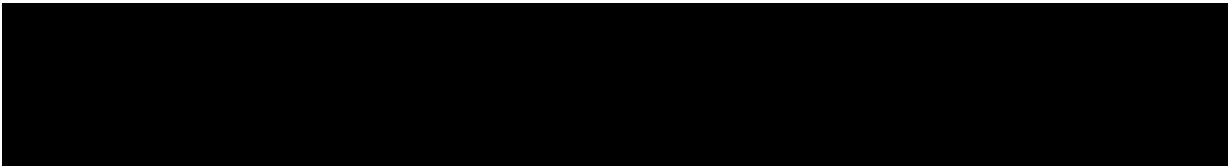


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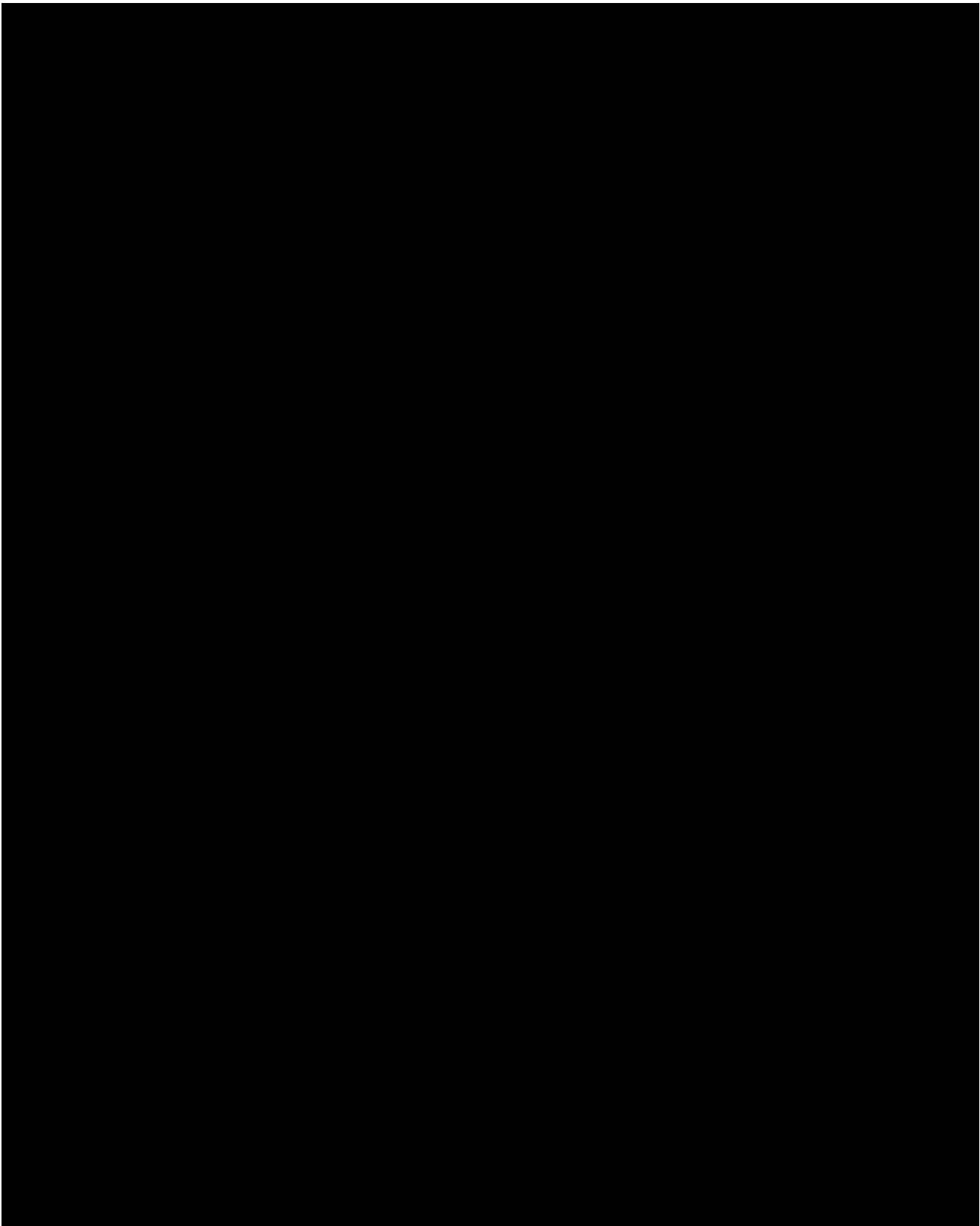
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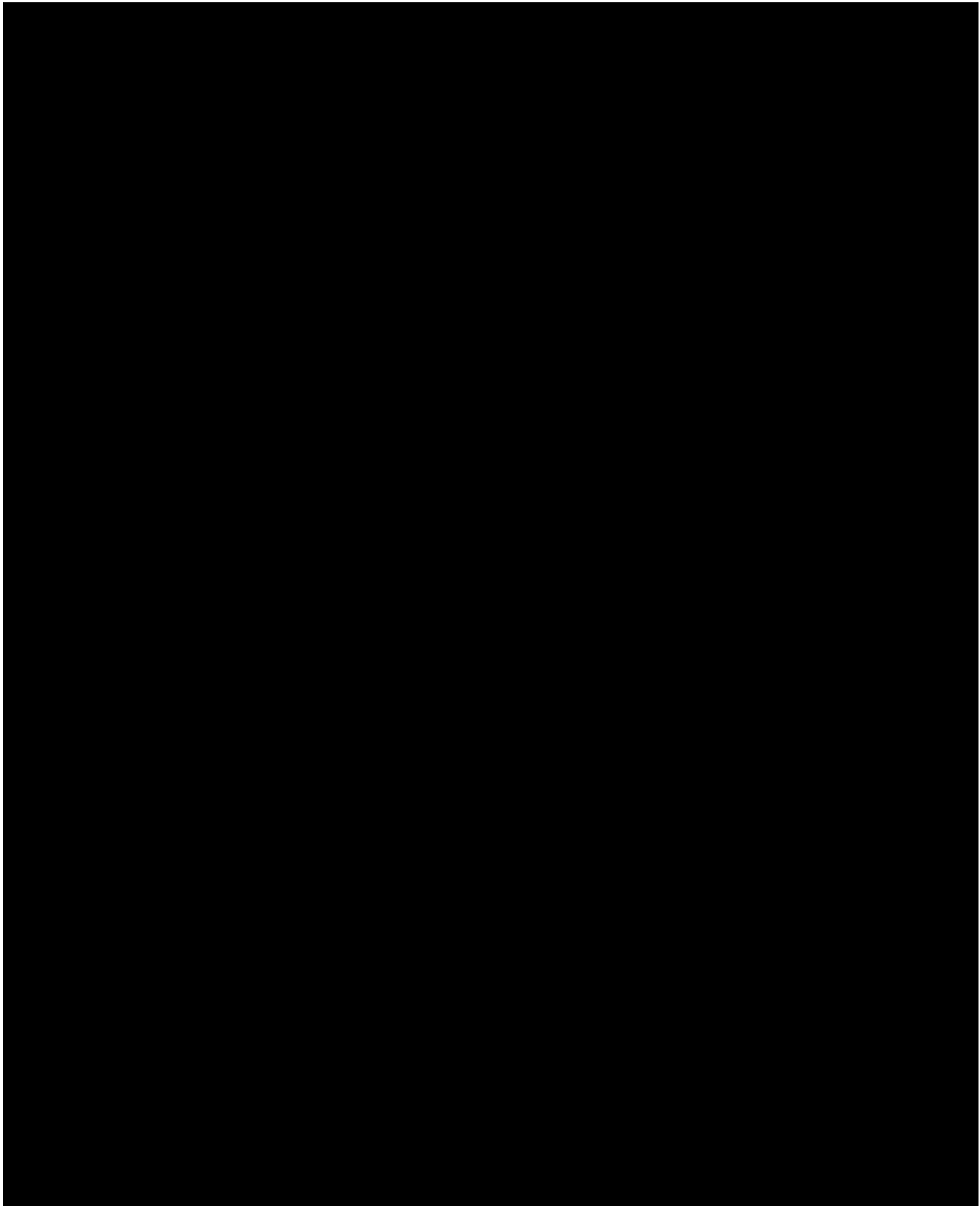
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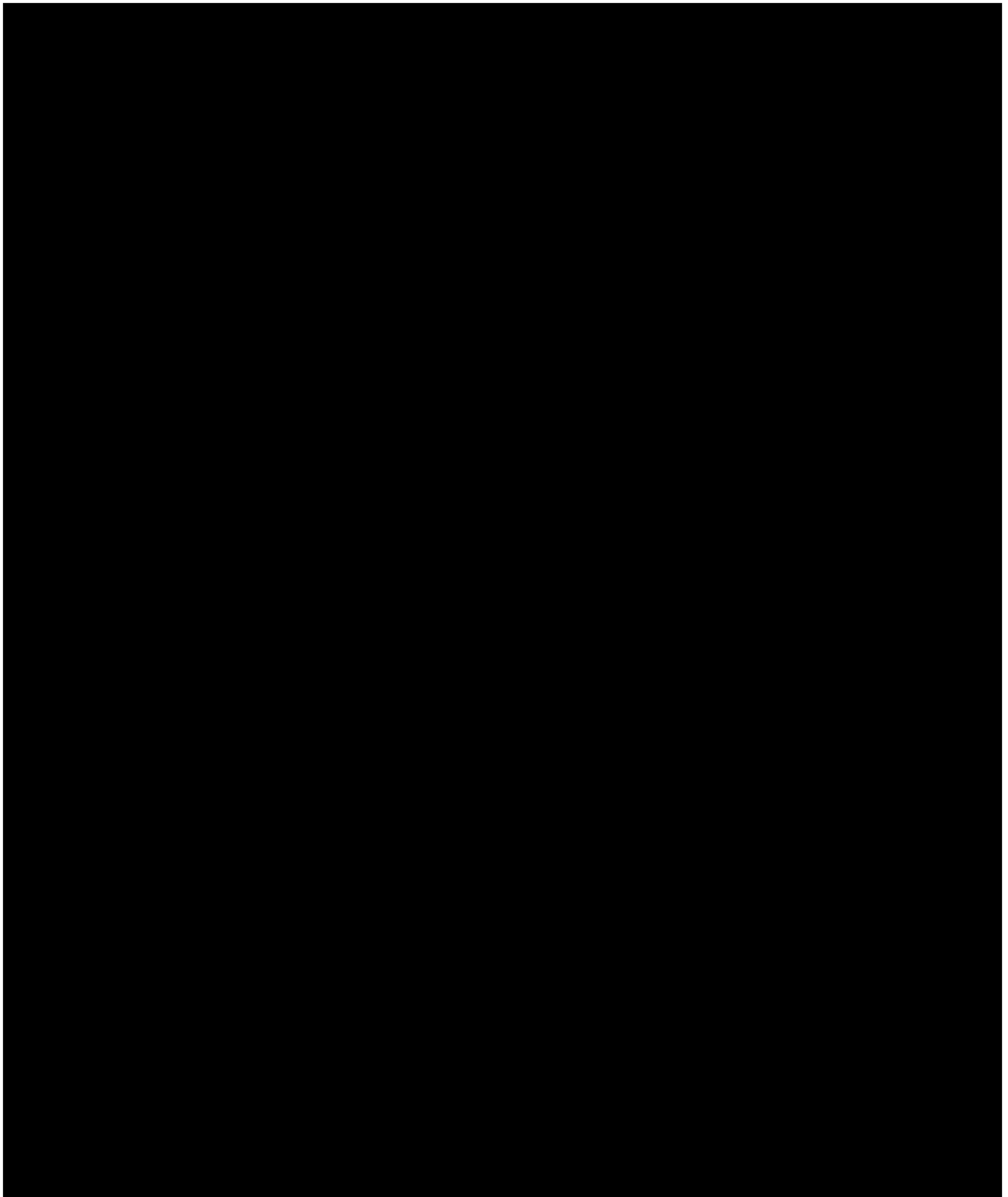
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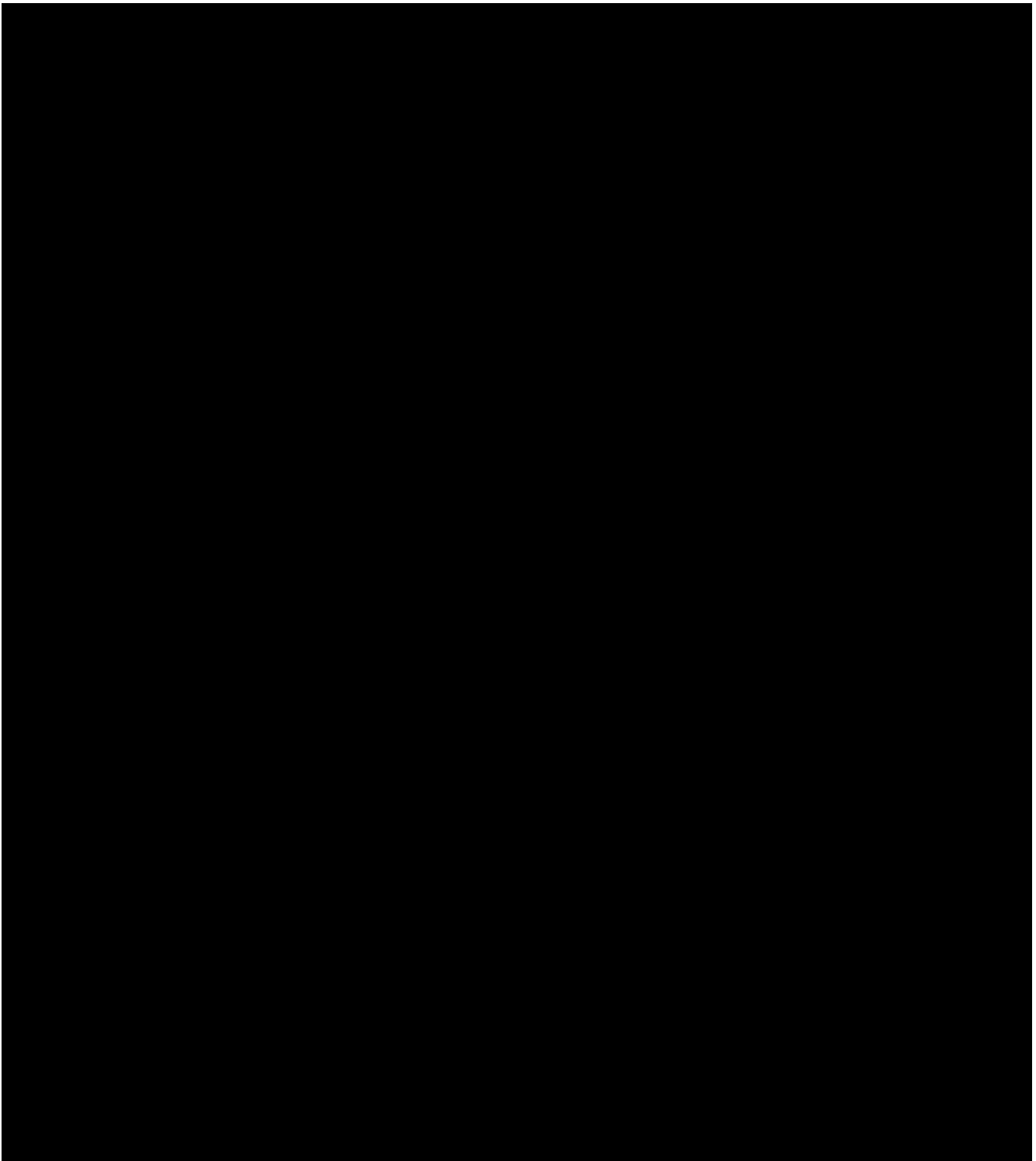


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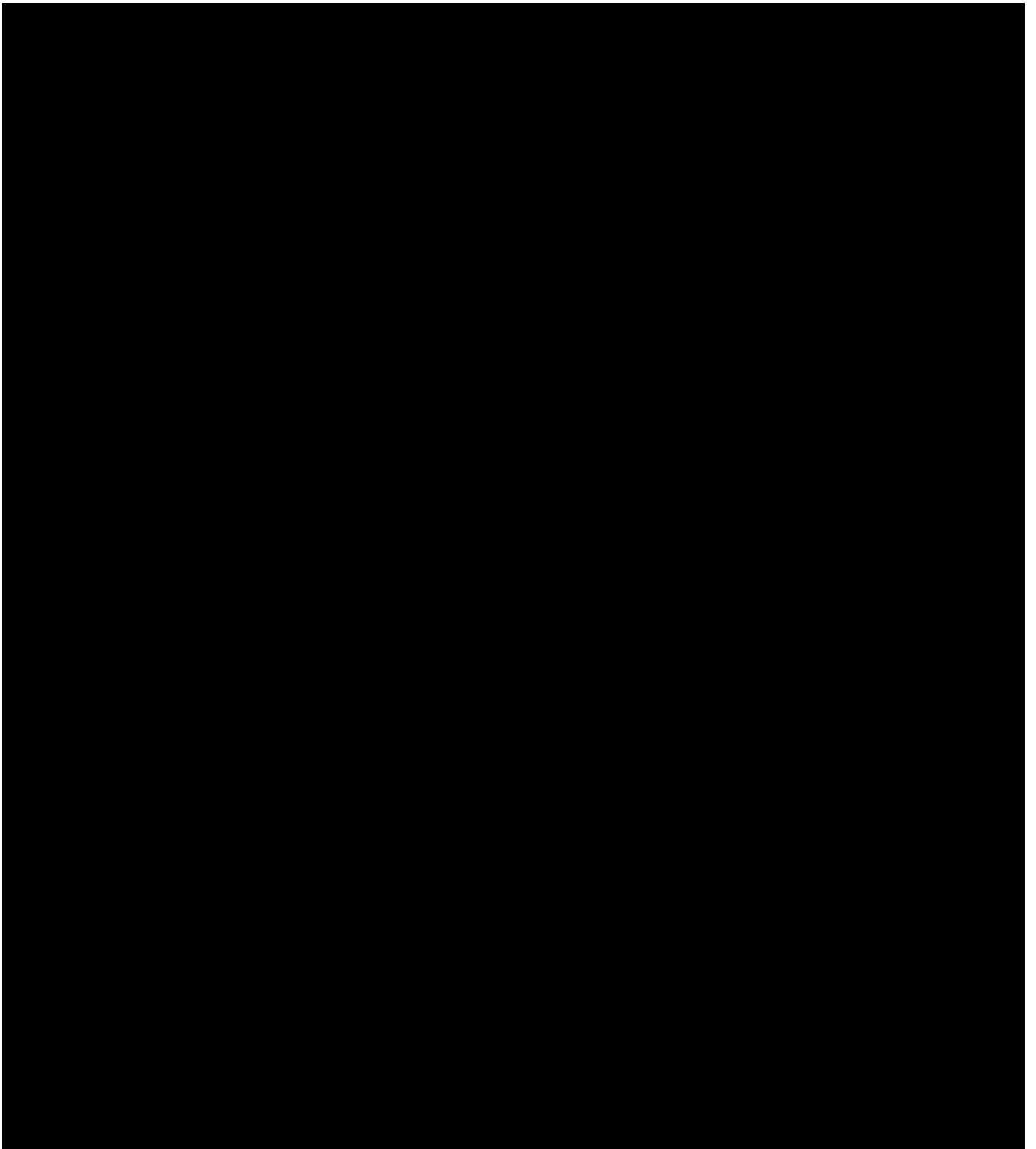


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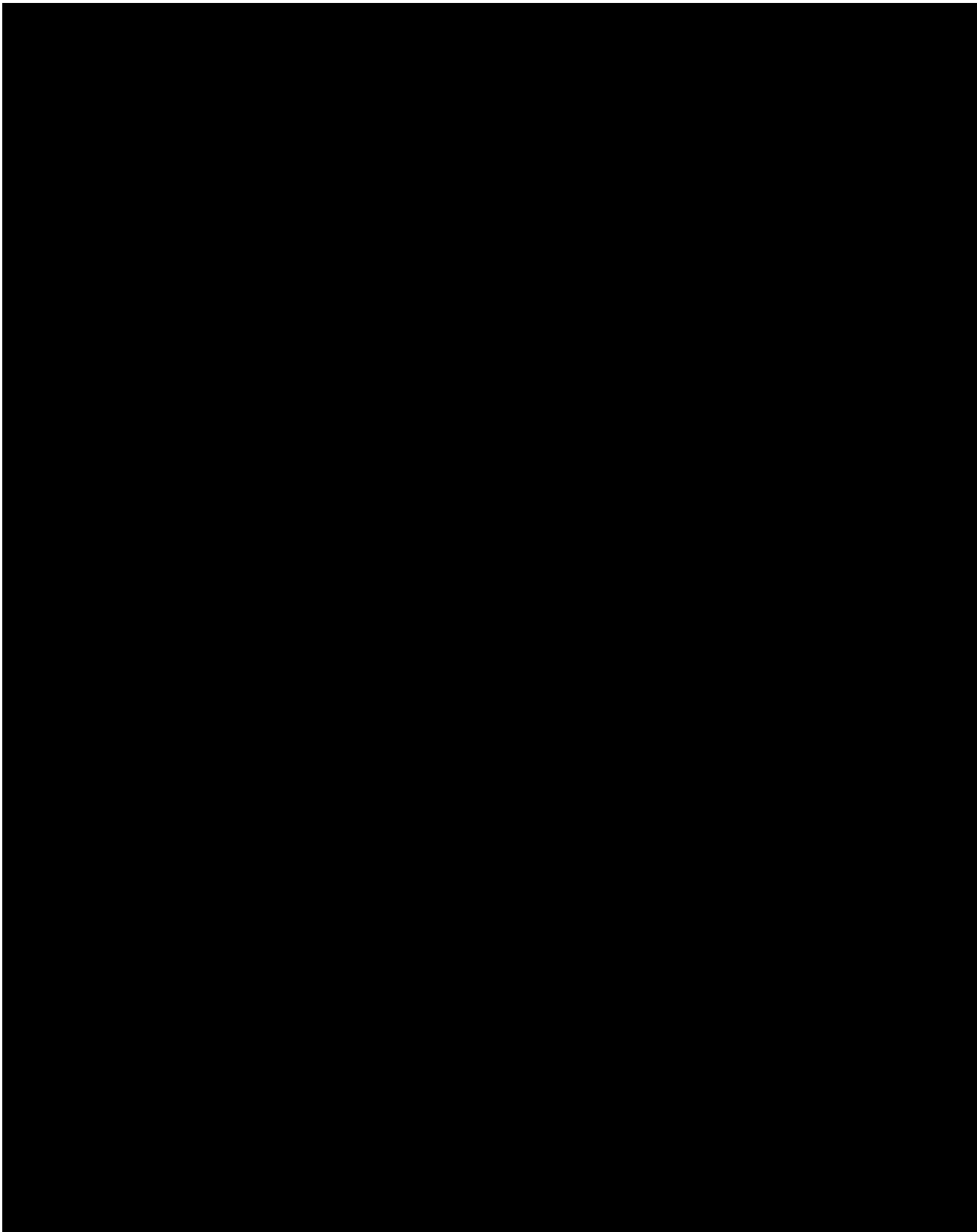


A small, solid black rectangular redaction box is positioned below a horizontal line, likely redacting a signature or name.

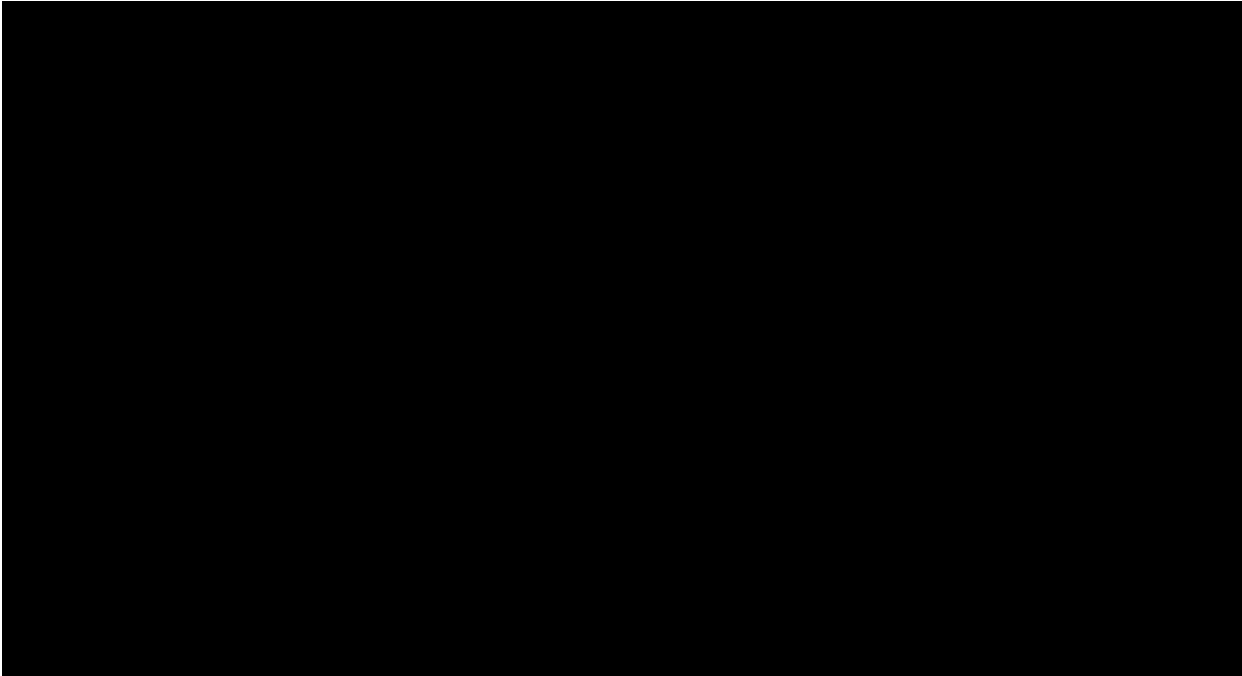
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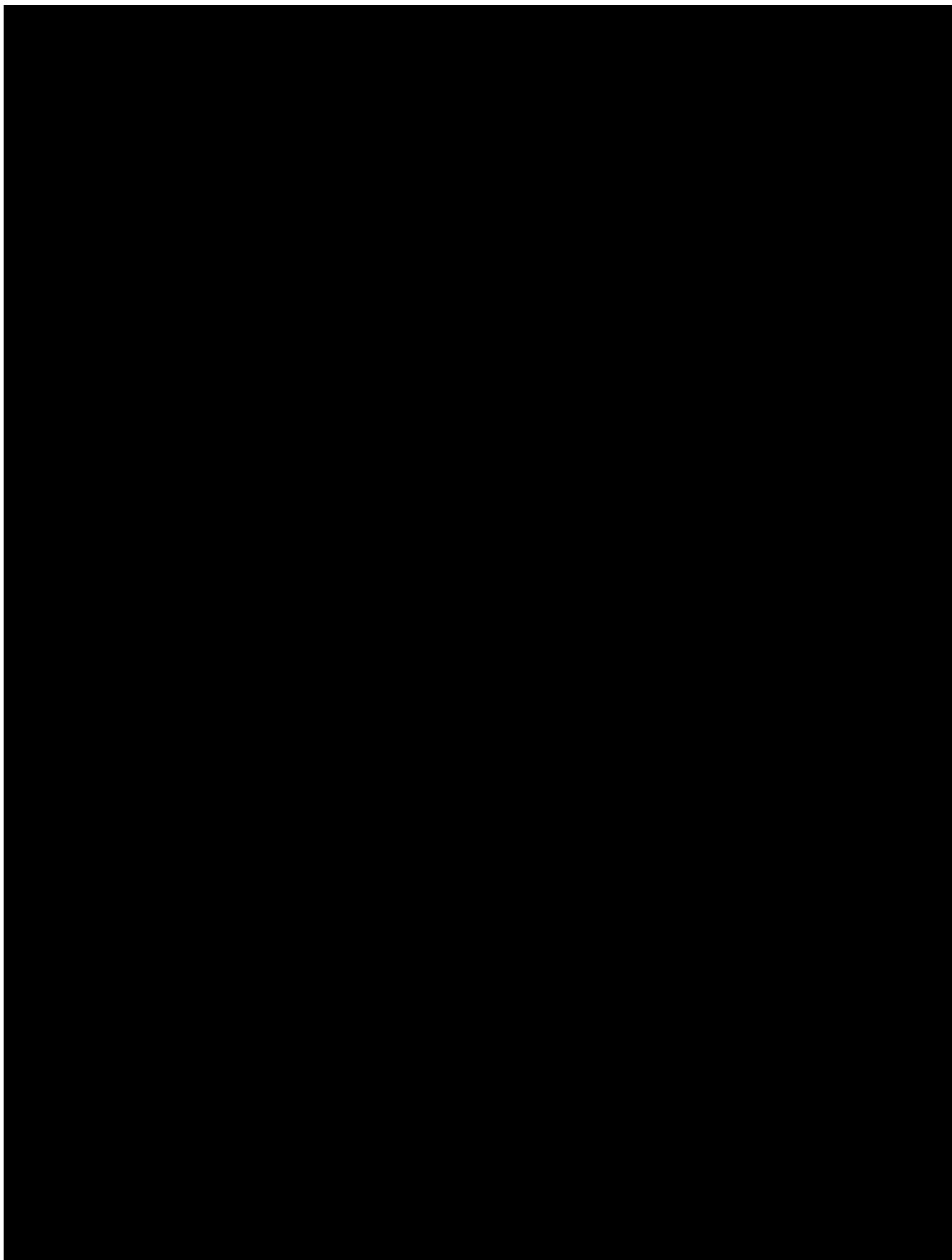
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2 **Q. Does this conclude your rejoinder testimony?**

3 A. Yes. I reserve the right to supplement my testimony as additional issues arise during the
4 course of this proceeding.