Application: A.25-06-XXX
Exhibit No.:
Witness: Jessica Kinnahan Foley

PREPARED DIRECT TESTIMONY OF
JESSICA KINNAHAN FOLEY
ON BEHALF OF
SOUTHERN CALIFORNIA GAS COMPANY

(CHAPTER 4 – ENVIRONMENTAL STUDIES)

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF CALIFORNIA

June 12, 2025

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PREPARED DIRECT TESTIMONY OF
JESSICA KINNAHAN FOLEY
(ENVIRONMENTAL STUDIES)

I. PURPOSE AND OVERVIEW OF TESTIMONY

The purpose of my direct testimony on behalf of Southern California Gas Company (SoCalGas) is to demonstrate the prudent and reasonable execution of SoCalGas's Angeles Link Phase 1 Environmental Studies. In its Application to Establish a Memorandum Account for the Angeles Link Project (Application (A.) 22-02-007) (Phase 1 Application), SoCalGas requested authorization to record costs to a memorandum account to study and develop Angeles Link.[1] In Decision (D.) 22-12-055 (Phase 1 Decision), the California Public Utilities Commission (Commission) authorized SoCalGas to record costs associated with Phase 1 activities.[2] In authorizing the Angeles Link Memorandum Account (ALMA), the Commission concluded that "the public interest is served if SoCalGas studies whether Angeles Link is feasible, cost-effective, and viable"[3] and that "it serves the public interest for SoCalGas to perform feasibility studies of the Project immediately."[4]

SoCalGas conducted over a dozen studies and produced an Environmental and Social Justice Community Engagement Plan (ESJ Plan)[5] and a Framework for Affordability Considerations (Affordability Framework) in Phase 1 (collectively, the Phase 1 Studies).[6] The Phase 1 Studies examined Angeles Link's viability, feasibility, cost effectiveness, and potential

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1 A.22-02-007, Application of Southern California Gas Company for Authority to Establish a Memorandum Account for the Angeles Link Project (February 17, 2022), *available at*: https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M451/K500/451500036.PDF.

2 Phase 1 Decision at 73 (Ordering Paragraph (OP) 1).

3 *Id.* at 68 (Conclusion of Law (COL) 4).

4 *Id.* at 16, 61-62 (Findings of Fact (FOF) 1, 3, 6, 7).

5 *See* Chapter 2 (Direct Testimony of Frank Lopez) for additional details.

6 *See* Chapter 1 (Direct Testimony of Shirley Arazi and Amy Kitson) for additional details.

public interest benefits to ratepayers and the broader community.[7] Additionally, the Phase 1 activities were performed with robust stakeholder engagement.

My testimony describes the activities associated with the Environmental Studies conducted during Phase 1. The costs associated with the Environmental Studies collectively amount to $4.4 million in operating and maintenance (O&M) expenditures and support the $24.3 million recorded to the ALMA.[8] The Environmental Studies include the following:

- Environmental Analysis (Environmental Analysis)
- Air Studies
  - Greenhouse Gas (GHG) Emissions Evaluation (GHG Study)
  - Hydrogen Leakage Assessment (Leakage Study)
  - Nitrogen Oxides (NOx) and Other Air Emissions Assessment (NOx Study)
- High Level Feasibility Assessment and Permitting Analysis (Permitting Analysis)
- Water Resources Evaluation (Water Evaluation)

My testimony provides the description and cost components for each of the Environmental Studies, explains how the Environmental Studies were executed in compliance and accordance with the Phase 1 Decision,[9] and demonstrates how the studies were prudently managed to control cost and achieve the deliverables outlined in the Phase 1 Decision while engaging with stakeholders throughout the process.

As demonstrated in my testimony and workpapers, these costs were prudently and reasonably incurred, and the associated revenue requirement is justified for rate recovery. To

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[7] In compliance with the Phase 1 Decision, SoCalGas made reports of the results and data of the Phase 1 Studies available to the public. The Decision recognized that sharing this information "should be beneficial to the development of the clean renewable hydrogen industry and thus serve the public interest." (Phase 1 Decision at 62.) The Phase 1 reports are available at: https://www.socalgas.com/regulatory/angeleslink.

[8] Expenditures for these activities were incurred from January 2023 through December 2024, with some discrete trailing charges in 2025. See Chapter 6 (Direct Testimony of Jenny Chhuor and Michael W. Foster) for details on the ALMA balance and associated revenue requirement requested for rate recovery in this Application.

[9] *See* Phase 1 Decision at 73-77 (OP 3(a), 3(c), 3(e), 3(h), 5, 7). The studies were scoped and conducted in compliance with the Phase 1 Decision in its entirety, which includes broader requirements than those required for cost recovery, including OP 6(b), 6(g), 6(h), 6(i), 6(n) (Phase 1 Decision at 75-77). Phase 1 Decision OP 6 requirements to advance to Phase 2 are being addressed in A.24-12-011.

facilitate the review process and for ease of reference, additional information regarding the Environmental Studies is included in my supporting workpapers. The information in this chapter provides a summary of the activities and associated costs.

II. COST COMPONENTS FOR ENVIRONMENTAL STUDIES

Table 1 below provides a summary of the fully loaded costs incurred by SoCalGas to prepare the Phase 1 Environmental Studies, totaling approximately $4.4 million. A combination of internal and external resources were utilized to effectively execute the Environmental Studies. Direct costs reflect labor and non-labor costs. Labor costs include SoCalGas personnel supporting Angeles Link, and non-labor costs include third-party contractor costs supporting the development of the studies as well as other miscellaneous costs.[10] Indirect costs reflect costs for overhead loaders.[11] As described in Chapter 6 (the Direct Testimony of Jenny Chhour and Michael W. Foster), the total ALMA balance of $24.3 million are the basis for the requested revenue requirement for cost recovery.

Table 1: Chapter 4 Total Costs (in millions)

Environmental Studies				
Study	**Labor**	**Non-Labor**	**Overheads**	**Total Loaded Costs**
Environmental Analysis	$0.2	$0.7	$0.2	$1.1
GHG Study	$0.1	$0.4	$0.1	$0.6
Leakage Study	$0.1	$0.3	$0.1	$0.5
NOx Study	$0.1	$0.6	$0.1	$0.8
Permitting Analysis	$0.1	$0.2	$0.1	$0.4
Water Evaluation	$0.1	$0.8	$0.1	$1.0
Total Costs	**$0.7**	**$3.0**	**$0.7**	**$4.4**

III. COMPLIANCE WITH PHASE 1 DECISION AND DESCRIPTION OF ENVIRONMENTAL STUDIES

In the Phase 1 Decision, the Commission provided that SoCalGas may seek recovery of Phase 1 costs if it satisfies the conditions set forth in OP 3 and demonstrates how the recorded

[10] *See* Chapter 1 (Direct Testimony of Shirley Arazi and Amy Kitson) for additional details.

[11] *See* Chapter 6 (Direct Testimony of Jenny Chhuor and Michael W. Foster) for additional details on the ALMA balance.

costs and activities meet the project-specific standards identified in OP 5. The Environmental Studies demonstrate compliance with the following requirements in OP 3 and OP 5:

- 3(a): Feasibility studies for the Angeles Link Project shall be restricted to the service of clean renewable hydrogen that is produced with a carbon intensity equal to or less than four kilograms of carbon dioxide-equivalent produced on a lifecycle basis per kilogram and does not use any fossil fuel in its production process.
- 3(c): SoCalGas shall study a localized hydrogen hub solution, under the specifications required to be eligible for federal funding provided through the Infrastructure Investment and Jobs Act, as part of Phase One.
- 3(e): SoCalGas shall conduct quarterly stakeholder engagement meetings, including quarterly meetings with Planning Advisory Group members. SoCalGas shall also identify and invite participation from community-based organizations that may potentially be impacted by the Project, including disadvantage communities and environmental social justice groups, in either the quarterly Planning Advisory Group meetings or some other stakeholder engagement process.
- 3(h): SoCalGas shall submit to the Commission's Deputy Executive Director for Energy and Climate Policy quarterly reports to provide an update of the Angeles Link Project and the feasibility studies, and to report on any preliminary results and findings. The reports shall not include any redacted data or finding unless SoCalGas is granted confidentiality of the data in accordance with General Order 66-D. The reports shall be made available to the public. SoCalGas shall solicit feedback from parties and the Planning Advisory Group members and include this feedback in the reports. SoCalGas shall serve these reports on the service list of this proceeding.
- 5(a): How did the planning process address affordability concerns in the development of the Project?
- 5(b): How did the planning process consider the impacts to disadvantaged communities and address environmental justice concerns in the development of the Project?

- 5(c): How did the planning process consider California environmental law and public policies in the development of the Project?
- 5(d): How did the planning process gather and address stakeholder concerns?
- 5(e): How did the planning process consider and evaluate Project alternatives, including a localized hydrogen hub or other decarbonization options such as electrification, their costs, and their environmental impacts?

The description of each study and how it complies with the Phase 1 Decision are provided below in Sections III.A. through III.D. The Environmental Studies considered clean renewable hydrogen as required by OP 3(a) and, in accordance with OP 3(e), OP 3(h), and OP 5(d), stakeholder feedback was gathered and incorporated where appropriate in the planning and execution of the studies.

A. Environmental Analysis

In accordance with the Phase 1 Decision,[12] the Environmental Analysis provided a desktop assessment of potential environmental impacts of the 1,300 miles of conceptual pipeline routes identified in the Preliminary Routing/Configuration Analysis (Routing Study),[13] as well as specified alternatives identified in the Project Options & Alternatives Study (Alternatives Study).[14] Together with the Permitting Analysis, the Environmental Analysis demonstrates how Angeles Link considers and would comply with California environmental laws and public policies consistent with OP 5(c).[15] The Environmental Analysis demonstrated that while there will be potential construction, operation, and maintenance impacts associated with Angeles Link, many of these impacts can potentially be minimized or avoided through established best management practices and avoidance measures.

B. Air Studies

In the Phase 1 Decision, the Commission acknowledged that Angeles Link could bring public interest benefits to the State because clean renewable hydrogen has the potential to

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[12] Phase 1 Decision at 73-77 (OP 3(a), 3(c), 3(e), 3(h), 5(a), 5(c)-(e), 6(i), 6(n)).

[13] *See* Chapter 5 (Direct Testimony of Katrina Regan) for additional details.

[14] *See* Chapter 3 (Direct Testimony of Vijai Atavane) for additional details.

[15] The Environmental Analysis considers California laws and public policies such as the California Environmental Quality Act (CEQA), CEQA Guidelines and California Endangered Species Act.

decarbonize the State and the Los Angeles Basin's energy future and bring economic opportunities and new jobs to the region.[16] The Phase 1 Studies confirm that Angeles Link could offer environmental and other public interest benefits to ratepayers and communities. In particular, the findings from the GHG Study and NOx Study demonstrate that Angeles Link can deliver substantial GHG reductions and improve air quality.

1. GHG Emissions Evaluation

The GHG Study examined Angeles Link's potential public interest benefits to ratepayers and the broader community. In accordance with the Phase 1 Decision,[17] the GHG Study evaluated GHG emissions in the context of environmental laws and public policies.[18] Specifically, the GHG Study assessed the potential GHG emissions reductions associated with displaced emissions from end users in the mobility, power generation, and hard-to-electrify industrial sectors while accounting for potential GHG emissions associated with new hydrogen infrastructure (i.e., third-party production and storage and pipeline transmission) to estimate the overall GHG emission reductions. Additionally, in response to stakeholder feedback, the study's estimates of overall GHG emission reductions accounted for the potential GHG emissions associated with hydrogen leakage from third-party production and storage and pipeline transmission and applied both the lowest global warming potential (GWP) 20 and highest (GWP 100) global warming potential values for hydrogen found in the literature, which enabled the overall projected GHG emission reductions provided in the GHG Study to be compared based on the different GWP values over a 20-year time horizon.

The GHG Study analyzed both the potential overall emission reductions for the market demand estimates for SoCalGas's service territory through 2045 (1.9 - 5.9 million metric ton per year (MMTPY)), as well as for Angeles Link's estimated throughput scenarios (0.5 - 1.5

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[16] Phase 1 Decision at 61 (FOF 1) ("The Angeles Link Project has the potential to bring public interest benefits to the state and especially the Los Angeles area, because clean renewable hydrogen has the potential to decarbonize the state's and the Los Angeles Basin's energy use and bring economic opportunities and new jobs to the Los Angeles region.").

[17] *Id.* at 73-77 (OP 3(a), 3(e), 3(h), 5(a), 5(c), 5(d) 6(n)).

[18] The GHG Study considers California laws and public policies such as the California Global Warming Solution Act (AB 32) and Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities.

MMTPY) as identified in the Demand Study.[19] The analysis shows that in 2045, based on various throughput scenarios, the Angeles Link system could result in a reduction of 4.5 to 9 million metric tons of carbon dioxide equivalent (CO2e) per year.[20] These GHG reductions are equivalent to removing approximately 725,000 to over 1 million gasoline passenger vehicles from the road, respectively.

2. Hydrogen Leakage Assessment

In accordance with the Phase 1 Decision,[21] the Leakage Study assessed the risks and mitigations for hydrogen leakage in the context of existing environmental laws and policies.[22] The assessment included a preliminary high-level volumetric estimate of potential for leakage associated with general hydrogen infrastructure (compression and transmission, as well as third-party production and third-party storage), and potential leakage associated specifically with Angeles Link infrastructure (i.e., transmission of hydrogen via pipeline, including compression). The study also evaluated potential mitigation measures in the design and engineering of new infrastructure, leak detection systems, and measurement methods with emerging tools and technologies.[23]

3. Nitrogen Oxide (NOx) and other Air Emissions Assessment

The NOx Study incorporated demand projections and Angeles Link throughput scenarios described in the Demand Study[24] to examine Angeles Link's potential public interest benefits to ratepayers and the broader community. In accordance with the Phase 1 Decision,[25] the NOx Study assessed the potential NOx emissions reductions associated with displaced emissions from

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[19] *See* Chapter 3 (Direct Testimony of Vijai Atavane) for additional details.

[20] GHG reductions are primarily attributable to the mobility sector, followed by the power generation and hard-to-electrify industrial end user sectors. While Angeles Link infrastructure would have associated emissions, the GHG Study highlights that they are small in comparison to the estimated GHG reductions associated with end users.

[21] Phase 1 Decision at 73-75 (OP 3(a), 3(e), 3(h), 5(a), 5(c), 5(d), 6(g)).

[22] The Leakage Study considers California laws and public policies such as the California Global Warming Solution Act (AB 32) and Greenhouse Gas Emission Standards for Crude Oil and Natural Gas Facilities (CARB Oil and Gas Rule).

[23] Angeles Link Phase 1 Studies Consolidated Report at 14.

[24] *Id.* at 16.

[25] Phase 1 Decision at 73-77 (OP 3(a), 3(e), 3(h) 5(a)-(d), 6(h)).

end users, primarily in the mobility sector, while accounting for potential NOx emissions associated with the transmission of hydrogen, third-party production, and third-party storage in the context of environmental laws and public policies.[26] The NOx Study also considered potential benefits to disadvantaged communities, consistent with OP 5(b), by including an appendix that depicts anticipated NOx reductions geographically by zip code and environmental justice communities by census tract. The geographic depiction of potential NOx reductions was included in the NOx Study in response to stakeholder feedback.[27] The study also evaluated impacts from volatile organic compounds (VOC) and diesel particulate matter (DPM). The analysis showed that in 2045 the Angeles Link system could result in a reduction of up to 5,200 tons per year of NOx emissions, primarily due to fuel displacement in the mobility sector. This value is equivalent to approximately 90% of the NOx reductions that the South Coast Air Quality Management District (South Coast AQMD) has proposed to be achieved by 2037 for total stationary (i.e., not mobile) commercial and large combustion source NOx control measures in their 2022 Air Quality Management Plan.

C. High-Level Feasibility Assessment & Permitting Analysis

In accordance with the Phase 1 Decision,[28] the Permitting Analysis evaluated approximately 1,300 miles of conceptual pipeline routes identified in the Routing Study in relationship to environmental law and public policies, specifically evaluating potential environmental and regulatory approvals that may be needed.[29] This evaluation included a high-level review of federal, state, and local jurisdictional lands and waters, military bases, existing transportation corridors, highway and railroad crossings, state and federally protected plants and wildlife, and land owned by special districts, and estimated permitting timelines.[30]

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[26] The NOx Study considers California laws and public policies such as the CARB Standard Emissions Tool and South Coast Air Quality Management District 2022 Air Quality Management Plan.

[27] Phase 1 Decision at 75 (OP 5(d)).

[28] *Id*. at 75-77 (OP 3(a), 3(e), 3(h), 5(a), 5(c), 5(d), 6(i), 6(n)).

[29] The Permitting Analysis considers California laws and public policies such as CEQA, CEQA Guidelines, the California Endangered Species Act, and Fish and Game Code.

[30] Permitting timelines may change if permit streamlining legislation is adopted that may impact permitting timelines for clean hydrogen projects.

D. Water Resources Evaluation

In accordance with the Phase 1 Decision,[31] the Water Evaluation identified the potential sources of water that could support third-party clean renewable hydrogen generation and estimated the costs associated for water supplies for third-party clean renewable hydrogen production (including water conveyance, treatment, and waste management).[32] This study evaluated the volume of water required and the availability of water resources (e.g., surface water, treated wastewater, groundwater, urban stormwater capture) for third-party clean renewable hydrogen production in Central and Southern California regions based on the demand projections and Angeles Link throughput scenarios in the Demand Study.[33]

IV. MANAGEMENT AND OVERSIGHT OF ENVIRONMENTAL STUDIES

SoCalGas reasonably and prudently managed the Environmental Studies by leveraging resources, maintaining financial oversight, and controlling costs.[34] As contemplated in the Phase 1 Decision, SoCalGas began conducting the feasibility studies immediately.[35] To facilitate a quick ramp up in selecting vendors, SoCalGas utilized existing Master Service Agreements (MSA), based on market rates stemming from previous competitive solicitations, as well as standalone agreements. These MSAs provide pre-negotiated terms, including market-based billing rates which offer cost predictability and typically do not escalate over the contract term. Additionally, the MSAs enabled SoCalGas to have greater certainty about the firm's capabilities, safety record, dedicated staff and staffing levels, insurance requirements, and commitment to engaging with diverse businesses.

As explained in Chapter 2 (Direct Testimony of Frank Lopez), throughout the development of the studies, in accordance with OP 3(e) and 5(d), SoCalGas presented

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[31] Phase 1 Decision at 73-77 (OP 3(a), 3(e), 3(h), 5(a), 5(c), 5(d), 6(b)).

[32] The Water Evaluation considers California laws and public policies such as the Sustainable Groundwater Management Act.

[33] *See* Chapter 3 (Direct Testimony of Vijai Atavane) for additional details.

[34] *See* Chapter 1 (Direct Testimony of Shirley Arazi and Amy Kitson) for more information on cost control measures in Phase 1 and Chapter 4 Workpapers for more information on cost control measures related to the Environmental Studies.

[35] Phase 1 Decision at 63 (FOF 13) ("Given the confluence of current events, including recent federal statutes, regional initiatives, and local interest, public interest is served if SoCalGas begins conducting feasibility studies of the Angeles Link Project immediately.").

opportunities for stakeholders to provide feedback at four key milestones while conducting each study: (1) scope of work, (2) technical approach, (3) preliminary data and findings, and (4) draft study.[36] These milestones were selected because they represented critical points at which relevant feedback could meaningfully influence the Phase 1 Studies. SoCalGas considered stakeholder feedback and incorporated feedback where appropriate. Responses to stakeholder feedback were provided in quarterly reports in accordance with OP 3(h) and 5(d).[37] Throughout the development of the studies, changes to scope, schedule, and/or cost resulted from stakeholder feedback, study development, as well as interdependencies with other Phase 1 studies.

The following sections describe the prudent development, management, and oversight of the Environmental Studies.

A. Environmental Analysis

As described in Section III.A, SoCalGas prepared the Environmental Analysis in accordance with the Phase 1 Decision to evaluate potential environmental impacts of conceptual pipeline routes and the identified alternatives. This analysis directly informed the Alternatives Study—alternatives that met initial screening criteria were carried forward for environmental evaluation, and the results of the high-level environmental analysis were incorporated back into the Alternatives Study. The O&M costs incurred to develop the Environmental Analysis total $1.1 million and include labor and non-labor costs.[38] The following sections describe the activities undertaken throughout the development of the Environmental Analysis—from the

[36] *See* Chapter 2 (Direct Testimony of Frank Lopez) for further details regarding the stakeholder engagement process.

[37] The quarterly reports provided status updates on the feasibility studies during Phase 1, identified and responded to stakeholder feedback, and attached transcripts of PAG and CBOSG meetings and materials presented at these meeting held during that quarter. The quarterly reports were submitted to the California Public Utilities Commission (Commission) and are published on SoCalGas's website, *available at:* https://www.socalgas.com/regulatory/angeleslink. *See also* my accompanying Chapter 4 Workpapers for details on stakeholder feedback incorporated into the Environmental Studies.

[38] Refer to my accompanying Chapter 4 Workpapers for additional cost information.

initial contracting stage, to integration of stakeholder feedback at the four key milestones (scope, technical approach, preliminary findings, and draft study), to completion of the final study.

1. Initiation – Scope of Work

SoCalGas initiated work on the Environmental Analysis[39] in June 2023 by selecting Insignia to support development of the study. Insignia was engaged through an existing MSA, which enabled SoCalGas to streamline the contracting process, control costs, and expedite the start of the work with a pre-vetted contractor. SoCalGas coordinated with Insignia to develop the scope of work. The objective of the study was to evaluate the potential environmental impacts of Angeles Link and the identified. The analysis relied on the conceptual pipeline routes as identified in the Routing Study[40] and the alternatives identified for further evaluation in the Alternatives Study.[41] Given the Phase 1 feasibility stage, the study scope focused on a desktop-level evaluation abased on the level of detail known in Phase 1.

The Environmental Analysis relied on the criteria from the California Environmental Quality Act (CEQA)[42] Guidelines Appendix G checklist as a framework for the evaluation.[43] This checklist, which is widely adopted by agencies throughout California, identifies key environmental factors typically evaluated under CEQA. Agencies at times tailor the Appendix G checklist to address specific needs or project circumstances. The Environmental Analysis's

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[39] The Environmental Analysis was initially titled the *Environmental and Social Justice Analysis*; however, the study was subsequently bifurcated into two separate studies—the *Environmental Analysis* and *Environmental Social Justice (ESJ) Community Engagement Plan and ESJ Screening*. *See* Chapter 2 (Direct Testimony of Frank Lopez) for more information on the Environmental Social Justice (ESJ) Community Engagement Plan and ESJ Screening.

[40] *See* Chapter 5 (Direct Testimony of Katrina Regan) for details regarding the Routing Study.

[41] *See* Chapter 3 (Direct Testimony of Vijai Atavane) for details regarding the Alternatives Study.

[42] CEQA generally requires state and local government agencies to inform decision makers and the public about the potential environmental impacts of proposed projects, and to reduce those environmental impacts to the extent feasible. The laws and rules governing the CEQA process are contained in the CEQA statute (Public Resources Code Section 21000 and following), the CEQA Guidelines (California Code of Regulations, Title 14, Section 15000 and following), published court decisions interpreting CEQA, and locally adopted CEQA procedures. *See* California Governor's Office of Land Use and Climate Innovation, *Getting Started with CEQA*, *available at:* https://lci.ca.gov/ceqa/getting-started/.

[43] Association for Environmental Professionals (AEP), *2025 California Environmental Quality Act (CEQA) Statute and Guidelines* at 359 (Appendix G: Environmental Checklist Form), *available at:* https://www.califaep.org/docs/CEQA_Handbook_2025combined.pdf.

study scope similarly used the Appendix G as a framework but tailored the checklist to provide a desktop review that was appropriate for the Phase 1 feasibility stage.

In accordance with OP 3(e) and OP 5(d), SoCalGas shared and presented the scope of work to the PAG and CBOSG in July 2023. Stakeholders provided feedback that resulted in further clarification of the CEQA environmental factors to be addressed in the study. Responses to stakeholder feedback were provided the quarterly report in accordance with OP 3(h) and OP 5(d).[44]

2. Planning – Technical Approach

The technical approach for the Environmental Analysis was developed collaboratively by SoCalGas and Insignia. The technical approach organized the environmental evaluation by dividing the conceptual pipeline routes into 13 study areas based on geographic features and the presence of environmental resources. The analysis was structured around key environmental factors and environmental social justice considerations, consistent with both stakeholder feedback and the Phase 1 Decision. The technical approach focused on the following environmental factors: (1) air quality and GHG emissions; (2) biological resources; (3) cultural resources and tribal cultural resources (TCRs); (4) energy; (5) hazards and hazardous materials; (6) hydrology and water quality; and (7) land use and planning. In accordance with OP 3(e) and OP 5(d), SoCalGas shared the technical approach with the PAG and CBOSG in September 2023. No stakeholder comments were received regarding the technical approach.

3. Execution

a. Preliminary Findings

The preliminary findings presented the initial results of the Environmental Analysis, offering early insights into potential impacts along the conceptual pipeline routes and identified alternatives. The preliminary findings were developed through a desktop analysis of publicly available datasets, Geographic Information Systems (GIS) mapping of environmental constraints, and review of sensitive environmental features by study area. The analysis also included coordination with other Phase 1 Studies to confirm consistency across workstreams. The findings provided a high-level summary of potential environmental impacts related to the conceptual pipeline routes and the identified alternatives.

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[44] *See* Q3 2023 Angeles Link Phase 1 Quarterly Report Appendices at 3-68.

In accordance with OP 3(e) and OP 5(d), preliminary findings were provided to the PAG and CBOSG in June 2024. Stakeholders requested additional detail in two areas: (1) the overall preliminary findings, and (2) the 200-foot width of the study corridor used in the study. In response to stakeholder feedback, the study provided greater detail on the evaluation of environmental impacts and included a new figure to provide a visual representation of the 200-foot-wide corridor in relation to the Angeles Link conceptual pipeline routes. Responses to stakeholder feedback were provided in the quarterly report in accordance with OP 3(h) and OP 5(d).[45]

b. Draft Study and Final Study

The draft study compiled analyses and research, expanded on the preliminary findings, and incorporated stakeholder feedback where appropriate. In accordance with OP 3(e) and OP 5(d), the draft study was shared with stakeholders in July 2024, followed by a presentation at the PAG and CBOSG. These presentations provided an overview of key findings and facilitated opportunities for stakeholder questions. In response to stakeholder feedback, the final study included enhanced map detail, as well as clarifications regarding hydrogen transport safety measures and the adequacy of proposed avoidance and minimization measures. Responses to stakeholder feedback were provided in the quarterly report in accordance with OP 3(h) and OP 5(d).[46] The final study was published in December 2024.

B. Air Studies

As described in Section III.B, and in accordance with the Phase 1 Decision, the Air Studies examined the technical feasibility and potential public interest benefits of Angeles Link. These studies include the GHG Study, Leakage Study, and the NOx Study. The scope and activities associated with the Air Studies evolved over time, informed by stakeholder feedback and in alignment with the Phase 1 Decision. The O&M costs incurred to prepare the Air Studies total $1.9 million and include labor and non-labor costs.[47] The following sections describe the activities undertaken throughout the development of the Air Studies—from the initial contracting stage, to integration of stakeholder feedback at four key milestones (scope, technical approach,

[45] *See* Q2 2024 Angeles Link Phase 1 Quarterly Report Appendices at 396-556.

[46] *See* Q3 2024 Angeles Link Phase 1 Quarterly Report Appendix 3: SoCalGas Response to Comments.

[47] *See* Chapter 3 Workpapers (Atavane) for additional information.

preliminary findings, and draft study), to completion of the final study.

1. Initiation & Planning –Scope of Work & Technical Approach

Given the interrelated nature of the Air Studies, SoCalGas developed a unified scope of work and technical approach to guide all three studies under a common framework. In 2023, SoCalGas conducted a competitive bid process through existing MSAs to support the Angeles Link Air Studies, allowing SoCalGas to control costs, streamline contracting, and quickly initiate work with a pre-vetted contractor. A single contractor, Stantec, was selected to lead this effort, leveraging its technical expertise and desktop/literature review capabilities across all three studies. The scope of work and technical approach were designed to assess the potential public health benefits associated with air emission reductions and to leverage data gathering across the three studies. The scope of work and technical approach were developed in collaboration with SoCalGas, Stantec, and stakeholder input where appropriate.

In accordance with OP 3(e) and OP 5(d), the scope of work and technical approach were shared with the PAG and CBOSG in July and September 2023, respectively. In response to stakeholder feedback, SoCalGas incorporated an additional global warming potential (GWP) value into its analysis and reviewed additional literature suggested by stakeholders. Responses to stakeholder feedback were documented in the quarterly reports in accordance with OP 3(h) and OP 5(d).[48]

Subsequently, the studies continued in parallel addressing each of the remaining key milestones (preliminary findings and data, draft study, and final study). Given the nuances of each study, the studies are discussed separately below.

2. Execution

a. GHG Emissions Evaluation

i. Preliminary Findings

The preliminary findings of the GHG Study provided an early opportunity to assess public interest benefits, align assumptions, obtain stakeholder input on evaluation criteria, and refine the analysis. These findings estimated potential GHG emission reductions associated with Angeles Link and identified opportunities to further minimize emissions. In accordance with

[48] *See* Q4 2023 Angeles Link Phase 1 Quarterly Report Appendices at 167-211, *see also* Q1 2024 Angeles Link Phase 1 Quarterly Report Appendices at 327-418.

OP 3(e) and OP 5(d), the preliminary findings were provided to PAG and CBOSG in February 2024. The preliminary findings included potential GHG emissions reductions associated with projected hydrogen demand in SoCalGas's service territory by 2045, as well as the potential reductions associated with the specific Angeles Link throughput scenarios.[49]

SoCalGas commented that the study should address volumetric leakage estimates and potential impacts from leakage. Stakeholders also commented on the potential for GHG emissions from the conveyance and treatment of water to supply third-party clean renewable hydrogen production. These concerns were addressed in the Leakage Study and Water Evaluation. Responses to stakeholder feedback was provided in the quarterly report in accordance with OP 3(h) and OP 5(d).[50]

ii. Draft Study and Final Study

The draft study compiled analyses and research, developed collaboratively by SoCalGas and Stantec. In accordance with OP 3(e) and OP 5(d), the draft study was shared with stakeholders in July 2024. In response to stakeholder feedback, the study incorporated both the lowest (GWP) 20 and highest (GWP 100) global warming potential values for hydrogen, reflecting the lowest and highest values found in the literature. This approach allowed for comparison of GHG emissions reduction projections based on the different GWP values. Responses to stakeholder feedback was provided in the quarterly report in accordance with OP 3(h) and OP 5(d).[51] The final study was published in December 2024 and demonstrates that Angeles Link could provide significant public interest benefits to ratepayers and the broader community (e.g., GHG emissions reductions of up to 9 MMT/year CO2e per year).

b. Leakage Study

i. Preliminary Findings

The preliminary findings summarized the initial results of the Leakage Study, providing early insights into potential leakage estimates and allowing for early alignment of assumptions, stakeholder input on evaluation criteria, and refinement of analysis prior to finalization. In

[49] A preview of the preliminary findings for the GHG Study were presented to the PAG and CBOSG in December 2023. During that preview, only the potential GHG emissions reductions associated with the projected demand for hydrogen in SoCalGas's service territory was presented.

[50] *See* Q1 2024 Angeles Link Phase 1 Quarterly Report Appendices at 327-418.

[51] *See* Q3 2024 Angeles Link Phase 1 Quarterly Report Appendix 3: SoCalGas Response to Comments.

accordance with OP 3(e) and OP 5(d), the preliminary findings were provided to the PAG and CBOSG in February 2024. Stakeholder comments focused on providing greater detail regarding potential leakage of end users. In response to stakeholder comments, SoCalGas expanded the scope of the Leakage Study to include hydrogen leakage rates for each sub-sector within the three primary sectors of potential end-users (mobility, power generation, and hard-to-electrify industrial). Responses to stakeholder feedback was provided in the quarterly report in accordance with OP 3(h) and OP 5(d).[52]

ii. Draft Study and Final Study

The draft study compiled analyses and research, developed collaboratively by SoCalGas and Stantec. Preliminary findings were developed through a desktop analysis of potential Angeles Link infrastructure to address leakage. In accordance with OP 3(e) and OP 5(d), the draft study was shared with the PAG and CBOSG in May 2024. In response to stakeholder feedback, the draft study incorporated a high-level range of volumetric estimates of the potential for leakage associated with Angeles Link infrastructure as well as leakage associated with third-party producers and storage. The draft study also reviewed relevant literature provided by stakeholders where applicable. Responses to stakeholder feedback was provided in the quarterly report in accordance with OP 3(h) and OP 5(d).[53] The final study was published in December 2024.

c. NOx and Other Air Emissions Assessment

i. Preliminary Findings

The preliminary findings of the NOx Study provided an early opportunity to assess potential public interest benefits, align assumptions, gather stakeholder input on evaluation criteria, and refine analysis prior to finalization. Preliminary findings were developed through a desktop analysis of potential Angeles Link infrastructure and third-party production and storage, as well as end users to address NOx, VOC, and DPM. Estimates were based on hydrogen demand in the SoCalGas service territory and Angeles Link throughput.

In accordance with OP 3(e) and OP 5(d), preliminary findings for the NOx Study were presented to the PAG and CBOSG in December 2023 and subsequently published in February

[52] *See* Q1 2024 Angeles Link Phase 1 Quarterly Report Appendices at 327-418.

[53] *See* Q2 2024 Angeles Link Phase 1 Quarterly Report at Appendices at 396-556.

2024.[54] Stakeholders provided feedback requesting greater detail on the NOx emissions methodology and impacts to disadvantaged communities, which were incorporated into the study where appropriate. Responses to stakeholder feedback were provided in the quarterly report.[55]

ii. Draft Study and Final Study

The draft study compiled analyses and research, developed collaboratively by SoCalGas and Stantec. The draft study was developed through a desktop analysis of potential Angeles Link infrastructure to address NOx emissions. In accordance with OP 3(e) and OP 5(d), the draft study was shared with stakeholders in July 2024. Stakeholders requested greater detail around projected NOx emissions, particularly in disadvantaged communities. Stakeholders also recognized the value of a sector-specific breakdown of emissions reductions, particularly the significant benefits in the mobility sector. In response to stakeholder feedback, SoCalGas developed a new appendix containing sixteen GIS maps that graphically depict where projected NOx emissions reductions would occur based on the demand and throughput scenarios. Responses to stakeholder feedback were provided in the quarterly report in accordance with OP 3(h) and OP 5(d).[56] SoCalGas released the Final NOx Study in December 2024 which confirmed that Angeles Link could bring public interest benefits to the State through improved air quality (e.g., NOx reductions of up to 5,200 tons per year).

C. High-Level Feasibility & Permitting Assessment

As described in Section III.C, and in accordance with the Phase 1 Decision, SoCalGas developed the Permitting Analysis to evaluate the permitting requirements that could be potentially applicable to Angeles Link. The O&M costs incurred to develop the Permitting Analysis total $0.4 million and include labor and non-labor costs.[57] The following sections describe the activities undertaken throughout the development of the Permitting Analysis—from the initial contracting stage, to integration of stakeholder feedback at four key milestones (scope, technical approach, preliminary findings, and draft study), to completion of the final study.

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[54] A preview of the preliminary findings for the NOx Study were presented to the PAG and CBOSG in December 2023. During that preview, only the potential NOx emissions reductions associated with the projected demand for hydrogen in SoCalGas's service territory was presented.

[55] *See* Q1 2024 Angeles Link Phase 1 Quarterly Report Appendices at 327-418.

[56] *See* Q3 2024 Angeles Link Phase 1 Quarterly Report Appendix 3: SoCalGas Response to Comments.

[57] Refer to my accompanying Chapter 4 Workpapers for additional cost information.

1. Initiation & Planning – Scope of Work & Technical Approach

To support the development of the Permitting Analysis, SoCalGas selected Rincon in April 2023 through an existing MSA. This approach allowed SoCalGas to control costs, streamline contracting, and, consistent with the Phase 1 Decision, initiate work immediately using a pre-vetted contractor. SoCalGas and Rincon collaborated to develop the scope of work to evaluate initial route configurations in relationship to federal and state regulations and requirements. The approach to the study included an evaluation by pipeline segment as identified in the Routing Study of the following information: (1) potential environmental permit requirements including but not limited to: (a) federal, state and local jurisdictions with environmental permitting authority; (b) environmental permits potentially triggered; and (c) high level permitting schedule; (2) discussion of environmental review subject to CEQA and/or NEPA including potential lead agencies; and (3) identification of permitting pathways for conceptual pipeline routes, including a discussion of environmental constraints that could be imposed on conceptual pipeline routes. In accordance with OPs 3(e) and 5(d), SoCalGas shared the scope of work and technical approach with the PAG and CBOSG in July 2023. No stakeholder feedback was received on the initial scope of work or technical approach.

2. Execution

a. Preliminary Findings

The preliminary findings offered an early assessment of potential permitting requirements and associated timelines, based on conceptual pipeline routes identified in the Routing Study.[58] In accordance with OP 3(e) and 5(d), SoCalGas provided the preliminary findings to the PAG and CBOSG in April 2024. Stakeholders commented on the level of detail in the preliminary findings, noting the preliminary nature of the conceptual pipeline routes. Responses to stakeholder feedback was provided in the quarterly report in accordance with OP 3(h) and 5(d).[59]

b. Draft Study and Final Study

The draft study was released in July 2024. Only one stakeholder comment letter was received, which addressed broader Phase 1 Studies (specifically related to GHG emissions and NOx emissions) rather than the Permitting Analysis itself. Accordingly, no changes were made

[58] *See* Chapter 5 (Direct Testimony of Katrina Regan) for details regarding the Routing Study.

[59] *See* Q3 2024 Angeles Link Phase 1 Quarterly Report Appendix 3: SoCalGas Response to Comments.

to the Permitting Analysis in response to that feedback. The final study was published in December 2024.

D. Water Resources Evaluation

As described in Section III.D, and in accordance with the Phase 1 Decision, SoCalGas prepared the Water Evaluation to assess the potential sources of water that could support third-party clean renewable hydrogen generation and to estimate the costs associated with water supplies for third-party clean renewable hydrogen production. The O&M costs incurred to develop the Water Evaluation total $1 million and include labor and non-labor costs.[60] The following sections describe the activities undertaken throughout the development of the Water Evaluation —from the initial contracting stage, to integration of stakeholder feedback at four key milestones (scope, technical approach, preliminary findings, and draft study), to completion of the final study.

1. Initiation – Scope of Work

In 2023, SoCalGas selected Rincon Consultants, with Jacobs Engineering as a subcontractor, to support the Water Evaluation. Rincon was selected through an existing MSA, allowing SoCalGas to control costs, streamline contracting, and, consistent with the Phase 1 Decision, begin studying Angeles Link immediately using a pre-vetted contractor. Additionally, the Rincon-Jacobs partnership allowed SoCalGas to leverage Rincon's regulatory and policy expertise alongside Jacob's engineering expertise. SoCalGas and Rincon/Jacobs collaborated to develop the scope for the study. The Water Evaluation scope of work included the identification and evaluation of potential water sources and evaluation of potential risks associated with access to water supplies that aligned with demand and Angeles Link throughput scenarios identified in the Demand Study.

In accordance with OP 3(e) and OP 5(d), the scope of work was shared with and presented to the PAG and CBOSG in July 2023. Stakeholders provided feedback on water sources and availability to support hydrogen production and local community impacts. Responses to stakeholder feedback were provided in the quarterly report in accordance with OP 3(h) and OP 5(d).[61]

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[60] Refer to my accompanying Chapter 4 Workpapers for additional cost information.

[61] *See* Q3 2023 Angeles Link Phase 1 Quarterly Report Appendices at 3-68.

2. Planning – Technical Approach

The technical approach outlined the structured approach for evaluating water resources and availability and detailed the activities identified in the scope of work. The technical approach was developed collaboratively by Rincon, Jacobs, and SoCalGas. As the study progressed, the technical approach was updated to modify portions of the initial scope of work based on what was necessary at the feasibility stage. In accordance with OP 3(e) and OP 5(d), SoCalGas shared the technical approach with the PAG and CBOSG in September 2023. Responses to stakeholder feedback were provided in the quarterly report in accordance with OP 3(h) and OP 5(d).[62]

3. Execution

c. Preliminary Findings

The preliminary findings provided early insights into water availability, allowing for alignment of assumptions, stakeholder input on evaluation criteria, and refinement of analysis prior to finalization. Preliminary findings were developed through desktop analysis of using publicly available datasets, GIS mapping of water resources, and coordination with other Phase 1 Studies. In accordance with Phase 1 Decision OP 3(e) and OP 5(d), preliminary findings were released and presented to the PAG and CBOSG in February 2024. In response to stakeholder feedback, the study was expanded to include a high-level, qualitative consideration of potential indirect GHG emissions from water conveyance and treatment. Responses to stakeholder feedback was provided in the quarterly report in accordance with OP 3(h) and OP 5(d).[63]

d. Draft Study and Final Study

The draft study compiled analyses and research and incorporated stakeholder feedback where appropriate. In accordance with OP 3(e) and OP 5(d), the draft study was shared with the PAG and CBOSG in July 2024. Stakeholders provided feedback on the availability of water for specific potential hydrogen third-party production areas given potential geographic challenges, cost considerations, and supply constraints. Responses to stakeholder feedback were provided in the quarterly reports in accordance with OP 3(h) and OP 5(d).[64] The final study was released in

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[62] *See* Q4 2023 Angeles Link Phase 1 Quarterly Report Appendices at 167-211.

[63] *See* Q1 2024 Angeles Link Phase 1 Quarterly Report Appendices at 327-418.

[64] *See* Q3 2024 Angeles Link Phase 1 Quarterly Report Appendix 3: SoCalGas Response to Comments.

December 2024.

V. CONCLUSION

My testimony describes the reasonable and prudent execution of the Environmental Studies. The Phase 1 Studies, including the Environmental Studies, confirmed Angeles Link's viability, feasibility, cost effectiveness, and potential public interest benefits to ratepayers and the broader community. The costs presented herein were incurred to conduct the Environmental Studies in accordance with the Phase 1 Decision and include the integration of stakeholder feedback at key milestones throughout the process. Additional information supporting the reasonableness of the costs incurred are contained in the accompanying workpapers. Based on the information contained in my testimony and supporting workpapers, the Commission should find reasonable the costs incurred in executing the Environmental Studies.

This concludes my prepared direct testimony.

VI. WITNESS QUALIFICATIONS

My name is Jessica Kinnahan Foley. I was employed by SoCalGas from 2014 to 2018 and again beginning in 2020. I have held positions of increasing responsibility in Environmental Services, Emergency Management, Construction, Clean Energy Innovations and currently in Integrity Management & Strategic Planning. My current position is Regulatory Strategy and Financial Controls Manager.

I hold a Bachelor's degree in Environmental Studies from University of California, Santa Barbara, and a Master in Business Administration in Energy from the University of Oklahoma. I am also a Certified Planner through the American Institute of Certified Planners, a subsidiary of the American Planning Association.

Prior to joining SoCalGas, I was employed at the County of Santa Barbara and subsequently as a consultant, where I managed environmental, siting, permitting and licensing activities for energy project, including wind, solar, battery energy storage and natural gas, as well as residential and commercial projects.

I have not previously testified before the Commission.