SOUTHERN CALIFORNIA GAS COMPANY

AUTHORITY TO ESTABLISH A MEMORANDUM ACCOUNT FOR THE ANGELES LINK PROJECT

(A.22-02-007)

(DATA REQUEST EDF-SCG-01)

Date Received: May 29, 2022; Date Responded: June 14, 2022

QUESTION 1:

Please describe the process by which Southern California Gas Company (SoCalGas) will bring each phase of Angeles Link before the California Public Utilities Commission (Commission). In this description, please describe how SoCalGas will engage community members and stakeholders. Include in this description the different approaches for customer outreach for core and non-core customers.

RESPONSE 1:

SoCalGas has identified three Project phases: (1) preliminary engineering, design, and environmental studies; (2) a front-end engineering and design ("FEED") study for the preferred pipeline system; and (3) development of a formal application for a certificate of public convenience and necessity ("CPCN"). SoCalGas proposes in the Application, at the conclusion of Phase 1, to issue a comprehensive status update to the Commission and indicate SoCalGas's next steps with respect to Phases 2 and 3. As noted in the Application, if the Phase 1 assessment identifies any serious flaws that would appear to render the Project infeasible, SoCalGas will describe those flaws in that submission. Assuming the flaws can be overcome, SoCalGas would intend to proceed to Phases 2 and 3. Further, the Application clarifies that a cost estimate for Phase 3 would be developed when the pipeline system is more defined, and that upon completion of the Phase 3 cost estimate, SoCalGas would provide an update to the Commission. Ultimately, the Application describes that SoCalGas would bring a formal CPCN application to the CPUC at the conclusion of Phase 3.

As noted in the Application, SoCalGas will conduct a robust stakeholder process throughout each phase. SoCalGas recognizes that a broad range of stakeholders is likely to have an interest in the study and development of Angeles Link, whether as potential end users, potential suppliers, environment and environmental justice community members, ratepayer advocates, union workforce, or for other reasons. Specifically, SoCalGas proposed in its Application to: (1) establish a Planning Advisory Committee for technical advice and collaboration on Project design and development; (2) hold periodic public workshops as the Project proceeds, including at the end of each phase and once preferred routes are identified; and (3) submit interim reports to the Commission and the public regarding Project status and updates. SoCalGas would provide copies of the referenced reports to the service list for this Proceeding and make them publicly available on its website.

To that end, SoCalGas recently held two informational webinars about Angeles Link on May 19 and May 31, 2022. SoCalGas provided opportunity for broad public participation through noticing on the Angeles Link Memo Account application proceeding service list and other communications channels such as paid social media advertisements in the SoCalGas service territory on Facebook, LinkedIn, and Twitter, emails to external stakeholders, and placing the information on our Angeles Link webpage (www.socalgas.com/angeleslink). SoCalGas has established an Angeles Link webpage for communicating key project proposal updates that includes an opt-in service list for periodic newsletters, the first of which was issued on June 9, 2022.

At the present time, SoCalGas has not planned any outreach exclusively for core or non-core customers.

QUESTION 2:

Please describe the process by which SoCalGas intends to bring Angeles Link cost recovery requests for each phase of Angeles Link before the Commission.

RESPONSE 2:

As described in the application, SoCalGas expects to seek recovery of Project costs at appropriate times, in accordance with California law on cost recovery. SoCalGas has not determined at this time whether costs will be sought for recovery following each phase, or at some other interval. SoCalGas would bring a formal filing or filings to the CPUC for any recovery in rates of any Angeles Link project costs.

QUESTION 3:

Given the preliminary cost estimates included in this Application, has SoCalGas considered if cost recovery will only come from participating hydrogen gas customers, from core gas customers, or from all gas customers? How would SoCalGas's request for this cost recovery treatment vary based on the total cost of the project?

RESPONSE 3:

SoCalGas did not include in the Application any proposals related to cost recovery, including cost allocation. As Commissioner Rechtschaffen explained in his Scoping Ruling within a section titled "Issues regarding Jurisdiction are Outside the Scope of this Proceeding:"

"Under the principle of cost causation, the recovery of costs is assigned to the group of ratepayers that benefit from the services that caused the costs to be incurred. If a memorandum account is authorized, whether an unfair subsidy exists, or whether the principle of cost causation is upheld, remains a standard that the Commission must apply, particularly at the time that SoCalGas seeks recovery of the recorded costs."

Within this context, SoCalGas has not reached a conclusion as to whether cost allocation might vary based on the total cost of the project.

QUESTION 4:

Please describe:

a. All plans SoCalGas has undertaken or intends to undertake regarding alternative scenarios to "one or more trunk transmission pipelines that would run from green hydrogen generation sources including, but not limited to, the Central Valley, Mojave Desert/Needles, or Blythe area, into one or more delivery points in the Los Angeles Basin."[1]
b. If SoCalGas is planning on producing, compressing and storing the hydrogen itself or if those services will be conducted by a third party. If done by SoCalGas, please describe the mechanism in which SoCalGas seeks approval for those additional services. If conducted by a third party, please describe the selection process.
c. If SoCalGas is willing to consider developing a scenario to have the hydrogen production and transport in the Los Angeles Basin.

RESPONSE 4:

a. As noted in the Application, SoCalGas has conducted initial scoping activities to better understand the feasibility of hydrogen market opportunities, including possible conceptual solutions, challenges, and risks to hydrogen delivery. These activities provide different conceptual alternatives and varying preliminary scenarios for potential hydrogen development, which will be further evaluated and refined as part of Phase 1. SoCalGas intends to schedule future public workshops or webinars as early as July to share the results of these preliminary activities and seek feedback.
b. SoCalGas does not plan to own and operate hydrogen production facilities as part of the Project. As a common carrier pipeline, SoCalGas anticipates open access rules would allow various producers to interconnect with Angeles Link. As noted in the Application, SoCalGas does anticipate that the Project would be supported by one or more compressor stations, as needed based on length and operating pressure, which are anticipated at this time to be owned and operated by SoCalGas. Regarding storage, Phase 1 will include a high-level, preliminary study of hydrogen storage options to facilitate system operability, processing, and reliability, which, if determined to be needed, could be owned and operated by SoCalGas. Any necessary

[1] Application at 22.

compression and storage facilities are anticipated to be presented for approval in SoCalGas's future Angeles Link CPCN application. *See* Application at 25: "All engineering estimates assume the following physical Project components: SoCalGas's point of receipt; production compression; hydrogen transmission pipeline, intermediate compression (as needed), and hydrogen storage options to facilitate system operability, processing, and reliability. SoCalGas does not propose developing hydrogen production facilities as part of the scope of the Project."

c. SoCalGas anticipates considering project options and alternatives as part of Phases 1-3, and has not precluded the possibility of in-basin hydrogen production.

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QUESTION 5:

Please describe any analysis performed by SoCalGas or at SoCalGas' direction related to pipeline leakage. What equipment does SoCalGas intend to use to measure hydrogen leakage, and is that equipment capable of measuring hydrogen leakage at a parts per million and a parts per billion level of granularity?

RESPONSE 5:

In connection with activities unrelated to Angeles Link, SoCalGas has studied the leak rate through a valve of natural gas with a small hydrogen blend. That study found that the leak rate did not change when compared to a traditional natural gas stream. SoCalGas has not yet analyzed detection technologies specifically for surveying dedicated hydrogen pipelines, however, leakage rates will be assessed in the future as part of Phases 1 through 3. The scope of activities included in the different phases of the Memorandum Account Application includes activities for project design to develop hydrogen transport infrastructure under the standards and protocols applicable to the industry. SoCalGas will seek a partnership with entities such as the Department of Energy to study issues related to potential leakage and leakage prevention, including the appropriateness of utilizing the GWP 10 scale recommended by EDF (*see,* e.g., Reply at 42).

QUESTION 6:

Please describe the material selection process that will be considered in these scenarios that will minimize hydrogen leakage. What third party standard will SoCalGas use in its material selection?

RESPONSE 6:

The term “material selection” is not defined in the question, therefore SoCalGas addresses the question with the assumption that material selection refers to all pipeline material and associated appurtenances. Material selection will be identified during the Project phases and in final project design and will adhere to all industry codes and standards related to hydrogen piping, tubing, instrumentation, flanges, equipment, or any other potential leakage sources. Pipe material will adhere to strength requirements for a given system design set forth by the American Society of Mechanical Engineers (ASME) B31.12 Standard on Hydrogen Piping and Pipelines. Tables IX-5A, IX-5B, and IX-5C from ASME B31.12 - Hydrogen Piping & Pipelines | Digital Book - ASME provide information on the design of carbon steel, alloy piping, and pipeline systems.

Material selection and design will consider these specifications and the requirements of the latest editions of the codes, standards and specifications published by, but not limited to, the following industry organizations, as applicable. If any federal or state statute or regulation conflicts with these specifications, the statute or regulation shall be followed.

1) US Federal and State of California, Occupational Safety and Health Administration (OSHA) and U.S. Department of Transportation – Pipeline and Hazardous Materials Safety Administration (PHMSA) Standards and Regulations (as applicable).
2) AGA - American Gas Association
    a) AGA XL1001 – Classification of Locations for Electrical Installations in Gas Utility Areas
3) AISC Steel Construction Manual 15th Edition
4) ANSI - American National Standards Institute, Inc.
    a) ANSI 37.90-Relays and Relay Systems associated with Electric Power Apparatus
    b) ANSI B1.1 – Unified Inch Screw Threads

c) ANSI B2.1 – *Pipe Threads*
d) ANSI C37.04-Rating Structure for AC High-Voltage Circuit Breakers on a Symmetrical Current
e) ANSI C37.06 Preferred Ratings and Related Required Capabilities for AC High Voltage Circuit Breakers Rated on a Symmetrical Current Basis
f) ANSI C37.11-Requirements for Electrical Control for AC High Voltage Circuit Breakers Rated on a Symmetrical Current Basis and a Total Current Basis
g) ANSI C37.13-Low-Voltage AC Power Circuit Breakers Used in Enclosures
h) ANSI C37.16-Preferred Ratings, Related Requirements, and Application Recommendations for Low-Voltage Power Circuit Breakers and AC Power Circuit Protectors
i) ANSI C37.20-Switchgear Assemblies Including Metal-Enclosed Bus
j) ANSI C37.50-Test Procedures for Low-Voltage AC Power Circuit Breakers Used in Enclosures
k) ANSI C37.51-Conformance Testing of Metal-Enclosed Low-Voltage AC Power Circuit Breaker Switchgear Assemblies
l) ANSI C57.12.00-General Requirements for Distribution, Power, and Regulation Transformers
m) ANSI C57.13-Requirements for Instrument Transformers
n) ANSI C76.1-Requirements and Test Codes for Outdoor Apparatus Bushings
o) ANSI C84.1 Voltage Ratings for Electric Power Systems and Equipment
p) ANSI C971-Low Voltage Cartridge Fuses, 600 Volts or Less
q) ANSI U1-General Requirements for Dry-Type Distribution and Power Transformers
r) ANSI/ISA 7.0.01: Quality Standard for Instrument Air
s) ANSI/NFPA 70, National Electric Code - National Electric Manufacturers Association (NEMA).
t) ANSI/NFPA 72, National Fire Alarm and Signaling Code
u) ANSI/NFPA Z535, Standards for Safety, Signs and Labels

5) American Petroleum Institute (API) – Standards, Specifications and Recommended Practices
    a) API 5L - Specification for Line Pipe.
    b) API RP 540-Recommended Practice for Electrical Installations in Petroleum Processing Plants.

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    c) API 620 – Design and Construction of Large Welded Lower Pressure Storage Tanks (49 CFR 195.2649(e)(3)
    d) API RP-500: Recommended Practice for Classification of Locations for Electrical Installations at Petroleum Facilities
    e) API RP-520: Sizing, Selection and Installation of Pressure-relieving Devices in Refineries, Part I—Sizing and Selection and Part II—Installation
    f) API 1104 – Standard for Welding Pipelines and Related Facilities
6) American Society of Civil Engineers
    a) ASCE 7-10 - Minimum Design Loads for Building and Other Structures
7) ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers
8) ASME - American Society of Mechanical Engineers
    a) ASME 1.20.1- Pipe Threads, General Purpose
    b) ASME B16.10 - Face-to-Face and End-to-End Ferrous Valves
    c) ASME B16.11 - Forged Steel Fittings Socket-Welding and Threaded
    d) ASME B16.20 - Metallic Gaskets for Pipe Flanges - Ring Joint, Spiral Wound & Jacketed
    e) ASME B16.21 - Nonmetallic Flat Gaskets for Pipe Flanges
    f) ASME B16.25 - Buttwelding Ends
    g) ASME B16.28 - Wrought Steel Buttwelding Short Radius Elbows and Returns
    h) ASME B16.34 - Valves - Flanged, Threaded and Welding End
    i) ASME B16.36 - Orifice Flanges
    j) ASME B16.5 – Pipe Flanges and Flanged Fittings
    k) ASME B31.1 - Prescribes minimum requirements for the design, materials, fabrication, erection, test, inspection, operation, and maintenance of piping systems
    l) ASME B31.12 - Hydrogen Piping and Pipeline Standards
    m) ASME B31.3 - Process Piping – Hydrogen Piping
    n) ASME B31.8 - Gas Transmission and Distribution Piping Systems
    o) ASME STP-PT-006, "Design Guidelines for Hydrogen Piping and Pipelines
9) American Society of Nondestructive Testing
    a) ASNT Recommended Practice SNT-TC-1A, 2016 edition
10) ASTM - American Society for Testing and Materials
    a) ASTM A105 - Standard Specification for Forgings, Carbon Steel for Piping Components
    b) ASTM A159 - Standard Specification for EFW Steel Pipe (size 4' and over)

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   c) ASTM A182 - Standard Specification for Forged or Rolled Alloy Steel Pipe Flanges/Forged Fitting and Valves and Parts for High-Temperature Service
   d) ASTM A234 - Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures
   e) ASTM A36 - Standard Specification for Structural Steel
   f) ASTM A518-Corrosion-Resistant High Silicon Cast Iron
   g) ASTM B31.12 Hydrogen Piping and Pipelines
   h) ASTM B33-Tinned Soft or Annealed Copper Wire for Electrical Purposes
   i) ASTM B418-Cast and Wrought Galvanic Zinc Anodes for Use in Saline Electrolytes
   j) ASTM B8-Concentric Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
   k) ASTM F1459 Susceptibility of Metallic Materials to Hydrogen Gas Embrittlement
11) American Welding Society
   a) AWS A2.4: Standard Symbols for Welding, Brazing and Nondestructive Examination
   b) AWS D1.1: Structural Welding Code—Steel
12) California Administrative Code, Title 8, Chapter 4, Subchapter 5, Electrical Safety Orders
13) California Building Code
14) California Electrical Code
15) California Public Utilities Commission: *General Order 112-F* (http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M163/K327/163327660.PDF)
16) Compressed Gas Association
   a) CGA G-5.5 - Design guidelines for hydrogen vent systems used in gaseous and liquid hydrogen systems
17) Comply with all local city, county and state Environmental Regulations
18) California Public Utilities Commission
   a) CPUC GO 58A
19) CSA Group Standards
20) FM - Factory Mutual
21) Southern California Gas Company Standard GS 192.0030 – *High Pressure Design Drawings*
22) ICEA - Insulated Cable Engineers Association

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a) ICEA 6-Ethylene Propylene Rubber Insulated Shielded Power Cables, Rated 5 through 69 kV
b) ICEA S-19-81, NEMA WC-3-Rubber Insulated Wire and-Cable for the Transmission and Distribution of Electrical Energy
c) ICEA S-19-81, NEMA WC3-Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy
d) ICEA S-66-524 Cross Linked-Thermosetting, Polyethylene-Insulated Wire and Cable for Transmission and Distribution of Electrical Energy
e) ICEA S-68-516 Ozone-Resistant Ethylene-Propylene Rubber Insulation for Power Cables Rated 0 to 35,000 Volts
f) ICEA S-68-516, NEMA WC-8-Ethylene-Propylene-Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy

23) IEEE - Institute of Electrical and Electronics Engineers

a) IEEE 112-Test Procedure for Polyphase Induction Motors and Generators
b) IEEE 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems
c) IEEE 450-Recommended Practice for Maintenance, Testing, and Replacement of Large Lead Storage Batteries
d) IEEE 484-Recommended Practice for Installation Design and Installation of Large Lead Storage Batteries
e) IEEE 519 Recommended Practices and Requirements for Harmonic Control in Electric Power Systems
f) IEEE 80-IEEE Guide for Safety in AC Substation Grounding
g) IEEE C37.010-Application Guide for AC High Voltage Circuit Breakers Rated on a Symmetrical Current Basis
h) IEEE C37.04-Rating Structure for AC High Voltage Circuit Breakers Rated on a Symmetrical Current Basis
i) IEEE C37.09-Test Procedure for AC High Voltage Circuit Breakers Rated on a Symmetrical Current Basis
j) IEEE C37.20-Switchgear Assemblies
k) IEEE C57.12.01-General Requirements for Dry-Type Distribution and Power Transformer
l) IEEE C57.12.90-Test Code for Liquid Immersed Distribution, Power, and Regulating
m) IEEE C57.12.91-Test Code for Dry-Type Distribution and Power Transformers

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   n) IEEE C62.11-Surge Arresters for AC Power Circuits

24) Insulated Cable Engineers Association (ICEA)

25) ISA - International Society of Automation
   a) ISA Standards & Recommended Practices (as applicable)

26) NACE Standard TM 0284-2003, Evaluation of Pipeline and Pressure Vessel Steels for Resistance to Hydrogen-Induced Cracking
   a) NEMA - National Electrical Manufacturers Association NEMA AB 1-Molded Case Circuit Breakers
   b) NEMA CC-1-Electrical Power Connectors for Substations
   c) NEMA ICS-2-Industrial Control Devices, Controllers, and Assemblies
   d) NEMA ICSI-General Standards for Industrial Controls and Systems
   e) NEMA ICS-Industrial Controls and Systems
   f) NEMA ICS-Industrial Controls and Systems
   g) NEMA KSI-Enclosed Switches
   h) NEMA MG13-Frame Assignment for Alternating Current Integral Horsepower Induction Motors
   i) NEMA MG1-Motors and Generators
   j) NEMA MG2-Safety Standard for Construction and Guide for Selection, Installation and Use of Electrical Motors and Generators
   k) NEMA PB1-Panelboards
   l) NEMA ST-20-Dry-Type Transformers for NEMA General Purpose Applications
   m) NEMA TC2, UL 514-Fittings for Electrical Rigid Nonmetallic Conduit
   n) NEMA TR-1-Transformers, Regulators, and Reactors
   o) NEMA VE-1 Cable Tray Systems
   p) NEMA WC-5, ICEA S-61-402-Thermoplastic-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy
   q) NEMA WC-7, SS-66-524-Cross-Linked-Thermosetting, Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy

27) NESC - National Electrical Safety Code

28) NETA - International Electrical Testing Association

29) NFPA - National Fire Protection Association
   a) NFPA 10, Portable Fire Extinguishers
   b) NFPA 12, Carbon Dioxide Extinguishing Systems
   c) NFPA 2 Hydrogen Technologies Code required for compliance
   d) NFPA 52, Vehicular Natural Gas Fuel Systems Code

e) NFPA 55, Standard for the Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks
f) NFPA 70, Standard for safe electrical design, installation, and inspection
g) NFPA 72, Fire detection, signaling, and emergency communication
h) NFPA 72E, Automatic Fire Detectors
i) NFPA 853, Standard for fire prevention and fire protection requirements

30) SoCalGas Gas Standard
   a) 188.0001 Standard Specification For Natural and Substitute Fuel Gases

31) South Coast AQMD Environmental Regulations (if applicable)

32) Steel Structures Painting Council (SSPC) – Standards, Specifications and Recommended Practices
   a) SSPC-PA1 - Shop, Field, and Maintenance Painting of Steel
   b) SSPC-PA2 - Measurement of Dry Paint Thickness with Magnetic Gages
   c) SSPC-SP10 - Near-White Blast Cleaning
   d) SSPC-SP2 - Hand Tool Cleaning
   e) SSPC-SP3 - Power Tool Cleaning
   f) SSPC-SP6 - Commercial Blast Cleaning
   g) SSPC-SP8 - *Pickling*
   h) SSPC-SPl - Solvent Cleaning

33) UL - Underwriters Laboratories, Inc.
   a) UL 121201 – Non-incendive Electrical Equipment for Use in Class I and II, Division 2 and Class III, Divisions 1 and 2 Hazardous (Classified) Locations
   b) UL 1741- Inverters, Converters, and Controllers for Use in Independent Power Systems
   c) UL 2075 – Standard for Gas and Vapor Detectors and Sensor
   d) UL 360 - Flexible Liquid-Tight Conduit
   e) UL 44 - Safety Standard for Rubber-Insulated Wires and Cable
   f) UL 489 - Molded Case Circuit Breakers and Circuit Breaker Enclosures
   g) UL 50 - Electrical Cabinets and Boxes
   h) UL 506 - Standard for Safety, Specialty Transformers
   i) UL 508A - Industrial Control Equipment
   j) UL 514, ANSI C80.4-*All Fittings*
   k) UL 57 - Standard for Safety, Electric Lighting Fixtures
   l) UL 6, ANSI C80.1 - *Rigid Steel Conduit*

m) UL 67 - Panelboards
n) UL 698A – Standard for Safety of Industrial Control Panels Relating to Hazardous (Classified) Locations
o) UL 797, ANSI C80.3-Electrical Metallic Tubing
p) UL 845 - Motor Control Centers
q) UL 886 - Hazardous Area Fittings
r) UL 913 - Standard for Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, III, Division 1, Hazardous (Classified) Locations
s) UL 924 - Standard for Safety, Emergency Lighting Equipment

34) OSHA Regulations 29 CFR 1910 Subpart H - Hazardous Materials
35) CGA G-5.4 - Standard For Hydrogen Piping Systems At User Locations

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QUESTION 7:

Please describe if SoCalGas conducted any analysis on the trade-offs between electricity line losses relative to pipeline distance traveled for energy benefits.

RESPONSE 7:

SoCalGas has not independently conducted this specific analysis at this time. However, the conclusions reached in a recent report titled "Cost of long-distance energy transmission by different carriers" highlighted that transmission by electricity is much more expensive than by gaseous and liquid carriers and that "the results indicate that the cost of electrical transmission per delivered MWh can be up to eight times higher than for hydrogen pipelines…".

Report available at: www.sciencedirect.com/science/article/pii/S2589004221014668

QUESTION 8:

Does SoCalGas have any estimate of the rate increase to non-participating customers for this project?

RESPONSE 8:

SoCalGas has not estimated rate increases for this project.

QUESTION 9:

Does SoCalGas have target customers segments that it thinks will use the hydrogen from the Angeles Link project?

RESPONSE 9:

Throughout the application, SoCalGas refers to the target customer segments for Angeles Link as heavy-duty transportation, “hard-to-electrify” industries, and electric generation. See, e.g., Application at 2.

<u>QUESTION 10:</u>

If SoCalGas is planning on seeking recovery from residential customers, does SoCalGas intend to apply the CARE discount for cost recovery for Angeles Link?

<u>RESPONSE 10:</u>

Please see Response 3. Notwithstanding, SoCalGas clarifies that the discount available to customers eligible for the California Alternate Rates for Energy (CARE) program is applicable to all costs included in such customers' transportation and procurement rates. To the extent any cost recovery for Angeles Link were authorized to be from residential customers transportation rates, SoCalGas presumes the CARE discount would apply.