

**SOUTHERN CALIFORNIA GAS COMPANY
AUTHORITY TO ESTABLISH A MEMORANDUM ACCOUNT FOR
THE ANGELES LINK PROJECT**

(A.22-02-007)

(DATA REQUEST UCAN-SOCALGAS-DR-01)

QUESTION 1:

SoCalGas anticipates spending \$26 million for the first Phase of A.22-02-007 for activities such as “consultant costs, desktop review of potential routes, engineering and design reports, preliminary environmental and real estate support, and legal support.” (Application p. 25). Please provide your best estimate of how much of this proposed work would be performed by in-house SoCalGas personnel and how much would be performed by consultants and/or other contractors?

RESPONSE 1:

Please see the attachments to Response 4. For Phase 1, it is anticipated that approximately 8% of the work will be performed by in-house SoCalGas personnel and 92% of the work will be performed by consultants and other contractors.

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QUESTION 2:

Does SoCalGas contemplate developing new hydrogen transportation pipelines within or in close proximity to existing SoCalGas natural gas pipelines, or would they be built in separate rights-of-way?

RESPONSE 2:

SoCalGas is evaluating potential pipeline routes and as part of that analysis will evaluate the feasibility of utilizing existing rights-of-way and other land rights as part of Phases 1 through 3 of the Project.

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QUESTION 3:

Do existing PHMSA regulations or California General Order provisions limit how close hydrogen pipelines can be located next to natural gas pipelines? If yes, please provide applicable citations to the germane regulations?

RESPONSE 3:

Neither PHMSA regulations nor California General Order provisions state specifically that a hydrogen pipeline should be installed or operated any differently than a natural gas pipeline. SCG intends to follow all applicable PHMSA regulations and California General Order provisions, including those that define limitations for installing new pipelines near existing lines, such as CFR 192.325 (Code of Federal Regulations – Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards, “Underground Clearance”) and ASME B31.12.

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QUESTION 4:

Please provide your best estimate of SoCalGas's anticipated expenditures for each of the activities delineated in the quoted section of Question 1 above.

RESPONSE 4:

Attachments to this response include the following files which provide SoCalGas' anticipated cost breakdown of all components of estimated costs for each Phase:

- Basis of Estimate
- Estimate by Phase
- Level 0 Schedule and Associated Annual Cash Flow for Phase 1 and Phase 2

SoCalGas provides the following detailed breakdown of all components of estimated costs for each Phase.

Angeles Link is composed, at a minimum, of four unique components: production planning, compression, system storage, and transmission pipeline. Each of these has unique preliminary engineering design and project planning activities.

SoCalGas analyzed actual and estimated costs for compressor stations and pipeline projects completed within the last seven years, with actual costs broken down by percentage for each of the following categories:

- Engineering Design Contractor
- Company Labor
- SCG Contractor
- Environmental
- Land/Rights-of-Way (ROW)

Contingency and loaders were then applied as a percentage to the above direct cost categories, as follows:

- Contingency set to 20% for each Phase to accommodate cost for execution of undefined Project scope.

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- Company loaders have been set to 35% for each Phase and include Allowance for Funds Used During Construction (AFUDC), Property Tax, and Company labor indirect costs.

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QUESTION 5:

Please provide your best estimate of SoCalGas's anticipated expenditures for each of the Phase I activities identified by bullet points on pp. 23-24

RESPONSE 5:

Please see the attachments for Response 4.

The Phase 1 scope of work, as described in the Memorandum Account Application, includes the development of a Basis of Design which consists of several activities including, but not limited to, an evaluation of supply and demand, and other project activities that influence the Basis of Design. Given the early stage of this project, SoCalGas applied a Rough Order of Magnitude (ROM) level of effort and cost, based on experienced personnel, and industry best practices. The estimate for Phase 1 pre-Front End Engineering Design (FEED) design scope and feasibility analysis includes the following components, which will be further refined during Phase 1:

Assessment of Hydrogen Production Potential

Assessment of hydrogen production potential is based on assumed full time equivalent (FTE) resources for the duration of Phase 1.

Transmission Pipeline

Project components for pipeline pre-FEED design are based on previous pipeline projects conducted by SoCalGas within the last seven years.

System Storage

Project components for storage pre-FEED design is based on assumed FTE resources for the duration of Phase 1.

Compression

Project components for compression pre-FEED design is based on historical actuals and estimated costs from previous compressor projects conducted by SoCalGas in the last seven years.

Phase 1 Supplemental Cost

An additional \$1.7M was budgeted as a direct cost to account for supplemental

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Outside Counsel and Outreach activities anticipated to occur during Phase 1. This support is expected to be provided by third-party contractor(s) and is included in the SoCalGas Contractor portion of the Phase 1 cost estimate.

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QUESTION 6:

Phase 2: Please provide SoCalGas's best estimate of its anticipated expenditures for each of the bullet point delineated activities listed on pp. 25-27.

RESPONSE 6:

Please see the attachments to Response 4.

The Phase 2 scope of work, as described in the Memorandum Account Application, would develop a preferred project option and advance engineering design to approximately 30%. It is assumed that by Phase 2, a third-party developer unaffiliated with SoCalGas will be responsible for designing and implementing hydrogen production project(s) (which is outside the scope of SoCalGas's proposal), and therefore that component is not included in the Phase 2 cost estimate. Phase 2 will focus on FEED for the point of receipt, compression, system storage, and transmission pipeline. The estimate for Phase 2 includes the following FEED components:

Transmission Pipeline

Project components for pipeline FEED design are based on previous pipeline projects conducted by SoCalGas within the last seven years. A scaled ratio was applied to accommodate engineering design to approximately 30%, possible routes along the Angeles Link transmission pipeline, pipeline materials and other factors which will be further evaluated and refined during Phase 1 and Phase 2 activities.

System Storage

Recent FEED actual costs for complex facility compressor projects were utilized as a basis for determining the FEED cost for System Storage. The estimated cost was scaled upward to accommodate the potential for multiple System Storage facilities located along the Angeles Link transmission pipeline. System storage will be further evaluated and refined during Phase 1 and Phase 2 activities.

Compression

Recent FEED actual costs for complex facility compressor projects were utilized as a basis for determining the FEED cost for Production Compression and Intermediate Compression. System compression will be further evaluated and refined during Phase 1 and Phase 2 activities.

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QUESTION 7:

What proportion of the work in Phase 2 will be performed by SoCalGas in-house staff versus that of consultants or contractors?

RESPONSE 7:

Please see the attachments for Response 4. For Phase 2, it is anticipated that approximately 7% performed of the work will be performed by in-house SoCalGas personnel and 93% of the work will be performed by consultants and other contractors.

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QUESTION 8:

Please provide SoCalGas's best estimate of the average hourly cost of project activities in Phase 2.

RESPONSE 8:

The term "average hourly cost of project activities" is not defined in the data request. In answering this question, SoCalGas understands the term "average hourly cost of project activities" to mean "average wage rate."

The estimate for Phase 2 is based on a Class 5 accuracy level, as defined by the ACEC Recommended Practice 97R-18. The estimate is a high-level estimate with an accuracy of +100% and -50% of the base estimate cost, and therefore the Phase 2 estimate provided was not based on a bottoms-up staffing plan with detailed personnel headcount forecasts by various project disciplines. However, for the limited purposes of responding to this data request, we are providing a base wage rate for specific disciplines from the Bureau of Labor Statistics that is consistent with wage rates expected within California and the Utility industry, including SoCalGas and associated contractors.

Based on current wage data taken from the Bureau of Labor Statistics, Occupation Employment and Wage Statistics for May 2021 for the State of California, the average base wage rate for the disciplines considered is approximately \$62.32 per hour. The average base wage rate is escalated to May 2022 and is considered the rate paid to the employee excluding Company "loaders" and/or contractor markup which consists of the following:

- Payroll Taxes (FICA, FUTA, SUTA)
- Insurance (Workers Comp, General Liability, Other)
- Fringe Benefits (Health & Welfare, Holidays, Retirement, Vacation, Sick, and Other)
- Company Overhead & Profit

In addition to the estimates described above, the Company loaders would be approximately 35%, bringing the average loaded rate to \$84.13 per hour for SoCalGas Personnel. Contractor loaders can vary between different contractors, however we can assume it would be approximately 100%, bringing the average loaded rate to \$125. These loaders will vary over time.

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Based on current market conditions, all major engineering contractors are seeing significant upward pressure to retain engineering expertise. The rates shown in the table below do not reflect the 2022 pay raise cycle, which may be significantly above the previous cycles and not captured by escalation indices.

In addition, the rates shown in the table below are average engineering rates and do not reflect rates for performing Phase 2 Engineering. Phase 2 (FEED) usually requires specific expertise and consultants to be used on the project, whose rates are significantly higher than rates presented in the table.

Engineering Wage Data/Estimate
 May 17, 2022

Discipline	May-21		May-22
	Base Wage	Escalation	Escalated Base Wage
Process**	\$ 76.92	1.07	\$ 82.30
Civil	\$ 52.83	1.07	\$ 56.53
Concrete*	\$ 52.83	1.07	\$ 56.53
Structural*	\$ 52.83	1.07	\$ 56.53
Mechanical	\$ 54.39	1.07	\$ 58.20
Piping*	\$ 54.39	1.07	\$ 58.20
Electrical	\$ 60.89	1.07	\$ 65.15
Instrumentation*	\$ 60.89	1.07	\$ 65.15

Notes:

Wage data taken from the Bureau of Labor Statistics, Occupational Employment and Wage Statistics, May 2021 Estimates

Wage data based on the State of California

*Specific discipline not shown in BLS data; rate for similar discipline used in this case

**Based on Petroleum Engineer position

May 2021 Wage data escalated by 7% to reflect May 2022 dollars, based on escalation provided on the Bureau of Labor Statistics Website

Base Wage is the rate paid to the employee and excludes the following:

Payroll Taxes (FICA, FUTA, SUTA)

Insurance (Workers Comp, General Liability, Other)

Fringe Benefits (Health & Welfare, Holidays, Retirement, Holidays, Vacation, Sick, other)

Company Overhead & Profit

https://www.bls.gov/oes/current/oes_ca.htm

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QUESTION 9:

Please provide SoCalGas's best estimate of the amount of SoCalGas's \$92 million expenditures for Phase 2 that would be devoted to each of the following activities: consultant costs, desk top reviews, and initial field work, environmental, real estate, engineering and design reports, and legal support.

RESPONSE 9:

Please see the attachments to Response 4.

SoCalGas analyzed actual and estimated costs for compressor stations and pipeline projects completed within the last seven years, with actual costs broken down by percentage for each of the following categories:

- Engineering Design Contractor
- Company Labor
- SCG Contractor
- Environmental
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Contingency and loaders were then applied as a percentage to the above direct cost categories, as follows:

- Contingency set to 20% for each Phase to accommodate cost for execution of undefined Project scope.
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QUESTION 10:

Has SoCalGas identified one or more firms that have expressed their willingness and/or ability to provide a sufficient quantity of green hydrogen to supply LADWP's Harbor, Haynes, Scattergood, and Valley generating stations?

RESPONSE 10:

Phase 1 of the Project, as described in the Application at 23, includes among other things a "refined assessment of potential sources of green hydrogen production to meet the identified demand." SoCalGas is aware of interest in hydrogen production through the normal course of business development activities, including through engagement with the HyDeal LA initiative; however, SoCalGas has not received any specific proposals to supply LADWP's Harbor, Haynes, Scattergood, and Valley generating stations with green hydrogen.

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QUESTION 11:

If the answer to 10 is yes, how long does SoCalGas anticipate it would take to site and construct a facility to provide green hydrogen?

RESPONSE 11:

Phase 1 of the Project, as described in the Application at 23, includes among other things a “refined assessment of potential sources of green hydrogen production to meet the identified demand.” SoCalGas is not proposing to own and operate green hydrogen production facilities as part of Angeles Link. Notwithstanding, SoCalGas anticipates such facilities could be online and producing green hydrogen within the timeline contemplated for the development of Angeles Link, especially when considering the potential for the project to be developed in stages.

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QUESTION 12:

Does SoCalGas anticipate that the facilities that it will rely upon to produce green hydrogen will be located within the Los Angeles Basin? Are there any safety concerns associated with the production of green hydrogen that would make it difficult to site such a facility in an urban area such as the Los Angeles Basin?

RESPONSE 12:

Please see response to Question 11. Additionally, as described in the Application at 22, “(t)he foundation of the system would be 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.” While at this time SoCalGas does not anticipate sufficient green hydrogen production could be located in the Los Angeles Basin to meet anticipated demand, SoCalGas is not currently aware of any safety concern that would specifically preclude the large-scale production of green hydrogen in an urban area such as the Los Angeles Basin, and observes that non-green hydrogen production is currently taking place in the Los Angeles Basin at refineries and other industry. Phase 1 of the Project, as described in the Application at 23, includes among other things a “refined assessment of potential sources of green hydrogen production to meet the identified demand.”

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QUESTION 13:

Does the addition of 10% hydrogen into existing natural gas pipeline service increase the volatility or explosive risk of routine pipeline operations? Does SoCalGas anticipate that it will need to modify its existing transmission and distribution networks once 10% hydrogen is added into the natural gas system?

RESPONSE 13:

SoCalGas objects to this request on the ground it seeks information that is not relevant to this Proceeding, assumes facts not in evidence, and calls for speculation. Subject to and without waiving the foregoing objection, SoCalGas responds that the intent of the Angeles Link project is to establish a dedicated system of trunk transmission pipelines that would transport green hydrogen from production sources to customers.

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QUESTION 14:

Assuming electrolysis is used to produce green hydrogen, where does SoCalGas anticipate obtaining the water needed to create the hydrogen?

RESPONSE 14:

SoCalGas does not propose to own and operate green hydrogen production facilities as part of Angeles Link. That said, SoCalGas is analyzing water availability requirements in Phases 1 through 3 of the Project, and the options available to produce electrolytic hydrogen to meet potential demand.