Application: A.25-08-XXX
Exhibit No.: SCG/Lakeside-02
Witness: D. Maas

Application of Southern California Gas Company (U 904 G) and Lakeside Pipeline LLC to Initiate Reasonableness Review and Recovery of Lakeside Maas Energy Works Dairy Biomethane Pilot Project Costs.	A.25-08-XXX

CHAPTER 2

PREPARED DIRECT TESTIMONY OF

DARYL MAAS

ON BEHALF OF LAKESIDE PIPELINE LLC

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

August 15, 2025

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CHAPTER 2

PREPARED TESTIMONY OF DARYL MAAS

I. PURPOSE AND OVERVIEW OF TESTIMONY

The purpose of this testimony is to provide details about the Lakeside Dairy Biomethane Pilot Project ("Project"), the ownership and structure of Lakeside Pipeline LLC ("Lakeside"), the costs incurred in constructing the Project, the factors that impacted Project costs, and why the actual costs incurred were reasonable based on California Public Utilities Commission ("Commission" or "CPUC") standards for reasonableness. As described herein, each cost overrun was incurred to overcome specific challenges and meet required standards, in line with what a prudent operator would do under similar circumstances. The Commission should determine that the costs Lakeside and Maas Energy Works, LLC ("MEW") incurred to develop and construct the Project were reasonable and authorize Lakeside and MEW to recover the additional $6,691,208 incurred above the project's initial cost estimates. This testimony is sponsored by Daryl Maas, founder and CEO of MEW. His Statement of Qualifications is contained in section VII. Qualifications.

II. BACKGROUND

MEW is a family-owned, disabled veteran-owned, small business in northern California that specializes in developing, owning, and operating anaerobic dairy manure digesters. MEW started working with digesters in founder Daryl Maas' home state of Washington in 2007 and moved to California in 2010. At the time of the pilot project application, MEW had fewer than 20 employees and less than $1 million in total member's equity. The experience gained in the projects enabled by the pilot program served as a catalyst for MEW's growth to become the largest developer of dairy biogas projects in North America. The company employs 185 full-

time professionals that have commissioned over 70 digester facilities, responsible for nearly half of all dairy biomethane supplied into the California market. The Pilot Project award recipient in this matter was Lakeside. Lakeside is an equal three-way partnership between MEW and two of the principal dairy farmers that participated in the Project. Each farmer has host digesters and portions of the biogas gathering pipeline route. One of these farmers also sold the gas processing hub site parcel to Lakeside. So, Lakeside is majority-owned by dairy farmers, and not MEW. Lakeside entered a Development, Operations and Maintenance Agreement on June 23, 2021, with its member MEW, because MEW is an experienced digester developer and operator of the Project. In the context of this testimony, MEW carried out most of the development activities on behalf of the Lakeside partnership. In most cases herein, to preserve simplicity we speak of MEW as performing actions, when in fact it was performing actions undertaken pursuant to its contract with Lakeside.

On June 15, 2017, the Commission issued Rulemaking ("R.") 17-06-015 to develop a framework to implement five dairy biomethane pilot projects to demonstrate interconnection to the common carrier pipeline system and allow for rate recovery of reasonable infrastructure costs pursuant to Senate Bill ("SB") 1383. As authorized by SB 1383, in December of 2017 the Commission issued its Decision Establishing Implementation and Selection Framework to Implement the Dairy Biomethane Pilots Required by Senate Bill 1383, Decision ("D.") 17-12-004. This dairy pilot project decision was issued largely to achieve a balance "on how to make the dairy biomethane industry a viable business … while addressing environmental concerns," including SB 1383's 40% reduction of methane from the level in 2013 by 2030.[1] As explained in the decision, "[t]he main impediment to achieving this goal is that dairy biomethane projects

[1] D.17-12-004, p. 11.

historically do not generate enough revenue through sales of the commodity to attract the upfront investment needed for the ***highly capital-intensive infrastructure necessary to build the project*** and support ongoing operating expenses."[2] Accordingly, D.17-12-004 allowed "cost recovery of the biogas collection lines owned by dairy biomethane producers, and allowing utilities to own and operate pipelines that carry biomethane from biogas conditioning and upgrading facilities to existing utility transmission systems."[3] The decision further allowed "the costs associated with the biogas collection lines and treatment equipment [to] be recovered from the transmission rates of utility ratepayers through a reimbursement to the dairy biomethane producer."[4]

D.17-12-004 also specified dairy project selection criteria, including: business model, financial plan, greenhouse gas ("GHG") reduction, project readiness, environmental benefits, and disadvantaged communities.[5] Furthermore, the decision outlined the pilot project Selection Committee, comprised of the CPUC as the lead agency, in consultation with the California Air Resources Board and California Department of Food and Agriculture, and described the process for the Selection Committee to issue a final solicitation for dairy pilots.[6] The final solicitation was issued on March 7, 2018, and proposed dairy pilot projects were required to be submitted "within 110 days following the issuing of the Final Solicitation."[7] MEW submitted its application for its proposed Lakeside Pipeline Project on June 15, 2018 to the Selection

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2 D.17-12-004, p. 11, emphasis added.

3 D.17-12-004, p. 7.

4 D.17-12-004, p. 7.

5 D.17-12-004, pp. 11-13; *see also* D.17-12-004, App. B, which describes the selection criteria in detail.

6 D.17-12-004, App. A, pp. 3-4.

7 D.17-12-004, App. A, p. 5.

Committee, consistent with the solicitation schedule. Statements in this testimony regarding MEW's actions refer to MEW's role in implementing the Lakeside Pipeline Project, owned by the three-way joint venture referred to herein as Lakeside. After reviewing MEW's application, the Selection Committee approved the Project as one of four proposed dairy biomethane pilot projects located in Southern California Gas Company's ("SoCalGas'") service territory.

Since being selected as a pilot project in 2018, MEW has successfully completed construction of the Project. The Project exceeded its initial Pilot Project application forecasts of gas production and carbon reductions.[8] Though it is now complete and achieving its promised goals, the Project had to overcome many obstacles, including the global COVID-19 pandemic, challenges associated with the birth of the dairy biomethane industry, the need to design and develop entirely new biomethane projects and project components, and utilizing first-of-its-kind arrangements for the transportation of biomethane. MEW overcame these obstacles to complete the Project but incurred significant additional expenses in doing so.

At the time of bidding (mid-2018), no fully operational dairy biomethane pipeline cluster existed in California. The only similar project, Calgren Dairy Fuels in Tulare County ("Calgren Dairy Fuels Project"), was in the early stages of construction. Consequently, MEW had to rely on preliminary designs, vendor quotes, and its general experience to estimate costs for this first-of-its-kind project. MEW prepared its best estimate within the 110-day application window,

[8] The initial Pilot Project application estimated a cluster total gas production of 533,688 MMBTU/year (497,004 MMBTU/year if you exclude Clear Lake). The latest 12 months of available historical gas production data as of November 14, 2024 totals 585,412 MMBTU/year. Even without excluding the estimate for Clear Lake from the original total gas production, the participating pilot project digesters significantly exceed the estimated annual gas production. Note, the initial application included 9 digesters with a total of 10 participating dairies. Two dairies (Decade Dairy and Richard Westra Dairy) contribute to one centralized digester, causing the discrepancy between the number of dairies and the number of digesters. *See* Appendix A, Supporting Materials 1.1 - Lakeside Pipeline LLC - Historical Gas Production, p. 2. *See also*, Appendix A, Supporting Materials 1.2 - Lakeside Pipeline LLC - Application - 2018 Solicitation SB1383 Dairy Pilot Projects, p. 17.

leveraging all available information. MEW's bid "Lane 2" cost of $9.327 million was based on input from experienced subcontractors and suppliers and reflected expected costs under normal conditions. However, as detailed in Section III, some costs could not be fully understood during the bid period (e.g., final route alignments, certain design details), and Section IV explains how global events and new requirements post-bid impacted the actual costs. Notably, MEW's prior project, the Calgren Dairy Fuels Project, did not involve utility-ratepayer funding or prevailing wage requirements, and it used different technology for Hydrogen Sulfide (H2S) removal. Thus, the Project encountered unique challenges once implementation began under CPUC oversight and California environmental regulations. These differences are important in understanding why some costs exceeded the initial estimate.

The final amount incurred to design, construct, test, and interconnect the Project to SoCal Gas was $16,018,503.17 ($6,691,208.17 over the initial cost estimates submitted to the Selection Committee). As outlined in D.17-12-004, Selection Committee-approved cost estimates for the Project are recoverable as per se reasonable.[9] The only remaining cost recovery issue is whether the overages MEW incurred in constructing the Project are demonstrated to be reasonable, meet the reasonable manager standard, and were prudently spent in support of the Project. While the costs exceeding the initial estimates approved by the Selection Committee are significant, many of the costs could not have been foreseen at the time the estimates were submitted as they occurred as a result of unexpected third-party involvement and unprecedented economic

[9] *See* D.17-12-004, p. 22, Conclusion of Law 12: "The costs booked to the memorandum and balancing accounts, up to the authorized bid amounts, should be reviewed for the utility's prudent administration of the project, but should otherwise be considered per se reasonable."

See also, D.17-12-004, App. A, p. 2: "The Final Cost Estimates submitted through the solicitation process for the selected project will establish the authorized level of per se reasonable costs, subject only to the utility's prudent administration of the projects."

conditions. At the same time, these costs were necessary and unavoidable to complete the Project. Perhaps most relevant, however, is that all costs incurred by MEW and submitted for reimbursement were reasonable under the circumstances facing MEW and meet the Commission's requirements for reasonableness.

The total financial impact of all the labor and material cost increases, timeline delays, Project redesign or reconfiguration, cost overruns, and other factors which increased the as-built cost of the Project is summarized in the following Table 1 which identifies all cost details discussed above. Note, MEW is requesting the $6,691,208 total shown in Table 1 for recovery.

Table 1 - Project Summary - All Cost Categories

Project Summary - All Cost Categories			
Cost Category as Submitted to the Selection Committee on the PISCE	**Estimated Cost**	**Actual Cost**	**Over (Under) Estimated Cost**
2a. Biogas Treatment	$ 3,493,484	$ 5,558,386	$ 2,064,902
2b. Collection Lines	$ 5,833,811	$ 10,460,118	$ 4,626,307
Total:	**$ 9,327,295**	**$ 16,018,503**	**$ 6,691,208**

Below, MEW provides the facts needed to establish that its costs were reasonable based on the Commission's established reasonableness standard.[10] The Commission's standard in a reasonableness review of managerial action is settled. In a reasonableness review, "[u]tilities are held to a standard of reasonableness based upon the facts that are known or should be known at the time."[11] D.02-08-064 provides additional factors for applying the reasonable management standard: "the reasonableness of a particular management action depends on what the utility knew or should have known at the time that the managerial decision was made, not how the decision holds up in light of future developments;" a reasonable and prudent act includes a "spectrum of possible acts consistent with the utility system need, the interest of the ratepayers, and the

[10] *See*, e.g., D.16-12-063, pp. 9-10, citing D.02-08-064 at 5 and 6, citing D.87-06-021.

[11] D.02-08-064 (2002 Cal. PUC LEXIS 534; 219 P.U.R.4th 421).

requirements of governmental agencies of competent jurisdiction;" and "[t]he act or decision is expected by the utility to accomplish the desired result at the lowest reasonable cost consistent with good utility practices. Good utility practices are based upon cost effectiveness, reliability, safety, and expedition."[12]

Specifically, based on best practices, existing conditions, and information available at the time, MEW prudently constructed the Project consistent with pilot program requirements. Based on pilot program goals, the Project is consistent with utility system need, the interest of ratepayers, and the requirements of the Commission and other agencies on the Selection Committee. Furthermore, MEW acted to complete the Project in a cost-effective and expeditious manner, at the lowest reasonable cost, all while promoting reliability and advancing safety, consistent with the Commission's reasonableness standard.[13] For these reasons, and as demonstrated in greater detail below, the Commission should approve the cost overages submitted by MEW as part of this Application.

III. MEW'S COST ESTIMATES WERE REASONABLE BASED ON INFORMATION AVAILABLE AT THE TIME

There were numerous factors which made it difficult to accurately predict the ultimate costs of the Project; however, MEW used its industry experience and relationships with industry professionals to develop as accurate cost estimates for the Project as possible considering the information available at the time of application. The sections below first provide context as to how MEW developed the cost estimates for the Project; second detail what inherent aspects of the application process made estimation difficult, impacting the soundness of estimates; and third

[12] D.02-08-064 at 5 and 6, citing D.87-06-021.

[13] Ibid.

explain what external developments impacted the accuracy of the Project's cost estimates as the project was developed.

A. MEW's Cost Estimates were Consistent with Work Performed for Similar Projects

MEW's initial $9,327,295 cost estimate was developed using the best information available at MEW's disposal at the time of submission and often relied on historical construction costs for similar projects under MEW's management and input from the below-mentioned experienced industry professionals.

At the time of application, MEW's biomethane pipeline installation experience was primarily limited to MEW's development of the Calgren Dairy Fuels Project in Tulare County. The Calgren Dairy Fuels Project was the first biomethane pipeline project ever attempted in California, and it was still under construction at the time the Project's application was submitted. Considering there were no other existing biomethane pipeline projects in California for MEW to reference, MEW relied upon its knowledge and experience from the Calgren Dairy Fuels Project to inform cost estimation when it was not possible to get quotes from contractors due to a lack of finalized designs. Due to requirements established by the pilot project, the Project design did not match the Calgren Dairy Fuels Project design exactly. Hence, only relevant information from the Calgren Dairy Fuels Project was used in designing and estimating the Project. Note, the experience from this project not only informed the preliminary cost estimates but also informed the design changes made as the Project progressed when operational experience from the Calgren Dairy Fuels Project identified failure points in the systems that were intended for the Project.

In addition to the above experience MEW drew from, MEW relied upon quotes and information provided by industry specialists. The primary specialists consulted for the Project include Energy Innovations[14], MV Technologies, Nicholas Construction, Lyles Utility Construction, Environmental Fabrics, and Provost & Pritchard Consulting Group.[15] Importantly, the Project was a relatively new type of project for MEW, as well as a new type of program for the industry. At the time applicants submitted their proposals to the CPUC in June of 2018, there were no operational dairy biogas pipeline injection projects in California, only the under-construction Calgren Dairy Fuels Project. Recorded data on specific project costs or necessary technologies simply did not exist. Therefore, while industry specialists provided information on which MEW constructed its estimates, these specialists were also limited by the immature nature of the biomethane pipeline industry.

Accordingly, in preparing its cost estimates, MEW relied upon its early experience in developing similar projects in similar locations (the Calgren Dairy Fuels Project is in Tulare County which shares a border with Kings County where the Project is located). MEW also collaborated with other developers, contractors, and pipeline operators to ascertain realistic and expected costs to develop the Project. Based on this information, MEW provided the most accurate cost estimates possible to the Selection Committee.

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[14] Energy Innovations, also doing business as Electric Innovations, is the contractor that MEW used for much of the design engineering and construction of equipment for the Project. While the original bids for the Project were submitted under the Electric Innovations name, the cost justification exhibits were provided under the name Energy Innovations, and to avoid confusion that name is used consistently in the remainder of this testimony.

[15] *See* Appendix A, Supporting Materials 1.2 - Lakeside Pipeline LLC - Application - 2018 Solicitation SB1383 Dairy Pilot Projects, pp. 394-435. Note, sensitive financial information of the Project owners previously included in the initial pilot project application has been omitted from the included copy of the application as this financial information is not relevant to any cost reasonableness determination.

The Project's cost overruns, while high, were much lower than those experienced by other established pipeline companies operating in the same time period. For example, a similar dairy biomethane project in Merced connected its biomethane pipeline to an existing natural gas gathering pipeline operated by California Energy Exchange Corporation ("CEE"). CEE experienced cost overruns of 115% in that project, an overrun that was approved as reasonable by the Commission.[16] CEE has built and operated hundreds of miles of pipelines over several decades, in multiple states; yet it still experienced significant unanticipated costs increases in excess of its initial project budget.

B. The Project was a New Pilot Project, and Costs to Complete the Project Were Accordingly Challenging to Estimate

The dairy biomethane pilot program sought to develop first-of-its-kind projects. By design, pilot programs seek to develop new, often untested technologies or projects, or assess the viability of new technologies, equipment, facilities, and procedures. Pilot projects do not always achieve their goals; this Project succeeded by directly delivering biomethane into the utility distribution system. As recognized by the Commission, "[p]ilot projects can help the Commission and interested parties better understand the potential benefits of new technologies and identify unforeseen barriers to implementation."[17] The novelty of a pilot program is inherent, and it correspondingly follows that predicting the success of a pilot program, or estimating the costs and benefits from the pilot program, is difficult. This was the case for the dairy biomethane pilot program, where the Legislature, in collaboration with the CPUC and

[16] D.24-10-004, Decision Addressing Reasonableness of Merced Dairy Biomethane Pilot Project Costs, pp. 38-40.

[17] Resolution E-4595, p. 8.

other Selection Committee members, sought to provide additional incentives to assist biomethane producers in light of the significant costs to bring biomethane production to market.

Despite the challenges described above, MEW was able to prepare cost estimates based on its experience with similar projects and opinions from industry specialists as described in further detail above. As evidenced by the many quotes, invoices, and supporting documentation provided in the initial pilot project application, MEW expended significant efforts to compile all relevant information related to the project to build its cost estimates, which demonstrates the reasonableness of the provided cost estimates despite a lack of industry maturity. As discussed below, the few years of industry development which occurred between initial application and construction allowed MEW to shift Project design to account for the lessons learned as the industry grew.

C. MEW Faced a Limited Window to Prepare its Cost Estimates

As described above, MEW was allotted only 110 days to prepare its cost estimates and submit its proposal. While MEW was equipped with industry specialist support and preliminary biomethane pipeline experience, this limited window to prepare cost estimates was very constricting when considering the scale of the pilot projects and the number of third-party entities required to ensure project success. The primary basis for cost estimation for the Project is the physical location of the pipeline, digesters, and gas processing facility. To establish the physical location of these items, a long process of negotiations with landowners and local government agencies must take place, which was challenging within the allotted time frame. The physical location of these assets provides the basis for the project design, and thus cost estimation. MEW built its cost estimates based on the most feasible pipeline routes (based on ongoing land right negotiations) it was able to determine by the end of the application window.

MEW had to develop preliminary engineering and design plans, coordinate with multiple dairy and pipeline operators, and review in-process and past projects, built by MEW and others, to assemble its best estimate of Project costs. Given the limited window, MEW could not finalize all the necessary designs or prepare final engineering plans. Nevertheless, MEW provided its best estimate of costs using its experience, support from experienced vendors, and knowledge of the status of third-party negotiations to develop the Project in accordance with the solicitation guidelines.

D. Certain Unanticipated Costs Were Not Included in MEW's Original Cost Estimates

Based on MEW's experience in the nascent biomethane/digester industry, MEW did not include certain unanticipated costs in its cost estimates as submitted to the Selection Committee. For example, MEW had never previously employed union contractors or paid prevailing wages for pipeline installation in the development of its other projects because manure digester projects typically operated in the agricultural sector and are not generally considered a "public work" requiring prevailing wage. Even the first large pipeline project that MEW had started in Tulare County did not use union contractors or pay prevailing wages from its outset through to the completion of that project. Furthermore, there was nothing in the pilot project solicitation documents that indicated that proposals were required to pay prevailing wages.

On February 19th, 2019, union attorneys made comments on the California Bioenergy (CalBio) Hanford dairy biomethane pipeline project which would ultimately lead to significant project delays by extending the permitting and environmental review process. The same attorneys for a consortium of unions who proposed a Project Labor Agreement ("PLA") indicated that similar public comments on the Project could lead to significant project delays.

After MEW had multiple discussions with the union attorneys, MEW consulted legal and environmental consultants on this matter to determine what course of action would best mitigate cost increases between either hiring more expensive union labor or facing significant project delays. These consultants suggested MEW enter a PLA to avoid significant project delays and the negative financial impacts resulting from these delays. Considering the input from the consultants and the anticipated Project impacts which would result from union attorney's public comments on the Project, MEW entered into a PLA.[18]

Similarly, MEW's previous experience with non-union contractors showed that those subcontractors' standard scope of work included pipeline installation support services such as traffic and dust control without listing those services separately in bids or using separate contractors to provide those services. Hence, MEW did not include specific estimates for these services in its application. It was not until MEW was under contract with union pipeline installers and construction had already begun that MEW learned that due to different work rules and job classifications, union contractors refused to provide those pipeline installation support services as part of their core bid but rather required additional allowances to support their work—thereby contributing substantial additional costs.

Relying on its experience, MEW reasonably did not account for expenses that it had not previously incurred on similar projects. The fact that unanticipated costs were required to complete the Project is neither unexpected, nor does it prevent recovery of such costs as reasonable. In conducting a similar reasonableness review for the Merced project in A.23-04-005, the Commission found that "MEW's decision to use standard wages in its pilot application

[18] *See also,* Appendix A, Supporting Materials 1.3 - Lakeside Pipeline LLC - Maas Hanford-Lakeside Dairy Digester Cluster PLA, pp. 862-902.

was reasonable."[19] The Commission approved recovery of such costs even though MEW had not included them in its original cost estimates for the Merced project.

In addition, MEW was required to comply with numerous specific requirements of Kings County as a result of the environmental review and permit application processes necessary to obtain permission to construct portions of the pipeline along and under County roads. Kings County specifically prohibited installing pipelines across County roads by means of trenching, and mandated all such crossings be constructed by boring under County roads. Additional specific requirements related to dust control, traffic control, and mitigation of impacts on wildlife were mandated in the permit documents.[20] These specific requirements were not made known to MEW until the permitting process began, which occurred well after the application for the pilot project was submitted to the Commission.

The fact that certain unanticipated costs were ultimately incurred by the Project does not change the fact that MEW's cost estimates were reasonable at the time submitted, based on MEW and its subcontractor's experience.

E. The Project Faced Unforeseeably High Costs Due to Global Supply Chain Issues and Extremely High Inflation Caused by the COVID-19 Pandemic

MEW submitted its cost estimates to the Selection Committee on June 15, 2018, well before the onset of the COVID-19 pandemic. Accordingly, MEW could not have anticipated

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[19] D.24-10-004, p. 25.

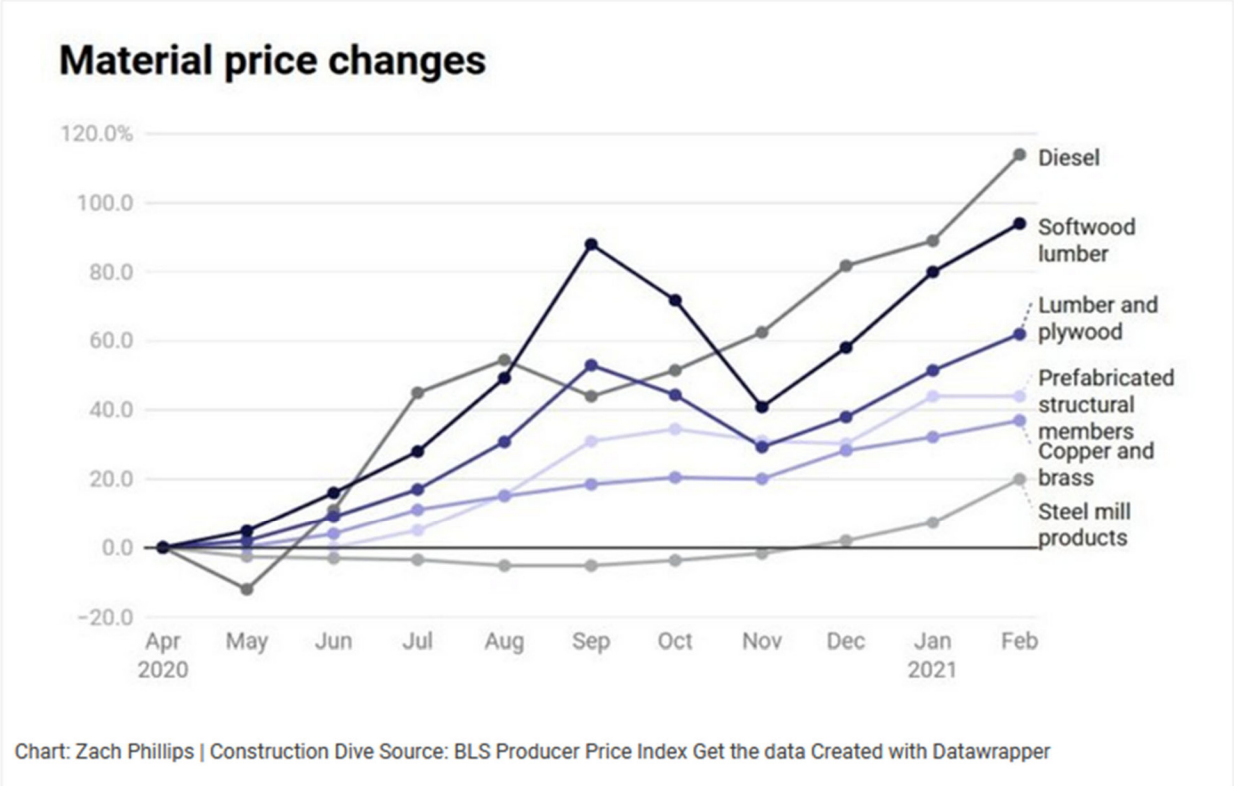
[20] *See* Appendix A, Supporting Materials 1.4 - Lakeside Pipeline LLC - Kings County Department of Public Works Encroachment Permit ID #3-03-21, pp. 903-905. *See also,* Appendix A, Supporting Materials 1.5 - Lakeside Pipeline LLC - Kings County Conditional Use Permit 17-14 – IS MND & MMRP, pp. 906-1090. *See also*, Appendix A, Supporting Materials 1.6 - Lakeside Pipeline LLC - Kings County Agreement in Connection with Application for Encroachment Permit, pp. 1091-1102. *See also*, Appendix A, Supporting Materials 1.7 - Lakeside Pipeline LLC - Kings County Encroachment Permit Application, pp. 1103-1119.

the myriad supply chain, labor force, and construction issues that would result from the pandemic in preparing its cost estimates. The COVID-19 pandemic caused worldwide supply chain disruptions and shortages as well as abnormally high inflation. According to the US Consumer Price Index, inflation rose a total of 16.6% between 2018 and 2022, which reflects the period between when applications were submitted and when the Project was completed.[21] However, in the construction industry inflation was much higher. Figure 1 below shows price increases during 2020 (during the main period that the Project was constructed) where major construction material prices rose between 20% and nearly 120% just up through the spring of 2021.[22] If anything, this chart understates the true impact of inflation because many construction and industrial equipment items were unavailable at any price. During COVID, projects were forced to pay to accelerate delivery times, bid up short supplies, or use more expensive alternatives when shortages existed.

[21] This inflation increase is calculated from the data provided by the St. Louis Federal Reserve Bank at: https://fred.stlouisfed.org/series/USACPALTT01IXNBM

[22] *See* Appendix A, Supporting Materials 1.8 - Lakeside Pipeline LLC - Lumber Price Skyrockets, Steel Provides Cost-Effective Solution, pp. 1120-1128.

Figure 1 - Material Price Changes



As documented herein, the Project experienced numerous price increases similar to or larger than the general economy-wide price spikes during COVID. These unusual and unforeseeable impacts to Project costs could not have been anticipated or included in MEW's 2018 Project cost estimates to the Selection Committee. A detailed discussion of specific cost overages related to pandemic inflation is included throughout Section IV below.

IV. COST OVERAGES INCURRED BY MEW TO DEVELOP AND CONSTRUCT THE PROJECT.

Through the development and construction of the Project to the commencement of commercial operation, MEW incurred costs of $6,691,208 above the initial $9,327,295 estimate submitted to the Selection Committee. These costs above the initially-submitted estimated amount were incurred due to a variety of factors and unforeseen circumstances, including final

engineering and design of the Project; environmental mitigations and other permitting agency requirements; project labor agreements; and pandemic-related inflation. None of these increased costs benefitted MEW, rather MEW was required to pay these additional material and third-party costs to complete the Project. In the following sections, this testimony details the cost increases for each Project cost category, as impacted by each of the various causes of cost overruns. MEW's cost estimates and actual Project costs are divided into two primary cost categories per the nomenclature of the pilot project solicitation: Cost Category 2a: Biogas Treatment and Cost Category 2b: Collection Lines.

A. Cost Category 2a: Biogas Treatment

This category includes the equipment and facilities at each dairy that treat the raw biogas (mainly for the removal of H2S and moisture) before it enters the gathering line. In designing and constructing the Project, MEW experienced significant cost overages to implement biogas treatment measures in comparison to the cost estimates approved by the Selection Committee. MEW's 2018 cost estimates for biogas treatment were $3,493,484. The final biogas treatment costs were $5,558,385, resulting in a cost overrun of $2,064,901. These overages occurred for two categories of equipment within the Biogas Treatment Cost Category 2a: (1) howitzers,[23] and (2) oxygen injection and biogas blowers. These overages are attributable to two main factors: (1) Design finalization changes/improvements and (2) Pandemic-related inflation affecting equipment and construction.

The overruns in both categories are the result of design changes based on lessons learned during the period between the 2018 pilot project submission and 2021 construction and

[23] A howitzer is a colloquial term in the biogas industry for one of a series of stainless-steel tubes filed with carbon material which are linked in series to filter H2S out of the renewable natural gas stream.

deployment. The howitzers and oxygen injection and biogas blowers are necessary under the pilot project solicitation requirements to remove H2S from the biogas before transporting the biogas from the dairies to the centralized cleanup system. In addition to these design changes, the manufacturers of this equipment saw unexpectedly high inflation between the submission of their bids in 2018 and the installation of the equipment in 2021. Detailed documentation has been provided by industry experts from Energy Innovations,[24] the contractor which provided the bids upon which the solicitation cost estimates were built, explaining the cost overages for design changes and the actual experience with inflation during this period.[25]

To allocate cost increases from the initial bid through the final contracts, Energy Innovations first determined which additional equipment and increased scopes of work had been necessary to add to the final contract to produce a viable product, then assigned the relative cost of those additional items based on the final contract details or company records. Energy Innovations assigned the remaining cost increases to pandemic related inflation for both labor and materials by considering the work outlined in the initial bid and final contract, inflation and supply chain impacts, and the share of materials and labor in the contracts' total cost. While an exact inflation rate for each of these specific products is not available, Energy Innovations provided evidence of the relative costs of their inputs to production at the time of the initial bid and at final implementation, which allowed them to develop a general range of inflation impacts for both labor and materials inputs for each component system. By comparing these inflation ranges for labor and materials with the estimated percentage of costs in the contract for both

[24] *See* Appendix A, Supporting Materials 1.9 - Energy Innovations - Company Profile, pp. 1129-1145.

[25] *See* Appendix A, Supporting Materials 1.10 - Energy Innovations - Biogas Processing Cost Increase Justifications, pp. 1146-1243. *See also*, Appendix A, Supporting Materials 1.11 - Lakeside Pipeline LLC - Biogas Blowers & O2 Injection Overage Summary, p. 1244.

materials and labor, Energy Innovations determined ranges for inflation impacts during this period for their specific equipment. All inflation estimates provided by Energy Innovations fall within the range determined by the above methodology. The above methodology can be seen in greater detail in the documentation provided by Energy Innovations.[26]

MEW provides a detailed narrative explanation of the cost overages for each category below. Precise breakdowns of these cost overages are summarized in Table 2, Table 3, and Table 4 below.

1. Biogas Scrubbing – Howitzers

One of the requirements for the pilot project program was for H2S to be scrubbed at each dairy prior to entering the biogas collection lines for transport to the centralized cleanup facility.[27] Typically for a dairy digester pipeline cluster, the raw biogas from each dairy would be sent to the centralized cleanup facility and then cleaned up using a caustic scrubber or other heavy technology common to natural gas wells or other industrial scale facilities. In fact, for the only other dairy digester pipeline cluster under construction at the time of the pilot project application, the dairy digesters each delivered raw biogas down the collection pipelines to a central cleanup facility for centralized H2S removal. This process, utilized by the Calgren Dairy Fuels Project in Tulare County, was not operational at the time of pilot project application, and was the only example of a large dairy digester cluster in the state or nation. Accordingly,

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[26] *See* Appendix A, Supporting Materials 1.10 - Energy Innovations - Biogas Processing Cost Increase Justifications, pp. 1146-1243. *See also*, Appendix A, Supporting Materials 1.11 - Lakeside Pipeline LLC - Biogas Blowers & O2 Injection Overage Summary, p. 1244.

[27] H2S is a highly toxic and flammable gas that can cause respiratory issues and other health effects even at low concentrations. Avoiding leaks or exposure is important to ensure a safe environment, as the gas can act quickly and may go undetected without proper monitoring. See, Solicitation for SB 1383 Dairy Pilot Projects by Selection Committee, p. 6. https://www.cpuc.ca.gov/-/media/cpuc-website/files/uploadedfiles/cpuc_website/content/utilities_and_industries/energy/energy_programs/gas/natural_gas_market/dairypilotssolicitation.pdf

there was zero industry experience available in removing the H2S upstream of a large dairy project pipeline. Neither MEW nor any other developer in California, or the United States, had previously built a biogas gathering network for a cluster of dairies where the newly designed howitzers were situated at each dairy to remove the H2S before the gas is transported through the cluster pipeline. MEW prepared its cost estimates for the pilot project H2S removal requirement by including third-party quotes for the newly designed howitzer gas scrubbing H2S removal vessels at the dairies.[28] MEW succeeded in building the new system as required by the pilot program to remove H2S at each dairy prior to transport, but the costs exceeded the original estimates as the designs were modified to reflect final engineering decisions and other related costs increases. MEW incurred cost overages for this category from two major sources: design improvements and pandemic-related inflation.

(a) Overruns due to Design Improvements

Based on the Project's cluster design utilizing upstream H2S removal equipment at each dairy, MEW employed a specialty biogas equipment design and fabrication company, Energy Innovations.[29] MEW had worked with Energy Innovations for over 10 years on many biogas equipment projects wherein Energy Innovations supplied dozens of custom-design biogas handling equipment packages.

Given Energy Innovations' experience, they were the most reliable source of information to create industry-standard cost estimates during the time available to prepare pilot project cost estimates. Energy Innovations developed a prototype H2S removal design during the 110 day bid window to submit the pilot project application. After the prototype design was drawn up

[28] *See* Appendix A, Supporting Materials 1.2 - Lakeside Pipeline LLC - Application - 2018 Solicitation SB1383 Dairy Pilot Projects, pp. 398-399.

[29] *See* Appendix A, Supporting Materials 1.9 - Energy Innovations - Company Profile, pp. 1129-1145.

and bid on by Energy Innovations, MEW relied on that estimate for each dairy's H2S scrubber needs to develop its quote submitted to the Selection Committee.[30] MEW's action to consult industry-leading suppliers for biogas equipment pricing demonstrated reasonableness given the information available in the industry at the time of application.

However, during the approximately 3 years between Project application submission and startup of the Project, the initial prototypes of these howitzers were installed at multiple stand-alone bio-methane facilities (those not connected to a pipeline). Based on experience with these howitzers, various operators of those projects recommended changes to increase performance, safety, and operational efficiency. The issues identified and actions taken to resolve them are outlined below. MEW took into account this real-world, field experience feedback from the first generation of howitzers and redesigned the howitzers to be used on the Project. The first of these design changes included changing materials from High Density Polyethylene ("HDPE") to stainless steel. This was necessary to ensure the materials withstood ambient conditions, and as real-world experience revealed, operators found the HDPE material was not able to handle intense pressure changes which may occur with hard shutdowns. This change improved safety and operational performance by reducing the risk of material degradation which could result in failure and leaks. Implementing this change helped mitigate the risk of system failure and inefficiency and the costs associated with those issues. Secondly, the base pricing structure had to be adjusted to account for redesign and additional safety components deemed necessary by real-world experience. Some of these changes include adjusting the size and quantity of the tubes, inlet and outlet valve reconfiguration, and adding a gangway with safety gates. Energy

[30] *See* Appendix A, Supporting Materials 1.2 - Lakeside Pipeline LLC - Application - 2018 Solicitation SB1383 Dairy Pilot Projects, pp. 398-399.

Innovations provided the justification for these changes for each digester, outlining all the design changes and their related costs for their designs which were implemented by MEW collaborating with various subcontractors and materials suppliers.[31] The design change decisions were made considering the goals of the pilot project to ensure safety, operational efficiency, and facility longevity, all of which contribute to the success and viability of the Project. Examples of MEW's commitment to prioritizing safety include switching from HDPE to stainless steel to prevent leaks of H2S-rich gas and reduce the risk of hazardous system failures, as well as reconfiguring the outlet valve and adding a gangway with safety gates to enhance operator safety. MEW demonstrated prudence by comparing the risks and inefficiencies of utilizing outdated designs versus the increased cost of updating the designs. MEW considered how these two options would impact both the upfront and long-term costs of the Project and ultimately made the decision to update the design to mitigate the largest risk of cost increases.

Ultimately due to capacity shortages at Energy Innovations, and the fact that MEW was able to find more competitive fabricators, Energy Innovations was not retained to construct the final version of the howitzer equipment. Working with new vendors, MEW successfully procured the redesigned howitzers and delivered purified gas safely and effectively, as required. The total cost increase due to these design changes was $256,819 over the original estimate amount.

(b) Overruns due to Pandemic Inflation

During the COVID-19 pandemic, the prices for procuring nearly all construction materials and equipment spiked due to supply chain disruptions and economic fragility. Industry

[31] *See* Appendix A, Supporting Materials 1.10 - Energy Innovations - Biogas Processing Cost Increase Justifications, p. 1151, 1163, 1175, 1187, 1199, 1211, 1223, 1235.

experts at Energy Innovations have provided an analysis which quantifies their design-specific inflation rates based on input component cost breakdowns for the initial bidding period compared to the actual product implementation period.[32] Given that the pandemic and the numerous design changes (mentioned above) occurred at the same time, it is difficult to calculate what the price for the final product would have been in the absence of pandemic-related inflation. Contractors simply do not bid projects based on theoretical scenarios. The actual total prices paid by MEW reflect both design changes and the impact of inflation on all the contractors and suppliers over this period of time.

Energy Innovations provided price and wage estimates for production inputs in 2018, when the equipment was bid, in addition to a revised price based on the same products in 2021. These different prices reflect the effect of inflation on both physical components and labor and allow a comparison to determine an approximate inflation range for the period between bidding and actual construction. Energy Innovations also provided estimates for the breakout of labor costs and materials costs for each system that was bid. Using both the inflation estimates and the labor and materials shares, Energy Innovations was able to determine a range for the inflation during this period and used these as guardrails for setting specific inflation values to each system based on the initial and final contract.[33] In total, they estimate that inflation added $144,015 to the total overage requested for recovery for Howitzers. See Table 2 below for more details.

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[32] *See* Appendix A, Supporting Materials 1.10 - Energy Innovations - Biogas Processing Cost Increase Justifications, pp. 1146-1243. *See also*, Appendix A, Supporting Materials 1.11 - Lakeside Pipeline LLC - Biogas Blowers & O2 Injection Overage Summary, p. 1244.

[33] *See,* Appendix A, Supporting Materials 1.10 - Energy Innovations - Biogas Processing Cost Increase Justifications, p. 1155, 1157, 1167, 1169, 1179, 1181, 1191, 1193, 1203, 1205, 1215, 1217, 1227, 1229, 1239, 1241.

This inflation determination is based on the prices of specific manufacturing inputs as provided by Energy Innovations in their correspondence. In addition to this explicit calculation of the effect of inflation, it is well documented that the manufacturing and construction industry in general saw high inflation across the board during this period.[34] In addition, the pandemic resulted in rising labor wages to produce the gas processing equipment needed to complete the Project. Labor shortages forced employers to increase rates to obtain the necessary employees to maintain necessary output. The Associated General Contractors of America (AGC) found that 91% of firms had difficulty hiring necessary labor.[35] MEW experienced the same trends. The quotes that MEW received from vendors in late 2020 and early 2021 (during COVID) came in substantially higher than those bid by Energy Innovations in the spring of 2018. However, MEW had committed to build this Project and was required to deliver a system that could remove H2S from biogas at the dairies. Other H2S removal technologies that were evaluated, such as iron sponge or caustic scrubbing, were even more expensive to install on a dairy farm. Accordingly, MEW proceeded to contract with known low cost and reliable contractors that were able to supply the equipment necessary to make the Project a success—even though the cost was higher than Energy Innovations' original bid in 2018. MEW would have to incur significant additional out-of-pocket costs to achieve the pilot project H2S reduction goals. However, MEW determined it was preferable to incur these costs rather than fail to meet pilot program requirements, including compliance with the H2S removal requirement. These actions speak to MEW's prudence in managing the Project by considering the cost impacts in relation to the

[34] *See* Appendix A, Supporting Materials 1.8 - Lakeside Pipeline LLC - Lumber Price Skyrockets, Steel Provides Cost-Effective Solution, pp. 1120-1128.

[35] *See,* Appendix A, Supporting Materials 1.10 - Energy Innovations - Biogas Processing Cost Increase Justifications, p. 1153.

ultimate outcomes of the Project, and looking to mitigate costs where possible without jeopardizing the success of the Project.

In fulfilling this H2S removal requirement, MEW incurred substantial cost overages of $400,834 over the estimate approved by the Selection Committee. The reasons for these costs were design finalization and improvements ($256,819) and pandemic-related inflation ($144,015) as detailed in Table 2 below.[36] These overages were necessary to complete the Project as proposed to the Selection Committee and to comply with pilot program requirements.

Table 2 - Cost Detail - 2a. Biogas Treatment (Howitzers)

Cost Detail - 2a. Biogas Treatment (Howitzers)					
Cost Category as Submitted to the Selection Committee on the PISCE	Estimated Cost	Actual Cost	Over (Under) Estimated Cost	$ over due to design improvements, changes, and finalizations	$ over due to inflation of materials and equipment
Decade Centralized (Digester) #1 Howitzer	$ 39,720	$ -	$ (39,720)	$ (39,720)	$ -
Clear Lake (Digester #2) Howitzer	$ 34,520	$ -	$ (34,520)	$ (34,520)	$ -
Dixie Creek (Digester #3) Howitzer	$ 39,720	$ 110,618	$ 70,898	$ 55,646	$ 15,252
Double L (Digester #4) Howitzer	$ 34,520	$ 135,222	$ 100,702	$ 67,949	$ 32,753
High Roller (Digester #5) Howitzer	$ 34,520	$ 135,222	$ 100,702	$ 67,949	$ 32,753
Lakeside (Digester #6) Howitzer	$ 39,720	$ -	$ (39,720)	$ (39,720)	$ -
Lone Oak Farms (Digester #7) Howitzer	$ 39,720	$ 110,618	$ 70,898	$ 55,646	$ 15,252
Poplar Lane (Digester #8) Howitzer	$ 34,520	$ 135,222	$ 100,702	$ 67,949	$ 32,753
River Ranch (Digester #9) Howitzer	$ 39,720	$ 110,612	$ 70,892	$ 55,640	$ 15,252
Total:	**$ 336,680**	**$ 737,514**	**$ 400,834**	**$ 256,819**	**$ 144,015**

2. Oxygen Injection and Blowers

The biogas blower system is a low-pressure compressor, plus various cooling, metering, controlling and electrical components, designed to remove moisture from the biogas at the dairy, and then transport the biogas down the collection pipelines to the centralized biogas cleanup facility. These blower systems were in the process of being deployed at MEW's first biogas

[36] The Decade and Lakeside digester's howitzers are not included for reimbursement herein as these systems were paid for by the farmer directly and the expense was not billed through the pipeline entity which makes these expenses ineligible for reimbursement under the pilot project regulations. Note that High Roller Dairy is owned by River Ranch Dairy. Hence, some of the expenses for High Roller Dairy were billed to River Ranch Dairy.

pipeline cluster in Tulare County at the time of pilot project application, and so the design was familiar but there was minimal field experience with these units at the time of the pilot project application. In addition to the blowers, the Project required a new system to meet the H2S reduction requirements of the program. The howitzers (mentioned above) use absorbent media to remove H2S. But in order to minimize media usage (which creates waste material, increases operator risk, and adds to operational cost and down-time), MEW included oxygen injection systems in the initial application to inject purified oxygen under the digester cover to assist with chemical H2S reduction upstream of the howitzer media. As previously mentioned in the section on howitzers, no digester company had ever built this type of upstream H2S reduction system in a cluster of dairies, so much of this work was unprecedented. The prior practice was to simply inject air under the digester cover, but in order to comply with the gas quality specifications for injecting biogas into a pipeline, MEW determined that it would be more efficient and desirable for the air entering the biogas system to first be compressed and filtered to create pure oxygen. These two items (Blowers and O_2 Injection Systems) are mostly made up of mechanical and electrical components. Accordingly, the cost overages MEW incurred here due to COVID-19 inflation were slightly different than that of the howitzers analyzed above, but still significant, and MEW calculated the inflation impacts differently for this set of costs. Like the howitzers, MEW also improved the final engineering design based on pilot program requirements and lessons learned as the new technology was deployed over the 3 years following the Project application submittal. Two specific factors (design finalizations and pandemic inflation) caused the cost overages in this category.

The cost overage analysis provided by Energy Innovations for oxygen injection and blowers follows the same methodology detailed above in the introduction of section A. Cost Category 2a. Biogas Treatment.

(a) Overruns due to Design Finalization and Improvements

MEW's proposed cost estimates for dairy-specific biogas conditioning and transportation equipment were based on estimates provided by specialty biogas designer and fabricator Energy Innovations. MEW has worked with Energy Innovations for over 10 years on many biogas equipment projects wherein Energy Innovations supplied dozens of custom-design biogas handling equipment packages. Based on its history, Energy Innovations was the most reliable source of information to create industry-standard cost estimates during the 110 days available to prepare project estimates.[37] After the Selection Committee selected the Project, MEW continued with permitting and detailed engineering. During this time, MEW was able to learn from the experience of systems commissioned and operated at the Calgren Dairy Fuels Project in the 2018-2019 period prior to ordering and installing the Project equipment. The referenced Calgren Dairy Fuels Project did not install oxygen injection systems as they employed a different H2S removal tactic. However, the Calgren Dairy Fuels Project deployed many biogas blowers on the nation's first large dairy biogas pipeline system. MEW took the real-life operational experience from the Calgren Dairy Fuels Project into account when finalizing designs for the Project. MEW used this new information from operational experience to mitigate increases to the Project's lifetime costs by updating equipment design to meet industry standards, increase operational efficiency, expand project longevity, and advance safety, thereby decreasing the Project's lifetime costs.

[37] *See* Appendix A, Supporting Materials 1.9 - Energy Innovations - Company Profile, pp. 1129-1145.

Energy Innovations, as both the contractor which supplied the bids used to estimate the Project and the contractor which supplied the final products commissioned on the digester sites, has provided a written analysis of all design changes and their relative costs for each digester's system. These costs are summarized below and described in detail in the letters provided by Energy Innovations for each digester project.[38]

First Set of Changes

The first set of changes apply to the physical equipment being installed. MEW's experience on facilities after the 2018 Pilot Project application demonstrated that some of the physical components included in the initial bid would not result in a successful product.

The first of these was the switch from HDPE to stainless steel biogas piping to improve safety and durability. Operational experience supported the use of HDPE in ambient pressure applications such as lagoon covers and biogas collection pipes. However, in higher pressure gas handling equipment, containers, or frequently-serviced equipment, HDPE presented a risk of degradation and eventual leaks. Given this, the ideal combination was using HDPE for some applications to control costs, but substituting stainless steel in other locations where it was required for added safety and reliability.

Secondly, MEW found more efficient ways to chill biogas. Instead of chilling the biogas with purely glycol-based chillers, as designed, MEW found that chillers in hot and dusty environments could not always maintain reliability. MEW found that using air-to-air coolers working in tandem with glycol-based chillers was more reliable and energy efficient than glycol-based chillers alone, so air-to-air coolers were added.

[38] *See,* Appendix A, Supporting Materials 1.10 - Energy Innovations - Biogas Processing Cost Increase Justifications, pp. 1146-1243. *See also*, Appendix A, Supporting Materials 1.11 - Lakeside Pipeline LLC - Biogas Blowers & O2 Injection Overage Summary, p. 1244.

Third, it was determined from operational experience that additional gauges, meters, and sensors were needed to allow for detailed gas analytics to inform proper equipment operation and later would be needed to comply with various carbon credit agencies and other regulatory requirements. Implementing these additional measurement systems gives the operator a higher level of visibility in gas quality which advances the ability to mitigate safety concerns with harmful gas. In addition, these measurement systems generate valuable data to help drive innovation of new technology within the dairy biomethane industry, advancing the goals of the pilot program.

Fourth, when these systems were commissioned at the project in Tulare County, it was learned that operating these systems around dust, direct sunlight, and other conditions in the field stressed the system. As a result, the systems could not operate at the needed capacity while staying within safe operational metrics. The added stress factors resulted in the systems running at dangerous heat levels, consuming excessive oil, and ultimately decreasing the system's reliability and operating life span. Considering the above, it was determined the biogas blower would operate within safe parameters when the system was designed for 125% of the flow needed at the digester to account for the field stress factors. While increasing the capacity of the blowers as described above increased upfront costs, MEW concluded that considering the cost impacts of system failures, downtime, and equipment longevity, it was ultimately wiser to mitigate these potential risks, costs, and safety concerns, notwithstanding the increased capital expense.

Fifth, considering the necessary increased system capacity, the electrical equipment needed to be modified including a reconfigured power distribution, enhanced control room design, and upgraded electrical equipment to meet the power needs of the larger system.

Sixth, gas condensate separators were added to avoid condensation and water build up in the gas processing systems and the collection lines to improve safety and avoid costly maintenance. The utilized gas condensate separators were simple in design, utilizing HDPE materials, and no alternative options were competitive in terms of cost efficiency.

Lastly, it was determined that a critical safety feature needed to be added to prevent pipeline backflow into the digester which could over-pressurize the covered lagoons. MEW reviewed alternative options, but there were no practical alternatives relative to the selected alteration. Due to the necessity of this last-mentioned backflow prevention device for safety, it was approved for recovery by the Commission in the Merced reasonableness review.[39] All the above changes were made to ensure the success of this equipment and its longevity in light of lessons learned from system implementation which took place between the time of initial bidding and final commissioning. All design changes depicted above were approved after careful consideration of the Project's holistic performance and with the foresight to mitigate operational costs and safety concerns which ultimately threatened the success of the Project.

Second Set of Changes

A second set of changes apply to the scope of labor necessary to fabricate and commission these H2S removal systems based on experience with the commissioning process at the similar Calgren Dairy Fuels Project. MEW learned of these issues related to the commissioning of the Calgren Dairy Fuels Project after it had submitted its bid for the Project. The first of these was a revised design scope of work ("SOW"), which was added to account for

[39] *See* D.24-10-004, p. 48, Conclusion of Law 10: "The requested $69,650 overage associated with the installation of the backflow prevention devices for the oxygen injection and biogas blower system is reasonable and should be recovered from ratepayers."

the design changes to implement the above-mentioned additional components to improve system performance and safety.

The second issue was the addition of an automation and controls SOW in order to empower remote operators to monitor and control the systems, rather than relying solely on on-site operators which increased operational expenses and did not provide the same level of visibility for safety as determined in MEW's experience with the Calgren Dairy Fuels Project.

The third issue was the addition of the site preparation SOW which contained the work necessary to prepare the site for the highly specialized equipment, as it was determined from the Calgren Dairy Fuels Project that technical professionals would need to travel to the site to properly prepare for equipment delivery and installation.

Fourth, it was necessary to add a field work SOW, including electrical work required to install the electrical infrastructure for lagoon mixers and equipment which were implemented to optimize gas production and quality as determined after the initial bidding period. These systems work to condition the biogas before being processed by the downstream howitzers.

Lastly, a commissioning SOW was added. This is similar to the site preparation work in that it was necessary to have a technical team travel to the site to ensure the complex electrical, mechanical, and control features were properly installed, implemented, and operating as intended. All the above additions are either a result of the necessary added infrastructure, as described above, or based on real-world experience with system installation and commissioning, and determined to be necessary after the initial bid was submitted.

In addition, to allow remote management for efficiency and safety, MEW installed improved supervisory control and data acquisition ("SCADA") controls and added additional networking infrastructure. The 2018 bid for the pilot project did include SCADA systems, but

these systems had not yet been tested in the field in 2018 (in the context of a dairy biomethane pipeline) as neither MEW nor anyone else in California at that time was operating a dairy digester pipeline cluster. During the operation of the Calgren Dairy Fuels Project, MEW learned that upgraded SCADA controls were necessary to coordinate flows from multiple dairies all feeding into the same biogas pipeline, since the insufficiency of SCADA controls introduced operational challenges. MEW has included a statement from Energy Innovations describing the nature of these changes and their necessity in the whole of the Project.[40] MEW incorporated the lessons learned on its first Calgren Dairy Fuels Project and improved the Project design to ensure optimal long-term operation of the equipment to meet the pilot program's goals.

The cost of the additional items described above were paid by MEW at normal market prices. All additional costs MEW incurred were evaluated to ensure the additional cost provided operational cost or safety concern mitigation and contributed to the Project's holistic success. MEW calculated that the total cost overrun for this category due to design finalization and improvements was $1,182,709 over the original estimate when accounting for the oxygen injection and blower equipment installed at all 8 participating dairies.[41] MEW acted prudently in making changes to the Project as originally bid in order to improve reliability and safety, while also advancing the pilot program's goals and objectives. See Table 3 below for the estimate and final cost details.

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[40] *See,* Appendix A, Supporting Materials 1.10 - Energy Innovations - Biogas Processing Cost Increase Justifications, pp. 1242-1243. *See also*, Appendix A, Supporting Materials 1.11 - Lakeside Pipeline LLC - Biogas Blowers & O2 Injection Overage Summary, p. 1244.

[41] The initial solicitation and approved estimates included 9 digesters contributing to the centralized clean up facility. The owner of Decade Centralized and Clear Lake decided to postpone the construction of Clear Lake until the financial validity of Decade Centralized could be solidified, leaving 8 participating digesters. Costs relating to the Clear Lake digester are hence not included herein for reimbursement. Accordingly, the exclusion of Clear Lake dropped the dairy participation from 10 dairies to 9 dairies.

(b) Overruns due to Pandemic Inflation

Additionally, as previously described, there was also abnormally high inflation during the COVID-19 pandemic period, which impacted construction costs through the industry. Given that the pandemic and the numerous design changes (described above) occurred at the same time, it is difficult to calculate what the price for the final product would have been in the absence of pandemic-related inflation. Contractors simply do not bid projects based on theoretical scenarios. The actual prices paid by MEW reflect both cost increases due to design changes and cost increases due to inflation since these contractors and suppliers all operated in the economic conditions of the COVID era. In order to determine what fraction of the cost increases were due to changes in design versus COVID era inflation, Energy Innovations was asked to review their bids, billing, and work on the Project. As Energy Innovations procured the necessary materials and labor and built the equipment discussed here, MEW determined their analysis would be more accurate than any calculation MEW could produce. Energy Innovations has provided price and wage estimates for production inputs in 2018, when the equipment was bid, and a second price based on the same products in 2021. These estimates are used to distinguish between the input inflation for both physical components and labor to determine an approximate inflation range for the period between bidding and actual construction. Energy Innovations also provided estimates for the breakout of labor costs and materials costs for the bid systems. Using both the inflation estimates and the labor and materials shares, Energy Innovations was able to determine a range for the inflation during this period and used this to calculate specific inflation values for the system based on the initial bid and final contract for each of the digester projects.[42] The

[42] *See,* Appendix A, Supporting Materials 1.10 - Energy Innovations - Biogas Processing Cost Increase Justifications, p. 1154, 1157, 1166, 1169, 1178, 1181, 1190, 1193, 1202, 1205, 1214, 1217, 1226, 1229, 1238, 1241.

resulting total inflation increase for all blower and oxygen injection systems was $481,358 for all digesters. See Table 3 below for the estimate and final cost details.

In summary, the additional costs MEW incurred related to biogas treatment were necessary to complete the Project as intended and MEW paid market prices for the agreed upon equipment. The cost increases were due to design finalizations and improvements ($1,182,709) and higher than normal cost inflation ($481,358) (due to the pandemic) for a total cost overrun of $1,664,067. The calculated overages by line item and participating digester project are specified in Table 3[43] below and additional detail is provided in the letters from Energy Innovations explaining the overage justification for each respective digester.[44]

[43] Some progress invoices for the blower and O2 injection systems at the High Roller, Lakeside, and Poplar digesters were paid for by the farmer directly and the expense was not billed through the pipeline entity which makes these expenses ineligible for reimbursement. These expenses are not included for reimbursement herein.

[44] *See,* Appendix A, Supporting Materials 1.10 - Energy Innovations - Biogas Processing Cost Increase Justifications, pp. 1146-1243. *See also*, Appendix A, Supporting Materials 1.11 - Lakeside Pipeline LLC - Biogas Blowers & O2 Injection Overage Summary, p. 1244.

Table 3 - Cost Detail for 2a. Biogas Treatment (O2 Injection and Blower Packages)

Cost Detail - 2a. Biogas Treatment (O2 Injection and Blower Packages)					
Cost Category as Submitted to the Selection Committee on the PISCE	Estimated Cost	Actual Cost	Over (Under) Estimated Cost	$ over due to design improvements, changes, and finalizations	$ over due to inflation of materials and labor
Decade Centralized (Digester #1) Blower	$ 178,900	$ 571,670	$ 220,914	$ 160,821	$ 60,093
Decade Centralized (Digester #1) O2 Injection	$ 171,856				
Clear Lake (Digester #2) Blower	$ 178,900	$ -	$ (350,756)	$ (350,756)	$ -
Clear Lake (Digester #2) O2 Injection	$ 171,856				
Dixie Creek (Digester #3) Blower	$ 178,900	$ 695,539	$ 344,783	$ 272,992	$ 71,791
Dixie Creek (Digester #3) O2 Injection	$ 171,856				
Double L (Digester #4) Blower	$ 178,900	$ 665,178	$ 314,422	$ 251,060	$ 63,362
Double L (Digester #4) O2 Injection	$ 171,856				
High Roller (Digester #5) Blower	$ 178,900	$ 568,993	$ 218,237	$ 158,425	$ 59,812
High Roller (Digester #5) O2 Injection	$ 171,856				
Lakeside (Digester #6) Blower	$ 178,900	$ 305,610	$ (45,146)	$ (76,748)	$ 31,602
Lakeside (Digester #6) O2 Injection	$ 171,856				
Lone Oak Farms (Digester #7) Blower	$ 178,900	$ 688,900	$ 338,144	$ 264,462	$ 73,682
Lone Oak Farms (Digester #7) O2 Injection	$ 171,856				
Poplar Lane (Digester #8) Blower	$ 178,900	$ 543,989	$ 193,233	$ 135,056	$ 58,177
Poplar Lane (Digester #8) O2 Injection	$ 171,856				
River Ranch (Digester #9) Blower	$ 178,900	$ 597,740	$ 246,984	$ 184,145	$ 62,839
River Ranch (Digester #9) O2 Injection	$ 171,856				
IT Network Infrastructure	$ -	$ 183,252	$ 183,252	$ 183,252	$ -
Total:	**$ 3,156,804**	**$ 4,820,871**	**$ 1,664,067**	**$ 1,182,709**	**$ 481,358**

B. Cost Category 2b: Collection Lines

MEW's Project bid approved by the Selection Committee estimated $5,833,811 for the collection line portion of the Project for 8 participating dairies. The final cost for this cost category was $10,460,118, which is an overage of $4,626,307. The various causes of this overage are outlined in the sections below. This category covers the gathering pipeline network (approximately 23.4 miles of pipeline) and related installation costs connecting the 8 dairies to the central upgrading facility. The final cost for collection lines was higher due to: (1) route changes and design adjustments, (2) compliance with Kings County permitting and environmental requirements, and (3) labor cost increases under a PLA prevailing wage. Table 4, Table 5, and Table 6 break down the cost impacts by component.

1. Collection Line Overages

Three primary factors led to MEW's cost overages for collection lines, including design finalizations and improvements, environmental and permitting requirements imposed by Kings County, and project labor agreement/prevailing wage impacts, each of which are described in detail below. These factors had differing impacts on various components of the Cost Category 2b: Collection Lines total. Each component of the collection lines cost category is described below, followed by the causes of the cost overrun that impacted that component. These cost components and reasons for overruns are broken out line-by-line and cause-by-cause in Table 4 and Table 5, and Table 6 provides a summary for the entire Cost Category 2b: Collection Lines cost category.

(a) Collection Lines (Materials and Installation)

The initial estimate for the materials and installation of the collection lines was $4,861,811. The final cost for these items was $6,841,223 for a total cost overage of $1,979,412.[45] There are numerous causes to this estimate overage, including design finalizations and improvements for the final route and pipeline diameter, permitting and environmental requirements, and numerous project labor agreement/prevailing wage impacts as described in detail below.

[45] These are the totals for all pipeline diameters shown in the PISCE cost analysis submitted with the Pilot Project Application. Collectively we are calling all these lines "Collection Lines (Materials and Installation)". *See* Appendix A, Supporting Materials 1.12 - Lakeside Pipeline LLC - PISCE, pp. 1245-1271. for a copy of the PISCE initial estimates submitted to the Selection Committee in June 2018.

(i) Overruns due to Design Finalization due to Route Changes

MEW's initial cost estimate included a proposed pipeline route based on the limited information available at the time. Within the 110-day application window, MEW had to evaluate all possible pipeline routes that would enable MEW to collect all the biogas from the 8 dairies, deliver it to a central site, and then inject the finished gas into a common carrier pipeline.

Planning the pipeline route required MEW to outline all reasonable routes to connect the digesters and the processing and injection facility. These routes then had to be evaluated by considering the landscape obstacles along these routes (roads, canals, etc.), environmental concerns present along the route in relation to County permitting requirements, potential environmental mitigation requirements, ownership of the land, and MEW's ability to obtain a right of way to install the pipeline in these locations. To inform this evaluation, MEW attempted to contact landowners along the pipeline routes and commenced easement negotiations, inquired about local permitting processes, and conducted preliminary environmental evaluations.[46] After reviewing the findings of the above evaluation, MEW selected the route which most efficiently connected all participating sites while avoiding identified obstacles wherever possible and utilizing property where the easement negotiations seemed most promising. There were multiple instances where MEW had made contact with landowners during the 110 days prior to bid submission to the Selection Committee, but later was unable to negotiate an easement with private landowners for the full route that was proposed to the Selection Committee. It was simply not possible to negotiate with all the landowners, draft, and execute easement agreements

[46] Wherever possible, MEW used participating dairy farmer land to mitigate the ownership issue and reduce costs. MEW was very successful in doing so as the vast majority of pipeline routes were provided by dairy farms and significantly reduced Project costs.

in order to obtain full site control of the entire right of way within the very limited 110 day period for application preparation.[47] In the 2018 application, MEW provided the most plausible pipeline route for its cost estimates given the standing knowledge of the status of negotiations at the time of application. Furthermore, the pilot program solicitation did not require applicants to demonstrate site control for proposed pipeline routes at the time of the application (rather, site control documentation was only required for the gas cleanup central facility site—which MEW provided and was not changed).

When MEW learned that it could not obtain all the necessary easements to allow construction of the originally planned pipeline route, MEW was able to use reroutes and undertake the necessary updated engineering and design changes to successfully complete the pipeline.[48] Specifically, when a small number of property owners would not agree to easements, MEW was able to reroute the project using either public rights of way or alternative private routes. If the ideal route was not available, then MEW obtained rights for the next most efficient route to minimize costs. These changes resulted in a minor increase in the net total collection pipeline distance of 2,053 feet relative to the original route submitted to the Selection Committee which measured 121,342 feet. The total collection pipeline installed was 123,395 feet to all participating dairies and MEW was able to complete the pipeline with less than a 1.7% increase (2,053 feet out of 123,395 feet) in total distance compared to the original route used in the application.

MEW acted reasonably in submitting its proposed pipeline route in accordance with the solicitation requirements. MEW was able to slightly modify the pipeline route and complete the

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47 *See*, D.17-12-004, p. 13.

48 *See,* Appendix A, Supporting Materials 1.13 - Lakeside Pipeline LLC - Lakeside Cluster Map Original vs Actual - 06.2024 - 24x36, p. 1272.

project with negligible changes in length—and only slight variations in the final route. The calculated net cost to install the pipeline was $55.44[49] per linear foot and so the additional cost attributable to rerouting based on the additional 2,053 feet of pipeline equals $113,818. See Table 4 below for cost details by cost category line item. MEW notes that in D.24-10-004 the Commission found similar reroute costs for the MEW Merced project to be reasonable when a portion of the routes included in that project bid proved infeasible.

(ii) Overruns due to Design Improvements and Finalization due to Pipeline Diameter Changes.

MEW's cost estimates approved by the Selection Committee included estimates for four-inch (4"), six-inch (6"), eight-inch (8"), and ten-inch (10") pipes to be utilized by the Project. Ultimately, the Project was built using 4", 6", 8", twelve-inch (12"), sixteen-inch (16"), and eighteen-inch (18") pipes. The pipeline sizes proposed in the bid approved by the Selection Committee were based on preliminary estimates only, as preliminary engineering of the pipeline had barely begun at the time MEW's bid was submitted. After final engineering was completed, the larger pipe sizes were determined to be necessary to ensure the pipeline would be operated in the 3-15 pounds per square inch gauge ("psig") pressure range, consistent with Selection Committee proposals. MEW's encroachment permits with Kings County also stipulated a pipeline pressure of 10-15 psig.[50] MEW complied with the standards set forth therein to ensure the highest level of safety, operational efficiency, and project longevity.

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[49] $55.44/ft represents the as-built cost of the pipeline by taking the total actual cost from Table 4 below divided by the total installed pipeline distance. The proposed estimates from the PISCE reflected $40.07/ft for the total proposed pipeline installation costs divided by the proposed pipeline distance. *See* Appendix A, Supporting Materials 1.12 - Lakeside Pipeline LLC - PISCE, pp. 1245-1271.

[50] *See,* Appendix A, Supporting Materials 1.7 - Lakeside Pipeline LLC - Kings County Encroachment Permit Application, p. 1103. Note that the project minimum pipeline depth was increased from 36" to 48" between initial and final design. However, due to the sloped moisture collection design of the

Additionally, the increase of pipeline size helped mitigate significant pressure loss between the digester outlet and biogas treatment facility inlet which would have significantly impacted pipeline performance at the size selected in the initial design. Within the dairy biomethane pilot project score card summary, it was stated that the "[p]ipelines ***must*** be designed to accept the ***maximum*** possible biomethane gas production."[51] MEW followed this guidance to ensure the Project was successful and accomplished the goals of the Commission. Included in MEW's supporting documentation is an overhead map of the pipeline notated with the measured pipeline pressure for the as-built pipeline across the dairy cluster which highlights the design's success at maintaining the target pressure range.[52] In addition, without the increased pipeline size, the pipeline would have to operate at higher pressures, which would in turn require the blower compression equipment at all the dairies to be upgraded. This would increase both the upfront costs and ongoing operational costs of these systems. As opposed to changing the equipment installed at each dairy pipeline inlet, increasing the pipeline wall thickness, or modifying other related equipment impacted by higher pressures, MEW found it more efficient to simply increase the pipeline size to accommodate the operational ratings of the existing pipeline and digester designs.

MEW had only just begun operating its first biogas pipeline in 2018 (indeed, it was the first large scale dairy biogas pipeline project anywhere in the country) and was still learning how

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pipeline, the pipeline was nearly always 48" deep anyway. Accordingly, changing the minimum depth of the pipeline had little if any impact on installation cost.

[51] *See*, SB 1383 Dairy Biomethane Pilot Project Selection Committee Score Card, p. 5, emphasis added. https://www.cpuc.ca.gov/-/media/cpuc-website/files/uploadedfiles/cpuc_website/content/utilities_and_industries/energy/energy_programs/gas/natural_gas_market/finalselectioncomscorecardsum.pdf

[52] *See,* Appendix A, Supporting Materials 1.14 - Lakeside Pipeline LLC - Pipeline Pressure Map, p. 1273.

important it was to increase pipeline diameters to keep pressure loss down. The lower pressure drops through larger pipelines enabled MEW to operate Project blower equipment (described earlier) at lower outlet pressures and thus reduce energy usage and risk of summertime overheating. Overheating and eventual failure of biogas equipment poses risks of expensive equipment repairs along with safety concerns as equipment failures could cause buildup of gas, leading to venting events at the digester, releasing harmful gases into the air. To mitigate these potential repair costs and safety hazards, MEW decided to increase the pipeline diameter to relieve pipeline pressure and ensure equipment was run within its operational parameters.

Furthermore, the larger diameter size provides the Project the flexibility to allow other dairies to participate in future expansions of the Project. This expansion goal is consistent with both pilot program goals and MEW's proposal made to the Selection Committee, which included numerous references that the Project and cluster was to be designed and built with future expansions in mind.[53]

As shown on the pipeline map with pressure measurements, the increased pipeline size resulted in successful operation of the project within the 3-15 psig goal for safety and reliability. Taken together, these facts demonstrate that MEW exercised prudent management judgment by considering the whole of the Project and choosing to mitigate the higher cost of redesigning equipment at each dairy site through the use of a lower cost option—increasing the pipeline size.

The average material cost per linear foot of pipeline for the Project was $7.86, slightly higher than the expected average of $6 per linear foot based on initial estimates using the smaller diameter pipe at the time of application. The total length of pipeline installed was 123,395

[53] *See* Appendix A, Supporting Materials 1.2 - Lakeside Pipeline LLC - Application - 2018 Solicitation SB1383 Dairy Pilot Projects, p. 19, 35, 36, 37, 105. These pages of the Project Narrative in that application reference building the Project for expansions.

linear feet. The 123,395 linear feet of pipeline length priced with a cost increase of $1.86 per linear foot resulted in a total overage of $229,515 attributable to the larger diameter pipeline materials. See Table 4 below for cost details by cost category line item.

In summary, the total cost overruns in the design improvements and finalization category, as generated by both pipeline route changes and pipeline diameter changes, is the sum of $113,818 for route changes and $229,515 for materials cost increase for larger pipe size which is an overage total of $343,333 (see Table 4 below for cost details by cost category line item).

(iii) Overruns due to Project Labor Agreement and Prevailing Wage Costs

The pilot project solicitation did not require applications to include prevailing wage rates nor was there a requirement to consult with unions prior to application submittal. Additionally, MEW had never previously worked with or been contacted by unions during its prior work in the industry. Based on its prior experience, coupled with the pilot program's lack of any prevailing wage requirement in the solicitation, it was reasonable in 2018 to assume the Project would be built with non-union labor. Therefore, MEW instructed all preliminary subcontractor bids to use standard wage rates. In the previously mentioned Merced reasonableness review, the Commission found that "MEW's decision to use standard wages in its pilot application was reasonable."[54] As the pilot program gained publicity, unions became interested in these projects—likely due to their public profile, quasi-public source of funds, and large size (almost $125,000,000 in capital spending was announced through the pilot project process). As had occurred during its Merced Dairy Pilot Project (see Comments of Maas Energy Works, LLC filed in A.23-04-005), after Project approval, MEW was approached by a law firm representing a

[54] D. 24-10-004, p. 25.

consortium of unions advocating for MEW to enter into a Project Labor Agreement (PLA). The result was the same; a new PLA was entered into on or about April 1, 2020. Securing union support was important for the timely progression of the project[55] and resulted in higher costs due to prevailing wage requirements and more expensive construction practices.

According to a study conducted by UC Berkeley, the average labor cost increases experienced in California for non-major cities when switching to prevailing wages was 23% overall. This results from the average share of construction costs attributable to labor being 43.3%. These labor costs are then escalated by the average prevailing wage increase of 53.0%.[56] As the union contractors hired for the Project did not provide a detailed breakdown of labor versus equipment costs, MEW used the above factors to estimate the cost impact of prevailing wage rates.[57]

MEW applied the 43.3% average labor share of construction to the initial collection lines estimate of $4,861,811 to reach a total labor cost of $2,105,164. Applying the average prevailing wage differential of 53.0% to the labor share results in increased labor costs of $1,115,737 which MEW is requesting for recovery (see Table 4 below for cost details by cost category line item).[58]

In addition to the above outlined impact of paying prevailing wages, MEW experienced significant cost overages because of the nature of the PLA's impact on union contracting procedures and the more limited responsibilities of the installation contractor under those

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[55] *See,* Appendix A, Supporting Materials 1.3 - Lakeside Pipeline LLC - Maas Hanford-Lakeside Dairy Digester Cluster PLA, pp. 862-902.

[56] *See,* Appendix A, Supporting Materials 1.15 - Lakeside Pipeline LLC - The Effects of Prevailing Wage Requirements on the Cost of Low-Income Housing, p. 1278.

[57] This methodology is consistent with the Merced reasonableness review. See D.24-10-004, p. 27 ("[g]iven that the Project did not occur in a major city, the use of these estimates [is] reasonable.")

[58] The cost overages detailed here exclude the PLA labor associated with the street crossing, boring, and other project scopes outlined in the sections below.

contracts. MEW examined whether the higher costs from these procedures and the use of additional subcontractors could be avoided, but concluded that this was not possible under the terms of the PLA provisions required by the unions. Throughout the span of Project construction, MEW was billed for miscellaneous time and materials charges for a variety of contractor activities consisting primarily of equipment and materials relocation, loading and unloading of equipment and materials, and miscellaneous installation related tasks (i.e. digging, potholing support, dirt compacting, site cleanup, etc.). In MEW's previous, limited experience working with non-union pipeline installation contractors, these various tasks were the responsibility of the contractor and were included within the project bid or other pipeline installation charges. But in a PLA union contract, each service is broken out and billed separately due to differing job classifications and work requirements. MEW was billed additional charges for each line item (line crossings, pipeline feet installed, butterfly valve installation, etc.) along with all additional hours spent by the crew on various small tasks relating to these line items.

MEW did attempt to mitigate these costs wherever possible by having MEW's construction managers provide observations and support. However, the nature of union contracts does not allow non-union workers to contribute to construction activities in the contractor's scope, and so MEW was limited in its ability to mitigate costs in this part of the Project. MEW's best mitigation option was to keep the pipeline as short as possible (see previous section) and provide timely permitting, engineering guidance, and schedule management so that completed work did not have to be modified or re-done. To comply with the PLA and ensure successful completion of the Project, MEW incurred these costs and ensured all work that was reasonable

and necessary to produce reliable and safe infrastructure was completed. These various charges for miscellaneous work added up to $330,342.

As an additional impact of the PLA, MEW experienced substantially higher than expected costs for additional safety work as these workplace protections are required by the PLA but are not performed within the contractors' main bid scope. Based on MEW's previous experience with pipeline installation, the safety tasks of pipeline marking and testing were relatively small expenses in relation to the pipeline as a whole or included in pipeline installation rates. The pipeline underwent substantial pressure testing after the pipeline was completed and tracer wire was added as is standard for non-metallic pipeline installations. All these tasks and additions were billed to MEW as additional costs outside the expected scope of work in the union installation contract. While this work was necessary to ensure the safety and longevity of the pipeline, these expenses were higher than MEW had anticipated because of the added requirements from the PLA. MEW paid an additional $190,000 to have the pipeline properly tested and to have proper tracer wire installed for the full length of the pipeline, which ultimately contributed to the success of the Project.

For the above-mentioned costs, MEW is requesting to recover the remaining overage amount of $520,342 to account for the overage experienced by MEW as a result of the billing structure and scope of work designations of the union contractors required in the PLA. Hence, MEW is requesting a total of $1,636,079 for recovery for PLA related costs, $1,115,737 of which is a direct impact of paying prevailing wages, and $520,342 is for scope of work and contracting impacts of the PLA which required MEW to pay for additional expenses that MEW had expected to be a part of the contractor's scope of work.

In summary, the collection pipelines installation component of the Cost Category 2b: Collection Lines category experienced overruns of $343,333 due to design improvements and finalization (including route changes and pipeline diameter changes) and overruns of $1,636,079 due to PLA impacts (including paying prevailing wages and PLA contracting regulations). Therefore, the total cost overruns for Cost Category 2b: Collection Lines (Materials and Installation) requested for recovery came to $1,979,412 as detailed in Table 4 below.

Table 4 - Cost Detail - 2b. Collection Lines (Materials and Installation)

Cost Detail - 2b. Collection Lines (Materials and Installation)						
Cost Category as Submitted to the Selection Committee on the PISCE	Estimated Cost	Actual Cost	Over (Under) Estimated Cost	$ over due to design improvements and finalizations: Route Changes	$ over due to design improvements and finalizations: Pipeline Diameter	$ over due to PLA: Prevailing Wage and other PLA Requirements
4" Collection Line	$ 1,993,355	$ 107,436	$ (1,885,919)			
6" Collection Line	$ 1,898,736	$ 248,507	$ (1,650,229)			
8" Collection Line	$ 528,432	$ 1,254,456	$ 726,024			
10" Collection Line	$ 441,288	$ -	$ (441,288)	$ 113,818	$ 229,515	$ 1,636,079
12" Collection Line	$ -	$ 2,873,354	$ 2,873,354			
16" Collection Line	$ -	$ 11,531	$ 11,531			
18" Collection Line	$ -	$ 1,552,627	$ 1,552,627			
Other T&M Install Charges	$ -	$ 793,311	$ 793,311			
Total:	**$ 4,861,811**	**$ 6,841,223**	**$ 1,979,412**	**$ 113,818**	**$ 229,515**	**$ 1,636,079**

(b) Surveys

MEW estimated in 2018 that only $27,000 would need to be spent on surveys based on the single biogas pipeline project that MEW had partially completed as of 2018. However, the ownership and funding structure required for the Project created new requirements that were not evident until 1-2 years after submitting the application to the Selection Committee. As explained in the project application, the Project was to be financed by bank loans provided by banks which had established relationships with the diary owner partners of Lakeside.[59] The Project was

[59] *See*, Appendix A, Supporting Materials 1.2 - Lakeside Pipeline LLC - Application - 2018 Solicitation SB1383 Dairy Pilot Projects, p. 50.

ultimately able to obtain the necessary bank financing needed to finish the Project with loans from these banks.[60] However, the Project was required to do substantially more in-depth surveys in order to obtain debt financing as requested by the banks and the United States Department of Agriculture. These more substantial survey requests had not been previously requested by prior lenders, so this was a reasonably unforeseen cost that was required for the Project to obtain financing. These surveys created an overage of $75,646. See Table 5 below for cost details.

(c) Engineering

MEW's engineering cost estimate as proposed to the Selection Committee estimated $280,000 for engineering of the pipeline. The Project ran a total cost for engineering of $310,641, resulting in an overage of $30,641 for this line item. This is equivalent to an 11% overage, which is considered a reasonable overage amount in the construction industry. The engineering costs were higher than expected due to obstacles encountered in the construction process and revised design requirements resulting from final engineering, as discussed throughout our testimony herein on Project overages. For example, the necessary route changes due to permitting requirements and obstacles encountered during construction created more engineering work. Likewise, the pipeline size changes required engineering adjustments to be made to ensure they were properly implemented and the final Project worked as designed. The pipeline has operated as it was engineered to operate.

(d) Potholing

On previous projects using non-union contractors, the pipeline installation contractor almost entirely handled potholing, so very little time and materials ("T&M") costs were expected

[60] The Project had to finance all its costs, including the $6,991,208 in cost overruns, by itself, at considerable expense, including interest payments that continue to the present.

for this cost category. Potholing is the practice of locating buried items that are shown on the plans, and need to be physically (and carefully) found before initiating any earth moving activities nearby. MEW estimated just $35,000 for unexpected potholing that might be required outside of the installation contractor's scope of work. MEW had experience with just one pipeline installer, on one non-union project, and that pipeline installer conducted its own potholing as part of its bid scope. When the Project switched to union contractors and prevailing wages due to the PLA (discussed above), the impact went well beyond just paying laborers higher wages. The new contractors also had different expectations of what work the contractor would accomplish within its contract scope. The pipeline contractor would not proceed with construction unless nearby lines were first located by potholing and required that the Project pay additional T&M costs to perform the work. The contractor often required a different set of employees and equipment to do this work, given union job categories. Given the labor rates, mobilization requirements, and other practices required under a union contract, what would normally be a minor cost turned into a very expensive cost category. Total overruns caused by this change to a PLA amounted to $449,860. These costs could not have been foreseen at the time of application to the Selection Committee due to bidding the Project based on prior experience and without the unions and prevailing wages in mind. Note that the Pilot Project solicitation did not require union contracts or prevailing wages, so MEW did not include this analysis when it submitted its Pilot Project application. Rather, those union requirements only emerged later during the CEQA public comment process. While this potholing was a significant expense, the practices employed provided an additional level of safety by identifying unidentified buried lines, which mitigated the cost of repairing damaged unidentified lines. In

order to proceed with the construction and comply with the PLA and all relevant engineering and safety standards, MEW was required to pay this amount. See Table 5 below for cost details.

(e) Canal Crossing

At the time of the application, MEW estimated $250,000 for canal crossings. In the end, MEW overestimated this category, and spent a total of $230,000, leaving a savings amount of $20,000. These savings are a result of MEW's efforts to locate the pipeline along the most efficient route with the fewest obstacles possible in order to mitigate the substantial costs associated with installing pipeline across these obstacles. These route modifications contributed to the cost savings in this category and demonstrate MEW's prudent management to implement efficient pipeline routes to avoid costly landscape obstacles.

(f) Street Crossings and Boring

MEW estimated $270,000 for trenching street crossings but completed the work with costs under this estimate, spending a total of $183,633 on street crossings, resulting in savings of $86,367. Meanwhile, MEW estimated $110,000 for the cost of boring under roadways, but the increased amount of boring resulted in a cost of $585,000, for an overage of $475,000 for the category. The overage is a result of two items, construction method alteration and paying higher prevailing wages as a result of the PLA. The results of environmental studies for the pipeline route revealed land areas MEW needed to route around in order to avoid potential environmental impacts to local wildlife and ecosystems identified by Kings County as part of its permitting process. These studies were performed long after the initial Project application was submitted, as they require on-site surveys during various seasons of the year and could not be conducted during the allotted 110 days to prepare an application. When boring was deemed necessary by Kings Country instead of open trenching on all crossings of county roads, costs were reallocated

from the street crossing cost category to the boring cost category.[61] Second, as with the pipeline installation costs, MEW paid significantly higher prevailing wages for labor for street crossings, as required by the PLA.

In MEW's previous experience installing pipelines in Tulare County, street crossings were completed using an open trench and backfill method, which was invoiced at a cost of $15,000 by Cal Valley Construction. On the other hand, boring a street crossing was invoiced at a cost of $50,000 per crossing, which is a 233% increase in cost to switch from an open trench to a bore. Road crossings labeled in the pipeline engineering documentation were crossed using the boring method as opposed to an open trench.[62] Additionally, along the pipeline installation route, MEW crossed many private roads, which required proper refinishing which added costs to the street crossing cost category as incurred.[63]

The boring cost category experienced a total of $387,794 in overages as a result of additional bored crossings as required by Kings County. Looking at the approved cost estimates from the initial application, MEW had planned to spend the additional $86,367 of estimated costs on open trench road crossings to close out the remaining estimated cost for the open trench road crossings.[64] However, due the County requirement to bore all crossings of County roads, MEW had to spend $287,890 to bore under those crossings instead of using the open trench method.

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[61] *See,* Appendix A, Supporting Materials 1.4 - Lakeside Pipeline LLC - Kings County Department of Public Works Encroachment Permit ID #0-03-21, p. 904.

[62] *See* Appendix A, Supporting Materials 1.16 - Lakeside Pipeline LLC - Lakeside East Pipeline Engineering Map, pp. 1293-1360. *See also*, Appendix A, Supporting Materials 1.17 - Lakeside Pipeline LLC - Lakeside West Pipeline Engineering Map, pp. 1361-1391.

[63] *See* Appendix A, Supporting Materials 1.16 - Lakeside Pipeline LLC - Lakeside East Pipeline Engineering Map, pp. 1293-1360. *See Also*, Appendix A, Supporting Materials 1.17 - Lakeside Pipeline LLC - Lakeside West Pipeline Engineering Map, pp. 1361-1391.

[64] *See* Appendix A, Supporting Materials 1.12 - Lakeside Pipeline LLC – PISCE, pp. 1245-1271.

This $287,890 figure is based on the relative price of an open cut street crossing at $15,000 and a bored crossing at $50,000, hence $287,890 of the $387,794 is attributed to higher cost of a bored crossing relative to a trench and fill crossing in the Project's initial cost estimates. In addition to the County's requirements to bore crossings, MEW evaluated each private road crossing to determine the most cost-effective method to install the pipeline. Some private roads, while they could be trenched, would have been more costly to trench and refinish than bore due to the road materials and methods required to restore the road to its original condition. Hence, where applicable MEW employed boring methods to cross private roads to mitigate the more costly alternative of refinishing expensive roads. The remaining $99,904 of the overage is attributable to the additional crossings selected for boring in order to mitigate overall costs.

The remaining cost overages are due to the increased cost of the PLA and paying prevailing wages. To follow the same logic applied in the Merced reasonableness review,[65] MEW applied the 43.3% average labor share of construction to the initial street crossing and boring estimate of $380,000 ($110,000 for boring and $270,000 for street crossings) to reach a total labor cost of $164,540. Applying the average prevailing wage differential of 53.0% to the labor share results in increased labor costs of $87,206 (See Table 5 below for cost details by cost category line item). [66]

In summary, the estimate for street crossings and boring experienced overruns of $87,206 due to paying higher prevailing wages as stipulated in the PLA and overruns of $387,794 due to Kings County permitting requirements to bore crossings instead of using less expensive open trench crossings. This is summarized below in Table 5.

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[65] *See*, D.24-10-004, p. 27.

[66] *See,* Appendix A, Supporting Materials 1.15 – Lakeside Pipeline LLC - The Effects of Prevailing Wage Requirements on the Cost of Low-Income Housing, p. 1278. *See also*, D.24-10-004, p. 27.

(g) Line Crossings

In MEW's prior experience on the Calgren Dairy Fuels Project using non-union contractors and a simple project delivery format, line crossings[67] were implicitly included in the overall installation contractor's fixed price bid. That is, in all MEW's prior pipeline installations, the contractor's fixed bid naturally included installing the biogas line over any other lines they might cross (unless the crossed line directly interfered with MEW's intended pipeline route). Based on this, MEW's original estimate did not include any separate costs for line crossings since they were previously included as part of the fixed price. When the Project switched to union contractors due to the PLA, MEW experienced detailed union contracts with language that contained extensive requirements every time any minor unexpected event occurred in the course of constructing a crossing. Under these requirements, just crossing an existing drain line at a farm now resulted in incremental costs for MEW. For example, one union contractor, Cal Valley, charged T&M rates for every line crossing that was encountered as the Project was constructed. This was an entirely new expense that MEW's project team had never encountered before, and there were a large number of lines to cross as Kings County roadways in the Project vicinity areas are considerably more crowded with underground lines than was the Calgren Dairy Fuels Project MEW had experienced to date. It is the responsibility of the landowner or the utility company to register all lines, but in Kings County, MEW encountered several unregistered lines. For example, at one street crossing, MEW was initially aware of three lines, but then the local landowner told the construction team about three more lines. During the potholing and hydro excavation process, MEW identified more lines than either the County or

[67] A line crossing is a point at which the installed pipeline crosses an existing buried line, such as a power line, irrigation line, or other line usually running perpendicular to the pipeline route. These lines are discovered during the potholing process discussed above.

the landowner were aware of. MEW did all reasonable due diligence by calling the Underground Service Alert (USA) hotline and talking to landowners before installing pipeline. To mitigate the standard cost of $8,000 for each line crossing, MEW's project manager negotiated with the contractor to lower the rate to $6,250. The cost for each line crossing led to a total of $761,750 in new costs, which could not have been foreseen at the time of application to the Selection Committee due to bidding the Project based on prior experience and without consideration of the impact of the PLA on additional work for line crossings.

Even if MEW had known in advance that the line crossings would create new contract costs, it may not have been possible to avoid this cost due to conditions in Kings County, including terrain with considerable amounts of lines and the cost of labor under the PLA. It was not possible for MEW to survey and locate all underground lines in the planned right of way during the 110 day period to complete and submit its application—instead, such knowledge could only be gained through later exploratory work. Every line crossing involved a tedious process of cutting the pipe after it had already been fused and then refusing the pipeline in the trench underground. Every line crossing would slow the project down by approximately half a day. However, the additional costs and time incurred were necessary to comply with the PLA which was needed in order to accomplish the pipeline as required by the pilot program goals.

These costs are best considered partially a design change (as the true underground situation became clear) and partly a PLA impact (due to the contract provisions that made these costs more expensive and the responsibility of the Project). Based on these factors, MEW has attributed $304,700, or 40%, of this cost to Design Improvement and Finalization (learning more about underground situation), and $457,050, or 60%, to the increased requirements under the PLA.

(h) Traffic Control

Traffic control was another cost that was not anticipated based on MEW's prior experience. In Tulare County, the County did not require traffic control when installing pipelines across rural roads, so it was reasonable for MEW to prepare its 2018 cost estimate based on that experience. There was not time in the 110 days for application preparation for MEW to review all of the relevant requirements in Kings County related to the construction of the Project. Later, nearly two years into Project development, Kings County and Lakeside signed an Agreement to govern their Encroachment Permit, and the County eventually issued an Encroachment Permit for building on county roads, and imposed a Traffic Control requirement on the Project.[68] Furthermore, during MEW's prior experience with non-union pipeline contractors, when minimal traffic control was necessary in the field for other reasons, the contractors did not incur or assess costs for traffic control since these contractors had included such costs in their construction bids. When the Project switched to a union general contractor under the PLA, the PLA stipulates that the Project now had to hire an entirely separate union company for traffic control during the entire duration of the relevant pipeline installation. The separate company then subsequently charged T&M to the Project above the main pipeline install bid, which led to a total of $122,207 in additional costs.

The Project had no ability to hire its own non-union traffic control, but rather the Project had to abide by the PLA and follow union rules concerning hiring separate specialty contractors which charged their own mobilization charges, standby charges, and prevailing wage rates.

[68] *See* Appendix A, Supporting Materials 1.4 - Lakeside Pipeline LLC - Kings County Department of Public Works Encroachment Permit ID #3-03-21, pp. 903-905. *See also,* Appendix A, Supporting Materials 1.5 - Lakeside Pipeline LLC - Kings County Conditional Use Permit 17-14 – IS MND & MMRP, pp. 906-1090.

These charges could not have been foreseen since a single non-union contractor who accomplished their own traffic control was the anticipated cost based on MEW's experience. Based on these factors, MEW estimates that 50% of the overrun in this category was due to Kings County requirements, and 50% was due to the impact of the PLA. These were compliance costs with local ordinances that exceeded initial assumptions. All these items were essentially pass-through mandates to MEW. Nor did MEW have the discretion to reduce these requirements on its own. Compliance was required if MEW wanted to obtain the necessary permits and complete construction. See Table 5 below for cost details.

(i) Dust Control

For pipelines that MEW had previously installed at the time of application to the Selection Committee, dust control was not a specific requirement from Tulare County for building pipelines in the public right of way. Instead, where dust became an obvious problem, the non-union contractor would water where needed to comply with county nuisance regulations (no specific dust control mitigation was required in MEW's prior permits). However, in 2020 when the Project received its final Encroachment Permit with Kings County, the permit included requirements for dust control.[69] By itself, this requirement would have created some relatively manageable cost overruns; however, as with the Traffic Control cost overage, the PLA and union rules require a dedicated contractor with its own workers, mobilization charges, standby charges, and prevailing wages to perform the dust control work. Compared to a non-union job (as per MEW's prior experience) where one of the workmen on site could operate a water truck for an

[69] *See* Appendix A, Supporting Materials 1.4 - Lakeside Pipeline LLC - Kings County Department of Public Works Encroachment Permit ID #3-03-21, p. 904. *See also,* Appendix A, Supporting Materials 1.5 - Lakeside Pipeline LLC - Kings County Conditional Use Permit 17-14 – IS MND & MMRP, p. 1074.

hour or two per day, under the PLA, an entirely separate company had to have dedicated personnel who solely operate a water truck for weeks on end to comply with this dust control requirement. The result is a very expensive cost that could not be mitigated under the PLA. This separate contractor led to a total of $415,020 in additional costs charged to the Project, which MEW allocates 50% due to Kings County requirements, and 50% due to PLA requirements. MEW could not have built this Project without paying these costs. See Table 5 below for cost details.

(j) Mobilization, Standby Costs, and T&M Fees

Substantial Project overages came in the form of standby costs, mobilization and demobilization fees, and miscellaneous T&M fees. These costs were largely due to alternative pricing structures imposed by PLA union contractors and unavoidable Project delays that MEW did its utmost to circumvent and mitigate.

Under the union contract with Cal Valley Construction for the pipeline installation, mobilization and demobilization fees were significantly higher than MEW anticipated (based on its experience with a single non-union contractor), with each mobilization or demobilization costing $60,000. There were initial Project mobilization and demobilization expenses as well as subsequent expenses during the western expansion of the Project.[70] These costs amounted to $240,000 in overages that were unexpected and a result of the PLA. Based on MEW's prior experience, these expenses were a small fraction of the installation costs and were accounted for as part of the pipeline installation rates. Thus, they were not included in the original proposed cost of the Project in the Application.

[70] Mobilization and demobilization fees are assessed at the beginning and end of a large project to relocate equipment, crews, and materials to and from the job site. This project had two phases of construction and hence were charged two of each of these fees.

Standby costs also occurred due to delays in receiving permitting documentation, easement agreements, and pipeline shipments. The delays in permitting and easement agreements could not have been avoided due to having limited time to apply for them during the initial phase of the Project. MEW Project managers had little control over the delayed pipeline shipments because the pipeline contractor was experiencing a trucking shortage which led to delayed delivery of the pipeline materials.[71] The trucking delays can be partially attributed to COVID-19 supply chain issues and difficulty for the pipeline materials supplier to manage trucking logistics. As a result, MEW had to employ the contractor's team to wait for pipeline materials or for the regulatory clearance to install it. Standby costs were $10,000 per day and there were 10 days that were delayed throughout the construction schedule, amounting to $100,000 in overages.

Whenever it was possible, MEW attempted to mitigate standby costs by assigning the contractor other tasks to complete. For example, the Project managers employed the construction team with the task of grape vine removal along the pipeline route on one of the days that pipeline delivery was delayed. In this way, they kept the contracted team productive instead of paying them standby rates. These tasks sometimes involved moving the team and equipment to other locations when there were restrictions where the team had originally planned to work. For instance, if a local farmer had to irrigate their fields where pipeline was supposed to be installed, MEW had to wait until the farmer was ready in order to install pipeline on their land. Thus, throughout the whole construction process, there were several unavoidable and

[71] *See,* Appendix A, Supporting Materials 1.18 - Lakeside Pipeline LLC - Email - Pipeline Materials Delivery Delays, pp. 1392-1394.

unforeseeable delays that accrued significant costs. The total overage for mobilization and demobilization, standby costs, and miscellaneous T&M fees was $423,138.

The cost components for Cost Category 2b: Collection Lines that included surveys, engineering, potholing, canal crossing, street crossing, boring, line crossings, traffic control, dust control, standby, mobilization, and demobilization experienced a combined overage of $2,646,895. See Table 5 below for cost details.

Table 5 - Cost Detail for 2b. Collection Lines (Other Charges)

Cost Detail - 2b. Collection Lines (other charges)						
Cost Category as Submitted to the Selection Committee on the PISCE	Estimated Cost	Actual Cost	Over (Under) Estimated Cost	$ over due to design improvements, changes, and finalizations	$ over due to CEQA / Other Agency Requirements	$ over due to Prevailing Wage and Other PLA Requirements
Surveys	$ 27,000	$ 102,646	$ 75,646	$ -	$ 75,646	$ -
Engineering	$ 280,000	$ 310,641	$ 30,641	$ 30,641	$ -	$ -
Potholing	$ 35,000	$ 484,860	$ 449,860	$ -	$ -	$ 449,860
Canal Crossing	$ 250,000	$ 230,000	$ (20,000)	$ (20,000)	$ -	$ -
Steet Crossing	$ 270,000	$ 183,633	$ (86,367)	$ -	$ (86,367)	$ -
Boring	$ 110,000	$ 585,000	$ 475,000	$ -	$ 387,794	$ 87,206
Line Crossings	$ -	$ 761,750	$ 761,750	$ 304,700	$ -	$ 457,050
Traffic Control	$ -	$ 122,207	$ 122,207	$ -	$ 61,103	$ 61,104
Dust Control	$ -	$ 415,020	$ 415,020	$ -	$ 207,510	$ 207,510
Standby/Mobilization/Demobilization	$ -	$ 423,138	$ 423,138	$ -	$ -	$ 423,138
Total:	**$ 972,000**	**$ 3,618,895**	**$ 2,646,895**	**$ 315,341**	**$ 645,686**	**$ 1,685,868**

In summary, when combining the total cost overruns experienced for the Cost Category 2b: Collection Line: Materials and Installation (Table 4 above) in addition to the various other Collection Line charges discussed above for surveys, engineering, potholing, canal crossing, street crossing, boring, line crossings, traffic control, dust control, standby, mobilization, and demobilization (Table 5 above), the total cost overruns for Cost Category 2b: Collection Lines came to $4,626,307 as summarized in Table 6 below.

Table 6 - Cost Detail - 2b. Collection Lines

Cost Detail - 2b. Collection Lines						
Cost Category as Submitted to the Selection Committee on the PISCE	Estimated Cost	Actual Cost	Over (Under) Estimated Cost	$ over due to design improvements, changes, and finalizations	$ over due to CEQA / Other Agency Requirements	$ over due to Prevailing Wage and Other PLA Requirements
Materials and Installation (Table 3)	$ 4,861,811	$ 6,841,223	$ 1,979,412	$ 113,818	$ 229,515	$ 1,636,079
Other Charges (Table 4)	$ 972,000	$ 3,618,895	$ 2,646,895	$ 315,341	$ 645,686	$ 1,685,868
Total:	**$ 5,833,811**	**$ 10,460,118**	**$ 4,626,307**	**$ 429,159**	**$ 875,201**	**$ 3,321,947**

V. THE COMMISSION SHOULD AUTHORIZE RECOVERY OF THE COSTS REASONABLY INCURRED TO DEVELOP THE LAKESIDE PROJECT

The total financial impact of all the labor and material cost increases, timeline delays, Project redesign or reconfiguration, cost overruns, and other factors which increased the as-built cost of the Project is summarized in the following Table 7 which identifies all cost details discussed above. MEW is requesting the $6,691,208 total shown in Table 7 for recovery.

Table 7 - Project Summary - All Cost Categories

Project Summary - All Cost Categories			
Cost Category as Submitted to the Selection Committee on the PISCE	Estimated Cost	Actual Cost	Over (Under) Estimated Cost
2a. Biogas Treatment	$ 3,493,484	$ 5,558,386	$ 2,064,902
2b. Collection Lines	$ 5,833,811	$ 10,460,118	$ 4,626,307
Total:	**$ 9,327,295**	**$ 16,018,503**	**$ 6,691,208**

VI. CONCLUSION

MEW is a family-owned, disabled veteran-owned, small business in northern California. Lakeside Pipeline LLC, under the management of MEW, expended millions of dollars of its own funds to complete the Project. Lakeside is still awaiting full reimbursement for those costs. Furthermore, Lakeside has not and will not be compensated for the time value of the money it expended, and additional delays in reimbursing Lakeside through the reasonableness review process will continue to increase the financial impacts on Lakeside. MEW has demonstrated that the costs it incurred to construct the Project were reasonable, particularly in light of the

innovative aspects of the pilot program and the challenges, including the global COVID-19 pandemic, faced along the way. As detailed throughout this testimony, the cost overages MEW incurred to complete the Project were necessary to adhere to Project specifications approved by the Selection Committee, address requirements that arose after submission of the cost estimates to the Selection Committee, and were consistent and reasonable in comparison to market prices and prevailing wages.

In conclusion, the Lakeside Dairy Biomethane Pilot Project was successfully completed and is operational, delivering renewable natural gas and helping California reduce methane emissions. However, this success required MEW to incur costs above the initial bid due to the various challenges and requirements discussed throughout this testimony. MEW has demonstrated that it managed the project prudently and that the overruns were driven by necessity (e.g., safety improvements, compliance, and unforeseeable changes in labor and materials costs). All costs above the bid have been verified with documentation and fall within the scope of eligible pilot program costs. Based on this testimony, the accompanying attachments and exhibits, and, consistent with D.17-12-004 and the Commission's reasonableness standard, MEW respectfully requests that the Commission find these costs MEW incurred to develop and construct the Project reasonable and direct SoCalGas to reimburse the additional $6,691,208 million expended on the Project in excess of the Selection Committee-approved estimates from balancing account funds.

MEW has demonstrated compliance with the Commission's standard for a reasonableness review, documenting that when faced with decisions regarding Project redesign, new contract or permitting requirements, or increased costs related to inflation, it made decisions

"based upon the facts that are known or should be known at the time."[72] MEW consistently balanced the need to achieve the Project objectives and construct a safe facility that performed as required with the increased costs of Project changes required by new information or unforeseen contract requirements. MEW submits that its decisions in designing, procuring materials and labor, and constructing the Project reflected "what a reasonable manager of sufficient education, training, experience and skills using the tools and knowledge at his disposal would do when faced with a need to make a decision and act."[73] Accordingly, MEW contends that its actions to construct and implement the Project should be found to be prudent and reasonable, and "consistent with utility needs, ratepayer interests, and regulatory requirements." [74]

[72] D.16-12-063, p. 9, citing D.88-03-036 (1988 Cal. PUC LEXIS 155, *7; 27 CPUC2d 525) and D.02-08-064 (2002 Cal. PUC LEXIS 534; 219 P.U.R.4th 421).

[73] D.87-12-018, 1987 Cal. PUC LEXIS 61 at *2 (citing D.86-10-069, p. 31).

[74] D.97-08-055, 1997 Cal. PUC LEXIS 763 at *110.

VII. QUALIFICATIONS

Q: Please provide your qualifications and experience.

A: My name is Daryl R. Maas. My business address is 1730 South Street, Redding, California, 96001-1811. I am the Founder and have been the Chief Executive Officer of Maas Energy Works since its inception in 2010. Maas Energy Works is a California-based renewable energy project development, construction management, operations company, fabrication, and financial management company specializing in on-farm anaerobic digestion. My responsibilities include directing all new project development and existing project operations, including design, permitting, regulatory compliance, remote management, project finance, and personnel. I oversee 180 employees in the operation of 70 renewable energy digester facilities and the active development of 50 more biogas facilities in ten US states.

Prior to the development of Maas Energy Works, I Co-Founded and served as Chief Executive Officer of Farm Power Northwest, a renewable energy project development and operations company specializing in anerobic digestion or agricultural and organic waste from 2007 through 2017.

Within the capacities of my roles at Farm Power Northwest and Maas Energy Works, I have overseen the development and operations of 70 successful digester projects, all of which remain in operation. Notable projects within this include the largest dairy digester cluster in the world, the first dairy biogas pipeline injection facility in California, and the first Calrecycle food waste co-digestion facility. With the development and operation of these facilities, I have procured digester air permits in nine separate air permitting districts in six states and ensure continued compliance with a multitude of water quality, solid waste, zoning, and other regulations. The aforementioned biogas facilities have leveraged over $500,000,000 in private

capital, grant funding, and government guaranteed loans. The operations of these facilities have produced over 10,000,000 metric tons of monetized greenhouse gas reductions.

My educational experience includes a Bachelor of Sciences Degree from the United States Air Force Academy (Distinguished Graduate) in 2000, and a Master of Arts Degree from the University of Texas at Austin (2002). From 2002 to 2007 I served as an officer in the United States Air Force in the 8th Special Operations Squadron and the Intelligence Analysis Agency. From 2008 to 2017, I served as an intelligence officer in the Washington Air National Guard, United States Air Force.