Quarterly Research Performance Progress Report

Enchant Energy LLC

Federal Agency and Organization Element to Which Report is Submitted	National Energy Technology Laboratory U.S. Department of Energy
FOA Name	FOA-0002058: Front-End Engineering Design (FEED) Studies for Carbon Capture Systems on Coal and Natural Gas Power Plants
Project Title	Large-Scale Commercial Carbon Capture Retrofit of the San Juan Generating Station
Report Identifier	Research Performance Progress Report (RPPR)
Award Number	DE-FE0031843
Award Type	Cooperative Agreement
PD/PI & Submitting Official Name, Title and Contact Information (e-mail address and phone number)	Peter D. Mandelstam, Principal Investigator Enchant Energy LLC 5101 College Boulevard Suite 5055 Farmington, NM, 87402 (o) 505-436-1828 (c) 917-327-2273 PeterM@EnchantEnergy.com
Submission Date	July 30, 2021
Recipient DUNS Number	081518061
Recipient Organization	Enchant Energy LLC 5101 College Boulevard Suite 5055 Farmington, NM, 87402
Project Period of Performance	10/15/2019 - 06/30/2022
Period Covered by the Report	Q7: April 1, 2021 – June 30, 2021
Report Frequency	Quarterly
Signature of Submitting Official	Peter D. Mandelstam

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1. INTRODUCTION[1]

The proposed project is to conduct a site-specific Front-End Engineering Design (FEED) Study for retrofitting two coal-fired generating units (~847 MWe net) at San Juan Generating Station (SJGS) with Mitsubishi Heavy Industries America (MHIA) KM CDR Process™ for Carbon Capture Utilization and Storage (CCUS) (together, the Project). The SJGS facility, located in Waterflow, New Mexico, has been identified as a prime candidate for retrofitting CCUS technology due to five site-specific factors that have the potential to make the Project attractive from a technical, economic, and financing perspective, including:

1. Environmental upgrades completed in 2017 so flue gas does not need additional controls upstream of the CCUS. Post CCUS, SJGS will have very low CO_2, and continue the extremely low NO_X, SO_2 , and Mercury emissions.
2. Shut-down of Units 2 and 3 in 2017 allows for the CCUS system to utilize existing permitted water rights, cooling capacity, and repurposed in-place equipment, and also provides available space in the plant footprint to construct the CCUS system.
3. Electricity production is currently low cost and will remain so post-CCUS, as it is based on high BTU coal mined adjacent to SJGS. Low electricity cost reduces the impact of the dedicated-CCUS load on the levelized cost of capture.
4. Proximity to the Cortez CO_2 pipeline located only 21 miles from SJGS which is connected to the Permian Basin oil fields where there is a strong commercial market for CO_2 used for Enhanced Oil Recovery (EOR) and also EPA-certified sites for permanent storage of the captured CO_2. (Design of EOR storage not included in the scope of this FEED study.)
5. Proximity to San Juan Basin possible locations for direct geologic sequestration. The investigation of this direct geologic sequestration is partly funded by a separate DOE Cooperative Funding Agreement called CarbonSAFE III where Enchant Energy is a sub-awardee to New Mexico Tech. In addition to the direct geologic sequestration being a separate DOE Cooperative Funding Agreement, it is a wholly separate Federal environmental review under the National Environmental Policy Act, as amended (NEPA).

The combination of these five (5) site-specific factors is anticipated to result in a sufficiently low levelized cost of capture for this application to be technically and commercially feasible.

The FEED study will document the initial engineering and cost estimates for the retrofit project, including the levelized cost of carbon capture utilizing the existing plant, SJGS, and provide estimates of the technical and economic viability of extending the life of the existing SJGS coal-fired power plant through the installation and 12 years minimum of operation of post-combustion carbon capture.

Enchant/Farmington's intention is to move forward into the negotiation of a fixed-priced engineering, procurement, and construction (EPC) contract, as well as final design based on the Design Basis previously submitted to the DOE, procurement, and installation upon completion of the FEED study should the results of this FEED study show the Project to be technically feasible and economically viable. This Project would have a significant impact on the local community by sustaining jobs and tax revenue, as well as the estimated 2 million worker hours associated just

[1] This introduction is an extract from PMP

with the construction of the carbon capture facility. This estimate comes from the project's contractor, Kiewit Power Constructors, that is part of the EPC consortium.

2. ACCOMPLISHMENTS

2.1. Project Goals

The overall goal of this project is to perform a Front-End Engineering and Design (FEED) study for the retrofit of the San Juan Generating Station (SJGS) with post-combustion carbon capture (the Project). The FEED study will document the initial engineering and cost estimates for the retrofit Project, including the levelized cost of carbon capture on an existing plant, and provide estimates of the technical and economic viability of extending the life of the existing SJGS coal-fired power plant through the installation and operation of post-combustion carbon capture designed to capture 95% of the CO_2. The FEED study will enable SJGS to move forward into detailed engineering, procurement, installation, and operation in future work.

In January 2021, Enchant Energy worked with the DOE to revise and update the Cooperative Funding Agreement for both cost share allocations as well as schedule. Enchant Energy submitted the revised Project Management Plan on July 27, 2021 to DOE. As a result of this PMP update, the Milestone Log reflected changes which are represented in the below Table 1-1, Milestone Status Report.

The milestones for this Project are provided in Table 1-1 below.

Table 1-1. Milestone Status Report

Task/ Subtask	Milestone Title/Description	Planned Completion Date	Actual Completion Date	Verification	Status/Comments
1.0	Kickoff Meeting	5/22/2020	5/22/20	Presentation File	**Complete/Meeting Occurred**
1.0	Updated Project Management Plan	1/22/2021	1/22/2021	PMP file	**Complete/**Updated PMP provided in support of newly definitized contract
2.1	Design Basis Finalized	6/25/2020	7/16/2020	RPPR	**Completed/**The 125-Page Design Basis was submitted by Peter D. Mandelstam to DOE/NETL, titled as follows: OVERALL DESIGN BASIS & CRITERIA ISSUE: FOR DOE INFORMATION, REV. C JULY 16, 2020 PROJECT NO. 13891-010 OVERALL DESIGN BASIS & CRITERIA
2.3	Four Factor Analysis to NMED	9/1/2020	9/1/2020	RPPR	**Completed/**Submitted to NMED, awaiting final determination

Task/ Subtask	Milestone Title/Description	Planned Completion Date	Actual Completion Date	Verification	Status/Comments
2.3	Preliminary Constructability Review	9/10/2020	9/10/2020	RPPR	**Completed**
2.3	Final Constructability Review	8/4/2021		RPPR	**Will be completed on schedule.**
2.3	HAZOP Review Completed	11/24/2021		RPPR	
2.1	Process Island Design Completion	12/20/2021		RPPR	
2.2	Balance of Plant Engineering Completion	12/29/2021		RPPR	
2.3	Studies and Investigations Completion	3/24/2022		RPPR	
2.4	Cost Estimating Completion	3/22/2022		RPPR	
3.0	FEED Study Package	6/30/2022		Engineering Drawings	
1.0	Final Report	9/30/2022		Written Report	

2.2. What Was Accomplished

During the 7th quarter of the FEED study, MHI and S&L finalized key parameters in the basic engineering design data (BEDD) so that MHI could begin Process Engineering and Design.

The DOE FEED Study participants (Team) also responded to a Freedom of Information Act (FOIA) request on July 23, 2021, for all the previous Quarterly Reports.

Task 1.0 – Project Management and Planning

The Recipient shall manage and direct the Project in accordance with this Statement of Project Objectives (SOPO) and the Project Management Plan (PMP) to meet the project's technical, schedule, and budget objectives and requirements. The Recipient shall manage, coordinate, and report on the technical scope, budget, risk, requirements of the National Environmental Policy Act (NEPA), and schedule consistent with a task-oriented work breakdown structure (WBS) to effectively accomplish the Project. The Recipient shall ensure that Project plans, results, and decisions are appropriately documented, and Project reporting and briefing requirements are satisfied. The Recipient will work with the DOE Contract Specialist (CS) and Project Officer (PO) to make revisions to the award and its associated documentation when necessary.

During this reporting period, Enchant and Enchant's consultants focused on revisions to the Project Management Plan, its milestones and the FEED Study budget in support of Enchant's submission provided in late July and in support of the new cooperative agreement. In addition under Task 1.0 relating to the National Environmental Policy Act (NEPA) ongoing consultations occurred with both local and Washington-based Federal officials by S&L and Enchant. Consultations specifically included discussions of the interaction with Bureau of Indian Affairs, as well as Bureau of Land Management Farmington field office (BLM) officials in the Farmington Field Office. These consultations furthered the on-going NEPA work and allowed Federal officials to ask questions about potential environmental impacts, such that the Federal officials can make informed decisions about any additional NEPA reviews.

Enchant held regular more-than-weekly meetings with S&L to review in-scope documents and plans in anticipation of upcoming work with MHIA. Such meetings specifically included a detailed analysis of carbon dioxide emissions rates and the impact of one or more trains being out of service. This emissions analysis is vital to the economic operation of the Carbon Capture Island. This carbon dioxide emissions work is required for the economic viability analysis under the FEED Study, Subtask 2.4, cost estimating. Deliverables included many drafts and the issuance of a final report of carbon production intensity, named ETA CO2 Emissions Calculation. This ETA Report was a focus during this reporting period.

Task 2.0 – Front-End Engineering & Design Study

The purpose of the FEED study is to complete engineering and design work to support developing a detailed cost estimate for retrofitting CO2 capture at SJGS. As part of the overall FEED study, multiple design studies will be performed based on Project-specific details. Various design and engineering packages will be developed which will help define commodity quantities, equipment specifications, and construction requirements to execute the Project. These FEED study packages will be prepared with the intent to develop an overall project Association for the Advancement of Cost Engineering (AACE) Class 2 capital cost estimate with an accuracy of ±15%, requiring approximately 50-75% project definition completed.

Subtask 2.1 – Process Engineering and Design

An overall Project Design Basis will be developed which will identify site-specific design characteristics, ambient conditions, fuel and flue gas characteristics, environmental requirements, and site-specific design considerations. Process Engineering and Design will be completed by the carbon capture technology provider and a series of process engineering documents will be developed.

Enchant notes that while the stack testing is not specifically in-scope under the SOPO, MHIA, S&L, and Farmington-Enchant unanimously agreed that the work needed to be done in order for the FEED to proceed. Accordingly, S&L in coordination with MHIA, designed the stack testing protocols, and Enchant was required to use AST, the preferred vendor of the San Juan Generating Station operator, PNM.

During this reporting period, the stack testing consultant, AST, finished their analysis of their on-site investigations. The AST report was analyzed by S & L in early April 2021 and

was transmitted to PNM, current SJGS operator, as required for their review before the information could be shared externally with MHIA. Upon PNM's review, the stack testing results were made available to MHIA in May 2021 for their use in finalizing the Design Basis. Enchant expects only modest design changes that would allow MHIA to increase its CO2 capture percentage above 90% of the treatment of 100% of the flue gases. Assuming a higher percentage of carbon is captured, Enchant will request that the higher percentage be warranted during the operational life of the project. Enchant notes that DOE's report on the Petra Nova project showed Year 3 capture of 95%, and a 3-year average of 92.4% capture.

MHIA began ISBL engineering and have completed the block flow diagram, process flow diagram, initial heat and material balances, utility flow diagrams, equipment list, and preliminary plot plan. The documents are being reviewed by the Team. MHIA's engineering teams also developed standard specifications/drawings and design basis/criteria.

Subtask 2.2 – Balance of Plant Engineering

This subtask involves the balance of plant (BOP) planning, design, and engineering to incorporate the CO2 capture technology into the existing SJGS facility. A site-specific Design Criteria Document will be developed which will document the primary design criteria, applicable codes and standards for the civil, structural, mechanical, electrical, and Instrumentation & Controls (I&C) designs.

- Civil Engineering – Nothing to Report
- Structural Engineering – Nothing to Report
- Mechanical Engineering – BOP P&IDs were reviewed with MHI for interfaces
- Electrical Engineering – Nothing to Report
- Instrumentation & Controls (I&C) Engineering (System Integration) – Nothing to Report
- Fire Protection Engineering – Nothing to Report
- Facilities Engineering and Site Security – Nothing to Report

S&L focused efforts in this quarter on the review of MHIA's design basis documents; including the BEDD, block diagrams, process flow diagram, and discipline design criteria. In addition, S&L also made a trip to SJGS to perform site walkdowns and finalize tie in locations for the existing systems.

Subtask 2.3 – Studies and Investigations

Various studies and investigations will be conducted which will provide key decisions on scope of work or selection of project-specific needs. This subtask will also provide detail on the permitting requirements necessary for the specific project development at SJGS.

The following studies will be performed, at minimum, as part of the input to the overall FEED study:

- Steam and Electric Sourcing Study – Nothing to Report

- Water Supply Study
    - During this reporting period Enchant and its sub-recipient City of Farmington and its municipal utility, Farmington Electric Utility System (FEUS) finished its more-than-a-year of work with the Bureau of Reclamation on the appropriate transfer of water conveyance system assets while retaining full rights to the water under Permit 2838. The transfer would be voluntary by FEUS and Enchant and would further the multi-decade effort called the Navajo Gallup Water Project.
- Water and Wastewater Treatment Study – Nothing to Report
- Cooling Water Options Study – Nothing to Report
- Control System Study
    - S&L visited the SJGS plant, as COVID-19 restriction abated, to review the existing control system and develop a plan for integrating the new Carbon Capture Controls with the existing controls
- Environmental Permitting, and Regulatory Review
    - Enchant and S&L continued ongoing consultations with the New Mexico Environment Department (NMED) answering questions and providing additional information in support of the submitted Four Factor Analysis
    - Enchant and S&L continued to engage in close and on-going consultations with Federal environmental officials.
    - Updated the project permit matrix to incorporate new information throughout this current reporting quarter.
- Cause and Effect Diagrams – Nothing to Report
- Compressor System Overpressure Relief Study – Nothing to Report
- HAZOP Review – Nothing to Report
- Basic Contracting and Purchasing Strategy – Nothing to Report
- Project Logistics – Nothing to Report
- Constructability Review – Nothing to Report
- Project DOR – Nothing to Report
- Project Execution Schedule – Nothing to Report

Subtask 2.4 – Cost Estimating

The Team will develop an overall project capital cost estimate that is consistent with an AACE Class 2 cost estimate (approximate accuracy of ± 15%), corresponding to ~50-75% Project definition. As part of the overall project estimate, capital costs will be developed along with operating and maintenance (O&M) costs. Together, the costs will be used to develop an overall cost of carbon capture.

The SOPO notes three cost areas: 1) Project Capital Cost Estimate, 2) Operating and Maintenance Costs, and 3) Cost of Capture. In this reporting period S&L met with Enchant numerous times to refine Item 1, Project Capital Cost Estimating. During this reporting period, the on-going costing effort intensified with the creation of a detailed equipment list which was delivered in July 2021 and will be addressed in the next quarterly report.

In the next reporting period, Enchant will begin EPC legal and budgetary drafting, and conclude EPC contract negotiations in Q1 2022.

Task 3.0 – Final FEED Study Package

The final FEED study package will be prepared and submitted in accordance with the SOPO.

Nothing to Report.

2.3. Opportunities for Training and Professional Development

There was ongoing progress and accomplishment in the realm of training and professional development. Specifically, Enchant Energy, the City of Farmington, and the San Juan College School of Energy (SJC) continued efforts on workforce development and job training ("WFD") at San Juan College. This WFD continues with Internet-based training due to COVID-19. Once it is safe to do so, training will continue in-person in the sophisticated hands-on laboratories at San Juan College. It is anticipated that such in-person training can commence in September 202, subject to COVID-19 restrictions.

2.4. Dissemination of Results to Communities of Interest

Outreach to communities of interest is an organizing principle for Enchant and its partner, the City of Farmington. Due to the innovative nature of this project and its importance to the San Juan County, there is regular media interest in the project. In this reporting period, Hank Adair, Electric Utility Director of Farmington Electric Utility System (FEUS), the City of Farmington's municipal utility, and Cindy A. Crane, Enchant's Chief Executive Officer, have done a number of Communities of Interest presentations (all via COVID-safe methods, and media interviews. Many of these can be found on Enchant's web site, https://www.enchantenergy.com/.

The full extent of the outreach to communities of interest is too extensive and the files too large to attach as an exhibit. The Enchant website has the complete media items and their outreach to communities of interest outreach for this reporting period.

2.5. Plan for Next Reporting Period

Enchant, S&L and MHIA expect greater progress in advancing the FEED Study scope of work during the next reporting period. Most importantly, all of the members of the FEED study group expect that significant progress will be made in the EPC negotiations. The expected work for each task is listed below:

Task 2.0 – Front-End Engineering & Design Study

- Basic Engineering Design Data (BEDD) – including Tie-In List, Block Flow Diagram, Process Flow Diagram, Utility Flow Diagram, and Initial Equipment List with Technical Data
- Initiation of MHIA Process Data Sheets
- Development of Plot Plan, Tie-In Point Location Map, Line List, Piping Route Plan
- Development of Stationary Equipment Engineering Drawing
- Development of Electrical One Line Diagram, Electrical Load List. Cable Route Plan, Cable Tray Layout Plan

- Development of Instrument Main Cable Route Plan
- Initialize Construction and Logistics Study
- Initialize Facility / Building Security Design
- Develop Project Site Plan and General Arrangements
- Develop BOP System Calculations (Steam, Condensate, Water, etc) & Equipment Datasheets
- Issue Overall Project Process Flow Diagram, Water Balance, and Material Balance
- Initialize Piping Isometrics for all systems
- Develop Basic Civil Design (Geotech analysis, Stormwater, Site Grading Plan)
- Initialize Foundation Design
- Develop Basic Structural Design for Ductwork & Support Steel
- Develop Basic Electrical Design (Load List, One Line, etc)
- Create Electrical Equipment Datasheets (SWGR, Transformer, etc)
- Develop Control Building Layouts (Electrical Room and Control Room)
- Initialize Cable Raceway Design
- Develop I&C Basic Design (Control System Architecture, DCS Spec, etc)
- Further develop Cooling Water, Steam Sourcing, Electric Sourcing, and Control System Study
- Initialized CFD Study
- Constructability Review

Task 3.0 – Final FEED Study Package

Nothing expected in next reporting period

3. PRODUCTS

3.1. Publications, Conference Papers, and Presentations

There following presentations were held during the quarter:

Presentation Title	Audience	Date	FEED Study Project Presenters
San Juan Generating Station Carbon Capture Update	San Juan County Area Business, Government and Education Leaders	5/6/2021	Cindy Crane Hank Adair Peter Mandelstam
San Juan Generating Station Carbon Capture Informational Briefings	Members of Congress and their Staffs, U.S. House of Representatives Select Committee on Climate, Executive Branch Departments including DOE,	5/25/2021-5/28/2021	Cindy Crane Peter Mandelstam

Presentation Title	Audience	Date	FEED Study Project Presenters
	EPA, and White House CEQ		

3.2. Website(s) or other Internet site(s)

As described above, the Enchant Energy website is a repository of most of the outreach, initial research, and media coverage of ongoing FEED work.

3.3. Technologies or techniques

Nothing to Report.

3.4. Inventions, patent applications, and/or licenses

Nothing to Report.

3.5. Other products

Nothing to Report.

4. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS

Several participants and organizations will be collaborating to achieve the goals of this FEED Study as the nature of work to complete these tasks requires specific technical knowledge and capabilities.

4.1. Individuals

Below is a list of individuals involved in the FEED study, including the PI and each individual who worked at least one person month per year on the project in this last quarter.

Name: Peter Mandelstam
Nearest Person Months Worked: 3.00
Project Role: Chief Operating Officer / Principal Investigator
Contribution to Project: Project Operations and Project Management
State, U.S. territory, country of residence: City of Farmington, New Mexico, U.S.A.
Funding Support: DOE and Enchant
Collaborated with individual in foreign country: Yes
Country(ies) of foreign collaborator: Japan
Travelled to foreign country: No

Name: Hank Adair
Nearest Person Months Worked: 1
Project Role: Co-Applicant
Contribution to Project: Site Coordination
State, U.S. territory, country of residence: City of Farmington, New Mexico, U.S.A.
Funding Support: DOE and Enchant
Collaborated with individual in foreign country: Yes
Country(ies) of foreign collaborator: Japan
Travelled to foreign country: No

4.2.Change in Active Other Support of PD/PI(s) or Key Personnel

Enchant is actively recruiting for an engineer to supplement Enchant's management of the FEED Study. This is included in the PMP.

4.3.Partner Organizations

Enchant has coordinated a Team of highly qualified sub-awardees, independent contractors, vendors and participants to complete the proposed project including particularly in this reporting period, Sargent & Lundy LLC (S&L), Navigant Consulting (Navigant) also referred to as Guidehouse, and Baker Tilly (BT). Additionally, Enchant continues to work with the City of Farmington and Mitsubishi Heavy Industries America, Inc. (MHIA) as sub-recipients of this award. City of Farmington is also a cost-share supporter. Further information on these partner organizations is provided below.

- Mitsubishi Heavy Industries America, Inc. (Sub-Awardee)
  - Location: Houston, Texas
  - Contribution to Project: Collaborative research
  - Additional Detail: vendor to provide commercial engineering services
- City of Farmington (Sub-Awardee)
  - Location: Farmington, New Mexico
  - Contribution to Project: In-kind support
  - Additional Detail: City to provide legal services
- Sargent & Lundy LLC
  - Location: Chicago, IL
  - Contribution to Project: Collaborative research
  - Additional Detail: Vendor to provide engineering and costing services for the FEED Study.
- Navigant Consulting
  - Location: Chicago, IL
  - Contribution to Project: Collaborative research
  - Additional Detail: Vendor to provide generating plant cost and performance evaluation.
- Baker Tilly
  - Location: Austin, Texas
  - Contribution to Project: Other
  - Additional Detail: Vendor to provide accounting services for project.

4.4. Other Collaborators or Contacts Involved

Nothing to report.

5. IMPACT

5.1. What is the impact on the development of the principal discipline(s) of the project?

Based on the increasing media visibility of carbon capture, it is reasonable to conclude that Enchant's work under the DOE FEED Study is helping to spread awareness and support for carbon capture utilization and sequestration, nationally.

5.2. What is the impact on other disciplines?

Nothing to report.

5.3. What is the impact on the development of human resources?

As described above, the SJC, Farmington, and Enchant signed a Memorandum of Understanding (MOU) on workforce development and job training in the previous reporting period. This MOU has led to Internet based training in this reporting period. This WFD provides a path to well-paying jobs building the Project, which will require a minimum of 2 million worker hours. The WFD training specifically seeks engagement by members of the Navajo Nation, veterans, and other underserved communities.

5.4. What was the impact on teaching and educational experiences?

Nothing to report.

5.5. What is the impact on physical, institutional, and information resources that form infrastructure?

Nothing to report.

5.6. What is the impact on technology transfer?

Nothing to report.

5.7. What is the impact on society beyond science and technology?

As the United States emerges from the COVID-19 pandemic, and as the Biden Administration has now articulated their climate goals, it is clear that the burgeoning carbon capture industry will have a major impact on society beyond the narrow successes of decarbonizing specific baseload power plants such as the San Juan Generating Station. Among the positive impacts are A) regional employment at the San Juan Generating Station carbon capture project, and B) the

positive employment benefits and economic output from the continued operation and deferred maintenance at the San Juan Generating Station. The construction of the carbon capture project, with an estimated capital cost of $1.295 billion, will require more than 2,000,000 worker hours, according to an analysis performed by the general contractor, Kiewit Power Constructors. The deferred maintenance is currently estimated to cost more than $139 million. While no analysis has yet been performed as to the number of worker hours associated with the deferred maintenance work, Enchant expects it to be a significant benefit to the regional workforce and the regional economy. Enchant's success at retrofitting the SJGS with carbon capture is expected to stimulate further large-scale carbon capture retrofits, in New Mexico and the Rocky Mountain West.

5.8. What percentage of the award's budget was spent in foreign country(ies)?

As of June 30, 2021, the cumulative costs incurred amounted to $1,993,201.86. Of this, 16.8% of these cumulative budgeted costs were incurred from Mitsubishi Heavy Industries, Japan.

6. CHANGES/PROBLEMS

6.1. Changes in approach and reasons for change

Nothing to report.

6.2. Actual or anticipated problems or delays and actions or plans to resolve them

As Enchant saw in this reporting period and due to the on-going challenges of travel during the COVID-19 Pandemic, third-party development financing delays impacted the FEED Study PMP, schedule and milestones from what was submitted in January 2021. As has been true since the day Enchant began this DOE FEED effort, its cofounders continue to fully support and finance our development and DOE FEED efforts. Enchant, S&L and MHIA made great strides during this reporting period focusing on reconciling and mitigating those impacts to the fullest extent possible. This is evidenced by our revision to the PMP and FEED Schedule and Milestones during this reporting period.

6.3. Changes that have a significant impact on expenditures

None at this time.

6.4. Significant changes in use or care of human subjects, vertebrate animals, and/or Biohazards

Nothing to report.

6.5. Change of primary performance site location from that originally proposed

Nothing to report.

7. SPECIAL REPORTING REQUIREMENTS

Nothing to report.

8. BUDGETARY INFORMATION

A summary of cumulative budgetary information for the overall project as well as the federal and cost share portions as of quarter ended 6/30/2021 for Phase 1 of the project is provided in Table 7.1 below. Please note that the budgetary information is based on the revised cooperative agreement that was definitized in January of 2021.

Table 7-1. Budgetary Information for Quarter Ending 3/31/2021

Baseline Reporting Quarter	Budget Period 1					
	Q1		Q2		Q3	
	10/1/2019–12/31/2019		1/1/2020–3/31/2020		4/1/2020–6/30/2020	
	Q1	Cumulative Total	Q2	Cumulative Total	Q3	Cumulative Total
Baseline Cost Plan						
Federal Share	$ -	$ -	$ 249,350.00	$ 249,350.00	$ 280,904.00	$ 530,254.00
Non-Federal Share	$ -	$ -	$ -	$ -	$ 9,118.00	$ 9,118.00
Total Planned	$ -	$ -	$ 249,350.00	$ 249,350.00	$ 676,228.55	$ 539,372.00
Actual Incurred Cost						
Federal Share	$ -	$ -	$ 102,288.35	$ 102,288.35	$ 540,971.99	$ 623,639.44
Non-Federal	$ -	$ -	$ 25,574.65	$ 25,574.65	$ 135,256.56	$ 180,452.11
Total Incurred	$ -	$ -	$ 127,863.00	$ 127,863.00	$ 676,228.55	$ 804,091.55
Variance						
Federal Share	$ -	$ -	$ (147,061.65)	$ (147,061.65)	$ 260,067.99	$ 113,006.33
Non-Federal Share	$ -	$ -	$ 25,574.65	$ 25,574.65	$ 126,138.56	$ 151,713.22
Total Variance	$ -	$ -	$ (121,487.00)	$ (121,487.00)	$ 386,206.55	$ 264,719.55

Baseline Reporting Quarter	Budget Period 1					
	Q4		Q5		Q6	
	7/1/2020–9/30/2020		10/1/2020–12/31/2020		1/1/2021–3/31/2021	
	Q4	Cumulative Total	Q5	Cumulative Total	Q6	Cumulative Total
Baseline Cost Plan						
Federal Share	$ 312,379.00	$ 842,633.00	$ 115,549.00	$ 958,182.00	$ 612,020.00	$ 1,570,202.00
Non-Federal Share	$ 18,523.00	$ 27,641.00	$ 36,854.00	$ 64,495.00	$ 328,096.00	$ 392,591.00
Total Planned	$ 330,902.00	$ 870,274.00	$ 152,403.00	$ 1,022,677.00	$ 940,116.00	$ 1,962,793.00
Actual Incurred Cost						
Federal Share	$ 268,581.75	$ 941,925.08	$ 133,387.14	$ 1,108,212.35	$ 49,098.87	$ 1,157,311.22
Non-Federal	$ 67,152.17	$ 197,900.39	$ 33,350.13	$ 198,350.39	$ 91,006.44	$ 289,356.83
Total Incurred	$ 335,733.92	$ 1,139,825.47	$ 166,737.27	$ 1,306,562.74	$ 140,105.31	$ 1,446,668.05
Variance						
Federal Share	$ (43,797.25)	$ 69,209.08	$ 17,838.14	$ 87,047.22	$ (562,921.13)	$ (475,873.91)
Non-Federal Share	$ 48,629.17	$ 200,342.39	$ (3,503.87)	$ 196,838.52	$ (237,089.56)	$ (40,251.04)
Total Variance	$ 4,831.92	$ 269,551.47	$ 14,334.27	$ 283,885.74	$ (800,010.69)	$ (516,124.95)

Baseline Reporting Quarter	Budget Period 1	
	Q7	
	4/1/2021–6/30/2021	
	Q7	Cumulative Total
Baseline Cost Plan		
Federal Share	$ 61,710.00	$ 1,631,912.00
Non-Federal Share	$ 58,400.00	$ 450,991.00
Total Planned	$ 120,110.00	$ 2,082,903.00
Actual Incurred Cost		
Federal Share	$ 437,218.28	$ 1,594,529.50
Non-Federal	$ 109,315.54	$ 398,672.37
Total Incurred	$ 546,533.81	$ 1,993,201.86
Variance		
Federal Share	$ 375,508.28	$ (100,365.63)
Non-Federal Share	$ 50,915.54	$ 10,664.50
Total Variance	$ 426,423.81	$ (89,701.14)

9. PROJECT OUTCOMES

Nothing to report.