

AGENDA
IRVINE RANCH WATER DISTRICT
ENGINEERING AND OPERATIONS COMMITTEE
TUESDAY, JANUARY 19, 2021

Due to COVID-19, this meeting will be conducted as a teleconference pursuant to the provisions of the Governor's Executive Orders N-25-20 and N-29-20, which suspend certain requirements of the Ralph M. Brown Act. Members of the public may not attend this meeting in person.

Participation by members of the Committee will be from remote locations. Public access and participation will only be available telephonically/electronically.

To virtually attend the meeting and to be able to view any presentations or additional materials provided at the meeting, please join online via Webex using the link and information below:

Via Web: <https://irwd.webex.com/irwd/j.php?MTID=m0fc192eb9038c273c990ccbca0f9ce02>

Meeting Number (Access Code): 146 890 3266

Meeting Password: vZ3G3wcJbP3

After joining the meeting, in order to ensure all persons can participate and observe the meeting, please select the "Call in" option and use a telephone to access the audio for the meeting by using the call-in information and attendee identification number provided.

As courtesy to the other participants, please mute your phone when you are not speaking.

PLEASE NOTE: Participants joining the meeting will be placed into the Webex lobby when the Committee enters closed session. Participants who remain in the "lobby" will automatically be returned to the open session of the Committee once the closed session has concluded. Participants who join the meeting while the Committee is in closed session will receive a notice that the meeting has been locked. They will be able to join the meeting once the closed session has concluded.

CALL TO ORDER 1:30 p.m.

ATTENDANCE Committee Chair: John Withers _____
Committee Member: Karen McLaughlin _____

<u>ALSO PRESENT</u>	Paul Cook	_____	Kevin Burton	_____	Wendy Chambers	_____
	Jose Zepeda	_____	Paul Weghorst	_____	Cheryl Clary	_____
	Rich Mori	_____	Eric Akiyoshi	_____	Richard Mykitta	_____
	Kelly Lew	_____	Jim Colston	_____	Ken Pfister	_____
	Lars Oldewage	_____	Malcolm Cortez	_____	Scott Toland	_____
	John Dayer	_____	Bruce Newell	_____	Mitch Robinson	_____
	Belisario Rios	_____	Jacob Moeder	_____		_____

PUBLIC COMMENT NOTICE

If you wish to address the Committee on any item, please submit a request to speak via the "chat" feature available when joining the meeting virtually. Remarks are limited to three minutes per speaker on each subject. You may also submit a public comment in advance of the meeting by emailing comments@irwd.com before 9:00 a.m. on Tuesday, January 19, 2021.

ALL VOTES SHALL BE TAKEN BY A ROLL CALL VOTE.

COMMUNICATIONS

1. Notes: Burton
2. Public Comments
3. Determine the need to discuss and/or take action on item(s) introduced that came to the attention of the District subsequent to the agenda being posted.
4. Determine which items may be approved without discussion.

ACTION

5. SEWAGE TREATMENT MASTER PLAN UPDATE, BUDGET ADDITION, AND BUDGET INCREASE – MOEDER / MORI / BURTON

Recommendation: That the Board authorize the addition of the MWRP Tributary Gravity Diversion, Project 11832, in the amount of \$2,942,000 to the FY 2020-21 Capital Budget and authorize a budget increase in the amount of \$193,130,250, from \$20,975,000 to \$214,105,250, for the LAWRP Treatment Modernization, Project 01477.

6. OPERATIONS CENTER COMPRESSED NATURAL GAS, DIESEL, AND GASOLINE FUELING FACILITY BUDGET INCREASE AND CONSULTANT SELECTION – BURK / CORTEZ / BURTON

Recommendation: That the Board authorize a budget increase in the amount of \$1,882,000, from \$748,000 to \$2,630,000, for Project 07881 and in the amount of \$4,509,000, from \$748,000 to \$5,257,000, for Project 07882, and authorize the General Manager to execute a Professional Services Agreement with AECOM in the amount of \$701,560 for engineering design services for the Operations Center Compressed Natural Gas, Diesel, and Gasoline Fueling Facility, Projects 07881 and 07882.

OTHER BUSINESS

7. Directors' Comments
8. Adjourn

Availability of agenda materials: Agenda exhibits and other writings that are disclosable public records distributed to all or a majority of the members of the above-named Committee in connection with a matter subject to discussion or consideration at an open meeting of the Committee are available for public inspection in the District's office, 15600 Sand Canyon Avenue, Irvine, California ("District Office"). If such writings are distributed to members of the Committee less than 72 hours prior to the meeting, they will be available from the District Secretary of the District Office at the same time as they are distributed to Committee Members, except that if such writings are distributed one hour prior to, or during, the meeting, they will be available electronically via the Webex meeting noted. Upon request, the District will provide for written agenda materials in appropriate alternative formats, and reasonable disability-related modification or accommodation to enable individuals with disabilities to participate in and provide comments at public meetings. Please submit a request, including your name, phone number and/or email address, and a description of the modification, accommodation, or alternative format requested at least two days before the meeting. Requests should be emailed to comments@irwd.com. Requests made by mail must be received at least two days before the meeting. Requests will be granted whenever possible and resolved in favor of accessibility.

January 19, 2021

Prepared by: J. Moeder / R. Mori

Submitted by: K. Burton

Approved by: Paul A. Cook



ENGINEERING AND OPERATIONS COMMITTEE

SEWAGE TREATMENT MASTER PLAN UPDATE, BUDGET ADDITION, AND BUDGET INCREASE

SUMMARY:

IRWD prepared a Wastewater Treatment Master Plan in 2003 to identify conveyance and treatment facility improvements to meet capacity and regulatory requirements through 2025. IRWD's sewage and recycled water systems and demands have changed significantly since then, and the District's service area is approaching buildout. IRWD contracted with HDR Engineering to prepare a new Sewage Treatment Master Plan (STMP). At the Strategic Planning Workshop held in January 2020, staff provided a project overview and an update on the status of the work. Since then, HDR and staff have advanced the work, and the STMP is complete. At the Committee meeting, staff will provide an overview of the completed STMP and additional information supporting the following recommendations. Staff recommends the Board:

- Authorize the addition of the MWRP Tributary Gravity Diversion, Project 11832, in the amount of \$2,942,000 to the FY 2020-21 Capital Budget, and
- Authorize a budget increase in the amount of \$193,130,250, from \$20,975,000 to \$214,105,250, for the LAWRP Treatment Modernization, Project 01477.

BACKGROUND:

In 2003, IRWD prepared a Wastewater Treatment Master Plan that defined a logical, cost effective program to upgrade and expand IRWD's recycling treatment plants to handle projected sewage flows, meet effluent quality requirements, and satisfy recycled water demands through 2025. IRWD has implemented many of the recommendations in the 2003 Master Plan including the Michelson Water Recycling Plant (MWRP) Phase 1 and Phase 2 Expansions, the Los Alisos Water Recycling Plant (LAWRP) 2005 Upgrades, and the Harvard Avenue Trunk Sewer Diversion to MWRP.

IRWD's service area, water recycling plants, and the wastewater industry in general have experienced a number of changes since completion of the 2003 Master Plan. This prompted staff to prepare a new master plan that evaluates the sewer system through District buildout. The 2020 STMP is now complete, and it provides a framework for handling future ultimate sewage flows. The framework is structured in a manner that identifies an overall strategy, which is organized into near-term and long-term recommendations. The STMP is also structured such that various near-term improvements can be implemented now without committing IRWD to completion of the identified long-term recommendations. This approach provides IRWD with the flexibility of proceeding with initial projects while continuing to monitor changing conditions that will then be considered in future evaluations and decisions regarding implementation of the long-term recommendations.

Near-term improvements include: 1) replacing the lagoon treatment system at LAWRP with a modernized treatment process, 2) expanding the capacity of the membrane bioreactors (MBR) and implementing improvements to the existing conventional activated sludge (CAS) treatment processes at MWRP to accommodate projected increases in sewer loading concentrations, and 3) constructing a new gravity sewer diversion from the MWRP tributary sewershed to the LAWRP tributary sewershed to deliver additional sewer flows to LAWRP for treatment.

At the Committee meeting, staff will provide an overview of the completed STMP and will discuss the following topics:

- Project overview;
- Summary of the January 2020 Strategic Planning Workshop;
- Results of the treatment plant alternatives evaluation;
- Implementation plan overview; and
- Recommendations for near-term improvements.

A draft of the Sewage Treatment Master Plan Overview presentation is provided as Exhibit “A”.

FISCAL IMPACTS:

Project 01477 for LAWRP Treatment Modernization is included in the FY 2020-2021 Capital Budget and funded 100% through Sewer Replacement. Staff requests a budget increase in the amount of \$193,130,250. Project 11832 for MWRP Tributary Gravity Diversion is not included in the FY 2020-2021 Capital Budget. Staff requests adding this project to the FY 2020-21 Capital Budget in the amount of \$2,942,000, which will be funded by the Regional Sewer Improvement District Split.

Projects 01659 and 01797 for MWRP Phase 3 MBR Expansion are not currently Board-approved but are included in the IRWD Long-Term Capital Program. Both projects are funded 100% through Regional Recycled Water and Sewer Improvement District Splits. The Long-Term Capital Program budgets for these projects will be increased as shown in the table below. Project 11833 for MWRP Expansion Phase 3 (CAS) will be added to the IRWD Long-Term Capital Program in the amount of \$17,867,000 and will be funded by the Regional Sewer Improvement District Split.

A summary of the proposed budget additions, budget increases, and modifications to the IRWD Long-Term Capital Program is provided in the table below.

Project No.	Current Budget	Addition <Reduction>	Total Budget
01477	\$20,975,000	\$193,130,250	\$214,105,250
11832	\$0	\$2,942,000	\$2,942,000
01659	\$11,896,500	\$9,361,500	\$21,258,000
01797	\$19,131,000	\$24,549,000	\$43,680,000
11833	\$0	\$17,867,000	\$17,867,000
Total	\$52,002,500	\$247,849,750	\$299,852,250

ENVIRONMENTAL COMPLIANCE:

California Environmental Quality Act (CEQA) as authorized under the California Code of Regulations, Title 14, Chapter 3, Section 15262 provides exemption for planning studies.

RECOMMENDATION:

That the Board authorize the addition of the MWRP Tributary Gravity Diversion, Project 11832, in the amount of \$2,942,000 to the FY 2020-21 Capital Budget and authorize a budget increase in the amount of \$193,130,250, from \$20,975,000 to \$214,105,250 for the LAWRP Treatment Modernization, Project 01477.

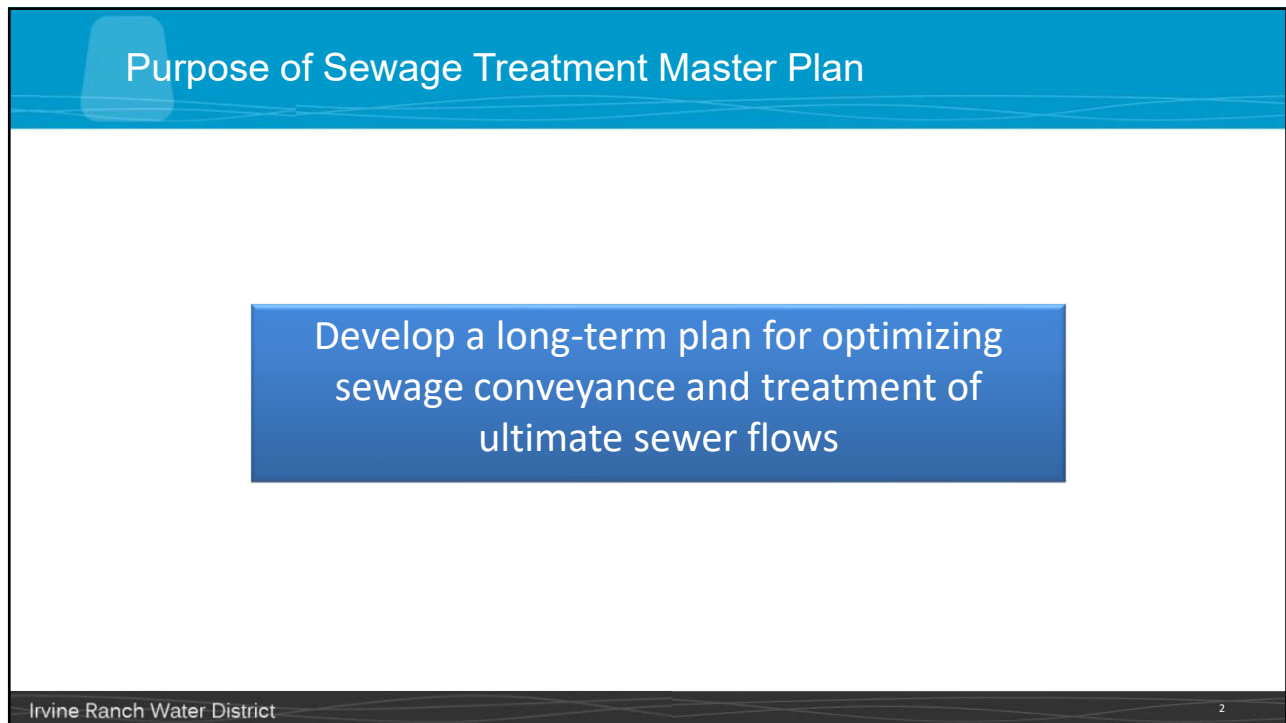
LIST OF EXHIBITS:

Exhibit “A” – Draft Sewage Treatment Master Plan Overview Presentation

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Agenda

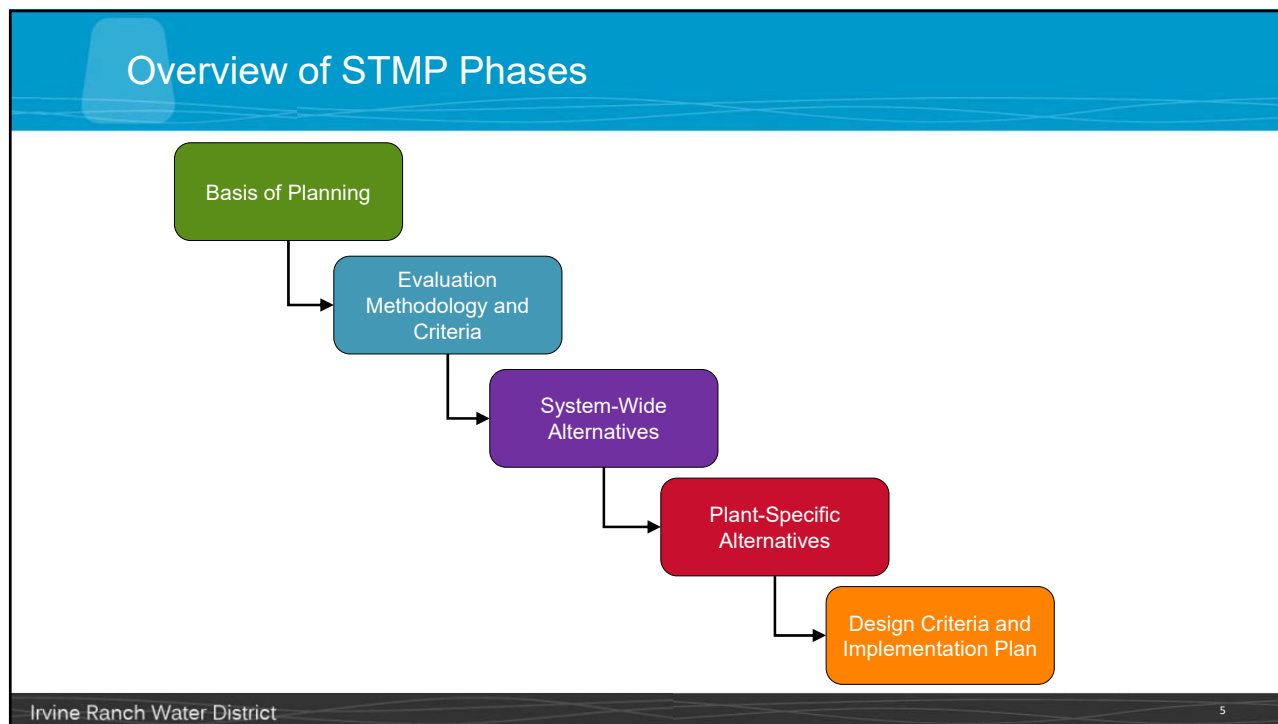
- Project Overview
- Updates since January 2020 Strategic Planning Workshop
- Implementation Plan
- Future Considerations and Next Steps
- Capital Budget Impacts

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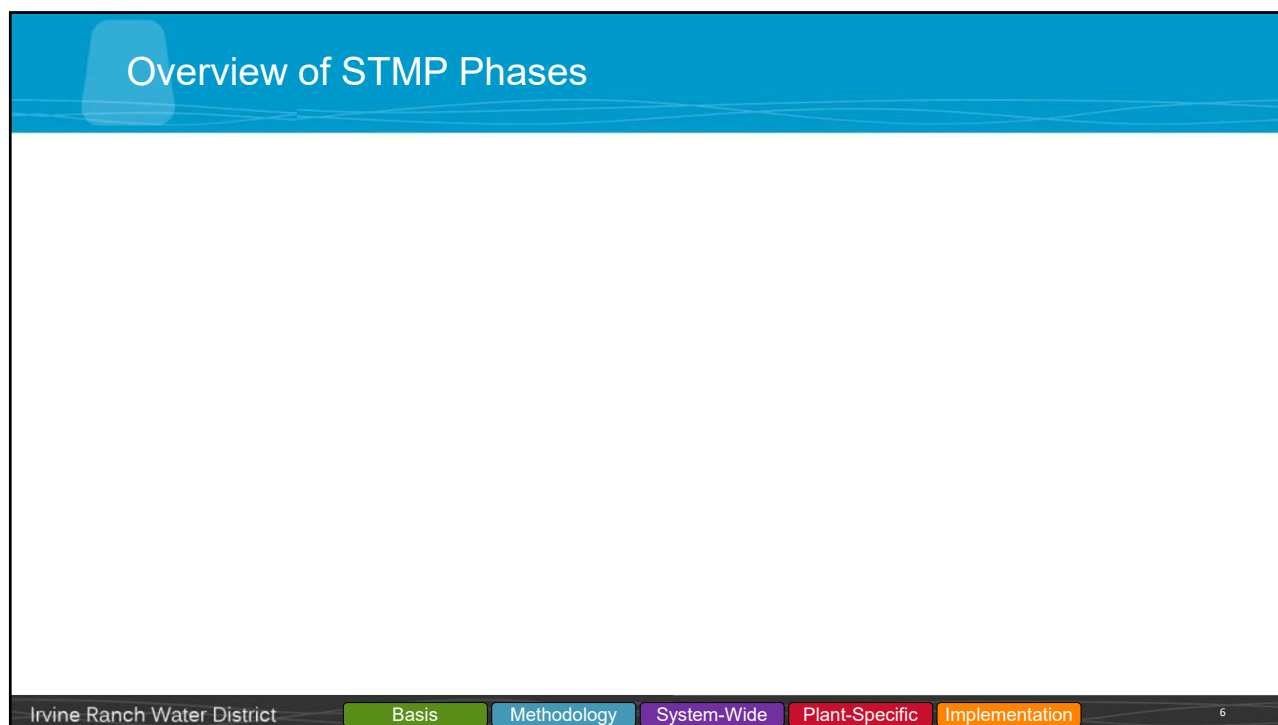


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Progress Since January 2020 Strategic Planning Workshop

- Considered treatment technology alternatives
- Shortlist and evaluated treatment alternatives for Michelson Water Recycling Plant (MWRP) and Los Alisos Water Recycling Plant (LAWRP)
- Develop and refine design criteria for system-wide and facility-specific improvements
- Develop implementation plan

Basis of Planning

Evaluation
Methodology and
Criteria

System-Wide
Alternatives

Plant-Specific
Alternatives

Design Criteria and
Implementation Plan

Irvine Ranch Water District

Basis

Methodology

System-Wide

Plant-Specific

Implementation

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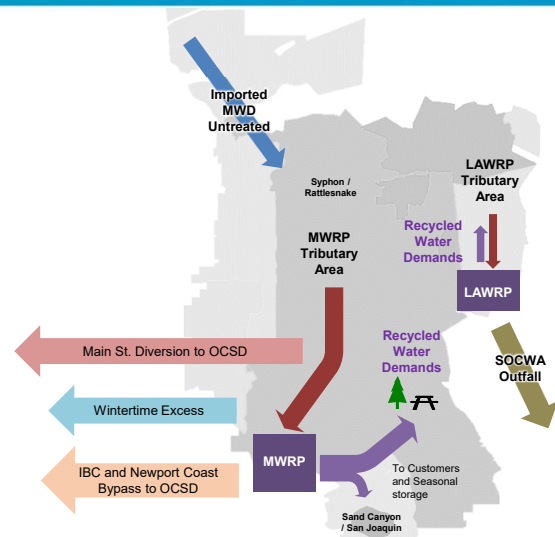
Sewage and Recycled Water System Overview

System Description

- Two tributary areas
- Two treatment plants

System-Wide Alternatives

- Six alternatives were shortlisted and evaluated



Irvine Ranch Water District

Basis

Methodology

System-Wide

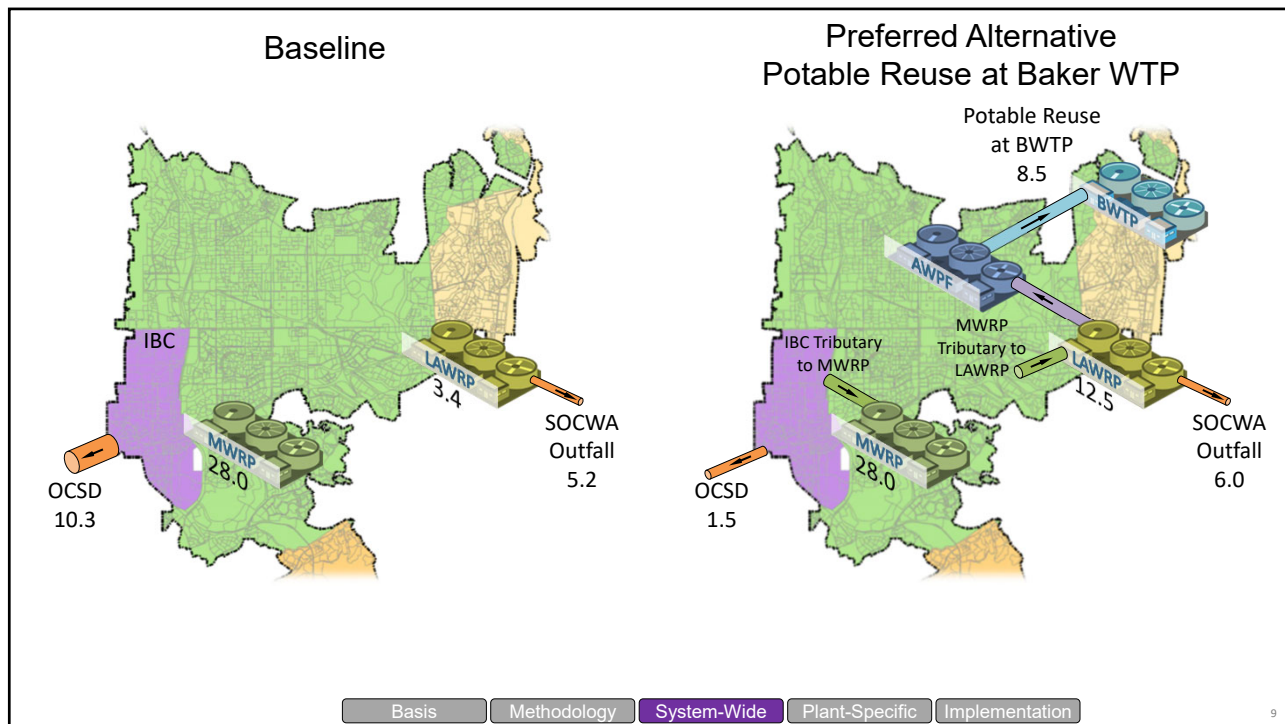
Plant-Specific

Implementation

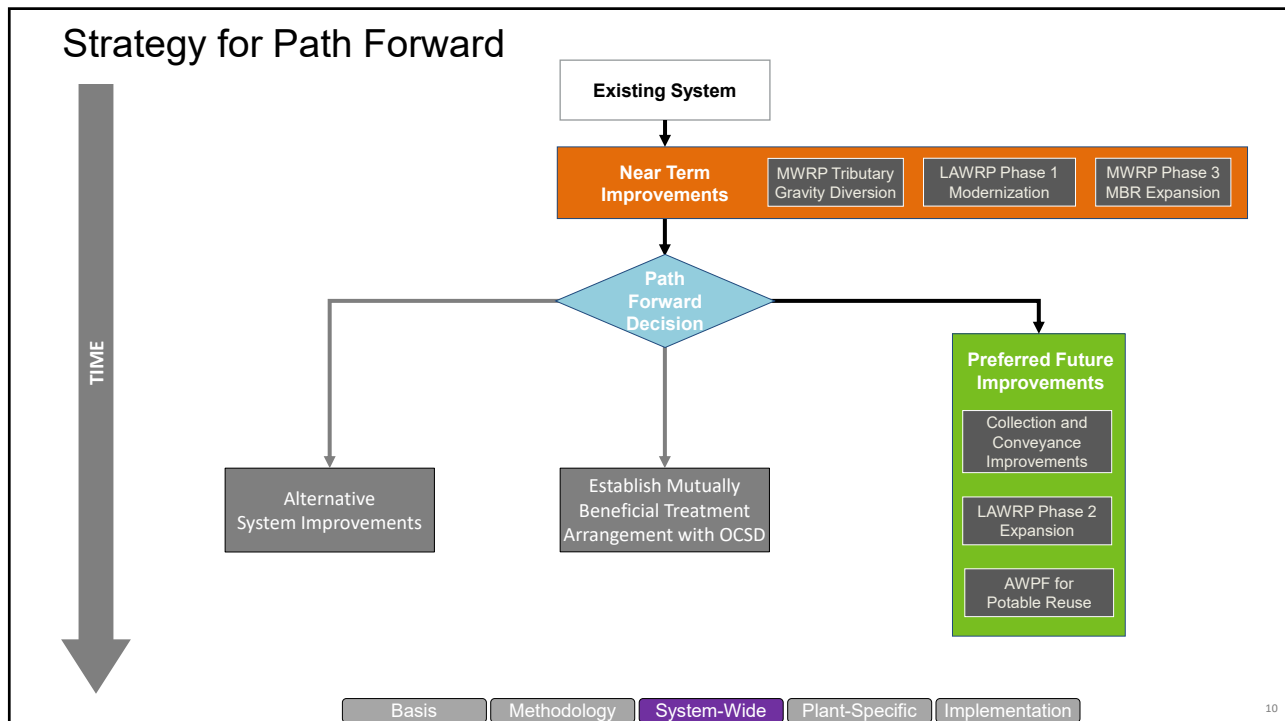
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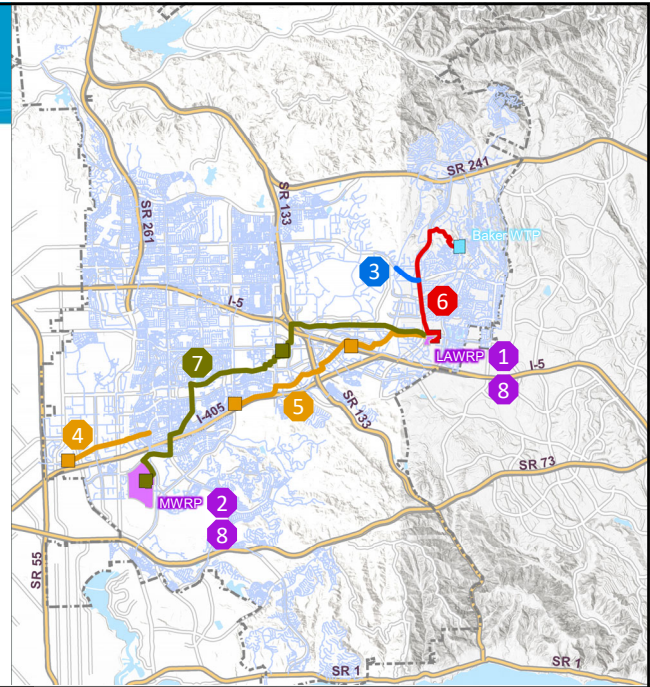


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Preferred System-Wide Alternative

- 1 LAWRP Phase 1 Modernization
- 2 MWRP Phase 3 MBR Expansion
- 3 MWRP Tributary Gravity Diversion
- 4 New IBC Lift Station & Forcemain
- 5 Pumped diversion from MWRP sewershed to LAWRP
- 6 New Pump Station & Pipeline from LAWRP to Baker WTP
- 7 New Pump Station & Brine Line from MWRP to SOCWA Outfall
- 8 LAWRP Phase 2 Expansion and AWPf & MWRP RO Facility



Irvine Ranch Water District

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System-Wide

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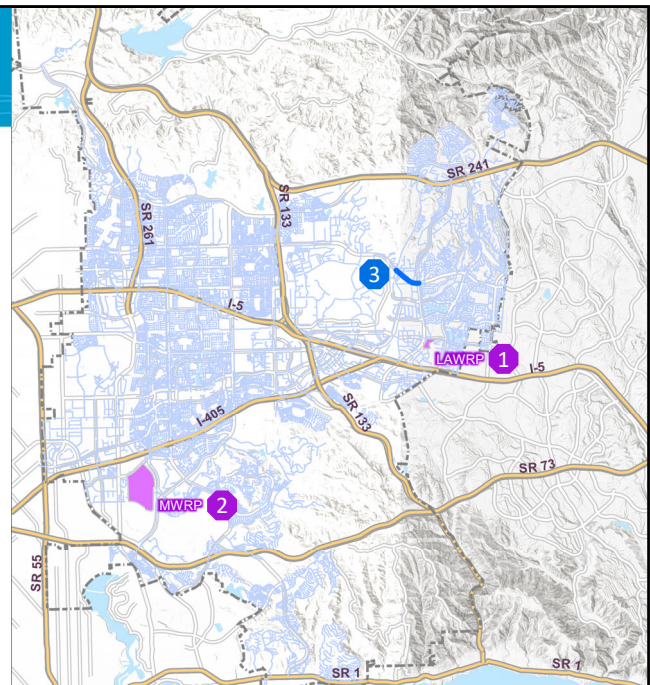
Implementation

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Recommended Near Term Projects

- 1 LAWRP Phase 1 Modernization (6.25 mgd)
- 2 MWRP Phase 3 MBR Expansion (28 mgd)
- 3 MWRP Tributary Gravity Diversion (1.9 mgd)



Irvine Ranch Water District

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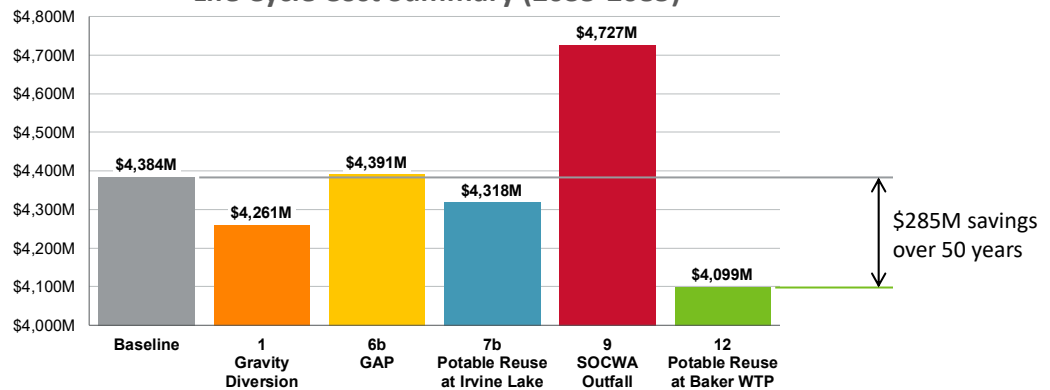
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Summary of System-Wide Evaluation

- Some adjustments were made to system-wide evaluation to capture changes to CORF calculation.
- Estimated life-cycle costs changed, but alternative ranking did not.
- Potable Reuse at Baker WTP has highest non-economic benefits.

Life Cycle Cost Summary (2035-2085)



Irvine Ranch Water District

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Michelson Water Recycling Plant Treatment Overview

Biosolids Facility

Flow Equalization

Conventional Activated Sludge

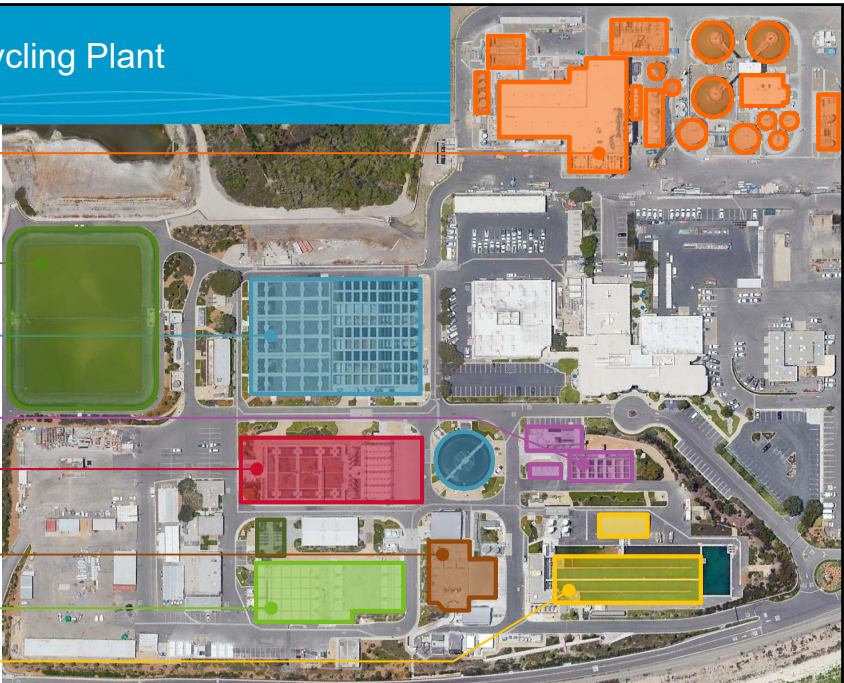
Tertiary Filtration

Membrane Bioreactor

Headworks

Primary Sedimentation

Disinfection



Irvine Ranch Water District

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Considerations for MWRP Treatment Evaluation

- Increasing influent concentrations means we have to consider both hydraulic and loading capacity
- Higher projected influent concentrations at ultimate flows result in loading capacity constraint, driven primarily by influent Ammonia concentrations
- Phase 3 MBR Expansion would address loading capacity constraint
- Future improvements address planned routing of IBC flows to MWRP that results in higher TDS



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Recycling Facility Treatment Evaluation MWRP Capacity based on Projected Concentrations

Conventional Activated Sludge (CAS)

- Hydraulic Capacity: 18.0 mgd
- Loading Capacity: 17.2 mgd at Ammonia Concentration of 44 mg/L

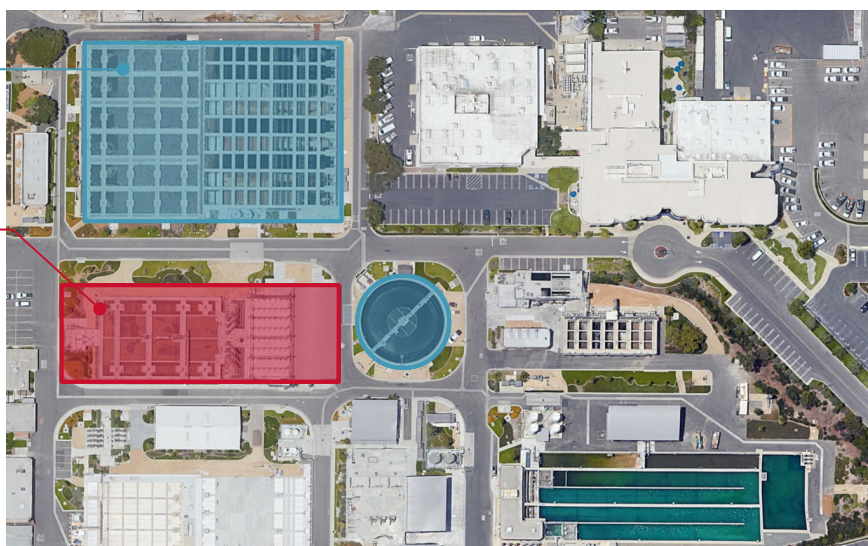
Membrane Bioreactor (MBR)

- Hydraulic Capacity: 10.5 mgd
- Loading Capacity: 9.9 mgd at Ammonia Concentration of 44 mg/L

MWRP Total Plant Capacity

Ammonia Loading Capacity = 9,960 lbs/day

Projected Ultimate Influent Ammonia Loading = 10,280 lbs/day



Irvine Ranch Water District

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Recycling Facility Treatment Evaluation MWRP Alternatives

Alternative	Impact to MBR	Impact to CAS
M1	Add third train Expand to 15 mgd	Address operational constraints Optimize for 13 mgd
M2	Add third train Expand to 15 mgd	Remove and replace with MBR at 13 mgd
M3	Add third train Expand to 15 mgd	Remove and replace with Aerobic Granular Sludge (AGS) at 13 mgd

Irvine Ranch Water District

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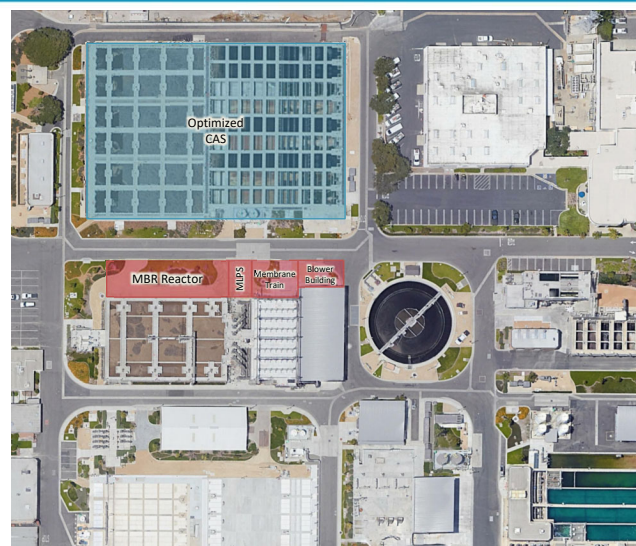
Implementation

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MWRP Alternative M1 Expand MBR to 15 mgd and Optimize CAS to 13 mgd

- Total Plant Loading Capacity: 28 mgd
- Expand MBR by adding 5 mgd train
- Reduce flow to CAS and improve biological treatment performance
- Optimize CAS configuration and address operational issues



Irvine Ranch Water District

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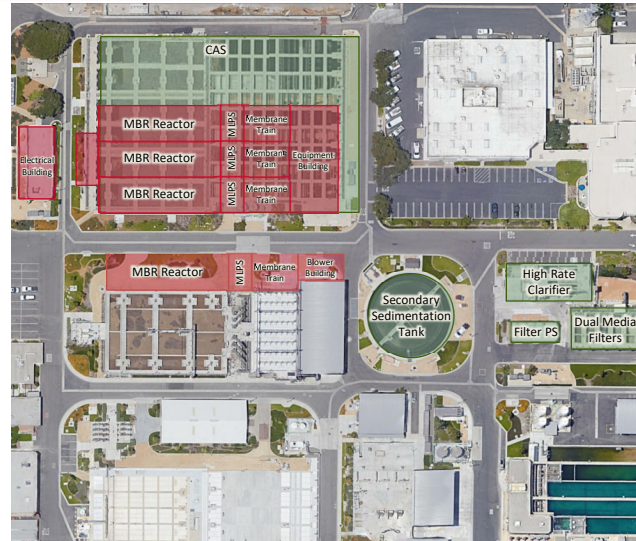
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MWRP Alternative M2

Expand MBR to 15 mgd and Replace CAS with 13 mgd MBR

- Total Plant Loading Capacity: 28 mgd
- Expand MBR by adding 5 mgd train
- Remove:
 - Conventional Activated Sludge
 - Filter Influent Pump Station
 - High Rate Clarifier
 - Dual Media Filters
- Construct new 13 mgd MBR



Irvine Ranch Water District

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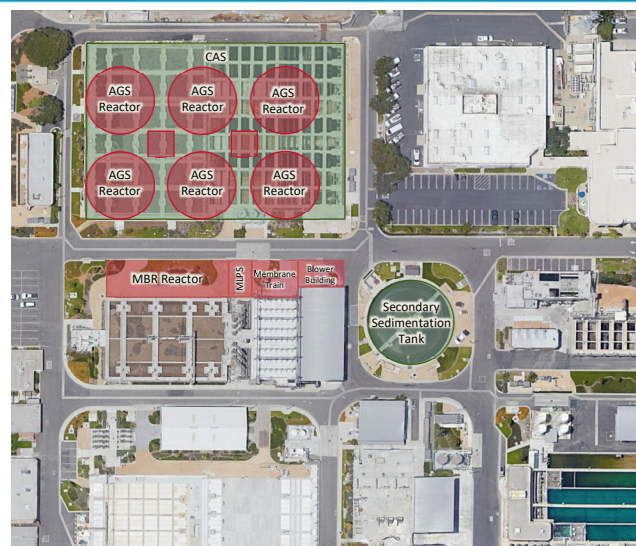
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MWRP Alternative M3

Expand MBR to 15 mgd and Replace CAS with 13 mgd AGS

- Total Plant Loading Capacity: 28 mgd
- Expand MBR by adding 5 mgd train
- Remove CAS
- Construct new 13 mgd AGS



Irvine Ranch Water District

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Recycling Facility Treatment Evaluation MWRP Alternatives

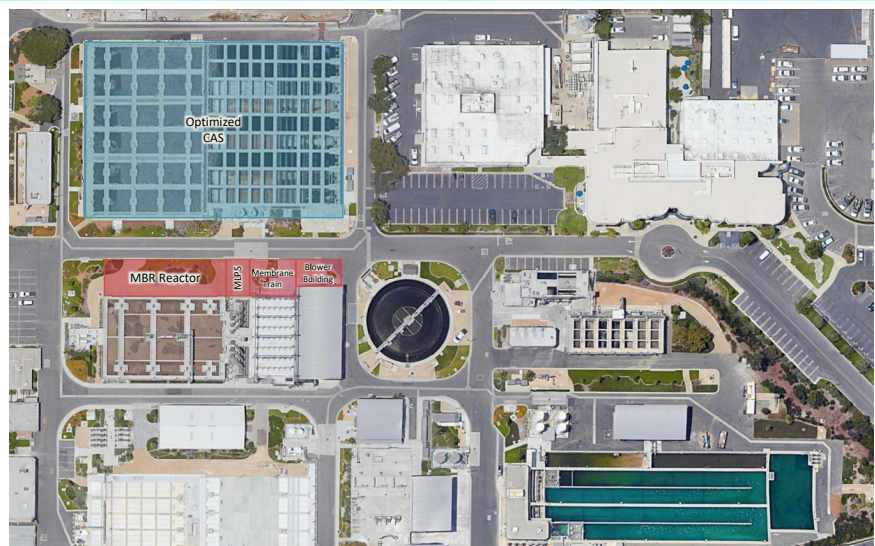
Alternative	Impact to MBR	Impact to CAS	Construction Cost
M1	Add third train Expand to 15 mgd	Address operational constraints Optimize for 13 mgd	\$74M
M2	Add third train Expand to 15 mgd	Remove and replace with MBR at 13 mgd	\$239M
M3	Add third train Expand to 15 mgd	Remove and replace with Aerobic Granular Sludge (AGS) at 13 mgd	\$91M

* Note capital costs do not include future improvements to address high TDS from IBC flows routed to MWRP.

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Recycling Facility Treatment Evaluation MWRP Preferred Alternative – Site Plan

- Lowest capital and life-cycle cost
- Lowest site disruption



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Los Alisos Water Recycling Plant Treatment Overview

Ponds 1 and 2: High-Rate Aerated
Ponds for BOD Removal Only

Headworks

Pond 5: Final Clarification and
Equalization

Pond 3: Solids Stabilization and
Storage

Pond 4: Solids Stabilization and Storage

SOCWA Pump Station

Disinfection

Tertiary Filtration



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Considerations for LAWRP Treatment Evaluation

- In the US, 90% of municipal aerated lagoon treatment plants are less than 1.0 mgd
- Largest aerated lagoon system in US (20 mgd) was in Modesto, CA; was converted to BNR + Tertiary Membrane in 2018
- Unifying the recycled water system requires nutrient removal and TDS reduction
- Phased implementation
- Phase 1 (Modernization)
 - Remove all process areas except disinfection
 - Retain access and use of SOCWA outfall
 - Construct new facility with 6.25 mgd capacity
- Phase 2 (Expansion)
 - Expand sewage treatment to 12.5 mgd
 - Add digestion facilities
 - Construct new AWWPF for raw water augmentation at Baker WTP



Irvine Ranch Water District

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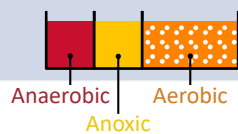


Recycling Facility Treatment Evaluation LAWRP Alternatives

- Developed and evaluated six shortlisted treatment alternatives
- Selected two preferred alternatives:

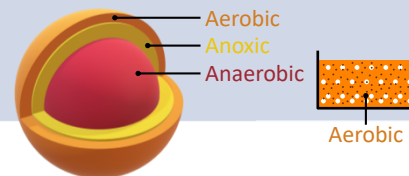
L2 Membrane Bioreactor (MBR)

- Second lowest capital and operating costs
- Established treatment process
- Staff familiarity
- Robust treatment
- Greater consistency in sludge produced
- Consolidated secondary and tertiary treatment



L3A Aerated Granular Sludge (AGS)

- Lowest capital and operating costs
- Eliminates primary sedimentation
- Ability to produce secondary effluent for disposal
- Biological phosphorus removal – improves reservoir water quality
- Granular sludge process is relatively new to US



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Recycling Facility Treatment Evaluation LAWRP Site Plan (at Ultimate Flows)



Irvine Ranch Water District

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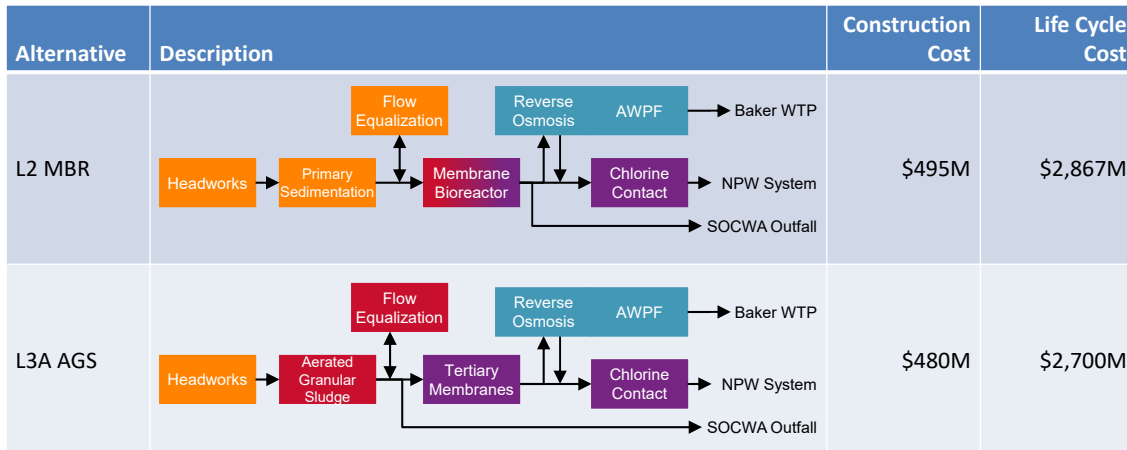
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Recycling Facility Treatment Evaluation LAWRP Alternatives



* Note capital and life cycle costs include Phase 1 and Phase 2 improvements, including the AWPf

Irvine Ranch Water District

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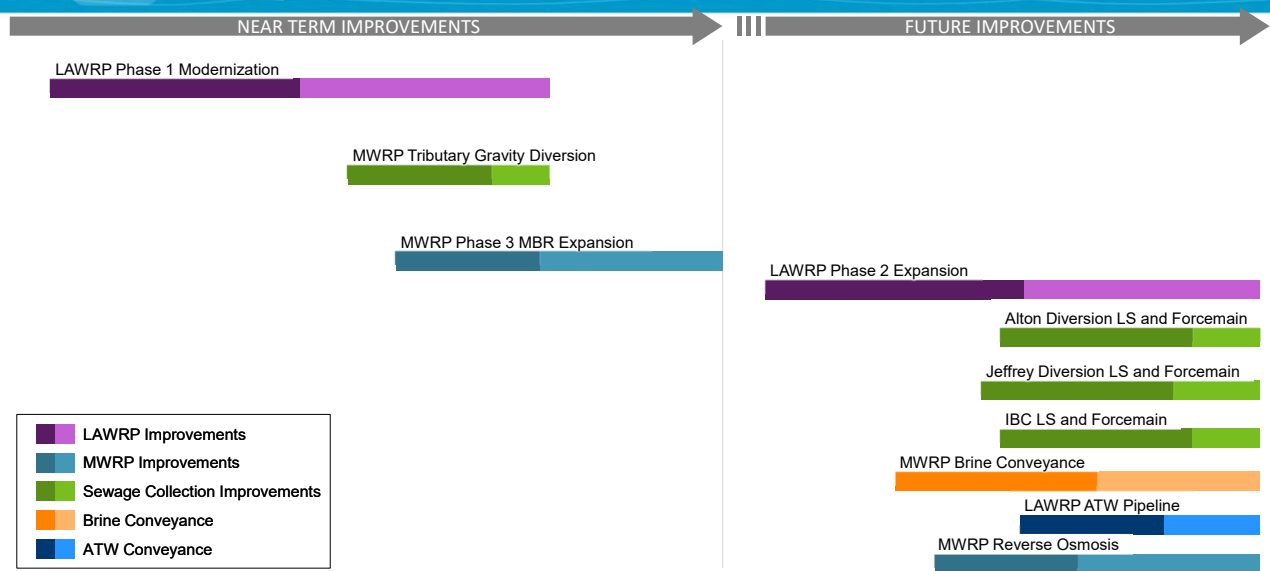
Plant-Specific

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Overall Implementation Plan



Irvine Ranch Water District

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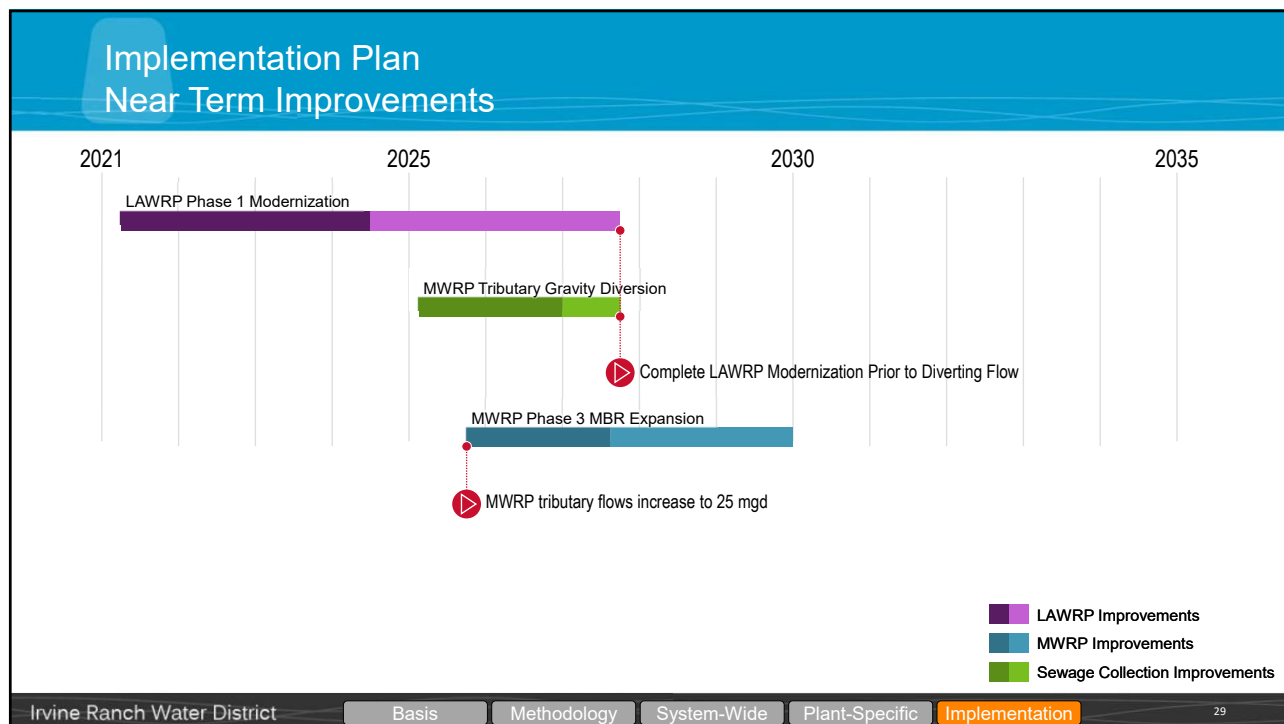
Plant-Specific

Implementation

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Implementation Plan and Future Considerations

- Impacts to Potable Water Supplies
- Potable Reuse Regulations
- Modification to Local Limits Program
- LAFCO considerations
- Interagency Agreements
 - Baker WTP Partners
 - OCSD
 - OCWD
 - SMWD

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Next Steps

- Proceed with recommended near term projects
 - LAWRP Phase 1 Modernization
 - MWRP Tributary Gravity Diversion
 - MWRP Phase 3 MBR Expansion
- Provide completed Master Plan Report to OCSD and SMWD and discuss improvement plans



Near Term Improvements Capital Budget Impacts

Project	Estimated Total Capital Cost	Current Capital Budget Amount	Capital Budget Increase	Recommended Improvement District Split
FY 2020-2021 Capital Budget Impacts				
MWRP Tributary Gravity Diversion	\$3 M	\$0	\$3 M	Sewer Regional Split
LAWRP Treatment Modernization	\$214 M ¹	\$21 M	\$193 M	Sewer Replacement ²
Long-Term Capital Program Impacts				
MWRP Expansion Phase 3				
MBR	\$64 M	\$31 M	\$33 M	RW and Sewer Regional Split
CAS	\$18 M	\$0	\$18 M	Sewer Regional Split
TOTAL	\$299 M	\$52 M	\$247 M	

1. Capital costs assume that thickened sludge would be trucked to MWRP for digestion.
2. The estimated increase to the Financial Replacement Model is \$256 M over the next 50 years.



Recommendations

- Authorize the addition of the MWRP Tributary Gravity Diversion project, in the amount of \$2,942,000 to the FY 2020-21 Capital Budget; and
- Authorize a budget increase in the amount of \$193,130,250, from \$20,975,000 to \$214,105,250 for the LAWRP Treatment Modernization project.

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Questions/Discussion

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January 19, 2021

Prepared by: R. Burk / M. Cortez

Submitted by: K. Burton

Approved by: Paul A. Cook



ENGINEERING AND OPERATIONS COMMITTEE

OPERATIONS CENTER COMPRESSED NATURAL GAS, DIESEL, AND GASOLINE FUELING FACILITY BUDGET INCREASE AND CONSULTANT SELECTION

SUMMARY:

The Operations Center Compressed Natural Gas (CNG), Diesel, and Gasoline Fueling Facility project will install a CNG Fueling Facility, replace the existing diesel and gasoline fueling systems, and install an additional diesel storage tank to increase the storage capacity to account for three days of emergency diesel fuel use. Staff recommends the Board:

- Authorize a budget increase in the amount of \$1,882,000, from \$748,000 to \$2,630,000, for Operations Center CNG, Diesel, and Gasoline Fueling Facility – DW, Project 07881;
- Authorize a budget increase in the amount of \$4,509,000, from \$748,000 to \$5,257,000, for Operations Center CNG, Diesel, and Gasoline Fueling Facility – SS, Project 07882; and
- Authorize the General Manager to execute a Professional Services Agreement with AECOM in the amount of \$701,560 for engineering design services for the Operations Center CNG, Diesel, and Gasoline Fueling Facility.

BACKGROUND:

IRWD's Fleet Services Facility located at the Michelson Operations Center maintains a fleet of approximately 300 vehicles fueled by either diesel, gasoline, or CNG. A fuel island located in the parking lot adjacent to the Fleet Services Facility is used for fueling vehicles with either diesel or gasoline. Currently, IRWD's CNG vehicles are fueled at the City of Irvine's facility or the City of Santa Ana's facility. This project will install a new CNG Fueling Facility to fuel the District's 11 sewer jetter trucks, vactor trucks, hydraulic excavators, tractor, and boom crane. The CNG Fueling Facility is proposed to be located on the northeast side of the Operations Center access road. A site plan is shown in Exhibit "A".

The existing diesel and gasoline fleet fueling systems are approaching the end of useful life and require replacement. The systems consist of a 15,000-gallon underground gasoline storage tank, a 12,000-gallon underground diesel storage tank, fuel dispensers, transition sumps, and piping. This project will replace the existing storage tanks with above ground storage tanks located on the hillside area northeast of the Operations Center Access Road (see Exhibit "A") as well as replace the existing fuel dispensers and associated piping and equipment at the fuel island.

The District is in the process of increasing emergency fuel storage capacity throughout IRWD's service area to account for three days of emergency fuel use for generators. The Michelson Operations Center has nine stationary generators and 11 portable generators. The last component of this project is the installation of an additional above ground diesel storage tank to supply the three days of emergency diesel fuel.

Consultant Selection:

Last year, IRWD retained Fuel Solutions to evaluate CNG fueling alternatives for the Michelson Operations Center as well as diesel storage requirements to allow for three days of emergency diesel fuel use. Based on Fuel Solutions' recommendations, staff developed the scope of the design. Staff issued a request for proposal for the design to three consultants: AECOM, HDR, and Stantec. HDR declined to submit a proposal citing staff availability. AECOM and Stantec submitted proposals on December 21, 2020.

Staff evaluated the proposals based on the consultants' project approach, project team and relevant experience and recommends the selection of AECOM. AECOM and Stantec provided proposals that reflected a good understanding of the scope of work and the work effort and commensurate fees required to complete the design. AECOM's design fee is \$701,560, and Stantec's design fee is \$583,887. Both firms included tasks to design a new CNG fueling facility, replace the existing diesel and gasoline fueling system, and install additional diesel storage capacity to account for three days of emergency diesel fuel use. AECOM included tasks to coordinate with regulatory agencies and prepare design plans for the removal of the existing underground storage tanks for diesel and gasoline.

Staff recommends the selection of AECOM based on the design concepts and project approach presented in its proposal, the strength of its project team, and its recent successfully completed design experience on District projects. The consultant evaluation matrix is provided as Exhibit "B", and a copy of AECOM's proposal is provided as Exhibit "C".

FISCAL IMPACTS:

Staff requests budget increases to Projects 07881 and 07882 as shown in the table below. These projects consist of building new facilities, replacing aging infrastructure, and supporting all District functions. The replacement components of the project will be funded equally by the Potable and Sewer Replacement Funds. The new facilities will be funded in equal parts by the Regional Potable, Sewer, and Recycled Water Improvement District Splits.

Project No.	Current Budget	Addition <Reduction>	Total Budget
07881	\$748,000	\$1,882,000	\$2,630,000
07882	\$748,000	\$4,509,000	\$5,257,000
Total	\$1,496,000	\$6,391,000	\$7,887,000

ENVIRONMENTAL COMPLIANCE:

This project is subject to the California Environmental Quality Act (CEQA). In conformance with the California Code of Regulations Title 14, Chapter 3, Section 15004, the appropriate environmental document will be prepared when "meaningful information" becomes available.

RECOMMENDATION:

That the Board authorize a budget increase in the amount of \$1,882,000, from \$748,000 to \$2,630,000, for Project 07881 and in the amount of \$4,509,000, from \$748,000 to \$5,257,000, for Project 07882, and authorize the General Manager to execute a Professional Services Agreement with AECOM in the amount of \$701,560 for engineering design services for the Operations Center Compressed Natural Gas, Diesel, and Gasoline Fueling Facility, Projects 07881 and 07882.

LIST OF EXHIBITS:

Exhibit “A” – Site Plan
Exhibit “B” – Consultant Selection Evaluation Matrix
Exhibit “C” – AECOM’s Proposal

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EXHIBIT "A"

PROJECT SITE PLAN OPERATIONS CENTER COMPRESSED NATURAL GAS (CNG), DIESEL, AND GASOLINE FUELING FACILITY



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EXHIBIT "B"

Operations Center Compressed Natural Gas (CNG), Diesel, and Gasoline Fueling Facility Consultant Selection Matrix
5-Jan-20

	Weights	AECOM	Stantec
TECHNICAL APPROACH	60%		
*Project Approach	50%	1	2
*Scope of Work	50%	1	2
Weighted Score (Technical Approach)		1.00	2.00
EXPERIENCE	40%		
*Firm/Team	30%	1	2
*Project Manager	40%	2	1
*Project Engineer	30%	1	2
Weighted Score (Experience)		1.40	1.60
Principal-in-Charge/Technical Advisor Project Manager Project Controls Project Engineering Manager/Mechanical Fuel System Engineering Civil Improvements Fueling Systems CNG Instrumentation & Controls CAD Civil/Structural Structural Electrical Permit Coordination		Heidi Goebel Bryan Paine Melanie Kirk Sean Goldsmith Bill Black Matt Hyatt James Young Tim Gutkowski Allen Randall	Jason Carr Joe Long Reb Guthrie - Fuel Solutions Tama Snow, Cole Warrick, Richard Robinson Faye Farahmand - Fuel Solutions Jeff Wilson Craig Wilcox Marty Armenta Reb Guthrie - Fuel Solutions
COMBINED WEIGHTED SCORE		1.16	1.84
		Man-hours	Man-hours
Task 1 Project Management		529	250
Task 2 Preliminary Design		434	632
Task 3 Final Design		2,870	1,316
TOTAL HOURS		3,833	2,198
Number of Construction Drawings		72	60

Operations Center Compressed Natural Gas (CNG), Diesel, and Gasoline Fueling Facility Consultant Selection Matrix
5-Jan-20

	Weights	AECOM	Stantec
FEE			
Task 1 Project Management		\$100,995	\$72,207
Task 2 Preliminary Design		\$80,650	\$122,646
Task 3 Final Design		\$519,915	\$389,034
Total		\$701,560	\$583,887
Average \$/manhrs		183	266
Professional Liability Insurance General Liability Insurance		YES YES	YES YES
FORCED RANKINGS:		1	2
1 - First			
2 - Second			



Michelson Water Recycling Plant Compressed Natural Gas Fueling Facility

Engineering and Design Services

Irvine Ranch Water District

Proposal reference: 1090978 - Rev 1

January 8, 2021

January 8, 2021

Our Reference
1090978 – Rev 1

Ms. Rachael L. Burk, PE
Project Manager
3512 Michelson Drive
Irvine, California 92612

via hard copy and email -
burk@irwd.com

MWRP CNG Fueling Facility and Upgrades to Diesel and Gasoline Fleet Fueling Systems

Dear Ms. Burk:

Irvine Ranch Water District (IRWD) has determined that the existing gasoline and diesel systems at its Michelson Water Recycling Plant (MWRP) need to be replaced. This will be done with new above-ground storage tanks (AST), dispensers, and fuel management system, along with a new CNG system will be constructed to facilitate CNG fueling. AECOM is pleased to offer this revised proposal to perform engineering services for the MWRP CNG Fueling Facility and Upgrades to Diesel and Gasoline Fleet Fueling Systems Project in Irvine, California. This proposal is based on items requested in the RFP received November 11, 2020 via email, site walk on November 30, 2020, and discussion held on January 6, 2021. We are excited to have the opportunity to present this information that outlines our understanding of the project, our anticipated deliverables, revised project team, preliminary schedule, and our cost and commercial terms to execute the project within your desired timeline.

When making contractor selections please consider the following:



Technical Expertise – Our multi-discipline staff are poised to provide IRWD with the most innovative, cost-effective, design solution. Our key personnel resumes highlight experience demonstrative of our ability to deliver fuel storage and compressed natural gas (CNG) projects. Our team will be led by **Sean Goldsmith, PE** who will serve as the project manager and mechanical lead. Sean brings more than 14 years of experience in project/mechanical engineering and technical oversight on projects for major oil and gas companies. Sean will be supported by **Bryan Paine, PE**, as QA/QC manager. Bryan brings 22 years of experience in the planning, design, construction, and operations of public infrastructure including managing multiple IRWD capital improvement projects. Of value on this project is the involvement of our CNG subject matter expert, **Bill Black, PE**, who has been designing fueling stations for more than 25 years. His expertise includes planning and design of fueling facilities (CNG, LNG, gasoline, propane, and diesel), municipal engineering, site design work, highway design, water, sewer and storm drainage studies, minor structural design, and contract administration. He is certified by the Natural Gas Vehicle Institute for the design of CNG stations and has personally designed and/or evaluated more than 50 fueling stations in North America. Bryan, Sean, and Bill will be supported by a team of engineers and designers.

Benefit – Our demonstrated experience and access to in-house subject matter experts provides IRWD the expertise and solutions that the best available technology and approaches are being employed for the MWRP CNG Fueling Facility and Upgrades to Diesel and Gasoline Fleet Fueling Systems Project.



Relevant Experience – Our submittal includes a listing of relevant project experience that shows the diversity we have in designing CNG and storage tanks projects as well as projects for IRWD. This listing includes multiple CNG projects in California as well as storage experience for several oil & gas companies.

Benefit – This diversity in expertise has helped identify a multitude of approaches and techniques that can be used to define the most effective design and construction approach for your project.



Local Presence – We plan to involve local Orange-based resources to execute the project.

Benefit – This allows us to cost effectively support all your desired meetings, while minimizing the associated travel expenses.

AECOM is proud to provide engineering and design services with a commitment to delivering the highest standards of business conduct and ethics. We are proud to be contributing to IRWD's business success, sharing its values, safety, and quality standards. We appreciate the opportunity to provide this proposal and look forward to working with the IRWD team towards a successful project. Should you have any questions or require additional information, please contact Sean Goldsmith at the information provided below.

Yours sincerely,

James R. Moon
Vice President, Industrial Engineering
AECOM
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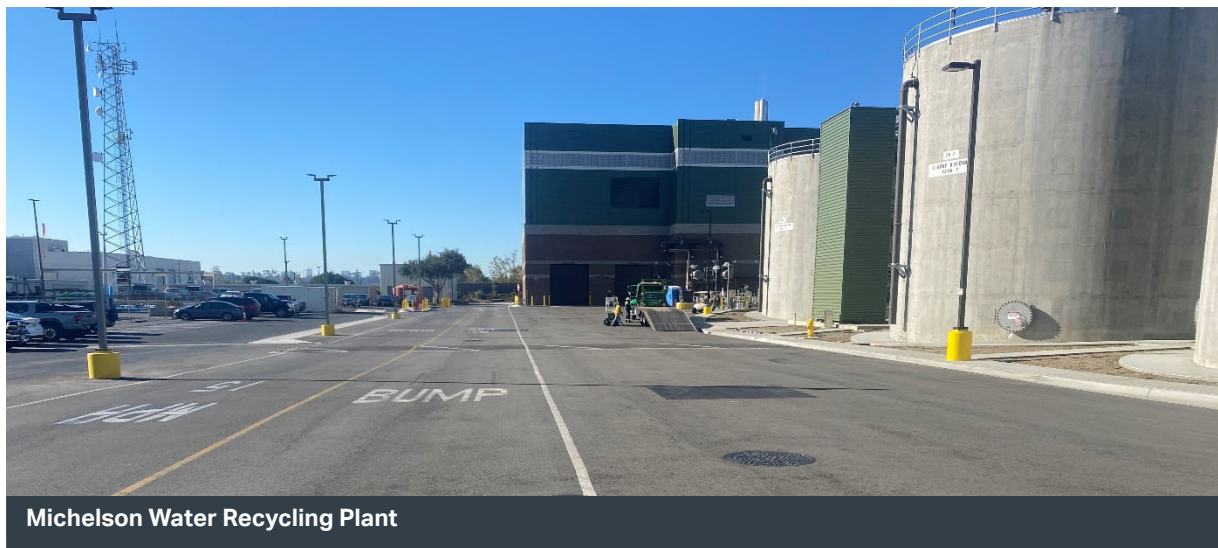
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1. Scope of Work

1.1 Project Understanding and Approach

1.1.1 Project Background

Irvine Ranch Water District (IRWD) operates the Michelson Water Recycling Plant (MWRP) in Irvine, California. MWRP maintains approximately 300 fleet vehicles ranging from passenger vehicles to heavy machinery. Most of the vehicles use gasoline and diesel fuel, while 11 vehicles use compressed natural gas (CNG). IRWD anticipates expanding the CNG vehicle fleet by five (5) heavy vehicles in the future.



MWRP currently has the capability to fuel gasoline and diesel vehicles on-site, while CNG vehicles must fuel offsite at the city of Irvine's CNG fueling facility or the Santa Ana CNG fueling facility. IRWD wishes to provide on-site CNG fueling at MWRP to alleviate the need for staff to travel offsite and wait in cue with other non-MWRP vehicles.

IRWD evaluated their on-site fuel storage capacities and determined the need to maintain a three-day supply of gasoline, diesel, and CNG. The existing diesel storage capacity does not meet the three-day capacity requirement. Additional storage for diesel will be required.

MWRP's current fleet fueling consists of a 15,000-gallon gasoline underground storage tank (UST), 12,000-gallon diesel UST, gasoline dispenser, diesel dispenser, and associated fuel management system. IRWD has determined that this equipment is near the end of its useful life and will require replacement.



1.1.2 Project Overview

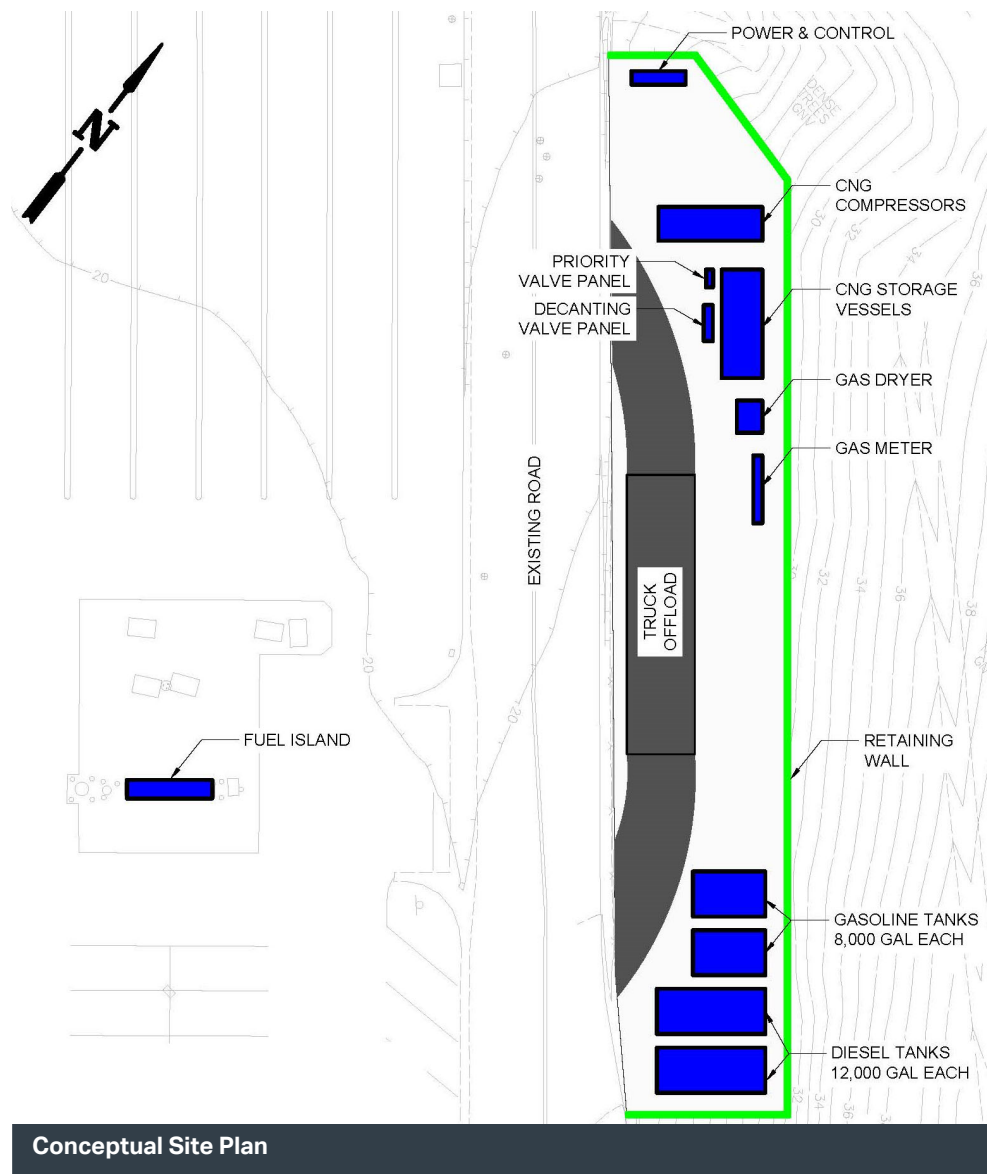
A detailed preliminary design report was completed to evaluate site requirements, existing equipment, fuel capacities, and fuel throughput. The existing gasoline and diesel systems will be replaced with new above-ground storage tanks (AST), dispensers, and fuel management system. A new CNG system will be constructed to facilitate CNG fueling.

1.1.2.1 Site Layout

Plot space at the MWRP site is in short supply, as most of the site is used for vehicle parking or allocated for future projects. A location near the north end of the facility has been identified for the new fueling equipment. The proposed location is currently a hillside and will require significant grading and a new retaining wall. During preliminary design, AECOM proposes to optimize the equipment layout to minimize the required plot space. A truck offloading lane will be established as to not restrict traffic on the road adjacent to the proposed site location.

The existing dispensing island is currently slated to be demolished and rebuilt to accommodate gasoline, diesel, and CNG fueling. AECOM proposes to evaluate alternate dispensing locations during preliminary design to potentially alleviate the downtime required to demolish and rebuild the dispensing island. Alternate locations may include dispensing near the storage tanks or using an area that is currently used for vehicle parking.

AECOM developed the conceptual site plan (presented below) for IRWD's consideration. The truck offload lane has been included as well as revised equipment arrangements discussed in Sections 1.1.2.2 and 1.1.2.3 that follow.



1.1.2.2 Compressed Natural Gas System

The preliminary design report evaluated both slow-fill and fast-fill options for CNG fueling. AECOM understands that IRWD has ruled out slow-fill, and fast-fill is preferred per Configuration D of the preliminary design report.

A 6-inch natural gas line owned by SoCal Gas runs through MWRP. Coordination with SoCal Gas will be required for SoCal Gas to tap the line and install a new gas meter to feed the CNG fueling system.

The CNG fueling system will consist of compressors, a manual regeneration desiccant dryer, filtration, storage, priority valve panel, decanting valve panel, and dispensing. The preliminary design report (PDR) made recommendations for compressor size, storage volumes, and three-day storage philosophy. AECOM concurs with the recommended 205 SCFM compressors instead of the smaller 75 SCFM compressors based on efficiency and reliability. AECOM would also like to build on the PDR by presenting a more efficient solution in terms of compressors for consideration. Such a recommendation would necessitate preparing a Form 5 and submitting it to SoCal Gas. The last fuel pressure analysis by SoCal Gas was two years ago. According to SoCal Gas, there may be an opportunity to take advantage of higher available pressure, and with the same 125 horsepower driver requirement, more efficiency could be achieved which translates to less energy and longer maintenance intervals.

Understanding there are power limitations, AECOM proposes to reevaluate the compressor size and power limitations during primary design to confirm optimum system performance. AECOM also proposes to evaluate the three-day storage philosophy such that it complements the compressor selection and fast-fill requirements during gas supply disruption.

The PDR identified spheres for gas storage. AECOM suggests considering gas cylinders to optimize plot required for gas storage. Gas cylinders will require less area per unit stored as well as a reduction in tubing needed for connection to the compressors, the priority and decanting valve panels.

Safety will always be considered of primary importance in the design of your CNG station. An example of this is “block and bleed” with the imperative that no one should ever put a wrench on a pressurized pipe. Pressure safety relief valves must be calibrated on a given schedule dictated by code. When they are removed, there needs to be a way to remove them safely. In many cases it has been observed that the operator had to “crack a thread” to relieve pressure so that pressure safety valves could be changed out. That will NOT happen on this station. Block and bleed will be addressed in our design.



Stoney Transit CNG Facility

1.1.2.3 Gasoline and Diesel Systems

The existing USTs are slated to be abandoned or removed. This will require coordination with the city of Irvine, Orange County Fire Authority, and Orange County Health Care Agency. AECOM's recent experience is that authorities having jurisdiction (AHJ) require USTs to be removed unless it can be shown that removal is not possible. Based on site observations, AECOM anticipates the AHJs will require removal. AECOM will coordinate with the appropriate AHJ to determine removal requirements (such as abandonment plan, soil sampling, and tank cleaning) during preliminary design and include those requirements in the final design drawings.

Three new aboveground storage tanks (AST) were identified in the PDR, two 12,000-gallon diesel tanks, and one 15,000-gallon gasoline tank. After review, AECOM proposes to reevaluate the storage capacities and arrangement during preliminary engineering. AECOM believes California Fire Code (CFC) may restrict the size of above ground motor fuel dispensing tanks to 12,000-gallons if they are not located in vaults.

1.1.2.4 Control System & Fuel Management

A new PLC will be provided for control of the CNG system as well as receive permissive signals due to utility power failure scenario identified in the preliminary design report. System status and alarms will be available in the control room on an operator consol. The present fuel management system will be replaced with a modern system. The system will include vehicle identification and user authentication at the dispensing island. The fuel management system will communicate via radio to the control room where the fuel management servers will be located. Each compressor will be supplied with a dedicated engine/compressor controller. Operational data can be polled from the controller and provided to the site control system for trending, archival, historical data capture, and alarm management. The control system will include shutdown or ESD functionality and will rely on interface signals and shutdown commands to be hardwired between the various systems. It should be noted that any ESD activation will shut down all fueling (gasoline, diesel, and CNG). Additional controls for CNG storage control will be integrated into the overall control system. Each dispenser is supplied with a standalone dispenser controller that monitors/manages the vehicle fueling and provides for data communications and hardwired signal interfaces.

1.2 Scope of Services

The scope of work for the design and implementation of the MWRP fueling upgrade project includes project management, preliminary design, and final design activities.

1.2.1 Project Management

AECOM will provide effective project management that adheres to the scope, schedule, and budget outlined in this proposal. We will provide efficient and frequent communication with IRWD and other project stakeholders throughout the project duration to confirm expectations are achieved. We will also implement our Quality Management System (QMS) in order to provide effective quality assurance/quality control for all deliverables and design activities. The scope of services for project management includes the following:

1.2.1.1 Project Status Reports

AECOM will prepare weekly and monthly project status reports for IRWD's management team. The weekly status reports will consist of a brief (one to two paragraphs) email summarizing work activities completed the previous week along with activities planned for the upcoming week. The monthly status reports will provide more detail as to project activities and will summarize work for the previous and upcoming month. The monthly reports will include an updated project schedule using Microsoft Project and a summary of budget status by task.

1.2.1.2 Meetings

AECOM will schedule and lead meetings with IRWD's team to verify that all design, operational, and maintenance issues are addressed appropriately. AECOM will provide agendas of upcoming project coordination meetings five working days in advance of the meeting and prepare meeting minutes and action items within five working days after the meetings. These efforts are intended to make sure that all technical issues are being addressed and that the project remains on schedule. For the purposes of budgeting, the following meetings are anticipated for the project:

- Kickoff meeting and site visit (2 hours)
- Draft Technical Memorandum Submittal Meeting – Basis of Design (2 hours)

- Present the 60% design and record IRWD's comments (2 hours)
- Present the 90% design, discuss IRWD's comments (2 hours)
- Present the 100% design, discuss IRWD's comments (2 hours)
- Final design plan signing (1 hour)

The budget has been allocated for two, two-hour, on-site meetings for key technical staff in addition to the meetings listed above.

1.2.1.3 Quality

AECOM will implement its QMS throughout the project to confirm consistent quality control for all project phases. The QMS system is based on the ISO 9001 standard and is required on all AECOM projects. The AECOM QMS system requires that each project deliverable undergo a detailed checking review, independent technical review, and construction documents will undergo a constructability review. The independent technical review will be provided by a technical expert in the related field, who has not been involved in preparation of the deliverable. The detailed checking review focuses on a review of grammar, spelling, notes, construction callouts, construction coordinates, plans and specification coordination, and discipline coordination. AECOM will provide IRWD with review comment disposition forms, redlines, redline back-checks, and QMS forms upon request.

Figure 1. Quality Management Process

Phase	Planning and Approach	Design and Development	Checking	Review	Verification
Responsible Parties	Project Manger Project Director Lead Verifiers Project Quality Rep	Discipline Leads Discipline Staff	Discipline Reviewers	Lead Verifier Project Manager Project Director Peer Teams	Project Quality Rep Project Manager

1.2.2 Preliminary Design

A preliminary design report has been completed (by others) for this project. AECOM will complete a basis of design technical memorandum with supporting drawings and exhibits. The assumptions stated in the preliminary design report will be validated and modifications (as needed) will be proposed. The following items will be addressed during preliminary design:

1.2.2.1 Basis of Design

The basis of design technical memorandum will include the following:

- CNG system criteria including requirements for utility gas supply, compressors, storage vessels, gas dryer, gas filters, fast-fill dispensers, priority valve panel, decanting valve panel, control system, valves, piping, etc.
- Gasoline and diesel system criteria including requirements for truck offloading, storage tanks, pumps, dispensers, control system, leak detection system, valves, piping, etc.
- Demolition requirements for the two existing USTs including soil sampling, tank cleaning, and backfilling.
- Identification of all permitting requirements for the project will be provided. Anticipated permitting agencies include, but are not limited to city of Irvine, Orange County Fire Authority, Orange County Health Care Agency Environmental Health Division, and South Coast Air Quality Management.

1.2.2.2 Piping and Instrumentation Diagrams (P&IDs)

Preliminary P&IDs will be developed during preliminary engineering in conjunction with the basis of design to convey the process operation for CNG, gasoline, and diesel systems.

1.2.2.3 Site Plan

A preliminary site plan will be developed to determine plot space requirements and equipment configuration to support the basis of design. The site plan will also identify locations for the truck offloading location. It will also verify separation criteria and aisle spacing required by the AHJs.

1.2.2.4 Electrical Load Study

The preliminary design report evaluated the CNG power requirements in conjunction with the site electrical limitations. AECOM will confirm the existing 480VAC/300A electrical service intended for the CNG facility will provide adequate capacity for the new loads. We assume IRWD maintains a coordination and arc flash model that depicts the current electrical system configuration and that the coordination and arc flash report will be updated by others.

1.2.3 Final Design

The final design will be completed in accordance with IRWD's Design Process Manual. AECOM will address the following items in the final design:

1.2.3.1 Utility Review

AECOM will perform a tabletop site utility investigation by reviewing IRWD record drawings and recent project as-builts. Appropriate third-party utility companies will be contacted to determine the location of third-party utilities. All third-party utilities will be shown on the project construction drawings.

1.2.3.2 Potholing

Once utilities are identified during the utility review, AECOM will prepare a pothole plan to confirm utility locations. We will subcontract with a potholing contractor to perform up to 10 potholes.

1.2.3.3 SoCal Gas Coordination

A new natural gas meter will be required to supply natural gas to the CNG system. IRWD will lead the coordination with SoCal Gas. AECOM will prepare two exhibits identifying the CNG facility location and necessary details to aid in IRWD coordination with SoCal Gas.

1.2.3.4 Permitting

AECOM will prepare a permit matrix that will identify all project required permits and their agencies. All permit prerequisites and requirements will be identified on the permit matrix. AECOM will submit permit applications on behalf of IRWD and work through the plan check process until plan check is complete and the permit is approved. After review of the project scope, AECOM believes the following permits will be required:

Table 1. Permits Required.

Agency	Permit	Notes
City of Irvine	Grading	
City of Irvine	Building	
City of Irvine	Electrical	
Orange County Fire Authority	Fire	
Orange County Health Care Agency, Environmental Health	Storage Tanks Installation/ Removal	
South Coast Air Quality Management District	Permit to Operate	Modify existing air permit per project

After discussion with IRWD during the job walk, AECOM assumes that environmental permitting will not be required.

1.2.3.5 Geotechnical Support

AECOM has performed a preliminary review of the geotechnical report provided by IRWD and concluded that additional geotechnical investigation will likely be required. During final design, AECOM will develop a scope of work and boring plan for the additional geotechnical scope. It is assumed that IRWD will contract with NMG Geotechnical, Inc. directly for the additional services.

AECOM can self-perform any additional geotechnical engineering services required for the project. An optional task for two additional borings up to 35 feet deep, along with lab analysis, and a technical report have been included in the fee schedule. AECOM assumes the boring location will be suitable for the boring equipment required.

1.2.3.6 Survey

AECOM has performed a preliminary review of the survey data provided by IRWD and concluded that additional survey data will likely not be required. This assumes the project selects the proposed site location as defined in the preliminary design report.

1.2.3.7 CNG Facility Power Supply

AECOM understands that a dedicated 480VAC/300A feeder has been installed for CNG facility power and proposes to evaluate the feeder suitability during preliminary engineering to align compressor selection with site power limitations. This will allow any major issues to be identified early in the project cycle. During final design, all the loads will be accounted for and the electrical construction drawings will be developed.

1.2.3.8 Electrical and Instrumentation

AECOM will prepare P&IDs, single line diagrams, load lists, panel schedules, instrument & IO list, cause & effect matrix, control panel layout drawings, control loop drawings, control description, and communication block diagrams for the CNG and gasoline/diesel systems. We will schedule a workshop with IRWD to confirm alignment with IRWD control system preferences, standard operations, programming, and tagging requirements.

1.2.3.9 Project Manual

AECOM will prepare the project manual in standard IRWD format and complete IRWD templates for the bidding and contract requirements section of the manual. We will use the latest version of IRWD's project manual for bidding, agreements, general provisions, and special provisions. The special provisions will be tailored for the project. The project manual will reference the applicable sections of IRWD's general technical specifications. AECOM will modify these sections and provide new technical sections as needed for the project.

An original set of bid documents in 8.5-inch x 11-inch format will be provided. Electronic native files of the project manual will be submitted to IRWD in the latest version of Microsoft Word on CD-1 and as a single PDF file on CD-2. We will use sample IRWD project manuals as reference.

1.2.3.10 Construction Plans

AECOM will prepare detailed construction drawings in the latest version of AutoCAD using NCS V4.0 layering standards. Construction drawings will be prepared on 22-inch x 34-inch sheet with an IRWD standard border template. Construction drawings will include general notes, construction notes, sheet index, location map, legends, plans, and associated sections & details. The horizontal and vertical control will be established with NAD83 and NAVD88 survey standards, respectively. Anticipated construction drawings are listed in the table below:

Table 2. Anticipated Construction Drawings.

Sheet Number	Drawing Number	Sheet Title
General		
1	G-1	Title Sheet
2	G-2	Location Map/Drawing Index
3	G-3	General Notes
Civil		
4	C-1	Civil Notes/Index
5	C-2	Site Plan
6	C-3	Location Control Plan
7	C-4	Grading Plan
8	C-5	Facilities Layout & Paving Plan
9	C-6	Demolition Plan – UST
10	C-7	Paving Plan - UST

Sheet Number	Drawing Number	Sheet Title
11	C-8	Civil Details
12	C-9	Civil Details
Structural		
13	S-1	Structural Notes/Index
14	S-2	Structural Site Plan
15	S-3	Retaining Wall Plan
16	S-4	Retaining Wall Section & Details
17	S-5	Retaining Wall Section & Details
18	S-6	CNG Foundation Plan
19	S-7	CNG Foundation Section & Details
20	S-8	Tank Foundation Plan
21	S-9	Tank Foundation Section & Details
22	S-10	Fuel Island Foundation Plan
23	S-11	Fuel Island Foundation Section & Details
24	S-12	Structural Details
25	S-13	Structural Details
Mechanical		
26	M-1	Mechanical Notes/Index/Legend/Symbols
27	M-2	Mechanical Plot Plan
28	M-3	CNG Piping Plan
29	M-4	CNG Piping Sections & Details
30	M-5	CNG Compressor Plan and Section
31	M-6	CNG Storage Plan and Sections
32	M-7	CNG Priority and Decanting Panel Plans & Sections
33	M-8	Tank Piping Plan
34	M-9	Tank Piping Section & Details
35	M-10	Dispensing Piping Plan
36	M-11	Dispensing Piping & Details
37	M-12	Piping Details
38	M-13	Piping Details
39	M-14	Signage Details
40	M-15	Signage Plan
Electrical		
41	E-1	Electrical Notes/Index/Legend/Symbols
42	E-2	Electrical Site Plan
43	E-3	Electrical Single Line Diagram

Sheet Number	Drawing Number	Sheet Title
44	E-4	Equipment Elevations
45	E-5	CNG Power & Control Plan
46	E-6	CNG Lighting & Grounding Plan
47	E-7	CNG Area Classification Plan
48	E-8	Tank Power & Control Plan
49	E-9	Tank Lighting & Grounding Plan
50	E-10	Tank Area Classification Plan
51	E-11	Fuel Island Power & Control Plan
52	E-12	Fuel Island Lighting & Grounding Plan
53	E-13	Fuel Island Area Classification Plan
54	E-14	Control Schematics
55	E-15	Control Schematics
56	E-16	Conduit and Cable Schedule
57	E-17	Electrical Details
58	E-18	Electrical Details
Instrumentation and Controls		
59	I-1	Instrumentation Notes/Index/Legend/Symbols
60	I-2	CNG P&ID
61	I-3	Gasoline and Diesel P&ID
62	I-4	Communication Block Diagram
63	I-5	CNG Control Panel Layout
64	I-6	CNG Control Panel Power Schematic
65	I-7	CNG Control Panel I/O Schematics
66	I-8	CNG Control Panel I/O Schematics
67	I-9	Gasoline/Diesel Control Panel Layout
68	I-10	Gasoline/Diesel Panel Power Schematics
69	I-11	Gasoline/Diesel I/O Schematics
70	I-12	Gasoline/Diesel I/O Schematics
71	I-13	Instrumentation Details
72	I-14	Instrumentation Details

1.2.3.11 Project Schedule

A detailed project schedule that identifies all critical factors including design activities, permitting, coordination events, submittal milestones, IRWD reviews, critical path items, shop drawing reviews, and construction activities will be developed and maintained. AECOM will submit monthly project schedule updates with each monthly status report. We will also submit monthly schedule updates with each design submittal. The schedule will be prepared in Microsoft Project format. A preliminary project schedule is attached in **Section 4**.

1.2.3.12 Liquidated Damage Calculation

AECOM will assist in calculating liquidated damages for the project which would take effect if the contractor exceeds the contract time. IRWD's standard liquidated damage calculation form will be used. AECOM has completed this form for IRWD on numerous projects.

1.2.3.13 Opinion of Probably Construction Costs

AECOM will provide IRWD with an engineer's estimate of probable construction costs for the 60%, 90%, and 100% design submittals. IRWD's comments related to the cost estimate will be incorporated and addressed. Construction costs will be determined from a variety of resources, including vendor quotes, RS Means Costworks software, recent IRWD construction bids, and bids from other local projects that AECOM has recently completed.

1.2.3.14 Design Deliverables

The final design deliverables pursuant to IRWD's design process manual will be provided. Hard copies of construction plans will be reproduced in either full-size (22-inch x 34-inch) format or tabloid (11-inch x 17-inch) format, per IRWD preference. The project manual will be reproduced in double-sided, letter-size format with color paper per IRWD standards. The submittals will be provided as described below.

A 3D model of the project showing all major components for each design submittal will also be developed. AECOM recommends a review meeting with IRWD technical staff where AECOM will present the 3D model in conjunction with the design drawings as an alternate method to convey the project design. We find that a 3D model review helps to identify operational, maintenance, and constructability issues that may be overlooked during a 2D drawing review. The 3D model will be provided in Navisworks format.



60% Submittal

AECOM will submit six (6) 11-inch x 17-inch and two (2) 22-inch x 34-inch bound hard copies and one (1) electronic file in PDF format of the 60% submittal drawings. Drawings will include civil/site layout, demolition, mechanical equipment and piping layout, structural layout, and electrical plans. The 60% submittal will include a table of contents for the project manual. A 3D model will also be provided.

90% Submittal

AECOM will submit six (6) 11-inch x 17-inch and two (2) 22-inch x 34-inch bound hard copies and one (1) electronic file in PDF of the 90% submittal. The 90% submittal will include all required project drawings and show all design components such as civil, structural, demolition, mechanical, electrical, and instrumentation. The 90% submittal will incorporate IRWD's 60% design submittal comments. AECOM will provide five (5) color coded copies of the 90% project manual including all sections, contract documents, general provisions, special provisions, general requirements, technical specifications, and appendices. AECOM will update the engineer's estimate of probable construction cost and provide a 3D model file.

100% Submittal

AECOM will submit six (6) 11-inch x 17-inch and two (2) 22-inch x 34-inch bound hard copies, one (1) CD with AutoCAD files for the entire drawing set, and one (1) CD with a single full-scale PDF file of the drawing set for the 100% submittal. The 100% submittals will have incorporated IRWD's 90% design submittal comments. AECOM will provide five (5) color coded copies of the 100% project manual and a binder with design calculations including civil, structural, mechanical, electrical, pipe thickness, and restraint calculations. One (1) CD will be provided containing all MS Word files used to prepare the project manual. AECOM will update the engineer's estimate of probable construction cost and provide a 3D model file.

Final Design

AECOM will submit one (1) full size stamped and signed reproducible plans (mylars) of the final construction drawings and original signed project manual for IRWD signatures. We will attend IRWD's meeting for signatures to explain the project and answer questions. A final engineer's estimate of probable construction cost will be submitted with the final plans and project manual.

1.2.3.15 Addenda Preparation and Pre-bid Meeting

During the bidding period, AECOM will provide support for information and clarification to the contract documents and construction drawings. We plan to consult with IRWD to address concerns or answer questions in support of administering the bid process. Up to three (3) addenda to the construction drawings and project manual have been budgeted for. For budgeting purposes, AECOM has included the following for addenda preparation:

- 16 hours for drawing revisions.
- 16 hours for specification revision.
- 24 hours to address bidder questions.

AECOM will prepare for and conduct one (1) two-hour pre-bid meeting along with a site visit with potential bidders, if required. AECOM will prepare the meeting agenda, exhibits, sign-in sheet, and minutes for the pre-bid meeting.

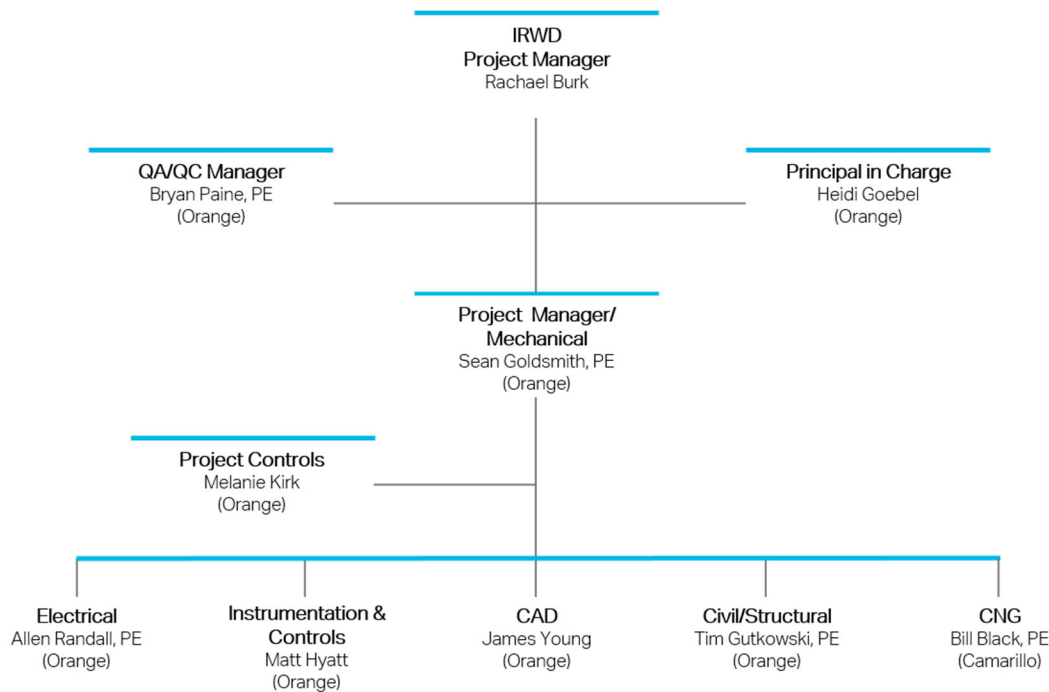
2. Team

2.1.1 Organization Chart

The key to the successful execution of the Michelson Recycling Plant Compressed Natural Gas Fueling Facility and Upgrades to Diesel and Gasoline Fleet Fueling Systems Project is an integrated, experienced team with a record of success of permitting and designing fuel and CNG facility projects. AECOM offers IRWD comprehensive environmental and engineering resources through a core team based in our Orange, California office. Our proposed key personnel have been selected based on their experience working on underground storage, CNG, and facility projects as well as similar scopes of work.

The project will be managed by **Sean Goldsmith, PE**. Sean brings more than 14 years of experience in project/mechanical engineering and technical oversight on projects for major oil and gas companies. He has managed and designed fueling projects for Kinder Morgan, Vopak, and PetroPort. Sean will be supported by a team of engineers and designers. **Bryan Paine, PE** will serve as the QA/QC manager and will support Sean. Bryan brings more than 22 years of experience and is familiar with IRWD's standards and requirements. He has worked on over a dozen IRWD capital improvement projects over the past two decades including pump stations, lift stations, disinfection facilities, pipelines, tanks, dams, and various updates at MWRP. He has also provided site civil design and permitting support for several diesel and CNG fueling facilities within Southern California. **Bill Black, PE** has been designing fueling stations for more than 25 years and will serve as the CNG expert. His expertise includes planning and design of fueling facilities (CNG, LNG, gasoline, propane, and diesel), municipal engineering, site design work, highway design, water, sewer and storm drainage studies, minor structural design, and contract administration. He is certified by the Natural Gas Vehicle Institute for the design of CNG stations and has personally designed and/or evaluated more than 50 fueling stations in North America (Calgary, Alberta Canada, California, Alabama, Michigan, Virginia, Florida, and Wisconsin). He is currently working on the CNG fueling station of an RNG facility in Bridgeville, Delaware. The proposed organization chart is provided in **Figure 2** below.

Figure 2. Proposed Project Organization Chart



If additional specialty resources are required, AECOM will draw on engineering resources from other offices throughout the United States. Our specialized resources, combined with our national network of technical experts across the United States, enables us to provide the most appropriate expertise to meet your needs, and ultimately, to provide the best value for your project.

AECOM pledges that the key personnel on this team will be available to the extent proposed for the duration of the project, and that no person designated as "key" to the project shall be removed or replaced without the prior written concurrence of IRWD.

We have included an overview of key team members in **Table 3**. Resumes are included in **Appendix A** at the end of this proposal. **Table 4** provides our key team members' availability.

Table 3. Overview of Team

Name Role	Location	Years of Experience	CNG	Liquid/ Conven- tional Fuels	IRWD	Under- ground Storage Demolition	Specialties and Capabilities
Sean Goldsmith, PE Project Manager/ Mechanical	Orange, CA	14		●		●	<ul style="list-style-type: none"> – UL142 Tanks – Piping Engineering – Equipment Specification – Stress Analysis
Bryan Paine, PE QA/QC Manager	Orange, CA	22	●	●	●	●	<ul style="list-style-type: none"> – Civil Site Improvements – Permitting – CNG and Diesel – Stormwater – Project Management
Heidi Goebel Principal in Charge	Orange, CA	35	●	●		●	<ul style="list-style-type: none"> – Fuel Quality – Fueling Systems – California Requirements – Permitting
Bill Black, PE CNG SME	Camarillo, CA	42	●	●		●	<ul style="list-style-type: none"> – CNG – Conventional Fuels – California Requirements – CNG Compression
Allen Randall, PE Electrical	Orange, CA	45	●	●	●		<ul style="list-style-type: none"> – Electrical Design of Water Systems – CNG
Matt Hyatt Instrumentation & Controls	Orange, CA	35	●	●	●		<ul style="list-style-type: none"> – Fuel Management Systems – CNG Compression – CNG & Fueling Measurement
James Young CAD	Orange, CA	10		●	●	●	<ul style="list-style-type: none"> – 3D Design – Piping, Electrical, & Instrumentation Design
Tim Gutkowski, PE Civil/Structural	Orange, CA	30		●		●	<ul style="list-style-type: none"> – California Requirements – Seismic – Tanks & Foundations
Melanie Kirk Project Controls	Orange, CA	30					<ul style="list-style-type: none"> – Cost – Scheduling

Table 4. Contributing to Project

Name	Role	Contributing to Project (% of Work Hours)
Sean Goldsmith, PE	Project Manager/Mechanical Lead	12%
Bryan Paine, PE	QA/QC Manager	6%
Heidi Goebel	Principal in Charge	2%
Bill Black, PE	CNG SME	7%
Allen Randall, PE	Electrical Lead	3%
Matt Hyatt	Instrumentation & Controls Lead	11%
James Young	CAD Lead	6%
Tim Gutkowski, PE	Civil/Structural Lead	6%
Melanie Kirk	Project Controls Lead	5%
Other Staff (8)	Supporting Roles	42%

2.2 Subcontractors

C Below – Underground Investigations/Potholing

C Below offers professional utility locating and mapping services throughout Southern California. Their highly experienced technicians use the most advanced non-destructive equipment in the industry to gather information. C Below specializes exclusively in subsurface imaging and has performed utility investigations at over 60 Southern California schools.

3. Experience

3.1 IRWD Experience

AECOM has been performing work for IRWD over the past 40 years. From this tenure, we have excellent knowledge of your expectations, requirements, and preferences, and believe we are very well positioned to provide a very efficient and successful project. A summary of IRWD recent projects follows.

Irvine Ranch Water District Orange Park Acres Well No. 1

IRWD contracted AECOM to design a wellhead, booster pump, and disinfection facility to provide a groundwater supply source to serve the Orange Park Acres (OPA) service area. The proposed well will have an initial maximum production rate of 2,000 gpm (capped to a maximum of 900 AFY) to meet the current domestic water demands of the Orange Park Acres (OPA) service area. The project also incorporates planned future expansions of the OPA Well No. 1 site, which includes an additional well and booster pump to increase the total production to 4,000 gpm to meet future demands posed by future developments.

The proposed well facility includes a contiguous building housing the new production well with constant-speed drive, wet-well/clearwell, vertical turbine booster pump with variable frequency drive, and an air-conditioned electrical control room. A wet-well was incorporated into the overall design to provide the booster pumps with a stable suction water level regardless of varying water well production rates caused by the variable water column within the production well. Since the production water will be directly incorporated into the domestic water distribution system, chloramine disinfection will be provided to meet CDPH requirements. Disinfection chemical storage and dosing facilities will be housed in a separate building onsite. The site will also include a surge tank for the booster pumps, a pump-to-waste system for the well, landscaping for the front yard of the site, security cameras, radio telemetry, drainage facilities, an asphalt-concrete parking area, fire suppression system for the chemical room, and a new electrical service and transformer.

The project site is located within a residential area and has sensitive receptors along all property lines; therefore, the city of Orange requires compliance with its noise ordinance, which limits nighttime noise levels to 50dB. Because the proposed buildings will be constructed of grout-filled concrete masonry blocks, sound-proofing measures for the building walls will not be required. The biggest challenge was to develop sound suppression for the building roof, door, hatches, and ventilation system while allowing for proper ventilation and air conditioning of the pumping and electrical equipment. AECOM prepared a noise study to aid in the design of noise suppression equipment for the proposed facilities as well as a hydraulic computer model network analysis of IRWD's Zone 5 OPA domestic water system. The hydraulic analysis was used to confirm the proposed pump hydraulic characteristics and ability of the proposed pumps to meet the design flow objectives while also meeting system demands within the OPA service area.



Orange Park Acres Well No. 1 Rendering



Orange Park Acres Well No. 1 Construction

Contract Value: \$5.3 million

Completed: 2015

Reference: Richard Mori, PE, Principal Engineer; 949.453.5570 (Irvine, California) or Jacob Moeder, PE, Project Manager; 949.453.5554 (Irvine, California)

Irvine Ranch Water District Syphon Reservoir Interim Facilities

AECOM designed an interim facility to integrate the Syphon Reservoir into the District's Zone A recycled water (RW) system. The scope of services included: preparation of a draft and final preliminary design report; utility potholing; utility research; topographic survey; construction drawings; project manual; construction cost estimate; project schedule; team meetings; assistance with CEQA documentation; permitting; equipment procurement; bid period assistance; and construction support services.

The filtration facilities included two 14-inch Hellan automatic strainers that each strains 5-cfs of reservoir water prior to gravity flow deliver to the Zone A RW system. Flow through the strainers is controlled by a mag-meter and motor-operated butterfly valve. AECOM designed a 200-gpm frame-mounted end-suction pump to supply backwash supply water to the strainers and a pre-packaged backwash lift station that discharges backwash back into the reservoir. The disinfection facilities include two 1,000-gallon sodium hypochlorite bulk storage poly-tanks, metering pumps, injection piping, controls, and a sun shade enclosure with concrete containment slab. AECOM provided electrical and instrumentation design for a new SCE service and transformer and pump and strainer control and telemetry system. Potable water was provided for eyewash/shower and site wash-down. We also assisted with the bidding process and provided construction support services.



Strainer

Contract Value: \$1.1 million

Completed: 2013

Reference: Harry Cho, PE, Project Manager; 949.453.5675 (Irvine, California) and Malcolm Cortez, PE, Principal Engineer; 949.453.5854 (Irvine, California)

Irvine Ranch Water District Eastwood Recycled Water Pump Stations



This project consisted of four different pump stations housed in a single building on a small, restricted site. Site constraints included a small, restricted site with only one entry point, townhomes on two side, and a busy intersection on the other two sides. Construction challenges included strict work hours, dust control, and conformance to the city of Irvine noise ordinance. AECOM confirmed that the site and building design met the demanding aesthetic needs of the community.

Additional effort was provided in phasing the pump stations as two were initially constructed and two equipped later, with all underground and electrical work requiring to be designed now to simplify the future work. Various pumping schemes needed to be evaluated for this project that also including pressure reducing stations. AECOM conducted transient analysis and recommended three surge tanks and other surge mitigation measures to protect the recycled water system and pump station from pressure surges that could occur during power outages, pump failures, or valve closures.

AECOM provided six alternative conceptual designs with architectural renderings followed by preliminary and final design services. The renderings included various site and building configurations, different roof types, and building exterior treatments, and landscaping arrangement. After the preferred site and building layout was selected, AECOM proceeded with site development, mechanical piping and equipment design,

building architecture, structural design, hydraulic and surge analyses, HVAC system design (ventilation and air conditioning), and electrical and instrumentation engineering including a SCADA system with radio telemetry. Acoustical panels, louvers, and other sound attenuation measures (50 dB at property line limit) were also included.

The 6,800-square-foot, fully automated facility contains 14 vertical turbine canned pumps serving the four different pressure zones, as well as the future expansion of Syphon Reservoir. The ultimate capacity is 70-mgd with all pumps running. While working on the development of the building and equipment layout, the AECOM design team realized that some variations in the layout could potentially represent significant cost savings. The selected layout maximized the small project site by housing all pumping and metering equipment inside a single room, which also included three pressure reducing stations and an ADA-compliant restroom. The electrical room houses constant speed and variable speed drives and is climate controlled with an air conditioning system. A separate mechanical room houses air compressors and controls for the surge suppression systems. Connections to existing utilities in the city streets where up to 15 feet in depth. AECOM recommended jack and bore tunneling to connect to these utilities, which greatly reduced cost compared to traditional cut and cover methods and reduced traffic shutdowns along the adjacent intersection.

With the pump stations being located within a residential area and having sensitive receptors along all property lines, noise suppression was a critical factor to the success of this project. AECOM developed a noise transmission model and designed sound suppression systems to address noise issues, specifically industrial and mechanical room applications. AECOM finalized the noise model using the Cadna/A® 3D acoustical noise model. Cadna/A® takes transmission loss, ground absorption, reflection, diffraction around building edges, topography, and noise attenuation due to spherical wave divergence all into account in order to generate accurate results. AECOM designed noise suppression measures including acoustic panels on all interior building walls, acoustic blankets on the underside of the roofing, insulated doors and roof hatches, double chevron acoustic louvers, and wrapped surge tanks.



Contract Value: \$1.0 million (design); \$12.2 million (construction)

Completed: 2020

Reference: Joe McGehee, PE, Senior Engineer and Project Manager; 949.453.5542 (Irvine, California)

3.2 CNG Experience

AECOM has significant experience in a multitude of projects involving natural gas, including recent work associated with the commercialization and dispensing of CNG in lieu of traditional fossil fuel. In the past 25 years, we have seen several both public and private sector companies transition to the use of natural gas for fueling both mass transit and long-haul vehicles with a focus on improved fuel efficiency and lower emissions.

For these projects, we provide full-service capabilities associated with environmental assessment and permitting, design, engineering, procurement, and construction management. These activities for these types of facilities can include:

- Feasibility studies
- Economic analysis
- Lifecycle assessment (sustainability)
- Environmental assessment/site preparation
- Environmental permitting
- Program management
- Conceptual and detailed engineering
- Procurement
- Construction management

City of Dinuba, California

CNG Station Initial Project and Phase I & II Expansion Improvements

AECOM completed both phases of a two-phase project to upgrade their CNG station originally designed by Bill Black in 2005. At the time the original station was designed, there was no viable fuel load, so the station had been designed to fuel a minimum number of vehicles. The two-phase improvement strategy was to serve the new load and provide for the future. The goal of the first station expansion was to add a second compressor and additional storage due to a limited budget.

The second phase of the project was considerably larger than the first and included many improvements:

- A second new-generation and larger compressor by Atlas Copco. This new compressor along with the one provided in Phase I tripled the capacity of the original station.
- A new higher capacity gas dryer with on-board regeneration capabilities.
- Upgraded compressor control panel to provide state of the art PLC control of both compressors so that they operate smoothly in an efficient manner.
- Replacement of the card reader. This replacement allowed Dinuba to bill credit cards in addition to fleet cards.
- Addition of new 10-bus covered time fill fueling area complete with fire sprinklers, fire alarm, and lights.
- Site improvements including storm drainage retention basin, drainage piping, and pavement.



Equipment Yard – Two Compressors
(Phase I)



10-Bus Fueling Area (Phase II)

Contract Value: \$16,000 (Phase I) and \$103,500 (Phase II)

Completed: September 2011 (Phase I) and May 2017 (Phase II)

Reference: Blanca Beltran, Director of Public Works; 559.591.5924 (Dinuba, California)

Kern County Superintendent of Schools CNG Station



Overview of CNG Fueling Facility

This multi-phase project began with an initial \$3.5 million in construction and involved design of a facility that could fuel a fleet of 90 school busses (**Phase 1**). The initial design was for two fast-fill fueling islands (four hoses) with provisions to expand to four; 16 time-fill hoses with provisions to expand to 96; and a de-fueling facility to facilitate on-site maintenance of the vehicles. In addition to design of the fueling station, the project also included street and parking lot design, over two acres of landscaping, extensive storm drainage work, security cameras, block walls, automatic opening gates and canopies. This phase was designed by Mr. Black with a prior firm. Phase 1 was completed in 2006.

The District engaged AECOM for design of its first major expansion, **Phase 2**. The expansion consisted of doubling the compression capability at the station, adding four additional fast-fill hoses, adding 46 more time-fill hoses and construction of canopies over each fast-fill island. Phase 2, which was the first phase by AECOM, concluded in the summer of 2015. It was delivered on time and provided for the equipment and construction improvements within the estimated budget.



Matrix Valve Panel
and Priority Valve
Panel

For **Phase 3**, the District reengaged AECOM to design the second expansion to add more compression, one transit fill nozzle, one tube trailer dispenser and nozzle, and four additional more time-fill nozzles. The station serves the fleet of busses for the superintendent of schools, the Kern High School District, Golden Empire Transit (GET), UPS, long-haul truckers, other agencies including the city of Arvin and the public in general. Vehicles that are fueled include 70 buses ranging in length from 32-40 feet as well as off-site, vehicles ranging from the size of Honda Civics to tractor trailer rigs with 53-foot trailers. The total cost of the station and expansions was \$7 million. The second expansion design occurred at a favorable time in terms of budget, as construction costs allowed for completion of all alternates. The second expansion was completed in Winter 2018. The District has accrued so much profit from serving outside customers that the station has paid for itself more than twice since its initial construction.

The project involves a single 26-acre site that houses a bus maintenance facility, administration offices, a bus wash, gasoline and diesel fueling, and a storm water management pond. At completion of

the third phase, the facility now stands at eight NGV-1 hoses on four islands, one transit fill hose, a tube trailer dispenser and hose, a defueling panel, and 66 time-fill hoses. The District maintains and operates the station but may call on a third-party maintenance contractor.

The load for the station prior to conversion was 526,000 therms per year or about 380,000 diesel gallons equivalent. This number has nearly doubled since the first expansion.



Priority Valve Panel

Contract Value: \$400,000 (Phase 1-3)

Completed: Winter 2018

Reference: George Carson, Construction Manager; 661.636.4895 (Kern County, California) or Scott Fieber, Energy Conservation Supervisor; 661.852.5863 (Kern County, California)

Lemoore Union High School District CNG Station



Lemoore Union High School CNG Fueling Station

AECOM has designed all phases of this project. The original project (**Phase 1**) was designed by Mr. Black in 2011 and constructed in 2012. It included two compressors, a dryer, three storage vessels, 20 time-fill dispensers, and a fast fill dispenser on an island. **Phase 2** added more storage and increase fill capacity to the time-fill dispensers. The design and construction were completed in 2016. The most recent phase, **Phase 3**, included the following elements:

- One additional compressor (205 scfm)
- No new dryer needed since the initial dryer was designed to accommodate this expansion
- An upgraded priority and time fill panel to accommodate transit fills
- Upgrade of the fast fill fueling island to include a transit high-volume fill dispenser
- Addition of a canopy to shelter the fast-fill island
- Site improvements to accommodate transit and long-haul trucking clients

Phase 3 construction was completed in August 2019. The final expansion (**Phase 4**) will be designed by AECOM when funds become available.

The project has been challenging due to the constraints of the parcel of land on which the station was constructed. The initial station was never intended for long-haul truckers, but with the second phase, the station accommodates them handily. With additional compression and the new high-flow nozzle, more long-haul and transit customers will use the station. The client will benefit from the additional revenue.

Contract Value: \$710,000 (Phase 1); \$350,000 (Phase 2); \$1,000,000 (Phase 3)

Completed: 2011 (Phase 1); 2016 (Phase 2); 2019 (Phase 3)

Reference: Mark Howard, Director of Business Services; 559.924.6610 x 206 (Lemoore, California)

3.3 Storage Experience

AECOM has provided services to a wide number of terminal facilities for storage and handling of liquids, gas, and solids, both onshore and at shore. From this work, we have created a staff of specialists including multi-discipline design teams, marine and geotechnical engineers, GIS/CADD staff, etc. We offer clients knowledgeable specialists with years of hands-on experience and active involvement in industry associations. Select projects follow.

Chevron

El Segundo Biodiesel Blending

AECOM performed design, permitting, and construction support services for the installation of a biodiesel truck offload facility, 40,000-gallon UL142 biodiesel storage tank, and biodiesel/diesel blending at the truck loading rack. AECOM coordinated with the city of El Segundo building department and fire department to secure the required permits. The project also required the removal of two underground storage tanks.

Contract Value: \$300,000

Completed: 2020

Reference: Sandy Cook, Terminal Engineer; 714.457.1336 (Fullerton, California)

Kinder Morgan

MaxBass NGL Injection Facility

AECOM performed design, permitting, and construction support services for a natural gas liquids (NGL) facility. The NGL facility included the installation of a two lane NGL truck offload rack, a 20,000 BBL pressurized storage tank, flare, propane blanketing system, and pipeline pumps. The project overcame many obstacles including tight schedule and construction during the winter in North Dakota. The project ultimately met the commercial timeframe for start of operations.

Contract Value: \$400,000

Completed: 2018

Reference: Rich Hulbert, Project Manager; 714.986.6148 (Irvine, California)

Enterprise Products Company

Jones Creek Tank Farm Expansion

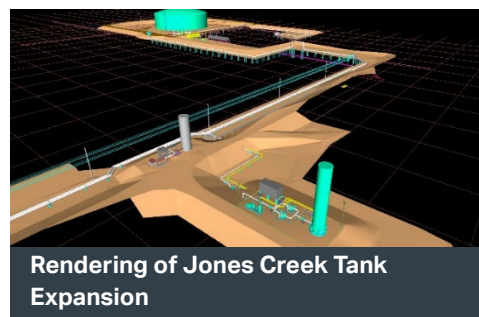
AECOM performed detailed design for the installation of pumps, piping, and other systems to provide an additional 600,000 barrels of crude oil storage at Enterprise's Seaway Pipeline Company's Jones Creek Terminal in Brazoria County, Texas.

In the role of owner's engineer, AECOM supported the tank design development. We provided engineering design and procurement assistance services for the systems external to the tank in order to support the installation and operations and maintenance of these new facilities at the Jones Creek Terminal, including the following equipment items:

- major piping systems
- pumps foundations and platforms
- electrical PCR building
- vacuum combustion unit (VCU) foundations

AECOM's scope of work initiated at the tank nozzle connections and includes but was not limited to: terminal piping design to connect the new storage tank to new piping systems; equipment and electrical and instrumentation design to connect tank-mounted and in-line instrumentation; motor operated valves; and other instruments for a new facility control system located in a new electrical and controls building.

In addition to the design scope above, AECOM reviewed the existing firewater protection system to assess the ability to provide firewater protection for the new tank installation. AECOM completed the design for a foam system for the new tank with new bladder tank, fire monitors, and fire hydrants around new tank.



Contract Value: \$40 million TIC

Completed: 2018

ExxonMobil Chalmette Tank and Loading Modifications

AECOM provided various engineering services to ExxonMobil's Project Implementation Department. This work was performed by a multi-discipline task force that included process/chemical, mechanical, electrical, instrumentation, controls, civil/structural, and environmental engineering resources. Projects were developed and executed in compliance with the ExxonMobil Gated work process. Typically, our services begin with pre-Gate 2 studies and continued through Gate 2, Gate 4, and engineering procurement of the respective project. Select projects include:

- **Low Sulfur Diesel (LSD) Header** – Installed a new suction piping from the LSD tank and converted the 89 gasoline pumps and piping to the dock to the new LSD service.
- **Mid-East Truck Loading Vapor Recovery Unit** – Project increased the loading capacity of the Mid-East rack by using lower RVP gasoline from tank 6344 in lieu of the 87 gasoline from tank 6309. Gasoline circulation increased. Work included a new suction and return lines as well as replacement of both gasoline circulation pumps on the VRU skid.
- **LPG Loading Rack Modifications** – Modifications include tankless operation and enhanced safety.

Contract Value: Varied

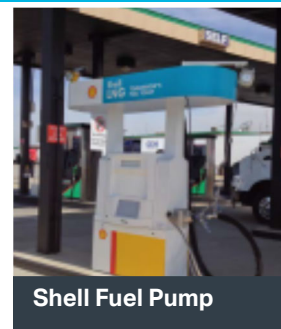
Completed: 2007

3.4 Fueling Experience

Shell US

Truck LNG Fueling (20 locations throughout the US)

AECOM provided engineering, procurement, and construction management (EPCM) for the construction of a network of 80 liquefied natural gas (LNG) fueling stations at TA Travel Centers America truck stops across the US interstate highway system. Project tasks included permit acquisition, design modification, equipment procurement, and construction contracting, construction management, and commissioning. Twenty locations were designed and permitted in Texas, Louisiana, Oklahoma, Arkansas, California, Oregon, Washington, and Pennsylvania.



Shell Fuel Pump

Contract Value: \$100K per location

Completed: 2015

Mass Transportation Authority

Davison Service Center



Fuel Pump Station

The Davison Area Service Center is a new facility to service the transportation needs of residents in the surrounding service area. The facility accommodates storage of 21 propane vehicles (12,500 sq. ft.), wash and inspection bay, fueling dispensing area, driver's lounge, office space and customer's waiting area (2,400 sq. ft.). Key elements included:

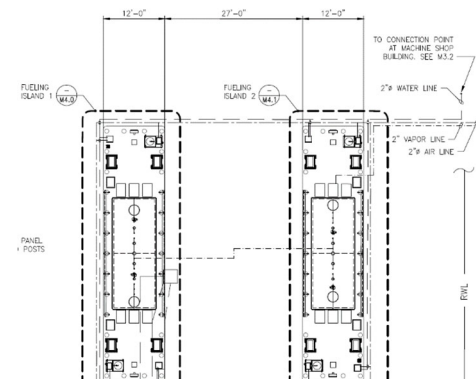
- Bus Storage Area for Propane Vehicles
- Concrete and Asphalt Pavement Entrances and Parking Areas
- Bus Wash Bay
- Offices and Dispatch Room
- Driver's Lounge & Restrooms
- HVAC Systems
- Gasoline and Propane Fueling Systems including canopy.
- Fuel Management System
- Radio Tower
- Gas Detection Systems
- Security and Video Surveillance Systems
- Lighting (LED) – Interior and Exterior Lighting
- IT Server Room
- Lightning Protection System

Contract Value: \$4.4 million

Completed: 2017

SF PUC CDD Fueling Station

AECOM designed an eight dual-hose dispenser for gasoline and diesel fueling on two large double-sided islands with dual-cell above ground storage tanks. The propane fueling station was also relocated.



Drawing of CDD Fueling Station

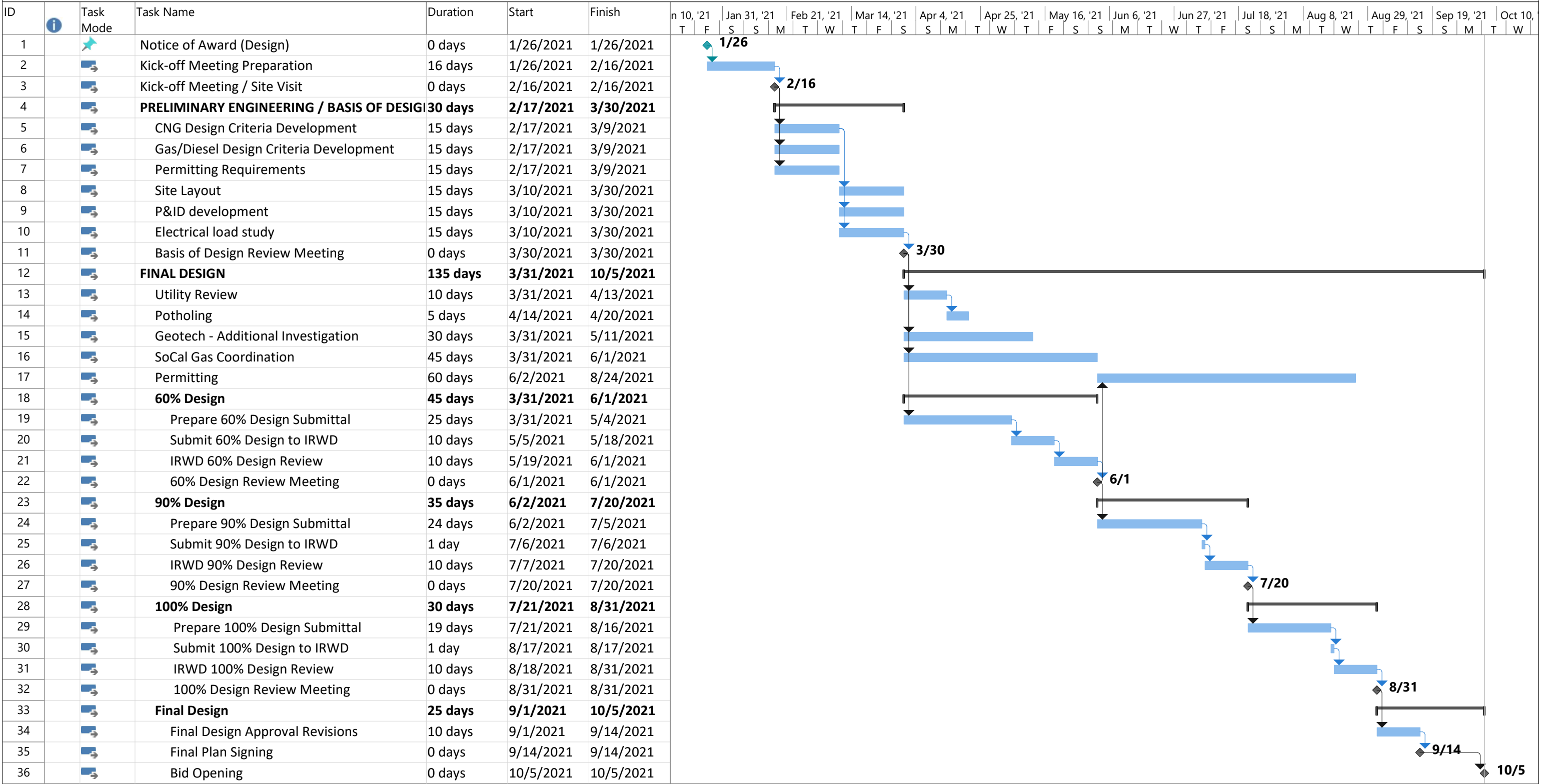
Contract Value: \$304,000

Completed: 2018

4. Schedule

AECOM confirms that all work can be completed according to the preliminary project schedule included on the following page.

IRVINE RANCH WATER DISTRICT
MWRP CNG FUELING FACILITY UPGRADE



5. Budget

The budget proposal, including fee schedules and breakdown of the fee by task, is being submitted in a sealed envelope separate from this technical proposal.

6. Joint Venture

AECOM is not proposing a joint venture for this project.

AECOM does plan to engage C Below for underground investigations and potholing. Details regarding this subcontractor can be found in Section 2.2 Subcontractors.

7. Conflict of Interest

AECOM is not aware of any personal or organizational conflicts of interest that would preclude us from providing the services proposed in this submittal.

8. Contract

Based on our review of the sample contract and our previous work with IRWD, we are confident that AECOM and IRWD can successfully agree on terms, if we are awarded this assignment.

Our team is fully capable in all areas outlined under the scope of work in the RFP. We can begin work immediately upon award and agreement of terms, and we are able to maintain the required level of effort to meet the proposed schedule.

9. Insurance

The insurance certificate included on the following page confirms that AECOM's liability coverage is compliant with the requirements for this project.

aeom.com

December 21, 2020

Our Reference
1090978

Ms. Rachael L. Burk, PE
Project Manager
3512 Michelson Drive
Irvine, California 92612

via hard copy

Budget Proposal - MWRP CNG Fueling Facility and Upgrades to Diesel and Gasoline Fleet Fueling Systems

Dear Ms. Burk:

Irvine Ranch Water District (IRWD) has determined that the existing gasoline and diesel systems at its Michelson Water Recycling Plant (MWRP) need to be replaced with new above-ground storage tanks (AST), dispensers, and fuel management system, along with a new CNG system to facilitate CNG fueling. AECOM is pleased to offer our fee estimate to perform engineering services for the MWRP CNG Fueling Facility and Upgrades to Diesel and Gasoline Fleet Fueling Systems Project in Irvine, California. This estimate is based on items requested in the RFP received November 11, 2020 via email and bid walk held on November 30, 2020.

Our technical proposal, including our qualifications and scope of work, is being submitted under separate cover.

The detailed budget proposal is included in **Appendix A**. This includes an analysis of the estimated hours that each member of the project team will contribute for the individual tasks depicted in the scope of work. We have also included the identity and estimated hours and costs of subcontractors, reproduction costs, and other direct costs.

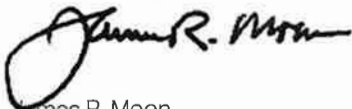
The estimated amount for each phase of the work is as follows:

Task	Amount
Project Management	\$100,995
Preliminary Design	\$ 80,650
Final Design	\$519,915

As shown, our total not to exceed price for performance of all services is **\$701,560**. Our billing rate schedule is included in **Appendix B**.

AECOM is proud to be contributing to IRWD's business success, sharing its values, safety, and quality standards. We appreciate the opportunity to provide this proposal and look forward to working with the IRWD team towards a successful project. Should you have any questions or require additional information, please contact Bryan Paine.

Yours sincerely,



James R. Moon
Vice President, Industrial Engineering
AECOM
M: 504.343.7940
E: jim.moon@aecom.com



Mr. Bryan Paine, PE, QSD
AVP, Senior Project Manager
AECOM
M: 714.483.1354
E: bryan.paine@aecom.com

Appendix A Detailed Budget Proposal

AECOM's detailed budget proposal broken down by task and team member for the MWRP CNG Fueling Facility and Upgrades to Diesel and Gasoline Fleet Fueling Systems Project can be found on the following page.

Task No.	Task Description	Labor Category with Billing Rate													TOTAL HOURS	TOTAL LABOR	Subcontractor	Subcontractor	Direct Costs / Materials¹	TOTAL
		Principal-in-Charge	Principal Engineer	Senior Engineer	Senior Engineer	Project Manager	Project Engineer-Architect	Estimator	Estimator	Senior Designer	Senior Drafter	Drafter	Senior Project Admin	Project Admin			Geotech Boring Services TBD	Utility Potholing Services C Below		
		\$270	\$250	\$230	\$175	\$230	\$150	\$170	\$150	\$150	\$110	\$100	\$140	\$120						
TASK 1: Project Management																				
A.	Project Status Reports					40							32	32	104	\$17,520				\$17,520
B.	Meetings/Workshops																			
	Kickoff Meeting and Site Visit (1 meeting of 2 hours)	2	4	2	2	2							1	1	14	\$3,070			\$40	\$3,110
	Basis of Design Review Meeting (1 meeting of 2 hours)	2	4	2	2	2							1	1	14	\$3,070			\$40	\$3,110
	60% Design Workshop (1 meeting of 2 hours)	2	4	2	2	2					2		1	1	16	\$3,290			\$40	\$3,330
	90% Design Workshop (1 meeting for 2 hours)	2	4	2	2	2					2		1	1	16	\$3,290			\$40	\$3,330
	100% design Workshop (1 meeting for 2 hours)	2	4	2	2	2					2		1	1	16	\$3,290			\$40	\$3,330
	Final design plan signing (1 meeting for 1 hour)	2	4	2	2	1							1	1	13	\$2,840			\$40	\$2,880
	Additional On-site visits (2 visits at 4 hours each)	8	4	8	8	16									44	\$10,080			\$40	\$10,120
C.	Quality Assurance/Quality Control	2	100		25	25	60			20	60				292	\$54,265				\$54,265
SUBTOTAL TASK 1		22	128	20	45	92	60			20	66		38	38	529	\$100,715		-	\$280	\$100,995
TASK 2: Basis of Design / Preliminary Design																				
A.	Review PDR Memorandum		8	4	4	4	4								24	\$5,140				\$5,140
B.	Hydraulic Model and Analysis						20								20	\$3,000				\$3,000
C.	Equipment Sizing		20		10		20								50	\$9,750				\$9,750
D.	Site Plan	2	4		4	2	4			10	20				46	\$7,000				\$7,000
E.	Permits & Coordination	2	4	12	10		12								40	\$7,850				\$7,850
F.	Schedule in Microsoft Project		20		10	4	12								46	\$9,470				\$9,470
G.	USTs Removal - Initial Investigation				6		12								18	\$2,850				\$2,850
H.	Preliminary PIDs			32	12	20	20			8	16				108	\$20,020				\$20,020
I.	Preliminary Single Line/ Load Summary		4				20			2	6				32	\$4,960				\$4,960
J.	Development of Basis of Design Document	4	12	12	6	4	12								50	\$10,610				\$10,610
SUBTOTAL TASK 2		8	72	60	62	34	136			20	42				434	\$80,650				\$80,650
TASK 3: Final Design																				
A.	Utility Review					4	24				12				40	\$5,840				\$5,840
B.	Potholing Underground Utilities				4		4				12				20	\$2,620		\$15,000		\$17,620
C.	Exhibits for Coordination with SCGC				4		4				16				24	\$3,060				\$3,060
D.	Permitting Assistance	4	4		4	20	40				40				112	\$17,780			\$10,000	\$27,780
E.	Recently Completed Geotechnical Investigation				3		20								23	\$3,525				\$3,525
F.	Recently Completed Site Survey				4										4	\$700				\$700
G.	CNG Fueling Facility Power Supply		4		4		4								12	\$2,300				\$2,300
H.	Electrical/Instrumentation			80						8	16				104	\$21,360				\$21,360
I.	Project Manual	8	55	50	10	70	80						16	16	305	\$61,420				\$61,420
J.	Construction Plans																			
	60% Design Plans	10	150	100	15	100	110			40	340	80	5	5	955	\$158,025				\$158,025
	90% Design Plans	10	100	50	15	60	80			20	180	60	10	10	595	\$99,025				\$99,025
	100% Design Plans	10	80	50	15	60	60			20	100				395	\$73,625				\$73,625
K.	Project Schedule				6	4	6						24	24	64	\$9,110				\$9,110
L.	Liquidated Damages Calculations				1		2								3	\$475				\$475
M.	Opinion of Probable Construction Cost at each Design Milestone				10			80	40						130	\$21,350				\$21,350
N.	Design Deliverables Printed										24				24	\$2,640			\$1,500	\$4,140
O.	Addenda Preparation and Pre-Bid Meeting																			
	Plan Revisions (16 hours)				6	2	2				4		1	1	16	\$2,510				\$2,510
	Specification Revisions (16 hours)			3	3	4	4						1	1	16	\$2,995				\$2,995
	Bidder Questions (24 hours)			5	5	4	4				4		1	1	24	\$4,245				\$4,245
	Pre-Bid Meeting (1 Meeting of 2 hours)				2	2									4	\$810				\$810
SUBTOTAL TASK 3		42	393	338	111	330	444	80	40	88	748	140	58	58	2,870	\$493,415		\$15,000	\$11,500	\$518,915
TOTAL (TASKS 1 THRU 3)		72	593	418	218	456	640	80	40	128	856	140	96	96	3,833	674,780		15,000	11,780	701,560
Optional Items																				
A.	Additional Geotech		6	25	25		30			5	15				106	\$18,525	\$35,000			\$53,525
SUBTOTAL "Optional Items"			6	25	25		30			5	15				106	\$18,525	\$35,000			\$53,525

Notes & Assumptions:

1.) Direct costs/materials include costs such as mileage to meetings/site, courier fees, document reproduction, permit fee allowances, and soil lab costs.

Appendix B Billing Rate Schedule

A copy of AECOM's billing rate schedule can be found on the following page.

AECOM Schedule of Fees and Charges (Rate Table)

This Schedule of Fees and Charges shown in the labor classification table below are subject to a 3% annual escalation.

PERSONNEL CHARGES*

The charge for all time required in the performance of the Scope of Service, including office, field and travel time, will be at the Unit Price Hourly rates set forth below for the labor classifications:

LABOR CLASSIFICATION	
Professional Staff	Hourly Rate
Staff Engineer/Scientist/Geologist	\$100
Senior Staff Engineer/Scientist/Geologist	\$120
Project Engineer/Scientist/Geologist.....	\$150
Senior Engineer/Scientist/Geologist.....	\$175
Project Manager/Senior Engineer	\$230
Principal Engineer/Architect.....	\$250
Principal-in-Charge	\$270
Technical Staff	Hourly Rate
Drafter/GIS/Graphics.....	\$100
Senior Drafter/GIS/Graphics.....	\$110
Design/GIS/Estimator/Scheduler.....	\$120
Senior Design/Estimator/Scheduler	\$150
Lead Design/Estimator/Scheduler	\$170
Project Support Staff	Hourly Rate
Office/Clerical	\$80
Project Assistant	\$90
Administrator/Contracts.....	\$100
Project Admin/Contracts	\$120
Sr Project Admin/Contracts	\$140
Principal Project Admin/Contract	\$160

Overtime (hours worked in excess of eight (8) hours per day) by exempt personnel will be charged at the above straight time rate. Overtime by non-exempt personnel will be charged at 1.5 times the above hourly rates.

OTHER PROJECT CHARGES

Subcontractors and Equipment Rental

The cost of services subcontracted by AECOM to others and other costs incurred by AECOM will be charged at cost with no mark-up.

Document Reproduction

In-house reproduction will be charged as follows:

8 ½x11 Black & White = \$0.09

11x17 Black & White = \$0.17

8 ½x11 Color = \$0.14

11x17 Color = \$0.26

Black & White plot/ square foot = \$0.20

Color plot/square foot = \$0.26

Vehicles and Mileage

Leased field vehicles (pick-ups, vans, trucks, etc.) used on project assignments will be charged at \$85 per day. The mileage charge for personal autos will be the current mileage rate established by the Internal Revenue Service.

This fee schedule contains confidential business information and is not to be copied or distributed for any purpose other than the use intended in this contract or proposal.

When AECOM/GEI staff, appear as expert witnesses at court trials, mediation, arbitration hearings and depositions, their time will be charged at 2.0 times the standard rate. All time spent preparing for such trials, hearings and depositions will be charged at the standard labor rate.

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