

PROFESSIONAL SERVICES AGREEMENT

This PROFESSIONAL SERVICES AGREEMENT, (hereinafter referred to as "Agreement"), is made and entered into to be effective the 22nd day of June, 2022, by and between the ORANGE COUNTY SANITATION DISTRICT, (hereinafter referred to as "OC SAN"), and BROWN AND CALDWELL, (hereinafter referred to as "CONSULTANT"). OC SAN and CONSULTANT are referred to herein collectively as the "Parties" or individually as a "Party."

WHEREAS, OC SAN desires to engage CONSULTANT for PS21-04 Energy and Digester Gas Master Plan to provide for OC SAN an Energy and Digester Gas Master Plan; and

WHEREAS, CONSULTANT is qualified to provide the necessary services in connection with these requirements and has agreed to provide the necessary professional services; and

WHEREAS, OC SAN has adopted procedures for the selection of professional services and has proceeded in accordance with said procedures to select CONSULTANT to perform this work; and

WHEREAS, at its regular meeting on June 22, 2022 the Board of Directors, by Minute Order, accepted the recommendation of the Operations Committee to approve this Agreement.

NOW, THEREFORE, in consideration of the promises and mutual benefits, which will result to the parties in carrying out the terms of this Agreement, it is mutually agreed as follows:

1. SCOPE OF WORK

CONSULTANT agrees to furnish necessary professional services to accomplish those project elements outlined in the Scope of Work attached hereto as Attachment "A", and by this reference made a part of this Agreement.

- A. The CONSULTANT shall be responsible for the professional quality, technical accuracy, and completeness and coordination of the work and services furnished by the CONSULTANT under this Agreement, including the work performed by its subconsultants (Subconsultants). Where approval by OC SAN is indicated, it is understood to be conceptual approval only and does not relieve the CONSULTANT of responsibility for complying with all applicable laws, regulations, codes, industry standards, and liability for damages caused by errors, omissions, noncompliance with industry standards, and/or negligence on the part of the CONSULTANT or its Subconsultants.
- B. CONSULTANT is responsible for the quality of work prepared under this Agreement and shall perform its work in accordance with engineering standards in effect for clarity, uniformity, and completeness. CONSULTANT shall timely respond to all of OC SAN's questions, comments, suggestions, corrections, and recommendations. All comments from OC SAN, or its agent, shall be incorporated into the work prior to the next review deadline or addressed, in writing, as to why the comment(s) has/have not been incorporated.

CONSULTANT shall ensure that each submittal is 100% accurate for the level of work submitted (i.e., correct references, terms, capitalization, or equal status, spelling, punctuation, etc.).

- C. In the event that CONSULTANT's services and/or work product(s) is not to the satisfaction of OC SAN and/or does not conform to the requirements of this Agreement or the applicable industry standards, the CONSULTANT shall, without additional compensation, promptly correct or revise any errors or deficiencies in its work product(s) within the timeframe specified by the Project Manager. OC SAN may charge to CONSULTANT all costs, expenses and damages associated with any such corrections or revisions.
- D. Any CADD drawings, figures, and other work produced by CONSULTANT and Subconsultants using OC SAN CAD Manual. Conversion of CADD work from any other non-standard CADD format to OC SAN format shall not be acceptable in lieu of this requirement.

Electronic files shall conform to OC SAN specifications. Any changes to these specifications by the CONSULTANT are subject to review and require advance written approval of OC SAN.

Electronic files shall be subject to an acceptance period of Number thirty (30) calendar days during which OC SAN shall perform appropriate reviews and including CAD Manual compliance. CONSULTANT shall correct any discrepancies or errors detected and reported within the acceptance period at no additional cost to OC SAN.

- E. All professional services performed by the CONSULTANT, including, but not limited to, all drafts, data, correspondence, proposals, and reports compiled or composed by the CONSULTANT, pursuant to this Agreement, are for the sole use of OC SAN, its agents and employees. Neither the documents nor their contents shall be released to any third party without the prior written consent of OC SAN. This provision does not apply to information that (a) was publicly known, or otherwise known to the CONSULTANT, at the time that it was disclosed to the CONSULTANT by OC SAN, or (b) subsequently becomes publicly known to the CONSULTANT other than through disclosure by OC SAN.
- F. The OC SAN shall furnish the CONSULTANT available studies, reports and other data pertinent to the CONSULTANT's service and not otherwise confidential or restricted from disclosure; obtain or authorize the CONSULTANT to obtain or provide additional reports and data as required; furnish to the CONSULTANT services of others required for the performance of the CONSULTANT's services hereunder, and the CONSULTANT shall be entitled to use and rely upon all such information and services provided by the OC SAN or others in performing the CONSULTANT's services under this Agreement.
- G. CONSULTANT shall not be responsible for delays caused by circumstances beyond its reasonable control, including, but not limited to (1) strikes, lockouts, work slowdowns or stoppages or accidents, and (2) acts of God. While CONSULTANT has made reasonable efforts to incorporate into its plan for the Project any known current project impacts of the COVID-19 pandemic, CONSULTANT has not accounted for, and is not responsible for, unknown future changes due to the COVID-19 pandemic, including, without limitation, additional restrictions by government agencies or others (such as the availability of the site

for access or client or consultant staff or others) to the extent they delay or otherwise impact the Project. In that event, CONSULTANT will notify OC SAN and work in good faith to equitably address any unexpected impacts therefrom.

2. COMPENSATION

Total compensation shall be paid to CONSULTANT for the services in accordance with the following provisions:

A. Total Compensation

Total compensation shall be in an amount not to exceed One Million Four Hundred Thirty-eight Thousand Thirty-six Dollars (\$1,438,036.00). Total compensation to CONSULTANT including burdened labor (salaries plus benefits), overhead, profit, direct costs, and Subconsultant(s) fees and costs shall not exceed the sum set forth in Attachment "E" - Fee Proposal.

B. Labor

As a portion of the total compensation to be paid to CONSULTANT, OC SAN shall pay to CONSULTANT a sum equal to the burdened salaries (salaries plus benefits) actually paid by CONSULTANT charged on an hourly-rate basis to this project and paid to the personnel of CONSULTANT. Upon request of OC SAN, CONSULTANT shall provide OC SAN with certified payroll records of all employees' work that is charged to this project.

C. Overhead

As a portion of the total compensation to be paid to CONSULTANT, OC SAN shall compensate CONSULTANT and Subconsultants for overhead at the rate equal to the percentage of burdened labor as specified in Attachment "E" - Fee Proposal.

D. Profit

Profit for CONSULTANT and Subconsultants shall be a percentage of consulting services fees (Burdened Labor and Overhead). When the consulting or subconsulting services amount is \$250,000 or less, the maximum Profit shall be 10%. Between \$250,000 and \$2,500,000, the maximum Profit shall be limited by a straight declining percentage between 10% and 5%. For consulting or subconsulting services fees with a value greater than \$2,500,000, the maximum Profit shall be 5%. Addenda shall be governed by the same maximum Profit percentage after adding consulting services fees.

As a portion of the total compensation to be paid to CONSULTANT and Subconsultants, OC SAN shall pay profit for all services rendered by CONSULTANT and Subconsultants for this project according to Attachment "E" - Fee Proposal.

E. Subconsultants

For any Subconsultant whose fees for services are greater than or equal to \$100,000 (excluding out-of-pocket costs), CONSULTANT shall pay to Subconsultant total compensation in accordance with the Subconsultant amount specified in Attachment “E” - Fee Proposal.

For any Subconsultant whose fees for services are less than \$100,000, CONSULTANT may pay to Subconsultant total compensation on an hourly-rate basis per Attachment “J” – Minor Subconsultant Hourly Rate Schedule and as specified in the Scope of Work. OC SAN shall pay to CONSULTANT the actual costs of Subconsultant fees and charges in an amount not to exceed the sum set forth in Attachment “E” - Fee Proposal.

F. Direct Costs

OC SAN shall pay to CONSULTANT and Subconsultants the actual costs of permits and associated fees, travel and licenses for an amount not to exceed the sum set forth in Attachment “E” - Fee Proposal. OC SAN shall also pay to CONSULTANT actual costs for equipment rentals, leases or purchases with prior approval of OC SAN. Upon request, CONSULTANT shall provide to OC SAN receipts and other documentary records to support CONSULTANT’s request for reimbursement of these amounts, see Attachment “D” - Allowable Direct Costs. All incidental expenses shall be included in overhead pursuant to Section 2 - COMPENSATION above.

G. Other Direct Costs

Other Direct Costs incurred by CONSULTANT and its Contractor due to modifications to the Scope of Work resulting from field investigations and field work required by the Agreement. These items may include special equipment, test equipment and tooling and other materials and services not previously identified. Refer to attachment “D” Allowable Direct Costs for payment information.

H. Reimbursable Direct Costs

OC SAN will reimburse the CONSULTANT for reasonable travel and business expenses as described in this section and further described in Attachment “D” - Allowable Direct Costs to this Agreement. The reimbursement of the above-mentioned expenses will be based on an “accountable plan” as considered by Internal Revenue Service (IRS). The plan includes a combination of reimbursements based upon receipts and a “per diem” component approved by IRS. The most recent schedule of the per diem rates utilized by OC SAN can be found on the U.S. General Service Administration website at <http://www.gsa.gov/portal/category/104711#>.

The CONSULTANT shall be responsible for the most economical and practical means or management of reimbursable costs inclusive but not limited to travel, lodging and meals arrangements. OC SAN shall apply the most economic and

practical method of reimbursement which may include reimbursements based upon receipts and/or “per diem” as deemed the most practical.

CONSULTANT shall be responsible for returning to OC SAN any excess reimbursements after the reimbursement has been paid by OC SAN.

Travel and travel arrangements – Any travel involving airfare, overnight stays or multiple day attendance must be approved by OC SAN in advance.

Local Travel is considered travel by the CONSULTANT within OC SAN geographical area which includes Orange, Los Angeles, Ventura, San Bernardino, Riverside, San Diego, Imperial, and Kern Counties. Automobile mileage is reimbursable if CONSULTANT is required to utilize personal vehicle for local travel.

Lodging – Overnight stays will not be approved by OC SAN for local travel. However, under certain circumstances overnight stay may be allowed at the discretion of OC SAN based on reasonableness of meeting schedules and the amount of time required for travel by the CONSULTANT. Such determination will be made on a case-by-case basis and at the discretion of OC SAN.

Travel Meals – Per-diem rates as approved by IRS shall be utilized for travel meals reimbursements. Per diem rates shall be applied to meals that are appropriate for travel times. Receipts are not required for the approved meals.

Additional details related to the reimbursement of the allowable direct costs are provided in the Attachment “D” - Allowable Direct Costs of this Agreement.

I. Limitation of Costs

If, at any time, CONSULTANT estimates the cost of performing the services described in CONSULTANT’s Proposal will exceed seventy-five percent (75%) of the not-to-exceed amount of the Agreement, including approved additional compensation, CONSULTANT shall notify OC SAN immediately, and in writing. This written notice shall indicate the additional amount necessary to complete the services. Any cost incurred in excess of the approved not-to-exceed amount, without the express written consent of OC SAN’s authorized representative shall be at CONSULTANT’s own risk. This written notice shall be provided separately from, and in addition to any notification requirements contained in the CONSULTANT’s invoice and monthly progress report. Failure to notify OC SAN that the services cannot be completed within the authorized not-to-exceed amount is a material breach of this Agreement.

3. REALLOCATION OF TOTAL COMPENSATION

OC SAN, by its Director of Engineering, shall have the right to approve a reallocation of the incremental amounts constituting the Total Compensation, provided that the Total Compensation is not increased.

4. PAYMENT

- A. Monthly Invoice: CONSULTANT shall include in its monthly invoice, a detailed breakdown of costs associated with the performance of any corrections or revisions of the work for that invoicing period, in a format acceptable to OC SAN. CONSULTANT shall warrant and certify the accuracy of these costs and provide all support documentation required by OC SAN. CONSULTANT understands that submitted costs are subject to Section 12 Audit Provisions.
- B. CONSULTANT will submit monthly statements covering services and/or work performed for payment for those items included in Section 2 hereof no later than the second Wednesday of the following month and in the format required by OC SAN. The format must include, as a minimum: 1) current billing period invoicing, 2) current billing period "total percent invoiced to date", 3) future activities, 4) previous billing period "total invoiced to date", 5) potential items that are not included in the Scope of Work, 6) concerns and possible delays, 7) percentage of completion to date, and 8) budget status and amount remaining. Such requests shall be accompanied by such supporting data as may be required by OC SAN.

Upon approval of such payment request by OC SAN, payment shall be made to CONSULTANT as soon as practicable of one hundred percent (100%) of the invoiced amount on a per-project element basis.

If OC SAN determines that the work under this Agreement, or any specified project element hereunder, is incomplete and that the amount of payment is in excess of:

- i. The amount considered by OC SAN's Director of Engineering to be adequate for the protection of OC SAN; or
- ii. The percentage of the work accomplished for each project element.

OC SAN may, at the discretion of the Director of Engineering, retain an amount equal to that which ensures that the total amount paid to that date does not exceed the percentage of the completed work for each project element or the Project in its entirety.

- C. CONSULTANT may submit periodic payment requests for each 30-day period of this Agreement for the profit as set forth in Section 2 - COMPENSATION above. Said profit payment request shall be proportionate to the work actually accomplished to date on a per-project-element basis. In the event OC SAN's Director of Engineering determines that no satisfactory progress has been made since the prior payment, or in the event of a delay in the work progress for any reason, OC SAN shall have the right to withhold any scheduled proportionate profit payment.

- D. Upon satisfactory completion by CONSULTANT of the work called for under the terms of this Agreement, and upon acceptance of such work by OC SAN, CONSULTANT will be paid the unpaid balance of any money due for such work based on the monthly statements, including any retained percentages relating to this portion of the work.
- E. Upon satisfactory completion of the work performed hereunder and prior to final payment under this Agreement for such work, or prior settlement upon termination of this Agreement, and as a condition precedent thereto, CONSULTANT shall execute and deliver to OC SAN a release of all claims against OC SAN arising under or by virtue of this Agreement other than such claims, if any, as may be specifically exempted by CONSULTANT from the operation of the release in stated amounts to be set forth therein.
- F. Pursuant to the California False Claims Act (Government Code sections 12650-12655), any CONSULTANT that knowingly submits a false claim to OC SAN for compensation under the terms of this Agreement may be held liable for treble damages and up to a \$10,000 civil penalty for each false claim submitted. This section shall also be binding on all Subconsultants.

A CONSULTANT or Subconsultant shall be deemed to have submitted a false claim when the CONSULTANT or Subconsultant: (a) knowingly presents or causes to be presented to an officer or employee of OC SAN a false claim or request for payment or approval; (b) knowingly makes, uses, or causes to be made or used a false record or statement to get a false claim paid or approved by OC SAN; (c) conspires to defraud OC SAN by getting a false claim allowed or paid by OC SAN; (d) knowingly makes, uses, or causes to be made or used a false record or statement to conceal, avoid, or decrease an obligation to OC SAN; or (e) is a beneficiary of an inadvertent submission of a false claim to OC SAN, and fails to disclose the false claim to OC SAN within a reasonable time after discovery of the false claim.

5. PREVAILING WAGES

- A. To the extent CONSULTANT intends to utilize employees who will perform work during the contract, as more specifically defined under Labor Code Section 1720, CONSULTANT shall be subject to prevailing wage requirements with respect to such employees.

6. CALIFORNIA DEPARTMENT OF INDUSTRIAL RELATIONS (DIR) REGISTRATION AND RECORD OF WAGES

- A. To the extent CONSULTANT's employees and/or Subconsultants who will perform work during the design and preconstruction phases of a construction contract for which Prevailing Wage Determinations have been issued by the DIR and as more specifically defined under Labor Code Section 1720 et seq, CONSULTANT and Subconsultants shall comply with the registration requirements of Labor Code Section 1725.5. Pursuant to Labor Code Section 1771.4, the work is subject to compliance monitoring and enforcement by the DIR.

- B. The CONSULTANT and Subconsultants shall maintain accurate payroll records and shall comply with all the provisions of Labor Code Section 1776, and shall submit payroll records to the Labor Commissioner pursuant to Labor Code Section 1771.4(a)(3). Penalties for non-compliance with the requirements of Section 1776 may be deducted from progress payments per Section 1776.
- C. Pursuant to Labor Code Section 1776, the CONSULTANT and Subconsultants shall furnish a copy of all certified payroll records to OC SAN and/or general public upon request, provided the public request is made through OC SAN, the Division of Apprenticeship Standards or the Division of Labor Enforcement of the Department of Industrial Relations.
- D. The CONSULTANT and Subconsultants shall comply with the job site notices posting requirements established by the Labor Commissioner per Title 8, California Code of Regulations Section 16461(e).

7. DOCUMENT OWNERSHIP – CONSULTANT PERFORMANCE

- A. Ownership of Documents for the professional services performed.

All documents in all forms (electronic, paper, etc.), including, but not limited to, studies, sketches, drawings, computer printouts, disk files, and electronic copies prepared in connection with or related to the Scope of Work or professional services, shall be the property of OC SAN. OC SAN's ownership of these documents includes use of, reproduction or reuse of and all incidental rights, whether or not the work for which they were prepared has been performed. OC SAN ownership entitlement arises upon payment or any partial payment for work performed and includes ownership of any and all work product completed prior to that payment. This Section shall apply whether the CONSULTANT's professional services are terminated: a) by the completion of the Agreement, or b) in accordance with other provisions of this Agreement. Notwithstanding any other provision of this paragraph or Agreement, the CONSULTANT shall have the right to make copies of all such plans, studies, sketches, drawings, computer printouts and disk files, and specifications.

- B. CONSULTANT shall not be responsible for damage caused by subsequent changes to or uses of the study or deliverable where the subsequent changes or uses are not authorized or approved by CONSULTANT, provided that the service rendered by CONSULTANT was not a proximate cause of the damage.

8. INSURANCE

- A. General

- i. Insurance shall be issued and underwritten by insurance companies acceptable to OC SAN.
- ii. Insurers must have an "A-" Policyholder's Rating, or better, and Financial Rating of at least Class VIII, or better, in accordance with the most current A.M. Best's Guide Rating. However, OC SAN will accept State

Compensation Insurance Fund, for the required policy of Workers' Compensation Insurance subject to OC SAN's option to require a change in insurer in the event the State Fund financial rating is decreased below "B". Further, OC SAN will require CONSULTANT to substitute any insurer whose rating drops below the levels herein specified. Said substitution shall occur within twenty (20) days of written notice to CONSULTANT, by OC SAN or its agent.

- iii. Coverage shall be in effect prior to the commencement of any work under this Agreement.

B. General Liability

The CONSULTANT shall maintain during the life of this Agreement, including the period of warranty, commercial general liability insurance written on an occurrence basis providing the following minimum limits of liability coverage: One Million Dollars (\$1,000,000) per occurrence with Two Million Dollars (\$2,000,000) aggregate. If aggregate limits apply separately to this contract (as evidenced by submission of ISO form CG 25 03 or 25 04), then the aggregate limit may be equivalent to the per occurrence limit. Said insurance shall include coverage for the following hazards: premises-operations, products liability/completed operations (including any product manufactured or assembled), broad form property damage, contractual liability, independent contractors liability, personal and advertising injury, mobile equipment, vicarious liability, and cross liability and severability of interest clauses. A statement on an insurance certificate will not be accepted in lieu of the actual additional insured endorsement(s). If requested by OC SAN and applicable, XCU coverage (Explosion, Collapse and Underground) must be included in the general liability policy and coverage must be reflected on the submitted certificate of insurance. Where permitted by law, CONSULTANT hereby waives all rights of recovery by subrogation because of deductible clauses, inadequacy of limits of any insurance policy, limitations or exclusions of coverage, or any other reason against OC SAN, its or their officers, agents, or employees, and any other consultant, contractor, or subcontractor performing work or rendering services on behalf of OC SAN in connection with the planning, development, and construction of the project. In all its insurance coverages related to the work, (except Errors and Omissions/Professional Liability), CONSULTANT shall include clauses providing that each insurer shall waive all of its rights of recovery by subrogation against OC SAN, its or their officers, agents, or employees, or any other consultant, contractor, or subcontractor performing work or rendering services at the project. Where permitted by law, CONSULTANT shall require similar written express waivers and insurance clauses from each of its Subconsultants of every tier. A waiver of subrogation shall be effective as to any individual or entity, even if such individual or entity (a) would otherwise have a duty of indemnification, contractual or otherwise, (b) did not pay the insurance premium, directly or indirectly, and (c) whether or not such individual or entity has an insurable interest in the property damaged.

C. Umbrella Excess Liability

The minimum limits of general liability and automobile liability insurance required, as set forth herein, shall be provided for through either a single policy of primary insurance or a combination of policies of primary and umbrella excess coverage. Umbrella excess liability coverage shall be issued with limits of liability which, when combined with the primary insurance, will equal the minimum limits for general liability and automobile liability.

D. Automobile/Vehicle Liability Insurance

The CONSULTANT shall maintain a policy of automobile liability insurance on a comprehensive form covering all owned, non-owned, and hired automobiles, trucks, and other vehicles providing the following minimum limit of liability coverage: combined single limit of One Million Dollars (\$1,000,000). A statement on an insurance certificate will not be accepted in lieu of the actual additional insured endorsement.

E. Drone Liability Insurance

If a drone will be used, drone liability insurance must be maintained by CONSULTANT in the amount of One Million Dollars (\$1,000,000) in a form acceptable by OC SAN.

F. Workers' Compensation Insurance

The CONSULTANT shall provide such workers' compensation insurance as required by the Labor Code of the State of California in the amount of the statutory limit, including employer's liability insurance with a minimum limit of One Million Dollars (\$1,000,000) per occurrence. Such workers' compensation insurance shall be endorsed to provide for a waiver of subrogation in favor of OC SAN. A statement on an insurance certificate will not be accepted in lieu of the actual endorsements unless the insurance carrier is State of California Insurance Fund and the identifier "SCIF" and endorsement numbers 2570 and 2065 are referenced on the certificate of insurance. If an exposure to Jones Act liability may exist, the insurance required herein shall include coverage for Jones Act claims.

G. Errors and Omissions/Professional Liability

CONSULTANT shall maintain in full force and effect, throughout the term of this Agreement, standard industry form professional negligence errors and omissions insurance coverage in an amount of not less than Two Million Dollars (\$2,000,000) with limits in accordance with the provisions of this paragraph. If the policy of insurance is written on a "claims made" basis, said policy shall be continued in full force and effect at all times during the term of this Agreement, and for a period of five (5) years from the date of the completion of the services hereunder.

In the event of termination of said policy during this period, CONSULTANT shall obtain continuing insurance coverage for the prior acts or omissions of CONSULTANT during the course of performing services under the term of this Agreement. Said coverage shall be evidenced by either a new policy evidencing no gap in coverage or by separate extended “tail” coverage with the present or new carrier.

In the event the present policy of insurance is written on an “occurrence” basis, said policy shall be continued in full force and effect during the term of this Agreement or until completion of the services provided for in this Agreement, whichever is later. In the event of termination of said policy during this period, new coverage shall be obtained for the required period to insure for the prior acts of CONSULTANT during the course of performing services under the term of this Agreement.

CONSULTANT shall provide to OC SAN a certificate of insurance in a form acceptable to OC SAN indicating the deductible or self-retention amounts and the expiration date of said policy, and shall provide renewal certificates not less than ten (10) days prior to the expiration of each policy term.

H. Proof of Coverage

The CONSULTANT shall furnish OC SAN with original certificates and amendatory endorsements effecting coverage. Said certificates and endorsements shall conform to the requirements herein stated. All certificates and endorsements are to be received and approved by OC SAN before work commences. CONSULTANT shall provide OC SAN with copies of its insurance certificates and amendatory endorsements affecting coverage. Confidential information may be redacted from said policies, provided that verification of coverage, name of carriers and agent/broker may not be redacted. Said policies and endorsements shall conform to the requirements herein stated. The following are approved forms that must be submitted as proof of coverage:

- Certificate of Insurance ACORD Form 25 or other equivalent certificate of insurance form
- Additional Insurance (General Liability) The combination of (ISO Forms) CG 20 10 and CG 20 37

All other additional insured endorsements must be submitted for approval by OC SAN, and OC SAN may reject alternatives that provide different or less coverage to OC SAN.
- Additional Insured (Automobile Liability) Submit endorsement provided by carrier for OC SAN approval.
- Waiver of Subrogation Submit workers’ compensation waiver of subrogation endorsement provided by carrier for OC SAN approval.

- Cancellation Notice No endorsement is required. However, CONSULTANT is responsible for notifying OC SAN of any pending or actual insurance policy cancellation, as described in Article I. Cancellation and Policy Change Notice, below.

I. Cancellation and Policy Change Notice

The CONSULTANT is required to notify OC SAN in writing of any insurance cancellation notice it receives or other knowledge of pending or actual insurance policy cancellation within two (2) working days of receipt of such notice or acquisition of such knowledge. Additionally, the CONSULTANT is required to notify OC SAN in writing of any material change in the terms of insurance, including reduction in coverage, within two (2) working days of receipt of such notice or knowledge of same.

Said notices shall be mailed to OC SAN at:

ORANGE COUNTY SANITATION DISTRICT
 10844 Ellis Avenue
 Fountain Valley, CA 92708
 Attention: Contracts, Purchasing & Materials Management Division

J. Primary Insurance

The general and automobile liability policies shall contain a “Primary and Non Contributory” clause. Any other insurance maintained by OC SAN shall be excess and not contributing with the insurance provided by CONSULTANT.

K. Separation of Insured

The general and automobile liability policies shall contain a “Separation of Insureds” clause.

L. Non-Limiting (if applicable)

Nothing in this document shall be construed as limiting in any way, nor shall it limit the indemnification provision contained in this Agreement, or the extent to which CONSULTANT may be held responsible for payment of damages to persons or property.

M. Deductibles and Self-Insured Retentions

Any deductible and/or self-insured retention must be declared to OC SAN on the certificate of insurance. All deductibles and/or self-insured retentions require approval by OC SAN. At the option of OC SAN, either: the insurer shall reduce or eliminate such deductible or self-insured retention as respects OC SAN; or the CONSULTANT shall provide a financial guarantee satisfactory to OC SAN guaranteeing payment of losses and related investigations, claim administration and defense expenses. OC SAN will not invoke the option expressed in this

paragraph unless it has reasonable cause to question CONSULTANT's financial strength.

N. Defense Costs

The general and automobile liability policies (except Errors and Omissions/ Professional Liability) shall have a provision that defense costs for all insureds and additional insureds are paid in addition to and do not deplete any policy limits.

O. Subconsultants

The CONSULTANT shall be responsible to establish insurance requirements for any Subconsultant hired by the CONSULTANT. The insurance shall be in amounts and types reasonably sufficient to deal with the risk of loss involving the Subconsultant's operations and work.

P. Limits Are Minimums

If the CONSULTANT maintains higher limits than any minimums shown above, then OC SAN requires and shall be entitled to coverage for the higher limits maintained by CONSULTANT. Nothing in this section, however, requires CONSULTANT in the absence of litigation to reveal its Errors and Omissions/ Professional Liability limits beyond that required above in Section 8.

9. SCOPE CHANGES

In the event of a change in the Scope of Work or a change in the proposed Project, as requested by OC SAN, the Parties hereto shall execute an amendment to this Agreement setting forth with particularity all terms of the new Agreement, including, but not limited to any additional CONSULTANT's fees. CONSULTANT hereby agrees to use any and all procedures, programs, and systems required by OC SAN to process and execute such Amendment(s), including, but not limited to, computer programs and systems.

10. PROJECT TEAM AND SUBCONSULTANTS

CONSULTANT shall provide to OC SAN, prior to execution of this Agreement, the names and full description of all Subconsultants and CONSULTANT's project team members anticipated to be used on this Project under this Agreement by CONSULTANT. CONSULTANT shall include a description of the work and services to be done by each Subconsultant and each of CONSULTANT's Project team member. CONSULTANT shall include the respective compensation amounts for CONSULTANT and each Subconsultant, broken down as indicated in Section 2- COMPENSATION.

There shall be no substitution of the listed Subconsultants and CONSULTANT's project team members without prior written approval by OC SAN.

11. ENGINEERING REGISTRATION

The CONSULTANT's personnel and Subconsultants are comprised of registered engineers and a staff of specialists and draftsmen in each department. The firm itself is not a registered engineer but represents and agrees that wherever, in the performance of this Agreement, the services of a registered engineer is required, such services hereunder will be performed under the direct supervision of registered engineers who are registered in California.

12. AUDIT PROVISIONS.

- A. OC SAN retains the reasonable right to access, review, examine, and audit, any and all books, records, documents, and any other evidence of procedures and practices that OC SAN determines are necessary to discover and verify that the CONSULTANT is in compliance with all requirements under this Agreement. The CONSULTANT shall include OC SAN's right as described above, in any and all of their subcontracts, and shall ensure that these rights are binding upon all Subconsultants.
- B. OC SAN retains the right to examine CONSULTANT's books, records, documents and any other evidence of procedures and practices that OC SAN determines are necessary to discover and verify all direct and indirect costs, of whatever nature, which are claimed to have been incurred, or anticipated to be incurred or to ensure CONSULTANT's compliance with all requirements under this Agreement during the term of this Agreement and for a period of three (3) years after its termination.
- C. CONSULTANT shall maintain complete and accurate records in accordance with generally accepted industry standard practices and OC SAN's policy. The CONSULTANT shall make available to OC SAN for review and audit, all project related accounting records and documents, and any other financial data within 15 days after receipt of notice from OC SAN. Upon OC SAN's request, CONSULTANT shall submit exact duplicates of originals of all requested records to OC SAN. If an audit is performed, CONSULTANT shall ensure that a qualified employee of the CONSULTANT will be available to assist OC SAN's auditor in obtaining all Project related accounting records and documents, and any other financial data.

13. LEGAL RELATIONSHIP BETWEEN PARTIES

The legal relationship between the parties hereto is that of an independent contractor and nothing herein shall be deemed to transform CONSULTANT, its staff, independent contractors, or Subconsultants into employees of OC SAN. CONSULTANT'S staff performing services under the Agreement shall at all times be employees and/or independent contractors of CONSULTANT. CONSULTANT shall monitor and control its staff and pay wages, salaries, and other amounts due directly to its staff in connection with the Agreement. CONSULTANT shall be responsible for hiring, review, and termination of its staff and shall be accountable for all reports and obligations respecting them, such as social security, income tax withholding, unemployment compensation, workers' compensation and similar matters.

14. NOTICES

All notices hereunder and communications regarding the interpretation of the terms of this Agreement, or changes thereto, shall be effected by delivery of said notices in person or by depositing said notices in the U.S. mail, registered or certified mail, return receipt requested, postage prepaid and addressed as follows:

ORANGE COUNTY SANITATION DISTRICT
10844 Ellis Avenue
Fountain Valley, CA 92708-7018
Attention: Clarice Marcin
Copy: Carmen Quan, Project Manager

CONSULTANT:

BROWN AND CALDWELL
18500 Von Karman Avenue
Suite 1100
Irvine, CA 92612
Attention: Dan Bunce

All communication regarding the Scope of Work, will be addressed to the Project Manager. Direction from other OC SAN staff must be approved in writing by OC SAN's Project Manager prior to action from the CONSULTANT.

15. TERMINATION

OC SAN may terminate this Agreement at any time, without cause, upon giving thirty (30) days written notice to CONSULTANT. In the event of such termination, CONSULTANT shall be entitled to compensation for work performed on a prorated basis through and including the effective date of termination.

CONSULTANT shall be permitted to terminate this Agreement upon thirty (30) days written notice only if CONSULTANT is not compensated for billed amounts in accordance with the provisions of this Agreement, when the same are due.

Notice of termination shall be mailed to OC SAN at the address listed in Section 14 - NOTICES.

16. DOCUMENTS AND STUDY MATERIALS

The documents and study materials for this Project shall become the property of OC SAN upon the termination or completion of the work. CONSULTANT agrees to furnish to OC SAN copies of all memoranda, correspondence, electronic materials, computation and study materials in its files pertaining to the work described in this Agreement, which is requested in writing by OC SAN.

17. COMPLIANCE

A. Labor

CONSULTANT certifies by the execution of this Agreement that it pays employees not less than the minimum wage as defined by law, and that it does not discriminate in its employment with regard to race, color, religion, sex or national origin; that it is in compliance with all federal, state and local directives and executive orders regarding non-discrimination in employment; and that it agrees to demonstrate positively and aggressively the principle of equal opportunity in employment.

B. Air Pollution

CONSULTANT and its subconsultants and subcontractors shall comply with all applicable federal, state and local air pollution control laws and regulations.

C. Iran Contracting Act

CONSULTANT and its subconsultants and subcontractors shall comply with the Iran Contracting Act of 2010 (Public Contract Code sections 2200-2208).

18. AGREEMENT EXECUTION AUTHORIZATION

Both OC SAN and CONSULTANT do covenant that each individual executing this document by and on behalf of each Party is a person duly authorized to execute this Agreement for that Party.

19. DISPUTE RESOLUTION

In the event of a dispute arising between the parties regarding performance or interpretation of this Agreement, the dispute shall be resolved by binding arbitration under the auspices of the Judicial Arbitration and Mediation Service ("JAMS"), or similar organization or entity conducting alternate dispute resolution services.

20. ATTORNEY'S FEES, COSTS AND NECESSARY DISBURSEMENTS

If any action at law or in equity or if any proceeding in the form of an Alternative Dispute Resolution (ADR) is necessary to enforce or interpret the terms of this Agreement, the prevailing party shall be entitled to reasonable attorney's fees, costs and necessary disbursements in addition to any other relief to which he may be entitled.

21. WARRANTY

CONSULTANT shall perform its services in accordance with generally accepted industry and professional standards. If, within the 12-month period following completion of its services, OC SAN informs CONSULTANT that any part of the services fails to meet those standards, CONSULTANT shall, within the time prescribed by OC SAN, take all such actions as are necessary to correct or complete the noted deficiency(ies).

22. INDEMNIFICATION

To the fullest extent permitted by law, CONSULTANT shall indemnify, defend (at CONSULTANT's sole cost and expense and with legal counsel approved by OC SAN, which approval shall not be unreasonably withheld), protect and hold harmless OC SAN and all of OC SAN's officers, directors, employees, consultants, and agents (collectively the "Indemnified Parties"), from and against any and all claims, damages, liabilities, causes of action, suits, arbitration awards, losses, judgments, fines, penalties, costs and expenses (including, without limitation, attorneys' fees, disbursements and court costs, and all other professional, expert or CONSULTANT's fees and costs and OC SAN's general and administrative expenses; individually, a "Claim"; collectively, "Claims") which may arise from or are in any manner related, directly or indirectly, to any work performed, or any operations, activities, or services provided by CONSULTANT in carrying out its obligations under this Agreement to the extent of the negligent, recklessness and/or willful misconduct of CONSULTANT, its principals, officers, agents, employees, CONSULTANT's suppliers, CONSULTANT, Subconsultants, subcontractors, and/or anyone employed directly or indirectly by any of them, regardless of any contributing negligence or strict liability of an Indemnified Party. Notwithstanding the foregoing, nothing herein shall be construed to require CONSULTANT to indemnify the Indemnified Parties from any Claim arising solely from:

- (A) the active negligence or willful misconduct of the Indemnified Parties; or
- (B) a natural disaster or other act of God, such as an earthquake; or
- (C) the independent action of a third party who is neither one of the Indemnified Parties nor the CONSULTANT, nor its principal, officer, agent, employee, nor CONSULTANT's supplier, CONSULTANT, Subconsultant, subcontractor, nor anyone employed directly or indirectly by any of them.

Exceptions (A) through (B) above shall not apply, and CONSULTANT shall, to the fullest extent permitted by law, indemnify the Indemnified Parties, from Claims arising from more than one cause if any such cause taken alone would otherwise result in the obligation to indemnify hereunder.

CONSULTANT's liability for indemnification hereunder is in addition to any liability CONSULTANT may have to OC SAN for a breach by CONSULTANT of any of the provisions of this Agreement. Under no circumstances shall the insurance requirements and limits set forth in this Agreement be construed to limit CONSULTANT's indemnification obligation or other liability hereunder. The terms of this Agreement are contractual and the result of negotiation between the parties hereto. Accordingly, any rule of construction of contracts (including, without limitation, California Civil Code Section 1654) that ambiguities are to be construed against the drafting party, shall not be employed in the interpretation of this Agreement.

23. DUTY TO DEFEND

The duty to defend hereunder is wholly independent of and separate from the duty to indemnify and such duty to defend shall exist regardless of any ultimate liability of CONSULTANT and shall be consistent with Civil Code section 2782.8. Such defense

obligation shall arise immediately upon presentation of a Claim by any person if, without regard to the merit of the Claim, such Claim could potentially result in an obligation to indemnify one or more Indemnified Parties, and upon written notice of such Claim being provided to CONSULTANT. Payment to CONSULTANT by any Indemnified Party or the payment or advance of defense costs by any Indemnified Party shall not be a condition precedent to enforcing such Indemnified Party's rights to indemnification hereunder. In the event a final judgment, arbitration, award, order, settlement, or other final resolution expressly determines that the claim did not arise out of, pertain to, or relate to the negligence, recklessness, or willful misconduct of the CONSULTANT, to any extent, then OC SAN will reimburse CONSULTANT for the reasonable costs of defending the Indemnified Parties against such claims.

CONSULTANT's indemnification obligation hereunder shall survive the expiration or earlier termination of this Agreement until such time as action against the Indemnified Parties for such matter indemnified hereunder is fully and finally barred by the applicable statute of limitations.

24. COMPLIANCE WITH OC SAN POLICIES AND PROCEDURES

CONSULTANT shall comply with all OC SAN policies and procedures including the Contractor Safety Standards, as applicable, all of which may be amended from time to time.

25. CLOSEOUT

When OC SAN determines that all work authorized under the Agreement is fully complete and that OC SAN requires no further work from CONSULTANT, or the Agreement is otherwise terminated or expires in accordance with the terms of the Agreement, OC SAN shall give the CONSULTANT written notice that the Agreement will be closed out. CONSULTANT shall submit all outstanding billings, work submittals, deliverables, reports or similarly related documents as required under the Agreement within thirty (30) days of receipt of notice of Agreement closeout.

Upon receipt of CONSULTANT's submittals, OC SAN shall commence a closeout audit of the Agreement and will either:

- i. Give the CONSULTANT a final Agreement Acceptance: or
- ii. Advise the CONSULTANT in writing of any outstanding item or items which must be furnished, completed, or corrected at the CONSULTANT's cost.

CONSULTANT shall be required to provide adequate resources to fully support any administrative closeout efforts identified in the Agreement. Such support must be provided within the timeframe requested by OC SAN.

Notwithstanding the final Agreement acceptance, the CONSULTANT will not be relieved of its obligations hereunder, nor will the CONSULTANT be relieved of its obligations to complete any portions of the work, the non-completion of which were not disclosed to OC SAN (regardless of whether such nondisclosures were fraudulent, negligent, or otherwise), and the CONSULTANT shall remain obligated under all those provisions of

the Agreement which expressly or by their nature extend beyond and survive final Agreement Acceptance.

Any failure by OC SAN to reject the work or to reject the CONSULTANT's request for final Agreement Acceptance as set forth above shall not be deemed to be acceptance of the work by OC SAN for any purpose nor imply acceptance of, or Agreement with, the CONSULTANT's request for final Agreement Acceptance.

26. ENTIRE AGREEMENT

This Agreement constitutes the entire understanding and agreement between the Parties and supersedes all previous negotiations between them pertaining to the subject matter thereof.

[Intentionally left blank. Signatures follow on the next page.]

IN WITNESS WHEREOF, this Agreement has been executed in the name of OC SAN and CONSULTANT by their respective duly authorized officers as of the day and year first written above.

CONSULTANT: BROWN AND CALDWELL

By _____ Date _____

Printed Name & Title

ORANGE COUNTY SANITATION DISTRICT

By _____ Date _____
John B. Withers
Board Chairman

By _____ Date _____
Kelly A. Lore
Clerk of the Board

By _____ Date _____
Ruth Zintzun
Purchasing & Contracts Manager

- Attachments: Attachment "A" – Scope of Work
Attachment "B" – Not Used
Attachment "C" – Not Used
Attachment "D" – Allowable Direct Costs
Attachment "E" – Fee Proposal Form
Attachment "F" – Not Used
Attachment "G" – Not Used
Attachment "H" – Not Used
Attachment "I" – Cost Matrix and Summary
Attachment "J" – Minor Subconsultant Hourly Rate Schedule
Attachment "K" – Contractor Safety Standards
Attachment "L" – Iran Contracting Act Verification

CMM:yp

ATTACHMENT “A”

SCOPE OF WORK

ATTACHMENT "A"

SCOPE OF WORK

Energy and Digester Gas Master Plan
PS21-04

TABLE OF CONTENTS

I. SUMMARY 2

II. BACKGROUND, GENERAL PROJECT DESCRIPTION, AND OBJECTIVES 2

BACKGROUND..... 2

GENERAL PROJECT DESCRIPTION..... 4

PROJECT OBJECTIVES..... 4

COORDINATION WITH OTHER PROJECTS 4

III. PROJECT SCHEDULE..... 4

IV. PROJECT EXECUTION 6

Task 1 – Standby Power 6

 Task 1.1 Develop a Standby Power Policy 6

 Task 1.2 Load Shedding and Power Restart Philosophy..... 8

 Task 1.3 Update OC San Procedures 9

 Task 1.4 Update Load Criticality Tables..... 10

Task 2 – Cen Gen Replacement 12

 Task 2.1 Cen Gen Replacement Alternatives..... 12

 Task 2.2 Gas Usage..... 17

 Task 2.3 Heat Balance Model 17

 Task 2.4 Renewable Energy Funding and Markets..... 17

Task 3 – Energy Resiliency and Independence..... 18

Task 4 – CIP Project Development..... 19

Task 5 – Energy and Digester Gas Master Plan..... 20

Task 6 - Project Management 20

 Task 6.1 Project Management Progress Meetings 20

 Task 6.2 Project Schedule 20

 Task 6.3 Project Logs..... 21

 Task 6.4 Progress Reports 21

 Task 6.5 Project Invoices 22

Task 7 – Meetings and Workshops..... 22

Task 8 - Quality Control..... 23

V. GENERAL REQUIREMENTS..... 24

GENERAL 24

VI. STAFF ASSISTANCE 25

EXHIBITS: 26

I. SUMMARY

This Scope of Work requests engineering services for the project as described herein to perform an engineering study.

II. BACKGROUND, GENERAL PROJECT DESCRIPTION, AND OBJECTIVES

BACKGROUND

The Orange County Sanitation District (OC SAN) is responsible for collection, treatment, and disposal of wastewater for the northern and central portion of Orange County, California. OC SAN operates and maintains two treatment facilities (Plants 1 and 2) which currently process an average of 188 million gallons per day (mgd) of wastewater.

Both plants have a 66-12.47kV substation. Plant 1 has dual 66kV feeds with two 66-12.47kV transformers and Plant 2 has a single 66kV feed with one 66-12.47kV transformer. A future project will upgrade Plant 2 to match Plant 1. The substations are owned by OC SAN and operated by Southern California Edison (SCE). The substation provides 12.47kV, Bus A and Bus B feeds to the 12kV Service Center, which consists of double-ended main-tie-tie-main switchgear that is used to distribute utility power to select process facilities and the Central Generation Facility (Cen Gen). Cen Gen has double-ended main-tie-tie-main switchgear and central generators fueled by digester and/or natural gas.

Digester gas produced by anaerobic digestion of wastewater solids during the treatment process is burned in large internal combustion engines at Cen Gen at both plants. Approximately 60% of the electricity requirements at Plant 1 and approximately 95% of the electricity requirements at Plant 2 are supplied by Cen Gen. Additionally, the waste heat from the engines is the primary source of heat for anaerobic digestion at each plant. Heat recovery steam generators installed on the engine exhausts produce steam. At Plant 1, the steam is used in absorption chillers for cooling occupied buildings. The steam at Plant 2 can drive a steam turbine generator or as a supplemental source of heat for the digester heating hot water loop.

The Plant 1 Cen Gen Facility consists of three identical 12-cylinder, four-stroke, turbocharged-intercooled Cooper Bessemer Model No. LSVB-12-SGC, 3,471-horsepower, natural gas and/or digester gas fired, reciprocating unit driving a 2,500-kW electric generator with a 5 million-BTU/hr. capacity exhaust heat recovery steam generator.

The Plant 2 Cen Gen Facility consists of five identical 16-cylinder, four-stroke, turbocharged-intercooled Cooper Bessemer Model No. LSVB-16-SGC, 4,166-horsepower, natural gas and/or digester gas fired, reciprocating unit and driving a 3,000-kW electric generator with 15.6 million BTU/hr. exhaust heat recovery steam generator.

The engines were installed in the early 1990s. The engines have undergone routine and regular maintenance based on hours of run-time following the manufacturer recommendations. All engines currently require a bottom-end overhaul at approximately 120,000 hours of run-time.

OC SAN advertised S-2020-1074BD contract for the bottom-end overhaul for two engines, one at each plant, and selected a Contractor.

The overhaul began in mid-January 2020 at Plant 1 with the shutdown of Engine No. 1. During the start-up and commissioning process for the reassembled Plant 1 Engine No. 1, the engine experienced a catastrophic failure when a fire broke out in the crank case during the first (initial) 24-hour startup sequence. The engine was disassembled, and a failure analysis performed and a lengthy, time-consuming, repair/refurbishment reassembly process began. The engine was reassembled, and another start-up and commissioning process was initiated. During the second start-up process the engine again experienced a second catastrophic failure.

OC SAN recently negotiated a contract with Cooper Machinery Services, LLC to perform the bottom-end overhaul on Plant 1, Engine 1. This engine will be commissioned in January 2022. OC SAN'S near-term plan is to award a contract to perform bottom-end overhauls on one more engine at Plant 1 and three engines at Plant 2. A future project may perform bottom-end overhauls on one more engine at each plant. In the future top-end overhauls will be performed in-house by OC SAN.

OC SAN's current standby power capacity is based on a Water-In/Water-Out philosophy, with Cen Gen used to provide standby power for Water-in/Water-out loads that do not have standby generators or critical process loads when there is additional capacity upon loss of utility power source. The recent National Pollutant Discharge Elimination System (NPDES) permit requires Cen Gen to provide standby power to the Trickling Filter Pump Station at Plant 2 in the event of a utility power outage to prevent primary effluent from bypassing secondary treatment. The NPDES permit does not waive compliance with permit requirements during a utility power outage. Only South Coast Air Quality Management District (SCAQMD) allows odor control to be out for service during a utility power outage for a defined period of time.

In 2019, a 5-MW, 32-MWh Tesla battery storage system was installed at Plant 1. This battery storage system is owned and operated by a third party under the SCE Local Capacity Requirements (LCR) Program, which allows SCE to call for the operation of the battery storage system to reduce grid loads for 4 hours per day during normal workdays. The battery storage system may also operate on the weekends by the third party operator as part of the Southern California Gas Self-Generation Incentive Program (SGIP).

An energy master plan was last performed by J-102 Strategic Plan Update – Energy Master Plan and completed in 2007. This master plan included the following project tasks as applicable to this project:

1. Project Task 1 – Develop Conceptual Level of Service Requirements and Expectations of OC SAN's Electrical and Power System(s) (This project task included the updating of the Load Criticality Tables)
2. Project Task 2 – Power Generation and Supply System Analysis
3. Project Task 3 – Digester Gas Generation and Consumption Analysis
4. Project Task 6 – Develop a Conceptual Heat Balance Model for the Treatment Plants
5. Project Task 10 – Standby Power Generation Study

More recently, Project PS20-04, Power Generation Overhaul Feasibility Study concluded that it is viable to continue to operate and maintain the existing internal combustion engines at both Plants. Other projects, such as J-124, Digester Gas Compressors and P2-128,

TPAD Digester Facility at Plant 2; contain information about digester gas production and quality at both Plants 1 and 2.

GENERAL PROJECT DESCRIPTION

This Project will develop an Energy and Digester Gas Master Plan that will develop a standby power policy, determine the future usage of digester gas and will address energy dependency issues that will lead to resiliency. For the future usage of digester gas, the study will look at long-term options if the engines can no longer be maintained due to lack of parts, qualified companies are no longer available to perform the bottom-end overhauls, and SCAQMD regulations change and prevent the operation of Cen Gen or future generation.

PROJECT OBJECTIVES

- Develop a standby power policy to maintain permit compliance and prevent adverse effects within the plants during power outages
- Develop a long-term plan for Cen Gen if overhauls are no longer viable in the future or if SCAQMD’s future regulations prevents the operation of the engines
- Develop an energy resiliency and independence strategy

COORDINATION WITH OTHER PROJECTS

The following projects may impact or require coordination with this project:

1. P2-128, TPAD Digester Facility at Plant 2
2. J-124, Digester Gas Facilities Replacement
3. Projects listed under Task 1.4 for Load Criticality Table updates

III. PROJECT SCHEDULE

Table 1 contains the time frames associated with each major project deliverable, including OC SAN’s review and approval of those deliverables. CONSULTANT shall comply with the deadlines indicated in the table.

Table 1 – Project Milestones and Deadlines

MILESTONE	DEADLINE
Kickoff (KO) Meeting	Within 10 working days from Notice to Proceed (NTP)
1.1 Standby Power Policy Draft Technical Memorandum	Within 80 workdays from KO Meeting (parallel with tasks 1.2 and 1.4)
1.1 Standby Power Policy Final Technical Memorandum	Within 10 workdays from receipt of OC San review comments (10-workday review)

Table 1 – Project Milestones and Deadlines

MILESTONE	DEADLINE
1.2 Load Shedding and Power Restart Philosophy Draft Technical Memorandum	Within 30 workdays from KO Meeting
1.2 Load Shedding and Power Restart Philosophy Final Technical Memorandum	Within 10 workdays from receipt of OC San review comments (10-workday review)
1.3 Draft updated IERP, Power Outage emergency Operation Procedures and Restart SOPs	Within 10 workdays from tasks 1.1 and 1.2
1.3 Final updated IERP, Power Outage emergency Operation Procedures and Restart SOPs	Within 10 workdays from receipt of OC San review comments (10-workday review)
1.4 Load Criticality Tables Draft Technical Memorandum	Within 60 workdays from KO Meeting (data collection in parallel with tasks 1.1 and 1.2)
1.4 Load Criticality Tables Final Technical Memorandum	Within 10 workdays from receipt of OC San review comments (10-workday review)
2.1 Cen Gen Replacement Draft Technical Memorandum	Within 165 workdays from KO Meeting
2.1 Cen Gen Replacement Final Technical Memorandum	Within 10 workdays from receipt of OC San review comments (10-workday review)
2.2 Digester Gas Usage Draft Technical Memorandum	Within 20 workdays from KO Meeting (parallel with tasks 1.1 and 1.2)
2.2 Digester Gas Usage Final Technical Memorandum	Within 10 workdays from receipt of OC San review comments (10-workday review)
2.3 Heat Balance Draft Technical Memorandum	Within 20 workdays from KO Meeting (parallel with tasks 1.1, 1.2 and 2.2)
2.3 Heat Balance Final Technical Memorandum	Within 10 workdays from receipt of OC San review comments (10-workday review)
2.4 Project Funding Draft Technical Memorandum	Within 100 workdays from task 2.3
2.4 Project Funding Final Technical Memorandum	Within 10 workdays from receipt of OC San review comments (10-workday review)
3 Energy Resiliency and Independence Draft Technical Memorandum	Within 100 workdays from task 2.3
3 Energy Resiliency and Independence Final Technical Memorandum	Within 10 workdays from receipt of OC San review comments (10-workday review)
4 CIP Development Draft Technical Memorandum	Within 20 workdays from task 2.1
4 CIP Development Final Technical Memorandum	Within 10 workdays from receipt of OC San review comments (10-workday review)

Table 1 – Project Milestones and Deadlines

MILESTONE	DEADLINE
5 Draft Energy and Digester Gas Master Plan	Within 20 workdays from task 4
5 Final Energy and Digester Gas Master Plan	Within 10 workdays from receipt of OC San review comments (10-workday review)

OC SAN will consider an alternative CONSULTANT-proposed schedule provided it is consistent with OC SAN resources and schedule constraints and adds value to OC SAN.

IV. PROJECT EXECUTION

TASK 1 – STANDBY POWER

TASK 1.1 DEVELOP A STANDBY POWER POLICY

CONSULTANT shall develop a standby power policy for Plants 1 and 2 that balances a probable outage duration with the power needs to achieve permit compliance. The following outlines the elements of this task:

1. Define potential outages and associated probability and durations for the following conditions.
 - a. Short-term outage: Southern California Edison (SCE) outage (rolling blackouts, fire, high winds, etc.)
 - b. Long-term outage: regional earthquake, cyberattack, terrorism, etc. Include the probability and duration of losing power and natural gas during a regional earthquake.
2. Benchmark what other similar wastewater facilities are doing regarding standby power, the length of outage duration they are designed for, amount and type of onsite generation, and the level of treatment that is maintained during a power outage.
3. Determine the maximum power outage duration that should be designed for and included in OC SAN's engineering design guidelines during dry and wet weather conditions. Determine the event and duration that should be used for the loss of natural gas. Determine which plant loads require standby power based on the new standby power policy.
4. Cen Gen uses natural gas as a pilot fuel during normal operation. Upon loss of natural gas a valve needs to be operated to switch over to 100% digester gas. Evaluate the benefit and cost of automating this process.
5. Determine additional standby power required, beyond the existing standby power, existing batteries (at Plant 1 only), and Cen Gen capacity, to meet permit requirements and prevent adverse effects within the plants. As described in Background, Cen Gen is

used to provide standby power for Water-in/Water-out loads or critical loads that do not have standby generators.

6. Develop an operational strategy on how to operate the plant load using staggered operation or rotation of equipment to leverage the available Cen Gen power during the different potential power outage scenarios. If there is insufficient Cen Gen power to meet the operational strategy, determine the amount of additional standby power that is required.
7. Determine the preferred source of power (new standby generators or Cen Gen) for loads that do not currently have a standby generator. Determine new standby generator technology through technology identification and screening. The following tables summarizes facilities with and without standby generation.

Plant 1 Existing Standby Power		
Facility	Standby Power	Cen Gen
Headworks	X	
Primary Clarifiers and Odor Control	X	
Trickling Filters	X	
AS1 (480V MCC loads)	X	
AS2 (life safety loads)	X	
Plant Water	X	
Digester	X	
Gas Compressors	X	
Cen Gen (Black Start)	X	
Thickening and Dewatering (life safety loads)	X	
Truck Loading	X	
Control Center	X	
AS1 Blowers, PEPS and RAS		X
AS2		X
Notes:		
<ol style="list-style-type: none"> 1. Gas compressors and digester standby power based on future feed from P1-105 Headworks Standby Power. This standby power capacity could be used for a limited time to maintain digester mixing and gas compressor operation until Cen Gen is restarted in the event power and natural gas is lost during a major earthquake event. Once Cen Gen is operational and these loads are transferred back to Cen Gen, this capacity could be used for future loads. 2. Primary Effluent Pump Station (PEPS), which is required for Water-in/Water-out to feed Activated Sludge Plant 1 (AS1) from Primary Basins No. 3-5, will be demolished after Project P1-126, Primary Sedimentation Basins No. 3-5 Replacement at Plant No. 1 is constructed. This project will elevate the height of these basin to allow for gravity flow. 		
Plant 2 Existing Standby Power		
Facility	Standby Power	Cen Gen
Headworks	X	
Primary Clarifiers and Odor Control	X	
Digesters (TPAD: life safety, mixing)	X	
OOBS and EPSA (3 pumps)	X	

LOFLO PS and Plant Water	X	
Cen Gen (Black Start)	X	
Centrifuges (life safety loads)	X	
Operations Center	X	
OOBS and EPSA (3 pumps)		X
Gas Compressors		X
PEPS and AS		X
Trickling Filter		X
Orange County Water District (OCWD) Pump Station		If capacity

Notes:

1. During dry weather flow, EPSA Standby Power will feed the LOFLO Pump Station and plant water pump station. Spare generator capacity from the EPSA Standby Power generation facility will be used to power the J-124 gas compressors and P2-128 TPAD facility. During wet weather conditions, the EPSA Standby Power generation facility will feed three OOBS or EPSA pumps, with Cen Gen used to feed the J-124 and P2-128 loads.
 2. PB-C standby generator powers life safety loads.
8. Review and update the diesel fuel storage capacities documented in J-102. EPSA Standby Power diesel storage capacity has recently been determined to be lower than the value shown in J-102. OC SAN's guideline is 48 hours.
 9. Evaluate siting options for recommended standby power equipment.

Task 1.1 Assumptions:

- Process modeling will be used to determine the impacts of power outages of differing durations on effluent quality and permit compliance to support determinations of standby power requirements. Process modeling to determine standby power requirements will be based on relative process modeling and comparisons. BioWin models or calibrated models will not be developed specific to OC San Plant No. 1 and Plant No. 2. If existing models are available, these can be used for process evaluation
- Benchmarking will include collection of information from up to 5 wastewater treatment plants. Benchmarking will be limited to phone interviews with plant staff and does not involve collection and analysis of detailed plant data.
- Up to 3 site layout alternatives will be evaluated for siting of standby power equipment.

TASK 1.2 LOAD SHEDDING AND POWER RESTART PHILOSOPHY

1. A Schweitzer load shedding system is being designed for Plant 1 by Project J-98 and installed at Plant 2 under Project J-117B. A central Schweitzer controller, which communicates with select Schweitzer relays via a Substation LAN, will be programmed to send the load shed trips to select 12kV breakers. The load shed trips will be based on Operator selectable load shed priorities. Load shedding will be triggered by detection of decoupling from the utility power source or reduction of system frequency. Review load

shedding sequences for Plants 1 and 2 as part of the power outage scenarios, available power generation in different modes of operations, and provide any recommended changes.

2. OC San currently has automatic restart sequencing and manual power restart strategies for select process areas as described below. Confirm all existing restart operating philosophies with OC San's Process Control Integration (PCI) Group. Other loads that are in REMOTE AUTO will automatically restart after power is restored based on process conditions. Some exhaust fans only have ON/OFF control. A standardized approach for restarting equipment after a power outage has not been developed. Develop a power restart philosophy (automatic, manual push button, etc.) with Operations and PCI to establish a common approach at both plants. Work with Operations and PCI to determine the appropriate restart grouping (i.e., by process equipment, by process train, etc.) and restart group sequencing to provide an adequate level of control when restarting equipment after a power outage during dry and wet weather conditions based on the number of standby generators that come online, loads not controlled by PLCs, process needs, and equipment with large starting amperage. Detailed restart control strategies with interlocks will be developed by a future project.
 - a. The following process areas have an automatic power restart
 - i. Plant 1 Primaries
 - ii. Plant 2 Headworks
 - b. The following process areas have manual restart push buttons on the human machine interface (HMI):
 - i. Plant 1: SALS, P1 Primaries East Sludge Pumps, AS-2 Basin Equipment (mixers and mix liquor return pumps), AS-2 Secondary Clarifiers (27, 29, 31, 32, 33 and 34), and Digesters 7-16
 - ii. Plant 2: Headworks odor control, PEPS, AS (aerators and RAS), trickling filters (pumps, blowers and drives), and DAFT (pumps and polymer pumps)

Deliverables – Tasks 1.1 and 1.2:

1. Standby Power Policy Technical Memorandum summarizing conclusions and recommendations.
2. Load Shedding and Power Restart Philosophy

TASK 1.3 UPDATE OC SAN PROCEDURES

Exhibit 1 – Updating OC San Procedures defines the procedures that the CONSULTANT needs to update and procedures that are provided For Information Only. Portions of the procedures that require updating are indicated in Exhibit 1 – Updating OC San Procedures to provide the CONSULTANT a means to estimate the level of effort required for this task. References to plans, procedures and training that are applicable to this study, but do not required updating, have been provided For Informaiton Only. Some relevant test in For Information Only documents have been extracted to assist the CONSULTANT with identifying the applicable

information. The following are the categories of procedures that are defined in Exhibit 1 – Udatint OC San Procedures.

1. Update Integrated Emergency Response Plan (IERP): see **Exhibit 1 – Updating OC San Procedures** for the detailed scope of work.
2. Update Power Outage Emergency Operation Procedures: see **Exhibit 1 – Updating OC San Procedures** for the detailed scope of work.
3. Review and update existing Restart Standard Operating Procedures (SOPs): see **Exhibit 1 – Updating OC San Procedures** for the detailed scope of work.
4. Review and update existing Plant Power Outage Emergency Response Training: see Exhibit 1 – Updating OC San Procedures for the detailed scope of work.

Deliverables:

1. Updated IERP, Power Outage emergency Operation Procedures, Restart SOPs, and Plant Power Outage Emergency Response Training.

Assumptions:

-CONSULTANT to update OC San procedures only as specifically outlined in Exhibit 1 of the RFP. Effort required to update OC San Procedures shall not exceed those allocated for this task in final negotiated fee and hours tables.

TASK 1.4 UPDATE LOAD CRITICALITY TABLES

OC SAN has load criticality tables in Excel format that lists equipment loads and their associated area and criticality grouping (1.1 Water-in, 3 Ocean Permit, 8 Odor Control, etc.), load data, switchgear and motor control center bus, quantity installed, quantity operating during dry weather and wet weather conditions, and acceptable outage duration. There are also brake horsepower and diversity factors associated with each load to adjust the demand based on the different operating conditions. These tables are used to calculate the loads for standby generators and Cen Gen during a loss of utility power. See **Exhibit 3 – P1 Sample Load Criticality Table and P2 Sample Load Criticality Table**.

The plant load criticality tables were last updated under J-102. Recent projects have developed their associated load criticality tables (see Item 3 below for list of projects), but this information has not been merged into the overall plant load criticality tables. It has also been determined during recent projects that the J-102 load criticality tables were not updated to reflect the actual installed loads.

An ETAP (Electrical Transient Analyzer Program) load flow study was recently completed for Plant 2. During this study, meetings were held with OC SAN Operations to review the quantity of loads that operate during dry weather and wet weather conditions. Equipment supervisory control and data acquisition (SCADA) historical data was used to determine the diversity factors of equipment. Power monitoring data was used to calibrate the diversity factor at the switchgear level. Loading factors were then entered into the ETAP model to run a revised load flow study and verify the transformer tap settings. This information can be used for the Plant 2 load

criticality tables (see **Exhibit 3 – Project PS18-11 P2 Loading Data**). This approach should be used to develop the diversity factors for Plant 1 (an updated load flow and loading factors analysis has not been done for Plant 1 yet).

The CONSULTANT shall perform the following to update the load criticality tables for Plants 1 and 2.

1. Combine entries so there is only one entry per type of equipment (i.e., main sewage pump, bar screens, collector drives, blowers, return activated sludge pumps, etc.). This has been done for only some loads. Use applicable common electrical bus at the highest level (i.e., 480V switchgear bus versus each MCC). Group valves and gates for an MCC into one entry. Specific MCC loads such as panelboards, HVAC, etc. can remain on the MCC bus. The normal power MCC should be listed when a panelboard is fed by an automatic transfer switch from two different MCCs. (Note: The load criticality tables are used to determine the standby power requirements. Electrical calculations will be developed in accordance with the National Electrical Code to size the equipment during design projects.)
2. Revise loads to match the existing single line diagrams. Update/add completed projects to the master load criticality table for each plant (P1-100, P1-101, P1-102, P2-89, P2-90, P2-92, and P2-110). See **Exhibit 3 – P1 Single Line Diagram Drawing List and P2 Single Line Diagram Drawing List**.
3. Add new projects currently in construction to the master load criticality table for each plant (J-117B, P1-105, P1-133, and P2-98A)
4. Add new projects currently in design to the master load criticality table for each plant (J-124 and P2-128)
5. Conduct meetings with Operations staff in each process area to verify/update “Duration (Hours)”.
6. Conduct meetings with Operations staff in each process area to verify/update the “Qty Operating” during dry and wet weather for each type of load.
7. Determine dry and wet weather brake horsepower for motors greater than 100 horsepower based on equipment service manual dry and wet weather operating conditions. Determine typical brake horsepower that should be used for other motors.
8. Develop diversity factors for typical process and facility equipment where the load cycles on and off (bar screens, sludge pumps, scum pumps, sump pumps, valves, gates, air compressors, HVAC, etc.), panelboards, cranes, etc. so there is a consistent approach on future projects.
 - a. For Plant 1, update diversity factors based on dry and wet weather operating conditions. Compare the load data in the load criticality table for Plant 1 with the power monitoring data and SCADA historical data for process loads. This was done to determine the diversity factors for PS18-11 ETAP Model Updates for Plant 2. Most of the power monitors (available for most of the 12kV & 480V switchgears and select MCCs) at Plant 1 are networked and

thus several years of data can be evaluated. For Plant 2, only the 12kV Service Center and Cen-Gen power monitors are networked. Manual data collection would be needed for non-networked power monitors to utilize their data.

- b. For Plant 2, use the brake horsepower and diversity factors developed by PS18-11 ETAP Model Updates for Plant No. 2.
9. Add a switchgear diversity factor to the load summary tables (new feature) to allow for a future overall load adjustment after actual loads is obtain and compared to the load criticality data.

Deliverables:

1. Revised load criticality tables for Plants 1 and 2.
2. Documentation on the methodology used for updating the load criticality tables (including assumptions, Operations feedback/notes, loading demand/diversity factors utilized, etc.).
3. Technical memorandum documenting the summary of the changes.

TASK 2 – CEN GEN REPLACEMENT

TASK 2.1 CEN GEN REPLACEMENT ALTERNATIVES

This task develops and analyzes digester gas usage alternatives to replace the existing central generation engines when they can no longer be maintained (i.e. parts not available, overhauls not feasible, or not cost effective to maintain, etc.) or SCAQMD emissions limits can no longer be achieved with internal combustion engines or turbines.

Task 2.1.1 – Review Existing Documentation

Consultant shall review the following:

1. Review PS15-01 Biosolids Master Plan, Final Report
2. Review PS20-04 Power Generation Overhaul Feasibility Study
3. Review J-102 Energy Master Plan, TM-2 Power Generation and Supply System Analysis
4. Review J-124 Digester Gas Facilities Replacement, Design Memo 1 (contains digester gas production)
5. Review P2-128 TPAD Digester Facility at Plant 2, Preliminary Design Report, Volume Design Memo 01A for gas production

Task 2.1.2 – Identify Cen Gen Replacement Alternatives

Under this task, the CONSULTANT shall develop a list of Cen Gen replacement technologies and alternatives. The CONSULTANT's Cen Gen replacement options shall incorporate the following:

- Reliable standby power capacity as determined in Task 1
- Complete solutions that sells or uses the digester gas as determined in Task 2.
- Required digester heating requirements and facility cooling requirements as determine in Task 2.3 Heat Balance Model
- Energy independence and resiliency as described in Task 3
- Fleet vehicle natural gas fueling Needs in accordance with future State of California requirements

Prior to developing alternatives, the CONSULTANT shall identify CenGen replacement technologies. The technologies will include any technologies identified by the CONSULTANT. The technologies will be screened using the criteria and methodology defined in Task 2.1.4. The technologies remaining after screening will be further developed into alternatives as described in this task.

For alterantives development, the CONSULTANT shall consider, but not be limited to, the options listed below. For each option, identify the successful use of the technology in real projects for similar applications, required auxiliary systems, maintenance requirements, and digester gas cleaning requirements. Develop a conceptual lifecycle cost (based on the existing projects of similar size/capacity) and footprint layout of the main equipment and auxiliary systems to help in identifying the alternatives that will be selected for further development under Task 2.1.3.

1. Develop a power generation option to replace the existing central generators with internal combustion engines. Include key issues such as impacts to the proposed J-124 Gas Compressor Facilities, digester gas cleaning requirements, etc. One layout option shall include the reuse of the existing Cen Gen Building. The following assumptions shall be made for this option:
 - a. The Cen Gen facility needs a full rehab. For the option which includes the installation of new internal combustion engines in the existing facility, the costs for the Cen facility rehabilitation shall also be included. For Plant 1, the existing Cen Gen 12kV switchgear will need to be replaced due to its age. For Plant 2, the Cen Gen 12kV switchgear is being replaced under Project J-117B.
 - b. For the option which would locate the new internal combustion engines in a new facility, assume a completely new facility which would include new 12kV Cen Gen switchgear, without the use of any existing equipment within the existing Cen Gen building. For Plant 2, only provide new Cen Gen 12kV switchgear for the generators and utilize the new Cen Gen 12kV switchgear (Bus A and Bus B) being installed by Project J-117B for power distribution.
2. Develop a power generation option to replace the existing central generators with turbines. Include key issues such as impacts to the proposed J-124 Gas Compressor Facilities, digester gas cleaning requirements, etc. Evaluate the feasibility of reusing the existing Cen Gen Building.

3. Develop an option to clean the digester gas to pipeline quality (renewable natural gas (RNG)) for injection back into Southern California Gas pipelines. Determine the benefit of OC SAN selling all the digester gas or using some of the gas for buildings and Fleet. Include other key issues. Include the following:
 - a. Standby Power:
 - i. Use Cen Gen infrastructure as a standby power source. Assume Cen Gen will be kept as a standby power source if SCAQMD no longer allows it to be used as a primary power source or if the digester gas is no longer used to generate electricity. Determine the quantity of generators that should be provided or maintained and identify any system modifications required to meet SCAQMD requirements for standby operation. Verify Cen Gen would serve as a reliable standby power source using the existing IC engines without bottom-end overhauls and it would be cost effective even with future required rehabilitation projects. The costs shall include the rehab of the existing Cen Gen facility (including Cen Gen 12kV switchgear) to maintain long-term functionality as a standby power facility.
 - ii. Do not use Cen Gen as standby power and provide a new standby power diesel generator facility with 12kV generator switchgear. Include option to provide new 12kV distribution switchgear in the standby generator facility to replace the existing Cen Gen switchgear.
 - iii. Leverage the Plant 1 battery storage system capacity to provide standby power for a few hours. OC San is currently in discussion with the battery storage system operator to confirm the feasibility.
 - b. Determine preferred fuel source for existing boilers for digester heating. Determine additional heating required for the digesters.
 - c. Replace the cooling capacity of the absorption chillers at Plant 1.
4. Review and document if fuel cells are a viable and reliable power generation option using digester gas.
5. Options involving digester gas used in more than one technology will be developed in Task 2.1.5..

The CONSULTANT shall perform an initial screening process and work with OC SAN to identify the most feasible technologies for the next step of comprehensive evaluation.

Task 2.1.3 – Develop Cen Gen Replacement Alternatives

Under this Task, the CONSULTANT shall further develop each Cen Gen replacement alternative selected under Task 2.1.2. Adequate conceptual design details and layouts shall be developed for the Cen Gen replacement alternatives, and all required supporting facilities to allow for an adequate evaluation. At a minimum, the CONSULTANT shall prepare a summary of the technologies that includes the following:

- Identify additional support facilities, such as boilers, chillers, etc.
- Outline the size and number of units for the potential facilities and supporting facilities
- Estimate cost of electric power, biogas and natural gas, including a sensitivity analysis of their future pricing
- Estimate short-term and anticipated mid-term benefit for selling RNG
- Estimate costs and cost savings for energy resiliency options
- Discuss the footprints and the site considerations
- Discuss the impacts to upstream and downstream facilities
- Discuss air quality impacts and mitigation costs, and other environmental impacts
- Short-term and long-term cost benefits based on current and future market trends for gas and electricity pricing
- Discuss impacts to greenhouse gases and carbon footprint
- Provide a description of the latest developments related to that technology, list the potential vendors, and provide a list of comparably sized installations
- Describe the advantages and disadvantages
- Develop conceptual layouts for each alternative
- Develop construction cost estimates and operations and maintenance costs for each alternative
- Develop a life cycle cost analysis

Task 2.1.4 – Develop Evaluation Criteria and Methodology

The CONSULTANT shall develop an evaluation method, define evaluation criteria, and establish a decision-making process to identify and rank the Cen Gen replacement technology and alternatives. The CONSULTANT shall confirm and validate with OC SAN a ranking procedure using a weighting criteria method for the alternatives. In developing the evaluation criteria, the CONSULTANT shall take into account, but not be limited to the following factors:

- End-use market factors
 - Short-term and mid-term demand for renewable natural gas (RNG)
- Technology and related risk factors
 - Compliance with short-term and mid-term permit requirements
 - Volatility in renewable energy market
 - Proven full scale performance, operation of the technology, and number of installations of similar capacity.
 - Implementation complexity
 - OC SAN's readiness to apply this technology
 - Manufacturer support and obsolescence
- Cost factors
 - Capital cost
 - Life cycle costs
 - Operating and Maintenance Costs
 - Offsetting energy or other revenues
- Impact to energy costs
 - Impact to SCE agreements and associated standby charges

- Utility bill charges and savings
- Operational and Maintenance factors
 - Changes to operational staffing level and qualifications
 - Redundancy, reliability, and longevity
 - Ease of operation and maintenance
 - Safety
- Greenhouse gas and carbon footprint impacts
- Footprint and impacts to existing facilities
 - Footprint of facility and impacts to future land use
 - Impacts to and compatibility with existing facilities and available utilities
 -

Task 2.1.5 – Evaluate and Make Final Selection

Under this Task, the CONSULTANT shall use the evaluation methodology established in Task 2.1.4 to perform a comprehensive evaluation and make a final recommendation for the Cen Gen replacement. CONSULTANT shall develop a flexible implementation road map that identifies key trigger points that would (1) prompt OC San to initiate the Cen Gen Replacement recommendation and (2) prompt OC SAN to revise the current recommendation.

The screening of alternatives in this Task will result in a short list of preferred alternatives. From this short list, several hybrid alternatives will be developed that include the use of digester gas in multiple technologies. This includes an option where a portion of the digester gas is used for RNG and the remaining portion is used to generate electricity. The CONSULTANT shall evaluate different combinations to determine the most beneficial option.

Following identification of short listed alternatives and hybrid alternatives, the CONSULTANT will evaluate ancillary systems and equipment to identify the equipment types and capacities to support each alternative. This will include systems and equipment such as gas conditioning (gas drying, siloxane removal, H₂S removal, ammonia removal) and compressor types.

The CONSULTANT shall develop an evaluation method for the remaining short listed alternatives and hybrid alternatives based on specific criteria, called “tie breaker” criteria, to allow differentiation and selection of the preferred CenGen replacement technology. Using the “tie breaker” criteria and additional sensitivity analysis, the CONSULTANT shall develop a flexible implementation road map that identifies key trigger points that would (1) prompt OC San to initiate the CenGen Replacement recommendation and (2) prompt OC San to revise the current recommendation.

Assumptions:

-Layout and drawings will be produced in PDF format. AutoCAD layouts and drawings will not be provided.

TASK 2.2 GAS USAGE

This task determines the digester gas production, quality and consumption, natural gas consumption, and includes the following:

1. Review the estimated gas production from J-102, PS15-01, J-124 and P2-128 TPAD.
2. Develop existing and future digester gas and natural gas utilization within the process areas (boilers, Cen Gen, and fleet).

Assumptions:

Gas Usage TM will be simplified TM with emphasis on tables and figures. Intent will be to document technical information to support Task 2.1.

TASK 2.3 HEAT BALANCE MODEL

This task develops a heat balance model and includes the following:

1. Review the J-102 heat balance model.
2. Develop a conceptual treatment plant heat balance model for each Cen Gen replacement option (except fuel cell) discussed under Task 2.1 above. The model shall include the major pieces of equipment that are involved in the power generation systems, digestion systems, and waste heat systems.

Assumptions:

-Heat Balance tm will be simplified TM with emphasis on tables and figures. Intent will be to document technical information to support Task 2.1.

-Development of a conceptual design for any additional heating and cooling systems with layout size and cost will be completed as part of Task 2.1

TASK 2.4 RENEWABLE ENERGY FUNDING AND MARKETS

Identify current funding (Federal and State grants, FEMA, etc.) available for proposed current projects and potential funding available for future projects. Define the applicability of the funding, available amount, and the requirements, including reporting needs.

Evaluate the maturity and long term projections of the renewable and non-renewable energy markets that will impact the long term recovery plan for the project(s). Include renewable fuel and energy, renewable energy mandates and portfolio standards, and carbon "Cap and Trade" markets (CARB, AB32).

Funding will be reviewed prior to Task 2.1.3; and funding will be reviewed after making final recommendations as part of the road map development under Task 2.1.5.

Task 2 Deliverables:

- Digester Gas Usage Technical Memorandum

- Heat Balance Technical Memorandum
- Cen Gen Replacement Technical Memorandum
- Renewable Energy Funding and Markets Technical Memorandum

TASK 3 – ENERGY RESILIENCY AND INDEPENDENCE

OC SAN's future policy statement under the Energy Independence Policy of the 2021 Strategic Plan states:

1. OC SAN seeks to be energy independent by self-generating all the electrical and thermal energy necessary to sustain its operations. This will be accomplished by economically minimizing its utilization requirements and maximizing energy harvested from the wastewater it receives. Energy independence will improve OC SAN'S environmental impact and improve its operational reliability and resiliency.
2. OC SAN will also study and use photovoltaic cells in non-process areas where it makes economic sense. For example, the new Administration Building will include photovoltaic panels linked to the treatment plant. Staff will also investigate the installation of photovoltaic arrays over OC SAN owned property between the treatment plants with additional battery storage systems.
3. OC SAN also plans to investigate the treatment and sale of Biogas to external users. The State of California has set goals for renewable energy utilization for electrical production and hydrogen transportation fuels. OC SAN'S Biogas is viewed favorably in these industries to meet the State of California targets. OC SAN is working very diligently and creatively to maximize the production of gas and reduce its own energy needs, but energy independence is the first goal which has not yet been met.
4. Staff recommends that innovative research continue to maximize energy harvesting and to minimize energy usage to make OC SAN energy independent in the most basic mission of protecting the public health and the environment. Super Critical Water Oxidation and other biosolids thermal conversion technologies offer some exciting opportunities to cut power use, reduce diesel fueled transportation, and create useful energy.

The Plant 1 battery storage system is owned and operated by a third-party based on incentives offered by SCE to the third party to manage grid loads. It is not operated to maximize OC SAN's savings, although OC SAN does realize significant savings.

Under the SCE LCR Program, the Plant 1 battery storage system may operate from 8 am to 9 pm. According to the battery storage system operator, the battery storage system is typically operated for 4 hours between 2 pm and 9 pm. During battery storage operation, there is approximately 500 to 1,000 kW of power imported from SCE based on current load data. This remaining demand is available to be offset by solar power.

In 2023, the Headquarters Building will be online and will be powered from Plant 1, Headworks Power Building 3. The Headquarters Building has been designed with solar power.

Plant 2 typically operates at near net zero import using three central generators fueled by digester gas and additional natural gas. Future Plant 2 loads consist of the OCWD Pump Station, J-124 Gas Compressor Facility Replacement (increased loads), and the future P2-128 TPAD Digester Facility at Plant 2. The future P2-138 Operations and Maintenance Complex at Plant 2 is planning to add solar in the parking lot and on the roof to offset some loads.

The space at Plants 1 and 2 continues to be very valuable for future process areas and construction project staging and laydown areas. There is potential space along the interplant right of way that could be used for solar, specifically, across Garfield Avenue from the southeast corner of Plant 1, along the Santa Ana River.

This task reviews alternative power generation and energy storage methods to achieve net zero import. CONSULTANT shall perform the following:

- Evaluate the Plant 1 dry weather flow load profile (current load and future load from projects currently in design) and determine the benefit and feasibility of adding solar, or solar with batteries, with and without Cen Gen as a normal power source. Include lifecycle costs, layout, and other key issues. **Exhibit 3 – Typical Plant 1 Power Flow for 1 Day** shows the typical power flow changes throughout the day (based on varying plant loading and STEM Tesla battery operation during peak power demand).
- Evaluate the Plant 2 dry weather flow load profile (current load and future load from projects currently in design) and determine the benefit and feasibility of adding solar, or solar with batteries, with and without Cen Gen as a normal power source. Include lifecycle costs, layout, and other key issues. Typically the present P2 loading varies between 6 to 7.5 MW on a typical day.
- OC San will be switching to “Direct Access”. Utilize these rates for cost benefit analysis.

Task 3 Deliverables:

- Energy Resiliency and Independence Technical Memorandum

Assumptions:

-Layout and drawings will be produced in PDF format. AutoCAD layouts and drawings will not be provided.

TASK 4 – CIP PROJECT DEVELOPMENT

Under this task, the CONSULTANT shall develop a Capital Improvement Program (CIP) project plan for the IC engine replacement for Plant Nos. 1 and 2. The timing shall be based on the inability to maintain the engines due to lack of parts, qualified companies are no longer available to perform the bottom-end overhauls, SCAQMD regulations change and prevent the operation of Cen Gen and/or one of the identified future generation trigger points occurs. The CIP project plan development shall include the projects recommended by this study under Task 2. In addition, the project plan shall include the project(s) identified in Task 3.

Based on the study results of Task 1, 2 and 3, the CONSULTANT shall develop the descriptions of project(s) and phase(s) to construct the proposed projects at Plant Nos. 1 and 2, including an implementation plan.

Task 4 will include two focus meetings with OC San. One focus meeting will be dedicated to Plant 1 and the other to Plant 2.

Task 4 Deliverables:

- Project Implementation Technical Memorandum

Assumptions:

-Layout and drawings will be produced in PDF format. AutoCAD layouts and drawings will not be provided.

TASK 5 – ENERGY AND DIGESTER GAS MASTER PLAN

Upon completion of the technical memoranda, the CONSULTANT shall compile all the documents into a draft Energy and Digester Gas Master Plan (Master Plan) with an executive summary for distribution and review. The CONSULTANT shall address all OC SAN staff comments in a final report.

The final Master Plan shall include all the materials listed in the draft Master Plan, but reflect the final comments received during the review of the draft Master Plan. Please note that one single *.pdf must be delivered for the final report that contains the entire report document. Appendices may be in separate *.pdf files.

Meeting agendas and minutes, Technical Memoranda, Reports, Appendices, etc. shall be delivered to OC SAN in a *.pdf version and native electronic version.

Task 5 Deliverables:

- Draft and Final Energy and Digester Master Plan

TASK 6 - PROJECT MANAGEMENT

CONSULTANT shall be responsible for managing CONSULTANT's project execution, schedule, budget, and coordination with other projects. The CONSULTANT shall be responsible for managing all subconsultants, including the assignment of scope, management of deliverables and schedules, reporting of progress, invoicing, and quality control.

TASK 6.1 PROJECT MANAGEMENT PROGRESS MEETINGS

CONSULTANT shall prepare an agenda and conduct monthly project management meetings with OC SAN's Project Manager and the CONSULTANT's Project Manager. The purpose of the meetings will be to review CONSULTANT's overall project progress and monthly Progress Report. Other meetings shall be scheduled on an as-needed basis. Assume 12 meetings.

TASK 6.2 PROJECT SCHEDULE

CONSULTANT shall create a detailed project schedule. The schedule shall include milestones for all dates listed in Section III – Project Schedule. The schedule shall be based on the same

work breakdown structure used for estimating earned value as described in “Progress Reports” above. Schedule updates shall be submitted with the monthly Progress Report.

At a minimum, the schedule shall indicate the following:

- Projected start date and finish date for each activity
- Each project task and subtask in the WBS with predecessors and successors
- Major meetings and workshops
- Physical percent complete for each activity in the WBS and percent complete by Task

CONSULTANT shall prepare planned, actual and earned value curves for the Baseline Schedule and for monthly updates. Monthly updates shall also include Cost Performance Index (CPI) and Schedule Performance Index (SPI) calculations.

TASK 6.3 PROJECT LOGS

CONSULTANT shall produce and maintain at least on a monthly basis the following logs through the course of the project:

Project Decision Log. The project decision log shall track decisions made during workshops and meetings, and as a result of OC SAN review of deliverables. The log shall include the date of the decision, the title of the meeting, where it was made (if applicable), a description of the decision, and a brief summary of the impacts.

Action Item Log. The action item log is used to track action items generated during meetings. Action items may only be assigned to members of the OC SAN or CONSULTANT teams. If action is required by a different party, the action item shall be assigned to the person on the team to track who will track the action item with that person. The action item log is not intended to include normal CONSULTANT tasks, nor to include comments on deliverables. The Action Item log shall include a tracking number (typically coded to the date), a date it was created, a description of the action required, the lead person, and the date it was resolved. If action is required by more than one person, the person who will be asked to coordinate that action shall be listed.

Meeting Log. See Task 7 Meetings and Workshops.

TASK 6.4 PROGRESS REPORTS

CONSULTANT shall submit monthly progress reports at the same time as monthly invoices that include the following contents:

- Work activities completed to date, in the current reporting period, and projected for the coming month.
- A brief description of outstanding issues and their potential for impact on scope, schedule (design and construction), budget (design and construction) and quality.
- Potential changes in the project scope or design scope.

- Budget status including estimates of actual costs to date, earned value, costs to complete, and costs at completion.
- Schedule status with a description of any variances between scheduled and forecasted milestone dates.
- A discussion of corrective actions to be taken to avoid or mitigate cases where the project schedule is expected to be delayed.

TASK 6.5 PROJECT INVOICES

The invoices shall document the man-hours and billing rate for each person that works on the project. Overhead, profit and any direct costs shall also be shown for each task. As part of the summary section of the invoice, CONSULTANT shall also include the following information:

- Budget
- Current billing period invoicing
- Previous billing period “total invoiced to date”
- Budget Amount Remaining
- Current billing period “total percent invoiced to date”
- ETC for each Task & Subtask

Approval of an invoice by OC SAN requires a Progress Report for the period covered by the invoice. Payment of an invoice will be delayed until the Progress Report is submitted. OC SAN will provide a sample invoice structure to CONSULTANT at the beginning of the project.

TASK 7 – MEETINGS AND WORKSHOPS

CONSULTANT shall hold virtual meetings and workshops throughout the project to keep OC SAN apprised of the job, review work-in-progress, share information, discuss project submittals, present findings of technical analyses, receive and resolve comments, and obtain decisions and direction by OC SAN staff. This task defines the major meetings and workshops to be held by the CONSULTANT.

CONSULTANT shall assume the following meetings will be required.

Task	Number of Meetings/ Workshops	Proposed Topics
N/A	<ul style="list-style-type: none"> One 2-hr Project Kickoff 	
1	<ul style="list-style-type: none"> Twelve 1-hr Meeting 	<ul style="list-style-type: none"> Four 1-hr meetings for task 1.1 topics Four 1-hr meetings for task 1.2 topics Four 1-hr meetings for task 1.4 topics
1	<ul style="list-style-type: none"> One 2-hr Workshop 	<ul style="list-style-type: none"> Review draft Task 1 TM
2	<ul style="list-style-type: none"> Fifteen 1-hr Meetings 	<ul style="list-style-type: none"> Eleven 1-hr meetings for task 2.1 topics Two 1-hr meetings for task 2.2 and 2.3 Two 1-hr meetings for task 2.4
2	<ul style="list-style-type: none"> One 2-hr Meeting 	<ul style="list-style-type: none"> Discuss Cen Gen Replacement alternatives TM
2	<ul style="list-style-type: none"> One 2-hr Workshop 	<ul style="list-style-type: none"> Review draft Task 2 TMs
3	<ul style="list-style-type: none"> Two 1-hr Meetings 	<ul style="list-style-type: none"> Discuss energy resilience and independence sizing and location. Discuss options
3	<ul style="list-style-type: none"> One 1-hr Workshop 	<ul style="list-style-type: none"> Review draft Task 3 TM
4	<ul style="list-style-type: none"> Two 1-hr Meetings 	<ul style="list-style-type: none"> Focus meetings dedicated to Plant 1 and Plant 2 CIP
4	<ul style="list-style-type: none"> One 1-hr Workshop 	<ul style="list-style-type: none"> Discuss proposed CIPs for the project
4	<ul style="list-style-type: none"> One 1-hr Meetings 	<ul style="list-style-type: none"> Review draft Task 4 TM
5	<ul style="list-style-type: none"> One 1-hr Workshop 	<ul style="list-style-type: none"> Present the draft Energy and Digester Gas Master Plan
5	<ul style="list-style-type: none"> One 2-hr Workshop 	<ul style="list-style-type: none"> Review responses to OC SAN comments on draft report
5	<ul style="list-style-type: none"> One 1-hr Workshop 	<ul style="list-style-type: none"> Present Energy and Digester Gas Master Plan to the EMT

CONSULTANT shall transmit the minutes to the OC SAN Project Manager within three business days of the meeting in MS Word format using OC SAN's template, or an approved substitution.

A copy of all comments on project issues obtained by CONSULTANT from OC SAN staff without direct OC SAN Engineering Project Manager's involvement shall be submitted for the Project Manager's approval within three business days of receipt.

TASK 8 - QUALITY CONTROL

CONSULTANT shall be responsible for the technical adequacy and quality control of the work. Prior to the submittal to OC SAN, each portion of a submittal shall be thoroughly reviewed and corrected by a member of the CONSULTANT's QC Team. The reviewer shall attest to their

review in the form of a written affidavit outlining the submittal subject and identifying the corrected deficiencies.

V. GENERAL REQUIREMENTS

GENERAL

Working Hours

CONSULTANT's on-site staff shall conform to OC SAN work schedules, unless otherwise approved by OC SAN. CONSULTANT shall refer to the Engineering Design Guidelines, Chapter 01, Section 01.3.5 "CONSULTANT Inspection of Treatment Facilities" for further requirements. Meetings with OC SAN staff shall be scheduled from Monday through Thursday between the hours of 8:00 AM and 4:00 PM.

Software

The CONSULTANT is expected to develop and provide the deliverables using the standard software currently approved for use by OC SAN. The standard OC SAN software includes, but is not limited to, the following:

Windows 10 Professional

Microsoft Internet Explorer 11

AutoCAD Plant 3D version 2018 (for P&ID drawings only)

Autodesk software 2018 (AutoCAD, AutoCAD Map3D or compatible dwg file format)

Microsoft Office 365

Bluebeam Revu eXtreme (version 2018.2)

Primavera P6 for scheduling

Any software that the CONSULTANT needs to comply with these standards shall be purchased and maintained by the CONSULTANT at no additional cost to OC SAN. In the event OC SAN provides the CONSULTANT with access to OC SAN software and hardware at an OC SAN facility in order to facilitate performance of their work, all software shall remain the property of OC SAN. Only software licensed to OC SAN shall be installed on OC SAN equipment. In addition, only OC SAN's IT Department staff will perform the installation of this software.

Submittal Review using Bluebeam

OC SAN has standardized on the use of Bluebeam Revu for reviewing and providing comments to PDF files. Prior to submitting electronic PDF files, format them as indicated below (underlined text refers to commands or functions within the Bluebeam software).

1. Flatten file with Document\Flatten
2. Reduce file size with Document\Process\Reduce File Size

3. Make PDF searchable with Document\OCR
4. Create page labels with Thumbnails Toolbar\Create Page Labels
5. Create bookmarks with Create Bookmarks\Page Labels
6. Enable hyperlinks with File\Batch\Link\New

PMWEB Procedures

This Agreement shall utilize PMWeb as the Project Control Management System (PCMS) for overall management of the Agreement. All PCMS related documents requiring formal signatures shall be digital, and all copies digitally distributed. The PCMS conforms to the requirements set forth in California Government Code section 16.5 regarding digital signatures; therefore, digital signatures are in full force and effect and are legally the same as hand-written signatures. At least one PCMS account shall have the authority to approve Amendments.

OC SAN shall maintain the PCMS and serve as the administrator for the duration of this Agreement. OC SAN will provide the CONSULTANT with user access for approved personnel as needed for the duration of the Agreement. OC SAN shall control access to the PCMS by assigning user profiles and login credentials. Notify OC San of any changes to personnel. Access modifications shall be coordinated as needed throughout the Agreement. Do not share PCMS account passwords with anyone inside or outside of the CONSULTANT's company.

Routine maintenance of the PCMS system may be required during the Agreement. Access to the PCMS system may be restricted or unavailable at these times and will be scheduled outside of typical working hours whenever possible.

The PCMS is a web-based environment and is therefore subject to the inherent speed and connectivity problems of the Internet. The CONSULTANT is responsible for its own connectivity to the Internet. PCMS response time is dependent on the CONSULTANT's equipment, including processor speed, Internet access speed, Internet traffic, etc.

OC SAN will not be liable for any delays associated with the utilization of the PCMS including, but not limited to, slow response time, down time periods, connectivity problems, or loss of information.

OC SAN will provide a one-time free training session of up to two (2) hours to train CONSULTANT's designated staff on general system requirements, procedures, and methods.

Automated system notifications generated via PCMS (e.g.; in-system notices, system generated email, or email with attachment) shall constitute a formal written notification in compliance with the Professional Services Agreement (PSA)

VI. STAFF ASSISTANCE

OC SAN staff member or designee assigned to work with CONSULTANT on the design of this project is Carmen Quan at (714) 593-7415, e-mail to: cquan@ocsan.gov.

EXHIBITS:

Exhibit 1 Updating OC San Procedures

Exhibit 2 Project Management Requirements

Exhibit 3 Project Reference Material

- A. J-102 Strategic Plan Update – Energy Master Plan
- B. PS15-01 Biosolids Master Plan
- C. J-124 Design Memo 1
- D. P2-128 Preliminary Design Report, Volume 1,DM01A
- E. PS20-04 Power Generation Overhaul Feasibility Study
- F. Typical Plant 1 Power Flow for 1 Day
- G. Project PS18-11 P2 Loading Data
- H. P1 Sample Load Criticality Table
- I. P2 Sample Load Criticality Table
- J. P1 Single Line Diagram Drawing List
- K. P2 Single Line Diagram Drawing List

Exhibit 4 Sample Construction Cost Estimate Format

MD:CQ:gr:sa

<https://ocsdgov.sharepoint.com/sites/ProjectPS21-04/ContractDocumentation/PS21-04 Attachment A SOW.docx>