NOTICE OF REGULAR MEETING
OF THE
SOUTH ORANGE COUNTY WASTEWATER AUTHORITY
ENGINEERING COMMITTEE

October 12, 2023
8:30 a.m.

NOTICE IS HEREBY GIVEN that a Regular Meeting of the South Orange County Wastewater Authority (SOCWA) Engineering Committee was called to be held on **October 12, 2023, at 8:30 a.m.** SOCWA staff will be present and conducting the meeting at the SOCWA Administrative Office located at 34156 Del Obispo Street, Dana Point, California.

THE SOCWA MEETING ROOM IS WHEELCHAIR ACCESSIBLE. IF YOU REQUIRE ANY SPECIAL DISABILITY RELATED ACCOMMODATIONS, PLEASE CONTACT THE SOUTH ORANGE COUNTY WASTEWATER AUTHORITY SECRETARY'S OFFICE AT (949) 234-5452 AT LEAST SEVENTY-TWO (72) HOURS PRIOR TO THE SCHEDULED MEETING TO REQUEST SUCH ACCOMMODATIONS. THIS AGENDA CAN BE OBTAINED IN ALTERNATE FORMAT UPON REQUEST TO THE SOUTH ORANGE COUNTY WASTEWATER AUTHORITY'S SECRETARY AT LEAST SEVENTY-TWO (72) HOURS PRIOR TO THE SCHEDULED MEETING. MEMBERS OF THE PUBLIC HAVE THE OPTION TO PARTICIPATE IN AND MAY JOIN THE MEETING REMOTELY VIA VIDEO CONFERENCE FOR VISUAL INFORMATION ONLY (USE ZOOM LINK BELOW) AND BY TELECONFERENCE FOR AUDIO PARTICIPATION (USE PHONE NUMBERS BELOW). THIS IS A PHONE-CALL MEETING AND NOT A WEB-CAST MEETING, SO PLEASE REFER TO AGENDA MATERIALS AS POSTED ON THE WEBSITE AT WWW.SOCWA.COM. ON YOUR REQUEST, EVERY EFFORT WILL BE MADE TO ACCOMMODATE PARTICIPATION. FOR PARTIES PARTICIPATING REMOTELY, PUBLIC COMMENTS WILL BE TAKEN DURING THE MEETING FOR ORAL COMMUNICATION IN ADDITION TO PUBLIC COMMENTS RECEIVED BY PARTIES PARTICIPATING IN PERSON. COMMENTS MAY BE SUBMITTED PRIOR TO THE MEETING VIA EMAIL TO ASSISTANT SECRETARY DANITA HIRSH AT DHIRSH@SOCWA.COM WITH THE SUBJECT LINE "REQUEST TO PROVIDE PUBLIC COMMENT." IN THE EMAIL, PLEASE INCLUDE YOUR NAME, THE ITEM YOU WISH TO SPEAK ABOUT, AND THE TELEPHONE NUMBER YOU WILL BE CALLING FROM SO THAT THE COORDINATOR CAN UN-MUTE YOUR LINE WHEN YOU ARE CALLED UPON TO SPEAK. THOSE MAKING PUBLIC COMMENT REQUESTS REMOTELY VIA TELEPHONE IN REAL-TIME WILL BE ASKED TO PROVIDE YOUR NAME, THE ITEM YOU WISH TO SPEAK ABOUT, AND THE TELEPHONE NUMBER THAT YOU ARE CALLING FROM SO THE COORDINATOR CAN UN-MUTE YOUR LINE WHEN YOU ARE CALLED UPON TO SPEAK. ONCE THE MEETING HAS COMMENCED, THE CHAIR WILL INVITE YOU TO SPEAK AND ASK THE COORDINATOR TO UN-MUTE YOUR LINE AT THE APPROPRIATE TIME.

AGENDA ATTACHMENTS AND OTHER WRITINGS THAT ARE DISCLOSABLE PUBLIC RECORDS DISTRIBUTED TO ALL, OR A MAJORITY OF, THE MEMBERS OF THE SOUTH ORANGE COUNTY WASTEWATER AUTHORITY ENGINEERING COMMITTEE IN CONNECTION WITH A MATTER SUBJECT FOR DISCUSSION OR CONSIDERATION AT AN OPEN MEETING OF THE ENGINEERING COMMITTEE ARE AVAILABLE FOR PUBLIC INSPECTION IN THE AUTHORITY ADMINISTRATIVE OFFICE LOCATED AT 34156 DEL OBISPO STREET, DANA POINT, CA ("AUTHORITY OFFICE") OR BY PHONE REQUEST MADE TO THE AUTHORITY OFFICE AT 949-234-5452. IF SUCH WRITINGS ARE DISTRIBUTED TO MEMBERS OF THE ENGINEERING COMMITTEE LESS THAN SEVENTY-TWO (72) HOURS PRIOR TO THE MEETING, THEY WILL BE AVAILABLE IN THE RECEPTION AREA OF THE AUTHORITY OFFICE AT THE SAME TIME AS THEY ARE DISTRIBUTED TO THE ENGINEERING COMMITTEE AND SENT TO ANY REMOTE PARTICIPANTS REQUESTING EMAIL DELIVERY OR POSTED ON SOCWA'S WEBSITE. IF SUCH WRITINGS ARE DISTRIBUTED IMMEDIATELY PRIOR TO, OR DURING, THE MEETING, THEY WILL BE AVAILABLE IN THE MEETING ROOM OR IMMEDIATELY UPON VERBAL REQUEST TO BE DELIVERED VIA EMAIL TO REQUESTING PARTIES PARTICIPATING REMOTELY.

THE PUBLIC MAY PARTICIPATE REMOTELY BY VIRTUAL MEANS. FOR AUDIO OF MEETING USE THE CALL IN PHONE NUMBERS BELOW AND FOR VIDEO USE THE ZOOM LINK BELOW.

Join Zoom Meeting
https://socwa.zoom.us/

Meeting ID: 826 1000 5512
Passcode: 863335

Dial by your location:
+1 669 900 6833 US (San Jose) +1 253 215 8782 US (Tacoma)
+1 346 248 7799 US (Houston) +1 312 626 6799 US (Chicago)
Find your local number: https://socwa.zoom.us/u/kdu2FoHrfJ

AGENDA

1. Call Meeting to Order

2. Public Comments

THOSE WISHING TO ADDRESS THE ENGINEERING COMMITTEE ON ANY ITEM LISTED ON THE AGENDA WILL BE REQUESTED TO IDENTIFY AT THE OPENING OF THE MEETING AND PRIOR TO THE CLOSE OF THE MEETING. THE AUTHORITY REQUESTS THAT YOU STATE YOUR NAME WHEN MAKING THE REQUEST IN ORDER THAT YOUR NAME MAY BE CALLED TO SPEAK ON THE ITEM OF INTEREST. THE CHAIR OF THE MEETING WILL RECOGNIZE SPEAKERS FOR COMMENT AND GENERAL MEETING DECORUM SHOULD BE OBSERVED IN ORDER THAT SPEAKERS ARE NOT TALKING OVER EACH OTHER DURING THE CALL.

PAGE NO.

Adjournment

I hereby certify that the foregoing Notice was personally emailed or mailed to each member of the SOCWA Engineering Committee at least 72 hours prior to the scheduled time of the Regular Meeting referred to above.

I hereby certify that the foregoing Notice was posted at least 72 hours prior to the time of the above-referenced Engineering Committee meeting at the usual agenda posting location of the South Orange County Wastewater Authority and at www.socwa.com.

Dated this 5th day of October 2023.

Danita Hirsh

Danita Hirsh, Assistant Secretary
SOUTH ORANGE COUNTY WASTEWATER AUTHORITY

Agenda Item 3

Engineering Committee Meeting

Meeting Date: October 12, 2023

TO: Engineering Committee

FROM: Roni Grant, Associate Engineer

SUBJECT: Approval of Minutes

Overview

Minutes from the following meetings are included for review and approval by the Engineering Committee:

- September 14, 2023

Recommended Action: Staff recommends that the Engineering Committee approve Minutes as submitted.

MINUTES OF REGULAR MEETING
OF THE
SOUTH ORANGE COUNTY WASTEWATER AUTHORITY

Engineering Committee

September 14, 2023

DRAFT

The Regular Meeting of the South Orange County Wastewater Authority (SOCWA) Engineering Committee Meeting was held on September 14, 2023, at 8:30 a.m. in-person and via teleconferencing from the Administrative Offices located at 34156 Del Obispo Street, Dana Point, California. The following members of the Engineering Committee were present:

MARK McAVOY	City of Laguna Beach
HANNAH FORD	El Toro Water District
MIKE DUNBAR	Emerald Bay Service District
DAVID LARSEN	Moulton Niguel Water District
DON BUNTS	Santa Margarita Water District
TARYN KJOLSING	South Coast Water District

Absent:

DAVE REBENSDORF	City of San Clemente

Staff Present:

JIM BURROR	Acting General Manager/Director of Operations
RONI GRANT	Associate Engineer
MARY CAREY	Finance Controller
AMBER BAYLOR	Director of Environmental Compliance
MATT CLARKE	IT Administrator
DINA ASH	HR Administrator
DANITA HIRSH	Executive Assistant

Also Present:

ROGER BUTOW	Clean Water Now (CWN)
SHERRY WANNINGER	Moulton Niguel Water District
SAUNDRA JACOBS	Santa Margarita Water District

1. Call Meeting to Order

   Ms. Roni Grant, Associate Engineer, called the meeting to order at 8:31 a.m.

2. Public Comments

   Mr. Roger Butow, from Clean Water Now, made comments regarding his concerns in the Laguna Beach area.

3. Approval of Minutes

   - Engineering Committee Minutes of August 10, 2023

ACTION TAKEN
A motion was made by Mr. Bunts and seconded by Mr. Larsen to approve the Engineering Committee Minutes for August 14, 2023, as submitted.

Motion carried:	Aye 6, Nay 0, Abstained 0, Absent 1	
	Mr. McAvoy	Aye
	Ms. Ford	Aye
	Mr. Dunbar	Aye
	Mr. Larsen	Aye
	Mr. Bunts	Aye
	Ms. Kjolsing	Aye
	Mr. Rebensdorf	Absent

4. Operations Report

Mr. Jim Burror, Acting General Manager/Director of Operations, stated nothing to report.

This was an information item; no action was taken.

5. Use Audit Flow and Solids Methodology – Annual Update FY 2022-23

ACTION TAKEN
A motion was made by Mr. Bunts and seconded by Mr. McAvoy to recommend that the Board of Directors approve the Use Audit calculated results for the close of the Use Audit for disbursement and collection of additional funds in FY 2022-23.

Motion carried:	Aye 5, Nay 0, Abstained 1, Absent 1	
	Mr. McAvoy	Aye
	Ms. Ford	Abstain
	Mr. Dunbar	Aye
	Mr. Larsen	Aye
	Mr. Bunts	Aye
	Ms. Kjolsing	Aye
	Mr. Rebensdorf	Absent

6. Package B Project Closeout Update [Project Committees 2]

Ms. Grant gave an update on the JBL Package B Project.

This was an information item; no action was taken.

7. Capital Improvement Construction Projects Progress and Change Order Report (September) [Project Committees 2, 15, 17, & 24]

ACTION TAKEN
A motion was made by Mr. Dunbar and seconded by Mr. McAvoy to recommend that the PC 15 Board of Directors approve Change Order 1 for $4,345.00 to DC Hubs Construction for the CTP AWMA Road Guardrail Replacement Project.

Motion carried:	Aye 3, Nay 0, Abstained 1, Absent 0	
	Mr. McAvoy	Aye
	Mr. Dunbar	Aye
	Mr. Larsen	Abstain
	Ms. Kjolsing	Aye

8. Contract Amendment for Design of Efluent Transmission Main Air Valve Replacement [Project Committee 21]

   ACTION TAKEN
   A motion was made by Ms. Ford and seconded by Mr. Larsen to recommend that the PC 21 Board of Directors approve the contract amendment to Tetra Tech for a total of $55,200 for additional design services for the ETM Air Valve Replacement Project.

Motion carried:	Aye 2, Nay 0, Abstained 0, Absent 0	
	Ms. Ford	Aye
	Mr. Larsen	Aye

9. Contract Award for Engineering Services During Construction for Coastal Treatment Plant (CTP) Aeration Diffuser Replacement Project [Project Committee 15]

   ACTION TAKEN
   A motion was made by Mr. Dunbar and seconded by Ms. Kjolsing to recommend that the PC 15 Board of Directors approve the contract to Hazen and Sawyer for a total of $68,580 for Engineering Services During Construction for the CTP Aeration Diffuser Replacement Project.

Motion carried:	Aye 3, Nay 0, Abstained 1, Absent 0	
	Mr. McAvoy	Aye
	Mr. Dunbar	Aye
	Mr. Larsen	Abstain
	Ms. Kjolsing	Aye

10. J.B. Latham Treatment Plant (JBL) Plant 1 Standby Generator Pre-Purchasing Update [Project Committee 2]

    Ms. Grant updated the Engineering Committee on the action the Board of Directors took on September 7, 2023, approving staff to purchase the Standby Generator.

    This was an information item; no action was taken.

Adjournment

There being no further business, Ms. Grant adjourned the meeting at 8:56 a.m.

I HEREBY CERTIFY that the foregoing Minutes are a true and accurate copy of the Minutes of the Regular Meeting of the South Orange County Wastewater Authority Engineering Committee of September 14, 2023, and approved by the Engineering Committee and received and filed by the Board of Directors of the South Orange County Wastewater Authority.

_____
Danita Hirsh, Assistant Board Secretary
SOUTH ORANGE COUNTY WASTEWATER AUTHORITY

Agenda Item 4

Engineering Committee Meeting

Meeting Date: October 12, 2023

TO: Engineering Committee

FROM: Jim Burror, Acting General Manager/Director of Operations

SUBJECT: Operations Report

Overview

Verbal update on operations and maintenance activities.

Recommended Action: Information Item.

Agenda Item 5

Engineering Committee Meeting

Meeting Date: October 12, 2023

TO: Engineering Committee

FROM: Roni Grant, Associate Engineer

SUBJECT: J.B. Latham Treatment Plant Package B Project Update [Project Committee 2]

Overview

Staff has been working with the Construction Management team, Butier Engineering, to close out the Package B project. All the potential change orders have been negotiated and finalized. In addition, Butier Engineering performed an extensive review of Olsson's Time Impact Analysis (TIA) and met with SOCWA to discuss their findings. A response to Olsson's TIA was sent to Olsson on September 22, 2023.

Recommended Action: Information Item.

Agenda Item 6

Engineering Committee Meeting

Meeting Date: October 12, 2023

TO: Engineering Committee

FROM: Roni Grant, Associate Engineer

SUBJECT: Capital Improvement Construction Projects Progress and Change Order Report (October*)* [Project Committee Nos. 2, 15, 17 & 24]

Overview

This agenda item provides an update on projects in construction, including any change orders. Attached are the updated CIP reports. Please note that there is one new change order for the CTP AWMA Road Guardrail Replacement project.

Project Updates

JBL Package B
The project is complete, and Staff continue to work with the Construction Management team to close out all outstanding items. There are eight new change orders for this project totaling $482,878.33:

- Change Order 73 for $67,278.13
- Change Order 74 for $82,810.21
- Change Order 75 for $6,537.01
- Change Order 76 for $39,052.96
- Change Order 77 for $41,697.76
- Change Order 78 for $57,928.56
- Change Order 79 for $79,117.65
- Change Order 80 for $108,456.05

ACOO Internal Seal Replacement
The contract was awarded at the July Board meeting. The first dive is scheduled for the night of October 12, 2023. All impacted facilities have been notified, and we will continue to coordinate with them through the completion of the shutdown.

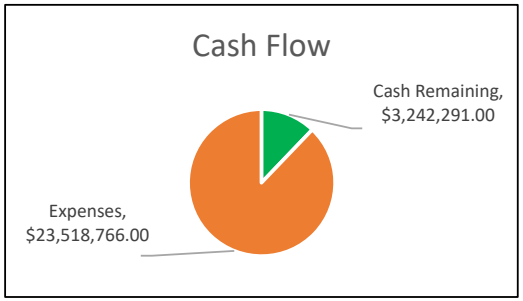
Recommended Action: Staff recommends that the Engineering Committee recommend that the PC 2 Board of Directors approve Change Orders 73 through 80 for $482,878.33 to Olsson Construction for the JBL Package B project.

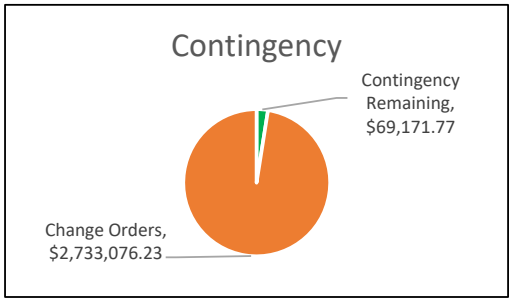
Project Financial Status

Project Committee	2
Project Name	Package B
Project Description	Plant 1 basin repairs, DAF rehabilitation, Energy Building seismic retrofit and minor rehabilitation, Digester 4 rehabilitation

Data Last Updated

September 28, 2023





Cash Flow

Collected	$ 26,761,057.00
Expenses	$ 23,518,766.00

Project Completion

Schedule	100%
Budget	97%

Contracts

Company	PO No.	Original	Change Orders*	Amendments	Total	Invoiced
Olsson	13497	$ 17,325,000.00	$ 1,784,746.22		$ 19,109,746.22	$ 18,626,868.23
Butier	13647	$ 895,727.00		$ 1,005,251.00	$ 1,900,978.00	$1,898,574.50
Carollo	13616	$ 846,528.00		$ 616,037.00	$ 1,462,565.00	$1,406,941.05
TetraTech	13605	$ 94,000.00		$ -	$ 94,000.00	$ 93,884.70
Ninyo & Moore	14279	$ 49,399.00		$ 30,000.00	$ 79,399.00	$ 50,166.27
ADS Environmental	16452	$ 107,200.00	$ -		$ 107,200.00	$ 61,875.00
Dudek	17401	$ 48,360.00		$ -	$ 48,360.00	$ 42,160.00
		$ 19,366,214.00	**$ 1,784,746.22**	**$ 1,651,288.00**	**$ 22,802,248.22**	**$ 22,180,469.75**

**Values include change orders to be reviewed by Engineering Committee and deductive change orders*

Contingency

Area	Project Code	Amount **	Change Orders*	Total Remaining	Percent Used
Liquids	3220-000	$ 1,219,679.00	$ 1,194,892.44	$ 24,786.56	98.0%
Common	3231-000	$ 38,120.00	$ 9,842.77	$ 28,277.23	25.8%
Solids	3287-000	$ 1,544,449.00	$ 1,528,341.02	$ 16,107.98	99.0%
		$ 2,802,248.00	**$ 2,733,076.23**	**$ 69,171.77**	**97.5%**

*** Amount reflects approved contingencies for Construction Contract only and direct Board change orders approval.*

Change Order No.	MNWD	SCWD	SMWD	$ Amount
73	$14,545.53	$13,455.63	$39,276.97	$67,278.13
74	$17,903.57	$16,562.04	$48,344.60	$82,810.21
75	$1,460.97	$1,596.54	$3,479.52	$6,537.03
76	$9,013.42	$11,262.87	$18,776.66	$39,052.95
77	$9,623.84	$12,025.63	$20,048.28	$41,697.75
78	$13,369.91	$16,706.60	$27,852.05	$57,928.56
79	$18,260.35	$22,817.53	$38,039.77	$79,117.65
80	$25,031.66	$31,278.72	$52,145.67	$108,456.05
Grand Total	**$109,209.25**	**$125,705.56**	**$247,963.52**	**$482,878.33**

Change Orders and Amendments

Change Order No.	Vendor Name	Project ID	Description	Status Date	Days	Amount
Within Contingency, to be reviewed by Engineering Committee						**$ 482,878.33**
73	Olsson	3287-000	TWAS/DAFT Area Modifications	9/27/2023		$ 67,278.13
74	Olsson	3287-000	Digester Area Ductbank Conflicts and Additional Work	9/27/2023		$ 82,810.21
75	Olsson	3231-000	Lab Building Footing Demolition	9/27/2023		$ 6,537.01
76	Olsson	3220-000	Plant 1 Additional Repair and Modification	9/27/2023		$ 39,052.96
77	Olsson	3220-000	Plant 2 Additional Repair and Modification	9/27/2023		$ 41,697.76
78	Olsson	3220-000	Aluminum Kickplate at Aeration Tanks	9/27/2023		$ 57,928.56
79	Olsson	3220-000	Phase 1 Bypass Pumping	9/27/2023		$ 79,117.65
80	Olsson	3220-000	Phases 2 and 3 Bypass Pumping	9/27/2023		$ 108,456.05
Approved by Board of Directors (Amendments)					**191**	**$ 1,318,583.14**
1	Olsson	3287-000	Addition of Loop Piping to the Existing Hot Water Lines Adjacent to Digester 3	12/12/2019	0	$ 4,725.00

2	Olsson	3287-000	Asbestos Gaskets in Boiler hazardous disposal	6/4/2020	0	$ 6,343.10
3	Olsson	3287-000	Add Analog Infrastructure and Cabling	6/4/2020	11	$ 37,969.60
4	Olsson	3287-000	Digester 4 Coating Additional Sealant	6/4/2020	3	$ 24,001.54
5	Olsson	3220-000	Valve Handwheel Ergonomic extension	8/6/2020	28	$ 16,370.30
6	Olsson	3287-000	Change to DeZurik Plug Valves to match existing	8/6/2020	90	$ 41,993.87
7	Olsson	3287-000	Digester 4 Additional Concrete Repair	8/6/2020	3	$ 7,412.74
8	Olsson	3287-000	Repair Existing Damaged Electrical Box	8/6/2020	0	$ (1,829.00)
9	Olsson	3220-000	Change the Telescoping Valve Boxes and Piping from Carbon Steel to Stainless Steel	8/6/2020	0	$ 18,677.63
10	Olsson	3287-000	Duct bank J Interferences	12/17/2020	18	$ 73,639.42
11	Olsson	3220-000	Blasting of Existing Influent Pipe Spools	12/17/2020	5	$ 20,868.52
12	Olsson	3220-000	Duct bank K Interferences	12/17/2020	0	$ 15,567.08
13	Olsson	3287-000	Digester 3/4 PLC Relocation	12/17/2020	14	$ 41,367.51
14	Olsson	3287-000	Digester 4 Additional Tank Repair	12/17/2020	18	$ 33,642.75
15	Olsson	3220-000	Duct bank O Interferences	12/17/2020	0	$ 1,686.88
16	Olsson	3287-000	Digester 3/4 Control Building Roof Replacement	2/4/2021	0	$ 42,780.00

17	Olsson	3287-000	MCC-D1 Modifications due to Change in Motor Size	5/6/2021	0	$ 34,392.02
18	Olsson	3287-000	Integrator Additional Site Visits	5/6/2021	0	$ 7,571.97
19	Olsson	3287-000	Multi-zone air conditioning unit in the Cogen MCC Room and Office	6/3/2021	0	$ 29,417.20
20	Olsson	3220-000	Overhead Walkway Removal at Plant 1 Secondary Basins 5 through 9	6/3/2021	0	$ 62,113.50
21	Olsson	3287-000	Cogeneration PLC Modifications and Integration	6/3/2021	0	$ 42,922.67
22	Olsson	3220-000	Plant 1 Secondary Basins UV Rated Wear Strips	9/2/2021	0	$ 28,965.33
23	Olsson	3287-000	MCC-F1 Design Change	9/2/2021		$ 481,290.42
24	Olsson	3287-000	DAF 2 Investigation Work and Inspection Blast	10/7/2021		$ 67,838.71
25	Olsson	3287-000	New Fiber Conduit in West Blower Building	10/7/2021		$ 4,957.71
26	Olsson	3220-000	Plant 1 Primary Basin Conduit Obstruction	10/7/2021		$ 8,444.20
27	Olsson	3220-000	Plant 1 Influent Channel Additional Coating between Primary Basins 5 and 6	10/7/2021		$ 15,469.98
28	Olsson	3287-000	MCC-F1 Lighting Changes	10/7/2021		$ 7,843.04
29	Olsson	3287-000	Digester 3 Ground Rod	10/14/2021		$ 7,269.16
30	Olsson	3220-000	New Fiber Conduits at East Electrical and Storm Water Buildings	10/14/2021		$ 8,045.43
31	Olsson	3220-000	Plant 2 Primary Influent Channel Repair Credit	12/9/2021		$ (15,903.00)

32	Olsson	3220-000	Plant 1 and 2 Telescoping Valve Pipe Supports	12/9/2021		$ 6,132.27
33	Olsson	3287-000	4" Gas Line Routing Modifications	12/9/2021		$ 18,146.07
34	Olsson	3287-000	Gas Mixer Conduit Conflict	12/9/2021		$ 12,383.89
35	Olsson	3220-000	P1 Primary Tanks 5 and 6 Temporary Power	3/10/2022		$ 7,256.05
36	Olsson	3220-000	P1 Primary Tanks Skimmers Starter Modification	3/10/2022		$ 45,374.13
37	Olsson	3220-000	P1 Primary Tanks Hopper Wall Coating	3/10/2022		$ 34,505.41
38	Olsson	3220-000	P1 Effluent Channel Conduit Conflict	3/10/2022		$ 9,274.98
39	Olsson	3220-000	P1 Primary Tanks Torque Limit Switch	3/10/2022		$ 7,149.86
40	Olsson	3287-000	Multi-zone air conditioning unit in the Cogen MCC Room and Office	3/10/2022		$ (2,309.09)
41	Olsson	3287-000	DAFT 2 Repair	3/10/2022		$ 59,403.53
42	Olsson	3287-000	Digesters 1 and 2 Heat Exchanger Layout Reconfiguration Electrical	6/2/2022	1	$ 12,885.18
43	Olsson	3287-000	Digester 3 Heat Exchanger Hot Water Loop Tie-In	6/2/2022		$ 2,774.58
44	Olsson	3220-000	Plant 1 Primary Basin 1 Shutdown Repair Work	6/2/2022		$ 1,009.86
45	Olsson	3287-000	Replace Compressor Line and Valve at Digester 4	6/2/2022		$ 10,762.85
46	Olsson	3220-000	Plant 2 Influent Gates Removal and Concrete Demo	6/2/2022		$ 5,389.66

47	Olsson	3287-000	DAFT 2 Launder Support Detail	6/9/2022		$ 45,682.30
48	Olsson	3220-000	Plant 1 Primary Basins 1, 2, 5 and 6 Coating Removal	6/9/2022		$ 111,101.16
49	Olsson	3220-000	Plant 1 Primary Basins 1, 2, 5 and 6 Existing Equipment Removal and Reinstallation	6/9/2022		$ 71,864.17
50	Olsson	3287-000	Digester Mixing Pumps Control Programming Change	8/4/2022		$ 4,397.77
51	Olsson	3220-000	Plant 1 Primary Basins Skimmers I/O Connection and Programming Change	8/4/2022		$ 14,237.83
52	Olsson	3287-000	Fiber Patch Cables to Connect the Centrifuge PLC to the Centrifuge Patch Panel	8/4/2022		$ 3,755.90
53	Olsson	3220-000	Plant 1 Primary Basins 3 and 4 Coating Removal	8/4/2022		$ 43,222.24
54	Olsson	3220-000	Plant 1 Secondary Basins Concrete Structural and Basins 2 and 3 Drive Plate Rework	8/4/2022		$ 20,860.16
55	Olsson	3220-000	Plant 2 Primary Basins Repair and Rehab of Head-Shaft Bearings	8/4/2022		$ 4,618.44
56	Olsson	3231-000	Board SOCWA Front Office with Plywood to Cover Windows	8/4/2022		$ 3,305.76
57	Olsson	3220-000	Seal the Openings at Plant 1 Primary Influent and Effluent Channels	8/4/2022		$ 25,491.03

58	Olsson	3220-000	Plant 1 Primary Basins 3 and 4 Existing Equipment Removal and Reinstallation	9/1/2022		$ 26,498.32
59	Olsson	3220-000	Plant 1 Secondary Basins Existing Embedded Metal Plates	9/1/2022		$ 4,290.48
60	Olsson	3220-000	Plant 2 Primary Baffle Frame Replacement	9/1/2022		$ 18,291.57
61	Olsson	3287-000	Digester hatch connection, temperature gauge adjustment, and potholing	11/3/2022		$ 9,971.62
62	Olsson	3220-000	Plant 1 Primary and Secondary Basins crack injection, concrete repair, channel cleaning, solids removal	11/3/2022		$ 146,734.55
63	Olsson	3287-000	Boiler Room Modifications	12/8/2022		$ 14,797.83
64	Olsson	3287-000	DAFT 1 Repair	12/8/2022		$ 66,992.33
65	Olsson	3220-000	Secondary Clarifier Telescoping Valve Modifications (Design Error)	12/8/2022		$ 32,709.94
66	Olsson	3287-000	Digester Control Buildings Modifications	2/2/2023		$ 9,746.81
67	Olsson	3220-000	Plant 1 and 2 Field Obstructions	2/2/2023		$ 8,871.74
68	Olsson	3287-000	MCC-F1 Site Modifications	2/2/2023		$ 57,233.12
69	Olsson	3287-000	DAFT and TWAS area additional slab modification and piping material change	2/2/2023		$ 19,368.58
70	Olsson	3287-000	DAFT 1 Area Reconfiguration	3/2/2023		$ 3,046.43

71	Olsson	3287-000	Digester 2 Hot Water Loop Change	3/2/2023		$ 29,525.46
72	Olsson	3220-000	Plant 1 Seal Influent Channel Openings and Helical Drives Temporary Covers	4/6/2023		$ 10,831.51
Deduct-Common	Olsson	3231-000	Energy Building Monorail System Descope (F1-F4)	8/4/2022		$ (70,585.34)
Deduct-Liquids	Olsson	3220-000	Effluent Pump Station Descope (A1-A6)	8/4/2022		$ (483,605.73)
Deduct-Solids	Olsson	3287-000	Energy Building Modifications Descope (G1-G2, & H1-H2)	8/4/2022		$ (357,382.60)
HAL 01	Hallsten	3220-000	Cover Layout Modifications	8/4/2022		$ 16,715.25
Approved by Board of Directors (Amendments)						**$ 1,651,288.00**
1CM Common	Butier	3231-000	CM Change Order No. 1	7/13/2021		$ 48,995.00
1CM Liquids	Butier	3220-000	CM Change Order No. 1	7/13/2021		$ 294,125.00
1CM Solids	Butier	3287-000	CM Change Order No. 1	7/13/2021		$ 269,595.00
1ESDC Common	Carollo	3231-000	ESDC Change Order No. 1	6/3/2021		$ 18,210.00
1ESDC Liquids	Carollo	3220-000	ESDC Change Order No. 1	6/3/2021		$ 109,256.00
1ESDC Solids	Carollo	3287-000	ESDC Change Order No. 1	6/3/2021		$ 100,151.00
1G Common	Ninyo & Moore	3231-000	Geotechnical Services Change Order No. 1	2/3/2022		$ 5,400.00
1G Liquids	Ninyo & Moore	3220-000	Geotechnical Services Change Order No. 1	2/3/2022		$ 12,300.00
1G Solids	Ninyo & Moore	3287-000	Geotechnical Services Change Order No. 1	2/3/2022		$ 12,300.00
2CM Liquids	Butier	3220-000	CM Change Order No 2	5/12/2022		$ 196,268.00
2CM Solids	Butier	3287-000	CM Change Order No. 2	5/12/2022		$ 196,268.00

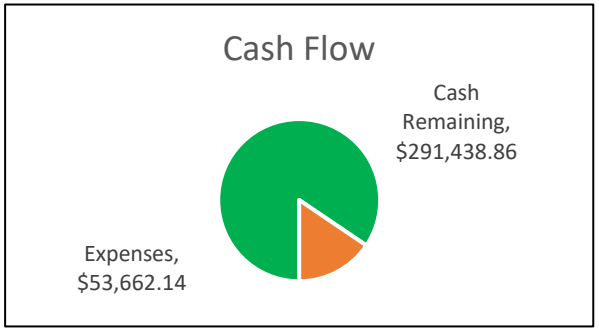
2ESDC Common	Carollo	3231-000	ESDC Change Order No. 2	12/9/2021		$ 11,075.00
2ESDC Liquids	Carollo	3220-000	ESDC Change Order No. 2	12/9/2021		$ 196,440.00
2ESDC Solids	Carollo	3287-000	ESDC Change Order No. 2	12/9/2021		$ 180,905.00
Grand Total					**191**	**$ 3,452,749.47**

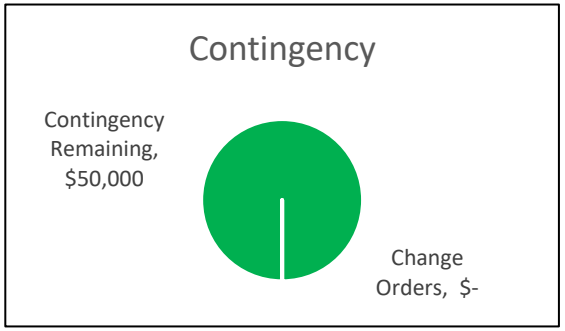
Project Financial Status

Project Committee	24
Project Name	Aliso Creek Ocean Outfall Internal Seal Replacement
Project Description	Replacing 5 seals on the interior of the outfall

Data Last Updated

September 28, 2023





Cash Flow

Collected	$	345,101.00
Expenses	$	53,662.14

Project Completion

Schedule	53%
Budget	5%

Construction Contracts

Company	PO No.	Original	Change Orders	Amendments	Total	Invoiced
J.F. Brennan	19185	$ 261,753.00			$ 261,753.00	$ -
Black & Veatch	18544	$ 75,310.00			$ 75,310.00	$ 17,612.50
		$ 337,063.00	**$ -**	**$ -**	**$ 337,063.00**	**$ 17,612.50**

**Values include change orders to be reviewed by Engineering Committee and deductive change orders*

Construction Contingency

Area	Project Code	Amount	Change Orders	Total Remaining	Percent Used
Outfall	3480-000	$ 50,000.00	$ -	$ 50,000.00	0.0%
		$ 50,000.00	**$ -**	**$ 50,000.00**	**0.0%**

Agenda Item 7

Engineering Committee Meeting

Meeting Date: October 12, 2023

TO: Engineering Committee

FROM: Roni Grant, Associate Engineer

SUBJECT: Contract Award for Coastal Treatment Plant (CTP) Diffuser Replacement Project [Project Committee 15]

Overview

The aeration diffusers for the Coastal Treatment Plant (CTP) have exceeded their useful life and are in need of replacement. SOCWA pre-purchased the new diffusers in 2021. The diffusers were delivered earlier this year, and the invitation for bids was published on August 24, 2023.

Bids

SOCWA solicited bids from qualified contractors through Planetbids and met with potential bidders for a pre-bid meeting. Three bids were received and are summarized below in Table 1.

The engineer's estimate for the work is $1.25 M.

Table 1 – Summary of Bids

Bid Breakdown	SS Mechanical	Filanc	Kingmen
Mobilization, inventory, demobilization, and cleanup	$47,142	$57,250	$60,000
Installation of new diffuser systems in Basins E-1 and E-2	$381,195	$260,000	$366,688
Installation of new baffle walls and new diffuser system in Basin E-3	$307,785	$272,000	$266,500
Installation of new diffuser systems in Basins W-1 and W-2	$371,710	$259,000	$395,000
Startup and commissioning	$46,400	$56,000	$61,900
All other items necessary to complete the work	$42,700	$118,000	$7,000
Base Bid	**$1,196,932**	**$1,022,250**	**$1,157,088**
Bid additive - Additional basin solids and sand removal	$0	$122,000	$137,400
Total Bid	**$1,196,932**	**$1,144,250**	**$1,294,488**

Contingency

There will be solids and sand to be removed prior to installation of the diffuser system in four basins. The actual quantity of the solids and sand will be determined upon draining each basin. Therefore, staff is requesting a contingency of $122,000 to cover additional basin solids and sand removal for this project.

Cost Allocation

The cost allocation for the construction and contingency is shown in Table 2.

Table 2 – Cost Allocation by Member Agency

Agency	Construction	Contingency	Total
City of Laguna Beach	$387,539.55	$46,250.75	$433,790.30
Emerald Bay Service District	$30,514.93	$3,641.79	$34,156.72
Moulton Niguel Water District	$299,046.27	$35,689.55	$334,735.82
South Coast Water District	$305,149.25	$36,417.91	$341,567.16
Total	$1,022,250.00	$122,000.00	$1,144,250.00

This work is funded by project 35228L-000. The project has a budget of $2.5 M for the construction and ESDC services.

Recommended Action: Staff recommends that the Engineering Committee recommend that the PC 15 Board of Directors award the contract to Filanc in the amount of $1,022,250 for the CTP Aeration Diffusers Replacement Project with a contingency of $122,000.

Agenda Item 8

Engineering Committee Meeting

Meeting Date: October 12, 2023

TO: Engineering Committee

FROM: Roni Grant, Associate Engineer

SUBJECT: Contract Award for J.B. Latham Treatment Plant (JBL) Centrate Line Upgrades Project [Project Committee 2]

Overview

The J.B. Latham Treatment Plant (JBL) uses centrifuges to dry solids removed from the wastewater stream. Centrate is the liquid that is removed from the solids in the centrifuges. The centrate is returned to the treatment plant for further treatment. The pipes that convey the centrate from the centrifuges back to the treatment plant are in need of replacement. The invitation for bids was published on September 1, 2023.

Bids

SOCWA solicited bids from qualified contractors through Planetbids and met with potential bidders for a pre-bid meeting. Two bids were received and are summarized below in Table 1.

The engineer's estimate for the work is $300,000.

Table 1 – Summary of Bids

Bid Breakdown	Filanc	SS Mechanical
Mobilization and demobilization	$12,000	$4,265
Replacement of centrate drain piping, non-portable water piping and appurtenances in the Solids Dewatering Building associated with Centrifuge No. 1	$65,000	$33,565
Replacement of centrate drain piping, non-portable water piping and appurtenances in the Solids Dewatering Building associated with Centrifuges Nos. 2 and 3	$121,000	$95,625
All other items necessary to complete the work that are not described in Bid Items A1 through A3, which might include, but not limited to: temporary connections, startup, and testing	$54,000	$15,000
Total Bid	**$252,000**	**$148,455**

Contingency

There is a short window for the contractor to complete the work at each centrifuge since it is an essential part of the operations. Therefore, staff is requesting a contingency of $14,850 for this project.

Cost Allocation

The cost allocation for the construction and contingency is shown in Table 2.

Table 2 – Cost Allocation by Member Agency

Agency	Construction	Contingency	Total
Santa Margarita Water District	$86,668.03	$8,669.43	$87,689.06
Moulton Niguel Water District	$32,095.97	$3,210.57	$36,389.18
South Coast Water District	$29,691.00	$2,970.00	$39,227.28
Total	$148,455.00	$14,850.00	$163,305.00

This work is funded by project 3234-000. The project has a budget of $450,000 for the construction and ESDC services.

Recommended Action: Staff recommends that the Engineering Committee recommend that the PC 2 Board of Directors award the contract to SS Mechanical in the amount of $148,455 for the JBL Centrate Line Upgrades Project with a contingency of $14,850.

Agenda Item 9

Engineering Committee Meeting

Meeting Date: October 12, 2023

TO: Engineering Committee

FROM: Roni Grant, Associate Engineer

SUBJECT: Effluent Transmission Main Trail Bridge Crossing Project Update [Project Committee 21, Reach D]

Overview

This agenda item provides a recommendation to amend the engineering services contract for Tetra Tech for the final design of the Effluent Transmission Main (ETM) Trail Bridge Crossing Design Project. The original contract was awarded in March 2018 for $345,370. In October 2018, scope was added to Amendment No. 1 for $21,758 to prepare a concept review report prior to developing the final design. The report was completed in 2019. Additional tasks were added to Amendment No. 2 in January 2022 for $136,439, which included biological, cultural surveys, CEQA preparation, and permitting.

SOCWA retained Tetra Tech to prepare a Technical Memorandum in 2014 to develop a conceptual-level alternative design for the Trail Bridge ETM crossing site. In March 2018, Tetra Tech was awarded the contract to complete the design for the crossing protection project. The project has been on hold since June 2022, and additional tasks were required to determine if the original approach is still feasible. The scope of work for Amendment No.3 includes the following additional tasks:

- Revisit the 2019 Report to update the existing ground measurement and prepare a memorandum to summarize the status.
- Evaluate various failure possibilities
- Develop additional conceptual project alternative approaches to comply with new RWCQB construction permitting requirements.
- Develop a monitoring plan to inspect and monitor the exposed portion of the Trail Bridge ETM crossing site.

Cost Analysis

The proposed cost for Amendment No. 3 is $53,571. This project is associated with project number: 3101-000 (Trail Bridge ETM Reach D); this project has sufficient funds collected to cover the cost of this amendment. Table 1 below shows the cost breakdown by member agency for the tasks associated with Amendment No. 3.

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Table 1 – Cost allocation by member agency for Tetra Tech Amendment No. 3

Agency	Tetra Tech Amendment No. 3
Project ID	3101-000
ETWD	$ 26,785.60
IRWD	$ 26,785.60
Total	**$53,571.00**

Recommended Action: Staff recommends that the Engineering Committee recommend that the PC 21 Reach D Board of Directors approve the Tetra Tech Amendment No. 3 in the amount of $53,571, for a total revised contract amount of $557,138, for the final design of the Effluent Transmission Main Trail Bridge Crossing Project.

January 5, 2022

SOCWA Trail Bridge Effluent Transmission Main Crossing Design

Modification No. 3 to Original SOW – Scope of Work for Additional Work

This Scope of Work (SOW) is a modification (MOD) to the original contract to request additional funding to the original tasks to provide additional support requests by South Orange County Wastewater Authority (SOCWA). The SOW has been prepared based on the conference call discussion between SOCWA and Tetra Tech on July 28, 2023.

Per SOCWA's request, Tasks 1 through 15 and 19 of the project have been on hold since June 2022 and will be on hold unless otherwise directed in future by SOCWA. Tasks 16 and 18 have been completed, and there is no Task 17.

It should be noted that the existing Trail Bridge ETM crossing site was identified in the 2014 study by Tetra Tech as one of the critical infrastructures in need of protection against potential channel scour and erosion. There will be continued risk to this ETM crossing if scour and erosion protection is not implemented.

Task 20: Revisit the 2019 Report

Task 20.1: Update Existing Ground Measurement in the 2019 Report

Tetra Tech will field measure existing ground at the upstream and downstream faces of the existing Trail Bridge ETM encasement in the creek and compare to the 2019 measurements to determine any progression of erosion in the immediate vicinity of the encasement. The measurement will be taken by placing a survey rod into the creek bed against the existing encasement. Visual assessment of the project site will also be performed for any sign of erosion for comparison with the 2019 condition, and qualitative evaluation of erosion will be documented. No additional field survey will be performed.

Task 20.2: Prepare a Memo Summarizing Current Status of Each Task in the 2019 Report

Tetra Tech will revisit each task in the 2019 report and summarize the current status and to-do list of each task to complete the project. The memo will help SOCWA to restart and complete the project in future if the agency decides to do so.

Task 21: Evaluate Various Failure Possibilities and Additional Conceptual Approaches to Mitigate the Failures

Tetra Tech will evaluate various failure possibilities that may damage the existing Trail Bridge ETM encasement in the creek, including erosion under the encasement, damages by floating debris, etc. Tetra Tech will assess potential scenarios that would cause the events and discuss the consequences of each failure.

Tetra Tech will explore additional conceptual approaches to mitigate the failure possibilities, including tunneling, a different pipe location, and one additional construction alternative concept. A potential non-construction alternative concept will also be evaluated. These approaches will be evaluated with conceptual-level typical sections and an order of magnitude cost estimates for comparison. No design drawings will be developed. No structural or geotechnical analysis will be performed. These additional conceptual design approaches will be compared to the 2019 riprap protection design in terms of total construction costs, constructability, potential environmental impacts/mitigation, expected life of each approach. No additional environmental impact/mitigation study will be performed but the conceptual approaches will be only compared in terms of sizes of impacted areas.

Task 22: Develop a Monitoring Plan

Tetra Tech will develop a monitoring plan to inspect and monitor the exposed portion of the Trail Bridge ETM crossing site. The plan will outline the requirements and activities necessary to monitor the project crossing for any sign of erosion and/or damages. The plan will recommend frequencies of monitoring and what needs to be monitored in the field.

It should be noted that a monitoring plan cannot replace the need for more permanent improvement and protection features at the project site.

Deliverables

Tasks 20 through 22

The draft memo documenting findings and discussions from Tasks 20 through 22 will be submitted to SOCWA 8 weeks after the receipt of notice to proceed. After a 2-week review period by SOCWA, the final memo which addresses any review comment will be submitted 3 weeks after the receipt of review comments.

Proposed Task Fee Summary

Task No	Task	Fee
20	Revisit the 2019 Report	$ 17,967
21	Evaluate Various Failure Possibilities and Additional Conceptual Approaches to Mitigate the Failures	$ 24,882
22	Develop a Monitoring Plan	$ 10,722
	Total:	**$ 53,571**

Tetra Tech Fee Proposal

Trail Bridge ETM Crossing

TASK NO.	Task	QA/QC (Program Manager)	Program Manager	Sr. PM	PM 2	Sr. Engineer 4	Sr. Engineer 1	Engineer 3	Sr. Project Admin.	TOTAL HOURS	ODC [1]	TOTAL FEE
		$ 347	$ 310	$ 275	$ 265	$ 235	$ 190	$ 155	$ 125			
1	Revisit the 2019 Report											**$ 17,967**
1.a	Update Existing Ground Measurement in the 2019 Report			1	4	6	4	8		23	$ 75	
1.b	Prepare a Memo Summarizing Current Status of Each Task in the 2019 Report	1	2	2	16	16	8	12	2	59		
2	Evaluate Various Failure Possiblities and Conceptual Options to Mitigate the Failtures											**$ 24,882**
2.a	Evaluate Various Failure Possiblities	1	2	2	12	16	8	10		51		
2.b	Conceptual Options to Mitigate the Failtures		2	2	14	16	16	10	1	61		
3	Develop a Monitoring Plan											**$ 10,722**
3.a	Develop a Monitoring Plan	1	2	2	12	16	8	4	1	46		
	Total	**3**	**8**	**9**	**58**	**70**	**44**	**44**	**4**	**240**	**$ 75**	**$ 53,571**

Note: 1. ODC includes 12% profit and 13.42% G&A, which are reflected in the cost shown.

Agenda Item 10

Engineering Committee Meeting

Meeting Date: October 12, 2023

TO: Engineering Committee

FROM: Roni Grant, Associate Engineer

SUBJECT: Regional Treatment Plant Standby Generation Study [Project Committee 17]

Overview

On September 6, 2022, the Regional Treatment Plant (RTP) experienced a power outage that lasted more than 12 hours. During the outage, the cogeneration engine was not running, and only certain plant equipment was able to run on emergency power.

SOCWA retained Carollo Engineers to perform a standby power study to evaluate the practicality of several standby power configurations during the loss of utility power. The study was completed in July 2023.

Carollo's recommendation for ensuring maximum power system reliability is to equip RTP with a permanent 1,500-kw standby generator along with a permanent load bank. The existing MCC A, C, G, and H replacement design by Lee & Ro has been on hold at 35% design, pending the outcome of the standby generation study. Carollo will also design a temporary generator connection as part of the standby generation study if needed.

Recommended Action: Staff recommends that the Engineering Committee recommend that the PC 17 Board of Directors provide direction on moving forward with the MCC replacement design.

South Orange County Wastewater Authority
Regional Treatment Plant

Technical Memorandum
STANDBY GENERATION STUDY

FINAL | July 2023

carollo

South Orange County Wastewater Authority

Technical Memorandum
STANDBY GENERATION STUDY

FINAL | July 2023

Digitally signed by Christopher L. Loving
Contact Info: Carollo Engineers, Inc.
Date: 2023.07.18 15:03:34 -06'00'

Contents

Appendices

Tables

Figures

Section 1

INTRODUCTION

The Regional Treatment Plant's (RTP) 480-volt distribution system was originally constructed in 1982 through 1984, with most of the original equipment manufactured in 1984. Expansions and other work replaced and added electrical gear in 1996, 2005, 2008, 2009, and 2017. Most recently, the cogeneration (cogen) and service entrance switchgear were replaced. The cogen system is not currently able to provide power to the plant loads during an outage by the electric utility, Southern California Edison (SCE).

The South Orange County Wastewater Authority (SOCWA) has retained Carollo Engineers, Inc., (Carollo) to perform a standby power study to evaluate practicability of several standby power configurations during the loss of utility power.

Section 2

EXISTING DISTRIBUTION AND STANDBY POWER SYSTEM

The service entrance gear at the RTP, as well as the sub fed main distribution gear, are both American National Standards Institute-class switchgear located in the Energy Building and provide power to all the motor control centers (MCCs) at the plant. Some of these MCCs have receptacles for connection to a temporary, trailer-mounted generator. SOCWA has a single permanent 250-kilowatt (kW) Caterpillar C9 generator connected providing backup power to the interstage pump station. In addition to the permanent generator SOCWA has two portable trailer-mounted diesel generators for providing local standby power to individual MCCs. One generator is a Caterpillar D150-8 with a 150-kW rating and the other is a Caterpillar C9 with a 250-kW rating. Comparing the generator ratings with the total connected standby load, these generators are only capable of providing individual standby power to a select few of the MCCs within the RTP. The existing standby power system falls short of meeting the reliability requirements outlined in the Environmental Protection Agency (EPA) 430-99-74-01 design criteria for wastewater treatment electrical systems. These requirements necessitate an adequate standby power supply to operate all essential components during periods of peak waste water flow, as well as critical lighting and ventilation.

Section 3

STANDBY PROCESS ASSESSMENT

For this study, plant operations staff categories electrical into three levels (high, medium and low) based on how long the equipment can be off before it starts to affect plant operations. High priority loads should not remain unpowered for periods greater than four hours. Medium priority may be offline for up to10 hours while low priority loads can be unpowered for periods of 24 hours or less. The plant loads can be broken down further into duty and standby loads. Some loads such as blowers 2 and 3 are listed as high priority loads but are not run during normal plant operations and serve only as a backup. As such, these loads should not be considered in the standby power assessment. Table 1 and Figure 1 show the breakdown of plant loads based on priority and duty/standby.

Table 1 RTP Load Priority

Load Priority	Number of Loads	Number of Duty Loads	Duty Load hp
High	42	20	684
Medium	114	89	710
Low Loads	59	45	180
Total	215	154	1,574

Notes:
Abbreviations: hp - horsepower.

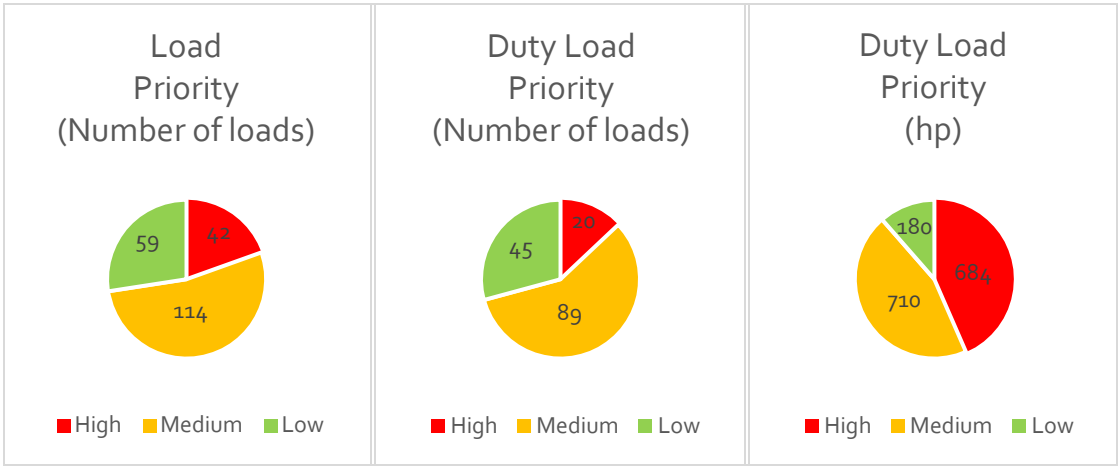

Figure 1 RTP Load Priority Distribution

Section 4

UTILITY POWER OUTAGE ANALYSIS

Based on the metering information obtained from SOCWA. From 2018 to 2021, there were seven power outages. The metering data during this time period does not indicate the duration of each outage. From 2021 and 2022, there were 13 recorded outages. Comparing the recorded outages with corresponding supervisory control and data acquisition trends suggests that only 17 of the 20 recorded outages were false positives and not genuine power outages. Among the recorded power outages, three were confirmed to be real outages. The durations of these outages were 30 minutes, 17 hours, and 19 hours, respectively.

No outages occur between the 1- to 4-hour timeframe during which high priority loads need to be run to keep the plant operational. Two of the three power outages persisted greater than 10 hours and would affect all loads. Although the duration and frequency of past outages do not reliably forecast future occurrences, the presence of only two significant power outages in the past five years suggests that these disruptions are rare events. As such it is most practical to size the standby power to accommodate all high, medium, and low criticality loads.

Section 5

STANDBY POWER ANALYSIS

The standby power analysis was performed using Caterpillar's generator sizing software and the SOCWA provided load list. The load list provided deviates slightly from the record drawings. However, SOCWA confirmed the load list is the most up to date information available. The sizing was performed based only on duty loads running at 100 percent brake hp. The plant will typically not be running at 100 percent capacity as such the motor power requirements will be less than the motor nameplate. Additionally, the calculations were performed using the worst-case scenarios for all non-continuous loads. All transformers were assumed to be two-thirds loaded. These assumptions cause the plant capacity in the study to be slightly higher than the metering data shows but should represent worst case conditions.

To ensure power system reliability and reduce damage to the plant equipment all calculations were performed using a maximum allowable voltage and frequency dip of 10 percent. Voltage dip, also known as voltage sag or momentary voltage reduction, is a temporary decrease in the voltage level of an alternating current power system. Starting large motor loads such as blowers are a common cause of voltage dip in power systems. When a motor is started, it draws a large amount of inrush current from the power system to overcome its initial inertia and establish motion and magnetic field. This high starting current causes a drop in the generators output voltage. Large voltage dips can have a number of negative effects on the power system, including equipment damage and nuisance tripping of protective devices. Motor soft starters can reduce the initial inrush current of the motor requiring a smaller generator to meet the voltage dip requirements. Motor inrush current can vary slightly between different soft starters, our calculations assume a 300 percent motor full load current. While motor soft starters can help to

limit inrush current variable frequency drives are current limiting and will eliminate any inrush. These devices reduce the initial inrush current of the motor, limiting the magnitude of the voltage dip and protecting sensitive equipment.

In addition to voltage dips, deviations in the generator frequency can also have an adverse effect on the plant's operations. Generator frequency variations are typically caused by sudden changes in load. Using a larger generator can help to reduce frequency deviations issues. A larger generator will have more inertia and will require more force to change its rotational speed. If the frequency deviation is too high, it can cause equipment to operate at speeds that are outside of its design range, which can cause damage or failure of plant equipment. To combat this, modern generator and power systems are equipped with governors and relaying to stop the generator or shut down the plant in the event of dangerous frequency deviations. While this shut down is critical to protect the plant, it can interrupt plant operations. These restrictions are often the limiting factor in many of the generator sizing scenarios causing the generator size to operate at a fraction of its rated capacity once all loads are running.

The sizing for each generator configuration includes three scenarios: All duty high priority loads, all high and medium priority loads, and all loads. All non-controllable loads such as lighting and heating, ventilation, and air conditioning were accounted for in the starting step of each scenario. Additionally, it was indicated that SOCWA may deviate from normal operation and run one of the backup Hoffman Blowers (300 hp) as an alternative to the Turblex Blower (450 hp) during a power outage. All scenarios that include power feeds to MCC-30310 (Blower MCC) have additional scenarios performed using both the Hoffman and Turblex. Furthermore, all the scenarios were evaluated considering a centralized generation system, a distributed generation standby power system, and a standby power system utilizing an islanded cogen system.

Section 6

CENTRALIZED STANDBY GENERATION

A single permanent standby generator may be installed near the energy building and used to supply the entire plant with power during an outage. This approach would require the installation of a transfer switch between the SCE transformer and the main switchgear or the installation of a new feeder breaker on the switchgear with breaker transfer controls to switch the plant from utility power to standby power during an outage and back once utility power is restored. The required size of the new generator would depend on the priority of the loads being supplied (refer to Table 2).

If the operation of the Turblex blower is required and only the high priority loads are powered, a 1,500 kW/1,875 kilovolt-ampere (kVA) generator is required. High and medium priority loads would require a 1,500 kW/1,875 kVA and all loads would also require a 1,500 kW/1,875 kVA generator. Although the generator is only 50 percent loaded when running only the high priority and non-controllable loads, the minimum size is restricted by the voltage dip caused by the large inrush current of the 450 hp Turblex blower. Due to this, it is most logical to operate all plant loads as the generator size requirement will be the same regardless of load priority.

If the plant operates a Hoffman blower during an outage, the required generator can be reduced to 1,000 kW/1,250 kVA gen set when powering only high priority loads. However, the minimum size increases to 1,500 kW/1,875 kVA for all high and medium priority loads and remains at 1,500 kW/1,875 kVA for loads. As such, if a single plant wide permanent generator is required, only high priority loads are needed and the Hoffman blower is used, then a 1,000 kW/1,250 kVA generator will meet the plant requirements. However, if SOCWA intends to provide standby power for medium priority loads, the required generator size increases to 1,500 kW regardless of what blower is operating.

Table 2 Full Plant Minimum Generator Size Requirements

Generator Configuration	High Priority Loads	High Priority Loads Used Capacity	High/Med Priority Loads Size	High/Med Priority Loads Used Capacity	All Loads Size	All Loads Used Capacity[3]
Full Plant[1]	1,500 kW/ 1,875 kVA	50.6%	1,500 kW/ 1,875 kVA	90.3%	1,500 kW/ 1,875 kVA	93.6%
Full Plant[2]	1,000 kW/ 1,250 kVA	64.5%	1,500 kW/ 1,875 kVA	82.7%	1,500 kW/ 1,875 kVA	86.0%

Notes:
(1) Generator sizing based on operation of Turblex blower (450 hp) with existing soft starter.
(2) Generator sizing based on operation of Hoffman blower (300 hp) with existing soft starter.
(3) Used capacity represents the percentage of the total powered load compared to the total generator capacity.

If SOCWA chose to install a new permanent generator, RTP would have the option to implement an open or closed transition for the power transfer. Closed and open transition are two methods of transferring a load between utility and standby power sources. An open transition involves the use of an automatic or manual transfer switch or system. During standby power operation after the utility power is restored the switch first disconnects the loads from the generator allows the plant to shut down then proceeds to connect to the power system back to the utility feed and restarts the plant. This is the simplest and most straight forward solution. It requires no extra equipment or utility coordination.

In a closed transition transfer, the plant is transferred back to the utility power source from the standby power source with no interruption. This is accomplished by allowing the transfer switch to close on both feeds at once paralleling the sources briefly before the load is transferred completely to the utility. However, this can only be accomplished with special transfer controls and relaying capable of synchronizing the standby power system with the utility feed. Additionally, the closed transfer scheme must be reviewed and approved by SCE prior to operation to ensure compliance with the Rule 21 requirements.

Benefits of open transition:

- Less expensive.
- Ease of installation permitting and maintenance.

Benefits of closed transition:

- **Smooth transfer**: Closed transition provides a smooth and seamless transfer of power between the primary and secondary sources, which is especially important for sensitive equipment that cannot tolerate even a momentary interruption in power.

- **Reduced wear and tear**: Closed transition can help reduce the wear and tear on electrical equipment because it avoids the power surges and fluctuations that can occur during an open transition.
- **Reduced inrush current**: Closed transition switches can also help to reduce inrush current, which is a sudden surge of electrical current that can occur when a motor or other equipment is switched on.
- **No need for a load bank to exercise the generator**: The power feed can be switched between the utility and standby power system without needing to shut down the plant. This can allow operators to exercise the generator using the plant load instead of a load bank or having to drop all plant load to transfer to generator power.

A rental portable generator could also be utilized to provide standby power to the main switchgear and feed power to the entire plant. This approach would require the installation of a manual transfer switch between the SCE transformer and the main switchgear or the installation of a new feeder breaker on the switchgear with a kirk key interlock between the main power feed and the standby power feed to prevent both breakers closing simultaneously.
A 1-megawatt (MW) or 1.5-MW generator could be rented from Sunbelt rentals (SOCWA Local Rep: Lisa M Jimenez, (562) 215-8639, Lisa.Jimenez@sunbeltrentals.com) and delivered to the site during an outage. The only way to reliably ensure the availability of a generator this large would place it on a yard hold. A yard hold would require SOCWA to pay a reduced monthly fee to have the generator reserved for their use. Once an outage occurs the generator would be deployed and SOCWA would pay the standard rental fee for the unit. See Table 3 for the fee schedule, note that additional costs may be accrued for refueling and deployment during declared states of emergency. If SOCWA chose not to yard hold, there would be no guarantee that the generator would be available during an outage.

Renting a portable generator would mean that SOCWA would not be responsible for emissions permitting, exercising or maintenance. However, even with a yard hold, it could still take as much as 4 hours for the generator to be shipped from the storage site to the RTP. Once there, the plant electricians would be responsible for tying the portable generator into the connection cabinet before the generator could be started and the plant brought back online. This setup time would likely exceed the 1-to 4-hour timeframe of the high priority loads.

Table 3 Full Plant Rental Generator Rates

Generator Capacity	Yard Hold Rate (monthly)	Rental Rate (daily)	Generator Purchase Price (one time purchase)
1,500 kW	$23,400	$4,315	$662,100

Section 7

DISTRIBUTED STANDBY GENERATION

The other solution to providing plant-wide backup power is to distribute the load amongst several portable generators, each powering one of the main plant load centers. There are some advantages to having distributed generation. SOCWA already owns a pair of trailer-mounted units and has some infrastructure for supporting a distributed generator system. However portable generator connection cabinets would need to be added to MCC-A, MCC-B, MCC-C, MCC-G, MCC-H, MCC-M, and MCC-30310. A small minority of these MCCs may not have adequate space to install a connection to a portable generator cabinet. The feed to these select MCCs may need to be intercepted and a transfer switch installed between the incoming feed and the MCC. If there is a partial failure of the facility's main distribution gear or a failure in the feeder cables feeding MCCs throughout the plant, distributed generation can provide temporary power while these issues are resolved. The minimum required generator size for each MCC is shown in Table 4.

Plant staff have expressed concern about the feasibility of powering the entire RTP with distributed generators, especially portable generators during an emergency. Operations staff indicated critical standby loads on all 12 MCCs at the plant. This will require 12 trailer-mounted generators and cables that all need to be brought in, manually plugged in, and turned on and then the same steps in reverse after power returns to normal. The plant only has three electricians and operations staff to perform this work, as well as maintain, exercise, and test the generators. Additionally, plantwide standby capacity would be roughly 3,500 kW (Turblex blower) or 2,650 kW (Hoffman blower) compared to the required 1,500 kW required if there was a single plantwide backup generator.

Table 4 Distributed Minimum Generator Size Requirements

Bus	High Priority Loads	High Priority Loads Used Capacity	High/Med Priority Loads Size	High/Med Priority Loads Used Capacity	High/Med/Low Priority Loads Size	High/Med/Low Priority Loads Used Capacity
MCC-A(2)	None	None	400 kW/500 kVA	38.0%	400 kW/500 kVA	43.0%
MCC-B	None	None	40 kW/50 kVA	88.5%	40 kW/50 kVA	95.5%
MCC-C(1)	None	None	300 kW/357 kVA	26.0%	300 kW/357 kVA	33.0%
MCC-D	None	None	300 kW/375 kVA	73.5%	300 kW/375 kVA	83.3%
MCC-E	300 kW/375 kVA	40.4%	300 kW/375 kVA	40.4%	300 kW/375 kVA	40.4%
MCC-F(2)	175 kW/218.8 kVA	74.0%	175 kW/218.8 kVA	94.3%	250 kW/312.5 kVA	76.9%
MCC-G	200 kW/250 kVA	34.6%	200 kW/250 kVA	53.8%	350 kW/437.5 kVA	45.9%
MCC-H	200 kW/250 kVA	33.5%	200 kW/250 kVA	33.5%	200 kW/250 kVA	47.1%
MCC-M	None	None	450 kW/562.5 kVA	60.8%	450 kW/562.5 kVA	60.8%
MCC-30310(1, 3)	1,500 kW/1,875 kVA	25.0%	1,500 kW/1,875 kVA	25.0%	1,500 kW/1,875 kVA	25.0%
MCC-30310(4)	700 kW/875 kVA	37.9%	700 kW/875 kVA	37.9%	700 kW/875 kVA	37.9%
DP-H	None	None	150 kW/187.5 kVA	47.9%	150 kW/187.5 kVA	47.9%
DP-1(1)	1,500 kW/1,875 kVA	44.7%	1,500 kW/1,875 kVA	44.7%	1,500 kW/1,875 kVA	44.7%
DP-1(4)	700 kW/875 kVA	42.5%	700 kW/875 kVA	71.0%	700 kW/875 kVA	74.0%

Notes:
Abbreviations: DP - distribution panel.
(1) Generator load bank is recommended to prevent wet stacking due to large amount of unused capacity.
(2) Load lists odor scrubber as a combination of multiple loads. Generator minimum size may be reduced if the odor scrubber loads can be started independently.
(3) Generator sizing based on operation of Turblex blower 3 (450 hp) with existing soft starter.
(4) Generator sizing based on operation of Hoffman blower 1 (300 hp) with existing soft starter.

Furthermore, because some MCCs such as MCC-C and MCC-30310 contain a large motor load and little additional load, the minimum size is completely dependent on the large inrush current necessary to start those motors. This means that once the generators reach steady state, they will be operating close to or below 30 percent of their total capacity. At such low used capacity generator wet stacking may occur.

Generator wet stacking refers to a condition where the fuel in the generator's combustion chamber is not burned completely, resulting in an accumulation of unburned fuel and oil inside the engine's exhaust system. Over time, this build-up of oil and fuel can cause clogging, reduced efficiency, and increased emissions. To prevent generator wet stacking, a load bank is often used. A load bank is a device that simulates the load of an electrical system, allowing the generator to run under actual working conditions, even when there is no real power demand. By running the generator regularly with a load bank, the engine stays in good condition, and the build-up of unburned fuel and oil is prevented. The addition of a load bank increases the cost and complexity of the system increasing the power draw while doing no usable work. However, these load banks could be used to exercise the other generators per National Fire Protection Association (NFPA) 110 requirements when they are not in use.

Section 8

BLOWER STANDBY POWER

The most critical loads not currently backed up by the existing standby generator and unable to be powered by the existing portable generators are the blowers. There are currently 3 blowers, two 300 hp Hoffman blowers and one 450 hp Turblex blower. The RTP currently only uses the 450 hp Turblex blower during normal operations and both Hoffman blowers are standby. SOCWA's staff have indicated during a power outage it is acceptable to operate a single Hoffman blower until utility power is restored. To provide standby power for the Turblex and all other MCC-30310 loads, a 1,500-kW generator is required due to the high blower starting current. In this case the generator will only operate at 25 percent capacity, requiring a load bank to prevent generator wet stacking. If one Hoffman blower is used, MCC-30310 can be backed up with a 700-kW generator exceeding 30 percent of the rated capacity and will not require a load bank to prevent wet stacking. In either scenario there is a very large amount of unused generator capacity that could be used to power other loads. MCC-30310 is fed from DP-1 which feeds both MCC-30310 and MCC-M. If the generator used to back up the blower is used to feed DP-1 it will not affect the size of the generator needed and will allow the RTP to power more loads. Additionally, this approach will circumvent the need to provide a load bank for the backup of the Turblex blower.

SOCWA has indicated that they may be replacing the existing blowers in the near future, possibly with turbo blowers. Unlike the existing blowers, turbo blowers are fed from variable frequency drives (VFD) instead of soft starters. When a motor is fed from a VFD, the VFD controls the voltage and frequency supplied to the motor, gradually ramping up the voltage and frequency over time. This controlled ramp-up process allows the motor to draw a more manageable starting current, which is only a fraction of the inrush current required by a motor

started by a soft starter. Due to lower inrush current, the generator needed to supply MCC-30310 could be reduced to 350 kW when operating a 300 hp turbo blower as shown in Table 5.

Table 5 Blower Standby Power Minimum Generator Size Requirements

Bus	High Priority Loads	High Priority Loads Used Capacity	High/Med Priority Loads Size	High/Med Priority Loads Used Capacity	High/Med/ Low Priority Loads Size	High/Med/ Low Priority Loads Used Capacity
MCC-30310(1, 2)	1,500 kW/ 1,875 kVA	25.0%	1,500 kW/ 1,875 kVA	25.0%	1,500 kW/ 1,875 kVA	25.0%
MCC-30310(3)	700 kW/ 875 kVA	37.9%	700 kW/ 875 kVA	37.9%	700 kW/ 875 kVA	37.9%
MCC-30310(4)	350 kW/ 437.7 kVA	79.6%	350 kW/ 437.7 kVA	79.6%	350 kW/ 437.7 kVA	79.6%
DP-1(2)	1,500 kW/ 1,875 kVA	44.7%	1,500 kW/ 1,875 kVA	60.2%	1,500 kW/ 1,875 kVA	62.7%
DP-1(3)	700 kW/ 875 kVA	42.5%	700 kW/ 875 kVA	71.0%	700 kW/ 875 kVA	74.0%

Notes:
(1) Generator load bank is recommended to prevent wet stacking due to large amount of unused capacity.
(2) Generator sizing based on operation of Turblex blower (450 hp) with existing soft starter.
(3) Generator sizing based on operation of Hoffman blower (300 hp) with existing soft starter.
(4) Generator sizing based on operation of a single 300 hp Aerzen "AT 300-0.8T" Turbo blower.

To implement either of the three standby power solutions proposed above, a portable generator connection cabinet would need to be installed outside of the blower room. The cost estimate and lead time to construct this standby power system is shown in Table 6. Reference Appendix A for the design fee estimate. Note the costs in Table 6 only include the cost to procure and install the portable generator cabinet and do not include the cost of the requisite generators.

Table 6 MCC-30310 Portable Generator Cabinet Cost Estimate

Portable Generator Size	Material Cost	Labor and Expenses	Total Cost
350 kW/437.7 kVA	$9,680	$11, 091	$20,771
700 kW/875 kVA	$18,857	$24,529	$43,387
1,500 kW/1,875 kVA	$37,805	$47,558	$85,363

Section 9

ISLANDING EXISTING COGEN SYSTEM

An island is defined as a generator or group of generators operating to power loads while not connected to the electrical grid. In terms of providing the RTP standby power, using the cogen in island mode could provide uninterrupted power when the utility source is lost. This is not entirely comparable to a standby diesel source and enabling this mode of operation requires some significant modifications to the system.

The existing cogen system is currently designed to only operate interconnected with the electrical grid. The controls would need to be modified to incorporate the island mode capability, using the Jenbacher Island Mode, which allows for island mode operation and for operator-initiated re-synchronizing to the utility source. Specific work includes:

- Coordination with SCE and the interconnection agreement to determine if additional relaying or other work is required.
- Add hardware and software as required to implement Island Mode. Staff indicated that this may have already been installed as part of the original project, but WES/Jenbacher should field verify that the unit has all of the required components.
- Modify programming in Jenbacher DIA.NE panel and Zenith programmable logic controller (PLC) to remove controls that trip the cogen unit when the main circuit breaker is open, and other minor changes as required for successful islanding operation.
- Modify settings in switchgear relaying and protective relays in the Jenbacher control panels to provide basic generator protection while allowing islanded operation without nuisance tripping. This is likely to require an alternate settings group for islanding operation, and an input to change to these settings when the main breaker is open.
- Provide for remote connections and coordinate them with the Western Energy Systems, including voltage sensing, circuit breaker closure contact, and an auxiliary contact from the main breaker in switchgear to provide faster indication of a main breaker trip than presently available over PLC communications.
- Make control terminations in switchgear control and Jenbacher panels.
- Work with the Western Energy Systems to ensure that the system operates as required, including participating in start-up testing and SCE testing and acceptance.

In addition to the modifications necessary for islanding, the following modifications will be needed to allow the cogen system to start up the plant when no utility power is available, known as a black start.

- Installation of new DIA.NE XT$_4$ control panel and modification of Zenith PLC.
- Modify settings in switchgear relaying and protective relays in the Jenbacher control panels to provide basic generator protection while allowing islanded operation without nuisance tripping. This is likely to require an alternate settings group for islanding operation, and an input to change to these settings when the main breaker is open.

Based on the metering data, it is likely the cogen system has the capacity to power the entire plant in the event of a power loss, operating in an islanded mode. However, there is an issue concerning the system's ability to start up from a black start due to the significant inrush current generated by the existing blowers. Western Energy Systems has advised that this inrush current would cause the cogen system to exceed the maximum allowable voltage dip during a black start. To black start the entire plant, the existing blowers would need to be replaced with VFD driven turbo blowers. The reduced inrush current resulting from using VFDs would eliminate the excessive voltage dip and would allow SOCWA to black start the cogen system.

Section 10

MAINTENANCE, TESTING, FUEL STORAGE, AND EMISSIONS

10.1 Maintenance

Maintenance is crucial for standby generators as these generators are designed to operate during power outages and other emergencies, when reliable power is essential. Without proper maintenance, the generator may fail to start or may not be able to deliver the necessary power, which can result in serious consequences, such as loss of life, property damage, and business interruption. Having several standby generators dramatically increases the amount of effort required to maintain the standby power system but is essential to improve the following:

- **Reliability**: Regular maintenance ensures that the generator is in good working order and can operate as intended when needed. This helps to ensure that it will be reliable during an emergency and reduce the risk of unexpected downtime.
- **Longevity**: Proper maintenance can extend the life of the generator, which can save money in the long run. Neglecting maintenance can lead to premature wear and tear on the generator, which can result in the need for costly repairs or replacement.
- **Safety**: Standby generators require fuel, electricity, and other potentially hazardous materials to operate, so it's important that they are maintained to ensure safe operation. For example, regular inspections of fuel lines and exhaust systems can help prevent fuel leaks and carbon monoxide exposure.
- **Compliance**: In many cases, regulatory authorities, such as local or state building codes, require that standby generators be maintained in accordance with certain standards. Regular maintenance can help ensure compliance with these regulations.

10.2 Testing

NFPA 110 provides testing requirements to ensure that standby diesel generators are ready to provide emergency power when needed, and that they will operate reliably during an emergency. The following are some of the key NFPA 110 testing requirements:

1. **Scheduled Exercising**: Standby diesel generators must be exercised at least once a month for a minimum of 30 minutes.
2. **Load Bank Testing**: Load bank testing is required annually for diesel generators that are seldom loaded.
3. **Full Load Testing**: In addition to monthly exercising, generators should be tested at least annually under full load conditions.
4. **Fuel System Testing**: The fuel system must be maintained to ensure that the generator can operate for the required duration. The fuel should be tested for water and other contaminants, and fuel filters should be changed as needed.
5. **Battery Testing**: Batteries used for starting the generator must be properly maintained, tested, and replaced as needed to ensure reliable starting.

10.3 Fuel Storage

To avoid extensive environmental permitting, the storage tanks should be double walled, above ground tanks. All piping should also be double walled containment piping to prevent environmental contamination.

Diesel fuel can slowly absorb water from air in the fuel tank as well as microbial contamination. The longer fuel is stored, the more it is likely to degrade and require "polishing" to stay in a usable state. A fuel polishing system pulls fuel from the bulk storage tank, filters it, and returns it to the bulk storage tank. This increases system reliability and reduces maintenance. The polishing system is operated automatically on a periodic basis. In addition, a biocide is added on a regular basis to inhibit microbial growth.

10.4 Emissions

Emissions controls of diesel generators are regulated by the EPA and local air quality control boards and depend on the stated use of the generator. Peak shaving and storm avoidance generation require greater emissions controls than standby units and may include selective catalytic reduction and urea systems. Preliminary coordination with generator vendors (Caterpillar, Cummins, and *mtu*) and their knowledge of the local air quality control board requirements has found that the plant's location will only require a standard diesel particulate filter and no additional emissions controls for generators located at this facility that are only used for standby power.

Section 11
RECOMMENDATIONS

Carollo's recommendation for ensuring maximum power system reliability is to equip the RTP with a permanent 1,500-kW standby generator along with a permanent load bank. This will allow the RTP to power all high, medium, and low priority loads while operating the 450 hp Turblex blower. Although a smaller generator could be used to backup only the critical loads the past metering data indicates most power outages are likely to either be short enough that no standby power is required or long enough that all plant loads are affected. Additionally, SOCWA will need to weigh the benefits of immediate transfer and reliability associated with a permanent generator against the reduced cost and space requirement but potential downtime of generator rentals. Carollo recognizes that there have only been three power outages over the past five years, and it is understandable that SOCWA may have to weigh the cost-effectiveness of such a comprehensive solution for relatively infrequent events. However, it is important to emphasize that the recommended approach guarantees the highest level of power system reliability for the current power system.

Although converting the cogen system to black start is technically feasible, it necessitates the replacement of the current blowers with VFD-driven turbo blowers to avoid exceeding the maximum permissible voltage dip during startup. If the blowers were already slated for replacement, this would likely be the most cost-effective solution.

If the blowers were not replaced and black starting the cogen system was still desired. One potential solution is to separate the blowers from cogen power and assign them their own dedicated backup generator at MCC-30310 or DP-1, allowing the cogen system to black start all other loads. However, this approach presents a major drawback: operating the Turblex blower would require a 1,500-kW generator, which is the same size needed to power the entire plant. Alternatively, using a Hoffman blower during backup power operations could reduce the generator size to 700 kW. Nevertheless, the additional costs associated with installing this 700-kW generator, along with the added complexity of retrofitting the existing cogen system for black start capability, would likely outweigh the benefits.

Providing separate backup power for the numerous potential MCCs poses challenges due to the logistics of distributed generation. Additionally, the exponential maintenance, testing, and emissions requirements further complicate the process, making it difficult and time-consuming. Furthermore, the required generator size to power MCC-30310 meets the requirements to power the entire plant. Additionally, if all portable generators during a large, system-wide outage, there would also be no generators for remote lift stations and other facilities. While distributed generation is not desirable for standby power, provisions for portable generators throughout the plant are desirable from a reliability and operational flexibility perspective, so we recommend incorporating portable generator provisions on MCCs as they are installed or replaced.

If SOCWA decides they will only require power to back up the blowers, it is most sensible to only do so if they are comfortable operating the 300 hp Hoffman blower during utility outages. In this case, it would make the most sense to provide the backup power at DP-1 as this will not affect the minimum size of the generator whilst allowing the operation of the blowers, centrifuges. If SOCWA intends to retrofit the existing blower process with turbo blowers driven by VFDs, it would be best to provide a dedicated generator for MCC-30310.

Appendix A

PORTABLE GENERATOR CONNECTION DESIGN FEE ESTIMATE

South Orange County Wastewater Authority
Regional Treatment Plant
Appendix A - Portable Generator Connection Design Fee Estimate

	Hourly Billing Rate	$266.00	$275.00	$290.00	$155.00	$145.00			$13.50		
Task No.	Task Description	Project Manager - Jeffrey Weishaar	Lead Engineer - Chris Loving & Walid Wasfy	Mechanical Engineer	Staff Engineer	Technician	Total Hours	Labor Fee	Project Equipment and Communication Expense [PECE] (per labor hour)	Other Direct Costs (ODCs)	Total Project Fee
1.0	**Project Management**	**12**	**0**	**0**	**0**	**0**	**12**	**$ 3,192.00**	**$ 162.00**	**$ -**	**$ 3,354.00**
1.1	Project Management	12					12	$ 3,192.00	$ 162.00		$ 3,354.00
1.2	Kickoff Meeting	4	4		4						$ -
2.0	**30% Design**	**2**	**8**	**0**	**44**	**30**	**84**	**$ 13,902.00**	**$ 108.00**	**$ 1,200.00**	**$ 16,236.00**
2.1	Site Investigation		4		4		8	$ 1,720.00	$ 108.00	$ 1,200.00	$ 3,028.00
2.2	30% Design	2	4		30	30	66	$ 10,632.00	$ 891.00		$ 11,523.00
2.3	30% Cost Estimate				10		10	$ 1,550.00	$ 135.00		$ 1,685.00
3.0	**60% Design**	**2**	**8**	**0**	**15**	**15**	**40**	**$ 7,232.00**	**$ 540.00**	**$ -**	**$ 7,772.00**
3.1	60% Design	2	8		15	15	40	$ 7,232.00	$ 540.00		$ 7,772.00
4.0	**90% Design**	**2**	**12**	**0**	**55**	**42**	**111**	**$ 18,447.00**	**$ 1,498.50**	**$ -**	**$ 19,945.50**
4.1	90% Design	2	10		45	40	97	$ 16,057.00	$ 1,309.50		$ 17,366.50
4.2	90% Cost Estimate		2		10	2	14	$ 2,390.00	$ 189.00		$ 2,579.00
5.0	**100% Design**	**2**	**4**	**0**	**8**	**0**	**14**	**$ 2,872.00**	**$ 189.00**	**$ -**	**$ 3,061.00**
5.1	100% Design	2	4		8		14	$ 2,872.00	$ 189.00		$ 3,061.00
TOTAL		**20**	**32**	**0**	**122**	**87**	**261**	**$ 45,645.00**	**$ 2,497.50**	**$ 1,200.00**	**$ 50,368.50**