NOTICE AND AGENDA
Regular Board Meeting
at Sanitary District No. 5 of Marin County Meeting Room
2001 Paradise Drive, Tiburon, CA 94920
Thursday, August 15, 2019

5:00 P.M. REGULAR BOARD MEETING

CALL TO ORDER

ROLL CALL

PUBLIC COMMENTS: The public is invited to address the Board on items that do not appear on the agenda and that are within the subject matter jurisdiction of the Board. The Brown Act does not allow the Board to take action on any public comment. Please limit public comments to no more than three minutes.

DIRECTORS' COMMENTS AND/OR AGENDA REQUESTS

CONSENT CALENDAR:

1. Approval of July 18, 2019, Regular Board Meeting Minutes (Dohrmann)
2. Review and Receive all Electronic Fund Transfers (EFT) and Approve Warrants for July 18 through August 8, 2019; JP Morgan Chase Bank Check No. 7031 through Check No. 7076, all transactions totaling in the amount of $297,742.92; and Review and Receive June 2019 Payroll, in the amount of $103,742.27 (Dohrmann)
3. Receipt of Financial Reports for July 2019 (Dohrmann)

MANAGEMENT REPORTS:

4. District Management Summary Report (Rubio)

NEW BUSINESS:

5. Review and Discuss HDR Bio Solid August 2019 Report for SD5 (Rubio)
6. Review and Approve Resolution No. 2019-07: A Resolution Accepting Completion and Directing District Manager to File Notice of Completion for the FY2017-2018 Sewer Rehabilitation Project – Tiburon & Belvedere (Rubio) – Action

7. Review Correspondence from Belvedere-Tiburon Library Requesting Waiver of Fees (Rubio) – Action

UNFINISHED BUSINESS:

COMMITTEE REPORTS:

8. Capital Improvement Program Committee (Lasky/Moody)

9. Governance Committee (Snyder/Lasky)

10. Finance & Fiscal Oversight Committee (Benediktsson/Moody)

11. Personnel Committee (Moody/Snyder)

OTHER BUSINESS:

ENVIRONMENTAL:

CORRESPONDENCE:

INFORMATIONAL ITEMS:

12. Nathan Su. "Chief Investment Officer of Largest US Public Pension Fund Has Deep Ties to Chinese Regime." *The Epoch Times,* July 8, 2019, updated July 11, 2019. https://www.theepochtimes.com/chief-investment-officer-of-us-largest-public-pension-fund-has-deep-ties-to-chinese-regime_2992183.html

ADJOURNMENT

The Board will be asked to adjourn the meeting to a Regular Board Meeting on September 19th, 2019, at 5:00 p.m. at the Main Plant of Sanitary District No. 5 of Marin County, located at 2001 Paradise Drive, Tiburon, California.

The Board of Directors may, at its discretion, consider agenda items out of the order in which they appear above.

Accessible public meetings: Upon request, the District will provide written agenda materials in appropriate alternate formats, or disability-related modification or accommodation, including auxiliary aids or services to enable individual with disabilities to participate in public meetings. Requests are to be submitted in writing to the District at P.O. Box 227, Tiburon, CA 94920 or rdohrmann@sani5.org at least two days prior to the meeting.

Minutes of a Regular Board Meeting
at Sanitary District No. 5 of Marin County Meeting Room
2001 Paradise Drive, Tiburon, CA 94920
Thursday, July 18, 2019

5:00 P.M. REGULAR BOARD MEETING

CALL TO ORDER by Vice President John Carapiet at 5:00 P.M.

ROLL CALL

Directors present: Tod Moody, President
John Carapiet, Vice President
Michael Lasky, Secretary (5:04 p.m.)
Richard Snyder, Director

Directors not present: Catharine Benediktsson, Director

Staff present: Tony Rubio, District Manager
Robin Dohrmann, Office Manager

Consultants present: Benjamin Stock, Burke, Williams, Sorensen, LLP

PUBLIC COMMENTS: The public is invited to address the Board on items that do not appear on the agenda and that are within the subject matter jurisdiction of the Board. The Brown Act does not allow the Board to take action on any public comment. Please limit public comments to no more than three minutes.

There were no public comments at this time.

DIRECTORS' COMMENTS AND/OR AGENDA REQUESTS

- Vice President Carapiet had several inquiries into:
  - more insight into President Moody's findings on solar energy at SD5;
  - PG&E's recent power shut-offs at Belvedere Pump Station at Lagoon Road; and
  - investigation of converting SD5 sewer rates from standardized/flat rates to consumption/flow-based rates via LAFCO
- Director Snyder suggested:
  - SD5 test for Ecoli, considering the proximity to Richardson Bay
  - SD5 review methodology re EFT payments, in light of cyber threats/security

CONSENT CALENDAR:

1. Approval of June 20, 2019, Regular Board Meeting Minutes (Dohrmann)
2. Review and Receive all Electronic Fund Transfers (EFT) and Approve Warrants for June 14 through July 17, 2019; JP Morgan Chase Bank Check No. 6974 through Check No. 7030, all transactions totaling in the amount of $256,371.71; and Review and Receive June 2019 Payroll, in the amount of $90,153.55 (Dohrmann)

(CONSENT CALENDAR cont'd):

3. Receipt of Financial Reports for June 2019 (Dohrmann)

Discussion by the Board. Motion (Snyder/Carapiet) to approve Items No. 1 through No. 3 on the Consent Calendar. Passed 4-0-0-1.

MANAGEMENT REPORTS:

4. District Management Summary Report (Rubio)

District Manager, Tony Rubio, presented a written and verbal report on current District issues, responding to questions from the Board. Discussion by the Board.

NEW BUSINESS:

5. Review and Approve Management Succession Plan (Rubio) – Action

Discussion by the Board. Motion (Snyder/Carapiet) to Approve SD5 Management Succession Plan. Passed 4-0-0-1.

6. Review and Approve Revised Final Sanitary District No. 5 of Marin County Code, from Code Publishing (Rubio) – Action

Discussion by the Board. Motion (Snyder/Carapiet) to Approve Revised Final Sanitary District No. 5 of Marin County Code, from Code Publishing. Passed 4-0-0-1.

7. Discussion re Current Cyber Security Threats (Rubio) – Discussion only

Discussion by the Board.

8. Review Correspondence from Belvedere-Tiburon Library Requesting Waiver of Fees (Rubio) – Action

Discussion by the Board. Motion (Snyder/Carapiet) to Deny Belvedere-Tiburon Library's Request for Waiver of Fees. Passed 3-0-1-1.

UNFINISHED BUSINESS:

COMMITTEE REPORTS:

9. Capital Improvement Program Committee (Lasky/Moody) – None

10. Governance Committee (Snyder/Lasky) – None

11. Finance & Fiscal Oversight Committee (Benediktsson/Moody) – None

12. Personnel Committee (Moody/Snyder) – None

OTHER BUSINESS: None

ENVIRONMENTAL: None

CORRESPONDENCE: None

INFORMATIONAL ITEMS:

13. County of Marin Department of Finance Correspondence, dated June 30, 2019 re Allocation of Net LAFCO Operating Expenses per AB2838

ADJOURNMENT

The Board adjourned at 5:38 p.m. to a Regular Board Meeting on August 15th, 2019, at 5:00 p.m. at the Main Plant of Sanitary District No. 5 of Marin County, located at 2001 Paradise Drive, Tiburon, California.

Approved:

Tod Moody
President, Board of Directors

Attest:

Michael Lasky
Secretary, Board of Directors

08/07/19

Sanitary Distr. No.5 of Marin Co.
Warrant List Summary
July 18 through August 8, 2019

Date	Num	Name	Memo	Amount
JP Morgan Chase - Primary 7399				
08/03/19	EFT	Deluxe	Cust ID#: 994073-748078, SD5 Checks, Aug '19	-767.54
08/07/19	EFT	CalPERS	EFT Health Premium, August '19, Cust #4163206459	-14,699.45
07/18/19	7031	California State Disbursement Unit	CSE Case# 20000002184580; Court Case# SFL 81271, June-Jul '19 (FY1...	-600.00
07/18/19	7032	Cottrell, Rulon	Employee Incentive, Jul '19	-5,000.00
07/18/19	7033	Comcast Business	Acct# 8155 30 11 0149465, Bus. Voice, Internet & Cable, Jul - Aug '19	-490.35
07/18/19	7035	PERS	CalPERS Lump Sum Payment for SD5 FY17-18 UAL (FY18-19 AJE)	-55.41
07/18/19	7037	Verizon Wireless	Acct #0342125502-00001: iPhones, Jun - Jul '19 (FY18-19 AJE)	-382.35
07/18/19	7038	Richard Banakus	Customer Refund @ 86 Sugar Loaf Dr., Jun '19 (FY18-19 AJE)	-6,000.00
07/18/19	7039	Westland Contractors, Inc.	FY17-18 Sewer Rehab Project, C.O. #4, #5, & #6 + Retention, Jun '19 (FY1...	-136,852.54
07/24/19	7041	PERS	CalPERS Unfunded Accrued Liability (UAL) Lump Sum Payment for SD5 FY...	-586.59
08/08/19	7042	Access Answering Service	Acct #4080C, Answering Service, Aug '19	-60.00
08/08/19	7043	Alhambra	Acct #547945611762129, Water, Jul '19	-121.15
08/08/19	7044	AT&T	Acct #960732-76375559, Jul - Aug '19	-767.95
08/08/19	7045	ATP Group, Inc.	M.P. & P.C. Plant Chemicals, Jul '19	-1,962.09
08/08/19	7046	Burke, Williams & Sorensen, LLP	Legal Advice, Jun '19 (FY18-19 AJE)	-1,201.50
08/08/19	7047	Burlingame Engineers, Inc.	M.P. Parts & Srvc., Apr '19 (FY18-19 AJE)	-20.00
08/08/19	7048	Caltest Analytical Laboratory	M.P./P.C. Lab Sampling, Jul '19	-1,363.25
08/08/19	7049	Caltronics Business Systems, Inc.	Acct #SD15, Multi-purpose Copier Contract Fee, Jul '19	-127.30
08/08/19	7050	Central Marin Sanitation Agency	Pollution Prevention (Unbudgeted) Pub Ed Costs, FY18-19 (FY18-19 AJE)	-494.54
08/08/19	7051	Cintas Corporation #626	Acct #626-00821, PPE/Safetywear + Service, Jul '19	-832.75
08/08/19	7052	CSRMA California Sanitation Risk Mgmt. Au	PLP Property Ins. Premium, FY2019-2020	-16,214.00
08/08/19	7053	CSRMA California Sanitation Risk Mgmt. Au	W.C. PLP Deposit & Retro Adj for FY2019-20	-33,476.00
08/08/19	7054	CWEA	Mbrshp Renewals, T O'Day #21518I & J Rosser #54889I, Sept-Oct '19 (AJE ...	-380.00
08/08/19	7055	Dig Safe Board	Acct #165410, Annual Fee, Aug '19	-265.45
08/08/19	7056	Goodman Building Supply Co.	Acct #20070, M.P. Supplies, P&L, Grounds Maint., Jul '19	-463.41
08/08/19	7057	Grainger	Acct #810128785, MP Maint. Supplies, Jul '19	-257.98
08/08/19	7058	Home Depot Credit Services	Acct #6035 3220 0516 4334, P&L, M.P. Maint., Genset Supplies, Jul '19	-789.57
08/08/19	7059	Jackson's Hardware, Inc.	Acct #7601, Janitorial Supplies, Jul '19	-23.96
08/08/19	7060	Maltby Electric Supply Co., Inc.	Cust No.15953, BPS P&L, Jul '19	-1,482.85
08/08/19	7061	Pacific Gas & Electric	Acct #2908031411-4, Utilities, Jun-Jul FY18-19-FY19-20 (AJE)	-22,786.66
08/08/19	7062	R & S Service	SD5 Truck Maint., May '19 (FY18-19 AJE)	-499.96
08/08/19	7063	Robert L Talavera, LLC	SSGIS ArcView Support, Jun - Jul '19 (FY18-19 AJE)	-750.00
08/08/19	7064	Roy's Sewer Service, Inc.	Tib Annual Line Cleaning + Tib P&L, Jun -Jul 19 (FY18-19 AJE)	-33,015.00
08/08/19	7065	Special District Risk Management Authorit	Member #7665, Life, Vision, DDS & LTD Ins., Aug '19	-1,499.31
08/08/19	7066	U.S. Bank	Acct#:4246-0441-0158-3635, Jun - Jul '19 (FY18-19 AJE)	-275.59
08/08/19	7067	Underground Service Alert	Acct #165410, Annual Fee, Aug '19	-397.65
08/08/19	7068	Univar	Cust ID #STDT001, Chemicals, Jul '19	-7,866.13
08/08/19	7069	Waste Management of Redwood Landfill	Acct #507-0000190-1507-2, Sludge Disposal, Jul '19	-1,002.71
08/08/19	7070	Water Components & Building Supply	Acct #454, M.P. Parts, Jul '19	-14.12
08/08/19	7071	Wintersun Chemical	M.P. Chemicals, Jul '19	-1,332.50
08/08/19	7072	WorkSmart Automation, Inc.	SCADA System Maintenance, Jul '19	-1,976.50
08/08/19	7073	Bilsborough, Chad	Reimb. for Standby Mi., Jul '19	-48.72
08/08/19	7074	Driscoll, Stephen	Reimb. for Standby Mileage, thru 7.31.19 (FY18-19 AJE)	-376.77
08/08/19	7075	Rosser, John	Standby Mileage Reimb, thru 7.10.19	-50.80
08/08/19	7076	Triola, Joseph	Reimb. for Standby Mi., Jun '19 (FY18-19 AJE)	-112.52
Total JP Morgan Chase - Primary 7399				-297,742.92
TOTAL				**-297,742.92**

Sanitary Distr. No.5 of Marin Co.
Warrant List Detail
July 18 through August 8, 2019

Date	Num	Name	Memo	Account	Class	Paid Amount
08/03/19	**EFT**	**Deluxe**	**Cust ID#: 994073-748078, SD5 Checks, Aug '19**	**JP Morgan Chase - Primary 7399**		
			Order#:2045585280, Item #SSLT104-2: 1000# Carbon Copy, Top M/P Unlin...	6047 · Office Supplies	Belvedere	-276.01
			Order#:2045585280, Item #SSLT104-2: 1000# Carbon Copy, Top M/P Unlin...	6047 · Office Supplies	Tiburon:Paradise Cove	-18.57
			Order#:2045585280, Item #SSLT104-2: 1000# Carbon Copy, Top M/P Unlin...	6047 · Office Supplies	Tiburon	-472.96
TOTAL						-767.54
08/07/19	**EFT**	**CalPERS**	**EFT Health Premium, August '19, Cust #4163206459**	**JP Morgan Chase - Primary 7399**		
			Active Employee Health Premium - Aug '19	8020.05 · Employee Health	Belvedere	-4,972.73
			Active Employee Health Premium - Aug '19	8020.05 · Employee Health	Tiburon:Paradise Cove	-334.65
			Active Employee Health Premium - Aug '19	8020.05 · Employee Health	Tiburon	-8,521.12
			Retiree Health Premium - Aug '19	8022.05 · Reitree Health	Belvedere	-293.43
			Retiree Health Premium - Aug '19	8022.05 · Reitree Health	Tiburon:Paradise Cove	-19.75
			Retiree Health Premium - Aug '19	8022.05 · Reitree Health	Tiburon	-502.82
			Active Employee Health Premium - Aug '19 - Admin Fee	8020.05 · Employee Health	Belvedere	-13.43
			Active Employee Health Premium - Aug '19 - Admin Fee	8020.05 · Employee Health	Tiburon:Paradise Cove	-0.90
			Active Employee Health Premium - Aug '19 - Admin Fee	8020.05 · Employee Health	Tiburon	-23.01
			Retiree Health Premium - Aug '19 - Admin Fee	8022.05 · Reitree Health	Belvedere	-6.33
			Retiree Health Premium - Aug '19 - Admin Fee	8022.05 · Reitree Health	Tiburon:Paradise Cove	-0.43
			Retiree Health Premium - Aug '19 - Admin Fee	8022.05 · Reitree Health	Tiburon	-10.85
TOTAL						-14,699.45
07/18/19	**7031**	**California State Disbursement Unit**	**CSE Case# 200000002184580; Court Case# SFL 81271, June-Jul '19 (FY...**	**JP Morgan Chase - Primary 7399**		
			CSE Case# 200000002184580	8012 · Wage Garnishments	Tiburon	-600.00
TOTAL						-600.00
07/18/19	**7032**	**Cottrell, Rulon**	**Employee Incentive, Jul '19**	**JP Morgan Chase - Primary 7399**		
			FY19-20 Employee Certification Incentive, Obtained add'l WW Distribution Ce...	8005 · Employee Incentives	Tiburon	-1,798.00
			FY19-20 Employee Certification Incentive, Obtained add'l WW Distribution Ce...	8005 · Employee Incentives	Belvedere	-121.00
			FY19-20 Employee Certification Incentive, Obtained add'l WW Distribution Ce...	8005 · Employee Incentives	Tiburon	-3,081.00
TOTAL						-5,000.00
07/18/19	**7033**	**Comcast Business**	**Acct# 8155 30 11 0149465, Bus. Voice, Internet & Cable, Jul - Aug '19**	**JP Morgan Chase - Primary 7399**		
			Bundle: Cable ($89.55), 7.12.19 - 8.11.19	8510 · Data/Alarms/IT Supp & Licensing	Belvedere	-32.20
			Bundle: Cable ($89.55), 7.12.19 - 8.11.19	8510 · Data/Alarms/IT Supp & Licensing	Tiburon:Paradise Cove	-2.17
			Bundle: Cable ($89.55), 7.12.19 - 8.11.19	8510 · Data/Alarms/IT Supp & Licensing	Tiburon	-55.18
			Bundle: Internet ($121.65), 7.12.19 - 8.11.19	8510 · Data/Alarms/IT Supp & Licensing	Belvedere	-43.75
			Bundle: Internet ($121.65), 7.12.19 - 8.11.19	8510 · Data/Alarms/IT Supp & Licensing	Tiburon:Paradise Cove	-2.94
			Bundle: Internet ($121.65), 7.12.19 - 8.11.19	8510 · Data/Alarms/IT Supp & Licensing	Tiburon	-74.96
			Bundle: Land Line Phones ($269.87), 7.12.19 - 8.11.19	8531 · Main Plant Telephones	Belvedere	-97.05
			Bundle: Land Line Phones ($253.45), 7.12.19 - 8.11.19	8532 · Paradise Cove Telephones	Tiburon:Paradise Cove	-6.53
			Bundle: Land Line Phones ($253.45), 7.12.19 - 8.11.19	8531 · Main Plant Telephones	Tiburon	-166.29
			Bundle: Taxes & Fees ($9.28/2), 7.12.19 - 8.11.19	8510 · Data/Alarms/IT Supp & Licensing	Belvedere	-1.67
			Bundle: Taxes & Fees ($9.28/2), 7.12.19 - 8.11.19	8510 · Data/Alarms/IT Supp & Licensing	Tiburon:Paradise Cove	-0.11
			Bundle: Taxes & Fees ($9.28/2), 7.12.19 - 8.11.19	8510 · Data/Alarms/IT Supp & Licensing	Tiburon	-2.86
			Bundle: Taxes & Fees ($9.28/2), 7.12.19 - 8.11.19	8531 · Main Plant Telephones	Belvedere	-1.67

Sanitary Distr. No.5 of Marin Co.
Warrant List Detail
July 18 through August 8, 2019

Date	Num	Name	Memo	Account	Class	Paid Amount
			Bundle: Taxes & Fees ($9.28/2), 7.12.19 - 8.11.19	8532 · Paradise Cove Telephones	Tiburon:Paradise Cove	-0.11
			Bundle: Taxes & Fees ($9.28/2), 7.12.19 - 8.11.19	8531 · Main Plant Telephones	Tiburon	-2.86
TOTAL						-490.35
07/18/19	**7035**	**PERS**	**CalPERS Lump Sum Payment for SD5 FY17-18 UAL (FY18-19 AJE)**	**JP Morgan Chase - Primary 7399**		
			CalPERS Lump Sum Payment for SD5 FY17-18 UAL - PEPRA Members, 7.1...	8019.08 · PERS Retirement - CalPERS ...	Belvedere	-20.00
			CalPERS Lump Sum Payment for SD5 FY17-18 UAL - PEPRA Members, 7.1...	8019.08 · PERS Retirement - CalPERS ...	Tiburon:Paradise Cove	-1.19
			CalPERS Lump Sum Payment for SD5 FY17-18 UAL - PEPRA Members, 7.1...	8019.08 · PERS Retirement - CalPERS ...	Tiburon	-34.22
TOTAL						-55.41
07/18/19	**7037**	**Verizon Wireless**	**Acct #0342125502-00001: iPhones, Jun - Jul '19 (FY18-19 AJE)**	**JP Morgan Chase - Primary 7399**		
			Inv #9833639901: Equipment charges(w/ data plan $55.41), 6.9.18 - 7.8.19	8531 · Main Plant Telephones	Belvedere	-20.00
			Inv #9831668561: Equipment charges(w/ data plan $55.41), 6.9.18 - 7.8.19	8532 · Paradise Cove Telephones	Tiburon:Paradise Cove	-1.19
			Inv #9831668561: Equipment charges(w/ data plan $55.41), 6.9.18 - 7.8.19	8531 · Main Plant Telephones	Tiburon	-34.23
			Inv #9831668561: Monthly Charges ($303.60)	8531 · Main Plant Telephones	Belvedere	-109.57
			Inv #9831668561: Monthly Charges ($303.60)	8532 · Paradise Cove Telephones	Tiburon:Paradise Cove	-6.50
			Inv #9831668561: Monthly Charges ($303.60)	8531 · Main Plant Telephones	Tiburon	-187.52
			Inv #9831668561: Taxes, Gov't Surcharges & Fees ($23.24)	8531 · Main Plant Telephones	Belvedere	-8.42
			Inv #9831668561: Taxes, Gov't Surcharges & Fees ($23.24)	8532 · Paradise Cove Telephones	Tiburon:Paradise Cove	-0.50
			Inv #9831668561: Taxes, Gov't Surcharges & Fees ($23.24)	8531 · Main Plant Telephones	Tiburon	-14.42
TOTAL						-382.35
07/18/19	**7038**	**Richard Banakus**	**Customer Refund @ 86 Sugar Loaf Dr., Jun '19 (FY18-19 AJE)**	**JP Morgan Chase - Primary 7399**		
			86 Sugar Loaf Dr. Refund, 6.26.19	7011 · Pumps & Lines Maintenance	Tiburon	-6,000.00
TOTAL						-6,000.00
07/18/19	**7039**	**Westland Contractors, Inc.**	**FY17-18 Sewer Rehab Project, C.O. #4, #5, & #6 + Retention, Jun '19 (FY...**	**JP Morgan Chase - Primary 7399**		
			C.O. #4, #5, #6: FY17-18 Sewer Rehab Project - Tiburon, thru 6.30.19	9301 · Tiburon Sewer Line Rehab Prog	Tiburon	-95,200.00
			C.O. #4, #5, #6: FY17-18 Sewer Rehab Project - Tiburon, thru 6.30.19	Retainage Payable	Tiburon	4,760.00
			Final Close-out: Retention paid re FY17-18 Sewer Reahb Project - Belvedere ...	Retainage Payable	Belvedere	-26,664.00
			Final Close-out: Retention paid re FY17-18 Sewer Reahb Project - Belvedere ...	Retainage Payable	Tiburon	-19,748.54
TOTAL						-136,852.54
07/24/19	**7041**	**PERS**	**CalPERS Unfunded Accrued Liability (UAL) Lump Sum Payment for SD5 ...**	**JP Morgan Chase - Primary 7399**		
			CalPERS Unfunded Accrued Liability (UAL) Lump Sum Payment for SD5 FY1...	8019.08 · PERS Retirement - CalPERS ...	Belvedere	-211.70
			CalPERS Unfunded Accrued Liability (UAL) Lump Sum Payment for SD5 FY1...	8019.08 · PERS Retirement - CalPERS ...	Tiburon:Paradise Cove	-12.55
			CalPERS Unfunded Accrued Liability (UAL) Lump Sum Payment for SD5 FY1...	8019.08 · PERS Retirement - CalPERS ...	Tiburon	-362.34
TOTAL						-586.59
08/08/19	**7042**	**Access Answering Service**	**Acct #4080C, Answering Service, Aug '19**	**JP Morgan Chase - Primary 7399**		
			Inv #20295, Answering Service, August '19 - SSO & Alarm Notifications	8510 · Data/Alarms/IT Supp & Licensing	Belvedere	-21.58

Sanitary Distr. No.5 of Marin Co.
Warrant List Detail
July 18 through August 8, 2019

Date	Num	Name	Memo	Account	Class	Paid Amount
			Inv #20295, Answering Service, August '19 - SSO & Alarm Notifications	8510 · Data/Alarms/IT Supp & Licensing	Tiburon:Paradise Cove	-1.45
			Inv #20295, Answering Service, August '19 - SSO & Alarm Notifications	8510 · Data/Alarms/IT Supp & Licensing	Tiburon	-36.97
TOTAL						-60.00
08/08/19	**7043**	**Alhambra**	**Acct #547945611762129, Water, Jul '19**	**JP Morgan Chase - Primary 7399**		
			Inv #12012314 072619 Water, 7.211.19 - 7.24.19	7023 · Janitorial Supplies & Service	Belvedere	-43.57
			Inv #12012314 072619 Water, 7.211.19 - 7.24.19	7042 · Paradise Supplies & Chemicals	Tiburon:Paradise Cove	-2.93
			Inv #12012314 072619 Water, 7.211.19 - 7.24.19	7023 · Janitorial Supplies & Service	Tiburon	-74.65
TOTAL						-121.15
08/08/19	**7044**	**AT&T**	**Acct #960732-76375559, Jul - Aug '19**	**JP Morgan Chase - Primary 7399**		
			PC Plant Telephones, 7.28.19 - 8.27.19	8532 · Paradise Cove Telephones	Tiburon:Paradise Cove	-289.15
			PC Pumps & Lines Telephones, 7.28.19 - 8.27.19	8533 · Pumps & Lines Telephones	Tiburon:Paradise Cove	-173.48
			Tib Pumps & Lines Telephones, 7.28.19 - 8.27.19	8533 · Pumps & Lines Telephones	Tiburon	-305.32
TOTAL						-767.95
08/08/19	**7045**	**ATP Group, Inc.**	**M.P. & P.C. Plant Chemicals, Jul '19**	**JP Morgan Chase - Primary 7399**		
			Inv #I209748, M.P., Caustic soda beads (Sodium Hydroxide) for foul air scrub...	7042 · Paradise Supplies & Chemicals	Belvedere	-705.57
			Inv #I209748, P.C., Caustic soda beads (Sodium Hydroxide) pH Control., 7.9....	7024 · Main Plant Chemicals	Tiburon:Paradise Cove	-47.48
			Inv #I209748, M.P., Caustic soda beads (Sodium Hydroxide) for foul air scrub...	7042 · Paradise Supplies & Chemicals	Tiburon	-1,209.04
TOTAL						-1,962.09
08/08/19	**7046**	**Burke, Williams & Sorensen, LLP**	**Legal Advice, Jun '19 (FY18-19 AJE)**	**JP Morgan Chase - Primary 7399**		
			Inv #243119, SD5 DCS, Jun '19	6039 · Legal	Belvedere	-180.27
			Inv #243119, SD5 DCS, Jun '19	6039 · Legal	Tiburon:Paradise Cove	-10.69
			Inv #243119, SD5 DCS, Jun '19	6039 · Legal	Tiburon	-308.54
			Inv #243119, FEMA/CALOES, Jun '19	6039 · Legal	Tiburon:Paradise Cove	-702.00
TOTAL						-1,201.50
08/08/19	**7047**	**Burlingame Engineers, Inc.**	**M.P. Parts & Srvc., Apr '19 (FY18-19 AJE)**	**JP Morgan Chase - Primary 7399**		
			SD5: Inv #BER8211, Shipping only for replacements part (Ops valves), 4.15.19	7022 · Plant Maint. Parts & Service	Belvedere	-7.38
			SD5: Inv #BER8211, Shipping only for replacements part (Ops valves), 4.15.19	7022 · Plant Maint. Parts & Service	Tiburon	-12.62
TOTAL						-20.00
08/08/19	**7048**	**Caltest Analytical Laboratory**	**M.P./P.C. Lab Sampling, Jul '19**	**JP Morgan Chase - Primary 7399**		
			Inv #0827, #1018, #1027, M.P. Testing, 7.17.19, 7.24.19, 7.25.19	7051 · Main Plant Lab Monitoring	Belvedere	-387.18
			Inv #1079, P.C. Testing, 7.26.19	7052 · Paradise Cove Monitoring	Tiburon:Paradise Cove	-312.55
			Inv #0827, #1018, #1027, M.P. Testing, 7.17.19, 7.24.19, 7.25.19	7051 · Main Plant Lab Monitoring	Tiburon	-663.52
TOTAL						-1,363.25

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08/08/19	**7049**	**Caltronics Business Systems, Inc.**	**Acct #SD15, Multi-purpose Copier Contract Fee, Jul '19**	**JP Morgan Chase - Primary 7399**		
			Inv #2830430, Konica Multi-purpose copier contract, 7.2.19 - 8.1.19	6047 · Office Supplies	Belvedere	-45.78
			Inv #2830430, Konica Multi-purpose copier contract, 7.2.19 - 8.1.19	6047 · Office Supplies	Tiburon:Paradise Cove	-3.08
			Inv #2830430, Konica Multi-purpose copier contract, 7.2.19 - 8.1.19	6047 · Office Supplies	Tiburon	-78.44
TOTAL						-127.30
08/08/19	**7050**	**Central Marin Sanitation Agency**	**Pollution Prevention (Unbudgeted) Pub Ed Costs, FY18-19 (FY18-19 AJE)**	**JP Morgan Chase - Primary 7399**		
			Inv #19-8155, Unbudgeted Funds for FY18-19 Shared Pollution Prevention P...	6059 · Pollution Prevention/Public Edu	Belvedere	-178.48
			Inv #19-8155, Unbudgeted Funds for FY18-19 Shared Pollution Prevention P...	6059 · Pollution Prevention/Public Edu	Tiburon:Paradise Cove	-10.58
			Inv #19-8155, Unbudgeted Funds for FY18-19 Shared Pollution Prevention P...	6059 · Pollution Prevention/Public Edu	Tiburon	-305.48
TOTAL						-494.54
08/08/19	**7051**	**Cintas Corporation #626**	**Acct #626-00821, PPE/Safetywear + Service, Jul '19**	**JP Morgan Chase - Primary 7399**		
			Inv #5164, #7888, #2671, #7483, #1305, PPE/Safetywear, 7.5.19, 7.12.19, 7....	8520 · Personal Protection/Safety Wear	Belvedere	-299.46
			Inv #5164, #7888, #2671, #7483, #1305, PPE/Safetywear, 7.5.19, 7.12.19, 7....	8520 · Personal Protection/Safety Wear	Tiburon:Paradise Cove	-20.15
			Inv #5164, #7888, #2671, #7483, #1305, PPE/Safetywear, 7.5.19, 7.12.19, 7....	8520 · Personal Protection/Safety Wear	Tiburon	-513.14
TOTAL						-832.75
08/08/19	**7052**	**CSRMA California Sanitation Risk...**	**PLP Property Ins. Premium, FY2019-2020**	**JP Morgan Chase - Primary 7399**		
			Inv #6471, Prop Ins Premium, FY2019-2020	6033.1 · PLP Public Entity Phys Damage	Belvedere	-5,119.98
			Inv #6471, Prop Ins Premium, FY2019-2020	6033.1 · PLP Public Entity Phys Damage	Tiburon:Paradise Cove	-344.56
			Inv #6471, Prop Ins Premium, FY2019-2020	6033.1 · PLP Public Entity Phys Damage	Tiburon	-8,773.46
			Inv #6471, Prop Ins - JPA Charge, FY2019-2020	6033.1 · PLP Public Entity Phys Damage	Belvedere	-309.62
			Inv #6471, Prop Ins - JPA Charge, FY2019-2020	6033.1 · PLP Public Entity Phys Damage	Tiburon:Paradise Cove	-20.84
			Inv #6471, Prop Ins - JPA Charge, FY2019-2020	6033.1 · PLP Public Entity Phys Damage	Tiburon	-530.55
			Inv #6471, Prop Ins - Program Dir. Fees, FY2019-2020	6033.1 · PLP Public Entity Phys Damage	Belvedere	-400.95
			Inv #6471, Prop Ins - Program Dir. Fees, FY2019-2020	6033.1 · PLP Public Entity Phys Damage	Tiburon:Paradise Cove	-26.98
			Inv #6471, Prop Ins - Program Dir. Fees, FY2019-2020	6033.1 · PLP Public Entity Phys Damage	Tiburon	-687.06
TOTAL						-16,214.00
08/08/19	**7053**	**CSRMA California Sanitation Risk...**	**W.C. PLP Deposit & Retro Adj for FY2019-20**	**JP Morgan Chase - Primary 7399**		
			Inv #6514, W.C.Pooled Deposit FY 2019-2020	8023 · Workers Comp Insurance	Belvedere	-7,173.30
			Inv #6514, W.C.Pooled Deposit FY 2019-2020	8023 · Workers Comp Insurance	Tiburon:Paradise Cove	-482.74
			Inv #6514, W.C.Pooled Deposit FY 2019-2020	8023 · Workers Comp Insurance	Tiburon	-12,291.96
			Inv #6514, W.C.Retro Adjustment FY2019-2020 (Spanning FY2010/11 - FY2...	8023 · Workers Comp Insurance	Belvedere	-4,864.67
			Inv #6514, W.C.Retro Adjustment FY2019-2020 (Spanning FY2010/11 - FY2...	8023 · Workers Comp Insurance	Tiburon:Paradise Cove	-327.38
			Inv #6514, W.C.Retro Adjustment FY2019-2020 (Spanning FY2010/11 - FY2...	8023 · Workers Comp Insurance	Tiburon	-8,335.95
TOTAL						-33,476.00
08/08/19	**7054**	**CWEA**	**Mbrshp Renewals, T O'Day #21518I & J Rosser #54889I, Sept-Oct '19 (AJ...**	**JP Morgan Chase - Primary 7399**		
			T O'Day, #21518I, Membership Renewal, 9.1.19 - 6.30.20	6025 · Dues & Subscriptions	Belvedere	-50.70
			T O'Day, #21518I, Membership Renewal, 9.1.19 - 6.30.20	6025 · Dues & Subscriptions	Tiburon:Paradise Cove	-3.41
			T O'Day, #21518I, Membership Renewal, 9.1.19 - 6.30.20	6025 · Dues & Subscriptions	Tiburon	-86.89

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			T O'Day, #21518I, Membership Renewal, 7.1.20 - 8.31.20 (AJE FY20-21)	6025 · Dues & Subscriptions	Belvedere	-16.90
			T O'Day, #21518I, Membership Renewal, 7.1.20 - 8.31.20 (AJE FY20-21)	6025 · Dues & Subscriptions	Tiburon:Paradise Cove	-1.14
			T O'Day, #21518I, Membership Renewal, 7.1.20 - 8.31.20 (AJE FY20-21)	6025 · Dues & Subscriptions	Tiburon	-28.96
			J Rosser, #54889I, Membership Renewal, 10.1.19 - 6.30.20	6025 · Dues & Subscriptions	Belvedere	-46.03
			J Rosser, #54889I, Membership Renewal, 10.1.19 - 6.30.20	6025 · Dues & Subscriptions	Tiburon:Paradise Cove	-3.10
			J Rosser, #54889I, Membership Renewal, 10.1.19 - 6.30.20	6025 · Dues & Subscriptions	Tiburon	-78.87
			J Rosser, #54889I, Membership Renewal, 7.1.20 - 9.31.20 (AJE FY20-21)	6025 · Dues & Subscriptions	Belvedere	-23.01
			J Rosser, #54889I, Membership Renewal, 7.1.20 - 9.31.20 (AJE FY20-21)	6025 · Dues & Subscriptions	Tiburon:Paradise Cove	-1.55
			J Rosser, #54889I, Membership Renewal, 7.1.20 - 9.31.20 (AJE FY20-21)	6025 · Dues & Subscriptions	Tiburon	-39.44
TOTAL						-380.00
08/08/19	**7055**	**Dig Safe Board**	**Acct #165410, Annual Fee, Aug '19**	**JP Morgan Chase - Primary 7399**		
			Inv #1654102019DIG, Annual Dues, based on % of SD5 tickets req'd in 2018,...	7011 · Pumps & Lines Maintenance	Belvedere	-95.46
			Inv #1654102019DIG, Annual Dues, based on % of SD5 tickets req'd in 2018,...	7011 · Pumps & Lines Maintenance	Tiburon:Paradise Cove	-6.42
			Inv #1654102019DIG, Annual Dues, based on % of SD5 tickets req'd in 2018,...	7011 · Pumps & Lines Maintenance	Tiburon	-163.57
TOTAL						-265.45
08/08/19	**7056**	**Goodman Building Supply Co.**	**Acct #20070, M.P. Supplies, P&L, Grounds Maint., Jul '19**	**JP Morgan Chase - Primary 7399**		
			Inv #782157, #782177, BPStations, 7.26.19, 7.26.19	7011 · Pumps & Lines Maintenance	Belvedere	-123.61
			Inv #780420, 782542, M.P. Maint. Supplies, 7.2.19, 8.1.19	7021 · Plant Maintenance Supplies	Belvedere	-120.04
			Inv #780420, 782542, M.P. Maint. Supplies, 7.2.19, 8.1.19	7021 · Plant Maintenance Supplies	Tiburon	-205.70
			Inv #781927, M.P. Grounds Maint., 7.24.19	7028 · Grounds Maintenance	Belvedere	-5.18
			Inv #781927, M.P. Grounds Maint., 7.24.19	7028 · Grounds Maintenance	Tiburon	-8.88
TOTAL						-463.41
08/08/19	**7057**	**Grainger**	**Acct #810128785, MP Maint. Supplies, Jul '19**	**JP Morgan Chase - Primary 7399**		
			Inv #9240606922, #9245716676, #9243014736, MP Maint. - Supplies, 7.22.1...	7021 · Plant Maintenance Supplies	Belvedere	-95.07
			Inv #9240606922, #9245716676, #9243014736, MP Maint. - Supplies, 7.22.1...	7021 · Plant Maintenance Supplies	Tiburon	-162.91
TOTAL						-257.98
08/08/19	**7058**	**Home Depot Credit Services**	**Acct #6035 3220 0516 4334, P&L, M.P. Maint., Genset Supplies, Jul '19**	**JP Morgan Chase - Primary 7399**		
			P&L, Pump Station parts, 7.25.19	7011 · Pumps & Lines Maintenance	Belvedere	-53.99
			P&L, Pump Station parts, 7.25.19	7011 · Pumps & Lines Maintenance	Tiburon	-92.51
			M.P. Maintenance Supplies, 7.25.19	7021 · Plant Maintenance Supplies	Belvedere	-100.85
			M.P. Maintenance Supplies, 7.25.19	7021 · Plant Maintenance Supplies	Tiburon	-172.84
			M.P. Supplies & Chemicals, 7.25.19	7025 · Lab Supplies & Chemicals	Belvedere	-100.85
			M.P. Supplies & Chemicals, 7.25.19	7025 · Lab Supplies & Chemicals	Tiburon	-172.84
			New Emergrency Generator Charging Parts, 7.11.19	9307 · PS Generator Replacement	Belvedere	-34.41
			New Emergrency Generator Charging Parts, 7.11.19	9307 · PS Generator Replacement	Tiburon:Paradise Cove	-2.32
			New Emergrency Generator Charging Parts, 7.11.19	9307 · PS Generator Replacement	Tiburon	-58.96
TOTAL						-789.57
08/08/19	**7059**	**Jackson's Hardware, Inc.**	**Acct #7601, Janitorial Supplies, Jul '19**	**JP Morgan Chase - Primary 7399**		
			Inv #32858, Janitorial Supplies, 7.22.19	7023 · Janitorial Supplies & Service	Belvedere	-8.83

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			Inv #32858, Janitorial Supplies, 7.22.19	7023 · Janitorial Supplies & Service	Tiburon:Paradise Cove	-15.13
TOTAL						-23.96
08/08/19	**7060**	**Maltby Electric Supply Co., Inc.**	**Cust No.15953, BPS P&L, Jul '19**	**JP Morgan Chase - Primary 7399**		
			BPS Electrical Upgrades, July '19	7011 · Pumps & Lines Maintenance	Belvedere	-741.43
			BPS Electrical Upgrades, July '19	7027 · Electrical & Instrument	Belvedere	-741.42
TOTAL						-1,482.85
08/08/19	**7061**	**Pacific Gas & Electric**	**Acct #2908031411-4, Utilities, Jun-Jul FY18-19-FY19-20 (AJE)**	**JP Morgan Chase - Primary 7399**		
			Acct #2908031411-4, Main Plant Utilities, 6.22.98 - 6.30.19	8542 · Main Plant Utilities	Belvedere	-1,833.44
			Acct #2908031411-4, P.C. Plant Utilities, 6.22.98 - 6.30.19	8543 · Paradise Cove Utilities	Tiburon:Paradise Cove	-326.64
			Acct #2908031411-4, Main Plant Utilities, 6.22.98 - 6.30.19	8542 · Main Plant Utilities	Tiburon	-3,137.92
			Acct #2908031411-4, Belv Pump St Utilities, 6.22.98 - 6.30.19	8544 · Pump Station Utilities	Belvedere	-338.79
			Acct #2908031411-4, P.C. Pump St Utilities, 6.22.98 - 6.30.19	8544 · Pump Station Utilities	Tiburon:Paradise Cove	-61.75
			Acct #2908031411-4, Tib Pump St Utilities, 6.22.98 - 6.30.19	8544 · Pump Station Utilities	Tiburon	-377.90
			Acct #2908031411-4, Main Plant Utilities, 7.1.19 - 7.21.19	8542 · Main Plant Utilities	Belvedere	-5,037.88
			Acct #2908031411-4, P.C. Plant Utilities, 7.1.19 - 7.21.19	8543 · Paradise Cove Utilities	Tiburon:Paradise Cove	-898.19
			Acct #2908031411-4, Main Plant Utilities, 7.1.19 - 7.21.19	8542 · Main Plant Utilities	Tiburon	-8,633.44
			Acct #2908031411-4, Belv Pump St Utilities, 7.1.19 - 7.21.19	8544 · Pump Station Utilities	Belvedere	-931.68
			Acct #2908031411-4, P.C. Pump St Utilities, 7.1.19 - 7.21.19	8543 · Paradise Cove Utilities	Tiburon:Paradise Cove	-169.80
			Acct #2908031411-4, Tib Pump St Utilities, 7.1.19 - 7.21.19	8544 · Pump Station Utilities	Tiburon	-1,039.23
TOTAL						-22,786.66
08/08/19	**7062**	**R & S Service**	**SD5 Truck Maint., May '19 (FY18-19 AJE)**	**JP Morgan Chase - Primary 7399**		
			Order #42492, #42416, #42408, Truck Maint: 2005 & 2012 Chevy + 2013 For...	7072 · Truck Maintenance	Belvedere	-180.44
			Order #42492, #42416, #42408, Truck Maint: 2005 & 2012 Chevy + 2013 For...	7072 · Truck Maintenance	Tiburon:Paradise Cove	-10.70
			Order #42492, #42416, #42408, Truck Maint: 2005 & 2012 Chevy + 2013 For...	7072 · Truck Maintenance	Tiburon	-308.82
TOTAL						-499.96
08/08/19	**7063**	**Robert L Talavera, LLC**	**SSGIS ArcView Support, Jun - Jul '19 (FY18-19 AJE)**	**JP Morgan Chase - Primary 7399**		
			Inv #RLT0619F1, SSGIS ArcView Support - Upload pipe history data, install, t...	8510 · Data/Alarms/IT Supp & Licensing	Belvedere	-135.34
			Inv #RLT0619F1, SSGIS ArcView Support - Upload pipe history data, install, t...	8510 · Data/Alarms/IT Supp & Licensing	Tiburon:Paradise Cove	-8.03
			Inv #RLT0619F1, SSGIS ArcView Support - Upload pipe history data, install, t...	8510 · Data/Alarms/IT Supp & Licensing	Tiburon	-231.63
			Inv #RLT0619F1, SSGIS ArcView Support - Upload pipe history data, install, t...	8510 · Data/Alarms/IT Supp & Licensing	Belvedere	-134.85
			Inv #RLT0619F1, SSGIS ArcView Support - Upload pipe history data, install, t...	8510 · Data/Alarms/IT Supp & Licensing	Tiburon:Paradise Cove	-9.08
			Inv #RLT0619F1, SSGIS ArcView Support - Upload pipe history data, install, t...	8510 · Data/Alarms/IT Supp & Licensing	Tiburon	-231.07
TOTAL						-750.00
08/08/19	**7064**	**Roy's Sewer Service, Inc.**	**Tib Annual Line Cleaning + Tib P&L, Jun -Jul 19 (FY18-19 AJE)**	**JP Morgan Chase - Primary 7399**		
			Inv #205421, Annual Sm Machine Line Cleaning @ Tiburon, 6.25.19	7011 · Pumps & Lines Maintenance	Tiburon	-28,320.00
			Inv #205452, Overflow at 18 Tamalpais, clear as directed, 7.24.19	7011 · Pumps & Lines Maintenance	Tiburon	-185.00
			#205714, #205451, Vactor Truck Cleaning + Service Van @ M.P. Digester, a...	7011 · Pumps & Lines Maintenance	Belvedere	-700.15
			#205714, #205451, Vactor Truck Cleaning + Service Van @ M.P. Digester, a...	7011 · Pumps & Lines Maintenance	Tiburon	-1,199.85
			#205715, Vactor @ TPS#2, 7.22.19	7011 · Pumps & Lines Maintenance	Tiburon	-650.00

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			#205401, Pumping from P.C. Plant, 6.20.19	7043 · Paradise Sludge Disposal	Tiburon:Paradise Cove	-980.00
			#205695, Pumping from PC Plant, 7.21.19	7043 · Paradise Sludge Disposal	Tiburon	-980.00
TOTAL						-33,015.00
08/08/19	**7065**	**Special District Risk Management...**	**Member #7665, Life, Vision, DDS & LTD Ins., Aug '19**	**JP Morgan Chase - Primary 7399**		
			Employee Life Insurance - Inv #29727, Aug '19	8020.05 · Employee Health	Belvedere	-56.14
			Employee Life Insurance - Inv #29727, Aug '19	8020.05 · Employee Health	Tiburon:Paradise Cove	-3.78
			Employee Life Insurance - Inv #29727, Aug '19	8020.05 · Employee Health	Tiburon	-96.19
			Employee DDS Insurance - Inv #29727, Aug '19	8020.05 · Employee Health	Belvedere	-324.42
			Employee DDS Insurance - Inv #29727, Aug '19	8020.05 · Employee Health	Tiburon:Paradise Cove	-21.83
			Employee DDS Insurance - Inv #29727, Aug '19	8020.05 · Employee Health	Tiburon	-555.93
			Employee Vision Insurance - Inv #29727, Aug '19	8020.05 · Employee Health	Belvedere	-100.67
			Employee Vision Insurance - Inv #29727, Aug '19	8020.05 · Employee Health	Tiburon:Paradise Cove	-6.77
			Employee Vision Insurance - Inv #29727, Aug '19	8020.05 · Employee Health	Tiburon	-172.50
			Employee LTD Insurance - Inv #29727, Aug '19	8020.05 · Employee Health	Belvedere	-57.92
			Employee LTD Insurance - Inv #29727, Aug '19	8020.05 · Employee Health	Tiburon:Paradise Cove	-3.90
			Employee LTD Insurance - Inv #29727, Aug '19	8020.05 · Employee Health	Tiburon	-99.26
TOTAL						-1,499.31
08/08/19	**7066**	**U.S. Bank**	**Acct#:4246-0441-0158-3635, Jun - Jul '19 (FY18-19 AJE)**	**JP Morgan Chase - Primary 7399**		
			#9545: Batteries Plus, M.P. Gate Valves, 7.11.19	7022 · Plant Maint. Parts & Service	Belvedere	-28.56
			#9545: Batteries Plus, M.P. Gate Valves, 7.11.19	7011 · Pumps & Lines Maintenance	Tiburon:Paradise Cove	-48.93
			#9545: USPO, Stamps, 7.18.19	6056 · Postage	Belvedere	-44.27
			#9545: USPO, Stamps, 7.18.19	6056 · Postage	Tiburon:Paradise Cove	-2.98
			#9545: USPO, Stamps, 7.18.19	6056 · Postage	Tiburon	-75.85
			#9545: Advertising (Barefoot Student) re FY18-19 Maint OIT, 6.28.19	6001 · Advertising	Belvedere	-27.07
			#9545: Advertising (Barefoot Student) re FY18-19 Maint OIT, 6.28.19	6001 · Advertising	Tiburon:Paradise Cove	-1.61
			#9545: Advertising (Barefoot Student) re FY18-19 Maint OIT, 6.28.19	6001 · Advertising	Tiburon	-46.32
TOTAL						-275.59
08/08/19	**7067**	**Underground Service Alert**	**Acct #165410, Annual Fee, Aug '19**	**JP Morgan Chase - Primary 7399**		
			Inv #1654102019, Annual Dues, based on % of tickets SD5 req'd in 2018, 7.1...	7011 · Pumps & Lines Maintenance	Belvedere	-142.99
			Inv #1654102019, Annual Dues, based on % of tickets SD5 req'd in 2018, 7.1...	7011 · Pumps & Lines Maintenance	Tiburon:Paradise Cove	-9.62
			Inv #1654102019, Annual Dues, based on % of tickets SD5 req'd in 2018, 7.1...	7011 · Pumps & Lines Maintenance	Tiburon	-245.04
TOTAL						-397.65
08/08/19	**7068**	**Univar**	**Cust ID #STDT001, Chemicals, Jul '19**	**JP Morgan Chase - Primary 7399**		
			Inv #SJ951710, Sodium Bisulfite 25% ($1.163/Gal), 7.19.19	7024 · Main Plant Chemicals	Belvedere	-2,149.50
			Inv #SJ951710, Sodium Bisulfite 25% ($1.163/Gal), 7.19.19	7042 · Paradise Supplies & Chemicals	Tiburon:Paradise Cove	-144.65
			Inv #SJ951710, Sodium Bisulfite 25% ($1.163/Gal), 7.19.19	7024 · Main Plant Chemicals	Tiburon	-3,683.32
			Inv #SJ952920, Sodium Hypochlorite 12.5% ($0.7001/Gal), 7.26.19	7024 · Main Plant Chemicals	Belvedere	-679.16
			Inv #SJ952920, Sodium Hypochlorite 12.5% ($0.7001/Gal), 7.26.19	7042 · Paradise Supplies & Chemicals	Tiburon:Paradise Cove	-45.71
			Inv #SJ952920, Sodium Hypochlorite 12.5% ($0.7001/Gal), 7.26.19	7024 · Main Plant Chemicals	Tiburon	-1,163.79
TOTAL						-7,866.13

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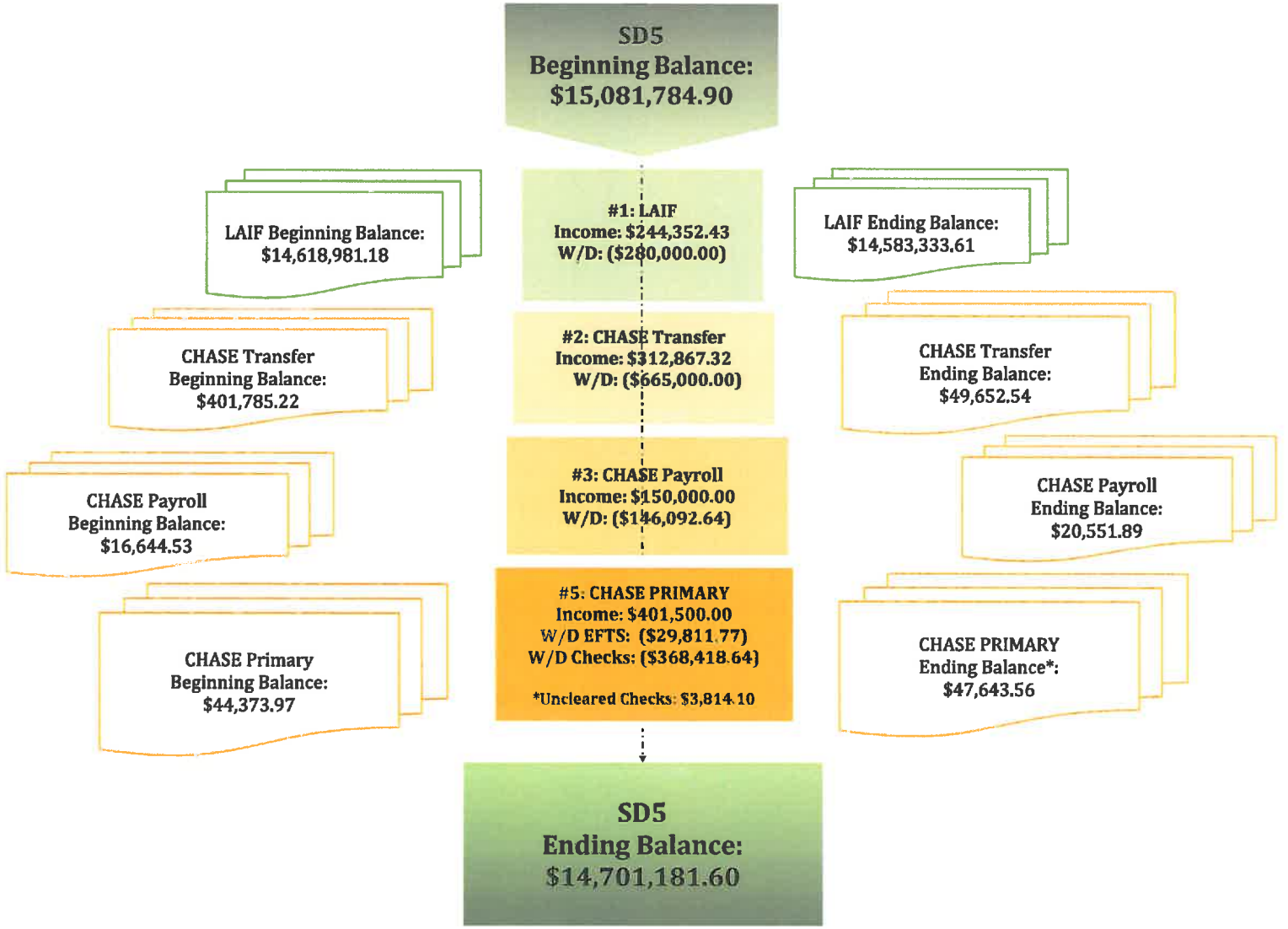
08/08/19	**7069**	**Waste Management of Redwood ...**	**Acct #507-0000190-1507-2, Sludge Disposal, Jul '19**	**JP Morgan Chase - Primary 7399**		
			Inv #0097826-1507-5 Sludge Disposal - 3 pick-ups, 25.79 tons, Jul '19	7029 · Main Plant Sludge Disposal	Belvedere	-360.57
			Inv #0097826-1507-5 Sludge Disposal - 3 pick-ups, 25.79 tons, Jul '19	7043 · Paradise Sludge Disposal	Tiburon:Paradise Cove	-24.27
			Inv #0097826-1507-5 Sludge Disposal - 3 pick-ups, 25.79 tons, Jul '19	7029 · Main Plant Sludge Disposal	Tiburon	-617.87
TOTAL						-1,002.71
08/08/19	**7070**	**Water Components & Building Su...**	**Acct #454, M.P. Parts, Jul '19**	**JP Morgan Chase - Primary 7399**		
			Inv #30504761, M.P. Maint. Supplies - Test plugs, 7.22.19	7021 · Plant Maintenance Supplies	Belvedere	-5.20
			Inv #30504761, M.P. Maint. Supplies - Test plugs, 7.22.19	7021 · Plant Maintenance Supplies	Tiburon	-8.92
TOTAL						-14.12
08/08/19	**7071**	**Wintersun Chemical**	**M.P. Chemicals, Jul '19**	**JP Morgan Chase - Primary 7399**		
			Inv #1904170-03, M.P. Odor Control - Ferrous Chloride Solution, 7.19.19	7024 · Main Plant Chemicals	Belvedere	-491.03
			Inv #1904170-03, M.P. Odor Control - Ferrous Chloride Solution, 7.19.19	7024 · Main Plant Chemicals	Tiburon	-841.47
TOTAL						-1,332.50
08/08/19	**7072**	**WorkSmart Automation, Inc.**	**SCADA System Maintenance, Jul '19**	**JP Morgan Chase - Primary 7399**		
			Inv #4842, SCADA/Bay Alarm Interface w Hypo + WAS PS Feedback, 7.3-7.1...	9225.95 · SCADA Upgrade & Replacem...	Belvedere	-728.34
			Inv #4842, SCADA/Bay Alarm Interface w Hypo + WAS PS Feedback, 7.3-7.1...	9225.95 · SCADA Upgrade & Replacem...	Tiburon	-1,248.16
TOTAL						-1,976.50
08/08/19	**7073**	**Bilsborough, Chad**	**Reimb. for Standby Mi., Jul '19**	**JP Morgan Chase - Primary 7399**		
			Belv. Standby Mi.Reimb., thru 7.21.19	6018.2 · Standby Mileage Expense Reimb	Belvedere	-48.72
TOTAL						-48.72
08/08/19	**7074**	**Driscoll, Stephen**	**Reimb. for Standby Mileage, thru 7.31.19 (FY18-19 AJE)**	**JP Morgan Chase - Primary 7399**		
			Reimb. for Standby Mileage, Belv M.P., thru 6.30.19	6018.2 · Standby Mileage Expense Reimb	Belvedere	-69.47
			Reimb. for Standby Mileage, P.C. Plant., thru 6.30.19	6018.2 · Standby Mileage Expense Reimb	Tiburon:Paradise Cove	-23.55
			Reimb. for Standby Mileage, Tib M.P., thru 6.30.19	6018.2 · Standby Mileage Expense Reimb	Tiburon	-118.91
			Reimb. for Standby Mileage, Belv M.P., thru 7.30.19	6018.2 · Standby Mileage Expense Reimb	Belvedere	-60.74
			Reimb. for Standby Mileage, Tib M.P., thru 7.30.19	6018.2 · Standby Mileage Expense Reimb	Tiburon	-104.10
TOTAL						-376.77
08/08/19	**7075**	**Rosser, John**	**Standby Mileage Reimb, thru 7.10.19**	**JP Morgan Chase - Primary 7399**		
			Belv P&L Standby Mileage Reimb., thru 7.10.19	6018.2 · Standby Mileage Expense Reimb	Belvedere	-50.80
TOTAL						-50.80
08/08/19	**7076**	**Triola, Joseph**	**Reimb. for Standby Mi., Jun '19 (FY18-19 AJE)**	**JP Morgan Chase - Primary 7399**		

Sanitary Distr. No.5 of Marin Co.
Warrant List Detail
July 18 through August 8, 2019

Date	Num	Name	Memo	Account	Class	Paid Amount
			Tib. Standby Mi.Reimb., thru 6.20.19	6018.2 · Standby Mileage Expense Reimb	Tiburon	-112.52
TOTAL						-112.52

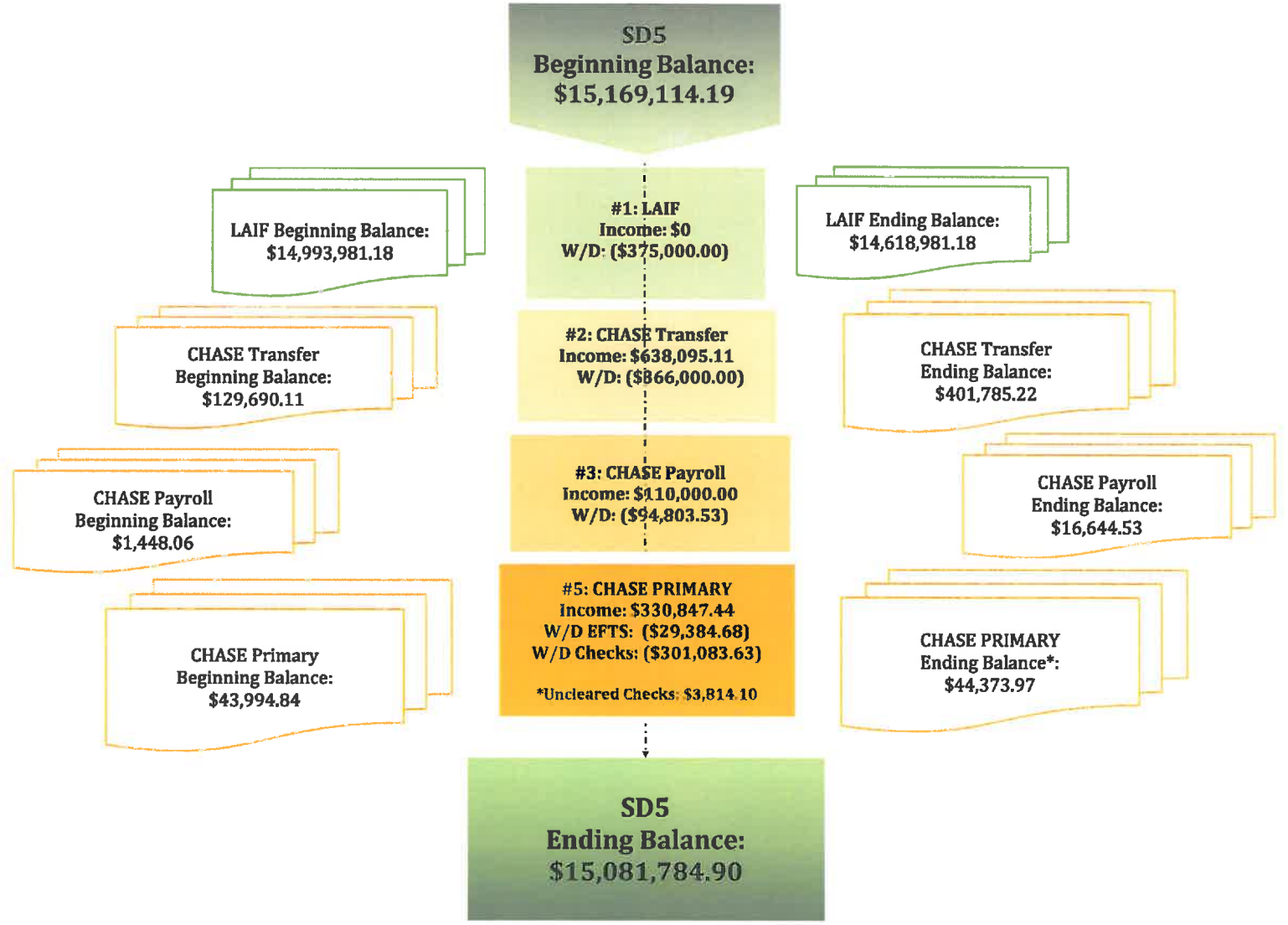
CASH FLOW CHART

SANITARY DISTRICT NO. 5 OF MARIN COUNTY: July, 2019



CASH FLOW CHART

SANITARY DISTRICT NO. 5 OF MARIN COUNTY: June, 2019



JUL 11, 2019

SANITARY DISTRICT NO 5 - 0400-2116
PO BOX 227
BELVEDERE TIBURON, CA 94920

CHECK DATE : 07/12/2019 WEEK 28
PERIOD BEGIN : 07/01/2019
PERIOD END : 07/15/2019

Dear Paychex Preview Client,

Enclosed are your payroll reports and checks. Please verify that all information is accurate and correct. If there are any questions or concerns, please contact us immediately.

If you have tax deposits due, ensure the deposits are initiated at least one banking day prior to the due date to avoid penalties. We will assume that these deposits were made on the due dates and they will be reflected on your returns accordingly.

This is a summary of your payroll transactions of the check date of 07/12/2019. It does not reflect miscellaneous administrative charges. Please refer to your Paychex Human Resource Services invoice(s) for any additional cash required for this check date.

PAYROLL TOTALS

DIRECT DEPOSIT DEBITED FROM YOUR ACCOUNT	33791.84		
READYCHEX DEBITED FROM YOUR ACCOUNT	0.00	NUMBER OF PAYROLL CHECKS	14
TOTAL NET PAYROLL	33791.84		
BILLING PAYMENT	228.35	Withdrawal made by PAYCHEX INC. on above check date.	
AMOUNT DEBITED FROM TAX ACCOUNT	17396.54		
TOTAL TAX LIABILITY DUE BY CLIENT	0.00		
TOTAL TAX LIABILITY	17396.54	**NUMBER OF CHECKS PRINTED**	14
TOTAL NET PAYROLL, TAX LIABILITY, AND SERVICES	51188.38		
TOTAL COST OF PAYROLL	51416.73	NUMBER OF MANUAL/VOID TRANSACTIONS	0

TAX DEPOSITS DUE

TAX AGENCY	TAXPAY	NON-TAXPAY	DUE DATE	
FEDERAL	14626.88		07/17/2019	Deposit made by PAYCHEX INC. on your behalf.
STATE - CA	2769.66		07/17/2019	Deposit made by PAYCHEX INC. on your behalf.

NEXT PERIOD DATES

CHECK DATE : 07/31/2019 WEEK 31 TRANSMIT DATE : 07/03/2019
PERIOD BEGIN : 07/16/2019
PERIOD END : 07/31/2019

JUL 29, 2019

SANITARY DISTRICT NO 5 - 0400-2116
PO BOX 227
BELVEDERE TIBURON, CA 94920

CHECK DATE : 07/31/2019 WEEK 31
PERIOD BEGIN : 07/16/2019
PERIOD END : 07/31/2019

Dear Paychex Preview Client,

Enclosed are your payroll reports and checks. Please verify that all information is accurate and correct. If there are any questions or concerns, please contact us immediately.

If you have tax deposits due, ensure the deposits are initiated at least one banking day prior to the due date to avoid penalties. We will assume that these deposits were made on the due dates and they will be reflected on your returns accordingly.

This is a summary of your payroll transactions of the check date of 07/31/2019. It does not reflect miscellaneous administrative charges. Please refer to your Paychex Human Resource Services invoice(s) for any additional cash required for this check date.

PAYROLL TOTALS

DIRECT DEPOSIT DEBITED FROM YOUR ACCOUNT	35172.36		
READYCHEX DEBITED FROM YOUR ACCOUNT	0.00	NUMBER OF PAYROLL CHECKS	15
TOTAL NET PAYROLL	35172.36		
BILLING PAYMENT	237.05	Withdrawal made by PAYCHEX INC. on above check date.	
AMOUNT DEBITED FROM TAX ACCOUNT	16916.13		
TOTAL TAX LIABILITY DUE BY CLIENT	0.00		
TOTAL TAX LIABILITY	16916.13	**NUMBER OF CHECKS PRINTED**	15
TOTAL NET PAYROLL, TAX LIABILITY, AND SERVICES	52088.49		
TOTAL COST OF PAYROLL	52325.54	NUMBER OF MANUAL/VOID TRANSACTIONS	0

TAX DEPOSITS DUE

TAX AGENCY	TAXPAY	NON-TAXPAY	DUE DATE	
FEDERAL	14111.59		08/07/2019	Deposit made by PAYCHEX INC. on your behalf.
STATE - CA	2804.54		08/07/2019	Deposit made by PAYCHEX INC. on your behalf.

NEXT PERIOD DATES

CHECK DATE : 08/15/2019 WEEK 33 TRANSMIT DATE : 07/19/2019
PERIOD BEGIN : 08/01/2019
PERIOD END : 08/15/2019

9:38 AM
08/06/19

Sanitary Distr. No.5 of Marin Co.
Comparative Balance Sheet - Abbreviated
As of July 31, 2019

	Jul 31, 19	Jun 30, 19	$ Change
ASSETS			
Current Assets			
Checking/Savings			
Local Agency Investment Fund			
Belvedere			
Belvedere Operating	3,565,902.14	3,692,092.99	-126,190.85
Belvedere Operating Reserve	284,923.05	284,923.05	0.00
Belvedere Capital & CIP Reserve	3,090,836.19	3,109,367.66	-18,531.47
Belvedere PERS Retirement Trust	152,530.00	152,530.00	0.00
Belvedere Disaster Recovery Fnd	356,250.00	356,250.00	0.00
Total Belvedere	7,450,441.38	7,595,163.70	-144,722.32
Tiburon			
Tiburon Operating	2,392,188.03	2,106,182.56	286,005.47
Tiburon Operating Reserve	414,430.00	414,430.00	0.00
Tiburon Capital & CIP Reserve	3,406,904.20	3,583,834.92	-176,930.72
Tiburon PERS Retirement Trust	275,620.00	275,620.00	0.00
Tiburon Disaster Recovery Fund	643,750.00	643,750.00	0.00
Total Tiburon	7,132,892.23	7,023,817.48	109,074.75
Total Local Agency Investment Fund	14,583,333.61	14,618,981.18	-35,647.57
JP Morgan Chase - Primary 7399	46,183.56	40,559.87	5,623.69
JP Morgan Chase - Payroll 7506	18,301.52	16,644.53	1,656.99
JP Morgan Chase - Transfer 7522	49,652.54	401,785.22	-352,132.68
Total Checking/Savings	14,697,471.23	15,077,970.80	-380,499.57
Accounts Receivable			
Accounts Receivable	22,031.07	-1,261.89	23,292.96
Total Accounts Receivable	22,031.07	-1,261.89	23,292.96
Other Current Assets			
Prepaid Expense	79,390.89	79,390.89	0.00
Petty Cash	881.92	881.92	0.00
Total Other Current Assets	80,272.81	80,272.81	0.00
Total Current Assets	14,799,775.11	15,156,981.72	-357,206.61
Fixed Assets	19,641,712.20	19,641,712.20	0.00
TOTAL ASSETS	**34,441,487.31**	**34,798,693.92**	**-357,206.61**
LIABILITIES & EQUITY			
Liabilities			
Current Liabilities			
Accounts Payable			
2000 · Accounts Payable	79,390.89	-238,146.32	317,537.21
Total Accounts Payable	79,390.89	-238,146.32	317,537.21
Other Current Liabilities			
Compensated Absences Current	154,737.02	154,737.02	0.00
Retainage Payable	0.00	41,652.54	-41,652.54
MPR Rev Bond Interest Payable	-86,137.50	-86,137.50	0.00
Total Other Current Liabilities	68,599.52	110,252.06	-41,652.54
Total Current Liabilities	147,990.41	-127,894.26	275,884.67
Long Term Liabilities			
2061 · OPEB Related Liability	853,649.00	853,649.00	0.00
Pension-related Liabilities	-475,963.00	-475,963.00	0.00
MPR Revenue Bonds Payable	7,675,000.00	7,675,000.00	0.00
MPR Rev Bond Premiums Payable	876,279.39	876,279.39	0.00
Total Long Term Liabilities	8,928,965.39	8,928,965.39	0.00
Total Liabilities	9,076,955.80	8,801,071.13	275,884.67
Equity			
3000 · Closing Entries	632,275.00	632,275.00	0.00
3900 · Net Assets	25,365,347.79	22,660,144.59	2,705,203.20
Net Income	-633,091.28	2,705,203.20	-3,338,294.48
Total Equity	25,364,531.51	25,997,622.79	-633,091.28
TOTAL LIABILITIES & EQUITY	**34,441,487.31**	**34,798,693.92**	**-357,206.61**

Sanitary Distr. No.5 of Marin Co.
Annual Budget vs Actual Expenses
July 2019

	Jul 19	Budget	$ Over Budget	% of Bud...
Ordinary Income/Expense				
Income				
5000 · Property Taxes				
5001.2 · TEETER	10,707.52	700,000.00	-689,292.48	1.5%
5002 · UNSEC	0.00	13,000.00	-13,000.00	0.0%
5003 · PUNS / PRIOR UNSECURED	0.00	0.00	0.00	0.0%
5004 · REDEMPTION / RDMPT	9.47	500.00	-490.53	1.9%
5006 · SPLU	0.00	100.00	-100.00	0.0%
5041 · SUPSEC	1,029.76	15,000.00	-13,970.24	6.9%
5043 · SECU	0.00	0.00	0.00	0.0%
5046 · Excess ERAF	0.00	250,000.00	-250,000.00	0.0%
5280 · HOPTR	0.00	3,333.00	-3,333.00	0.0%
5483 · Other tax	17.97	0.00	17.97	100.0%
Total 5000 · Property Taxes	11,764.72	981,933.00	-970,168.28	1.2%
5007 · Sewer Service Charge				
5007.1 · Sewer Service - Tiburon Ops	10,916.36	2,454,797.00	-2,443,880.64	0.4%
5007.5 · Sewer Service - Tiburon Cap	2,529.59	230,977.00	-228,447.41	1.1%
5007.2 · Sewer Service-Belv Ops	4,487.95	1,396,621.00	-1,392,133.05	0.3%
5007.3 · Sewer Service-Belv Cap	3,168.70	923,348.00	-920,179.30	0.3%
5007.4 · Other User Fees	0.00	24,826.00	-24,826.00	0.0%
Total 5007 · Sewer Service Charge	21,102.60	5,030,569.00	-5,009,466.40	0.4%
5201 · Interest				
5201.2 · Interest LAIF	89,352.43	25,000.00	64,352.43	357.4%
Total 5201 · Interest	89,352.43	25,000.00	64,352.43	357.4%
5900.3 · Connection Fees				
5900.30 · Connection Permit Fees	600.00	10,000.00	-9,400.00	6.0%
5900.31 · Collection	0.00	100,000.00	-100,000.00	0.0%
5900.34 · Treatment	0.00	100,000.00	-100,000.00	0.0%
Total 5900.3 · Connection Fees	600.00	210,000.00	-209,400.00	0.3%
5900.4 · Inspection Permit Fees	900.00	10,000.00	-9,100.00	9.0%
5900.5 · SASM Expense Reimb.	17,292.96	65,000.00	-47,707.04	26.6%
5900.9 · Other Income	0.00	100.00	-100.00	0.0%
5900.10 · Paradise Sewer Line Ext. Fees	0.00	13,365.00	-13,365.00	0.0%
Total Income	141,012.71	6,335,967.00	-6,194,954.29	2.2%
Expense				
6000 · Administrative Expenses				
6001 · Advertising	950.02	1,000.00	-49.98	95.0%
6002 · Outreach & Newsletter	0.00	1,000.00	-1,000.00	0.0%
6008 · Audit & Accounting	0.00	33,700.00	-33,700.00	0.0%
6017 · Consulting Fees	62,739.32	100,000.00	-37,260.68	62.7%
6018 · Travel & Meetings				
6018.1 · Meetings & Travel	1,324.88	8,000.00	-6,675.12	16.6%
6018.2 · Standby Mileage Expense Reimb	500.51	7,000.00	-6,499.49	7.2%
Total 6018 · Travel & Meetings	1,825.39	15,000.00	-13,174.61	12.2%
6020 · Continuing Education	6,897.72	10,000.00	-3,102.28	69.0%
6021 · County Fees	4,842.24	16,500.00	-11,657.76	29.3%
6024 · Director Fees	6,400.00	9,000.00	-2,600.00	71.1%
6025 · Dues & Subscriptions	5,962.33	25,000.00	-19,037.67	23.8%
6033 · Insurance Property & Liability				
6033.1 · PLP Public Entity Phys Damage	0.00	17,377.00	-17,377.00	0.0%
6033.2 · General Liability	18,646.50	42,840.00	-24,193.50	43.5%
6033.3 · Physical Property Damage - Auto	1,227.00	1,435.00	-208.00	85.5%
Total 6033 · Insurance Property & Liability	19,873.50	61,652.00	-41,778.50	32.2%

Sanitary Distr. No.5 of Marin Co.
Annual Budget vs Actual Expenses
July 2019

	Jul 19	Budget	$ Over Budget	% of Bud...
6039 · Legal	567.00	70,000.00	-69,433.00	0.8%
6047 · Office Supplies	569.94	7,000.00	-6,430.06	8.1%
6056 · Postage	114.20	1,000.00	-885.80	11.4%
6059 · Pollution Prevention/Public Edu	0.00	4,000.00	-4,000.00	0.0%
Total 6000 · Administrative Expenses	110,741.66	354,852.00	-244,110.34	31.2%
7000 · Ops & Maintenance Expenses				
7010 · Pumps & Lines Maintenance				
7011 · Pumps & Lines Maintenance	74,300.28	200,000.00	-125,699.72	37.2%
7013 · Emergency Line Repair	0.00	50,000.00	-50,000.00	0.0%
Total 7010 · Pumps & Lines Maintenance	74,300.28	250,000.00	-175,699.72	29.7%
7020 · Main Plant Maintenance				
7021 · Plant Maintenance Supplies	1,010.82	10,000.00	-8,989.18	10.1%
7022 · Plant Maint. Parts & Service	9,116.56	50,000.00	-40,883.44	18.2%
7023 · Janitorial Supplies & Service	374.62	6,000.00	-5,625.38	6.2%
7024 · Main Plant Chemicals	9,717.21	105,000.00	-95,282.79	9.3%
7025 · Lab Supplies & Chemicals	2,677.34	15,000.00	-12,322.66	17.8%
7027 · Electrical & Instrument	1,296.00	5,000.00	-3,704.00	25.9%
7028 · Grounds Maintenance	389.94	8,000.00	-7,610.06	4.9%
7029 · Main Plant Sludge Disposal	2,036.22	30,000.00	-27,963.78	6.8%
Total 7020 · Main Plant Maintenance	26,618.71	229,000.00	-202,381.29	11.6%
7040 · Paradise Cove Plant Maint				
7041 · Paradise Parts & Service	0.00	10,000.00	-10,000.00	0.0%
7042 · Paradise Supplies & Chemicals	318.70	5,000.00	-4,681.30	6.4%
7043 · Paradise Sludge Disposal	44.52	8,000.00	-7,955.48	0.6%
Total 7040 · Paradise Cove Plant Maint	363.22	23,000.00	-22,636.78	1.6%
7050 · Monitoring				
7051 · Main Plant Lab Monitoring	7,906.20	45,000.00	-37,093.80	17.6%
7052 · Paradise Cove Monitoring	666.00	15,000.00	-14,334.00	4.4%
Total 7050 · Monitoring	8,572.20	60,000.00	-51,427.80	14.3%
7060 · Permits/Fees				
7062 · Permits/Fees - General	18,522.39	40,000.00	-21,477.61	46.3%
7063 · Paradise Cove Permits/Fees	231.28	8,000.00	-7,768.72	2.9%
Total 7060 · Permits/Fees	18,753.67	48,000.00	-29,246.33	39.1%
7070 · Truck Maintenance				
7071 · Fuel	952.04	8,000.00	-7,047.96	11.9%
7072 · Truck Maintenance	0.00	5,000.00	-5,000.00	0.0%
Total 7070 · Truck Maintenance	952.04	13,000.00	-12,047.96	7.3%
Total 7000 · Ops & Maintenance Expenses	129,560.12	623,000.00	-493,439.88	20.8%
8000 · Salaries and Benefits Expenses				
8001 · Salaries	72,436.80	1,153,504.00	-1,081,067.20	6.3%
8003 · Overtime	9,870.58	100,000.00	-90,129.42	9.9%
8004 · Standby Pay	5,953.14	69,428.00	-63,474.86	8.6%
8005 · Employee Incentives	5,000.00	40,000.00	-35,000.00	12.5%
8006 · Vacation Buyout	2,037.12	25,000.00	-22,962.88	8.1%
8013 · Payroll Taxes	7,425.23	94,891.00	-87,465.77	7.8%
8015 · Payroll/Bank Fees	465.40	5,500.00	-5,034.60	8.5%
8016 · Car Allowance	6,000.00	6,000.00	0.00	100.0%
8019 · PERS Retirement				
8019.05 · PERS Retirement	26,197.30	147,885.00	-121,687.70	17.7%
8019.08 · PERS Retirement - CalPERS UAL	642.00	20,000.00	-19,358.00	3.2%
8019.10 · PERS Retirement Trust	0.00	286,555.00	-286,555.00	0.0%
Total 8019 · PERS Retirement	26,839.30	454,440.00	-427,600.70	5.9%

Sanitary Distr. No.5 of Marin Co.
Annual Budget vs Actual Expenses
July 2019

	Jul 19	Budget	$ Over Budget	% of Bud...
8020 · Employee Health				
8020.05 · Employee Health	15,369.62	217,176.00	-201,806.38	7.1%
8021 · Employee Health Deductions	-250.40			
Total 8020 · Employee Health	15,119.22	217,176.00	-202,056.78	7.0%
8022 · Retiree Health				
8022.05 · Reitree Health	34,403.37	79,551.00	-45,147.63	43.2%
8022.10 · CERBT/OPEB Annual Arc Contribtn	0.00	70,200.00	-70,200.00	0.0%
Total 8022 · Retiree Health	34,403.37	149,751.00	-115,347.63	23.0%
8023 · Workers Comp Insurance	0.00	29,365.00	-29,365.00	0.0%
Total 8000 · Salaries and Benefits Expenses	185,550.16	2,345,055.00	-2,159,504.84	7.9%
8500 · Other Operating Expenses				
8510 · Data/Alarms/IT Supp & Licensing	19,908.24	80,000.00	-60,091.76	24.9%
8515 · Safety	0.00	20,000.00	-20,000.00	0.0%
8520 · Personal Protection/Safety Wear	1,161.98	15,000.00	-13,838.02	7.7%
8530 · Telephone				
8531 · Main Plant Telephones	1,141.50	11,000.00	-9,858.50	10.4%
8532 · Paradise Cove Telephones	601.74	4,000.00	-3,398.26	15.0%
8533 · Pumps & Lines Telephones	957.72	7,000.00	-6,042.28	13.7%
Total 8530 · Telephone	2,700.96	22,000.00	-19,299.04	12.3%
8540 · Utilities				
8541 · Water	1,736.12	4,000.00	-2,263.88	43.4%
8542 · Main Plant Utilities	34,613.78	180,000.00	-145,386.22	19.2%
8543 · Paradise Cove Utilities	2,388.60	13,500.00	-11,111.40	17.7%
8544 · Pump Station Utilities	5,723.76	35,000.00	-29,276.24	16.4%
Total 8540 · Utilities	44,462.26	232,500.00	-188,037.74	19.1%
Total 8500 · Other Operating Expenses	68,233.44	369,500.00	-301,266.56	18.5%
Total Expense	494,085.38	3,692,407.00	-3,198,321.62	13.4%
Net Ordinary Income	-353,072.67	2,643,560.00	-2,996,632.67	-13.4%
Other Income/Expense				
Other Expense				
9100 · Capital Expenditures				
9200 · Main Plant Equipment Capital				
9204 · M.P. Boiler Replacement	525.00			
9212 · Headworks Grinder Replacement	0.00	15,000.00	-15,000.00	0.0%
Total 9200 · Main Plant Equipment Capital	525.00	15,000.00	-14,475.00	3.5%
9300 · Pumps & Lines Capital				
9301 · Tiburon Sewer Line Rehab Prog	190,400.00	600,000.00	-409,600.00	31.7%
9302 · PS Control Panel Upgrades	553.06	40,000.00	-39,446.94	1.4%
9304 · Belvedere Sewer Line Rehab Prog	0.00	600,000.00	-600,000.00	0.0%
9306 · PS Pump & Valve Replacements	52,247.95	50,000.00	2,247.95	104.5%
9307 · PS Generator Replacement	16,027.50	20,000.00	-3,972.50	80.1%
9310 · BPS Communication Project	1,675.00			
9314 · Portable Emergency Generators	997.14			
Total 9300 · Pumps & Lines Capital	261,900.65	1,310,000.00	-1,048,099.35	20.0%
9500 · Undesignated Capital				
9510 · Undesignated Cap - M.P.	0.00	25,000.00	-25,000.00	0.0%
9520 · Undesignated Cap - P.C. Plant	0.00	10,000.00	-10,000.00	0.0%
9540 · Undesignated Cap - Tiburon	0.00	25,000.00	-25,000.00	0.0%
9550 · Undesignated Cap - Belvedere	0.00	25,000.00	-25,000.00	0.0%
Total 9500 · Undesignated Capital	0.00	85,000.00	-85,000.00	0.0%
Total 9100 · Capital Expenditures	262,425.65	1,410,000.00	-1,147,574.35	18.6%

Sanitary Distr. No.5 of Marin Co.
Annual Budget vs Actual Expenses
July 2019

	Jul 19	Budget	$ Over Budget	% of Bud...
9700 · Debt Service				
9730 · Debt Service - MPR Project				
9731 · Debt Service MPR Bond Principal	0.00	470,000.00	-470,000.00	0.0%
9732 · Debt Service MPR Bond Interest	0.00	330,650.00	-330,650.00	0.0%
Total 9730 · Debt Service - MPR Project	0.00	800,650.00	-800,650.00	0.0%
Total 9700 · Debt Service	0.00	800,650.00	-800,650.00	0.0%
Total Other Expense	262,425.65	2,210,650.00	-1,948,224.35	11.9%
Net Other Income	-262,425.65	-2,210,650.00	1,948,224.35	11.9%
Net Income	**-615,498.32**	**432,910.00**	**-1,048,408.32**	**-142.2%**

08/06/19

Sanitary Distr. No.5 of Marin Co.
Zone Report
July 2019

	Paradise Cove (Tiburon)	Tiburon - Other (Tiburon)	Total Tiburon	Belvedere	TOTAL
Ordinary Income/Expense					
Income					
5000 · Property Taxes					
5001.2 · TEETER	358.70	10,348.82	10,707.52	0.00	10,707.52
5004 · REDEMPTION / RDMPT	0.32	9.15	9.47	0.00	9.47
5041 · SUPSEC	34.50	995.26	1,029.76	0.00	1,029.76
5483 · Other tax	0.60	17.37	17.97	0.00	17.97
Total 5000 · Property Taxes	394.12	11,370.60	11,764.72	0.00	11,764.72
5007 · Sewer Service Charge					
5007.1 · Sewer Service - Tiburon Ops	365.70	10,550.66	10,916.36	0.00	10,916.36
5007.5 · Sewer Service - Tiburon Cap	84.74	2,444.85	2,529.59	0.00	2,529.59
5007.2 · Sewer Service-Belv Ops	0.00	0.00	0.00	4,487.95	4,487.95
5007.3 · Sewer Service-Belv Cap	0.00	0.00	0.00	3,168.70	3,168.70
Total 5007 · Sewer Service Charge	450.44	12,995.51	13,445.95	7,656.65	21,102.60
5201 · Interest					
5201.2 · Interest LAIF	0.00	38,047.32	38,047.32	51,305.11	89,352.43
Total 5201 · Interest	0.00	38,047.32	38,047.32	51,305.11	89,352.43
5900.3 · Connection Fees					
5900.30 · Connection Permit Fees	0.00	300.00	300.00	300.00	600.00
Total 5900.3 · Connection Fees	0.00	300.00	300.00	300.00	600.00
5900.4 · Inspection Permit Fees	0.00	700.00	700.00	200.00	900.00
5900.5 · SASM Expense Reimb.	0.00	9,874.55	9,874.55	7,418.41	17,292.96
Total Income	844.56	73,287.98	74,132.54	66,880.17	141,012.71
Expense					
6000 · Administrative Expenses					
6001 · Advertising	20.34	586.82	607.16	342.86	950.02
6017 · Consulting Fees	12,970.12	26,137.12	39,107.24	23,632.08	62,739.32
6018 · Travel & Meetings					
6018.1 · Meetings & Travel	28.91	818.09	847.00	477.88	1,324.88
6018.2 · Standby Mileage Expense Reimb	30.75	201.35	232.10	268.41	500.51
Total 6018 · Travel & Meetings	59.66	1,019.44	1,079.10	746.29	1,825.39
6020 · Continuing Education	149.02	4,259.98	4,409.00	2,488.72	6,897.72
6021 · County Fees	117.12	2,983.82	3,100.94	1,741.30	4,842.24
6024 · Director Fees	136.96	3,953.28	4,090.24	2,309.76	6,400.00
6025 · Dues & Subscriptions	128.17	3,695.01	3,823.18	2,139.15	5,962.33
6033 · Insurance Property & Liability					
6033.2 · General Liability	451.25	11,489.97	11,941.22	6,705.28	18,646.50
6033.3 · Physical Property Damage - Auto	29.69	756.08	785.77	441.23	1,227.00
Total 6033 · Insurance Property & Liability	480.94	12,246.05	12,726.99	7,146.51	19,873.50
6039 · Legal	12.13	350.24	362.37	204.63	567.00
6047 · Office Supplies	12.20	352.06	364.26	205.68	569.94
6056 · Postage	2.75	70.37	73.12	41.08	114.20
Total 6000 · Administrative Expenses	14,089.41	55,654.19	69,743.60	40,998.06	110,741.66
7000 · Ops & Maintenance Expenses					
7010 · Pumps & Lines Maintenance					
7011 · Pumps & Lines Maintenance	0.00	64,670.94	64,670.94	9,629.34	74,300.28
Total 7010 · Pumps & Lines Maintenance	0.00	64,670.94	64,670.94	9,629.34	74,300.28
7020 · Main Plant Maintenance					
7021 · Plant Maintenance Supplies	0.00	638.02	638.02	372.80	1,010.82
7022 · Plant Maint. Parts & Service	0.00	5,754.40	5,754.40	3,362.16	9,116.56
7023 · Janitorial Supplies & Service	0.00	236.54	236.54	138.08	374.62
7024 · Main Plant Chemicals	0.00	6,133.72	6,133.72	3,583.49	9,717.21
7025 · Lab Supplies & Chemicals	0.00	1,689.94	1,689.94	987.40	2,677.34
7026 · SASM Supplies & Chem	0.00	5,528.78	5,528.78	3,230.38	8,759.16
7027 · Electrical & Instrument	0.00	0.00	0.00	1,296.00	1,296.00

Sanitary Distr. No.5 of Marin Co.
Zone Report
July 2019

	Paradise Cove (Tiburon)	Tiburon - Other (Tiburon)	Total Tiburon	Belvedere	TOTAL
7028 · Grounds Maintenance	0.00	246.25	246.25	143.69	389.94
7029 · Main Plant Sludge Disposal	0.00	1,285.30	1,285.30	750.92	2,036.22
Total 7020 · Main Plant Maintenance	0.00	21,512.95	21,512.95	13,864.92	35,377.87
7040 · Paradise Cove Plant Maint					
7042 · Paradise Supplies & Chemicals	318.70	0.00	318.70	0.00	318.70
7043 · Paradise Sludge Disposal	44.52	0.00	44.52	0.00	44.52
Total 7040 · Paradise Cove Plant Maint	363.22	0.00	363.22	0.00	363.22
7050 · Monitoring					
7051 · Main Plant Lab Monitoring	0.00	4,990.38	4,990.38	2,915.82	7,906.20
7052 · Paradise Cove Monitoring	666.00	0.00	666.00	0.00	666.00
Total 7050 · Monitoring	666.00	4,990.38	5,656.38	2,915.82	8,572.20
7060 · Permits/Fees					
7062 · Permits/Fees - General	0.00	11,696.89	11,696.89	6,825.50	18,522.39
7063 · Paradise Cove Permits/Fees	231.28	0.00	231.28	0.00	231.28
Total 7060 · Permits/Fees	231.28	11,696.89	11,928.17	6,825.50	18,753.67
7070 · Truck Maintenance					
7071 · Fuel	20.37	588.08	608.45	343.59	952.04
Total 7070 · Truck Maintenance	20.37	588.08	608.45	343.59	952.04
Total 7000 · Ops & Maintenance Expenses	1,280.87	103,459.24	104,740.11	33,579.17	138,319.28
8000 · Salaries and Benefits Expenses					
8001 · Salaries	1,959.48	44,507.57	46,467.05	25,969.75	72,436.80
8030 · Salaries Reimbursed by SASM	0.00	5,386.53	5,386.53	3,147.27	8,533.80
8003 · Overtime	238.87	6,082.23	6,321.10	3,549.48	9,870.58
8004 · Standby Pay	144.06	3,668.33	3,812.39	2,140.75	5,953.14
8005 · Employee Incentives	0.00	4,879.00	4,879.00	121.00	5,000.00
8006 · Vacation Buyout	49.30	1,255.27	1,304.57	732.55	2,037.12
8007 · Voluntary Deductions	0.00	0.00	0.00	0.00	0.00
8008 · Deferred Comp 457	0.00	0.00	0.00	0.00	0.00
8012 · Wage Garnishments	0.00	300.00	300.00	0.00	300.00
8013 · Payroll Taxes	179.69	4,575.43	4,755.12	2,670.11	7,425.23
8015 · Payroll/Bank Fees	11.27	286.78	298.05	167.35	465.40
8016 · Car Allowance	145.20	3,697.20	3,842.40	2,157.60	6,000.00
8019 · PERS Retirement					
8019.05 · PERS Retirement	550.73	16,187.38	16,738.11	9,459.19	26,197.30
8019.08 · PERS Retirement - CalPERS UAL	13.74	396.56	410.30	231.70	642.00
Total 8019 · PERS Retirement	564.47	16,583.94	17,148.41	9,690.89	26,839.30
8020 · Employee Health					
8020.05 · Employee Health	371.91	9,470.78	9,842.69	5,526.93	15,369.62
8021 · Employee Health Deductions	-6.06	-154.30	-160.36	-90.04	-250.40
Total 8020 · Employee Health	365.85	9,316.48	9,682.33	5,436.89	15,119.22
8022 · Retiree Health					
8022.05 · Reitree Health	832.52	21,199.38	22,031.90	12,371.47	34,403.37
Total 8022 · Retiree Health	832.52	21,199.38	22,031.90	12,371.47	34,403.37
Total 8000 · Salaries and Benefits Expenses	4,490.71	121,738.14	126,228.85	68,155.11	194,383.96
8500 · Other Operating Expenses					
8510 · Data/Alarms/IT Supp & Licensing	427.85	12,296.33	12,724.18	7,184.06	19,908.24
8520 · Personal Protection/Safety Wear	24.86	717.76	742.62	419.36	1,161.98
8530 · Telephone					
8531 · Main Plant Telephones	0.00	720.59	720.59	420.91	1,141.50
8532 · Paradise Cove Telephones	601.74	0.00	601.74	0.00	601.74
8533 · Pumps & Lines Telephones	346.96	610.76	957.72	0.00	957.72
Total 8530 · Telephone	948.70	1,331.35	2,280.05	420.91	2,700.96
8540 · Utilities					

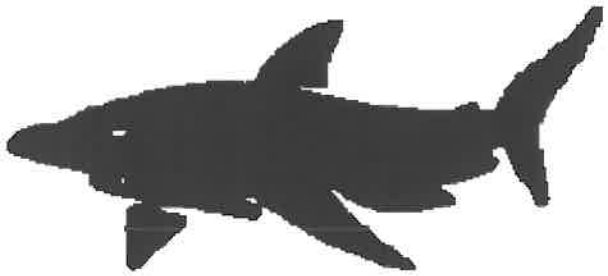
Sanitary Distr. No.5 of Marin Co.
Zone Report
July 2019

	Paradise Cove (Tiburon)	Tiburon - Other (Tiburon)	Total Tiburon	Belvedere	TOTAL
8541 · Water	0.00	1,010.52	1,010.52	725.60	1,736.12
8542 · Main Plant Utilities	0.00	21,848.22	21,848.22	12,765.56	34,613.78
8543 · Paradise Cove Utilities	2,388.60	0.00	2,388.60	0.00	2,388.60
8544 · Pump Station Utilities	468.90	2,841.10	3,310.00	2,413.76	5,723.76
Total 8540 · Utilities	2,857.50	25,699.84	28,557.34	15,904.92	44,462.26
Total 8500 · Other Operating Expenses	4,258.91	40,045.28	44,304.19	23,929.25	68,233.44
Total Expense	24,119.90	320,896.85	345,016.75	166,661.59	511,678.34
Net Ordinary Income	-23,275.34	-247,608.87	-270,884.21	-99,781.42	-370,665.63
Other Income/Expense					
Other Expense					
9100 · Capital Expenditures					
9200 · Main Plant Equipment Capital					
9204 · M.P. Boiler Replacement	0.00	331.38	331.38	193.62	525.00
Total 9200 · Main Plant Equipment Capital	0.00	331.38	331.38	193.62	525.00
9300 · Pumps & Lines Capital					
9301 · Tiburon Sewer Line Rehab Prog	0.00	190,400.00	190,400.00	0.00	190,400.00
9302 · PS Control Panel Upgrades	0.00	0.00	0.00	553.06	553.06
9306 · PS Pump & Valve Replacements	0.00	26,123.98	26,123.98	26,123.97	52,247.95
9307 · PS Generator Replacement	0.00	0.00	0.00	16,027.50	16,027.50
9310 · BPS Communication Project	0.00	0.00	0.00	1,675.00	1,675.00
9314 · Portable Emergency Generators	0.00	629.39	629.39	367.75	997.14
Total 9300 · Pumps & Lines Capital	0.00	217,153.37	217,153.37	44,747.28	261,900.65
Total 9100 · Capital Expenditures	0.00	217,484.75	217,484.75	44,940.90	262,425.65
Total Other Expense	0.00	217,484.75	217,484.75	44,940.90	262,425.65
Net Other Income	0.00	-217,484.75	-217,484.75	-44,940.90	-262,425.65
Net Income	-23,275.34	-465,093.62	-488,368.96	-144,722.32	-633,091.28

Sanitary Distr. No.5 of Marin Co.
Monthly O.T. Report
July 2019

Type	Date	Num	Name	Memo	Amount	Balance
Bilsborough, Chad						
Check	07/31/19	2121-3256	Bilsborough, Chad	16.0 Hrs. O.T. @ 1.5x	827.28	827.28
Total Bilsborough, Chad					827.28	827.28
Cottrell, Rulon						
Check	07/12/19	1931-3243	Cottrell, Rulon	16.25 Hrs. O.T. @ 1.5x	1,199.39	1,199.39
Check	07/31/19	2121-3258	Cottrell, Rulon	80.0 Hrs. Comp Buy Out	4,074.23	5,273.62
Total Cottrell, Rulon					5,273.62	5,273.62
Dohrmann, Robin						
Check	07/12/19	1931-3244	Dohrmann, Robin	2.50 Hrs. O.T. @ 1.5x	184.52	184.52
Check	07/31/19	2121-3260	Dohrmann, Robin	9.0 Hrs. O.T. @ 1.5x	687.53	872.05
Total Dohrmann, Robin					872.05	872.05
Driscoll, Stephen						
Check	07/12/19	1931-3246	Driscoll, Stephen	4.0 Hrs. O.T. @ 1.5x	325.50	325.50
Check	07/12/19	1931-3246	Driscoll, Stephen	1.0 Hrs. O.T. @ 2.0x	108.50	434.00
Check	07/31/19	2121-3262	Driscoll, Stephen	18.0 Hrs. O.T. @ 1.5x	1,516.00	1,950.00
Check	07/31/19	2121-3262	Driscoll, Stephen	1.0 Hrs. O.T. @ 2.0x	112.30	2,062.30
Total Driscoll, Stephen					2,062.30	2,062.30
Rosser, John						
Check	07/12/19	1931-3250	Rosser, John	3.0 Hrs. O.T. @ 1.5x	210.88	210.88
Check	07/12/19	1931-3250	Rosser, John	2.5 Hrs. O.T. @ 2.0x	234.31	445.19
Check	07/31/19	2121-3264	Rosser, John	2.0 Hrs. O.T. @ 1.5x	145.51	590.70
Check	07/31/19	2121-3264	Rosser, John	1.0 Hrs. O.T. @ 2.0x	97.01	687.71
Total Rosser, John					687.71	687.71
Triola, Joseph						
Check	07/12/19	1931-3254	Triola, Joseph	2.0 Hrs. O.T. @ 1.5x	147.62	147.62
Total Triola, Joseph					147.62	147.62
TOTAL					**9,870.58**	**9,870.58**

Sanitary District No. 5 of Marin County



District Management Report

July 2019

Contents:

Transmittal Memo

Date: August 15, 2019

To: Board of Directors

From: Tony Rubio, District Manager/ Chief Plant Operator

Subject: Management Report for July 2019

Fiscal Status

Period Covered:	July 1, 2019 –July 31, 2019
Percent of Fiscal Year:	8%
Percent of Budgeted Income to Date:	2.2%
Percent of Budgeted Expenditures to Date:	13.4% operating only

Personnel

Separations:	None
New Hires:	None
Promotions:	None
Recruitment Activities:	None

Regulatory Compliance

MP Collection System WDR Compliance:	Full Compliance with all regulations
PC Collection System WDR Compliance:	Full Compliance with all regulations
MP NPDES Permit Compliance:	Full Compliance with all regulations
PC NPDES Permit Compliance:	Full Compliance with all regulations
BAAQMD Compliance:	Full Compliance with all regulations
Bio-Solids Compliance:	Full Compliance with all regulations
Significant Comments:	None

Summary of Operational Highlights are on the following pages.

Significant Events for the Month of July 2019 Include:

Financial/Budgetary/Business Administration

- District Code being prepared for Website
- Beginning 19-20 fiscal year capital expenditures
- Working with FEMA-application regarding Vistazo West sewer line repairs
- Fiscal Year 19-20 sewer fees submitted to County of Marin
- Robin preparing for end of fiscal year closing- scheduled date with Perotti & Carrade.

HR and Personnel

- Completed District Draft Management Succession Plan

Continuing Education and Safety Training

- Reviewing District Emergency Response Plan – ongoing
- Creating Emergency Preparedness Plan for use on Districts website - ongoing

Collection System Performance

Belvedere:

- Sewer line cleaning with Rodder truck under way

Tiburon:

- Sewer line cleaning with Rodder truck under way

Paradise Cove:

- Submitted No Spill report to RWQCB on CIWQS

Treatment Plant Performance

Paradise Cove:

- Tesco Controls investigating L2000 alarm registers- working with Worksmart to troubleshoot issue.
- Submitted 2nd Q SMR to RWQCB

Main Plant:

- Submitted June 2019 SMR and DMR to the RWQCB

- Work Orders being performed
- Bio-solids Master plan communications with HDR.
- Site Visit to Lystek Facility in Fairfield CA.

Pollution Prevention Activities

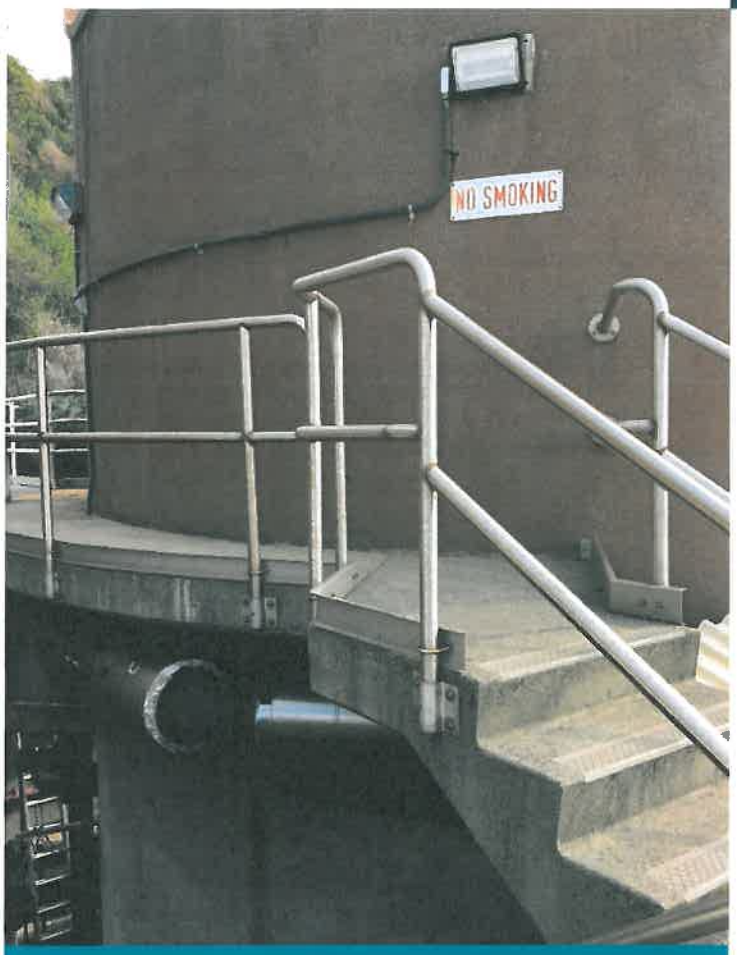
- CB attended P2 Monthly Meeting.

Capital Improvement Projects

- 19' Sewer Rehabilitation Project Contract awarded to Glosage Engineers Inc NTP issued August 2
- Design of Cove Road force main rehabilitation project underway. Meeting with Nute this week about dates.
- Working on getting quotes for Vactor Truck
- Received grinder for headworks
- Working to get proposals for Main plant drain rehabilitation work.

Item #5

SANITARY DISTRICT No. 5 of Marin County



Biosolids Management and Future Biosolids Master Plan

Sanitation District No. 5 of Marin County

HDR

August
2019

REGISTERED PROFESSIONAL ENGINEER
Mary Martis
C73150
Exp.
12/31/2020
STATE OF CALIFORNIA

Contents

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Executive Summary

Background

Sanitary District No. 5 of Marin County (SD5), along with other Marin County wastewater agencies, is confronting an increasingly challenging and complex biosolids management environment. As California (CA) regulations mandating reductions in greenhouse gas (GHG) emissions expand to include more aggressive goals requiring significant diversion of organics from landfill (including biosolids), both the wastewater and solid waste industries must find alternative means of organics disposal. Senate Bill 1383 (SB 1383) requires that diverted municipal solid waste (MSW) organics be treated through composting and/or anaerobic digestion before disposal – both processes will produce solids/products requiring disposal through the same market channels currently employed for biosolids disposal/reuse (e.g., land application; soil amendment).

SB 1383 requires that the majority of the estimated 23 million wet tons (WT) of organic waste requiring disposal annually in CA be diverted from landfill with a diversion target of 11.5 and 17.25 million WT in 2020 and 2025, respectively (CalRecycle, 2019). Compared to these MSW organics volumes, the amount of municipal biosolids in CA requiring disposal is relatively small at 3 million WT per year (CASA, 2017).

SB 1383, as well as other GHG emissions reductions programs, combined with increasingly stringent biosolids management regulations, will drive municipal wastewater agencies to create or identify other means of securing long-term, sustainable biosolids management programs. For smaller agencies such as SD5, the challenge is compounded by competition with larger agencies for a fixed amount of biosolids disposal capacity in the San Francisco Bay Area (Bay Area) – larger agencies that will likely move toward co-digestion of diverted MSW organics to capture a new source of revenue,[1] but as a result, will significantly increase the volume of biosolids requiring disposal.[2]

While larger agencies produce sufficient volume for private sector biosolids management to be financially feasible (thus securing available capacity within private sector operations), private sector biosolids management companies will face many of the same challenges as regulations drive industry to create additional and/or alternative management capacity. Nevertheless, pooling resources and volume will be part of the solution. The formation of the Bay Area Biosolids Coalition (Coalition) in 2004 is a good example of wastewater agencies in the Bay Area recognizing how developing GHG reduction programs, in addition to increasingly stringent biosolids management regulations, would have the potential to significantly impact how biosolids are managed in the future. The Coalition recognized the need to facilitate and encourage the development of biosolids management capacity in the Bay Area and has engaged private sector investment interests by entering into a collaborative agreement between participating agencies to commit a portion of each agency's biosolids to a developmental effort – the goal being to foster the development of regional or sub-regional biosolids management facilities to secure a long-term sustainable solution for management of participating agency biosolids, while at the same time, reducing each agency's operating carbon footprint/GHG emissions (collectively, Coalition members average more than 1 million miles annually transporting biosolids).

It is imperative for smaller agencies like SD5 to develop a strategy for long-term management of biosolids recognizing that traditional management options are diminishing. It is clear that a more diverse management portfolio and/or collaborative approach to managing biosolids within the region will be required (e.g., working with other wastewater treatment agencies in Marin County to support a regional solution), perhaps similar to the Coalition's approach.

[1] Municipal agencies may benefit from charging a tipping fee for the MSW organics as well as benefit from increased biogas production.

[2] Dewatered treated co-digested sludge and MSW organics produces biosolids cake requiring disposal.

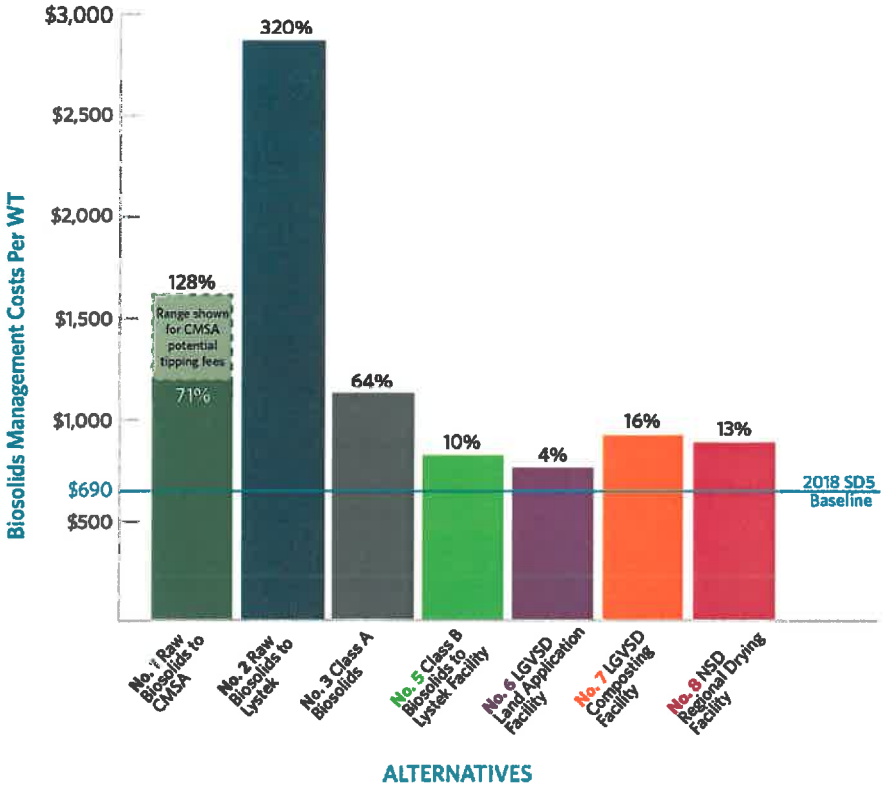

Figure ES-1. Estimated Increase in Relative Biosolids Management Cost by Alternative

Alternatives Analysis Summary of Findings

A summary of the alternatives considered in the evaluation with estimated cost per WT biosolids by alternative follows in Table ES-1 and is shown on Figure ES-1. (Note: Alternative No. 4 was removed from consideration.)

TABLE ES-1
Alternatives Considered in Developing a Biosolids Management Master Plan for SD5

Alternative No.	Description of Alternative	Estimated Total Cost per WT Biosolids
1	Transporting raw biosolids from SD5 to CMSA	$1,180 to $1570[a]
2	Transporting raw biosolids from SD5 to the Solano County Lystek facility	$2,900
3	Upgrading the SD5 wastewater treatment plant to produce Class A biosolids and transporting the cake off-site	$1,130
4	Transporting Class B biosolids cake from SD5 to Santa Rosa for composting at the Laguna Treatment Plant operation	N/A
5	Transporting Class B biosolids cake from SD5 to the Lystek facility	$760
6	Developing a Class B biosolids land application site at LGVSD with seasonal or year-round storage	$710 to $720[b]
7	Developing a biosolids composting operation at LGVSD with seasonal or year-round storage	$720 to $800[b]
8	Supporting the development of a commercial scale regional biosolids management facility (by committing a combined biosolids volume) at NSD's abandoned Ignacio wastewater treatment plant	$780

[a] This range is for CMSA potential tipping fees.
[b] This range is for public and private funding, either by the collaborating agencies using low interest loans, or else by a biosolids management company partner.

The conceptual level analysis of the eight alternatives resulted in removal of four alternatives:

Alternative No. 1	Transporting raw biosolids from SD5 to CMSA
Alternative No. 2	Transporting raw biosolids from SD5 to the Solano County Lystek facility
Alternative No. 3	Upgrading the SD5 wastewater treatment plant to produce Class A biosolids and transporting the cake off-site
Alternative No. 4	Transporting Class B biosolids cake from SD5 to Santa Rosa for composting at the Laguna Treatment Plant operation

Given that SD5 generates such a relatively small volume of biosolids annually, should Redwood Landfill discontinue accepting biosolids in the immediate- or near-term the only currently viable alternative for SD5 is to haul its biosolids cake to the Solano County Lystek facility (Alternative No. 5), which would require executing an agreement with Lystek for a minimum of two years and up to 20 years or longer to manage its biosolids cake. While the remaining alternatives (Nos. 6, 7, and 8) show promise, further development of the three alternatives would be needed to determine which alternatives, if any, are physically and/or financially viable.

A comparison of relative total biosolids management cost increases for the three most promising alternatives (Nos. 5, 6, and 7) is shown on Figure ES-2.

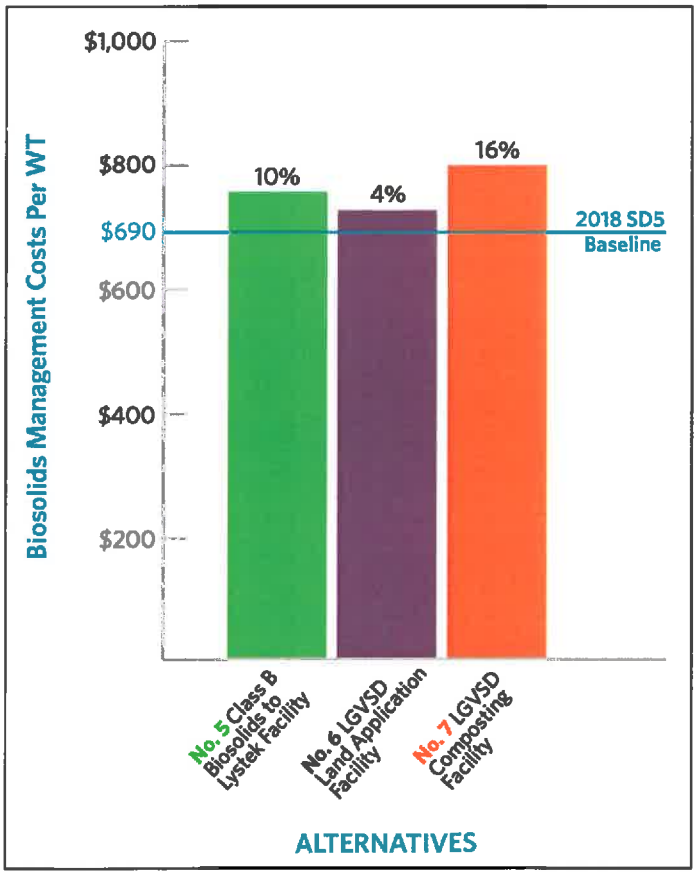

Figure ES-2. Estimated Increase in Relative Biosolids Management Cost for Most Promising Alternatives

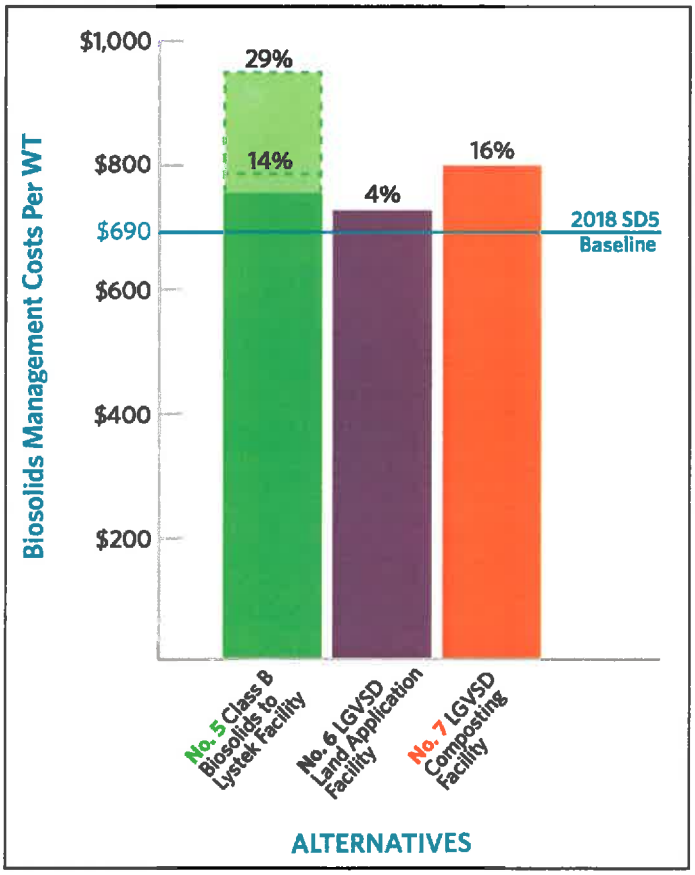

Figure ES-3. Estimated Increase in Relative Biosolids Management Cost with Greater than 3 percent Annual Escalation

The estimated relative percent increase in biosolids management costs for Alternative Nos. 5 and 6 do not appear to be significant and therefore may not have a significant impact on overall annual operating costs for SD5 (i.e., the relative estimated cost increase of 4 to 10 percent per wet ton would remain as a small fraction of the overall annual cost of the operation). However, the analysis of Alternative No. 5 assumed 3 percent annual escalation and there are data points that suggest that the projected annual increase could be significantly higher. For example, Lystek's original target tip fee was $55 per WT when it opened the Solano County facility in 2016. As of 2019, tip fees have been reported in the range of $80 to $95 per WT, representing an average annual increase of 13 percent to 20 percent from the initial target tip fee. Further, Lystek reports it is currently at 40 percent capacity. Assuming the remainder of the capacity will be contractually obligated by 2024, the tip fee could be as high as $150 to $240 for the last 10 percent of capacity (based on the three year tip fee trend reported). This means that by 2024, the Lystek facility tip fee could potentially be in the range of $115 to $215 per WT. The potential for this scenario (i.e., greater than 3 percent annual escalation) is shown on Figure ES-3. It is recommended that further discussion with Lystek about these projected tip fees be conducted and the projected tip fee range be adjusted accordingly.

As previously mentioned, the only currently viable alternative to landfill is Alternative No. 5 should Redwood Landfill discontinue accepting biosolids in the near-term. However, if proven physically and financial viable, Alternative Nos. 6 and 7 could potentially provide a long-term biosolids management solution to SD5 and other smaller agencies in Marin County.

Recommendations

For the alternatives analysis, it was assumed that SD5 will discontinue hauling biosolids to Redwood Landfill by the end of 2024. SD5 should be prepared to stop hauling and/or have another biosolids disposal option(s) in place (at a planning level) no later than 2021. It is likely that landfill gate fees will rise as competition increases for allowable organics capacity, and landfills may choose to stop taking biosolids altogether. Although Redwood Landfill may continue to accept biosolids beyond 2024, the uncertainty and risk associated with probable escalated costs and competition for capacity could leave SD5 vulnerable to having no means of disposing of its biosolids, and therefore a biosolids management strategy must be developed.

The majority of medium to large municipal wastewater agencies in the Bay Area contract with private sector entities (i.e., biosolids management companies) to dispose of/beneficially reuse biosolids in an environmentally responsible, permit-compliant manner. An agency typically enters into a one to three year agreement (on average) for biosolids management services, with options to extend or renew the services without competition (if desired). Contracting for biosolids management services with a reputable biosolids management company enables an agency to maintain focus on wastewater treatment without having to expand its operating footprint beyond the wastewater treatment facility fence-line. On the other hand, many small municipal wastewater treatment plants that do not have sufficient biosolids volume to support contract biosolids management, either land apply on agency-owned property, or pay to haul biosolids to landfill. For small wastewater treatment agencies like SD5, owning no land or facilities that could be used for biosolids disposal/beneficial use, if landfilling ceases to be an option, the agency may be left with no ability to dispose of its biosolids.

There is currently one existing viable alternative to landfilling of biosolids for SD5 – hauling to the Lystek facility, located in Solano County, about 50 miles from the treatment plant. It is assumed that most agricultural land in the area permitted for biosolids land-application is already tied-up contractually by other agencies or biosolids management companies and will not accept SD5's biosolids. Alternative means of biosolids disposal for the agency need to be identified and a long-term, cost-effective program secured. Based on the alternatives analysis findings, an outline of the recommended approach or biosolids management plan and timeline follows.

A simplified summary of key milestones for developing Alternative Nos. 5, 6, 7, along with estimated total cost per WT for SD5, follows on Figure ES-4.

A pictorial overview of the suggested approach/plan showing the developmental timeline for constructing new biosolids management facility options, including developing Alternative 8 as a biosolids drying facility, is shown on Figure ES-5.

Year 2019:

- Assume diversion of green waste beginning 2024 (per SB 1383) at Redwood Landfill and that biosolids may no longer be accepted (i.e., green waste is typically needed for a landfill to accept biosolids).
- Plan to continue to haul Class B biosolids cake to Redwood Landfill through 2023 or until a cost-competitive option becomes available.
- Begin discussions with Solano County Lystek facility owner/operator.
- Begin discussions with Marin County wastewater treatment agencies to establish framework for collaborative agreement to manage combined biosolids volume; collaborative agreement could include developing land owned by LGVSD and/or combining biosolids to support development of regional facility on NSD property.
- Perform regulatory assessment and site investigations to confirm viability of LGVSD land for development and based on site investigation results, assess actual capacity of land for the two alternatives (i.e., land application and compost) and re-evaluate options.

Year 2020:

- If LGVSD land is determined viable for development, agencies collaborate to:
  - **January 2020:** develop and issue a Request for Information (RFI) to biosolids management companies.
  - **March 2020:** begin development of Request for Qualifications (RFQ) for potential biosolids management company partner.
  - **June 2020:** enter into a collaborative agreement with interested wastewater treatment agencies for:
    - Developing a portion of LGVSD's property as a sub-regional biosolids land application site or compost facility, and/or
    - Agreeing to combine biosolids volume in support of a regional facility on NSD property
- If MOU or other form of collaborative agreement is executed, lead agency to take following recommended actions:
  - **August 2020:** issue RFQ.
  - **October 2020:** shortlist prequalified biosolids management companies.
  - **November 2020:** meet with shortlisted biosolids management companies.
  - **November 2020:** develop project scope.
  - **December 2020:** prequalified companies submit bids to develop and/or operate project.

Year 2021:

- January 2021: execute agreement with Lystek to haul SD5 biosolids cake to its Solano County facility starting 2022 (or sooner/later depending on business and/regulatory climate), and/or move forward with collaborative partnership. If collaborative partnership moves forward:
  - » **January 2021:** select biosolids management company partner.
  - » **February 2021:** evaluate option of private-sector funding for facility construction versus public sector funding for facility construction and private sector facility operation; estimate facility tip fee based on funding method selected.
  - » **February 2021:** make funding and tip fee determination so term sheet can be developed with selected biosolids management company partner.
  - » **February 2021:** make funding and tip fee determination so term sheet between wastewater agency partners can be developed.
  - » **August 2021:** enter into term sheet agreements.

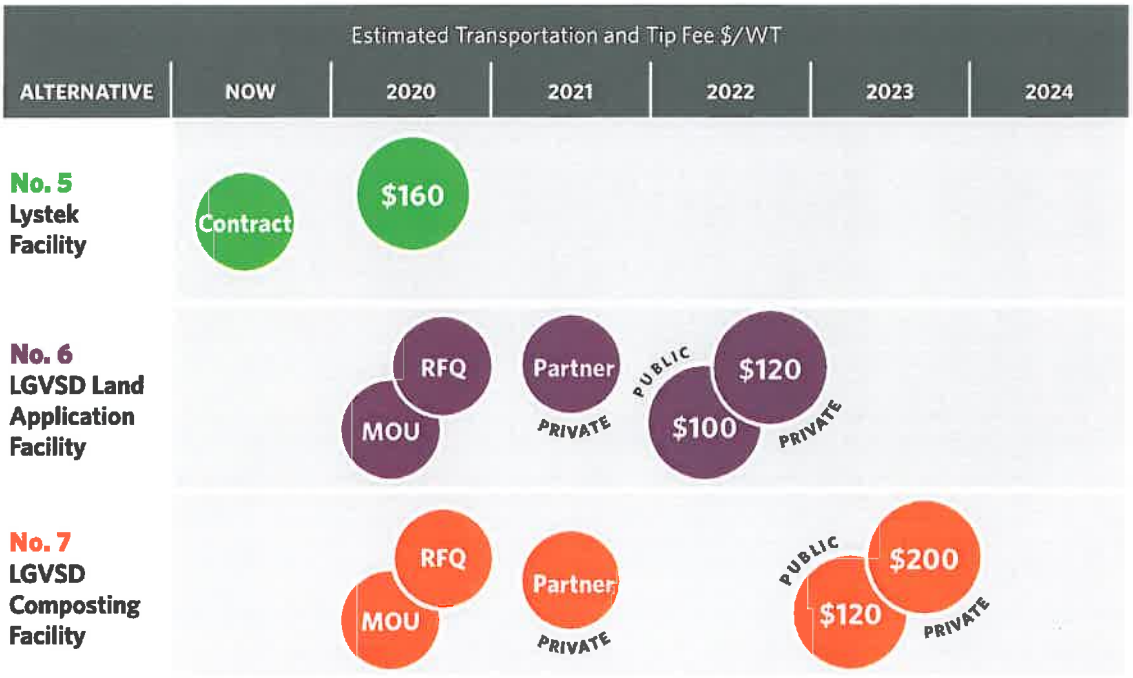

Figure ES-4. Timing and Costs of Recommended Class B Biosolids Management Alternatives for SD5

Sub-regional Class B Land-Application Facility

A planning level assessment was performed to evaluate the feasibility of constructing a sub-regional biosolids land application operation at LGVSD, including year-round storage. A conceptual capacity analysis was prepared for the LGVSD site, assuming use of Class B biosolids from a minimum of four generators in Marin County, totaling about 5,000 WT per year. Initial findings indicate that biosolids from SD5 would fit withing the overall land application capacity of the LGVSD site (initial estimate of 100 to 150 acres would be needed), and would proportionlly use the lowest amount of acreage amount the wastewater treatment plants evaluated on an annual basis, assuming all biosolids from SD5 were land applied.

For the purpose of the financial analysis, it was assumed that if the biosolids generators decide to move forward with a sub-regional land application facility (located at LGSVSD), they would either finance the permitting, design, and construction of the facility with low interest loans or through a private sector biosolids management company. In both cases, the facility would then be operated by a private sector biosolids management company. Given known permitting requirements and an examination of the estimated permitting and facility development and construction timeline, if a collaborative agreement is executed by interested wastewater agencies by June 2020, it is feasible that a Class B land application site could be operational by April 2022. On this basis, the estimated total cost for land applying SD5's Class B cake would be an approximate range between $100 to $120 per WT.

Sub-regional Compost Facility

A planning level assessment was performed to evaluate the feasibility of constructing a sub-regional biosolids composting operation at LGVSD. The compost facility would process about 5,000 WT of Class B biosolids per year (requiring an additional 10,000 tons of green waste and amendment). The facility footprint would require approximately 3 acres and year-round storage, an estimated additional 6 acres, for a total of 9 acres of operating footprint.

When estimating the capital and operating costs for a compost operation at LGVSD, it was assumed that the wastewater agencies would either finance the permitting, design, and construction of the facility with low interest loans or through a private sector biosolids management company. In both cases, the facility would then be operated by a private sector biosolids management company. Given known permitting requirements and an examination of the estimated permitting and facility development and construction timeline, if a collaborative agreement is executed by interested wastewater agencies by April 2022, it is feasible that a biosolids compost facility could be operational by April 2023. On this basis, the estimated total cost for composting SD5's Class B cake would be an approximate range between $120 to $200 per WT.

Regional Drying Facility

A planning level assessment was performed to evaluate the feasibility of constructing a sub-regional biosolids drying facility at NSD's abandoned Ignacio Wastewater Treatment Plant. A drying facility would need to be scaled to 15,000 WT/y to be economically viable, which would require importing biosolids from outside Marin County. It is estimated that the projected gate rate (i.e., tipping fee) would be about $120 per WT of biosolids, plus a minimum additional cost of $350 per load (hauling). Therefore, the estimated total cost for managing SD5's biosolids cake would be about $180 per WT.

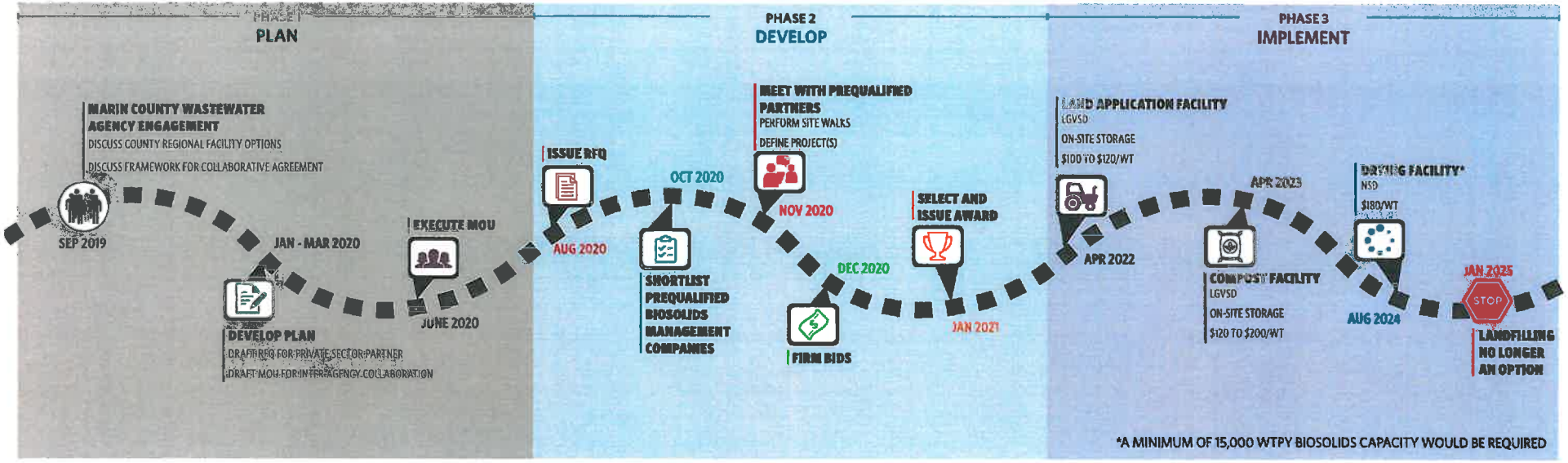

Figure ES-5. Suggested Approach and Estimated Timeline to Develop 5,000 WTPY Marin County Regional Biosolids Management Facility Options

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01. Introduction

Sanitary District No. 5 of Marin County (SD5), along with other Marin County wastewater agencies, is confronting an increasingly challenging and complex biosolids management environment. As California (CA) regulations mandating reductions in greenhouse gas (GHG) emissions expand to include more aggressive goals requiring significant diversion of organics from landfill (including biosolids), both the wastewater and solid waste industries must find alternative means of organics disposal. Senate Bill 1383 (SB 1383) requires that diverted municipal solid waste (MSW) organics be treated through composting and/or anaerobic digestion before disposal – both processes will produce solids/products requiring disposal through the same market channels currently employed for biosolids disposal/reuse (e.g., land application; soil amendment). SB 1383 requires that the majority of the estimated 23 million wet tons (WT) of organic waste requiring disposal annually in CA be diverted from landfill with a diversion target of 11.5 and 17.25 million WT in 2020 and 2025, respectively (CalRecycle, 2019). Compared to these MSW organics volumes, the amount of municipal biosolids in CA requiring disposal is relatively small at 3 million WT per year (CASA, 2017).

SB 1383 Implementation Timeline

2017-2019
Rulemaking & Regulations

CalRecycle will conduct informal workshops in 2017 and eary 2018, initiate the informal rulemaking in 2018, and adopt the regulations in late 2018 and early 2019. Although the regulations will not take effect until 2022, adopting them in 2019 allows regulated entities approximately three years to plan and implement necessary budgetary contractual, and other programmatic changes. Jurisdictions, haulers, and generators, should consider taking actions to implement programs to be in compliance with the regulations on January 1, 2022.

July 1, 2020
Measuring Progress

By this date, CalRecycle, in consultation with the Air Resources Board, must analyze the progress that the waste sector, state government, and local governments have made in meeting the organic waste reduction targets for 2020 and 2025. If the department determines that significant progress has not been made in meeting the targets, CalRecycle may include incentives or additional requirements in the regulations to facilitate progress toward achieving the organic disposal reduction targets. The Department may also recommend to the Legislature revisions to the targets.

January 1, 2025
75 Percent Reduction

By this date, the state must achieve a 75 percent reduction in the level of statewide disposal of organic waste from the 2014 level. In addition, not less than the 20 percent of currently disposed edible food must be recovered for human consumption.

2019
CalRecycle Offers Support to Jurisdictions

CalRecycle will offer ongoing support by networking, providing technical assistance, and developing tools, model ordinances, contracts, and case studies to support efforts at the local level to meet organic waste reduction targets any comply with the regulatory requirements.

January 1, 2020
50 Percent Reduction

No later than this date, the state must achieve a 50 percent reduction in the level of the statewide disposal of organic waste from the 2014 level.

January 1, 2022
Enforcement and Penalties Begin

CalRecycle's regulations to meet the organic waste reduction and the edible foods recovery targets take effect. The enforcement provisions, including penalties for noncompliance issued by the state, take effect.

January 1, 2024
Expanded Enforcement Requirements

Effective on this date, the regulations may require local jurisdictions to impose penalties for noncompliance on regulated entities subject to their authority.

The volume of MSW-derived organic waste to be diverted from landfill and treated is expected to far exceed the existing disposal capacity within the state that is currently used for biosolids. The infrastructure required to anaerobically digest the projected volumes of diverted MSW organics does not currently exist, and therefore the solid waste industry will look for treatment options such as co-digestion at municipal wastewater treatment plants, while considering constructing dedicated digestion and/or compost facilities. Medium to large wastewater treatment plants could greatly benefit from accepting imported organics, charging a tip fee for receiving and processing the organics, while realizing increased biogas production from the imported waste. This increase in biogas production could be used for electricity and heat generation as well as conversion to other forms of energy (e.g., compressed natural gas).

Co-digestion at municipal wastewater treatment plants will bring with it the need for additional infrastructure such as treatment trains to pre-process and pulp the MSW organics (these could be built at the solid waste management facility or wastewater treatment plant), and new or expanded receiving infrastructure and upgrades to the wastewater treatment plants to manage the imported organics (e.g., improved digester mixing, odor control, biogas conditioning, and electricity production or other means of energy conversion). Co-digestion at municipal wastewater treatment plants will significantly increase the volume of biosolids requiring disposal, so much so, that additional infrastructure for biosolids disposal will need to be built (assuming destructive technologies are not being employed).

It is anticipated that by 2025, landfills may no longer accept biosolids for disposal or as alternative daily cover (ADC). Until recently, it was observed that land application of biosolids was becoming more restrictive, with more than 80 jurisdictions in CA restricting biosolids beneficial reuse in some capacity, a number of jurisdictions banning biosolids land application all together, as Kern County tried to do, or restricting to Class A only (Los Angeles Times, 2016). To some extent, SB 1383 may be changing the nature of biosolids land application as it takes away jurisdictional regulation/prohibition of treated organics (including biosolids) in an effort to create more alternatives to landfill disposal.

SB 1383, as well as other GHG emissions reductions programs, combined with increasingly stringent biosolids management regulations, will drive municipal wastewater agencies to create or identify other means of securing long-term, sustainable biosolids management programs. For smaller agencies such as SD5, the challenge is compounded by competition with larger agencies for a fixed amount of biosolids disposal capacity in the San Francisco Bay Area (Bay Area) – larger agencies that will likely move toward co-digestion of diverted MSW organics to capture a new source of revenue,[3] but as a result, will significantly increase the volume of biosolids requiring disposal.[4]

While larger agencies produce sufficient volume for private sector biosolids management to be financially feasible (thus securing available capacity within private sector operations), private sector biosolids management companies will face many of the same challenges as regulations drive industry to create additional and/or alternative management capacity. Nevertheless, pooling resources and volume will be part of the solution. The formation of the Bay Area Biosolids Coalition (Coalition) in 2004 is a good example of wastewater agencies in the Bay Area recognizing how developing GHG reduction programs, in addition to increasingly stringent biosolids management regulations, would have the potential to significantly impact how biosolids are managed in the future. The Coalition recognized the need to facilitate and encourage the development of biosolids management capacity in the Bay Area and has engaged private sector investment interests by entering into a collaborative agreement between participating agencies to commit a portion of each agency's biosolids to a developmental effort – the goal being to foster the development of regional or sub-regional biosolids management facilities to secure a long-term sustainable solution for management of participating agency biosolids, while at the same time, reducing each agency's operating carbon footprint/GHG emissions (collectively, Coalition members average more than 1 million miles annually transporting biosolids).

It is imperative for smaller agencies like SD5 to develop a strategy for long-term management of biosolids recognizing that traditional management options are diminishing. It is clear that a more diverse management portfolio and/or collaborative approach to managing biosolids within the region will be required (e.g., working with other wastewater

The current local control approach associated with Water Quality Order No. 2004-12-DWQ (General Order) will be modified by the requirements of SB 1383, specifically, that local jurisdictions can no longer ban land application of local or imported biosolids. SB 1383 will allow any agricultural land to be permitted under the state General Order.

[3] Municipal agencies may benefit from charging a tipping fee for the MSW organics as well as benefit from increased biogas production.

[4] Dewatered treated co-digested sludge and MSW organics produces biosolids cake requiring disposal.

treatment agencies in Marin County to support a regional solution), perhaps similar to the Coalition's approach.

HDR Engineering, Inc. (HDR) has been retained by SD5 to prepare a biosolids master plan, evaluating alternatives for managing SD5's biosolids over the next decade, while taking into consideration that landfill disposal/beneficial use may no longer be an option beginning 2025.

1.1 Study Purpose and Objectives

The purpose of this study is to develop a biosolids management plan or master plan, focusing on securing capacity for disposal/beneficial use of SD5's biosolids for the next decade as demands for disposal capacity increase with mandated diversion of organics, including biosolids, from landfill.

The objectives of this study are to:

- Estimate the cost of SD5's current biosolids management program, or "business as usual," for comparison with other management alternatives;
- Evaluate up to eight biosolids management alternatives, and
- Develop a recommended biosolids management strategy/master plan through year 2030; based on the results of the alternatives evaluation and comparison to business as usual, under the assumption that landfill disposal will no longer be an option beginning 2025.

1.2 Study Assumptions

Relevant assumptions that were made for this study are:

- There is no anticipated population growth in SD5's service area so population growth factors were not included as part of the analysis.
- Given location-specific site constraints, limited space and/or capacity is available on-site for biosolids storage, composting, or co-digestion programs at SD5. These alternatives were therefore not considered further.
- The storage volume in SD5's secondary digester is not sufficient to store solids for the wet weather season, even if the primary solids were separated, so wet weather solids storage at the treatment plant was removed as an option.
- Land application in the wet season will still require Class A biosolids.
- Land acquisition by SD5 for biosolids management was not considered in the analysis.
- Seasonal digester operation at SD5 was not considered because of potential process challenges associated with bringing a digester back online that has been out-of-service during the dry weather season.
- Potential regulatory impacts to land application of biosolids in CA associated with recent concerns across the U.S. over perfluorinated chemicals (WEF, 2018) are presently not known and are therefore not considered in the study.
- Hauling raw solids to Las Gallinas Valley Sanitary District (LGVSD) was not considered as a viable alternative because the treatment plant is not currently configured for accepting and processing imported raw biosolids. In order for LGVSD to be an option for processing SD5's raw solids, a plant treatment capacity analysis (including biogas management) would need to be performed, as well as a capacity analysis of the plant's current treated effluent storage, biosolids land application site, and final effluent spray fields.[5]
- All cost calculation results are reported in 2019 dollars and assume alternative options could be available as soon as 2025.

[5] Municipal agencies may benefit from charging a tipping fee for the MSW organics as well as benefit from increased biogas production.

02. Current Biosolids Management Practice in Marin County

Biosolids management for most municipal wastewater agencies in CA has historically been relatively straightforward and predictable with secure, safe pathways for disposal/beneficial reuse. The vast majority, about 56 percent, of biosolids in CA are currently land-applied. The remainder of the biosolids go to landfill or compost where they are used beneficially, and a small amount to surface disposal and incineration (CalRecycle, 2019). Within the greater Bay Area, biosolids are primarily managed through land application and landfill ADC of Class B cake (BACWA, 2009).

There are six municipal wastewater treatment plants in Marin County. The Marin County wastewater treatment agencies are listed in Table 2-1 as well as shown on Figure 2-1.

TABLE 2-1
Wastewater Treatment Agencies Located in Marin County

Agency	
Central Marin Sanitation Agency (CMSA)	Novato Sanitary District (NSD)
Sanitary District No. 5 of Marin County (SD5)	Sausalito-Marin City Sanitary District (Sausalito-Marin)
Las Gallinas Valley Sanitary District (LGVSD)	Sewerage Agency of Southern Marin (SASM)

With the exception of LGVSD and NSD that use agency-owned dedicated land disposal sites (disposing of approximately 4,170 and 18,000 WT per year, respectively), the majority of municipal wastewater agencies in Marin County haul biosolids cake to Redwood Landfill for use as ADC. Redwood Landfill is located in Novato, CA and currently serves as the primary site for management of regional biosolids. A summary of biosolids volumes hauled to Redwood Landfill in 2018, both within and outside of Marin County, is provided in Table 2-2 (Waste Management, 2019).

Figure 2-1. Wastewater Treatment Agencies Located in Marin County

Should Redwood Landfill discontinue accepting biosolids, approximately 6,000 WT per year between the above-listed Marin County wastewater agencies will require an alternative means of management.

TABLE 2-1
Marin County Reported 2018 Biosolids Utilized for ADC at Redwood Landfill

AGENCY	ADC, WT[a]	DISPOSAL, WT
MARIN COUNTY		
Central Marin Sanitation Agency	3,431[b]	0
Sanitary District No. 5 of Marin County	298	0
Sausalito-Marin City Sanitary District	990	0
Sewerage Agency of Southern Marin	1,113	0
Subtotal	**5,832**	**0**
OTHER AREAS		
Fort Bragg	258	181
Sonoma Valley Sanitation District	2,060	1,446
Russian River Sanitation District	371	260
City of Santa Rosa	1,890	1,327
Sonoma County Water Agency	697	489
City of Willits	0	0
Healdsburg Wastewater Treatment Plant	1,110	779
Mendocino City Community Services	34	20
Total	**12,252**	**4,502**

[a] Based on 2,000 lbs. per ton and average of 20 percent dry solids content

[b] Approximately 1,500 WT of biosolids from CMSA are also land applied annually in Solano County by a local biosolids management company (Pugliaresi, 2019).

2.1 SD5 Biosolids Management – Current Practice

SD5 owns and operates the Main Treatment Plant (Main Plant) and its associated collection system. The Main Plant serves a current population of 8,400 residents, which provides secondary treatment of domestic and commercial wastewater collected from the Town of Tiburon, the City of Belvedere, and surrounding unincorporated areas. SD5 also operates the Paradise Cove Treatment Plant and its associated pumping stations. An overview of the Main Plant treatment processes, followed by an estimate of current annual operating costs for solids management or "business as usual," follows.

Liquids Treatment Process Description

The Main Plant collection system consists of 28.5 miles of gravity sewer line, 2.4 miles of force mains and 22 pumping stations within its service area. The treatment process utilizes a conventional activated sludge process (see Figure 2-2) and has an average dry weather design treatment capacity of 0.98 million gallons per day (Mgal/d), and can treat up to 2.3 Mgal/d through secondary treatment during wet weather season. The Paradise Cove treatment plant has an average dry weather treatment capacity of 0.04 Mgal/d, and can treat up to 0.10 Mgal/d during wet weather. Settled solids from the Paradise Cove treatment plant are trucked to the Main Plant for final treatment.

Solids Treatment Process Description

A schematic diagram of the solids management process at the Main Plant is shown on Figure 2-3. Primary sludge and scum from Dry Weather Primary Sedimentation Basins No. 1 and No. 2 are pumped directly to the Primary Digester approximately 0.5 to 0.01 hours per day, respectively, for an average of 2,860 or about 3,000 gal/d at about 1.0 percent solids. Return activated sludge (RAS) from the Secondary Sedimentation Basins No. 1 and No. 2 is pumped to the Gravity Thickener. The Gravity Thickener is typically operated continuously, processing approximately 500 gal/d (20 gal/min) of thickened sludge. The thickened sludge with a solids concentration of approximately 4 to 6 percent is collected in a thickened sludge sump and then pumped to the Primary Digester by the thickened waste activated sludge (WAS) pump. Primary sludge and scum from the Wet Weather Primary Sedimentation Basin are pumped directly to the Primary Digester. The digester system is run in a primary – secondary mode and each digester is mixed by pumps. The primary digester is heated with a spiral heat exchanger that uses hot water from the plant heat loop system; the secondary digester is not heated. For reference, the wastewater treatment plant is plumbed such that primary solids can be pumped around the solids treatment process directly to a truck; however, TWAS can not be pumped directly to a truck, but the treatment plant could have the capability of doing so with some minor plumbing modifications.

The solids retention time in the primary digester is about 20 days before being transferred to the secondary digester and then to dewatering. Digested sludge with a solids concentration of approximately 2 to 3 percent gravity flows to the Secondary Digester and is pumped to dewatering where it is dewatered using an FKC screw press. The screw press is typically operated for 4 hours every other day and produces roughly 300 to 350 WT per year of dewatered cake.[6]

Estimated Cost of Solids Treatment and Disposal for SD5

A heat and energy balance was performed across the solids treatment train to determine the amount of energy used for every ton of biosolids cake produced. The total energy (i.e., natural gas and electricity) was then converted into dollars per year. A summary of solids handling pump and process equipment operational data used in the computation of solids process energy input is provided in Appendix A. The operations and maintenance (O&M) costs associated with solids handling/treatment were also estimated based on input from SD5 (Rubio, 2019). Estimated hauling and disposal costs were derived from current cost data provided by SD5 (Appendix A). The three inputs, cost of energy, cost of O&M, and cost for disposal, were used to estimate SD5's current annual average cost of solids management.

The estimated annual cost of producing dewatered sludge, including the energy and labor costs associated with pumping, mixing, digester heating, thickening, dewatering, the chemical (polymer) cost, and hauling costs, is $208,000, or about $690 per WT. The makeup of SD5's annual operating costs are summarized on Figure 2-4. A detailed breakdown of the costs is provided in Appendix A.

[6] For the purpose of this study, 300 WT of biosolids per year are assumed.

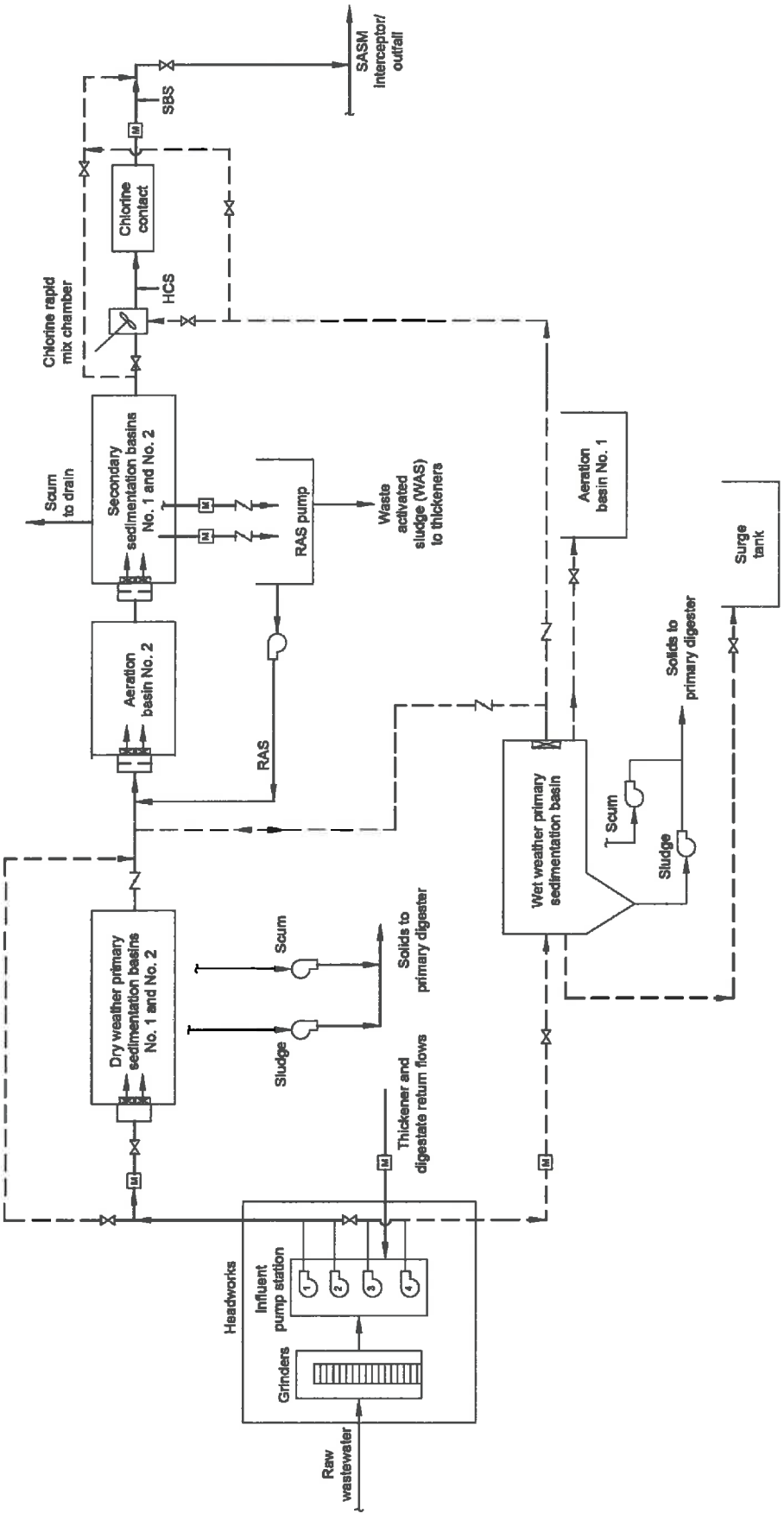

Figure 2-2. Process flow diagram for Sanitary District No. 5 of Marin County (adapted from Carollo, 2014)

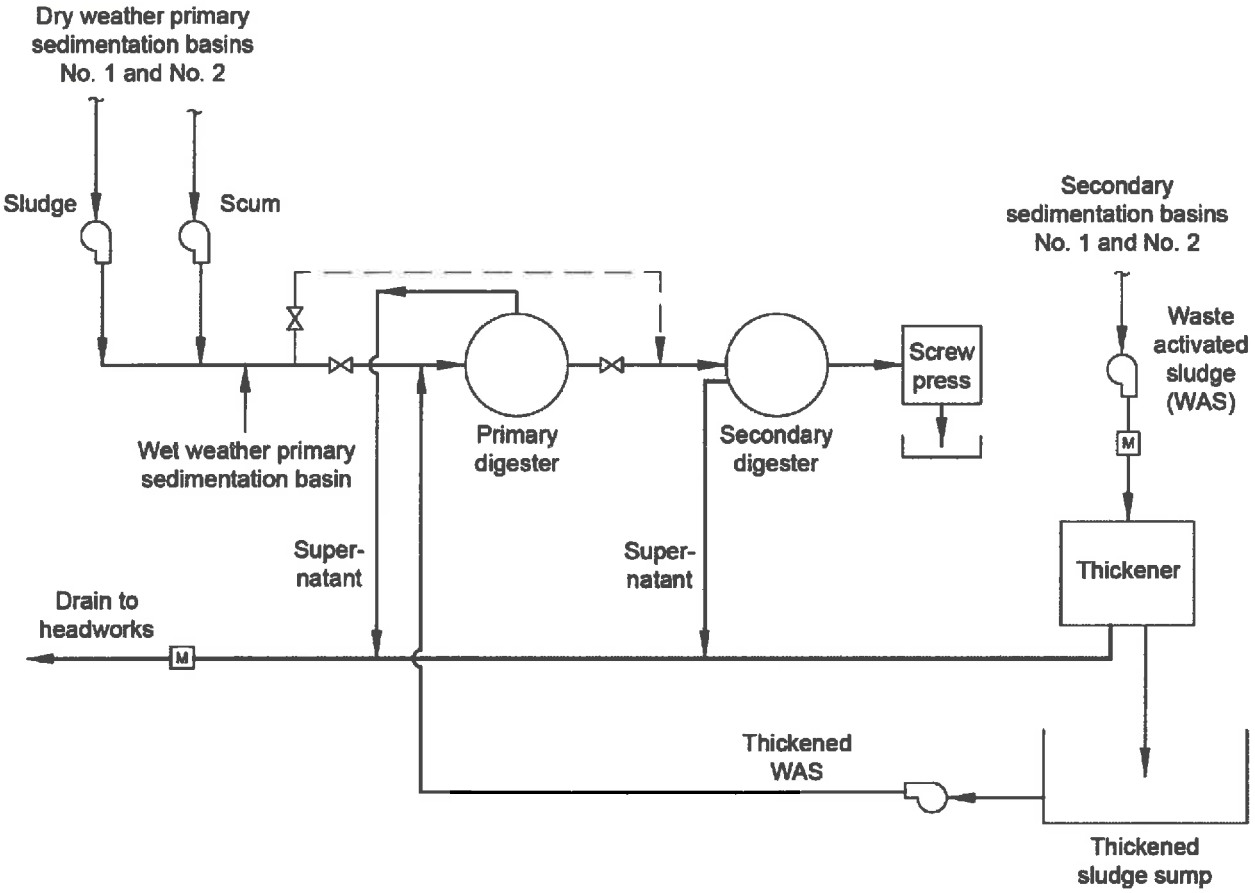

Figure 2-3. Process flow diagram for Sanitary District No. 5 of Marin County (adapted from Carollo, 2014)

Based on SD5's current overall annual operating costs of $2.1 million (Rubio, 2019), biosolids management accounts for approximately 10 percent of the treatment plant operating costs. Since SD5 generates such a small volume of biosolids annually (approximately 300 WT), and the cost of biosolids management only accounts for about 10 percent of its annual operating costs, alternative means of off-site management may or may not have a significant impact on overall operating costs when considered.

Without the option of landfilling, SD5 has little choice but to consider hauling its biosolids to an existing sub-regional facility, acquiring land for self-disposal, or collaborating with another wastewater agency or agencies for disposal. Land acquisition was not included in the analysis.

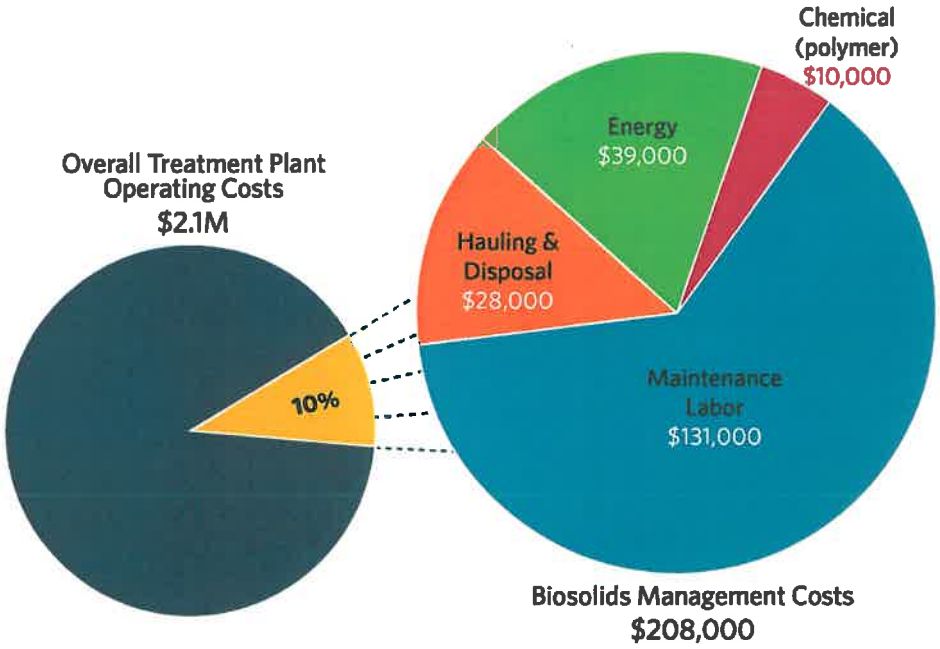

Figure 2-4. SD5 Estimated Overall Operating Costs, 2018

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03. Alternatives Analysis

A number of potential alternatives for managing SD5's biosolids were identified during recent meetings between the Marin County wastewater treatment agencies (Rubio, 2019), including hauling raw solids to CMSA.[7] Other alternatives identified during the meetings focused on a bigger picture envisioning collaboration between all, or a subset of Marin County wastewater treatment agencies, to develop a county-wide solution, or one that could at a minimum, support the smaller agencies at highest risk. These alternatives included:

- Developing a Class B land application site at LGVSD with seasonal or year-round storage;
- Developing a biosolids composting operation at LGVSD with seasonal or year-round storage, and
- Supporting the development of a commercial scale regional biosolids management facility (by committing biosolids) at NSD's abandoned Ignacio wastewater treatment plant.

In addition to the aforementioned alternatives, four additional alternatives were considered in this evaluation: (1) haul raw biosolids to the Lystek Organics Recovery Materials Center (Lystek facility) in Solano County, (2) upgrade the SD5 treatment plant to produce Class A biosolids, and (3) transport Class B biosolids from SD5 outside of Marin County to either the biosolids compost operation at the Laguna Wastewater Treatment Plant in Santa Rosa (Sonoma County) or the Lystek facility for conversion into a liquid fertilizer material.

A summary of the alternatives that were considered as part of the evaluation, assuming landfill disposal would no longer be available starting 2025, follows in Table 3-1.

TABLE 3-1
Alternatives Considered in Developing a Biosolids Management Master Plan for SD5

Alternative No.	Description of Alternative
1	Transporting raw biosolids from SD5 to CMSA
2	Transporting raw biosolids from SD5 to the Solano County Lystek facility
3	Upgrading SD5 treatment plant to produce Class A biosolids and transporting the cake off-site
4	Transporting Class B biosolids cake from SD5 to Santa Rosa for composting at the Laguna Treatment Plant operation
5	Transporting Class B biosolids cake from SD5 to the Lystek facility
6	Developing a Class B biosolids land application site at LGVSD with seasonal or year-round storage
7	Developing a biosolids composting operation at LGVSD with seasonal or year-round storage
8	Supporting the development of a commercial scale regional biosolids management facility (by committing a combined biosolids volume) at NSD's abandoned Ignacio wastewater treatment plant

3.1 Alternative No. 1: Hauling Raw Biosolids from SD5 to CMSA for Treatment and Disposal

CMSA, in an effort to expand its co-digestion program, is open to considering accepting raw solids (i.e., primary solids, including scum, and thickened WAS) from SD5 (approximately 5,300 WT/y at 1 percent solids[8]). CMSA has the ability to enter into a long-term agreement with SD5 to process SD5's raw biosolids for 10 years or longer (Dow, 2019).

[7] CMSA could benefit from the raw solids as additional digestion material to enhance its co-digestion operation.

[8] 300 WT per year at 20 percent cake.

Alternative No. 1 Evaluation Results

Hauling of raw solids to an outside agency could remove the need for SD5's existing anaerobic digesters (including boiler used for heating the digesters), digested sludge dewatering system, and biogas flare. In evaluating this alternative, it was assumed that the digesters would be repurposed for blending, volatile fatty acid production, liquid waste holding, and equalization.[9] In addition, it was assumed that odor control at the truck loading area would be needed.[10] Further, it was assumed that CMSA may charge a tip fee upon receipt of SD5's raw solids to cover the cost of treatment and disposal of the solids. This analysis assumed a CMSA tip fee range of $0 per WT to approximately $21.59 per WT (based on CMSA's current septage tip fees).

This alternative assumes SD5 would convert its primary digester to a holding tank, install mixing in the tank, and upgrade its truck loading area with odor control. Primary sludge, scum and thickened waste activate sludge would be conveyed to the plant's primary digester (now being repurposed as a holding tank) where it would be stored until hauled off-site for disposal.

A planning level cost analysis for the required treatment train and truck loading area upgrades, as well as hauling and disposal of the raw and thickened solids was performed. Supporting planning level analyses are provided in Appendices B and C. A summary of the cost analysis results follows in Table 3-2.

TABLE 3-2
Summary of Solids Management Analysis Results for Alternative No. 1

	Estimated Annual Costs	Estimated Capital Costs
SD5 treatment plant capital upgrades	$44,000[a]	$750,000
Operation of upgraded SD5 facilities	$160,000	-
Transportation from SD5 to CMSA	$152,000	-
Tip fee	$0 to $115,000[b]	-
Total	$356,000 to $470,000[b]	$750,000

Values rounded to nearest $1,000

[a] Assumes one time capital cost will be paid back over 20 years at an interest rate of 1.5 percent.

[b] Range of tipping fees from no cost to CMSA's septage hauler tipping fee costs.

The estimated cost to upgrade SD5's solids management train and truck loading area is $750,000, assuming a loan payback of $44,000 per year for 20 years (Appendix B). The projected operating costs for the upgraded plant facilities should decrease due to a reduction in energy demand (i.e., solids treatment train repurposed) with an estimated total annual cost for the biosolids treatment train of $160,000. Combining the annual loan payback, operating, transportation, and tip fee costs, the estimated biosolids management cost for SD5 under this alternative is between $356,000 to $470,000 or about $1,180 to $1,570 per WT as compared to current estimated business as usual cost of approximately $690 per WT, resulting in an increase per WT of more than 70 to 120 percent, respectively. This would result in an increase in annual operating costs from $2.1 million to

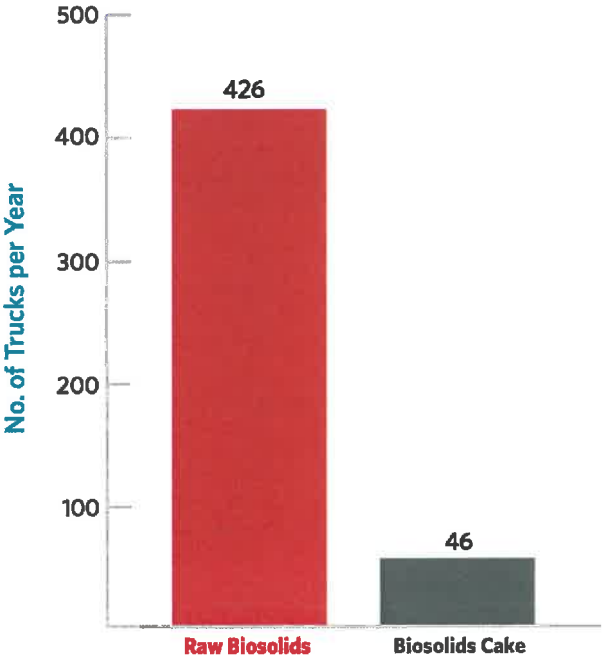

Figure 3-1. Estimated Future Truckloads Per Year

[9] Sludge will become acidic under these conditions and it may become necessary to monitor for corrosion.

[10] Odor control is a significant concern with this alternative given the close proximity of residential housing and restaurants.

approximately $2.3 to $2.4 million (including debt service), or approximately 7 to 12 percent.

Further the number of truck trips to manage the projected increase in volume of raw and thickened solids (5,300 WT per year) would increase from approximated 46 trucks per year (about one almost every week) to 426 trucks per year, or 1.6 trucks per weekday (see Figure 3-1). For these reasons (more than 70 to 120 percent increase in cost per WT and truck traffic impact), this alternative is not considered an option for managing SD5's biosolids.

3.2 Alternative No. 2: Transporting Raw Biosolids from SD5 to Solano County Lystek Facility

The Lystek facility was initially designed to process biosolids cake at a regional level. The facility is also capable of processing raw biosolids. The facility uses thermo-chemical hydrolysis to convert the raw biosolids or biosolids cake into a liquid product for land application by sub-surface injection (the process produces a fertilizer product). The Lystek facility has been in operation since 2016 and sits adjacent to the Fairfield Suisun Sanitary District's (FSSD's) wastewater treatment plant on district-owned property.

Lystek primarily accepts dewatered treated biosolids at about 20 percent cake, but is open to accepting raw solids from SD5 (i.e., approximately 5,300 WT/y at 1 percent solids). Hauling of raw solids to Lystek could remove the need for the treatment plant's existing anaerobic digester (including boiler used for heating the digester), digested sludge dewatering system, and biogas flare. Similar to Alternative No. 1, the cost analysis assumed that the digesters would be repurposed for blending, volatile fatty acid production, liquid waste storage, and equalization, and odor control would be installed in the truck loading area. Lystek has the ability to enter into a long-term agreement with SD5 to accept its raw solids for a minimum of 2 to more than 20 years (Dunbar, 2019).

Alternative No. 2 Evaluation Results

As with Alternative No. 1, this alternative assumes SD5 would convert its primary digester to a holding tank, install mixing in the tank, and upgrade its truck loading area with odor control. Primary sludge, scum and thickened waste activate sludge would be conveyed to the plant's primary digester (now holding tank) where it would be stored until hauled off-site for disposal.

A planning level cost analysis for the required treatment train and truck loading area upgrades, as well as hauling and disposal of the raw solids was performed. Supporting planning level analyses are provided in Appendices B and C. A summary of the cost analysis results follows in Table 3-3.

TABLE 3-3
Summary of Cost Analysis Results for Alternative No. 2

	Estimated Annual Costs	Estimated Capital Costs
SD5 treatment plant capital upgrades	$44,000[a]	$750,000
Operation of upgraded SD5 facilities	$160,000	-
Transportation from SD5 to Lystek facility	$212,000	-
Tip Fee	$453,000	-
Total	$869,000	$750,000

Values rounded to nearest $1,000

[a] Assumes one time capital cost will be paid back over 20 years at an interest rate of 1.5 percent.

The estimated cost to upgrade SD5's solids management train and truck loading area is $750,000, assuming a loan payback of $44,000 per year for 20 years (Appendix C). The projected operating costs for the upgraded plant facilities should decrease due to a reduction in energy demand (solids treatment train repurposed) with an estimated total annual cost for the biosolids train of $160,000. Combining the annual loan payback, operating, transportation, and tip fee costs, the estimated biosolids management cost for SD5 under this alternative is $869,000 or about $2,900 per WT as

compared to current estimated business as usual cost of approximately $690 per WT, resulting in an increase per WT of more than 320 percent. This would result in an increase in annual operating costs from $2.1 million to approximately $2.8 million (including debt service), or approximately 31 percent. Similar to Alternative 1, this alternative is not considered an option for managing SD5's biosolids.

3.3 Alternative No. 3: Upgrading The SD5 Wastewater Treatment Plant to Produce Class A Biosolids and Transporting The Cake Off-Site

This alternative considers upgrading SD5's solids treatment train to produce Class A biosolids. Upgrading the treatment train to produce Class A biosolids would require replacement of the existing FKC screw press, installation of a caustic chemical feed system (i.e., lime), and installing additional boiler capacity. Since SD5 generates such a small volume of biosolids cake annually (i.e., 300 WT), upgrading the treatment plant to produce Class A cake would not likely result in any additional options for ultimate disposal or reuse.

Alternative No. 3 Evaluation Results

A planning level cost analysis for upgrading the treatment plant to produce Class A biosolids was performed. Supporting planning level analyses are provided in Appendices B and D. A summary of the cost analysis results follows in Table 3-4.

TABLE 3-4
Summary of Cost Analysis Results for Alternative No. 3

	Estimated Annual Costs	Estimated Capital Costs
SD5 treatment plant capital upgrades	$86,000[a]	$1,470,000
Operation of upgraded SD5 facilities	$206,000	-
Transportation from SD5 to Lystek	$21,000	-
Tip Fee	$26,000	-
Total	$339,000	$1,470,000

Values rounded to nearest $1,000

[a] Assumes one time capital cost will be paid back over 20 years at an interest rate of 1.5 percent.

The estimated cost to upgrade SD5's solids management train and truck loading area is $1,470,000, assuming a loan payback of $86,000 per year for 20 years (Appendix D). The projected operating costs for the upgraded plant facilities should increase due to a greater O&M labor requirements (i.e., new screw press) with an estimated total annual cost for the biosolids treatment train of $206,000. Combining the annual loan payback, operating, transportation, and tip fee costs, the estimated biosolids management cost for SD5 under this alternative is $339,000 or about $1,130 per WT as compared to current estimated business as usual cost of approximately $690 per WT, resulting in an increase per WT of more than 60 percent. This would result in an increase in annual operating costs from $2.1 million to approximately $2.23 million (including debt service), or approximately 6 percent.

Upgrading to Class A biosolids would not likely provide any additional avenues for biosolids disposal/beneficial use when compared to current Class B options; producing Class A biosolids could however reduce storage requirements if SD5 were to participate in development of a land application or compost facility option, but again, considering an annual volume of 300 WT, any cost savings would likely be negligible. For these reasons (60 percent increase in cost per WT and no additional options for disposal/reuse of Class A biosolids), this alternative is not considered an option for managing SD5's biosolids.

3.4 Alternative No. 4: Transporting Class B Biosolids Cake From SD5 to Santa Rosa for Composting at The Laguna Wastewater Treatment Plant Operation

While Santa Rosa has an existing biosolids compost operation at its Laguna Wastewater Treatment Plant, the facility was designed to compost Class B biosolids generated from its wastewater treatment plant operation, and has no available capacity for managing biosolids from other agencies (Kay, 2019). This alternative was therefore ruled out as an option for managing SD5's biosolids.

3.5 Alternative No. 5: Transporting Class B Biosolids Cake from SD5 to The Lystek Facility

Lystek is the only existing commercial facility (non-composting or land applying) in the region that can process biosolids from multiple agencies. Lystek's current business model requires contractual agreements at a negotiated tip fee for each agency's biosolids and is currently operating at about 40 percent capacity (Dunbar, 2019). The Lystek facility uses thermo-chemical hydrolysis to convert biosolids cake into a liquid product for land application by sub-surface injection.

Lystek has the ability to enter into a long-term agreement with SD5 for a minimum of 2 to more than 20 years. Lystek requires year round delivery of biosolids and will not enter into an agreement with an agency for seasonal delivery only (Dunbar, 2019). Should SD5 consider a method of disposal that would require storage during wet weather season (i.e., land application or composting), the Lystek facility currently would not be an option for wet weather diversion in lieu of storage.

Alternative No. 5 Evaluation Results

Alternative No. 5 would require no additional capital costs (i.e., treatment plant upgrades) and would entail signing a long-term agreement with Lystek to accept SD5's biosolids. A planning level cost analysis of hauling and disposal of SD5's Class B biosolids was performed. Supporting planning level analysis is provided in Appendix B. A summary of the cost analysis results follows in Table 3-5.

TABLE 3-5
Summary of Cost Analysis Results for Alternative No. 5

	Estimated Annual Costs	Estimated Capital Costs
SD5 treatment plant capital upgrades	$0	$0
Operating costs for solids processing	$181,000[a]	-
Transportation from SD5 to Lystek	$21,000	-
Tip Fee	$26,000	-
Total	$227,000	$0

Values rounded to nearest $1,000

[a] No change from baseline

For this alternative, projected operating costs are not expected to increase. Combining the operating, transportation, and tip fee costs, the estimated biosolids management cost for SD5 under this alternative is $227,000 or about $760 per WT as compared to current estimated business as usual cost of approximately $690 per WT, resulting in an increase per

WT of more than 10 percent. This would result in a relatively minimal increase in annual operating costs from $2.1 million to approximately $2.12 million (including debt service), or approximately 0.9 percent. Given this alternative would result in little increase in annual operating costs, it should be further considered.

3.6 Alternative No. 6: Developing a Class B Land Application Site at LGVSD with Seasonal or Year-Round Storage

Land application of SD5's Class B biosolids at LGVSD in Marin County was considered. LGVSD is open to considering accepting biosolids from SD5 and other Marin County wastewater agencies under a collaborative agreement to land apply Class B biosolids – this could secure a reliable, long-term solution for managing area biosolids. Wet weather storage could be built on LGVSD property as well to enable year-round acceptance of biosolids. For the purpose of this evaluation, it was assumed that on-site storage would be constructed and land application would occur once per year. Storage of SD5 biosolids and spreading costs are analyzed conceptually in Appendix F.

Alternative No. 6 Evaluation Results

This alternative should require no facility upgrades to the SD5 wastewater treatment plant. The following assumptions were made:

- Interested agencies would participate under a collaborative agreement to fund the development and operation of a land application site, including storage, at LGVSD.
- Initial funding to cover regulatory, engineering and construction costs would be provided by the agency partners through a State Revolving Fund (SRF) loan, or funded by a private sector party.
- The storage and land application site would be operated by a private sector party.

A planning level cost analysis of hauling SD5's Class B biosolids to a land application facility at LGVSD was performed. Supporting planning level analyses are provided in Appendices B and E. A summary of the cost analysis results follows in Table 3-6.

TABLE 3-6
Summary of Cost Analysis Results for Alternative No. 6

	Estimated Annual Costs	Estimated Capital Costs
SD5 treatment plant capital upgrades	$0	$0
Operating costs for solids processing	$181,000[a]	-
Transportation from SD5 to LGVSD	$16,000	-
Tip Fee	$15,000 to $20,000	-
Total	$212,000 to $217,000	$0

Values rounded to nearest $1,000

[a] No change from baseline

SD5's share of the annual loan and operating costs for the land application site is paid for by the tipping fees for its 300 WT per year and are assumed to be $49 to $67 per WT, for public and private financing, respectively.

SD5's operating costs are not expected in increase with an estimated total annual cost for its biosolids treatment train of $181,000. Combining the operating, transportation, and tip fee costs, the estimated biosolids management cost for SD5 under this alternative is $212,000 to $217,000 or about $710 to $720 per WT as compared to current estimated business as usual cost of approximately $690 per WT, resulting in an increase per WT of 3 to 4 percent. This would result in a negligible increase in annual operating costs from $2.1 million to approximately $2.1 to 2.11 million (including debt service), or approximately 0.2 to 0.4 percent.

3.7 Alternative No. 7: Developing a Biosolids Composting Operation at LGVSD with Seasonal or Year-Round Storage

There is currently no compost operation at LGVSD so conceptual level planning costs to construct a composting facility (as well as developmental and construction timeline) were estimated and included as a shared cost in the analysis.

Storage of SD5 biosolids and development of a composting facility to produce Class A biosolids was analyzed conceptually in Appendix F.

Alternative No. 7 Evaluation Results

Alternative No. 7 should require no SD5 facility upgrades, and would entail Marin County entering into a collaborative agreement to develop the facility itself and then the terms of an agreement with a private-sector operator. For the purpose of the financial analysis, it was assumed that the agencies, under a collaborative agreement, would either finance the permitting, design, and construction of the facility with a 20 year loan at 1.5 percent interest (EPA, 2019) or through a private sector biosolids management company.[11] In both cases, the facility would then be operated by a private sector biosolids management company. Supporting planning level analyses are provided in Appendices B and F. A summary of the cost analysis results follows in Table 3-7.

TABLE 3-7
Summary of Cost Analysis Results for Alternative No. 7

	Estimated Annual Costs	Estimated Capital Costs
SD5 treatment plant capital upgrades	$0	$0
Operating costs for solids processing	$181,000[a]	-
Transportation from SD5 to LGVSD	$16,000	-
Tip Fee	$19,000 to $43,000	-
Total	$216,000 to $240,000	$0

Values rounded to nearest $1,000

[a] No change from baseline

SD5's projected operating costs are not expected in increase with an estimated total annual cost for the biosolids treatment train of $181,000. Combining the operating, transportation, and tip fee costs, the estimated biosolids management cost for SD5 under this alternative is $216,000 to $240,000 or about $720 to $800 per WT as compared to current estimated business as usual cost of approximately $690 per WT, resulting in an increase per WT of 4 to 16 percent. This would result in a negligible increase in annual operating costs from $2.1 million to approximately $2.11 to 2.13 million (including debt service), or approximately 0.4 to 1.5 percent.

3.8 Alternative No. 8: Supporting The Development of a Commercial Scale Regional Biosolids Management Facility At NSD's Abandoned Ignacio Wastewater Treatment Plant

Based on a recent discussion with NSD (Karkal, 2019), NSD is open to considering alternatives to developing NSD's abandoned Ignacio wastewater treatment plant as well as developing an alternative biosolids management facility at its existing (i.e., currently operational) wastewater treatment plant. Developing a biosolids management facility at the NSD wastewater treatment plant would enable NSD to process its solids on-site rather than transporting them via pipeline for off-site storage and disposal, and the agency is open to the idea of accepting additional biosolids cake from other agencies.

[11] While it is possible to receive up to fifty percent loan forgiveness using the Green Project Reserve (California Water Board, 2016), to be conservative, this analysis assumed no loan forgiveness. 20 year loan was chosen to be conservative.

Since NSD currently has a long-term viable biosolids program in place (off-site lagoon storage and direct land disposal on its own property, with more than 50 years of existing capacity), its program should not be immediately impacted by SB 1383, but the agency may seek alternative means of managing its biosolids to reduce costs.

For the purpose of evaluating this alternative, construction of a regional biosolids drying facility at the abandoned Ignacio wastewater treatment plant (to be financed, operated, and maintained by a private sector party) was evaluated at a planning level. It is understood that other types of facilities could be built at this location, but there currently is not sufficient information available for inclusion in the analysis. A drying operation was selected for this alternative based on experience so that costs could be estimated. In addition, constructing a biosolids management facility at the active NSD wastewater treatment plant was not considered.

Alternative No. 8 Evaluation Results

Further development of this alternative would be needed in order to estimate the potential construction costs and ultimate total cost for management. However, Synagro (Pugliaresi, 2019) provided an estimated tipping fee on a WT basis of $100 to $120 under the assumption that the minimum facility capacity would be 15,000 WT per year.[12] Assuming a minimum hauling fee of $350 per truckload, the estimated total cost per WT for SD5's biosolids would be $175.

SD5's projected operating costs are not expected in increase with an estimated total annual cost for the biosolids treatment train of $181,000. Combining the operating, transportation, and tip fee costs, the estimated biosolids management cost for SD5 under this alternative is $233,000 or about $780 per WT as compared to current estimated business as usual cost of approximately $690 per WT, resulting in an increase per WT of more than 13 percent. This would result in a relatively minimal increase in annual operating costs from $2.1 million to approximately $2.13 million (including debt service), or approximately 1.2 percent. The supporting planning level analysis is provided in Appendix B.

[12] This analysis conservatively assumed $120 per WT.

04. Summary of Findings

A summary of the alternatives considered in the evaluation with estimated cost per WT biosolids by alternative follows in Table 4-1 and is shown on Figure 4-1. (Note: Alternative No. 4 was removed from consideration.)

TABLE 4-1
Alternatives Considered in Developing a Biosolids Management Master Plan for SD5

Alternative No.	Description of Alternative	Estimated Total Cost per WT Biosolids
1	Transporting raw biosolids from SD5 to CMSA	$1,180 to $1,570[a]
2	Transporting raw biosolids from SD5 to the Solano County Lystek facility	$2,900
3	Upgrading the SD5 wastewater treatment plant to produce Class A biosolids and transporting the cake off-site	$1,130
4	Transporting Class B biosolids cake from SD5 to Santa Rosa for composting at the Laguna Treatment Plant operation	N/A
5	Transporting Class B biosolids cake from SD5 to the Lystek facility	$760
6	Developing a Class B biosolids land application site at LGVSD with seasonal or year-round storage	$710 to $720[b]
7	Developing a biosolids composting operation at LGVSD with seasonal or year-round storage	$720 to $800[b]
8	Supporting the development of a commercial scale regional biosolids management facility (by committing a combined biosolids volume) at NSD's abandoned Ignacio wastewater treatment plant	$780

[a] This range is for CMSA potential tipping fees.
[b] This range is for public and private funding, either by the collaborating agencies using low interest loans, or else by a biosolids management company partner.

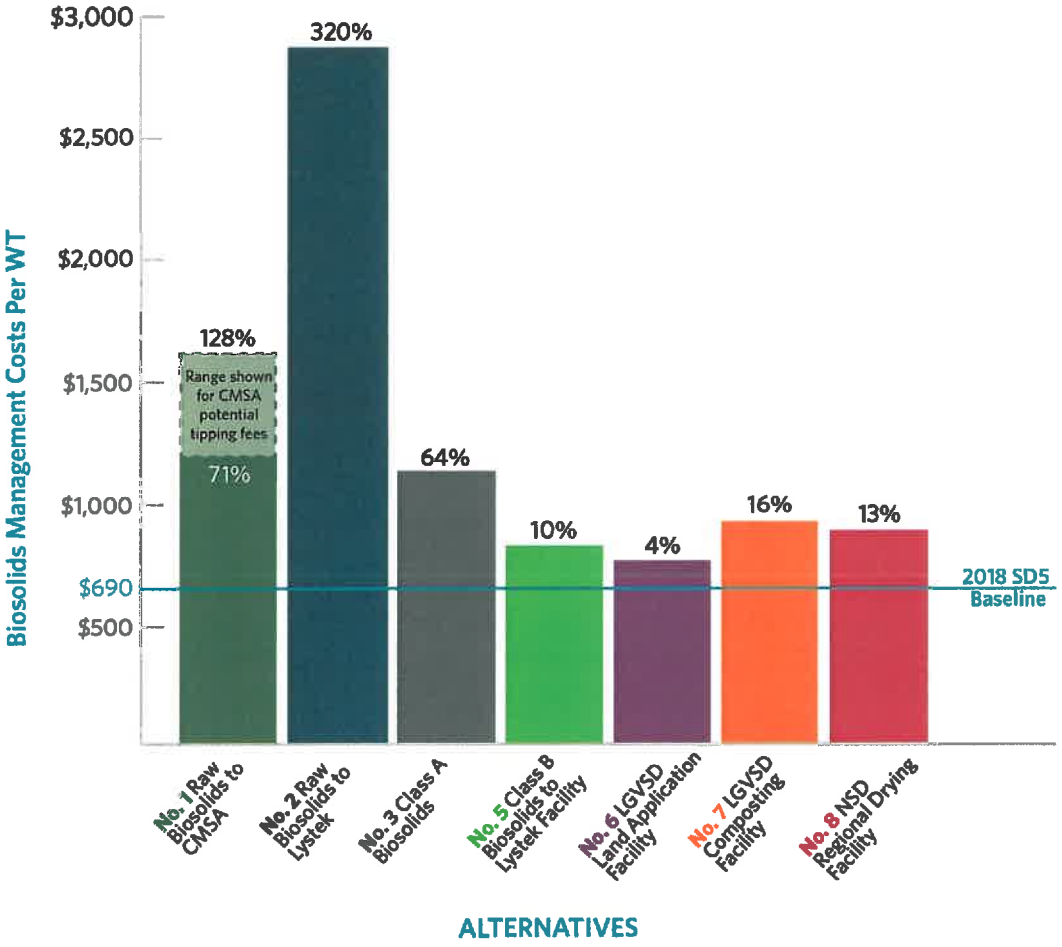

Figure 4-1. Estimated Increase in Relative Biosolids Management Cost by Alternative

The conceptual level analysis of the eight alternatives resulted in removal of four alternatives as not currently viable:

Alternative No. 1	Transporting raw biosolids from SD5 to CMSA
Alternative No. 2	Transporting raw biosolids from SD5 to the Solano County Lystek facility
Alternative No. 3	Upgrading the SD5 wastewater treatment plant to produce Class A biosolids and transporting the cake off-site
Alternative No. 4	Transporting Class B biosolids cake from SD5 to Santa Rosa for composting at the Laguna Treatment Plant operation

Given that SD5 generates such a relatively small volume of biosolids annually, should Redwood Landfill discontinue accepting biosolids in the immediate- or near-term the only currently viable alternative for SD5 is to haul its biosolids cake to the Solano County Lystek facility (Alternative No. 5), which would require executing an agreement with Lystek for a minimum of two years and up to 20 years or longer. While the remaining alternatives (Nos. 6, 7, and 8) show promise, further development of the three alternatives would be needed to determine which alternatives, if any, are physically and/or financially viable.

A comparison of relative total biosolids management cost increases for the three most promising alternatives (Nos. 5, 6, and 7) is shown on Figure 4-2.

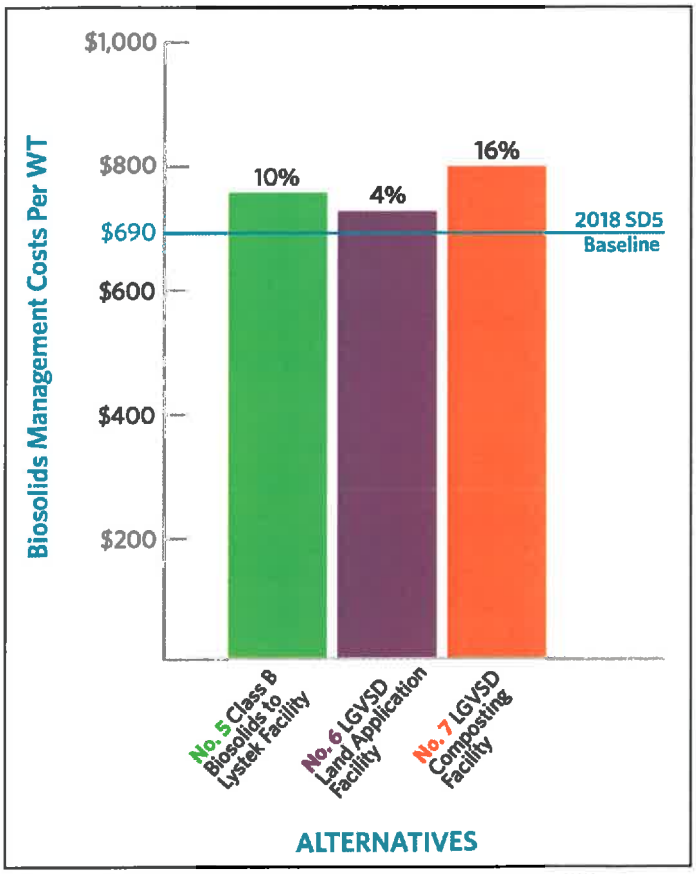

Figure 4-2. Estimated Increase in Relative Biosolids Management Cost for Most Promising Alternatives

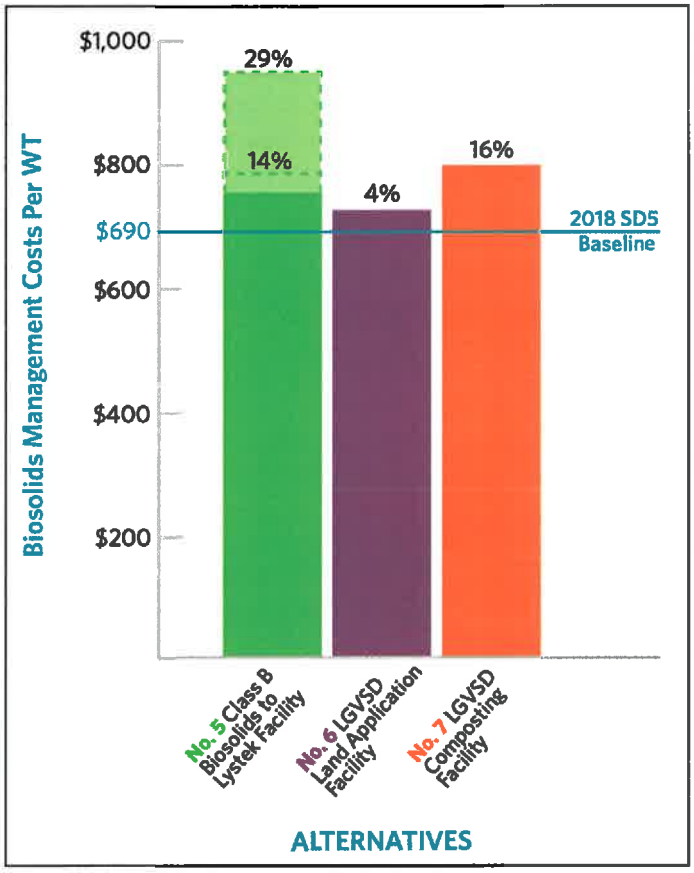

Figure 4-3. Estimated Increase in Relative Biosolids Management Cost with Greater than 3 percent Annual Escalation

The estimated relative percent increase in biosolids management costs for Alternative Nos. 5 and 6 do not appear to be significant and therefore may not have a significant impact on overall annual operating costs for SD5 (i.e., the relative estimated cost increase of 4 to 10 percent per wet ton would remain as a small fraction of the overall annual cost of the operation). However, the analysis of Alternative No. 5 assumed 3 percent annual escalation and there are data points that suggest that the projected annual increase could be significantly higher. For example, Lystek's original target tip fee was $55 per WT when it opened the Solano County facility in 2016. As of 2019, tip fees have been reported in the range of $80 to $95 per WT, representing an average annual increase of 13 percent to 20 percent from the initial target tip fee. Further, Lystek reports it is currently at 40 percent capacity. Assuming the remainder of the capacity will be contractually obligated by 2024, the tip fee could be as high as $150 to $240 for the last 10 percent of capacity (based on the three year tip fee trend reported). This means that by 2024, the Lystek facility tip fee could potentially be in the range of $115 to $215 per WT. The potential for this scenario (i.e., greater than 3 percent annual escalation) is shown on Figure 4-3. It is recommended that further discussion with Lystek about these projected tip fees be conducted and the projected tip fee range be adjusted accordingly.

As previously mentioned, the only currently viable alternative to landfill is Alternative No. 5 should Redwood Landfill discontinue accepting biosolids in the near-term. However, if proven physically and financial viable, Alternative Nos. 6 and 7 could potentially provide a long-term biosolids management solution to SD5 and other smaller agencies in Marin County.

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05. Recommendations

For the alternatives analysis, it was assumed that SD5 will discontinue hauling biosolids to Redwood Landfill by the end of 2024. SD5 should be prepared to stop hauling and/or have another biosolids disposal option(s) in place (at a planning level) no later than 2021. It is likely that landfill gate fees will rise as competition increases for allowable organics capacity, and landfills may choose to stop taking biosolids altogether. Although Redwood Landfill may continue to accept biosolids beyond 2024, the uncertainty and risk associated with probable escalated costs and competition for capacity could leave SD5 vulnerable to having no means of disposing of its biosolids, and therefore a biosolids management strategy must be developed.

The majority of medium to large municipal wastewater agencies in the Bay Area contract with private sector entities (i.e., biosolids management companies) to dispose of/beneficially reuse biosolids in an environmentally responsible, permit-compliant manner. An agency typically enters into a one to three year agreement (on average) for biosolids management services, with options to extend or renew the services without competition (if desired). Contracting for biosolids management services with a reputable biosolids management company enables an agency to maintain focus on wastewater treatment without having to expand its operating footprint beyond the wastewater treatment facility fence-line. On the other hand, many small municipal wastewater treatment plants that do not have sufficient biosolids volume to support contract biosolids management, either land apply on agency-owned property, or pay to haul biosolids to landfill. For small wastewater treatment agencies like SD5, owning no land or facilities that could be used for biosolids disposal/beneficial use, if landfilling ceases to be an option, the agency may be left with no ability to dispose of its biosolids.

There is currently one existing viable alternative to landfilling of biosolids for SD5 – hauling to the Lystek facility, located in Solano County, about 50 miles from the treatment plant. It is assumed that most agricultural land in the area permitted for biosolids land-application is already tied-up contractually by other agencies or biosolids management companies and will not accept SD5's biosolids. Alternative means of biosolids disposal for the agency need to be identified and a long-term, cost-effective program secured. Based on the alternatives analysis findings, an outline of the recommended approach or biosolids management plan and timeline follows. A pictorial overview of the suggested approach/plan showing the developmental timeline for constructing new biosolids management facility options is shown on Figure 5-1.

Year 2019:

- Assume diversion of green waste beginning 2024 (per SB 1383) at Redwood Landfill and that biosolids may no longer be accepted (i.e., green waste is typically needed for a landfill to accept biosolids).
- Plan to continue to haul Class B biosolids cake to Redwood Landfill through 2023 or until a cost-competitive option becomes available.
- Begin discussions with Solano County Lystek facility owner/operator.
- Begin discussions with Marin County wastewater treatment agencies to establish framework for collaborative agreement to manage combined biosolids volume; collaborative agreement could include developing land owned by LGVSD and/or combining biosolids to support development of regional facility on NSD property.
- Perform regulatory assessment and site investigations to confirm viability of LGVSD land for development and based on site investigation results, assess actual capacity of land for the two alternatives (i.e., land application and compost) and re-evaluate options.

Year 2020:

- If LGVSD land is determined viable for development, agencies collaborate to:
  - » **January 2020:** develop and issue a Request for Information (RFI) to biosolids management companies.
  - » **March 2020:** begin development of Request for Qualifications (RFQ) for potential biosolids management company partner.
  - » **June 2020:** enter into a collaborative agreement with interested wastewater treatment agencies for:
    - Developing a portion of LGVSD's property as a sub-regional biosolids land application site or compost facility, and/or
    - Agreeing to combine biosolids volume in support of a regional facility on NSD property.
- If MOU or other form of collaborative agreement is executed, lead agency to take following recommended actions:
  - » **August 2020:** issue RFQ.
  - » **October 2020:** shortlist prequalified biosolids management companies.
  - » **November 2020:** meet with shortlisted biosolids management companies.
  - » **November 2020:** develop project scope.
  - » **December 2020:** prequalified companies submit bids to develop and/or operate project.

Year 2021:

- January 2021: execute agreement with Lystek to haul SD5 biosolids cake to its Solano County facility starting 2022 (or sooner/later depending on business and/regulatory climate), and/or move forward with collaborative partnership. If collaborative partnership moves forward:
  - » **January 2021:** select biosolids management company partner.
  - » **February 2021:** evaluate option of private-sector funding for facility construction versus public sector funding for facility construction and private sector facility operation; estimate facility tip fee based on funding method selected.
  - » **February 2021:** make funding and tip fee determination so term sheet can be developed with selected biosolids management company partner.
  - » **February 2021:** make funding and tip fee determination so term sheet between wastewater agency partners can be developed.
  - » **August 2021:** enter into term sheet agreements.

A simplified summary of key milestones for developing Alternative Nos. 5, 6, 7, along with estimated total cost per WT for SD5, follows on Figure 5-1.

A pictorial overview of the suggested approach/plan showing the developmental timeline for constructing new biosolids management facility options, including developing Alternative 8 as a biosolids drying facility, is shown on Figure 5-2.

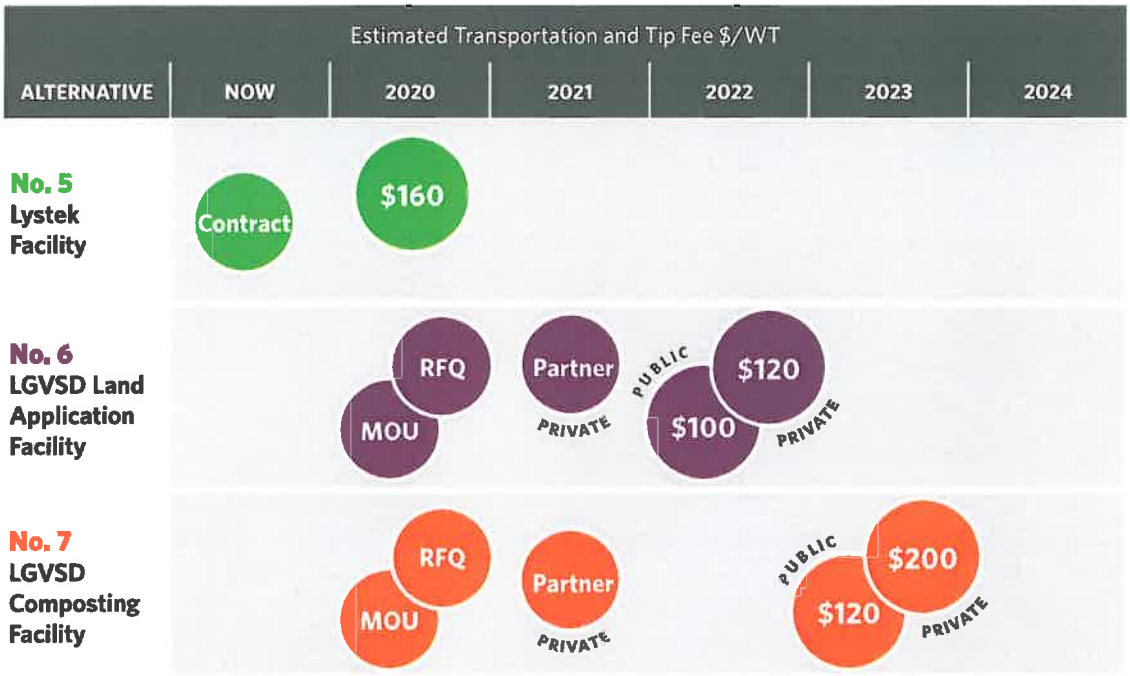

Figure 5-1. Timing and Costs of Recommended Class B Biosolids Management Alternatives for SD5

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Sub-regional Class B Land-Application Facility

A planning level assessment was performed to evaluate the feasibility of constructing a sub-regional biosolids land application operation at LGVSD, including year-round storage. A conceptual capacity analysis was prepared for the LGVSD site, assuming use of Class B biosolids from a minimum of four generators in Marin County, totaling about 5,000 WT per year. Initial findings indicate that biosolids from SD5 would fit withing the overall land application capacity of the LGVSD site (initial estimate of 100 to 150 acres would be needed), and would proportiaonlly use the lowest amount of acreage amount the wastewater treatment plants evaluated on an annual basis, assuming all biosolids from SD5 were land applied.

For the purpose of the financial analysis, it was assumed that if the biosolids generators decide to move forward with a sub-regional land application facility (located at LGSVSD), they would either finance the permitting, design, and construction of the facility with low interest loans or through a private sector biosolids management company. In both cases, the facility would then be operated by a private sector biosolids management company. Given known permitting requirements and an examination of the estimated permitting and facility development and construction timeline, if a collaborative agreement is executed by interested wastewater agencies by June 2020, it is feasible that a Class B land application site could be operational by April 2022. On this basis, the estimated total cost for land applying SD5's Class B cake would be an approximate range between $100 to $120 per WT.

Sub-regional Compost Facility

A planning level assessment was performed to evaluate the feasibility of constructing a sub-regional biosolids composting operation at LGVSD. The compost facility would process about 5,000 WT of Class B biosolids per year (requiring an additional 10,000 tons of green waste and amendment). The facility footprint would require approximately 3 acres and year-round storage, an estimated additional 6 acres, for a total of 9 acres of operating footprint.

When estimating the capital and operating costs for a compost operation at LGVSD, it was assumed that the wastewater agencies would either finance the permitting, design, and construction of the facility with low interest loans or through a private sector biosolids management company. In both cases, the facility would then be operated by a private sector biosolids management company. Given known permitting requirements and an examination of the estimated permitting and facility development and construction timeline, if a collaborative agreement is executed by interested wastewater agencies by April 2022, it is feasible that a biosolids compost facility could be operational by April 2023. On this basis, the estimated total cost for composting SD5's Class B cake would be an approximate range between $120 to $200 per WT.

Regional Drying Facility

A planning level assessment was performed to evaluate the feasibility of constructing a sub-regional biosolids drying facility at NSD's abandoned Ignacio Wastewater Treatment Plant. A drying facility would need to be scaled to 15,000 WT/y to be economically viable, which would require importing biosolids from outside Marin County. It is estimated that the projected gate rate (i.e., tipping fee) would be about $120 per WT of biosolids, plus a minimum additional cost of $350 per load (hauling). Therefore, the estimated total cost for managing SD5's biosolids cake would be about $180 per WT.

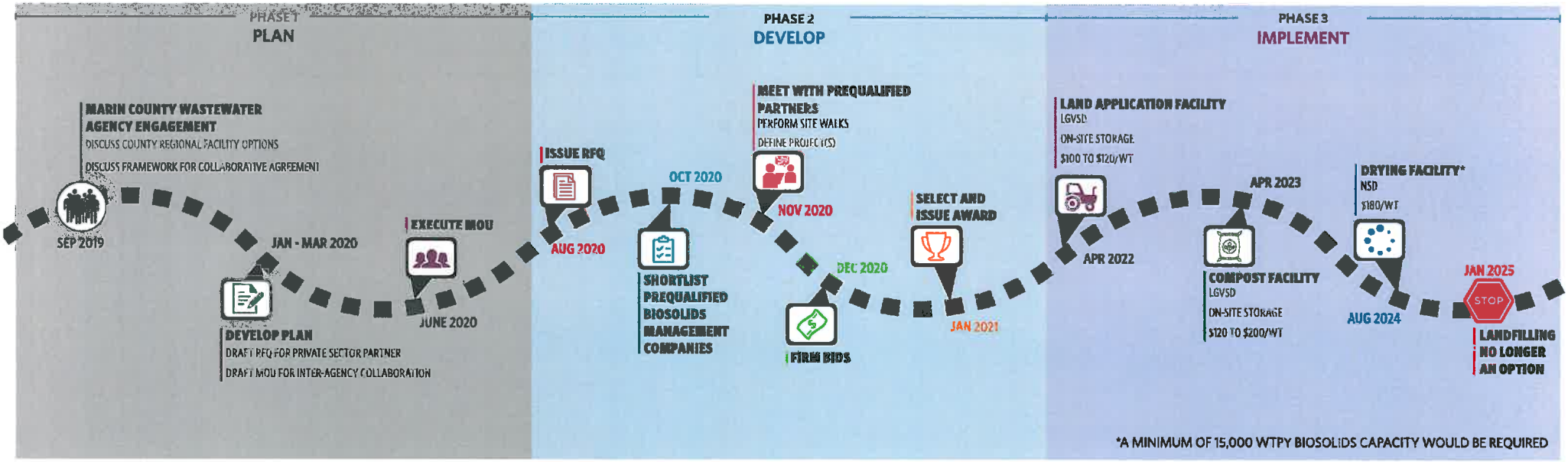

Figure 5-2. **Suggested Approach and Estimated Timeline to Develop 5,000 WTPY Marin County Regional Biosolids Management Facility Options**

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Appendix A

SD5 Total Biosolids Management Costs

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Appendix A. SD5 Total Biosolids Management Costs

A heat and energy balance was performed across the biosolids treatment train to determine the amount of energy used for every ton of biosolids cake produced. Table A-1 includes a summary of the solids handling pump operational data. Table A-2 includes a summary of the solids process equipment operational data. The total energy (i.e., natural gas and electricity) was then converted into dollars per year. Estimated transportation and tipping fee costs were derived from current cost data provided by SD5.

The total estimated energy demand for biosolids pumping is 160 megawatt (MWh)/y (includes digester mixing). The total energy demand for the biosolids processing equipment is 20 MWh/y (thickener and screw press).

The operation and maintenance costs of producing dewatered sludge, including the energy and labor costs associated with pumping, mixing, digester heating, thickening, dewatering, the chemical (polymer) cost, and transportation and tipping fee costs are summarized in Table A-3.

The following transportation and tipping fee and disposal data applies to current practice for SD5:

- 300 WT delivered to Redwood Landfill for disposal per year;
- 6.5 WT per container: one container almost every week (46 deliveries per year);
- Transport and handling of $350 per trucking delivery via Recology Marin; and
- $38.35 per ton tipping fee via Waste Management.

Based on the above data, annual transportation and tipping fee costs to Redwood Landfill are estimated to be $28,000.[1]

Based on the analysis presented in Table A-3 the total annual cost for biosolids management by SD5 is $208,000 per year. At a dewatered solids production rate of 300 WT/y and 69 dry ton (DT)/y, the biosolids processing cost is estimated to be $602/WT and $2,618/DT. The cost per ton of biosolids hauled to the landfill is estimated to be $92/WT and $400/DT for estimated 2018 overall biosolids management costs of $694/WT and $3,018/DT.

The current biosolids management operations accounts for approximately 10 percent of the treatment plant's overall operating costs (estimated current overall plant annual operating cost is $2.1M).

[1] For an average 300 WT per year at 6.5 WT per container is 46 containers of biosolids cake per year; $350 per container and $38.35 per wet ton tip fee; 46 x $350 = $16,100; $16,100 + (6.5 x 46 x $38.35) = $27,600.

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TABLE A-1
Summary of SD5 Biosolids Handling Pump Operational Data

Equipment/Biosolids Handling Pumps	Flow Rate, gal/min	Sludge Feed, gal/d	Operational Time [a]	Rated Power, hp
Primary sludge	100	2,800	0.5 h/d	10
Scum	100	60	0.01 h/d	10
Digester mixing	100	-	Cont.	15
Sludge recirculation	100	-	Cont.	5
WAS feed	100	-	Cont.	2
Thickened WAS	100	500	0.1 h/d	10
Dewatering feed	100	500	10 h/d, 5 d/wk	5

[a] Operational time is based on the rated flow of the equipment and the process flow rate

TABLE A-3
SD5 Estimated 2018 Overall Biosolids Management Costs

Process	Energy [a]	Chemical (polymer)	Maintenance Labor [c,d]	Transportation & Tipping Fees [e]
Sludge pumping	$10,000	-	$21,000	-
Digester pumping & heating	$27,000[b]	-	$50,000	-
Thickening	$2,000	$7,000	$30,000	-
Dewatering	$500	$3,000	$30,000	$28,000
Total sub-cost	$39,000	$10,000	$131,000	$28,000
Total annual cost	$208,000			

[a] Electrical energy based on generation and delivery cost of $0.1630/kWh and natural gas cost of $5.39/therm (100,000 Btu) in 2019 (Rubio, 2019).

[b] Heating cost of $11,000 assumes boiler fired on natural gas 10 percent of the time, with the balance on digester gas in 2019 (Rubio, 2019).

[c] Maintenance labor based on weighted senior O&M rate of $82/hr and non-senior rate of $65/hr in 2019 (Rubio, 2019).

[d] Does not include administration costs.

[e] Based on transportation to Redwood landfill.

TABLE A-2
Summary of SD5 Biosolids Process Equipment Operational Data

Equipment/Biosolids Process	Flow Rate, gal/min	Operational Time [c]	Rated Power, hp	Volume, gal	Solids Retention Time, d	Inlet Solids, %	Outlet Solids, %	Outlet Solids, gal/min	Heating Capacity, MMBTU/h	Output Capacity, MMBTU/h
Primary digester	0.6			16,500	20	4 to 6				
Secondary digester				10,400	-		2			
Rotary drum sludge thickener[b]	20	Continuous	2			1.2	4 to 6	0.65		
Screw press dewatering[b]	20	4 h/d; 3 d/wk	3 [a]			2	23	1 (587 lb/d)		
Spiral sludge heat exchanger	150								0.25	
Fire tube boiler									0.80	0.67

[a] Includes floc tank mixer

[b] Polymer use is approximately 5 liters/d at $15/gal

[c] Operational time is based on the rated flow of the equipment and the process flow rate

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Appendix B

SD5 Transportation and Tip Fee Costs for the Alternatives

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Appendix B. SD5 Transportation and Tip Fee Costs for the Alternatives

This appendix provides a detailed cost analysis of the expected biosolids management for 2025 and specific analysis of the transportationand tipping fee costs. For relatively small wastewater agencies such as SD5, the changing regulatory environment and other unknowns makes biosolids management complex and unpredictable. A number of assumptions were used to allow for comparison in 2025.

To calculate the NPV, a discount rate of 3 percent was used to show costs in 2019 dollars. Specific escalation factors are used where possible, they include inflation, which is assumed to be 2 percent per year in California for 2019 through 2029 based on the previous ten years (California, 2019).

This analysis looked at transportation specifically and used the following assumptions:

- Primary solids and scum pumped to Primary Digester is 3,000 gal/d (Appendix A);
- Thickened WAS pumped to Primary Digester is 500 gal/d (Appendix A);
- Plant produces an average of 300 WT per year of Class B cake at approximately 23 percent solids (Appendix A);
- For a sludge density similar to water, 3,500 gal/d of sludge and thickened WAS would have a weight of about 14.5 WT;
- Transport at $3.50/mi roundtrip and handling at $100/load ($135/load for tanker trucks) with a minimum of $350 transportation fee based on the current Waste Management Transportation Contract to Redwood Landfill (Rubio, 2019; Pugliaresi, 2019);
- Trucks will continue to transfer similar sized loads (6.5 WT for 46 times per year) (Appendix A) except in the case of transporting raw biosolids, this would be in 3,000 gallon loads (Appendix A);
- Distances shown in Table B-1 were determined using Google Maps;
- For Alternative No. 3, (Upgrading the SD5 wastewater treatment plant to produce Class A biosolids and transport the biosolids off-site for disposal/beneficial reuse), biosolids are expected to be transported to Lystek in Fairfield;
- Transportation escalation of 3.3 percent per year for 2019 through 2029 based on fuel projections and assuming 17 percent of total transportation costs with GHG impacts factored in (EIA, 2019); and
- For 2025, transport at $3.56/mi roundtrip and handling at $102/load ($137/load for tanker trucks) with a minimum of $356 transportation fee in 2019 dollars.

The tipping fee analysis uses the following information:

- Redwood Landfill tipping fees escalation of 5 percent per year for 2019 through 2025; this is shown for comparison purposes only;
- Other tipping fees are assumed to have 3 percent escalation due to signed contracts through 2029;
- CMSA tipping fee (Alternative No. 1) could range between $0 and $85.03/1000 gallons, plus $15 per load;
- Lystek tipping fee is assumed to be $80 to $95 per WT based on conversations with Lystek and potential users of Lystek. To be conservative, this analysis uses $85/WT in 2019. This value is used for both Alternatives Nos. 2 and 5 (Transporting raw biosolids from SD5 to the Solano County Lystek facility for treatment and disposal and Transporting Class B biosolids cake from SD5 to the Lystek facility for further processing and ultimate beneficial use of the liquid fertilizer material); however, the tipping fee for raw biosolids could be substantially lower (Dunbar, 2019);
- For Alternative No. 3, (Upgrading the SD5 wastewater treatment plant to produce Class A biosolids and transporting to Lystek), disposal of Class A biosolids would occur at Lystek, as there are currently no other known facilities that would accept Class A biosolids. The tipping fee of $85 in 2019 was used;

- Class B biosolids land application tipping fees at LGVSD (Alternative No. 6) are calculated at a range between $49 and $67 per WT in 2019 based on public and private financing (Appendix E)[1];
- Class B biosolids to be composted tipping fees at LGVSD (Alternative No. 7) are calculated at a range between $63 and $143 per WT based on public and private financing (Appendix F)[1];
- For Alternative No. 8 (Developing a commercial scale regional biosolids management facility at NSD's abandoned Ignacio wastewater treatment plant) tipping fees are assumed to be between $100 to $120 per WT (Pugliaresi, 2019). To be conservative, this analysis uses $120/WT in 2019.

Table B-1 demonstrates how to calculate the transportation and tipping fee cost for the various alternatives and scenarios. These values are for the year 2025 in 2019 dollars. Figure B-1 highlights the transportation and tipping fee costs in 2025 for the various alternatives in 2019 dollars. The discontinued alternative of hauling to the Redwood Landfill is included only for comparison purposes. These values were calculated using the escalation assumptions and discounting described in this Appendix.

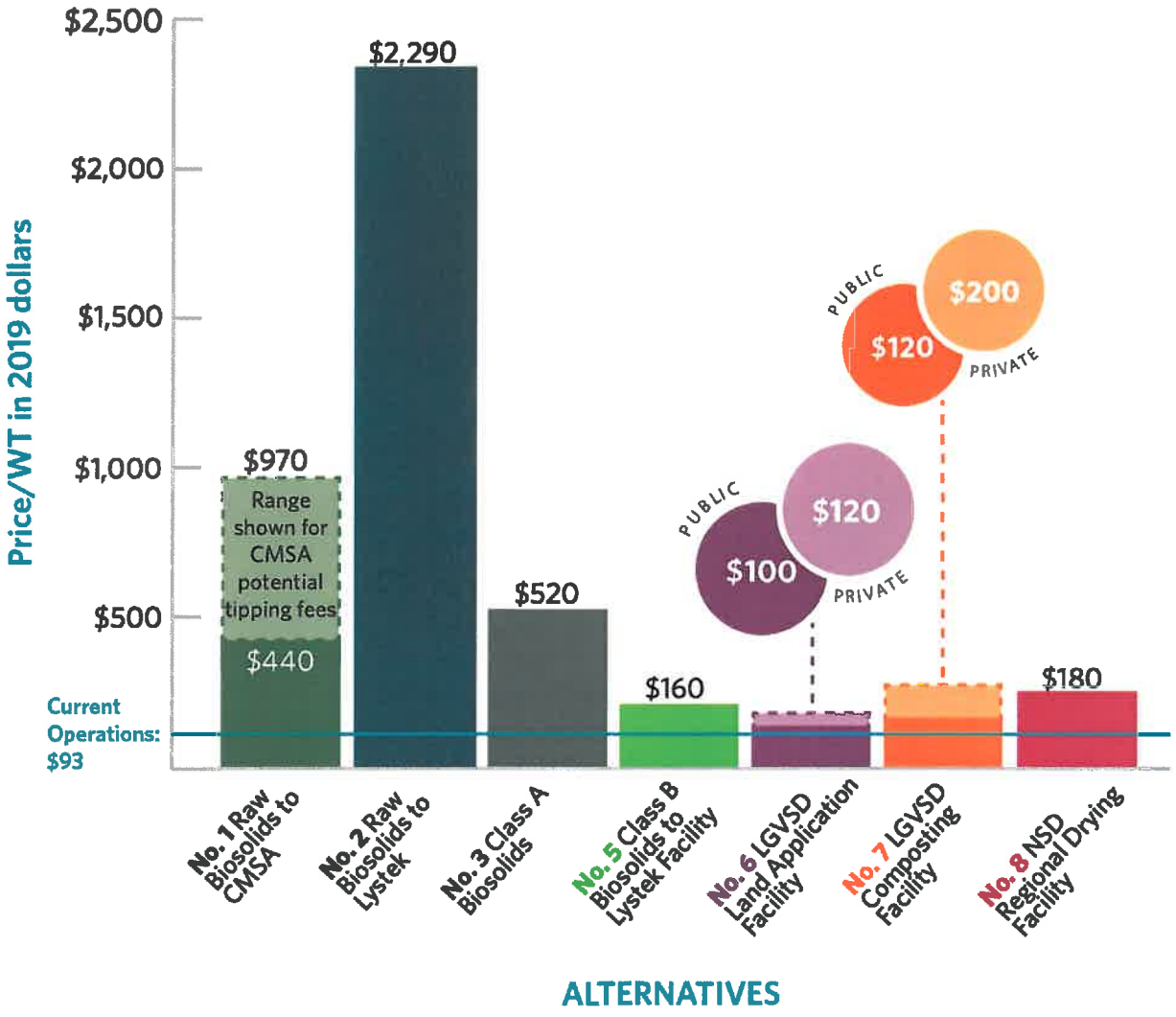

Figure B-1. SD5 Biosolids Management Alternatives Estimated Transportation, Tipping, Loan Repayment, and Change in Operation Costs in 2025

[1] Public Financing is assumed to be 20 year loan at 1.5 percent interest rate (EPA, 2019).

TABLE B-1
SD5 Biosolids Management Alternatives Estimated Transportation and Tipping Cost Calculations for 2025 in 2019 Dollars

	Alternative	Transportation						Tipping Fee Cost				Transportation & Tipping Fee Cost	
		Roundtrip Distance	Distance Charge	Handling Fee	Total Transportation Fee	Trips per Year	Annual Cost	$/Unit	Units	Quantity	Annual Cost	Annual Cost	Price/WT
1	Transporting raw biosolids from SD5 to CMSA	18.6	-	-	$356	426	$152,000	$0.00 to $0.09[a]	Gal	1,277,500	$0 to $115,000[a]	$152,000 to $267,000[a]	$506 to $889[a]
2	Transporting raw biosolids from SD5 to the Solano County Lystek facility	101.2	$360	$137	$498	426	$212,000	$85	WT	5,331	$453,000	$665,000	$2,217
3	Upgrading the SD5 wastewater treatment plant to produce Class A biosolids and transporting the cake off-site	101.2	$360	$102	$462	46	$21,000	$85	WT	300	$26,000	$47,000	$156
5	Transporting Class B biosolids cake from SD5 to the Lystek facility	101.2	$360	$102	$462	46	$21,000	$85	WT	300	$26,000	$47,000	$156
6	Developing a Class B biosolids land application site at LGVSD with seasonal or year-round storage	30.6	-	-	$356	46	$16,000	$49 to $67	WT	300	$15,000 to $20,000[b]	$31,000 to $36,000[b]	$104 to $122[b]
7	Developing a biosolids composting operation at LGVSD with seasonal or year-round storage	30.6	-	-	$356	46	$16,000	$63 to $143	WT	300	$19,000 to $43,000[b]	$35,000 to $59,000[b]	$118 to $198[b]
8	Supporting the development of a commercial scale regional biosolids management facility (by committing a combined biosolids volume) at NSD's abandoned Ignacio wastewater treatment plant	41	-	-	$356	46	$16,000	$120	WT	300	$36,000	$52,000	$175

Values rounded to nearest $1,000

[a] Range shown for CMSA potential tipping fees.

[b] Range shown for public and private financing, respectively.

This evaluation determined the expected costs of biosolids treatment and disposal for the year 2025 in 2019 dollars. As mentioned previously, this analysis assumes Redwood Landfill would be utilized through the end of 2024. Additional assumptions include:

- Current equipment is assumed to need no major retrofits between now and 2029;
- New capital improvements at SD5 are assumed to have escalation factor of 3 percent per year for 2019 through 2029 and to be paid for with a 1.5 percent interest 20 year loan (EPA, 2019); (Appendices C and D);
- Energy escalation of 3.8 percent per year for 2019 through 2029 and include GHG emissions impacts already factored in (EIA, 2019);
- Chemical escalation of 2 percent per year for 2019 through 2029 (California, 2019);
- No additional costs from GHG impacts are currently considered; and
- OM&R labor escalation of 3.8 percent per year for 2019 through 2029 (Rubio, 2019).

The results are shown in Table B-2.

The values are converted to price per WT based on an assumed 300 WT per year. The results are shown in Table B-3.

TABLE B-2
SD5 Biosolids Management Alternatives Estimated Overall Solids Management Costs in 2025 in 2019 dollars

	Alternative	Total Capital Costs	Annual Biosolids Management Costs									Total Operating Costs	Biosolids Management to 2018 Total Operating Costs
			Operating Costs					Transportation & Tipping Fee			Total Cost		
			Capital/ Loan Repayment	Energy [a,b]	Chemicals (e.g., Polymer)	OM&R Labor [c,d]	Subtotal Operating Costs	Transportation	Tipping	Subtotal			
1	Transporting raw biosolids from SD5 to CMSA	$750,000	$44,000	$23,000	$7,000	$131,000	$160,000	$152,000	$0 to $115,000[e]	$152,000 to $267,000[e]	$355,000 to $470,000[f]	$2,250,000 to $2,360,000[e]	16% to 20%[e]
2	Transporting raw biosolids from SD5 to the Solano County Lystek facility	$750,000	$44,000	$23,000	$7,000	$131,000	$160,000	$212,000	$453,000	$665,000	$869,000	$2,760,000	32%
3	Upgrading the SD5 wastewater treatment plant to produce Class A biosolids and transporting the cake off-site	$1,470,000	$86,000	$41,000	$12,000	$155,000	$206,000	$21,000	$126,000	$47,000	$339,000	$2,230,000	15%
5	Transporting Class B biosolids cake from SD5 to the Lystek facility	$0	$0	$41,000	$10,000	$131,000	$181,000	$21,000	$26,000	$47,000	$227,000	$2,120,000	11%
6	Developing a Class B biosolids land application site at LGVSD with seasonal or year-round storage	$0	$0	$41,000	$10,000	$131,000	$181,000	$16,000	$15,000 to $20,000[f]	$31,000 to $36,000[f]	$212,000 to $217,000[f]	$2,100,000 to $2,110,000 [f]	10%
7	Developing a biosolids composting operation at LGVSD with seasonal or year-round storage	$0	$0	$41,000	$10,000	$131,000	$181,000	$16,000	$19,000 to $43,000[f]	$35,000 to $59,000[f]	$216,000 to $240,000[f]	$2,110,000 to $2,130,000[f]	10% to 11%[f]
8	Supporting the development of a commercial scale regional biosolids management facility (by committing a combined biosolids volume) at NSD's abandoned Ignacio wastewater treatment plant	$0	$0	$41,000	$10,000	$131,000	$181,000	$16,000	$36,000	$52,000	$233,000	$2,130,000	11%

Values are rounded to the nearest $1,000

TABLE B-3
SD5 Biosolids Management Alternatives Estimated Biosolids Management Costs per WT in 2025 in 2019 dollars

	Alternative	Price/WT					
		Transportation	Tipping	Loan Repayment	Change in Operations	Transportation, Tipping, Loan, Repayment, and Change in Operations	Total Biosolids Management Costs
1	Transporting raw biosolids from SD5 to CMSA	$506	$0 to $383[e]	$146	($69)	$437 to $966[e]	$1,185 to $1,568[e]
2	Transporting raw biosolids from SD5 to the Solano County Lystek facility	$707	$1,510	$146	($69)	$2,294	$2,896
3	Upgrading the SD5 wastewater treatment plant to produce Class A biosolids and transporting the cake off-site	$71	$85	$285	$85	$526	$1,128
5	Transporting Class B biosolids cake from SD5 to the Lystek facility	$71	$85	$0	$0	$156	$758
6	Developing a Class B biosolids land application site at LGVSD with seasonal or year-round storage	$55	$49 to $67[f]	$0	$0	$104 to $122[f]	$706 to $724[f]
7	Developing a biosolids composting operation at LGVSD with seasonal or year-round storage	$55	$63 to $143[f]	$0	$0	$118 to $198[f]	$720 to $800[f]
8	Supporting the development of a commercial scale regional biosolids management facility (by committing a combined biosolids volume) at NSD's abandoned Ignacio wastewater treatment plant	$55	$120	$0	$0	$175	$777

[a] Electrical energy based on generation and delivery cost of $0.1630/kWh and natural gas cost of $5.39/therm in 2019 (100,000 Btu) (Rubio, 2019).
[b] Heating cost of $11,000 assumes boiler fired on natural gas 10 percent of the time, with the balance on digester gas except for the case of Alternative Nos. 2 and 3 in 2019 (Rubio, 2019).
[c] Maintenance labor based on weighted senior O&M rate of $82/hr and non-senior rate of $65/hr in 2019 (Rubio, 2019).
[d] Does not include administration costs.
[e] Range shown for CMSA potential tipping fees.
[f] Range shown for public and private financing, respectively.

Appendix C

Costs to Discontinue Biosolids Treatment at SD5 and Transport to Another Facility

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Appendix C. Costs to Discontinue Biosolids Treatment at SD5 and Transport to Another Facility

While transporting of raw biosolids to an outside agency could remove the need for the treatment plant's existing anaerobic digester, digested sludge dewatering system, and biogas flare it would require additional capital expenses and have impacts on operating expenses.

In the scenario, it is assumed that the digesters would be repurposed for blending, volatile fatty acid (VFA) production, liquid waste storage, and equalization. Sludge will become acidic under these conditions and it may become necessary to monitor for corrosion.

This alternative assumes SD5 would convert its primary digester to a holding tank. Odor control is a big concern with this alternative given the close proximity of residential housing and restaurants. Long term odor control includes installation of air diffuser system into the holding tank with blowers as well as odor control unit with a bio trickling filter and activated carbon for the building where trucks would be filled with raw biosolids.

It has been determined based on discussions with the vendor, the holding tank (previously the primary digester) could be kept mixed with six diffuser heads, a single manifold and two distributor laterals. Two Aerzen GM3S DN50 5 HP PD blowers (one on standby) would provide 100 scfm in the holding tank (Leidecker, 2019). In addition, an EcoPure EP8122 would provide 4,000 scfm in the transfer area to prevent odors from escaping (Sawyer, 2019). The expected purchase and installation price of $750,000 (Table C-1) is expected to be sufficient to handle odor issues and allow for hauling of raw biosolids.

TABLE C-1
Equipment Necessary to Discontinue Biosolids Treatment Cost Estimate for SD5

ITEM	COSTS
EcoPure EP8122 Biotrickling filter & Activated Carbon Unit	$191,000
Coarse Bubble Sanitare Diffuser	$25,000
Aerzen GM3S DN50 5 HP PD blower	$40,000
Civil/Site, Installation, and Taxes	$494,000
Total	**$750,000**

Sources: Sawyer, 2019.; Leidecker, 2019; HDR

The following is assumed to calculate annual capital repayment:

- Purchase of this equipment (and repayment of the associated loan) is expected in 2024;
- Capital purchase escalation of 3 percent per year;
- Loan of 20 years to match expected lifespan of equipment;
- Interest rate of 1.5 percent (EPA, 2019); and
- Discount rate of 3 percent (Rubio, 2019).

The annual capital (loan repayment) would be $44,000 in 2019 dollars.

Modifications to SD5's existing biosolids handling system would decrease operating costs by the following with no other changes compared to business as usual as mentioned in Appendix B:

- Decrease in sludge pumping energy use by $7,000/year;
- Decrease in digester heating and mixing energy use by $27,000/year;
- Increase in sludge holding tank mixing energy use by $5,000;
- Increase in odor control energy use by $11,000;
- Total decrease in energy use of $17,000;
- Decrease in chemicals (polymer) by $3,000; and
- No change to operation and maintenance labor.

The following additional assumptions were made:

- Current equipment is assumed to need no major retrofits between now and 2029;
- Energy escalation of 3.8 percent per year for 2019 through 2029 and include GHG emissions impacts already factored in (EIA, 2019);
- Chemical escalation of 2 percent per year for 2019 through 2029 (California, 2019);
- No additional costs from GHG impacts are currently considered; and
- OM&R labor escalation of 3.8 percent per year for 2019 through 2029 (Rubio, 2019).

Table C-2 shows all of the costs associated with solids treatment in the year 2025 in 2019 dollars.

TABLE C-2
SD5 Estimated Biosolids Treatment Costs in 2025 with All Values in 2019 dollars

	Solids Treatment Annual Costs				
Alternative	**Capital/Loan Repayment**	**Energy[a,b]**	**Chemicals (e.g. polymer)**	**OM&R Labor[c,d]**	**Total Cost**
Discontinued: Redwood Landfill	$0	$41,000	$10,000	$131,000	$181,000
Raw Biosolids Processing	$44,000	$23,000	$7,000	$131,000	$204,000

Values are rounded to the nearest $1,000

[a] Electrical energy based on generation and delivery cost of $0.1630/kWh and natural gas cost of $5.39/therm in 2019 (100,000 Btu) (Rubio, 2019).
[b] Heating cost of $0 as no digester heating and no digester gas produced (Rubio, 2019).
[c] Maintenance labor based on weighted senior O&M rate of $82/hr and non-senior rate of $65/hr in 2019 (Rubio, 2019).
[d] Does not include administration costs.

Appendix D

Costs to Achieve Class A Biosolids at SD5

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Appendix D. Costs to Achieve Class A Biosolids at SD5

It is noted that while many areas allow Class B biosolids, some agencies that land apply biosolids are being required to upgrade to Class A to continue to be able to land apply (Black & Veatch, 2017). It is expected that wet season biosolids land application will also require Class A treatment; these include upgrading to produce Class A biosolids using FKC screw press with steam injection.

Upgrading to produce Class A biosolids using FKC screw press with steam injection

It has been determined based on discussions with the vendor that the FKC screw press would need to be replaced to facilitate operation to produce Class A biosolids with an expected purchase and installation price of $1.47 million (Table D-1) as it will be necessary to apply both steam and a vector attraction reduction method to satisfy the 503 Rule for Class A (FKC, 2019). Class A biosolids production requires use of one of a number of options of pathogen reduction and use of one of a number of options of a Vector Attraction Reduction (VAR). While the FKC unit can take high pH sludge and operate at elevated temperature at the same time, the high pH and temperature will also drive off ammonia and will require the use of an ammonia scrubber for treatment of process vapor.

Because of the low amount of biosolids generated, there may also be an option for batch thermal treatment. In this scenario, a batch of biosolids would be held in a heated vessel to achieve 70 °C and stay at that elevated temperature for at least 30 minutes.

Table D-1 includes the detailed cost estimate to replace the screw press to achieve Class A biosolids.

TABLE D-1 New Screw Press Cost Estimate for SD5 to Achieve Class A Biosolids	
Item	**Cost**
Screw press, boiler, lime feed and screw conveyor material	$665,000
Screw press, boiler, lime feed and screw conveyor install, startup and testing	$67,000
Boiler stack and roof penetration	$3,000
Anchor bolts	$ 500
Gas supply piping	$20,000
Makeup water piping for boiler	$15,000
Expansion joints	$4,000
Polymer totes and drums and feed piping	$500
Pipe supports	$5,000
Item	**Cost**
Disconnect and reconnect existing sludge feed pump to system	$1,000
Modifications to dewatered solids discharge	$3,000
Electrical conduit and wiring	$20,000
Electrical tie in to existing electrical and controls	$10,000
Temporary Dewatering	$100,000
Taxes on new equipment and piping	$64,000
Subtotal	$ 977,000
Estimating Contingency (35%)	$ 343,000
Contractor Overhead, Mobilization and Demobilization (15%)	$ 150,000
Total	$1,470,000

Sources: FKC, 2019; HDR

The following is assumed to calculate annual capital repayment:

- Purchase of this equipment (and repayment of the associated loan) is expected in 2024;
- Capital improvement escalation of 3.0 percent per year;
- Loan of 20 years to match expected lifespan of equipment;
- Interest rate of 1.5 percent (EPA, 2019); and
- Discount rate of 3 percent (Rubio, 2019).

The annual capital (loan repayment) would be $86,000 in 2019 dollars.

Modifications to SD5's existing dewatering system to allow for production of Class A cake would increase operating costs by the following with no other changes compared to business as usual as mentioned in Appendix A:

- $1,000/year for lime/high pH; and
- $24,000/year for ammonia scrubber operation and maintenance.

The following additional assumptions were made:

- Current equipment is assumed to need no major retrofits between now and 2029;
- Energy escalation of 3.8 percent per year for 2019 through 2029 and include GHG emissions impacts already factored in (EIA, 2019);
- Chemical escalation of 2 percent per year for 2019 through 2029 (California, 2019);
- No additional costs from GHG impacts are currently considered; and
- OM&R labor escalation of 3.8 percent per year for 2019 through 2029 (Rubio, 2019).

Table E-2 shows all of the costs associated with biosolids treatment in the year 2025 in 2019 dollars.

TABLE D-2
SD5 Estimated biosolids Treatment Costs in 2025 with All Values in 2019 dollars

	Solids Treatment Annual Costs				
Alternative	**Capital Repayment**	**Energy[a,b]**	**Chemicals (e.g. polymer)**	**OM&R Labor[c,d]**	**Total Costs**
Discontinued: Redwood Landfill	$0	$41,000	$10,000	$131,000	$181,000
Upgrade FKC Screw Press for Class A	$86,000	$41,000	$11,000	$155,000	$293,000

Values are rounded to the nearest $1,000

[a] Electrical energy based on generation and delivery cost of $0.1630/kWh and natural gas cost of $5.39/therm (100,000 btu) in 2019 (Rubio, 2019).
[b] Heating cost of $11,000 assumes boiler fired on natural gas 10 percent of the time, with the other percent on digester gas in 2019 (Rubio, 2019).
[c] Maintenance labor based on weighted senior O&M rate of $82/hr and non-senior rate of $65/hr in 2019 (Rubio, 2019).
[d] Does not include administration costs.

FKC CO., LTD.

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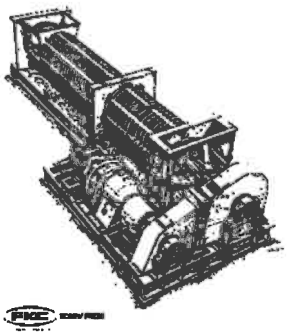
June 6, 2019



Mary Martis
HDR, Inc.

Re: Budgetary Pricing – Marin SD #5
Class Screw Press System

Mary,

Attached is budgetary pricing for the Marin SD #5 for a Class A Screw Press System.

This system will throughput 83 Dry # per hour or 1.0 dry tons per day operating 24 hours. The outlet dryness with for the Class "A" option of the anaerobic sludge would be 25% to 30% with lime, polymer and steam use.

In summary the following equipment is included in the budgetary price:

1.	FKC Model SHX-400 Class "A" Capable Screw Press Dewatering Skid with screw press, flocculation tank, rotary screen thickener, polymer feed system, control panel, headbox pressure element/transmitter, headbox hi-hi level conductive switch and skid platform.
2.	Natural Gas Boiler Skid with boiler, boiler feed system, blow down separator, water softener, and chemical feed system.
3.	Lime Feed System with lime hopper, lime agitator, lime conveyor and air compressor.
4.	Shaftless Screw Conveyor

For clarification, the following items are NOT included in this proposal or pricing:

- Sludge feed pumps
- Boiler stack / exhaust piping
- Boiler blow-down vent, condensate overflow, blow-down, drain and safety valve piping
- All Anchor bolts (will be sized by FKC but supplied by general contractor)
- All other valves, reducers and pipe fittings not listed in the scope of supply
- Utility pipe, conduit, wiring and fittings not integral to the equipment offered
- All water pressure regulators

(con't from Page i)

- All expansion Joints
- Natural gas, polymer, water, lime slurry, grease, oil, boiler chemicals, boiler softener salt, and other consumables
- Polymer totes/drums, hoses and fittings
- Lab testing & analysis costs including sample containers, testing and sampling labor.
- Field terminations & wiring not integral to the equipment and LSDLCP offered.
- Unloading, field assembly, erection and installation services.

The list above is not an exhaustive list but is provided as comments for some important points of clarification.

Taxes and Bonding are not included in the Budgetary Price offered.

Please note that the polymer, lime, grease, oil, boiler chemicals, boiler softener salt and other consumables are costs NOT included in the FKC pricing offered.

Thank you for your interest in FKC Dewatering Equipment. Please don't hesitate to contact this office if you have questions, or if you require any further information.

Sincerely,
FKC Co., Ltd.

Trent Bohman

FKC
Screw Press
Class A
Dewatering Equipment

for
Marin SD #5

QT02-061119Atb
June 6, 2019

Table of Contents

A. Proposed Equipment

1. Class "A" Capable Screw Press Dewatering Skid

Qty.	Description	Unit Price, FOB Tiburon, CA
1	**FKC Screw Press** **Model SHX - 400 x 3500L**	**Included**
	Material:	Municipal Waste Activated Sludge
	Inlet Capacity:	83 dry pounds per hour 1.0 dry tons per 24 hour day
	Inlet consistency:	1.1% Total Solids (TS) 15 gpm @ 1.1% TS
	Outlet consistency:	21-23 % Total Solids with Polymer Use 25-30 % Total Solids with Polymer, Lime & Steam Use
	Materials of construction:	304 Stainless Steel wetted parts, Base coated CS Non-wetted parts coated CS
	Screw design:	304 Stainless Steel wetted parts
	Screens:	Perforated 304 Stainless Steel
	Speed reducer:	Sumitomo Cyclo reducer
	Motor:	2.0 HP, 1800 rpm, NEMA B, 480 VAC, 3 Ph, 60 Hz **motor included** Suitable for variable speed operation w/ PWM constant torque inverter
	Other:	(1) set standard tools (1) set drum covers (1) motor coupling (4) spare screens (1) 21'x8' Marine Grade Aluminum Skid Platform (1) Ship Ladder and 3' Walkway (1) Rotary Screen Thickener Model 315x1000L (1) 70GL Flocculation Tank (1) NEMA 4 Control Panel (1) Polymer Makedown System (1) Headbox Pressure Element/Transmitter (1) Headbox Hi-Hi Level Conductive Probe

A. Proposed Equipment (con't)

2. Boiler Skid

Qty.	Description	Unit Price FOB Tiburon, CA
1	**Parker Steam Boiler, 10 BHP** UL Listed for Nat. Gas Firing with 100 PSI Trim (50 PSI Operation), Parker-Lite Panel, Reflex Water Gauge and OR Code Controls (CSD-1) 115/60/1	**Included**
	Rating:	398,000 BTU/hr with an output of 318,000 BTU/hr
	Other:	- ONE ORR1036 Kompact Mounted Duplex Feedwater Return System with (2) 1/2 H.P. Burks Pumps - ONE BD1248 ASME Blowoff Tank with Cooling Assembly and Water Level Gauge- Blowoff Separator, Model F-10 - ONE ST-50 Automatic Compound Feeder 115/60/1 - ONE C41-30 Twin Alternating Water Softener 115/60/1 - ONE Factory Skid with Interconnecting Piping and Wiring of all above components - Steam Piping Accessories (shipped loose) Including steam trap, flex hoses, sight glass flow indicator, and rotary joints.

A. Proposed Equipment (con't)

3. Lime Feed System

Qty.	Description	Unit Price FOB Tiburon, CA
1	**Spiroflow Lime Feed System and Bag Dump Station**	**Included**
	Other:	- 7 CF Hopper with 1/3 HP hopper agitator - 3" auger x 9' long @ approx. 24 deg. - 3HP auger drive - Exhaust fan with air filter - Lime/sludge premix tank - Air compressor - 1/3 HP hopper agitator

A. Proposed Equipment (con't)

4. Shaftless Screw Conveyor

Qty.	Description	Unit Price FOB Tiburon, CA
1	**Shaftless Screw Conveyor**	**Included**

Inclined Shaftless Conveyor
Approximately 10.5 feet @ 25 degrees
3 HP, 460V, 3ph, 1800 rpm motor

To include:

Reducers: SEW Eurodrive, Type FAZ, Parallel Shaft Helical Gearmotors with AM type "C" face adapter.

Spiral Flighting: Diameter of 12" minimum, 2.75" wide x 1" thick spiral. Spring effect at full load will not elongate more than .08" per foot of length. 8620 steel material. Drive end of flighting to include shop installed torque plate for bolting to drive shaft. Shop/field full penetration welds at all splice connections.

Troughs: 10 gauge, 304 stainless steel formed flange u-troughs fabricated in maximum 8' lengths. Trough end plates will be minimum 3/8" thick 304 stainless steel. The screw conveyor trough will be provided with two 2-inch threaded out at each, the discharge end will be capped, and the inlet end will connect to the drain.

Trough Liners: 1/2" thick UHMW trough liner in 4' long sections. Liners held in place with 304 stainless steel 1/2" square bar retaining rods.

Covers: 10 gauge 304 stainless steel formed conveyor covers in maximum 48" lengths. Covers will be gasketed and bolted to trough flange.

Inlet Chutes:
Fabricated from 10 gauge, 304 stainless steel with inlet to match the Screw Press or other conveyor outlets and the slope of the conveyor (if applicable).

Conveyor Supports: 3"x3"x1/4" 304 stainless steel angle as required. Include anchor bolt calculations by Structural PE in state of California. Anchor bolts sized by FKC but supplied by Purchaser.
Safety Stop Switch: NEMA 4x, 120vac safety stop switch with orange vinyl coated aircraft cable with stainless steel eyebolt supports and cable clips

Assembly: Conveyor supports, safety stop switches, discharge chutes, and assembly bolts shipped loose for field installation by contractor.

B. Miscellaneous

1. Delivery

On-site delivery for the dewatering equipment will be within eight (8) months after approval of submittals and notice to proceed with manufacturing.

2. Shipping Arrangements

The dewatering equipment, boiler skid, lime feed system and shaftless screw conveyor will be shipped best way to Tiburon, CA.

All shipping terms are FOB Tiburon, CA.

3. Equipment Summary & Pricing

The following summarizes the equipment offered in this scope of supply. The pricing for all the items in this scope of supply will be offered as one lump sum.

1.	FKC Model SHX-400 Class "A" Capable Screw Press Dewatering Skid with screw press, flocculation tank, rotary screen thickener, polymer feed system, control panel, headbox pressure element/transmitter, headbox hi-hi level conductive switch and skid platform.
2.	Natural Gas Boiler Skid with boiler, boiler feed system, blow down separator, water softener, and chemical feed system.
3.	Lime Feed System with lime hopper, lime agitator, lime conveyor and air compressor.
4.	Shaftless Screw Conveyor

All shipping terms are FOB Tiburon, CA.

Budget Pricing for this equipment is $578,000.

Pricing does not include taxes or bonding.

4. Options Offered

No options are offered at this time.

5. Effective Period

This proposal shall remain valid 30 days from the date of the proposal.

6. Payment Terms

30% with approval drawings & submittals
30% with shipment
30% with delivery
10% with performance or within 6 months of delivery whichever occurs first if performance testing is delayed due to no fault of FKC.

Net 30 days

7. Installation

The equipment is shipped as completely assemble as possible for transportation and unloading. Several pieces of equipment such as the flocculation tank agitator, conveyor, etc. will require some assembly for installation. Installation drawings are provided.

Each piece of equipment offered is loose and separate. Purchaser would need to unload, install and provide utilities and connections to and in between all pieces of equipment offered in this proposal.

Anchor bolts are sized by FKC but are not included in this scope. Anchor bolts are to be provided by the Contractor.

Installation and erection assistance are not included in the price of the equipment and generally are not required. However, the service is available for our standard service rates (see the enclosed rate sheet).

8. Operator Training and Start Up

Operator and maintenance training and start up services are included in the price of the equipment.

Operator and maintenance training can be accomplished in approximately two hours per group. Ideal training sessions include both classroom and on-site (at the screw press) sessions.

Generally speaking, training and start up can be accomplished in a three-day period.

A follow-up/performance testing visit of a two-day duration is also included in the price of the equipment.

Erection assistance and a separate trip for training are not included in the price of the equipment. Additional engineering service days are billed at the rates on the enclosed rate sheet.

9. Warranty

FKC's mechanical warranty covers material and workmanship for a period of twelve (12) months from beneficial use of the equipment.

10. Documentation Schedule

A. Approval Drawings - within 4 weeks after receipt of purchase order
   Buyer must return approval drawings within 14 days
   or delivery schedule will be affected
B. Certified Drawings - within 2 weeks after return of approval drawings
C. Operation and Maintenance Manuals - 14-16 weeks after receipt of order

11. Performance Guarantee

The performance figures and conditions in this proposal are conditional on further sludge sample testing by FKC. FKC Co., Ltd.'s performance guarantee and the conditions required to meet the guarantee are denoted in section A of this proposal. All of the consistency figures are based on total solids (TS) not total suspended solids (TSS).

In the event that performance is not met, FKC will provide all parts, engineering, and labor associated with the work necessary to bring the equipment into conformance with the performance guarantee.

12. Exceptions to the Specification

Not applicable.

13. Spare Parts List

None.

14. Screw Press Standard Coating Specification

Surface Preparation : SSPC SP-10
Prime Coat: Carboline Carbozinc 11 HS , 3 mils
Top Coat: Carboline Carboguard 890, 5 mils
Top Coat Colors : FKC standard blue and yellow

15. Service Rates

Note: For off-site work, when applicable, final billing of airfare, lodging, and rental car expenses will be based on actual costs plus 10% for administrative costs.

Weekdays

$1000.00 - Per eight (8) hour day on weekdays plus, lodging, and rental car expenses.
$187.50 - Per hour for all hours exceeding eight (8) hour workday on weekdays.
$108.00 - Per hour for office engineering services and telephone consultations.

Saturdays, Sundays and Holidays

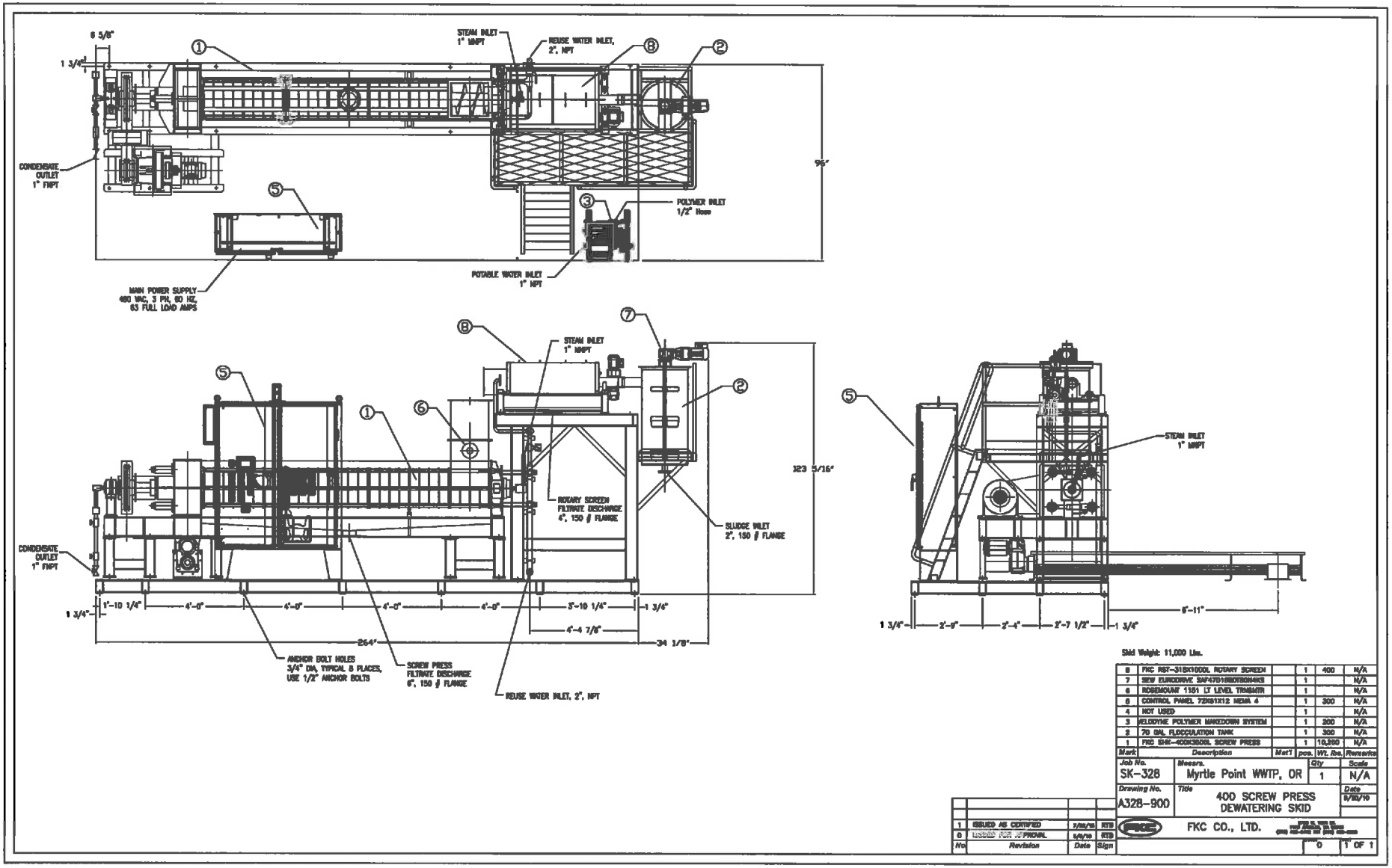
$1,440.00 - Per eight (8) hour day plus lodging and rental car expenses.
$270.00 - Per hour for all hours exceeding eight (8) hour workday.

Travel Time - Weekdays

$80.00 - Per hour travel time. (Not to exceed $990/day)

Travel Time – Weekends and US Holidays

$120.00 - Per hour travel time (Not to exceed $1,440/day)



Skid Weight: 11,000 Lbs.

Mark	Description	Mat'l	pcs.	Wt. lbs.	Remarks
8	FKC RST-318X1000L ROTARY SCREEN		1	400	N/A
7	SEW EURODRIVE SAF47DT80S/BG/HR/KS		1		N/A
6	ROSEMOUNT 1151 LT LEVEL TRNSMTR		1		N/A
5	CONTROL PANEL 72X81X12 NEMA 4		1	300	N/A
4	NOT USED		1		N/A
3	KELDYNE POLYMER MAKEDOWN SYSTEM		1	200	N/A
2	70 GAL FLOCCULATION TANK		1	300	N/A
1	FKC SHC-400X3000L SCREW PRESS		1	10,200	N/A

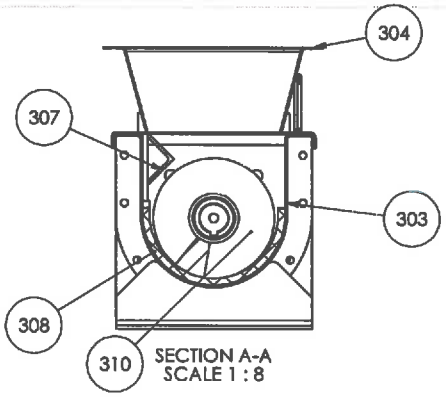
Job No.	Means.	Qty	Scale
SK-328	Myrtle Point WWTP, OR	1	N/A
Drawing No.	Title		Date
A328-900	400 SCREW PRESS DEWATERING SKID		9/22/16

No	Revision	Date	Sign
1	ISSUED AS CERTIFIED	7/25/16	RTB
0	ISSUED FOR APPROVAL	5/6/16	RTB

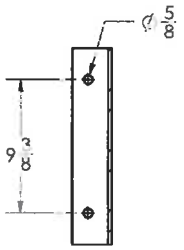
FKC CO., LTD.

0 | 1 OF 1

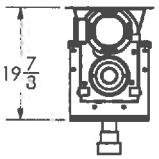
Conveyor	Manufacturer	Part Number	Quantity (Per Machine)	Item #	Material of Construction
Motor 3 Hp 1750 RPM	SEW	DRE100L4	1	301	CS
Gear Box	SEW	FAZ77 Ratio 108.46	1	302	CS
10 ga. Trough	FKC	NA	2	303	304 LSS
12 ga. Inlet Hopper	FKC	NA	1	304	304 LSS
10 ga. Covers	FKC	NA	3	305	304 LSS
12 ga. Discharge	FKC	NA	2	306	304 LSS
Hold Down Bars	FKC	NA	4	307	304 LSS
1/2 Liner	FKC	NA	4	308	UHMW
Zero Speed Switch Probe	SIEMENS	7MH7146-0EA	1	309	
9" Shaftless Screw RH Full Pitch	FKC	NA	1	310	8620

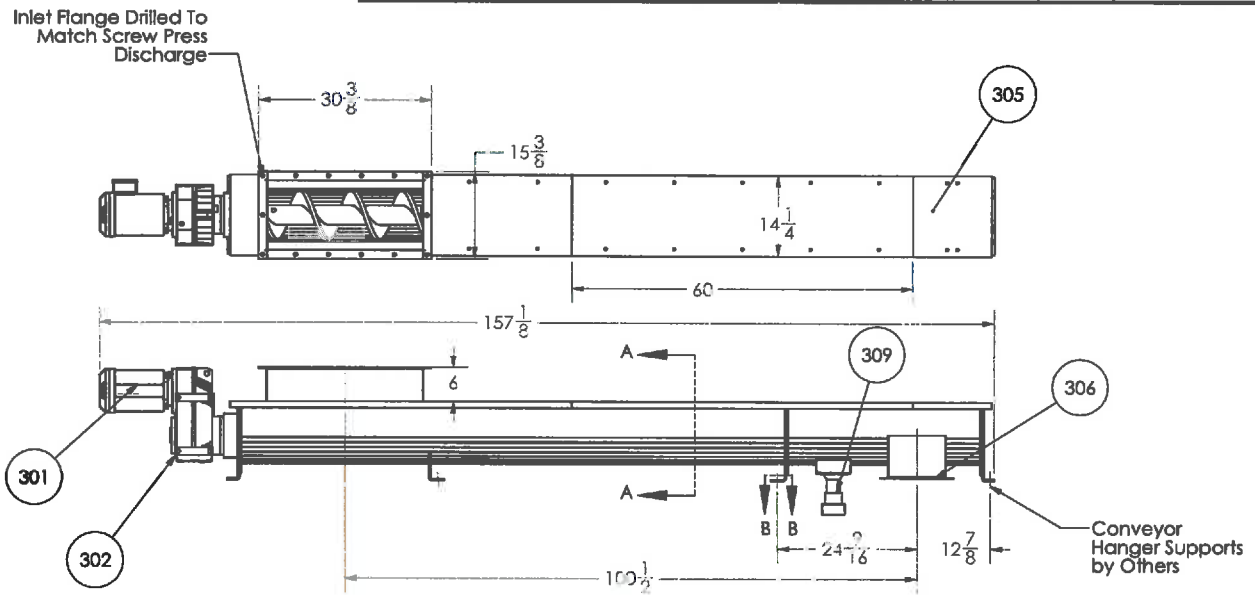


SECTION A-A
SCALE 1 : 8



SECTION B-B
SCALE 1 : 8





Note:
- Screw Speed 16 RPM
- Equipment Weight: 1,000 Lbs.
- Operating Weight: 1,500 Lbs.
- All Hardware to be 316 S.S.

Job No.	Customer		Wt. Lbs.
C-328	Myrtle Point WWTP Myrtle Point, OR		
Drawing No.	Title		Quantity
A328-300	9" Shaftless Screw Conveyor Assembly Details		1
			Date
			8/1/14
			Drawn By
			RTB

No.	Alteration	Date	Sign
1	Issued as Certified	7/22/15	RTB
0	Issued for Approval	6/9/15	RTB

FKC CO. LTD
2708 W 18th St.
Port Angeles, WA 98363
(360) 452-9472 Fax (360) 452-6880

Revision

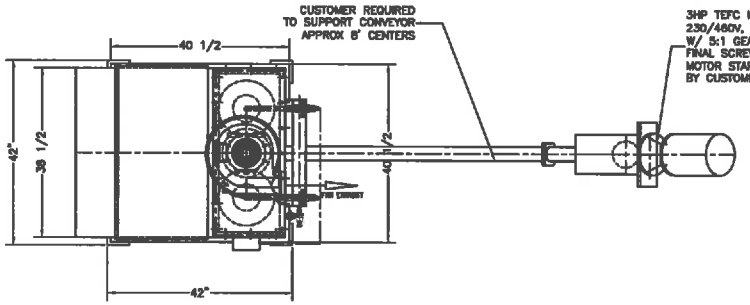
SHEET 1 OF 1

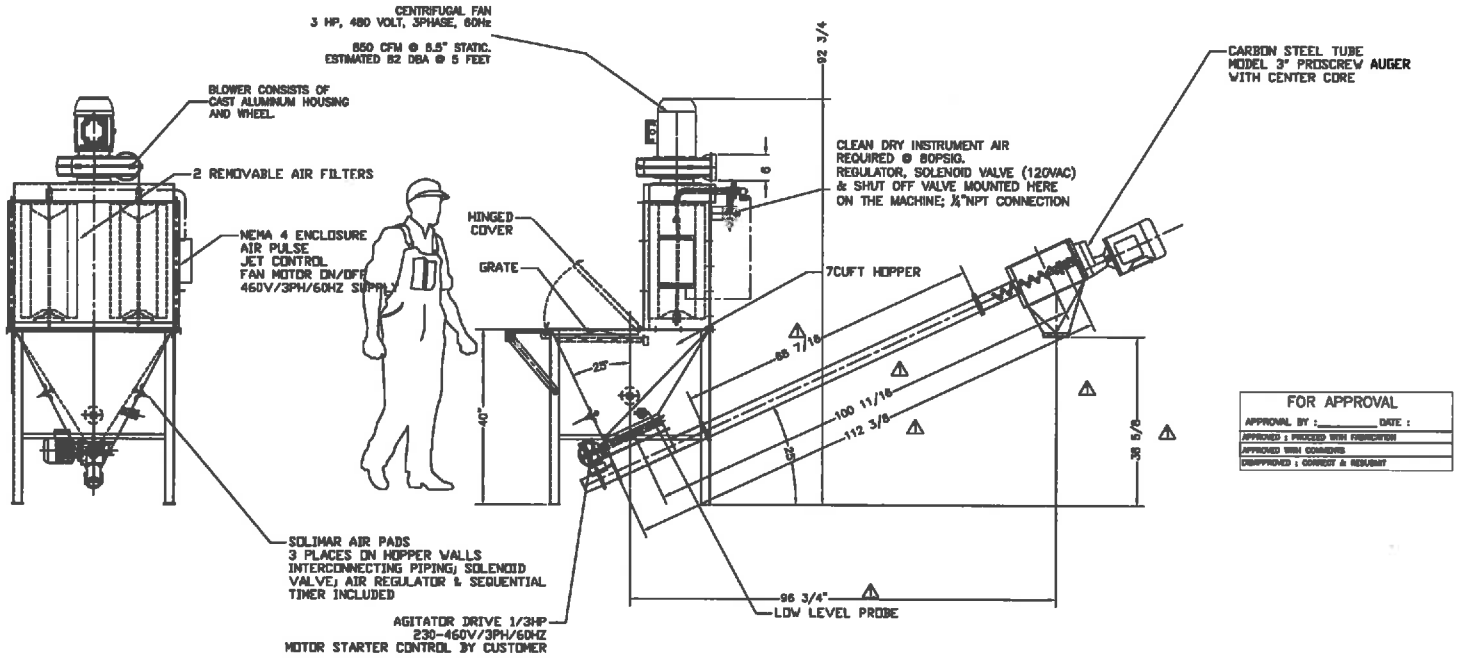
IF IN DOUBT ASK

THIRD ANGLE PROJECTION

DO NOT SCALE

NOTES:
1) PRODUCT CONTACT SURFACES = CARBON STEEL
2) SUPPORT FRAME & HARDWARE = CARBON STEEL
3) SURFACE FINISH (CARBON STEEL) = WELDS CLEANED AND BRUSHED PAINTED W/ "STEEL-IT" POLYURETHANE PAINT; COLOR = METALLIC GRAY
4) ELECTRICAL CLASSIFICATION = NEMA 4.
BLOWER DESIGN FLOW RATE = 850 CFM
BAG DUMP STATION FACE VELOCITY = 200 FT/MIN
FOR FILTER BLOWBACK 3-5 CFM REQUIRED
60-80 PSIG REQUIRED FOR FILTER BLOWBACK
SUPPLY VOLTAGE 460V/3PH/60HZ AND 120V/1PH/60HZ





FOR APPROVAL

APPROVAL BY : _____ DATE :

APPROVED : PROCEED WITH FABRICATION

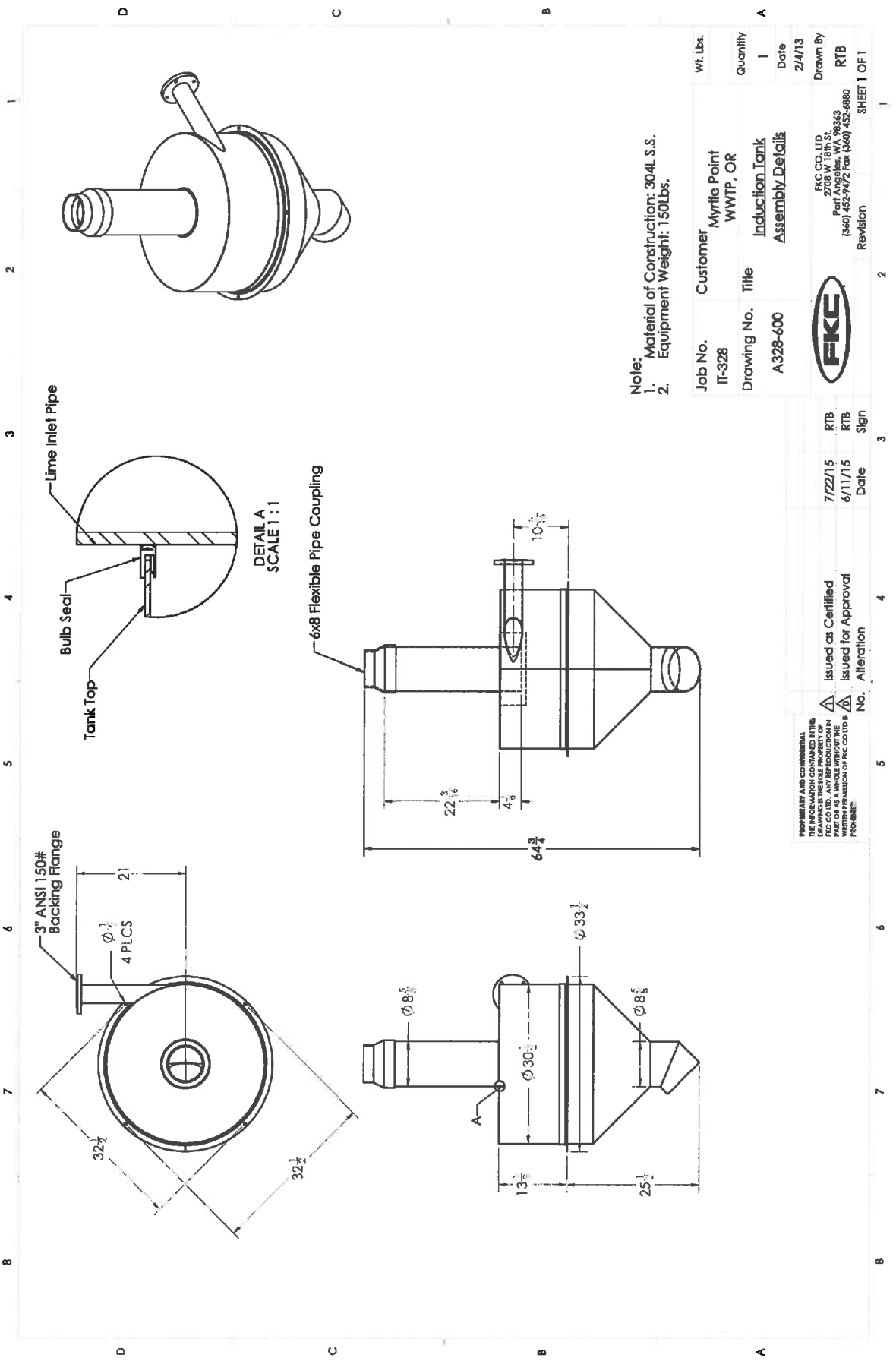
APPROVED WITH COMMENTS

DISAPPROVED : CORRECT & RESUBMIT

REV.	
1	Length RTB
2	
3	
4	
5	

	X
CERTIFIED FINAL PRINT	
FOR RECORD/INFORMATION ONLY	
DATE: _____ INITIALS: _____	

DATE: 5.4.15	PROJECT #: 1504018	SPIROFLOW SYSTEMS, INC	
CUST. ORDER #: 15671	CUSTOMER: FKC COMPANY		
REF. DWG. #:	TITLE: BAG DUMP STATION W/ FSC318A-22		
	DRAWN BY: DFH	DWG #: 1504018/01	REV 1


Note:
1. Material of Construction: 304L S.S.
2. Equipment Weight: 150Lbs.
Job No. IT-328
Drawing No. A328-600
Customer Myrtle Point WWTP, OR
Title Induction Tank Assembly Details
FKC CO. LTD. 2708 W 18th St. Port Angeles, WA 98363 (360) 452-9472 Fax (360) 452-6880
Wt. lbs.
Quantity 1
Date 2/4/13
Drawn By RTB
Revision
SHEET 1 OF 1
No. Alteration
Issued as Certified 7/22/15 RTB
Issued for Approval 6/11/15 RTB
Date Sign
PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FKC CO. LTD. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FKC CO LTD IS PROHIBITED
Lime Inlet Pipe
Bulb Seal
Tank Top
DETAIL A SCALE 1 : 1
6x8 Flexible Pipe Coupling
3" ANSI 150# Backing Flange
4 PLCS
A

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Appendix E

Conceptual Design and Cost Estimate for Land Application at LGVSD

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Appendix E. Conceptual Design and Cost Estimate for Land Application at LGVSD

SB 1383 removes jurisdictional boundaries for land application of treated organics, and hence biosolids, and will enable agricultural land to be permitted for organics/biosolids application as long as the property where land application occurs meets the requirements of the California Biosolids General Order (State Water Resources Control Board, 2004 - 0012 – DWQ). It is expected that LGVSD should be able to obtain a permit for land application on its property, of which a portion is currently used for crop production and recycling of treated effluent (see Figure E-1, APNs 13, and 14). LGVSD is open to considering accepting and land applying biosolids from other agencies on a portion of the land it owns, including the area currently dedicated to effluent spray irrigation, and potentially the 66 acre parcel that is currently unused. If other local options are not available for disposal of SD5's biosolids, it could be advisable for SD5 to enter into an agreement to secure the land application capacity at LGVSD, whether the agency uses it or not in the short-term, or even the long-term.

It is assumed that LGVSD would only be able to apply Class B biosolids in the dry season and Class A biosolids year-round. If LGVSD were to accept Class B biosolids year-round, on-site storage of the biosolids would be required. If SD5 plans to continue to produce Class B biosolids, wet weather storage of the biosolids would be required, and is therefore included in the analysis (e.g., locating the storage facility at LGVSD as well).

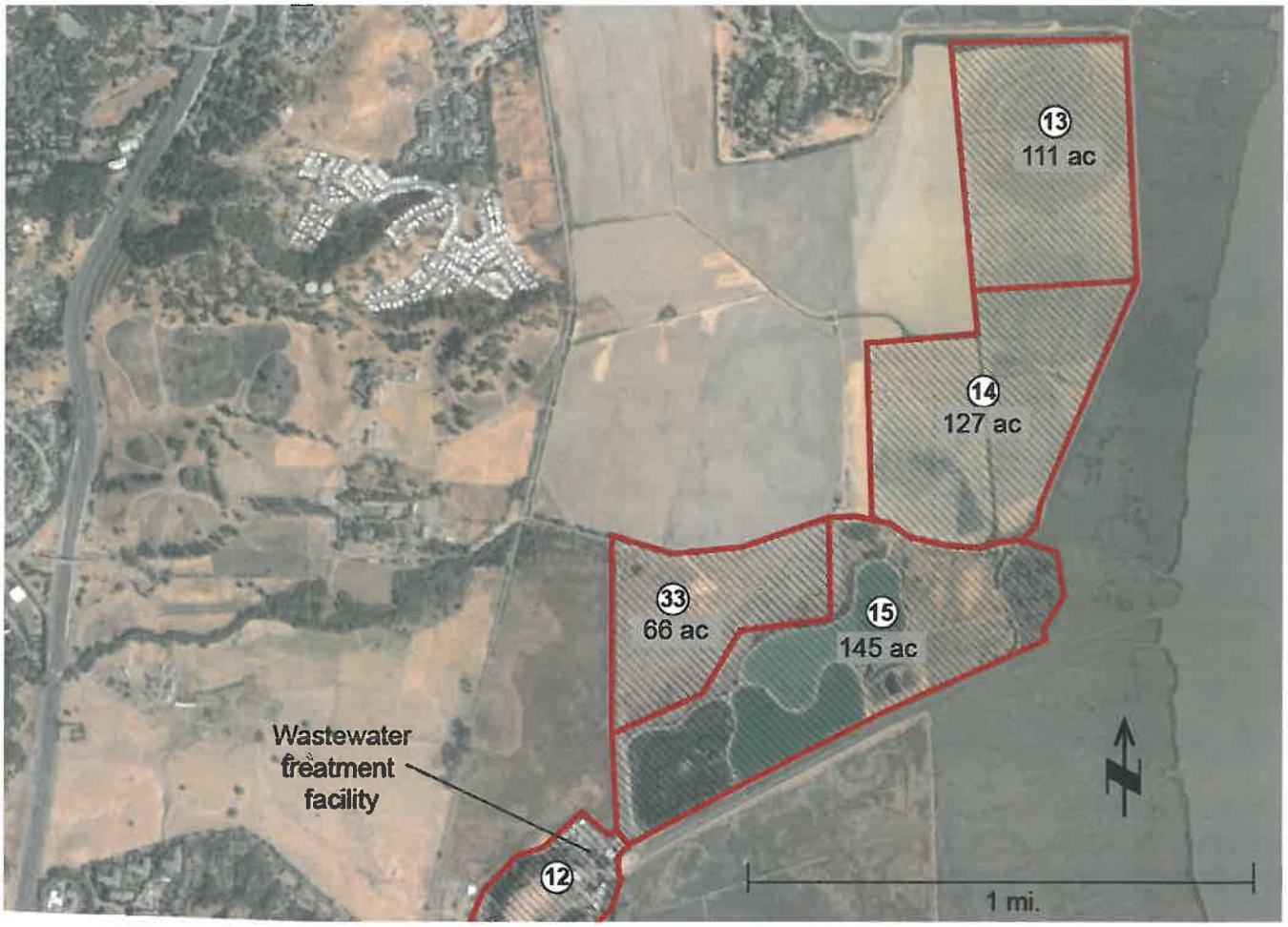

Figure E-1. Parcels owned by LGVSD; circled value is Assessor's Parcel Number.

LGVSD owns several parcels of land (approximately 450 acres) adjacent to its main wastewater treatment plant (see Figure E-1). Currently, about 145 acres are comprised primarily of storage lagoons for plant effluent and stabilized sludge, including 9 acres for surface disposal of the stored sludge, and 238 acres are used as spray fields for disposal of the stored plant effluent, leaving about 66 acres of unused land.

A conceptual capacity analysis was prepared for the LGVSD site, assuming use of Class B biosolids from four generators in Marin County: SD5, SASM, Sausalito-Marin, and LGVSD (for evaluation purposes only; other agencies could be included as well). Results are shown in Table E-1. The capacity analysis uses 2018 biosolids production data reported for each WWTP (Waste Management, 2019), and makes assumptions concerning potential crops grown, each crop's nitrogen demand requirement, and biosolids physical and chemical properties important in establishing appropriate agronomic application rates. Biosolids from SD5 would fit within the overall land application capacity of the LGVSD site, and proportionally uses the lowest amount of acreage among the four wastewater treatment plants evaluated on an annual basis, assuming all biosolids from SD5 were land applied. The capacity analysis does not consider the addition of nitrogen to the soil from the use of treated effluent for crop irrigation, which is an on-going activity that must be maintained at LGVSD. At the time of General Order permitting, testing of the spray effluent for nitrogen content will be required and the data used in the final application rate calculations. In general, spray effluent recycling will slightly reduce biosolids application rates.

CMSA and NSD may also wish to participate. Their participation would be expected to decrease the total cost per ton, as the greater volume would reduce per WT capital repayment. A more in-depth analysis would be necessary to determine if there would be sufficient acreage available to accept additional volume.

TABLE E-1
LGVSD Site Biosolids Land Application Capacity Analysis

Example Crop	Crop N[a] Demand, Lb/Ac	Biosolids N[b] Loading Limit, Wt/Ac	Area needed for biosolids management for biosolids generator (production, WT/y)				
			SD5 (300)	SASM (1,113)	Sausalito -Marin (990)	LGVSD (1,703)	Total Area (4,106)
Dry pasture	200	29	12	39	35	60	145
Irr. pasture[c]	300	43	8	26	23	40	97

[a] Projections do not account for residual nitrogen at land application site, or account for nitrogen added in treated effluent used for crop irrigation

[b] Assumes: Biosolids N content = 7 lb available N/WT biosolids; Biosolids percent solids is 20 percent.

[c] Assumes irrigated pasture with 2 "cuttings" during growing season and crop removed.

Sources: Grey, 2018; Waste Management, 2019.

Space requirement calculations below are the area required for biosolids only and assume an uncovered storage pad with use of K-rails or "ecology" blocks around the area perimeter on three sides to contain biosolids and allow space for delivery and removal. The space requirement calculation assumes biosolids may be co-mingled and not separated. Separate storage for each biosolids generator would increase the footprint slightly but not significantly because ecology blocks/K-rails are approximately 3 feet in width and the facility would require 3 additional rows of blocks/k-rails to divide generators into four separate "bays".

Biosolids Land Application at LGVSD Site for Land Application

A four Marin County biosolids generator option was conceptually analyzed. The LGVSD location contains available, open space within the facility footprint that could be converted to a storage area. One potential location, for example, is the existing 9-acre surface disposal site. For the purpose of this analysis, storage of biosolids and area required is based on annual production and assumes all four biosolids generators from Marin County produce dewatered cake; two options

were considered: (1) field spreading annually and (2) twice per year.

If storage was limited to SD5 biosolids, the facility footprint for biosolids storage could be small and reside on less than one tenth of one acre. If storage includes all four Marin County biosolids generators (4,106 WT annually) the required footprint for biosolids storage alone (ingress/egress area to be determined) is approximately one acre. Note because LGVSD currently stores biosolids in lagoons within the facility, and land disposes of liquid biosolids, the storage facility footprint dedicated to biosolids storage could be reduced to just over 0.5 acres until such time LGVSD produces dewatered cake biosolids (and the storage location could be moved to an area adjacent to the 9-acre surface disposal site). In addition, regardless of the space required for biosolids storage, some additional working surface will be necessary to off load biosolids, and re-load biosolids into spreading equipment. For purposes of this analysis we are assuming 0.5 acres, for a total facility footprint of about 1.5 acres.

The storage area can be designed to be either covered or uncovered. Covering is typically more expensive, but it significantly mitigates air and water quality concerns of the Regional Water Quality Control Board (RWQCB) and Bay Area Air Quality Management District (BAAQMD). Uncovered storage requires a CA Title 27 compliant liner and stormwater runoff management containment system. In most cases, such a modification would involve preparation of an amendment to the LGVSD wastewater discharge permit or Waste Discharge Requirements (WDR). For uncovered storage, additional BAAQMD permitting may be required if existing emissions controls at the LGVSD site are insufficient.

Space requirement calculations below are the area required for biosolids only and assume an uncovered storage pad with use of K-rails or "ecology" blocks around the area perimeter on three sides to contain biosolids and allow space for delivery and removal. The space requirement calculation assumes biosolids may be co-mingled and not separated. Separate storage for each biosolids generator would increase the footprint slightly but not significantly because ecology blocks/K-rails are approximately 3 feet in width and the facility would require 3 additional rows of blocks/k-rails to divide generators into four separate "bays".

Conceptual Biosolids Storage Space Requirement

A demonstration with SD5 production would be 300 WT biosolids annually with hauling of 6.5 WT per load or up to 10 cubic yards. Storage would consist of 3-sided contained surface storage, 4-6 feet high, using K-rails/Ecology blocks for biosolids containment, on a suitable smooth working surface. Each load would need about 40 sq ft. (30' by 1.3' area space). At 46 hauls, this would take 0.07 acres.

Full facility with 4,106 WT per year would use the same storage type and take 0.9 acres. Including all requirements, this analysis assumes 1.5 acres.

Land application at LGVSD considers a storage facility to accept biosolids during the wet season months (October to April), and to provide operational flexibility during all months and weather conditions. In addition, the facility may be used during the dry season months for biosolids delivery/unloading/staging for land application, rather than hauling dewatered cake biosolids directly to the land application area. The cost analysis conservatively assumes storage of up to 4,106 WT of biosolids. As discussed, the dry pasture application rate is 29 WT of biosolids per acre per year (typically performed during spring months, while the irrigated pasture (which may require two cuttings) application rate is 43 WT of biosolids per year; note biosolids may be applied once per year to irrigated pasture, or applied twice per year—once in the spring and then again following the first cutting.

If the four biosolids generators (SD5, Sausalito-Marin, SASM, LGVSD) decide to move forward with a sub-regional land application, they will most likely utilize a private company to operate and maintain the facility and either finance the permitting, design, and construction of the facility with 20 year loan at 1.5 percent interest (EPA, 2019) or through a private sector biosolids management company. Operations would include accepting biosolids cake, storage for up to one year, land applying the biosolids once per year, and then harvesting the crops grown once per year. This analysis assumes capital costs for 4,106 WT of biosolids per year.

Program Permitting and Operations Cost Estimate

The General Order NOI preparation process can be done in one to two months, assuming the necessary data defined in the NOI and pre-application report process are readily available. Review time by the Regional Board can be minimized, by bringing in staff into the project planning process early on, at the time of NOI preparation. After initial staff review and any response by the four biosolids generators (SD5, Sausalito-Marin, SASM, LGVSD) to prepare the NOI, the time for permitting approval (issuance of the NOA) will come down to availability of the data, agreement among the parties, and any additional review time from the Regional Board or local government agencies. This process can take months, and up to a year in some cases. For purposes of this analysis, permitting was assumed to take 8 months with construction (concrete pad and ecology block walls) an additional four months.

An estimate of costs to permit and operate a land application program at the LGVSD site was prepared (Table E-2). For the purpose of the overall program cost analysis, it was assumed that LGVSD would pay for program permitting (or some arrangement would be made between the participating agencies to cover permitting costs). Permitting costs are based on complying with the California Biosolids General Order Notice of Intent (NOI) process, leading to issuance of a Notice of Applicability (NOA) by the San Francisco Regional Water Quality Control Board. On-going annual program and operations and monitoring costs are based on local and regional experience, and contact with consultants who support land application, and vendors such as Synagro (2019).

The permitting cost estimate also includes potential costs to address local Marin County issues of concern, primarily those related to CEQA compliance, which are not addressed in most cases by the EIR prepared to support the Biosolids General Order. In some instances, existing CEQA documentation for wastewater treatment plant locations includes allowance for a certain level of transportation service (i.e., truck trips), which are generated due to land application activities. Conversely, if transportation level of service has not been considered or is deemed inadequate, additional analysis and potential mitigation may be required. In addition, some counties in California (e.g., Sacramento County) have required additional GHG impact analysis to support existing CEQA approvals including where mitigated negative declarations or EIRs have been issued and certified (Synagro, 2017). Estimated costs due to additional environmental analysis are shown in the same table (Table E-2).

Cost Estimate

Land application at LGVSD considers a storage facility to accept biosolids during the wet season months (October to April), and to provide operational flexibility during all months and weather conditions. In addition, the facility may be used during the dry season months for biosolids delivery/unloading/staging for land application, rather than hauling dewatered cake biosolids directly to the land application area.

The cost analysis assumes the following:

- This analysis conservatively assumes land application done either once (29 WT per acre per year) using the dry pasture biosolids application rate;
- Storage for up to 4,106 WT per year with design, permitting and construction of $500,000, for a 1.5 acre facility with concrete or asphalt pad and berm;
- Finance for the permitting, design, and construction of the facility would either be a public option (e.g. MOU between agencies) with 20 year loan at 1.5 percent interest (EPA, 2019) or through a private sector biosolids management company at 60 percent leverage, 7 year loan payback with 20 percent rate of return (Pugliaresi, 2019; Durnin, 2019);
- In both cases, the facility would then be operated by a private sector biosolids management company;
- Annual permitting costs of $25,000;
- Storage, spreading and private company profit of $23 per WT for annual spreading (Pugliaresi, 2019);
- Crop harvest of $153 to $253 per acre in 2019 dollars ($87 to $144 per acre (UC Davis, 2003) inflated using 1.73 factor (USDA, 2019). This analysis is conservative and uses $253 per acre;
- 10 percent contingency on operations costs;
- Operations start in 2025 for comparison to other alternatives;
- Escalation rate for capital expenditures of 3 percent;

- Escalation rate for operations of 3 percent;
- Discount rate of 3 percent; and
- Assumed increase of tipping fees of 3 percent.

Total annual operating costs would be $172,000 in 2019 dollars (Table E-3). The 4,106 tons of biosolids would have tipping fees ranging from $49 to $67 per WT for public and private financing, respectively (Tables E-4 and E-5). SD5 would expect to face disposal costs between $15,000 and $20,000, for public and private financing, respectively.

TABLE E-2
Estimated Biosolids Land Application Permitting and Operations Costs at LGVSD[a]

Permitting and Site Analysis Costs	Initial	Annual Cost	Comments
General Order			
NOI application fee	$8,000	$8,000	Applies to sites > 40 acres
NOI/pre-app biosolids analysis	$10,000	$5,000	Upfront costs higher than annual due to lack of available data
NOI/pre-app report soil sampling	$4,000	$2,500	6 inch depth
NOI/pre-app report mapping	$5,000	$1,000	Mapping changes can be due to changing practices/other needs
Pre-app report agronomic/ metals prediction	$3,000	$1,000	
NOI/pre-app land productivity report	$5,000	None	Regional Board now pushing to prepare for all sites
NOI spill response, traffic, storage, adverse weather plan	$1,500	None	Necessary requirements
NOI/pre-app report groundwater monitoring	$30,000	$3,000	3 wells required, if GW depth <25 feet below ground surface; annual testing
NOI annual report preparation	None	$2,500	
Biological resource assessment[b]	$15,000	None	If required/necessary
GHG emissions analysis[b]	$5,000	None	If required/necessary
Truck trip/transportation analysis[b]	$2,500	None	If required/necessary
Public and community relations	$2,500	$2,500	
Permitting & Site Analysis Cost Subtotal	**$91,500**	**$25,500**	

[a] Costs assume four biosolids generators in program with total annual biosolids of 4,106 WT.
[b] Estimated costs due to additional environmental analyses that may be required.

TABLE E-3
LGVSD Land Application (Year Round Storage) Operating Cost Calculations

	UNITS	PER UNIT	TOTAL
Storage, Spreading and Profit: Biosolids WT/Yr	4,106	$23	$94,000
WT/acre/yr	29	-	-
Acre Needed	142	$253	$36,000
Annual Permitting	1	$25,000	$25,000
Contingency	10%		$16,000
Total Operating Costs	**4,106**	**$42**	**$172,000**

Values rounded to nearest $1,000

TABLE E-4
LGVSD Land Application (Year Round Storage) Tipping Fee Calculations

CATEGORY	PUBLIC FINANCING	PRIVATE FINANCING
Total Capital Cost	$500,000	$500,000
Debt Percentage	100%	60%
Loan Amount	$500,000	$300,000
Private Entity Capital	$0	$200,000
Interest Rate	1.5%	7.0%
Loan (Yrs)	20	7
Loan Payback[a]	$29,000	$56,000
Private Capital Payback[b]	$0	$48,000
Operating Costs	$171,000	$171,000
Revenue	$0	$0
Total	$200,000	$275,000
Price/WT	$49	$67

Values rounded to nearest $1,000

[a] Loan payback is annual cost and decreases each year in 2019 dollars.
[b] This is calculated from Table E-5.

TABLE E-5
LGVSD Land Application (Year Round Storage) Tipping Fee Calculation Details

YEAR	COSTS	REVENUES[a]	ANNUAL
0	($200,000)		($200,000)
1	($227,000)	$275,000	$48,000
2	($232,000)	$283,000	$51,000
3	($237,000)	$292,000	$55,000
4	($243,000)	$300,000	$57,000
5	($248,000)	$310,000	$62,000
6	($254,000)	$319,000	$65,000
7	($260,000)	$328,000	$68,000
Total	($1,901,000)	**$2,107,000**	**$206,000**
Rate of Return			20%
Tipping Fee			$67

Values rounded to nearest $1,000 and are not discounted to 2019.

[a] Revenues include biosolids tipping fees at $67 per WT for Year 1; values in other years have an escalation rate of 3 percent.

Appendix F

Conceptual Design and Cost Estimate for Compost Facility at LGVSD

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Appendix F. Conceptual Design and Cost Estimate for Compost Facility at LGVSD

Composting can be done open air or enclosed (fully or partially) within a structure or a combination, with the size of the facility proportional to amount of biosolids being managed and amount of bulking agent needed for the composting process. At a conceptual level, for example, the 9-acre surface disposal site is large enough in size to contain a composting facility using biosolids from the four generators analyzed in this report and assuming import of chipped or size reduced green waste as a bulking agent.

From a comparative facility size standpoint, the enclosed Inland Empire Utilities Agency Regional Biosolids Compost Facility, located in Rancho Cucamonga, CA, resides on a 9.4 acre site, and manages 150,000 WT of biosolids and 60,000 WT of bulking agent per year; the facility uses a 3-acre biofilter for a total footprint of 12.4 acres (IEUA, 2019).

Another example is the Laguna sub-regional compost facility, located in Santa Rosa, CA. This enclosed facility located within a 7.8 acre footprint was designed to process 50.6 WT of biosolids per day (approximately 18,500 WT annually), within 12 composting beds occupying approximately 1 acre in area (CalRecycle, 2017; Santa Rosa Water, 2016).

A third example, analyzed specifically for the LGVSD property, is provided by Engineered Compost Systems (ECS) and is an open-air aerated static pile compost system (ECS, 2019). Using the assumption of managing 4,106 WT of biosolids annually, this mass then requires approximately 11,000 WT of green waste for bulking agent (2.65:1 ratio). According to ECS, a 15,000 wet ton per year aerated static pile composting facility requires 13,000 sq ft (0.3 acres) for primary and secondary composting. A common rule of thumb for additional facility area for material processing, storage, and transfer, in addition to primary and secondary phase composting, is to multiply by 10 for total site area, which results in a conceptual facility footprint of three acres.

It appears feasible, therefore, that the 9-acre location is adequate for any additional compost facility siting analysis assuming only Marin County biosolids generators. Note that because LGVSD currently stores biosolids in lagoons within the facility, and land disposes of liquid biosolids, compost operations for a three Marin County biosolids generator option could be reduced to approximately 2.5 acres, until such time LGVSD produces dewatered cake.

Given the location of the LGVSD site within a relatively dense urban area, covered or partially covered composting may be preferred from a containment and permitting standpoint. However, there are fully outdoor, uncovered composting systems with sophisticated runoff and ammonia/volatile organic compound emission reduction management systems that meet California water and air permitting requirements.

A recommendation to consider for SD5 is to approach LGVSD concerning development of a biosolids demonstration Class A composting facility strictly for SD5 biosolids, at a preferred location at the wastewater treatment plant. Such a demonstration could conceivably use the ECS aerated static pile system (ECS, 2019) and be scaled down to process SD5 biosolids only (300 WT per year) and green waste (800 WT per year). The space requirement for this alternative is approximately 0.75 acre. A demonstration facility would most likely be already covered under current discharge permits and construction would occur in less than one year.

Regardless of technology and process selected, any regulatory or permitting needs and challenges could be managed and addressed, creating a long-term solution for SD5 in the process. And if the site location was adequate, and space was maintained, an expanded regional facility for all four Marin County biosolids generators could be constructed at a later time adjacent to the pilot project location, and using the same ECS aerated static pile composting system. Such a pilot system, using the area assumptions discussed above, could be situated on a portion of the existing 9-acre surface disposal site, assuming LGVSD decides to abandon its current use.

Under any biosolids compost production scenario, compost produced must be removed from the production facility and beneficially reused in some manner. Compost is most often used (sold or in some cases given away) for a soil amendment in landscaping applications within urban and suburban areas. In other cases, if agricultural areas are nearby, compost can be sold or given away to farmers for use as a soil amendment or soil conditioner. Typically, because of biosolids compost's low available nitrogen content relative to pure biosolids, compost is not applied to meet crop N fertilization demand. However, as a pre-plant soil amendment, or as pre-plant soil conditioner to improve unfertile or damaged soils (eg. salt build up, erosion protection, wildfire damage), compost can be applied at rates of up to 5 WT per acre (based on professional experience and communication with UC extension professionals). Such an approach (using a portion of the existing agricultural area at LGVSD and any available open space) may be feasible at the LGVSD location and would reduce the amount of compost required to be sold or given away and removed from the compost processing location. More analysis will be necessary to produce a facility compost mass balance, which includes the end uses of the product.

Cost Estimate

A conceptual cost estimate was prepared for four generators in Marin County: SD5, SASM, Sausalito-Marin and LGVSD (for evaluation purposes only; other agencies could be included as well). If Marin County sanitary districts decide to move forward with a sub-regional land application or composting facility, they will most likely utilize a private company to operate and maintain the facility and either finance the permitting, design, and construction of the facility with 20 year loan at 1.5 percent interest (EPA, 2019) or through a private sector biosolids management company. Operations would include accepting biosolids cake and chipped/size-reduced green waste, storing and processing the materials, and then using the resulting compost at LGVSD or providing compost for sale or give-away, or other end uses.

CMSA and NSD may also wish to participate. Their participation would be expected to decrease the total cost per ton, as the greater volume would reduce per WT capital repayment.

Cost Analysis for Composting

The proposed composting facility at LGVSD is expected to accept chipped or size-reduced green waste and use it as a bulking agent at a 2 to 3 to 1 ratio to the biosolids (ECS, 2019). The composting process includes about a fifty percent reduction in mass as water evaporates. The facility is therefore expected to accept a total of 15,000 WT of material per year and produce around 7,500 tons of finished Class A compost. The cost analysis assumes the following based on a local biosolids processing facility:

- Finance for the permitting, design, and construction of the facility would either be a public option (e.g. MOU between agencies) with 20 year loan at 1.5 percent interest (EPA, 2019) or through a private sector biosolids management company at 60 percent leverage, 7 year loan payback with 20 percent rate of return (Pugliaresi, 2019; Sentinel, 2019);
- In both cases, the facility would then be operated by a private sector biosolids management company;
- Capital costs for the facility would be $2.2 million, which includes all the permitting, planning, grading equipment and storage (Pugliaresi, 2019, ECS, 2019; HDR);
- Operations cost of $350,000 per year with no additional contingency added (Pugliaresi, 2019); and
- 10,916 WT of green waste with a tipping fee of $20 for $218,000 per year (Pugliaresi, 2019);
- Sales of $0 per ton for finished compost;
- Operations start in 2025 for comparison to other alternatives;
- Escalation rate for capital expenditures of 3 percent;
- Discount rate of 3 percent;
- Assumed increase of tipping fees of 3 percent.

The 4,106 tons of biosolids would have tipping fees ranging from $63 to $143 per WT for public and private financing, respectively (Tables F-1 and F-2). SD5 would expect to face disposal costs between $19,000 and $43,000, for public and private financing, respectively.

TABLE F-1
LGVSD Composting Operating Cost Calculations in 2019 dollars

CATEGORY	PUBLIC FINANCING	PRIVATE FINANCING
Total Capital Cost	$2,200,000	$2,200,000
Debt Percentage	100%	60%
Loan Amount	$2,200,000	$1,320,000
Private Entity Capital	$0	$880,000
Interest Rate	1.5%	7.0%
Loan (Yrs)	20	7
Loan Payback[a]	$128,000	$245,000
Private Capital Payback[b]	0	$211,000
Operating Costs	$350,000	$350,000
Revenue	($218,000)	($218,000)
Total	$260,000	$588,000
Price/WT	$63	$143

Values rounded to nearest $1,000

[a] Loan payback is annual cost and decreases each year in 2019 dollars.
[b] This is calculated from Table G-2.

TABLE F-2
LGVSD Composting Operating Cost Calculation Details

ANNUAL COSTS AND REVENUES (PRIVATE ENTITY)

YEAR	COSTS	REVENUES[a]	ANNUAL
0	($880,000)		($880,000)
1	($595,000)	$275,000	$211,000
2	($605,000)	$283,000	$225,000
3	($616,000)	$292,000	$239,000
4	($627,000)	$300,000	$254,000
5	($639,000)	$310,000	$269,000
6	($651,000)	$319,000	$284,000
7	($663,000)	$328,000	$300,000
Total	($5,276,000)	**$2,107,000**	**$902,000**
Rate of Return			20%
Tipping Fee			$143

Values rounded to nearest $1,000 and are not discounted to 2019.

[a] Revenues include biosolids tipping fees, green waste tipping fees and compost sales ($143/WT, $20/WT and $0/ton, respectively, for Year 1; values in other years have an escalation rate of 3%).

engineered COMPOST systems

ECS Budgetary Estimate
Aerated Static Pile Composting System

Client: Mary Martis
Proposal: California Biosolids Composting
By: Geoff Hill & Steve Diddy
Date May 22, 2019

System Components: CASP Primary Composting System, CompTroller automated control and monitoring system, Aeration system with reversing air-flow, low-friction trench aeration floor and biofiltration; Secondary composting in an ECS ASP System with positive aeration, low-friction trench aeration floor, and CompTroller automated control and monitoring system. Feedstock Mixing System with 4 auger mixer, scale, motor controls, RF pendant, and discharge conveyor.

Volume & Retention Assumptions		
Annual Wet Tons of FW and YW	tons/yr	15,000
Total Daily Mix Volume	yd3/day	93
Design Density of Initial Mix	lb/yd3	890

Primary CASP Data		
Retention Time in Primary (on aeration)	days	21
Zone Length	ft	45
Zone Width	ft	25
Pile Depth	ft	8.5
Depth of Top Cover Material	ft	1
Nominal Zone Capacity (mix only)	yd3	316
Number of Primary Zones	#	6
Estimated Installed Horsepower	HP	40
Total Zone Area	ft2	7,020

Secondary ASP Data		
Retention Time in Secondary (on aeration)	days	21
Zone Length	ft	50
Zone Width	ft	20
Pile Depth	ft	9
Depth of Top Cover Material	ft	0
Nominal Zone Capacity	yd3	308
Number of Secondary Zones	#	6
Estimated Installed Horsepower	HP	10
Total Zone Area	ft2	6,000

Feedstock Mixing System		
Mixer Rated (level) Capacity	ft3	550
Usable Mixing Volume (per batch)	yd3	17
Estimated Mixer Loads Required per Week	#	38

Cost Estimate for Equipment & Services Provided by ECS in 2019		USD
Primary CASP Composting System (a)		$500,000
Secondary CASP Composting System (a)		$290,000
ECS/Helm Mixer System with Discharge Conveyor		$200,000
	Total	$990,000

Notes (a) Includes installation drawings (not stamped), start-up, training, 1 year unlimited technical support, 12 month warrantee, allowance for freight FOB Central Maryland

www.compostsystems.com

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Walnut Creek, CA 94596
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We practice increased use of sustainable materials and reduction of material use.

RESOLUTION NO. 2019-07

SANITARY DISTRICT NO. 5 OF MARIN COUNTY

A RESOLUTION ACCEPTING COMPLETION AND DIRECTING DISTRICT MANAGER TO FILE NOTICE OF COMPLETION FOR FY2017-2018 SEWER REHABILITATION PROJECT – TIBURON & BELVEDERE

WHEREAS, Antonio Rubio, District Manager, of said District, did file with the Secretary of said District, his Certificate of Completion as to the completion of all the work provided to be processed under and pursuant to the contract between said District and Westland Contractors, Inc., Inc., dated March 26, 2018; and

WHEREAS, it appears to the satisfaction of this Board that said work under said contract has been fully completed as provided for in said contract and the plans and specifications therein referred to;

NOW THEREFORE BE IT RESOLVED, by the Board of Directors of Sanitary District No. 5 of Marin County, California, the following:

1. That acceptance of completion of said work shall be, and it is hereby made and ordered.

2. That the District Manager is directed to execute and file for record with the County Recorder of the County of Marin, Notice of Completion thereof, pursuant to § 3093 of the Civil Code of the State of California.

* * * * *

I hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly passed and adopted by the Board of Directors of Sanitary District No. 5 of Marin County, California, at a meeting thereof duly held on the 15th day of August 2019, by the following vote:

AYES, and in favor thereof, Directors:

NOES, Directors:

ABSENT, Directors:

ABSTAIN, Directors:

APPROVED:

Tod Moody
President, Board of Directors

ATTEST:

Michael Lasky
Secretary, Board of Directors

RECORDING REQUESTED BY
Sanitary District No. 5 of Marin County
AND WHEN RECORDED MAIL TO

Name Sanitary District No. 5 of Marin County
Street Address 2001 Paradise Drive
City & State P.O. Box 227
Tiburon, CA 94920

SPACE ABOVE THIS LINE FOR RECORDER'S USE

RECORD WITHOUT FEE Govt. Code § 27383

NOTICE OF COMPLETION

Notice is hereby given that:

1. The undersigned is the owner of the project.
2. The full name of the undersigned owner is:

NAME	ADDRESS	CITY AND STATE
Sanitary Distr. No. 5 of Marin Co.	**2001 Paradise Drive**	**Tiburon, CA 94920**

3. On August 15, 2019, there was completed on the property described below the contract for the FY2017-2018 Sewer Rehabilitation Project – Tiburon & Belvedere. In general, the work consisted of pipe-bursting approximately 3,000 linear feet of sewer pipeline to replace existing deteriorating pipeline.
4.
5. The name of the contractor for the work is:

NAME	ADDRESS	CITY AND STATE
Westland Contractors, Inc.	**3100 E. 10th Street, Unit A**	**Oakland, CA 94601**

6. The real property herein referred to is located throughout the Town of Tiburon and the City of Belvedere, County of Marin, California.

I certify under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

SANITARY DISTRICT NO. 5 OF MARIN COUNTY

BY:_____
Antonio Rubio, District Manager

VERIFICATION

I, Antonio Rubio, declare that I am the District Manager of Sanitary District No. 5 of Marin County and am authorized to make this verification for that reason. I have read the Notice of Completion and know the contents thereof to be true and correct.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on August 15, 2019 (date) at 2001 Paradise Drive in Tiburon, CA 94920, California (place where signed)

By:_____

Antonio Rubio
District Manager

Belvedere
Tiburon
Library

Item #7

June 26, 2019

Tod Moody, President
John Carapiet, Vice President
Michael Lasky, Secretary
Catherine Benediktsson, Director
Richard Snyder, Director
Sanitary District No. 5 Marin County

Re: Belvedere Tiburon Library Expansion Project

Dear Mr. Moody and Members of the District Board,

First a thank you for completing the processing of the plans for the Library Expansion project, which we intend to get into construction in the next month or two. Working with your District Manager, Tony Rubio, has made the process understandable and responsive to our requirements.

As you know from the press the Expansion Project is being carried out by our Library, which is a Joint Powers Agency formed by The City of Belvedere and the Town of Tiburon, as a public project predominantly funded by donations from citizens of our two communities.

The Town of Tiburon is the lead agency as the site of the Library is in Tiburon adjacent to Tiburon Town Hall. The Town and the Library also share the parking lot, the civic plaza and Zelinsky Park. The Town has generously waived its usually applied fees for plan review and processing and by this letter we are requesting that the District also waive its fee of $16,746.00 as a measure of support for this community facility, which serves all the community free of charge.

Should the Board wish us to present the plans for the expansion at one of its meetings we would be pleased to do so.

Your favorable consideration would be very much appreciated.

Respectfully,

Deborah Mazzolini, Library Director

Cc: Tony Rubio, General Manager

1501 Tiburon Boulevard, Tiburon, CA 94920
P 415.789.2665 www.beltiblibrary.org

BURKE, WILLIAMS & SORENSEN, LLP

101 Third Street - Suite 200
San Rafael, California 94901-6537
voice 415.755.2600 - fax 415.482.7542
www.bwslaw.com

Direct No.: 415.755.2605
bstock@bwslaw.com

August 6, 2019

Deborah Mazzolini
Library Director
Belvedere Tiburon Library
1501 Tiburon Boulevard
Tiburon, CA 94920

Re: Belvedere Tiburon Library Expansion Project

Dear Ms. Mazzolini:

Our office serves as District Counsel for Sanitation District No. 5 of Marin County. We are in receipt of your June 26, 2019 request to waive fees associated with your library expansion project and offer the following response.

The Board of Directors considered your waiver request at its July 18, 2019 Board meeting, and declined to waive the fees as it relates to your expansion project. While the District is excited about your upcoming project, as a governmental entity fully funded by its ratepayers, it is unable to grant a waiver from one ratepayer at the expense of others. If you have any questions, please feel free to contact me.

Sincerely,

Benjamin L. Stock

BLS:lam
cc: Tony Rubio, District Manager
Tod Moody, Board President

OAK #4838-0001-9871 v1

Mutual Waiver and Cooperation Agreement Between the Town of Tiburon and Marin Sanitary District No. 5

This Agreement ("Agreement") is entered into by the Town of Tiburon, a municipal corporation ("Town") and Sanitary District No. 5 of the County of Marin, a public sanitary district formed under Division 6 of the California Health and Safety Code ("San 5"), on this 20th day of NOVEMBER, 2014.

Recitals

1. Both Town and San 5 exist for the betterment of life on the peninsula and the orderly and cost-effective delivery of vital public services.

2. Town owns and manages most public rights-of-way within the Town. The Town requires any party working within said rights-of-way to obtain an encroachment permit. Town performs inspections for said work.

3. Town also administers the California Building Code, which includes processing planning and building permits for non-exempt work, inspections of said work and determinations of compliance.

4. San 5's mission includes installation and maintenance of those portions of its collection system located within Town's rights-of-way and which are subject to Town encroachment permits and fees.

5. San 5 provides vital sewage collection and treatment services for residential and commercial properties in a significant portion of the Tiburon Peninsula, including most Town facilities such as Tiburon Town Hall, the Tiburon Police Station, the Belvedere-Tiburon Library, public restrooms in the downtown, the Public Works Corporation Yard, the Dairy Knoll Recreation Facility, the Railroad-Ferry Museum and seven Town-owned affordable housing units at Point Tiburon Marsh ("Housing Units").

6. Town and San 5 have a long history of cooperation and, in most cases, the mutual waiver of fees and charges to maximize the efficiency and timeliness of their service delivery.

7. Town and San 5 wish to enter into an Agreement to establish a framework of mutual cooperation and waiver of fees and charges to ensure equal and even-handed treatment of such charges between the Parties.

NOW, THEREFORE, in consideration of the mutual covenants and conditions contained herein, San 5 and Town agree as herein set forth:

Agreement

1. Mutual Fee Waiver; Housing Unit Priority.

a. Town agrees to waive charges and fees that it would otherwise impose upon San 5, including, without limitation, planning, building and encroachment permit or inspection fees and similar charges ("Town Charges").

b. San 5 agrees to waive charges and fees that it would otherwise impose on Town, including, without limitation, charges for sewer connections, sewer usage and other services and similar charges ("San 5 Charges").

c. The Town will offer available Housing Units for rental according to the following priority: (1) qualified Town employees; (2) qualified employees of San 5 and the Tiburon Fire Protection District; (3) other qualified persons as set forth in the Town Policy Governing Town-Owned Affordable Housing Units or any successor policy.

d. This Agreement is not intended to waive any costs and/or damages incurred by either Town or San 5 associated with any legal action, claim or damages relating to any project undertaken in conjunction with the waiver of any Town Charges or San 5 Charges. If any damage is incurred by any party to this agreement resulting from another party's action, the parties may assert any and all legal rights pertaining to any such claim for damages.

2. Miscellaneous.

a. This Agreement may be terminated by either party by giving the other party written notice one year before the termination date.

b. The laws of the State of California shall govern the interpretation, validity, and enforcement of this Agreement. Any suit, claim, or legal proceeding of any kind related to this Agreement shall be filed and heard in a court of competent jurisdiction in the County of Marin.

c. The Parties agree to negotiate in good faith to resolve any disagreements that may arise from this Agreement.

d. In the event any legal action is commenced to enforce this Agreement, the prevailing party is entitled to reasonable attorneys' fees, costs, and expenses incurred.

e. This Agreement constitutes the entire Agreement and understanding between the Parties and may not be modified orally or in any manner other than by an agreement in writing signed by both Parties.

f. The individuals executing this Agreement represent and warrant that they have the right, power, legal capacity, and authority to enter into and to execute this Agreement on behalf of the respective legal entities of Town and San 5. This Agreement shall inure to the benefit of and be binding upon the Parties hereto and their respective successors and assigns.

(Signatures on following page)

TOWN OF TIBURON

Dated: 12/8/14

Alice Fredericks
Mayor

SANITARY DISTRICT NO. 5

Dated: 11/20/14.

Cathy Benediktsson
President of the Board

APPROVED AS TO FORM:

By

Dated: 12/16/14

Ann R. Danforth, Esq.
Town Attorney, Town of Tiburon

By

Dated: 11/20/14

Benjamin L. Stock, Esq.
Attorney, Sanitary District No. 5

ATTEST:

DIANE CRANE IACOPI
TIBURON TOWN CLERK

SANITARY DISTRICT NO. 5
JOHN CADARET
SECRETARY OF THE BOARD

DECISION/ACTION ITEM LOG
CIP Committee: August 8, 2019
Sanitary District No. 5 of Marin County
ACTIVE ITEMS SHEET

No.	Item	Submission Date	Responsible Party	DECISION ONLY Due	DECISION ONLY / Completed	ACTION REQUIRED Due	ACTION REQUIRED / Completed	Comment/Reference Document
27	FY2017-2018 Sewer Rehab Project	11.7.17	Nute/TR/CIP	1.31.18				Working on Design Drawings for new FY2017-2018 Sewer Rehab Project; CIP Recv'd & Approved Specs, Plans & Estimate for Bid, as of 2.13.18, Notice of Award to be decided at 3.15.18 Brd. Mtg.; Awarded to Westland Contractors, Inc.; NTP issued for 7.1.18; Work currently in progress, as of 7.10.18, 8.15.18, 9.15.18, 10.15.18; Work to be completed no later than Oct. 31st.2018 11 15; **Project complete, as of 11.13.18; ~~Waiting on final invoice from Westland, as of 2.12.19-3.12.19 4.9.19, 5.14.19; Received 2 Change Orders + 1 Adjusting Change Order; Still waiting for Add'l Work Change Orders;~~ Paid in Full, 7.18.19; Will issue Notice of Completion, upon Brd Approval, 8.15.19**
28	2019 Sewer Rehab Project	3.12.19	Nute/TR/CIP					Recv'd Proposal for Project Eng. From Nute, 3.11.19; Currently Reviewing Plans, 5.14.19 - will bring to SD5 Board for approval, 5.16.19; Received Lowest Bid from Glossage Engineering, Inc., 6.7.19; **Contract fully executed & NTP issued on 8.2.19 (work to begin within 10 days of notice)**
29	Cove Rd. Force Main Replacement Project	3.12.19	Nute/TR/CIP					Nute Preparing Bid Docs, as of 3.12.19; Waiting for CalTrans response re horizontal drilling, as of 5.14.19

THE EPOCH TIMES
Truth and Tradition

Chief Investment Officer of Largest US Public Pension Fund Has Deep Ties to Chinese Regime – BY NATHAN SU

July 8, 2019 Updated: July 11, 2019

CalPERS headquarters in Sacramento, Calif. (Coolcaesar/CC-BY-SA-3.0/Wikimedia Commons)

CHINA-US NEWS

Newly discovered deep ties between the chief investment officer (CIO) of the California Public Employees Retirement System (CalPERS) and the Chinese government, along with CalPERS's China investment holdings, have provoked controversy about the operations of the largest public retirement fund in the United States. CalPERS manages more than $350 billion for public employees either retired from or currently working for most of the state and local public agencies in California.

The fund holds tens of millions of shares in equities of Chinese companies. Among other things, these companies develop advanced weapons for China's People's Liberation Army (PLA), and, according to one expert, are

involved in unethical business practices and human rights abuses, including the concentration camps holding Uyghurs in Xinjiang.

According to a 2017 report by People's Daily, the official mouthpiece of the Chinese Communist Party (CCP), CalPERS's current CIO, Yu "Ben" Meng, as of 2015 was a participant in the Chinese government's prestigious headhunting program called the Thousand Talents Plan (TTP). In testimony by the FBI to the U.S. Senate Judiciary Committee in December 2018, the TTP was called part of "China's non-traditional espionage against the United States."

Thousand Talents Plan

The TTP, according to a 2016 unclassified FBI report, is a program that allows China to gain access to and benefit from advanced technology from the United States and to "severely impact the U.S. economy." The program recruits and hires professionals who hold high-level positions, mainly in the United States, but also throughout the Western world.

Individuals recruited by the TTP, according to the FBI report, have been experts or scholars in prestigious universities or research institutes, senior managerial professionals in internationally known financial institutions, or entrepreneurs holding IP rights. According to the FBI report, the TTP is a program that "[poses] a serious threat to U.S. businesses and universities through economic espionage and theft of IP."

Associating with the TTP is legal and breaks no law, the FBI report said, but the individuals who participate in the TTP may easily conduct illegal activities through the program. What makes the TTP different from an ordinary headhunting operation is that the individuals who participate in the program are often required to work in China for certain amount of time each year while still holding their positions in the West, so that they can help Chinese institutions or companies benefit from their counterparts in the West. The TTP started its operations in 2008. According to a report by BioSpace.com, China recruited more than 6,000 high-level professionals through the TTP in the decade since its beginning.

Meng's Relationship With TTP

Meng's résumé posted on the fund's website shows that he worked in CalPERS for seven years starting in 2008 before leaving for three years. It states that in 2019, he "returned to CalPERS after serving as the deputy CIO at the State Administration of Foreign Exchange (SAFE) for three years." The CalPERS website doesn't specifically state to its own members or the general public that SAFE is a top-level Chinese state agency managing and regulating China's foreign-exchange activities.

Before Meng first joined CalPERS in 2008, he worked at Barclays as a senior portfolio manager and at Lehman Brothers Holdings as a risk officer, and he was a fixed-income trader at Morgan Stanley, according to a report by

Institutional Investor. Meng's experience in the United States qualified him to be a candidate for the TTP program.

According to an Oct. 2, 2017, report by People's Daily, Meng was officially hired by SAFE through the TTP program in November 2015. It's unclear whether there is any continuation of the relationship between Meng and China's TTP program, although most of the participants in the program continue their commitments to the TTP by working for institutions both in China and in the West.

China had more than $3 trillion in foreign-exchange reserves during the time that Meng served as deputy CIO at SAFE. The position of deputy CIO at SAFE is a prestigious position, in which Meng was exposed to the Chinese regime's sensitive information. Meng maintained significant influence over the investment decisions of China's foreign reserve system, which is the world's largest such system. Tightly controlled by the regime, China's foreign reserve system is one of the key institutions for the world's second-largest economy. The person hired for the position needs to go through strict security checks in order to confirm the person's loyalty to the CCP.

Meng's decision to leave his public sector job in the United States and work for the Chinese state was widely reported by many state-owned Chinese media, as it stimulated China's national pride. According to the report by People's Daily, Meng said that nothing else could give him more honor and responsibility than serving China. He said he fit into his position at SAFE almost perfectly. Many Chinese state-owned media praised Meng for his success at SAFE. When Meng later decided to leave SAFE and return to CalPERS, he also received positive reports from China's media.

Concerns About Agency's Hiring Decision

It's unclear how much scrutiny CalPERS applied during the recruitment process that led to Meng being hired straight from a top-level Chinese agency. In response to questions posed by The Epoch Times relating to CalPERS's decision to hire Meng, the fund simply referred to a September 2018 press release announcing his appointment.

Meng did not respond to a request for comment.

However, given the fund's extensive holdings of shares in Chinese companies, concerns have been raised about the potential risks facing CalPERS, which is now making investment decisions under Meng's oversight.

"Somebody coming from China who clearly had [a] close relationship with [the] Communist Party would clearly [be] helping investment into China. This of course will bring risk to CalPERS, because we are in the middle of rebalancing our economy away from China," said Robert Spalding, former senior director at the White House National Security Council and senior fellow at Washington-based think tank the Hudson Institute.

Konstantinos Roditis, the vice chairman of advocacy group Reform California, voiced concerns about CalPERS's hiring decision, given Meng's previous role working for the Chinese government.

"We have to wonder, did CalPERS hire someone that will direct investments so he can have access to companies that are in the best interest of China and not Californians?" he said. "I will presume the innocence of Mr. Meng, but with CalPERS's poor history of not properly vetting employees and poor oversight, I think a closer look into Mr. Meng is warranted." Roditis was one of the two candidates for California state controller in the November 2018 midterm election. Reform California is a 527 political action committee dedicated to holding state and local governments accountable.

Agency's China Investments

CalPERS's investment in Chinese companies has also been criticized. Based on its 2017–2018 annual investment report, CalPERS invested in more than 100 Chinese companies. Among them are companies related to China's military, cyberwarfare, human rights abusers, and defense industries, and some that have been cited for unethical business practices outside China. One of CalPERS's holdings is China Communications Construction Co. (CCCC). CalPERS held more than 16 million shares in CCCC's equity. CCCC, a state-owned company, is one of the largest contractors of China's "One Belt, One Road" initiative. According to a report by Bloomberg Businessweek, CCCC was alleged by U.S. members of Congress to have helped with the Chinese military's island construction in the disputed area of the South China Sea. The Bloomberg report also provided a long list of countries with allegations against CCCC for corruption, labor abuse, environmental damage, and other practices. In 2009, CCCC was blacklisted by the World Bank for alleged fraudulent bidding practices.

CalPERS, according to its 2017–2018 report, also held more than 2.7 million shares in China Aerospace International Holding Ltd., which is a subsidiary of state-owned China Aerospace Science and Technology Corp., China's largest space contractor. Other companies under the space contractor include China Academy of Launch Vehicle Technology, China Academy of Space Technology, China Great Wall Industry Corp., and China Satellite Communications.

"It is a well-known fact that the Chinese space program is operated by the PLA," said Roger W. Robinson, president and CEO of RWR Advisory Group, a Washington-based risk management company. Robinson was the senior director of International Economic Affairs at the National Security Council during the Reagan administration, and later served as chairman of the Congressional U.S.–China Economic and Security Review Commission.

Another company on the list of CalPERS's China investment holdings was China Unicom. The 2017–2018 CalPERS report showed that the fund held more than 20 million shares in China Unicom, a company that has helped North Korea build its internet network since 2010, according to a report from The Washington Post.

Based on the 2017–2018 report, CalPERS appears to hold shares in funds that track against the MSCI Emerging Markets index. MSCI Inc. is a U.S.-based investment company.

According to research findings by RWR Advisory Group, this index has included companies like AVIC Aircraft, Hangzhou Hikvision Digital Technology Co., Zhejiang Dahua Technology Co., and China Shipbuilding Industry Group Power. AVIC Aircraft develops and produces a range of aircraft, unmanned aircraft systems, and airborne weapons for the PLA air force, PLA naval air force, and PLA rocket force. Hikvision and Dahua are companies that play important roles in China's video surveillance system, which is the world's largest.

In September 2018, 17 members of the U.S. Congress sent a letter to the secretaries of state and the Treasury urging sanctions against the two companies. China Shipbuilding is a company that provides naval equipment including guided missile destroyers, frigates, nuclear-powered ballistic missile submarines, and aircraft carriers to China's PLA navy.

In April, 43 members of Congress sent a letter to the secretaries stating, "We believe the United States should establish strengthened disclosure requirements to alert American investors about the presence of Hikvision, Dahua Technology, and other Chinese enterprises that pose national security dangers or are complicit in human rights abuses, in the U.S. capital markets." In response to The Epoch Times' request for comment on its Chinese investments, CalPERS referred to a policy document on its governance and sustainability principles.

Calls for Scrutiny of China Investments

Robinson called for greater scrutiny of CalPERS's China-related investments.

"Relevant state legislative committees should call for a comprehensive review of Chinese companies in the investment portfolios of CalPERS and other state pension and insurance funds that have ties to human rights abuses and national security concerns, because of the material risks such companies pose to the hard-earned retirement dollars of state employees," Robinson told The Epoch Times. "Not only have [these] material, often asymmetric, risks to share value and corporate reputation been overlooked by state fund managers, they are associating California state employees with Uyghur concentration camps in Xinjiang, advanced Chinese weapons manufacturers working with PLA, and other such activities likely contrary to their principles, values, and moral compass.

"The bulk of the 50 states have a similar problem to that of California," Robinson said. He urged all states to take steps to require their public employee pension systems to conduct national security - and human rights-related risk assessments concerning their prospective Chinese investment holdings. In May 2000, Robinson testified before the California State Joint Legislative Audit Committee on CalPERS's China investments. It is ironic, he said, that he is seeing the same kind of diligence-related blind spots witnessed then.