

**APPENDIX I
WASTEWATER TREATMENT
PLANT OPERATIONAL
CAPACITY EVALUATION**

**WASTEWATER TREATMENT PLANT
OPERATIONAL CAPACITY EVALUATION**

FOR

**CATE
SCHOOL**

Located in
Carpinteria, CA

Published: November 15, 2012

Prepared By:

WREA

Water Resource Engineering Associates
2300 Alessandro Drive, Suite 215 • Ventura, California 93001
805.653.7900 • Fax: 805.653.0610
1-800-25-WATER
www.wreassoc.net



**CATE SCHOOL
CARPINTERIA, CA**

**WASTEWATER TREATMENT PLANT
OPERATIONAL CAPACITY EVALUATION**

The Cate School Wastewater Treatment Plant was reportedly designed by the Wallace Group to accommodate on-site wastewater generation as follows¹:

30-Day Average	15,000 Gallons Per Day
Peak Day	30,000 Gallons Per Day(GPD)

This report was commissioned by Hartigan-Foley to verify that the plant is of sufficient size to accommodate the present and future needs of the school.

The daily flow through the plant has been recorded since the plant was activated and historical flow data is provided herein for a 13-month period beginning in August 2011. To compare the historical data with estimated data, WREA used population figures provided by Cate School to estimate peak flows in accordance with Table K-3, *Estimated Waste/Sewage Flow Rates* in the California Code of Regulations, Title 24, Part 5, the California Plumbing Code (CPC) and Tables 3-1, *Typical wastewater flowrates from urban residential sources in the United States* and Table 3-3, *Typical Wastewater flowrates from institutional sources in the United States* in *Wastewater Engineering, Treatment and Reuse* by Metcalf & Eddy (M&E). Importantly, both sources indicate that flow rates generated by the information contained in the source are only estimates, and that many variables will influence actual flow rates. Table K-3 of the CPC states "*Because of the many variables encountered, it is not possible to set absolute values for waste/sewage flow rates for all situations.*" Additionally, M&E states (158) "*it is stressed that flowrates vary with the region, climate, and type of facility. The actual records of institutions are the best sources of flow data for design purposes.*"

Analysis of the historical flow data recorded over the full-annual cycle shows a maximum day flow generation of 17,060-gallons, roughly 57% of the design Peak Day (30,000 GPD). The 30-Day Average from May 2012, is 9,956-gallons per day and the highest recorded average, roughly 66% of the design 30-Day Average (15,000 GPD).

Cate School plans to add 30 boarding students, up to 62 resident staff personnel and family, and 5 each commuting students and staff members. This will result in a total population increase of roughly 30%, with a corresponding increase in wastewater flow generation. "Full build out" Peak Day flow generation is conservatively estimated to be 36,320-gallons using the M&E method. However, based on actual flow data, the current maximum wastewater generation of 17,060 GPD (see attached Table 1) is 60% of the

¹ 7- Day average is not analyzed herein.

**CATE SCHOOL
CARPINTERIA, CA**

**WASTEWATER TREATMENT PLANT
OPERATIONAL CAPACITY EVALUATION**

estimated flow of 28,753 GPD (see attached Metcalf & Eddy Table 3). Therefore, it is anticipated that the Peak Day flow generation at full build-out will be approximately 20,703 (36,320 X .6) GPD (GPD FUTURE theoretical data Table 3 vs. estimated flow based on historical data).

After examining the historical flow data, and comparing with estimated flow data using CPC and M&E figures, the treatment plant appears to be of sufficient size to accommodate the present and known future needs of the Cate School.

PREPARED BY:

WREA

**WATER RESOURCE ENGINEERING
ASSOCIATES**

2300 Alessandro Drive, Suite 215, Ventura, CA 93001
(805) 653-7900 800-25-WATER Fax (805) 653-0610
November 16, 2012



11/15/12

**CATE SCHOOL
CARPINTERIA, CA**

**WASTEWATER TREATMENT PLANT
OPERATIONAL CAPACITY EVALUATION**

13-MONTH FLOW DATA; August 2011 through August 2012

MONTH	TOTAL FLOW	AVG GPD	MAX DAY- GALLONS	Total Days Over 10,000-Gallons
August 2011	211,500	6,823	12,550	2
September 2011	263,044	8,768	12,550	5
October 2011	287,310	9,268	11,980	10
November 2011	211,790	7,059	14,420	5
December 2011	196,800	6,348	14,340	5
January 2012	233,891	7,545	12,740	4
February 2012	267,560	9,226	13,340	8
March 2012	211,979	6,838	13,966	9
April 2012	272,996	9,100	14,370	5
May 2012	308,628	9,956	17,060	15
June 2012	259,355	5,312	12,050	3
July 2012	209,683	6,553	13,090	1
August 2012	165,229	5,330	13,350	2

Table 1

**CATE SCHOOL
CARPINTERIA, CA**

**WASTEWATER TREATMENT PLANT
OPERATIONAL CAPACITY EVALUATION**

**ESTIMATED DAILY WASTEWATER GENERATION USING
THE CALIFORNIA PLUMBING CODE
Monday – Friday**

DESCRIPTION	CURRENT	FUTURE	Rate Gal/P/Day	GPD	
				CURRENT	FUTURE
Students – Boarding	220	250	100 ¹	22,000	25,000
Students – Commuting	45	50	25 ²	1,125	1,250
Staff – Resident	88	150	100 ³	8,800	15,000
Staff-Resident (OWTS) ⁴	60	60	0	0	0
Staff – Commuting ⁵	110	115	20 ⁶	2,200	2,300
Dining Hall	155 ⁷	165	8 ⁸	1,240	1,320
				35,365	44,870
Saturday & Sunday					
Students – Boarding	220	250	100	22,000	25,000
Students – Commuting	0	0	25	0	0
Staff – Resident	88	150	100	8,800	15,000
Staff-Resident (OWTS) ⁴	60	60	0	0	0
Staff – Commuting	0	0	20	0	0
Dining Hall	60	60	8	480	480
				31,280	40,480
Recap of Plumbing Code Calculated Current Flow Generation				Current Peak Day	35,365
				Build-Out Peak Day	44,870

Table 2

**ESTIMATED DAILY WASTEWATER GENERATION USING WASTEWATER ENGINEERING,
TREATMENT AND REUSE by METCALF & EDDY
Monday – Friday**

DESCRIPTION	CURRENT	FUTURE	Rate Gal/P/Day	GPD	
				CURRENT	FUTURE
Students – Boarding	220	250	85 ⁹	18,700	21,250
Students – Commuting	45	50	25 ¹⁰	1,125	1,250
Staff – Resident	88	150	76 ¹¹	6,688	11,400
Staff-Resident (OWTS) ⁴	60	60	0	0	0
Staff – Commuting	50	55	20 ¹²	1,000	1,100
Dining Hall	155 ¹³	165	8 ¹⁴	1,240	1,320
				28,753	36,320
Saturday & Sunday					
Students – Boarding	220	250	85 ¹	18,700	21,250
Students – Commuting	0	0	25 ²	0	0
Staff – Resident	88	150	76 ³	6,688	11,400
Staff-Resident (OWTS) ⁴	60	60	0	0	0
Staff – Commuting	0	0	20 ⁴	0	0
Dining Hall	0 ⁵	0	8 ⁶	480	480
				25,868	33,130
Recap of M & E Calculated Current Flow Generation				Current Peak Day	28,753
				Build-Out Peak Day	36,320

Table 3

**CATE SCHOOL
CARPINTERIA, CA**

**WASTEWATER TREATMENT PLANT
OPERATIONAL CAPACITY EVALUATION**

-
- ¹ California Plumbing Code, 2010 Table K-3 Schools, 16. Schools, Intermediate and high, Boarding total waste.
- ² California Plumbing Code, 2010 Table K-3 Schools, 16. Schools Intermediate and high, with gym and showers.
- ³ California Plumbing Code does not estimate a per person flow generation for residential units.
- ⁴ Staff residences on individual OWTS and do not contribute to the wastewater treatment plant.
- ⁵ Resident staff who live in residences with individual OWTS are counted as commuting staff for this purpose.
- ⁶ California Plumbing Code, 2010 Table K-3 Schools, 16. Schools – Staff and office.
- ⁷ Dining Hall Meals Per Day
- ⁸ California Plumbing Code, 2010 Table K-3 Schools, 15 Restaurants – cafeterias.
- ⁹ “Wastewater Treatment and Reuse” Metcalf & Eddy C 2003. Table 3-3 Typical wastewater flowrates from institutional sources in the United States. “School, boarding” per student.
- ¹⁰ California Plumbing Code, 2010, Table K-3 Schools, intermediate and high, with gym and showers.
- ¹¹ “Wastewater Treatment and Reuse” Metcalf & Eddy C 2003. Table 3-1 Household size, no. of persons.
- ¹² California Plumbing Code, 2010, Table K-3 Schools, Staff and office.
- ¹³ Dining Hall Meals Per Day: 95 is the population of commuting students and staff M-F. Resident student and staff population are accounted for as “Total” under individual headings.
- ¹⁴ California Plumbing Code, 2010, Table K-3 15. Restaurants – cafeterias, kitchen waste and disposal service.

**CATE SCHOOL
CARPINTERIA, CA**

**WASTEWATER TREATMENT PLANT
OPERATIONAL CAPACITY EVALUATION**

The Cate School Wastewater Treatment Plant was reportedly designed by the Wallace Group to accommodate on-site wastewater generation as follows¹:

30-Day Average	15,000 Gallons Per Day
Peak Day	30,000 Gallons Per Day(GPD)

This report was commissioned by Hartigan-Foley to verify that the plant is of sufficient size to accommodate the present and future needs of the school.

The daily flow through the plant has been recorded since the plant was activated and historical flow data is provided herein for a 13-month period beginning in August 2011. To compare the historical data with estimated data, WREA used population figures provided by Cate School to estimate peak flows in accordance with Table K-3, *Estimated Waste/Sewage Flow Rates* in the California Code of Regulations, Title 24, Part 5, the California Plumbing Code (CPC) and Tables 3-1, *Typical wastewater flowrates from urban residential sources in the United States* and Table 3-3, *Typical Wastewater flowrates from institutional sources in the United States* in *Wastewater Engineering, Treatment and Reuse* by Metcalf & Eddy (M&E). Importantly, both sources indicate that flow rates generated by the information contained in the source are only estimates, and that many variables will influence actual flow rates. Table K-3 of the CPC states "*Because of the many variables encountered, it is not possible to set absolute values for waste/sewage flow rates for all situations.*" Additionally, M&E states (158) "*it is stressed that flowrates vary with the region, climate, and type of facility. The actual records of institutions are the best sources of flow data for design purposes.*"

Analysis of the historical flow data recorded over the full-annual cycle shows a maximum day flow generation of 17,060-gallons, roughly 57% of the design Peak Day (30,000 GPD). The 30-Day Average from May 2012, is 9,956-gallons per day and the highest recorded average, roughly 66% of the design 30-Day Average (15,000 GPD).

Cate School plans to add 30 boarding students, up to 62 resident staff personnel and family, and 5 each commuting students and staff members. This will result in a total population increase of roughly 30%, with a corresponding increase in wastewater flow generation. "Full build out" Peak Day flow generation is conservatively estimated to be 37,520-gallons using the M&E method. However, based on actual flow data, the current maximum wastewater generation of 17,060 GPD (see attached Table 1) is 57% of the

¹ 7- Day average is not analyzed herein.

**CATE SCHOOL
CARPINTERIA, CA**

**WASTEWATER TREATMENT PLANT
OPERATIONAL CAPACITY EVALUATION**

estimated flow of 29,953 GPD (see attached Metcalf & Eddy Table 3). Therefore, it is anticipated that the Peak Day flow generation at full build-out will be approximately 21,386 (37,520 X .57) GPD (GPD FUTURE theoretical data Table 3 vs. estimated flow based on historical data).

After examining the historical flow data, and comparing with estimated flow data using CPC and M&E figures, the treatment plant appears to be of sufficient size to accommodate the present and known future needs of the Cate School.

PREPARED BY:

WREA

**WATER RESOURCE ENGINEERING
ASSOCIATES**

2300 Alessandro Drive, Suite 215, Ventura, CA 93001
(805) 653-7900 800-25-WATER Fax (805) 653-0610
Published November 16, 2012
Revised March 7, 2013

**CATE SCHOOL
CARPINTERIA, CA**

**WASTEWATER TREATMENT PLANT
OPERATIONAL CAPACITY EVALUATION**

13-MONTH FLOW DATA; August 2011 through August 2012

MONTH	TOTAL FLOW	AVG GPD	MAX DAY-GALLONS	Total Days Over 10,000-Gallons
August 2011	211,500	6,823	12,550	2
September 2011	263,044	8,768	12,550	5
October 2011	287,310	9,268	11,980	10
November 2011	211,790	7,059	14,420	5
December 2011	196,800	6,348	14,340	5
January 2012	233,891	7,545	12,740	4
February 2012	267,560	9,226	13,340	8
March 2012	211,979	6,838	13,966	9
April 2012	272,996	9,100	14,370	5
May 2012	308,628	9,956	17,060	15
June 2012	259,355	5,312	12,050	3
July 2012	209,683	6,553	13,090	1
August 2012	165,229	5,330	13,350	2

Table 1

**CATE SCHOOL
CARPINTERIA, CA**

**WASTEWATER TREATMENT PLANT
OPERATIONAL CAPACITY EVALUATION**

**ESTIMATED DAILY WASTEWATER GENERATION USING
THE CALIFORNIA PLUMBING CODE
Monday – Friday**

DESCRIPTION	CURREN T	FUTURE	Rate Gal/P/Day	GPD CURRENT	GPD FUTURE
Students – Boarding	220	250	100 ¹	22,000	25,000
Students – Commuting	45	50	25 ²	1,125	1,250
Staff – Resident	88	150	100 ³	8,800	15,000
Staff-Resident (OWTS) ^{4,5}	60	60	20	1,200	1,200
Staff – Commuting	50	55	20 ⁶	1,000	1,100
Dining Hall	155 ⁷	165	8 ⁸	1,240	1,320
				35,365	44,870
Saturday & Sunday					
Students – Boarding	220	250	100	22,000	25,000
Students – Commuting	0	0	25	0	0
Staff – Resident	88	150	100	8,800	15,000
Staff-Resident (OWTS) ⁴	60	60	0	0	0
Staff – Commuting	0	0	20	0	0
Dining Hall	60	60	8	480	480
				31,280	40,480
Recap of Plumbing Code Calculated Current Flow Generation				Current Peak Day	35,365
				Build-Out Peak Day	44,870

Table 2

**ESTIMATED DAILY WASTEWATER GENERATION USING WASTEWATER ENGINEERING,
TREATMENT AND REUSE by METCALF & EDDY**

Monday – Friday

DESCRIPTION	CURRENT	FUTURE	Rate Gal/P/Day	GPD CURRENT	GPD FUTURE
Students – Boarding	220	250	85 ⁹	18,700	21,250
Students – Commuting	45	50	25 ¹⁰	1,125	1,250
Staff – Resident	88	150	76 ¹¹	6,688	11,400
Staff-Resident (OWTS) ^{4,5}	60	60	20	1,200	1,200
Staff – Commuting	50	55	20 ¹²	1,000	1,100
Dining Hall	155 ¹³	165	8 ¹⁴	1,240	1,320
				29,953	37,520
Saturday & Sunday					
Students – Boarding	220	250	85 ¹	18,700	21,250
Students – Commuting	0	0	25 ²	0	0
Staff – Resident	88	150	76 ³	6,688	11,400
Staff-Resident (OWTS) ⁴	60	60	0	0	0
Staff – Commuting	0	0	20 ⁴	0	0
Dining Hall	0	0	8	480	480
				25,868	33,130
Recap of M & E Calculated Current Flow Generation				Current Peak Day	29,953
				Build-Out Peak Day	37,520

**CATE SCHOOL
CARPINTERIA, CA**

**WASTEWATER TREATMENT PLANT
OPERATIONAL CAPACITY EVALUATION**

Table 3

-
- ¹ California Plumbing Code, 2010 Table K-3 Schools, 16. Schools, Intermediate and high, Boarding total waste.
- ² California Plumbing Code, 2010 Table K-3 Schools, 16. Schools Intermediate and high, with gym and showers.
- ³ California Plumbing Code does not estimate a per person flow generation for residential units.
- ⁴ Staff residences on individual OWTS and do not contribute to the wastewater treatment plant.
- ⁵ Resident staff who live in residences (on-site) with individual OWTS, but as employees, contribute to daily flow generation on campus. For the purposes of this report and totalizing flow generation to the treatment plant, these staff are counted as commuting contributors.
- ⁶ California Plumbing Code, 2010 Table K-3 Schools, 16. Schools – Staff and office.
- ⁷ Dining Hall Meals Per Day
- ⁸ California Plumbing Code, 2010 Table K-3 Schools, 15 Restaurants – cafeterias.
- ⁹ “Wastewater Treatment and Reuse” Metcalf & Eddy C 2003. Table 3-3 Typical wastewater flowrates from institutional sources in the United States. “School, boarding” per student.
- ¹⁰ California Plumbing Code, 2010, Table K-3 Schools, intermediate and high, with gym and showers.
- ¹¹ “Wastewater Treatment and Reuse” Metcalf & Eddy C 2003. Table 3-1 Household size, no. of persons.
- ¹² California Plumbing Code, 2010, Table K-3 Schools, Staff and office.
- ¹³ Dining Hall Meals Per Day: 95 is the population of commuting students and staff M-F. Resident student and staff population are accounted for as “Total “under individual headings.
- ¹⁴ California Plumbing Code, 2010, Table K-3 15. Restaurants – cafeterias, kitchen waste and disposal service.



WATER RESOURCE ENGINEERING ASSOCIATES

CONSULTING CIVIL AND ENVIRONMENTAL ENGINEERS IN WATER AND WASTEWATER
COLLECTION, CONSERVATION, DISTRIBUTION AND TREATMENT

December 21, 2016

Mr. Alex Tuttle
Ms. Joyce Gerber
County of Santa Barbara
Planning & Development
123 E. Anapamu St.
Santa Barbara, CA 93101

Re: Cate School Wastewater Plant (WWTP) – Design Capacity

This letter is to clarify the design (a.k.a. peak) capacity of the existing Cate School WWTP.

The original Engineering Report was prepared in accordance with the California Department of Public Health's March 2001 "Guidelines for the Preparation of an Engineering Report for the Production, Distribution and Use of Recycled Water", (Report) prepared by the Engineer of Record, The Wallace Group, dated September 22, 2008 and revised December, 2008.

This aforementioned Report was accepted by the California Regional Water Quality Control Board, Central Coast Region (Board) as the basis for the issuance of the Waste Discharge Requirements (WDR) for Cate School's Order No. R3-2009-0037 for the onsite reuse.

The Wallace Report clearly states that the design (peak) capacity of the WWTP is 30,000 Gallons per Day (GPD). And the approved construction plans also clearly states this. However, due to the age of the project and Staff changes at the Board, the WDR uses a design (peak) capacity of 25,000 GPD thereby creating a discrepancy between the two official documents.

Water Resource Engineering Associates (WREA) prepared Wastewater Treatment Plant Operational Capacity Evaluation (Evaluation) (up)dated March 24, 2014. This Evaluation was commissioned to verify that the WWTP is of sufficient size to accommodate the present and future needs of the School.

This Evaluation is based on the analysis of the historical flow data (empirical) data recorded over the full annual cycle and the planned build-out of the campus. In short. Using this data and standard engineering practices, WREA determined that the future peak flow for the WWTP will be approximately 21,400 GPD.

This calculated peak flow rate of 21,400 GPD results in a design safety factor of about 15% based on the WDR 25,000 GPD flow rate and 29% based on the Report's 30,000 GPD.

Therefore, it is WREA's professional opinion that the WWTP can operate presently and in the future within the WDR's 25,000 GPD.

Should you have any questions or require additional information on this matter, please feel free to contact us at (805) 653-7900.

Sincerely,



Louis M. Nagy, PE

