APRIL 2014

City of Manteca
Wastewater Quality Control Facility

Report of Waste Discharge for Renewal of NPDES Permit No. CA0081558

Submitted to:

CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD

LARRY WALKER ASSOCIATES

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Section I - U.S. EPA Form 1

Please print or type in the unshaded areas only
(fill-in areas are spaced for elite type, i.e., 12 characters/inch).

For Approved. OMB No. 2040-0086. Approval expires 5-31-92

FORM 1 GENERAL

U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERAL INFORMATION

Consolidated Permits Program

(Read the "General Instructions" before starting.)

I. EPA I.D. NUMBER

S		T/A	C
F			D
1	2 13	14	15

LABEL ITEMS

- **I. EPA I.D. NUMBER**
- **III. FACILITY NAME**
- **V. FACILITY MAILING LIST**
- **VI. FACILITY LOCATION**

PLEASE PLACE LABEL IN THIS SPACE

GENERAL INSTRUCTIONS

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill-in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill-in area*(s)* below. If the label is complete and correct, you need not complete Items I, III, V, and VI*(except VI-B which must be completed regardless)*. Complete all items if no label has been proved. Refer to the instructions for detailed item descriptions and for the legal authorization under which this data is collected.

II. POLLUTANT CHARACTERISTICS

INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental from listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of **bold-faced terms**.

SPECIFIC QUESTIONS	MARK "X" YES	NO	FORM ATTACHED	SPECIFIC QUESTIONS	MARK "X" YES	NO	FORM ATTACHED
A. Is this facility a **publicly owned treatment works** which results in a **discharge** to **waters of the U.S.?** (FORM 2A)	☒ 16	☐ 17	☒ 18	B. Does or will this facility *(either existing or proposed)* include a **concentrated animal feeding operation** or **aquatic animal production facility** which results in a **discharge** to **waters of the U.S.?** (FORM 2B)	☐ 19	☒ 20	☐ 21
C. Is this facility which currently results in **discharges** to **waters of the U.S.** other than those described in A or B above? (FORM 2C)	☐ 22	☒ 23	☐ 24	D. Is this proposal facility *(other than those described in A or B above)* which will result in a **discharge** to **waters of the U.S.?** (FORM 2D)	☐ 25	☒ 26	☐ 27
E. Does or will this facility treat, store, or dispose of **hazardous wastes?** (FORM 3)	☐ 28	☒ 29	☐ 30	F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4)	☐ 31	☒ 32	☐ 33
G. Do you or will you inject at this facility any produced water other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4)	☐ 34	☒ 35	☐ 36	H. Do you or will you inject at this facility fluids for special processes such as mining of sulfer by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4)	☐ 37	☒ 38	☐ 39
I. Is this facility a proposed **stationary source** which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment area?** (FORM 5)	☐ 40	☒ 41	☐ 42	J. Is this facility a proposed **stationary source** which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an **attainment are?** (FORM 5)	☐ 43	☒ 44	☐ 45

III. NAME OF FACILITY

C 1 | SKIP (16-29) | ***City of Manteca Wastewater Quality Control Facility*** (30 – 69)

IV. FACILITY CONTACT

A. NAME & TITLE *(last, first, & title)*	B. PHONE *(area code & no.)*
C 2 **Ramirez, Margaret L., Wastewater Systems Superintendent** (16 – 45)	**209** (46 48) **456** (49 51) **8478** (52 55)

V. FACILITY MAILING ADDRESS

A. STREET OR P.O. BOX

C 3 **1001 West Center Street** (16 – 45)

B. CITY OR TOWN	C. STATE	D. ZIP CODE
C 4 **Manteca** (16 – 40)	**CA** (41 42)	**95337** (47 51)

VI. FACILITY LOCATION

A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER

C 5 **2450 West Yosemite Avenue** (16 – 45)

B. COUNTY NAME

San Joaquin (46 – 70)

C. CITY OR TOWN	D. STATE	E. ZIP CODE	F. COUNTY CODE
C 6 **Manteca** (16 – 40)	**CA** (41 42)	**95337** (47 51)	**39** (52 54)

CONTINUED FROM THE FRONT

VII. SIC CODES (4-digit, in order of priority)

A. FIRST		B. SECOND	
4952	(specify) Sewerage Systems	4971	(specify) Irrigation

C. THIRD		D. FOURTH	
9511	(specify) Resource Management		(specify)

VIII. OPERATOR INFORMATION

A. NAME: City of Manteca

B. Is the name listed in Item VIII-A also the owner? ☒ YES ☐ NO

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box, if "Other," specify.)
F = FEDERAL; S = STATE; P = PRIVATE; M = PUBLIC (other than federal or state); O = OTHER (specify)
(specify) M

D. PHONE (area code & no.): 209 456 8478

E. STREET OR PO BOX: 1001 West Center Street

F. CITY OR TOWN: Manteca

G. STATE: CA

H. ZIP CODE: 95337

IX. INDIAN LAND

Is the facility located on Indian lands? ☐ YES ☒ NO

X. EXISTING ENVIRONMENTAL PERMITS

A. NPDES (Discharges to Surface Water): CA0081558		D. PSD (Air Emissions from Proposed Sources): P	
B. UIC (Underground Injection of Fluids): U		E. OTHER (specify): San Joaquin Valley Air Pollution Control District N-1049-3-0 N-1049-9-0 N-1049-4-0 N-1049-10-0 N-1049-7-0 N-1049-11-0 N-1049-8-0 P-7100-1-0	(Specify)
C. RCRA (Hazardous Wastes): R		E. OTHER (specify)	(Specify)

XI. MAP

Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)

Publicly owned treatment works serving the City of Manteca and portions of the City of Lathrop.

XIII. CERTIFICATION (see instructions)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Phil Govea, Deputy Director Public Works	Phil Govea	4/8/14

COMMENTS FOR OFFICIAL USE ONLY

Section II - California EPA Form 200

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

State of California
Regional Water Quality Control Board

APPLICATION/REPORT OF WASTE DISCHARGE
GENERAL INFORMATION FORM FOR
WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT

I. FACILITY INFORMATION

A. Facility:

Name: City of Manteca Wastewater Quality Control Facility			
Address: 2450 West Yosemite Avenue			
City: Manteca	County: San Joaquin	State: CA	Zip Code: 95337
Contact Person: Margaret L. Ramirez		Telephone Number: 209-456-8478	

B. Facility Owner:

Name: City of Manteca			Owner Type (Check One) 1. ☐ Individual 2. ☐ Corporation 3. ☑ Governmental Agency 4. ☑ Partnership 5. ☐ Other:
Address: 1001 West Center Street			
City: Manteca	State: CA	Zip Code: 95337	
Contact Person: Phil Govea		Telephone Number: 209-239-8415	Federal Tax ID: 94-6000366

C. Facility Operator (The agency or business, not the person):

Name: Same as B. Facility Owner			Operator Type (Check One) 1. ☐ Individual 2. ☐ Corporation 3. ☑ Governmental Agency 4. ☑ Partnership 5. ☐ Other:
Address:			
City:	State:	Zip Code:	
Contact Person:		Telephone Number:	

D. Owner of the Land:

Name: Same as B. Facility Owner			Owner Type (Check One) 1. ☐ Individual 2. ☐ Corporation 3. ☑ Governmental Agency 4. ☐ Partnership 5. ☐ Other:
Address:			
City:	State:	Zip Code:	
Contact Person:		Telephone Number:	

E. Address Where Legal Notice May Be Served:

Address: Same as B. Facility Owner		
City:	State:	Zip Code:
Contact Person:	Telephone Number:	

F. Billing Address:

Address: Same as B. Facility Owner		
City:	State:	Zip Code:
Contact Person:	Telephone Number:	

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

State of California
Regional Water Quality Control Board

APPLICATION/REPORT OF WASTE DISCHARGE GENERAL INFORMATION FORM FOR WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT

II. TYPE OF DISCHARGE

Check Type of Discharge(s) Described in this Application (A or B):

☐ **A. WASTE DISCHARGE TO LAND** ☑ **B. WASTE DISCHARGE TO SURFACE WATER**

Check all that apply:

- ☑ Domestic/Municipal Wastewater Treatment and Disposal
- ☐ Cooling Water
- ☐ Mining
- ☐ Waste Pile
- ☑ Wastewater Reclamation
- ☐ Other, please describe: _____
- ☐ Animal Waste Solids
- ☐ Land Treatment Unit
- ☐ Dredge Material Disposal
- ☑ Surface Impoundment
- ☐ Industrial Process Wastewater
- ☐ Animal or Aquacultural Wastewater
- ☐ Biosolids/Residual
- ☐ Hazardous Waste (see instructions)
- ☐ Landfill (see instructions)
- ☐ Storm Water

III. LOCATION OF THE FACILITY

Describe the physical location of the facility.

1. Assessor's Parcel Number(s)	2. Latitude	3. Longitude
Facility: 241-300-49,50	**Facility:** 37° 47' 30"N	**Facility:** 121° 15' 30"W
Discharge Point: 241-520-01	**Discharge Point:** 37° 46' 45"N	**Discharge Point:** 121° 18' 0"W

IV. REASON FOR FILING

- ☐ New Discharge or Facility
- ☐ Changes in Ownership/Operator (see instructions)
- ☐ Change in Design or Operation
- ☑ Waste Discharge Requirements Update or NPDES Permit Reissuance
- ☐ Change in Quantity/Type of Discharge
- ☐ Other: _____

V. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Name of Lead Agency: _____

Has a public agency determined that the proposed project is exempt from CEQA? ☐ **Yes** ☐ **No**

If Yes, state the basis for the exemption and the name of the agency supplying the exemption on the line below.

Basis for Exemption/Agency: _____

Has a "Notice of Determination" been filed under CEQA? ☐ **Yes** ☐ **No**

If Yes, enclose a copy of the CEQA document, Environmental Impact Report, or Negative Declaration. If no, identify the expected type of CEQA document and expected date of completion.

Expected CEQA Documents:

☐ **EIR** ☐ **Negative Declaration** **Expected CEQA Completion Date:** _____

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

State of California
Regional Water Quality Control Board

APPLICATION/REPORT OF WASTE DISCHARGE
GENERAL INFORMATION FORM FOR
WASTE DISCHARGE REQUIREMENTS OR NPDES PERMIT

VI. OTHER REQUIRED INFORMATION

Please provide a COMPLETE characterization of your discharge. A complete characterization includes, but is not limited to, design and actual flows, a list of constituents and the discharge concentration of each constituent, a list of other appropriate waste discharge characteristics, a description and schematic drawing of all treatment processes, a description of any Best Management Practices (BMPs) used, and a description of disposal methods.

Also include a site map showing the location of the facility and, if you are submitting this application for an NPDES permit, identify the surface water to which you propose to discharge. Please try to limit your maps to a scale of 1:24,000 (7.5' USGS Quadrangle) or a street map, if more appropriate.

VII. OTHER

Attach additional sheets to explain any responses which need clarification. List attachments with titles and dates below:

See attached NPDES Form 2A including complete effluent characterization, site maps, and flow schematics.

You will be notified by a representative of the RWQCB within 30 days of receipt of your application. The notice will state if your application is complete or if there is additional information you must submit to complete your Application/Report of Waste Discharge, pursuant to Division 7, Section 13260 of the California Water Code.

VIII. CERTIFICATION

"I certify under penalty of law that this document, including all attachments and supplemental information, were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Print Name: Phil Govea **Title:** Deputy Director Public Works

Signature: Phil Govea **Date:** 4/8/14

FOR OFFICE USE ONLY

Date Form 200 Received:	Letter to Discharger:	Fee Amount Received:	Check #:

Section III - NPDES Form 2A

1. Part A - Basic information
2. Part B - Additional information
3. Part C - Certification
4. Part D - Expanded effluent testing data summary
5. Part E - Toxicity testing summary
6. Part F - Industrial user discharges and RCRA/CERCLA wastes

Form 2A NPDES

NPDES FORM 2A APPLICATION OVERVIEW

APPLICATION OVERVIEW

Form 2A has been developed in a modular format and consists of a "Basic Application Information" packet and a "Supplemental Application Information" packet. The Basic Application Information packet is divided into two parts. All applicants must complete Parts A and C. Applicants with a design flow greater than or equal to 0.1 mgd must also complete Part B. Some applicants must also complete the Supplemental Application Information packet. The following items explain which parts of Form 2A you must complete.

BASIC APPLICATION INFORMATION:

A. Basic Application Information for all Applicants. All applicants must complete questions A.1 through A.8. A treatment works that discharges effluent to surface waters of the United States must also answer questions A.9 through A.12.

B. Additional Application Information for Applicants with a Design Flow > or = 0.1 mgd. All treatment works that have design flows greater than or equal to 0.1 million gallons per day must complete questions B.1 through B.6.

C. Certification. All applicants must complete Part C (Certification).

SUPPLEMENTAL APPLICATION INFORMATION:

D. Expanded Effluent Testing Data. A treamtent works that discharges effluent to surface waters of the United States and meets one or more of the following criteria must complete Part D (Expanded Effluent Testing Data):

1. Has a design flow rate greater than or equal to 1 mgd,
2. Is required to have a pretreatment program (or has one in place), or
3. Is otherwise required by the permitting authority to provide the information.

E. Toxicity Testing Data. A treatment works that meets one or more of the following criteria must complete Part E (Toxicity Testing Data):

1. Has a design flow rate greater than or equal to 1 mgd,
2. Is required to have a pretreatment program (or has one in place), or
3. Is otherwise required by the permitting authority to provide the information.

F. Industrial User Discharges and RCRA/CERCLA Wastes. A treatment works that accepts process wastewater from any significant industrial users (SIUs) or receives RCRA or CERCLA wastes must complete Part F (Industrial User Discharges and RCRA/CERCLA Wastes). SIUs are defined as:

1. All industrial users subject to Categorical Pretreatment Standards under 40 Code of Federal Regulations (CFR) 403.6 and 40 CFR Chapter I, Subchapter N (see instructions); and
2. Any other industrial user that:
   a. Discharges an average of 25,000 gallons per day or more of process wastewater to the treatment works (with certain exclusions); or
   b. Contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the treatment plant; or
   c. Is designated as an SIU by the control authority.

G. Combined Sewer Systems. A treatment works that has a combined sewer system must complete Part G (Combined Sewer Systems).

ALL APPLICANTS MUST COMPLETE PART C (CERTIFICATION)

BASIC APPLICATION INFORMATION

PART A. BASIC APPLICATION INFORMATION FOR ALL APPLICANTS:

All treatment works must complete questions A.1 through A.8 of this Basic Application Information packet.

A.1 Facility Information.

Facility name: City of Manteca Wastewater Quality Control Facility

Mailing Address: 1001 West Center Street, Manteca, CA 95337

Contact Person: Margaret L. Ramirez

Title: Wastewater Systems Superintendent

Telephone Number: 209-456-8478

Facility Address (not P.O. Box): 2450 West Yosemite Avenue Manteca, CA 95337

A.2 Applicant Information. If the applicant is different from the above, provide the following:

Applicant name: City of Manteca

Mailing Address: 1001 West Center Street, Manteca, CA 95337

Contact Person: Phil Govea

Title: Deputy Director Public Works

Telephone Number: 209-456-8415

Is the applicant the owner or operator (or both) of the treatment works

X owner X operator

Indicate whether correspondence regarding this permit should be directed to the facility or the applicant

_____ facility X applicant

A.3 Existing Environmental Permits. Provide the permit number of any existing environmental permits that have been issued to the treatment works (include state-issued permits).

Permit Type	Permit Number	Permit Type	Permit Number
NPDES	CA0081558	PSD	N-1049-3-0
PSD	N-1049-4-0	PSD	N-1049-7-0
PSD	N-1049-8-0	PSD	N-1049-9-0
PSD	N-1049-10-0	PSD	N-1049-11-0
PSD	P-7100-1-0		

A.4. Collection System Information. Provide information on municipalities and areas served by the facility. Provide the name and population of each entity and, if known, provide information on the type of collection system (combined vs. separate) and its ownership (municipal, private, etc.).

Name	Population Served	Type of Collection System	Ownership
City of Manteca	est. 71,000	Separate	Public
City of Lathrop	est. 16,000	Separate	Public

Total Population Served est. 87,000

A.5. Indian Country.

a. Is the treatment works located in Indian Country?

___ Yes X No

b. Does the treatment works discharge to a receiving water that is either in Indian Country or that is upstream from (and eventually flows through) Indian Country?

___ Yes X No

A.6. Flow. Indicate the design flow rate of the treatment plant (i.e., the wastewater flow rate that the plant was built to handle). Also provide the average daily flow rate and maximum daily flow rate for each of the last three years. Each year's data must be based on a 12-month time period with the 12th month of "this year" occurring no more than three months prior to this application submittal.

a. Design flow rate 9.87 mgd (current) 17.5 mgd (planned)

	Two Years Ago	Last Year	This Year	
b. Annual average daily flow rate	5.782	5.685	5.157	mgd
c. Maximum daily flow rate	7.812	8.004	7.719	mgd

A.7. Collection System. Indicate the type(s) of collection system(s) used by the treatment plant. Check all that apply. Also estimate the percent contribution (by miles) of each.

X	Separate sanitary sewer	100 %
___	Combined storm and sanitary sewer	___ %

A.8. Discharges and Other Disposal Methods.

a. Does the treatment works discharge effluent to waters of the U.S.? X Yes ___ No

If yes, list how many of each of the following types of discharge points the treatment works uses:

i. Discharges of treated effluent	1
ii. Discharges of untreated or partially treated effluent	0
iii. Combined sewer overflow points	0
iv. Constructed emergency overflows (prior to the headworks)	0
v. Other	0

b. Does the treatment works discharge effluent to basins, ponds, or other surface impoundments that do not have outlets for discharge to waters of the U.S.? ___ Yes X No

If yes, provide the following for each surface impoundment:

Location: _____

Annual average daily volume discharged to surface impoundment(s _____ mgd

Is discharge _____ continuous or _____ intermittent

c. Does the treatment works land-apply treated wastewater? X Yes _____ No

If yes, provide the following for each land application site:

Location: Farmland surrounding treatment plant

Number of acres: 260.7

Annual average daily volume applied to site: 1.38 mgd or 4.78 mgd on approx. 100 days/yr

Is discharge _____ continuous or X intermittent

d. Does the treatment works discharge or transport treated or untreated wastewater to another treatment works? _____ Yes X No

If yes, describe the mean(s) by which the wastewater from the treatment works is discharged or transported to the other treatment works (e.g., tank truck, pipe).

_____

If transport is by a party other than the applicant, provide:

Transporter name: _____

Mailing address: _____

_____

Contact person: _____

Title: _____

Telephone number: _____

For each treatment works that receives this discharge, provide the following:

Name: _____

Mailing address: _____

Contact person: _____

Title: _____

Telephone number: _____

If known, provide the NPDES permit number of the treatment works that receives this discharge. _____

Provide the average daily flow rate from the treatment works into the receiving facility. _____

e. Does the treatment works discharge or dispose of its wastewater in a manner not included in A.8.a through A.8.d above (e.g., underground percolation, well injection)? _____ Yes _X_ No

If yes, provide the following for each disposal method:

Description of method (including location and size of site(s) if applicable):

_____

Annual daily volume disposed of by this method: _____

Is disposal through this method _____ continuous or _____ intermittent

WASTEWATER DISCHARGES:
If you answered "yes" to quetion A.8.a, complete questions A.9 through A.12 **once for each outfall** (including bypass points) through which effluent is discharged. Do not include information on combined sewer overflows in this section. **If you answered "no" to question A.8.a.,** go to Part B, "Additional Application Information for Applicants with a Design Flow Greater than or Equal to 0.1 mgd."

A.9 Description of Outfall.

a. Outfall number: EFF-001

b. Location:
Unincorporated San Joaquin County (City of town, if applicable) — 95337 (Zip Code)
San Joaquin (County) — CA (State)
37° 46' 45"N (Latitude) — 121° 18' 00"W (Longitude)

c. Distance from shore (if applicable): Variable 0 ft.

d. Depth below surface (if applicable): Variable 0 ft.

e. Average daily flow rate: 5.57 mgd Average daily flow rate (10/1/09 to 11/30/13)

f. Does this outfall have either an intermittent or a periodic discharge? X yes ____ no (go to A.9.g)

If yes, provide the following information:

Number of times per year discharge occurs: Time-released to correspond with outgoing tides; discharge is variable, dependant on disposal to land.

Average duration of each discharge: Variable

Average flow per discharge: Variable mgd

Months in which discharge occurs: Year-round, approximately 280 days/year.

g. Is outfall equipped with a diffuser? ____ yes X no

A.10 Description of Receiving Waters.

a. Name of receiving water: San Joaquin River

b. Name of watershed (if known): San Joaquin River

United States Soil Conservation Service 14-digit watershed code (if known): ____

c. Name of State Management/River Basin (if known): San Joaquin

United States Geological Survey 8-digit hydrologic cataloging unit code (if known): 11303500

d. Critical low flow of receiving stream (if applicable):

acute 564 cfs (1Q10) chronic 615 cfs (7Q10)

e. Total hardness of receiving stream at critical low flow (if applicable): 172 mg/l of $CaCO_3$

A.11. Description of Treatment

a. What level of treatment are provided? Check all that apply.

☒ Primary ☒ Secondary

☒ Advanced ☐ Other. Describe: _____

b. Indicate the following removal rates (as applicable):

Design BOD_5 removal or Design $CBOD_5$ removal	**95** %
Design SS removal	**95** %
Design P removal	____ %
Design N removal	**94** %
Other _____	____ %

c. What type of disinfection is used for the effluent from this outfall? If disinfection varies by season, please describe:

UV

If disinfection is by chlorination is dechlorination used for this outfall? ☐ Yes ☐ No

d. Does the treatment plant have post aeration? ☐ Yes ☒ No

A.12 Effluent Testing Information. All Applicants that discharge to waters of the United States must provide effluent testing data for the following parameters. Provide the indicated effluent testing required by the permitting authority for each outfall through which effluent is discharged. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. At a minimum, effluent testing data must be based on at least three samples and must be no more than four and one-half years apart.

Outfall number: **EFF-001**

PARAMETER	MAXIMUM DAILY VALUE		AVERAGE DAILY VALUE		NUMBER OF SAMPLES
	Value	Units	Value	Units	
pH (Minimum)	**6.50**	**Std. Units**			
pH (Maximum)	**7.64**	**Std. Units**			
Flow Rate	**8.19**	**MGD**	**5.57**	**MGD**	**1,299**
Temperature (Winter) Daily Maximum, Nov - Apr	**76.5**	**ºF**	**68.0**	**ºF**	**623**
Temperature (Summer) Daily Maximum, May - Oct	**83.0**	**ºF**	**77.0**	**ºF**	**651**

* For pH please report a minimum and a maximum daily value

POLLUTANT		MAXIMUM DAILY DISCHARGE		AVERAGE DAILY DISCHARGE		NUMBER OF SAMPLES	ANALYTICAL METHOD (current use)	ML/MDL (current use)
		Conc.	Units	Conc.	Units			
CONVENTIONAL AND NON CONVENTIONAL COMPOUNDS								
BIOCHEMICAL OXYGEN DEMAND (Report one)	BOD_5	**11.7**	**mg/L**	**1.92**	**mg/L**	**1,292**	**SM 5210B**	**1.5 / 1.5**
	$CBOD_5$							
~~FECAL~~ COLIFORM (TOTAL)		**170**	**MPN / 100mL**	**<2.0**	**MPN / 100mL**	**1,298**	**SM9221B**	**2 / 2**
TOTAL SUSPENDED SOLIDS (TSS)		**5.6**	**mg/L**	**0.94**	**mg/L**	**1,294**	**SM2540B**	**0.4**

END OF PART A.

REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

BASIC APPLICATION INFORMATION

PART B. ADDITIONAL APPLICATION INFORMATION FOR APPLICANTS WITH A DESIGN FLOW GREATER THAN OR EQUAL TO 0.1 MGD (100,000 gallons per day).

All applicants with a design flow rate greater than or equal to 0.1 mgd must answer questions B.1 through B.6. All others go to Part C (Certification).

B.1. **Inflow and Infiltration.** Estimate the average number of gallons per day that flow into the treatment works from inflow and/or infiltration.

<10% gpd

Briefly explain any steps underway or planned to minimize inflow and infiltration.

B.2. **Topographic Map.** Attach to this application a topographic map of the area extending at least one mile beyond facility property boundaries. This map must show the outline of the facility and the following information. (You may submit more than one map if one map does not show the entire area.)

Attached. See Section III.

a. The area surrounding the treatment plan, including all unit processes.

b. The major pipes or other structures through which wastewater enters the treatment works and the pipes or other structures through which treated wastewater is discharged from the treatment plant. Include outfalls from bypass piping, if applicable.

c. Each well where wastewater from the treatment plant is injected underground.

d. Wells, springs, other surface water bodies, and drinking water wells that are: 1) within 1/4 mile of the property boundaries of the treatment works, and 2) listed in public record or otherwise known to the applicant.

e. Any areas where the sewage sludge produced by the treatment works is stored, treated, or disposed.

f. If the treatment works receives waste that is classified as hazardous under the Resource Conservation and Recovery Act (RCRA) by truck, rail or special pipe, show on the map where that hazardous waste enters the treatment works and where it is treated, stored and/or disposed.

B.3. **Process Flow Diagram or Schematic.** Provide a diagram showing the processes of the treatment plant, including all bypass piping and all backup power sources or redundancy in the system. Also provide a water balance showing all treatment units, including disinfection (e.g., chlorination and dechlorination). The water balance must show daily average flow rates at influent and discharge points and approximate daily flow rates between treatment units. Include a brief narrative description of the diagram.

Attached. See Section IV.

B.4. **Operation/Maintenance performed by Contractor(s).**

Are any operational or maintenance aspects (related to wastewater treatment and effluent quality) of the treatment works the responsibility of a contractor. ____ Yes X No

If yes, list the name, address, telephone number, and status of each contractor and describe the contractor's responsibilities (attach additional pages if necessary.

Name: _____

Mailing Address: _____

_____

Telephone Number: _____

Responsibilites of Contractor: _____

B.5. Scheduled Improvements and Schedules of Implementation. Provide information on any uncompleted implementation schedule or uncompleted plans for improvements that will affect the wastewater treatment, effluent quality, or design capacity of the treatment works. If the treatment works has several different implementaiton schedules or is planning several improvements, submit separate response to question B.5 for each. (If none, go to question B.6.)

a. List the outfall number (assigned in question A.9) for each outfall that is covered by this implementation schedule.

EFF-001

b. Indicate whether the planned improvements or implementation schedule are required by local, State, or Federal agencies.

_____ Yes _____ No

c. If the answer to B.5.b is "Yes," briefly describe, including new maximum daily inflow rate (if applicable).

See note below.

d. Provide dates imposed by any compliance schedule or any actual dates of completion for the implementation steps listed below, as applicable. For improvements planned independently of local, State, or Federal agencies, indicate planned or actual completion dates, as applicable. Indicate dates as accurately as possible.

Implementation Stage	Schedule MM / DD / YYYY	Actual Completion MM / DD / YYYY
- Begin construction	See note below	
- End construction		
- Begin discharge		
- Attain operational level		

e. Have appropriate permits/clearance concerning other Federa/State requirements been obtained?. X Yes ____ No

Describe briefly: All permits / clearances have been obtained; CEQA clearance was obtained February 4, 2008.

NOTE:
The planned Phase IV Expansion project increases the design capacity to 17.5mgd (ADWF) with new aerated grit tanks, primary sedimentation basins, aeration basins, secondary clarifiers, dissolved-air floation units, filters, rapid mixing and flocculation tanks, UV channels, effluent pumps and equalization pond, digesters, and outfall pipeline. See attached Basis of Design Report for more details.

Though Phase IV facilities have not yet been constructed, the WQCF is permitted to discharge to Phase IV capacity (RWQCB Order No. R5-2009-0095).

The specific construction schedule for the Phase IV Expansion project is to be determined based on actual flow, load increases, and future operational needs.

B.6. EFFLUENT TESTING DATA (GREATER THAN 0.1 MGD ONLY).

Applicants that discharge to waters of the US must provide effluent testing data for the following parameters. Provide the indicated effluent testing required by the permitting authority for each outfall through which effluent is discharged. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. At a minimum, effluent testing data must be based on at least three pollutant scans and must be no more than four and one-half years old.

Outfall Number EFF-001

POLLUTANT	MAXIMUM DAILY DISCHARGE		AVERAGE DAILY DISCHARGE			ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Conc.	Units	Number of Samples		
CONVENTIONAL AND NONCONVENTIONAL COMPOUNDS.							
Ammonia (as N)	5.40	mg/L as N	0.46	mg/L as N	249	SM 4500 NH3-G	0.09
Chlorine (Total Residual, TRC)	0.00	mg/L	0.00	mg/L	56	Discontinued (UV disinfection instead)	0
Dissolved Oxygen	10.50	mg/L	8.52	mg/L	101	SM4500-O G	
Total Kjeldahl Nitrogen (TKN)							
Nitrate plus Nitrite Nitrogen	12.96	mg/L as N	5.80	mg/L as N	229	EPA 300	0.02
Oil and Grease	0.70	mg/L	< 0.50	mg/L	50	EPA 1664A	0.5
Phosphorus (Total)	4.60	mg/L	2.88	mg/L	12	EPA 365.4	0.04
Total dissolved Solids (TDS)	518.00	mg/L	449.00	mg/L	63	SM 2540C	5
Electrical Conductivity	867.00	umhos/c	760.00	umhos/c	87	SM 2510B	1
Hardness as CaCO3	191.00	mg/L	142.00	mg/L	113	SM 2340B	0.41

END OF PART B.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

FACILITY NAME AND PERMIT NUMBER:
City of Manteca Wastewater Quality Control Facility CA008155

This permit application form was elctronically generated by P.A.S.S.

Form Approved 1/14/99
OMB Number 2040-0086

BASIC APPLICATION INFORMATION

PART C. CERTIFICATION

All applicants must complete the Certification Section. Refer to instructions to determine who is an officer for the purposes of this certification. All applicants must complete all applicable sections of Form 2A, as explained in the Application Overview. Indicate below which parts of Form 2A you have completed and are submitting. By signing this certification statement, applicants confirm that they have reviewed Form 2A and have completed all sections that apply to the facility for which this application is submitted.

Indicate which parts of Form 2A you have completed and are submitting:

X Basic Application Information Packet

Supplemental Application Information packet:

X Part D (Expanded Effluent Testing Data)

X Part E (Toxicity Testing: Biomonitoring Data)

X Part F (Industrial User Discharges and RCRA/CERCLA Wastes)

____ Part G (Combined Sewer Systems)

ALL APPLICANTS MUST COMPLETE THE FOLLOWING CERTIFICATION.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name and official title: Phil Govea, Deputy Director Public Works

Signature: Phil Govea

Telephone number: 209-456-8415

Date signed: 4/8/14

Upon request of the permitting authority you must submit any other information necessary to assess wastewater treatment practices at the treatment works or identify appropriate permitting requirements.

SEND COMPLETE FORMS TO:

City of Manteca WQCF CA0081558
Form 2A Part D - Effluent Characterization

		Maximum				Average				Analytical	
Constituent	Count	Concentration	Units	Mass	Units	Concentration	Units	Mass	Units	Method	MDL
Antimony	12	0.4	µg/L	8.43	g/day	ID	µg/L	ID	g/day	200.8	0.1
Arsenic	14	7.9	µg/L	167	g/day	4.49	µg/L	94.6	g/day	200.8	0.1
Beryllium	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	200.8	0.1
Cadmium	11	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	200.8	0.1
Chromium (total)	12	1	µg/L	21.1	g/day	ID	µg/L	ID	g/day	200.8	0.1
Chromium (VI)	12	2.4	µg/L	50.6	g/day	ID	µg/L	ID	g/day	7199	0.96
Copper	63	6	µg/L	126	g/day	2.35	µg/L	49.4	g/day	200.8	0.1
Lead	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	200.8	0.1
Mercury	50	0.00271	µg/L	0.057	g/day	0.0014	µg/L	0.029	g/day	1631E	0.2
Nickel	12	2	µg/L	42.2	g/day	ID	µg/L	ID	g/day	200.8	0.1
Selenium	12	2.3	µg/L	48.5	g/day	1.32	µg/L	27.9	g/day	200.8	4
Silver	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	200.8	0.1
Thallium	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	200.8	0.1
Zinc	12	51	µg/L	1075	g/day	37.8	µg/L	798	g/day	200.8	0.1
Cyanide	14	5.1	µg/L	108	g/day	2.60	µg/L	54.8	g/day	4500 CN	1
Asbestos	12	ND	MFL	ND	---	ND	MFL	ND	---	100.2	0.19
Dioxin TEQ	0	ND	pg/L	ND	µg/day	ND	pg/L	ND	µg/day	1613B	1.5
Acrolein	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	1.1
Acrylonitrile	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.63
Benzene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.065
Bromoform	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.14
Carbon tetrachloride	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.082
Chlorobenzene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.1
Dibromochloromethane	14	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.16
Chloroethane	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.062
2-Chloroethylvinyl ether	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.39
Chloroform	14	1	µg/L	21.1	g/day	0.61	µg/L	12.9	g/day	624	0.077
Dichlorobromomethane	14	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.067
1,1-Dichloroethane	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.065
1,2-Dichloroethane	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.098
1,1-Dichloroethylene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.067

City of Manteca WQCF CA0081558
Form 2A Part D - Effluent Characterization

		Maximum				Average				Analytical	
Constituent	Count	Concentration	Units	Mass	Units	Concentration	Units	Mass	Units	Method	MDL
1,2-Dichloropropane	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.06
1,3-Dichloropropylene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.062
Ethylbenzene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.09
Methyl bromide	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.44
Methyl chloride	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.08
Methylene chloride	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.13
1,1,2,2-Tetrachloroethane	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.056
Tetrachloroethylene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.1
Toluene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.09
Trans-1,2-Dichloroethylene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.059
1,1,1-Trichloroethane	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.046
1,1,2-Trichloroethane	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.12
Trichloroethylene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.057
Vinyl chloride	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.062
2-Chlorophenol	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.11
2,4-Dichlorophenol	12	0.16	µg/L	3.37	g/day	ID	µg/L	ID	g/day	625	0.1
2,4-Dimethylphenol	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.15
2-Methyl-4,6-Dinitrophenol	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.11
2,4-Dinitrophenol	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.27
2-Nitrophenol	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.21
4-Nitrophenol	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.26
3-Methyl-4-Chlorophenol	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.1
Pentachlorophenol	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.2
Phenol	12	0.24	µg/L	5.06	g/day	0.10	µg/L	2.12	g/day	625	0.1
2,4,6-Trichlorophenol	14	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.14
Acenaphthene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.004
Acenaphthylene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.0023
Anthracene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.002
Benzidine	15	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	1.4
Benzo(a)anthracene	12	0.0028	µg/L	0.059	g/day	ID	µg/L	ID	g/day	625	0.0023
Benzo(a)pyrene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.0033

City of Manteca WQCF CA0081558
Form 2A Part D - Effluent Characterization

		Maximum				Average				Analytical	
Constituent	Count	Concentration	Units	Mass	Units	Concentration	Units	Mass	Units	Method	MDL
Benzo(b)fluoranthene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.0021
Benzo(ghi)perylene	12	0.0064	µg/L	0.13	g/day	ID	µg/L	ID	g/day	625	0.0038
Benzo(k)fluoranthene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.0028
Bis(2-chloroethoxy)methane	12	0.14	µg/L	2.95	g/day	ID	µg/L	ID	g/day	625	0.1
Bis(2-chloroethyl)ether	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.15
Bis(2-chloroisopropyl)ether	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.12
Bis(2-ethylhexyl)phthalate	50	8	µg/L	169	g/day	0.63	µg/L	13.3	g/day	625	0.29
4-Bromophenyl phenyl ether	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.1
Butylbenzyl phthalate	12	0.2	µg/L	4.22	g/day	0.12	µg/L	2.45	g/day	625	0.1
2-Chloronaphthalene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.1
4-Chlorophenyl phenyl ether	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.23
Chrysene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.0011
Dibenzo(a,h)anthracene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.0031
1,2-Dichlorobenzene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.054
1,3-Dichlorobenzene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.059
1,4-Dichlorobenzene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.094
3,3'-Dichlorobenzidine	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.54
Diethyl phthalate	12	0.25	µg/L	5.27	g/day	0.065	µg/L	1.36	g/day	625	0.1
Dimethyl phthalate	12	0.14	µg/L	2.95	g/day	ID	µg/L	ID	g/day	625	0.1
Di-n-butyl phthalate	12	0.2	µg/L	4.22	g/day	0.12	µg/L	2.54	g/day	625	0.14
2,4-Dinitrotoluene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.1
2,6-Dinitrotoluene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.36
Di-n-octyl phthalate	12	0.11	µg/L	2.32	g/day	ID	µg/L	ID	g/day	625	0.1
1,2-Diphenylhydrazine	12	0.3	µg/L	6.32	g/day	ID	µg/L	ID	g/day	625	0.1
Fluoranthene	12	0.026	µg/L	0.55	g/day	0.0040	µg/L	0.085	g/day	625	0.0012
Fluorene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.0043
Hexachlorobenzene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.15
Hexachlorobutadiene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.13
Hexachlorocyclopentadiene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.14
Hexachloroethane	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.1
Indeno(1,2,3-cd)pyrene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.0027

City of Manteca WQCF CA0081558
Form 2A Part D - Effluent Characterization

		Maximum				Average				Analytical	
Constituent	Count	Concentration	Units	Mass	Units	Concentration	Units	Mass	Units	Method	MDL
Isophorone	12	0.27	µg/L	5.69	g/day	ID	µg/L	ID	g/day	625	0.11
Naphthalene	12	0.1	µg/L	2.11	g/day	0.029	µg/L	0.61	g/day	625	0.0027
Nitrobenzene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.11
N-Nitrosodimethylamine	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.48
N-Nitrosodi-n-propylamine	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.1
N-Nitrosodiphenylamine	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.24
Phenanthrene	12	0.0032	µg/L	0.067	g/day	ID	µg/L	ID	g/day	625	0.0024
Pyrene	12	0.012	µg/L	0.25	g/day	0.0024	µg/L	0.050	g/day	625	0.0014
1,2,4-Trichlorobenzene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	625	0.1
Aldrin	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.00079
Alpha-BHC	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.0025
Beta-BHC	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.00054
gamma-BHC	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.0025
Delta-BHC	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.0006
Chlordane	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.026
4,4'-DDT	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.0007
4,4'-DDE	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.00061
4,4'-DDD	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.00072
Dieldrin	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.00097
Alpha-Endosulfan	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.00089
Beta-Endosulfan	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.0018
Endosulfan sulfate	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.00074
Endrin	12	0.01	µg/L	0.21	g/day	ID	µg/L	ID	g/day	608	0.00081
Endrin aldehyde	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.00067
Heptachlor	12	0.0054	µg/L	0.11	g/day	ID	µg/L	ID	g/day	608	0.00068
Heptachlor epoxide	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.00069
PCB-1016	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.05
PCB-1221	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.063
PCB-1232	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.05
PCB-1242	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.05
PCB-1248	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.02

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Form 2A Part D - Effluent Characterization

		Maximum				Average				Analytical	
Constituent	Count	Concentration	Units	Mass	Units	Concentration	Units	Mass	Units	Method	MDL
PCB-1254	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.05
PCB-1260	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.015
Toxaphene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.035
2,4,5-TP (Silvex)	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	515.3	0.2
2,4-D	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	515.3	1.9
Dalapon	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	515.3	2.3
Dinoseb	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	515.3	0.38
Aluminum	63	34.1	µg/L	719	g/day	14.2	µg/L	299	g/day	200.8	0.1
Barium	12	112	µg/L	2361	g/day	74.8	µg/L	1576	g/day	200.8	0.1
Iron	14	60	µg/L	1265	g/day	38.2	µg/L	806	g/day	200.8	0.1
Manganese	14	36	µg/L	759	g/day	17.7	µg/L	374	g/day	200.8	0.1
Tributyltin	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	GC/MS	0.03
Chloride	12	110	mg/L	2319	kg/day	99.3	mg/L	2092	kg/day	300	1.1
Fluoride	12	250	µg/L	5270	g/day	176	µg/L	3719	g/day	4500 F C	15
Sulfate	12	69	mg/L	1455	kg/day	33.0	mg/L	696	kg/day	300	0.7
Sulfide (as S)	11	0.085	mg/L	1.79	kg/day	ID	mg/L	ID	kg/day	4500-S	0.01
Sulfite (as SO3)	12	ND	mg/L	ND	kg/day	ND	mg/L	ND	kg/day	4500SO3 B	1.33
1,1,2-Trichlorotrifluoroethane	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.14
1,2-Dibromo-3-chloropropane	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	504.1	0.006
Cis-1,2-Dichloroethene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.043
Di(2-ethylhexyl)adipate	12	0.29	µg/L	6.11	g/day	ID	µg/L	ID	g/day	525.2	0.16
Ethylene dibromide	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	504.1	0.005
MBAS	52	260	µg/L	5481	g/day	76.9	µg/L	1620	g/day	5540C	0.0054
Methoxychlor	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	608	0.0009
MTBE	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.1
Styrene	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.067
Thiobencarb	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	525.2	0.057
Trichlorofluoromethane	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	624	0.092
Xylenes	12	0.33	µg/L	6.96	g/day	ID	µg/L	ID	g/day	624	0.22
Alachlor	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	525.2	0.062
Atrazine	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	525.2	0.084

City of Manteca WQCF CA0081558
Form 2A Part D - Effluent Characterization

		Maximum				Average				Analytical	
Constituent	Count	Concentration	Units	Mass	Units	Concentration	Units	Mass	Units	Method	MDL
Bentazon	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	515.3	0.3
Carbofuran	5	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	531.1	0.67
Chlorpyrifos	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	525.2	0.065
Diazinon	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	525.2	0.062
Diquat	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	549.2	1.3
Endothall	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	548.1	15
Glyphosate	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	547	2.1
Molinate	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	525.2	0.061
Oxamyl	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	531.1	1.3
Picloram	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	515.3	0.19
Simazine	12	ND	µg/L	ND	g/day	ND	µg/L	ND	g/day	525.2	0.12

Mass loads calculated using average effluent flow of 5.56 MGD, from October 2009 through November 2013 (effluent dataset timeframe).

ND stands for Not Detected: no effluent data were detected between October 2009 and November 2013.

ID stands for Insufficient Detected Data: less than 20% of the effluent data were detected, insufficient detected results to calculate an average

A Data Analysis Tool (DAT) was used when calculating the average values for concentration datasets containing some detected and some non-detected results. The DAT utilizes the Helsel-Cohn methodology (regression on ordered statistics) to calculate statistical fill-in values for non-detected data points, and to then calculate summary statistics for each dataset. The resulting average values are more statistically accurate than those resulting from setting non-detected results equal to their reporting limits. The DAT requires at least three unique detected values to calculate an average.

City of Manteca WQCF CA0081558
Form 2A Part E - Acute Toxicity

Location	Sample Date	Test Type	Species	Survival (%)
EFF-001	10/18/09	Survival	Pimephales promelas	95
EFF-001	11/16/09	Survival	Pimephales promelas	100
EFF-001	12/1/09	Survival	Pimephales promelas	100
EFF-001	12/9/09	Survival	Pimephales promelas	100
EFF-001	12/20/09	Survival	Pimephales promelas	100
EFF-001	12/28/09	Survival	Pimephales promelas	90
EFF-001	1/3/10	Survival	Pimephales promelas	95
EFF-001	1/12/10	Survival	Pimephales promelas	100
EFF-001	1/18/10	Survival	Pimephales promelas	100
EFF-001	1/24/10	Survival	Pimephales promelas	100
EFF-001	2/1/10	Survival	Pimephales promelas	100
EFF-001	2/7/10	Survival	Pimephales promelas	95
EFF-001	2/15/10	Survival	Pimephales promelas	100
EFF-001	2/22/10	Survival	Pimephales promelas	100
EFF-001	3/1/10	Survival	Pimephales promelas	100
EFF-001	3/7/10	Survival	Pimephales promelas	95
EFF-001	3/16/10	Survival	Pimephales promelas	100
EFF-001	3/22/10	Survival	Pimephales promelas	100
EFF-001	3/29/10	Survival	Pimephales promelas	100
EFF-001	4/9/10	Survival	Pimephales promelas	95
EFF-001	4/12/10	Survival	Pimephales promelas	90
EFF-001	4/18/10	Survival	Pimephales promelas	95
EFF-001	4/26/10	Survival	Pimephales promelas	100
EFF-001	5/3/10	Survival	Pimephales promelas	80
EFF-001	5/9/10	Survival	Pimephales promelas	100
EFF-001	5/18/10	Survival	Pimephales promelas	95
EFF-001	5/24/10	Survival	Pimephales promelas	95
EFF-001	6/1/10	Survival	Pimephales promelas	85
EFF-001	6/6/10	Survival	Pimephales promelas	100
EFF-001	6/18/10	Survival	Pimephales promelas	100
EFF-001	6/28/10	Survival	Pimephales promelas	95
EFF-001	7/6/10	Survival	Pimephales promelas	95
EFF-001	7/11/10	Survival	Pimephales promelas	100
EFF-001	7/19/10	Survival	Pimephales promelas	100
EFF-001	7/30/10	Survival	Pimephales promelas	100
EFF-001	8/1/10	Survival	Pimephales promelas	100
EFF-001	8/11/10	Survival	Pimephales promelas	90
EFF-001	8/25/10	Survival	Pimephales promelas	95
EFF-001	9/4/10	Survival	Pimephales promelas	80
EFF-001	9/7/10	Survival	Pimephales promelas	70
EFF-001	9/15/10	Survival	Pimephales promelas	100
EFF-001	9/21/10	Survival	Pimephales promelas	100
EFF-001	9/27/10	Survival	Pimephales promelas	95
EFF-001	10/5/10	Survival	Pimephales promelas	95
EFF-001	10/11/10	Survival	Pimephales promelas	95

City of Manteca WQCF CA0081558
Form 2A Part E - Acute Toxicity

Location	Sample Date	Test Type	Species	Survival (%)
EFF-001	10/18/10	Survival	Pimephales promelas	100
EFF-001	10/24/10	Survival	Pimephales promelas	90
EFF-001	11/2/10	Survival	Pimephales promelas	95
EFF-001	11/8/10	Survival	Pimephales promelas	100
EFF-001	11/14/10	Survival	Pimephales promelas	95
EFF-001	11/21/10	Survival	Pimephales promelas	95
EFF-001	11/29/10	Survival	Pimephales promelas	100
EFF-001	12/5/10	Survival	Pimephales promelas	100
EFF-001	12/14/10	Survival	Pimephales promelas	100
EFF-001	12/19/10	Survival	Pimephales promelas	100
EFF-001	12/27/10	Survival	Pimephales promelas	100
EFF-001	1/4/11	Survival	Pimephales promelas	95
EFF-001	1/10/11	Survival	Pimephales promelas	65
EFF-001	1/25/11	Survival	Pimephales promelas	90
EFF-001	1/31/11	Survival	Pimephales promelas	85
EFF-001	2/6/11	Survival	Pimephales promelas	100
EFF-001	2/15/11	Survival	Pimephales promelas	100
EFF-001	2/23/11	Survival	Pimephales promelas	95
EFF-001	2/27/11	Survival	Pimephales promelas	95
EFF-001	3/8/11	Survival	Pimephales promelas	100
EFF-001	3/14/11	Survival	Pimephales promelas	100
EFF-001	3/20/11	Survival	Pimephales promelas	100
EFF-001	3/29/11	Survival	Pimephales promelas	95
EFF-001	4/5/11	Survival	Pimephales promelas	95
EFF-001	4/23/11	Survival	Pimephales promelas	100
EFF-001	4/25/11	Survival	Pimephales promelas	100
EFF-001	5/1/11	Survival	Pimephales promelas	100
EFF-001	5/10/11	Survival	Pimephales promelas	100
EFF-001	5/16/11	Survival	Pimephales promelas	100
EFF-001	5/24/11	Survival	Pimephales promelas	100
EFF-001	6/3/11	Survival	Pimephales promelas	80
EFF-001	6/6/11	Survival	Pimephales promelas	95
EFF-001	6/12/11	Survival	Pimephales promelas	100
EFF-001	6/21/11	Survival	Pimephales promelas	95
EFF-001	6/27/11	Survival	Pimephales promelas	65
EFF-001	7/3/11	Survival	Pimephales promelas	100
EFF-001	7/10/11	Survival	Pimephales promelas	100
EFF-001	7/18/11	Survival	Pimephales promelas	95
EFF-001	7/28/11	Survival	Pimephales promelas	90
EFF-001	8/2/11	Survival	Pimephales promelas	95
EFF-001	8/8/11	Survival	Pimephales promelas	100
EFF-001	8/14/11	Survival	Pimephales promelas	100
EFF-001	8/24/11	Survival	Pimephales promelas	95
EFF-001	8/31/11	Survival	Pimephales promelas	100
EFF-001	9/6/11	Survival	Pimephales promelas	95

City of Manteca WQCF CA0081558
Form 2A Part E - Acute Toxicity

Location	Sample Date	Test Type	Species	Survival (%)
EFF-001	9/12/11	Survival	Pimephales promelas	95
EFF-001	9/20/11	Survival	Pimephales promelas	100
EFF-001	9/26/11	Survival	Pimephales promelas	100
EFF-001	10/3/11	Survival	Pimephales promelas	100
EFF-001	10/11/11	Survival	Pimephales promelas	90
EFF-001	10/18/11	Survival	Pimephales promelas	100
EFF-001	10/26/11	Survival	Pimephales promelas	100
EFF-001	10/31/11	Survival	Pimephales promelas	100
EFF-001	11/6/11	Survival	Pimephales promelas	100
EFF-001	11/15/11	Survival	Pimephales promelas	95
EFF-001	11/21/11	Survival	Pimephales promelas	100
EFF-001	11/28/11	Survival	Pimephales promelas	100
EFF-001	12/6/11	Survival	Pimephales promelas	100
EFF-001	12/12/11	Survival	Pimephales promelas	100
EFF-001	12/18/11	Survival	Pimephales promelas	100
EFF-001	12/27/11	Survival	Pimephales promelas	100
EFF-001	1/3/12	Survival	Pimephales promelas	95
EFF-001	1/8/12	Survival	Pimephales promelas	95
EFF-001	1/17/12	Survival	Pimephales promelas	95
EFF-001	1/23/12	Survival	Pimephales promelas	100
EFF-001	1/31/12	Survival	Pimephales promelas	100
EFF-001	2/7/12	Survival	Pimephales promelas	100
EFF-001	2/13/12	Survival	Pimephales promelas	100
EFF-001	2/19/12	Survival	Pimephales promelas	100
EFF-001	2/28/12	Survival	Pimephales promelas	100
EFF-001	3/8/12	Survival	Pimephales promelas	100
EFF-001	3/11/12	Survival	Pimephales promelas	90
EFF-001	3/20/12	Survival	Pimephales promelas	100
EFF-001	3/26/12	Survival	Pimephales promelas	100
EFF-001	4/1/12	Survival	Pimephales promelas	95
EFF-001	4/10/12	Survival	Pimephales promelas	100
EFF-001	4/16/12	Survival	Pimephales promelas	90
EFF-001	4/22/12	Survival	Pimephales promelas	90
EFF-001	5/1/12	Survival	Pimephales promelas	95
EFF-001	5/14/12	Survival	Pimephales promelas	100
EFF-001	5/22/12	Survival	Pimephales promelas	85
EFF-001	5/29/12	Survival	Pimephales promelas	100
EFF-001	6/3/12	Survival	Pimephales promelas	100
EFF-001	6/12/12	Survival	Pimephales promelas	85
EFF-001	6/18/12	Survival	Pimephales promelas	100
EFF-001	6/27/12	Survival	Pimephales promelas	100
EFF-001	7/4/12	Survival	Pimephales promelas	100
EFF-001	7/9/12	Survival	Pimephales promelas	90
EFF-001	7/23/12	Survival	Pimephales promelas	95
EFF-001	8/6/12	Survival	Pimephales promelas	100

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Form 2A Part E - Acute Toxicity

Location	Sample Date	Test Type	Species	Survival (%)
EFF-001	8/13/12	Survival	Pimephales promelas	95
EFF-001	8/20/12	Survival	Pimephales promelas	90
EFF-001	9/1/12	Survival	Pimephales promelas	90
EFF-001	9/4/12	Survival	Pimephales promelas	90
EFF-001	9/11/12	Survival	Pimephales promelas	100
EFF-001	9/18/12	Survival	Pimephales promelas	95
EFF-001	9/24/12	Survival	Pimephales promelas	100
EFF-001	10/1/12	Survival	Pimephales promelas	100
EFF-001	10/8/12	Survival	Pimephales promelas	95
EFF-001	10/15/12	Survival	Pimephales promelas	100
EFF-001	10/22/12	Survival	Pimephales promelas	100
EFF-001	10/30/12	Survival	Pimephales promelas	100
EFF-001	11/5/12	Survival	Pimephales promelas	100
EFF-001	11/13/12	Survival	Pimephales promelas	100
EFF-001	11/19/12	Survival	Pimephales promelas	100
EFF-001	11/26/12	Survival	Pimephales promelas	100
EFF-001	12/3/12	Survival	Pimephales promelas	90
EFF-001	12/11/12	Survival	Pimephales promelas	100
EFF-001	12/17/12	Survival	Pimephales promelas	100
EFF-001	12/26/12	Survival	Pimephales promelas	100
EFF-001	1/2/13	Survival	Pimephales promelas	100
EFF-001	1/7/13	Survival	Pimephales promelas	100
EFF-001	1/14/13	Survival	Pimephales promelas	95
EFF-001	1/22/13	Survival	Pimephales promelas	90
EFF-001	1/28/13	Survival	Pimephales promelas	100
EFF-001	2/4/13	Survival	Pimephales promelas	100
EFF-001	2/11/13	Survival	Pimephales promelas	100
EFF-001	2/18/13	Survival	Pimephales promelas	100
EFF-001	2/25/13	Survival	Pimephales promelas	95
EFF-001	3/3/13	Survival	Pimephales promelas	95
EFF-001	3/11/13	Survival	Pimephales promelas	100
EFF-001	3/18/13	Survival	Pimephales promelas	95
EFF-001	3/25/13	Survival	Pimephales promelas	100
EFF-001	4/1/13	Survival	Pimephales promelas	95
EFF-001	4/11/13	Survival	Pimephales promelas	100
EFF-001	4/15/13	Survival	Pimephales promelas	100
EFF-001	4/22/13	Survival	Pimephales promelas	100
EFF-001	5/9/13	Survival	Pimephales promelas	100
EFF-001	5/13/13	Survival	Pimephales promelas	100
EFF-001	5/20/13	Survival	Pimephales promelas	100
EFF-001	5/27/13	Survival	Pimephales promelas	95
EFF-001	6/3/13	Survival	Pimephales promelas	95
EFF-001	6/10/13	Survival	Pimephales promelas	90
EFF-001	6/17/13	Survival	Pimephales promelas	100
EFF-001	6/24/13	Survival	Pimephales promelas	100

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Location	Sample Date	Test Type	Species	Survival (%)
EFF-001	7/1/13	Survival	Pimephales promelas	100
EFF-001	7/8/13	Survival	Pimephales promelas	100
EFF-001	7/15/13	Survival	Pimephales promelas	100
EFF-001	7/22/13	Survival	Pimephales promelas	95
EFF-001	7/29/13	Survival	Pimephales promelas	95
EFF-001	8/5/13	Survival	Pimephales promelas	100
EFF-001	8/12/13	Survival	Pimephales promelas	100
EFF-001	8/22/13	Survival	Pimephales promelas	100
EFF-001	8/26/13	Survival	Pimephales promelas	100
EFF-001	9/2/13	Survival	Pimephales promelas	100
EFF-001	9/9/13	Survival	Pimephales promelas	95
EFF-001	9/16/13	Survival	Pimephales promelas	100
EFF-001	9/23/13	Survival	Pimephales promelas	100
EFF-001	9/30/13	Survival	Pimephales promelas	100
EFF-001	10/7/13	Survival	Pimephales promelas	100
EFF-001	10/14/13	Survival	Pimephales promelas	100
EFF-001	10/21/13	Survival	Pimephales promelas	100
EFF-001	10/28/13	Survival	Pimephales promelas	90
EFF-001	11/4/13	Survival	Pimephales promelas	100
EFF-001	11/11/13	Survival	Pimephales promelas	100
EFF-001	11/18/13	Survival	Pimephales promelas	100
EFF-001	11/25/13	Survival	Pimephales promelas	90

Acute toxicity tests were performed using the EPA 2000 method and the EPA 821/R-02-012 5th Edition Manual.

City of Manteca WQCF CA0081558
Form 2A Part E - Chronic Toxicity

Location	Sample date	Start date	End date	Test type	Species	NOEC	Result (TUc)
EFF-001	10/19/2009	10/20/2009 11:00	10/24/2009 11:30	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	10/19/2009	10/20/2009 16:15	10/26/2009 14:30	Survival	Ceriodaphnia dubia	100%	1
EFF-001	10/19/2009	10/20/2009 16:15	10/26/2009 14:30	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	10/27/2009	10/27/2009 16:30	11/3/2009 9:50	Survival	Pimephales promelas	100%	1
EFF-001	10/27/2009	10/27/2009 16:30	11/3/2009 9:50	Growth	Pimephales promelas	100%	1
EFF-001	11/18/2009	11/18/2009 16:40	11/25/2009 9:30	Survival	Pimephales promelas	100%	1
EFF-001	11/18/2009	11/18/2009 16:40	11/25/2009 9:30	Growth	Pimephales promelas	100%	1
EFF-001	12/2/2009	12/3/2009 17:00	12/10/2009 10:15	Survival	Pimephales promelas	100%	1
EFF-001	12/2/2009	12/3/2009 17:00	12/10/2009 10:15	Growth	Pimephales promelas	100%	1
EFF-001	12/14/2009	12/15/2009 16:10	12/22/2009 8:30	Survival	Pimephales promelas	100%	1
EFF-001	12/14/2009	12/15/2009 16:10	12/22/2009 8:30	Growth	Pimephales promelas	100%	1
EFF-001	3/1/2010	3/2/2010 15:45	3/6/2010 15:00	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	3/1/2010	3/2/2010 12:00	3/8/2010 14:20	Survival	Ceriodaphnia dubia	100%	1
EFF-001	3/1/2010	3/2/2010 12:00	3/8/2010 14:20	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	3/1/2010	3/2/2010 16:30	3/9/2010 9:30	Survival	Pimephales promelas	100%	1
EFF-001	3/1/2010	3/2/2010 16:30	3/9/2010 9:30	Growth	Pimephales promelas	100%	1
EFF-001	5/3/2010	5/4/2010 17:00	5/8/2010 16:30	Cell growth	Selenastrum capricornutum	50%	2
EFF-001	5/3/2010	5/4/2010 17:00	5/10/2010 15:40	Survival	Ceriodaphnia dubia	100%	1
EFF-001	5/3/2010	5/4/2010 17:00	5/10/2010 15:40	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	5/3/2010	5/4/2010 19:00	5/11/2010 10:15	Survival	Pimephales promelas	100%	1
EFF-001	5/3/2010	5/4/2010 19:00	5/11/2010 10:15	Growth	Pimephales promelas	100%	1
EFF-001	5/3/2010	5/4/2010 17:00	5/8/2010 16:30	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	5/3/2010	5/4/2010 17:00	5/10/2010 15:40	Survival	Ceriodaphnia dubia	100%	1
EFF-001	5/3/2010	5/4/2010 17:00	5/10/2010 15:40	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	5/3/2010	5/4/2010 19:00	5/11/2010 10:15	Survival	Pimephales promelas	100%	1
EFF-001	5/3/2010	5/4/2010 19:00	5/11/2010 10:15	Growth	Pimephales promelas	100%	1
EFF-001	6/22/2010	6/22/2010 15:00	6/26/2010 14:00	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	7/6/2010	7/7/2010 15:50	7/11/2010 14:15	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	7/15/2010	7/15/2010 14:15	7/19/2010 13:45	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	7/31/2010	7/31/2010 14:20	8/4/2010 14:30	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	9/20/2010	9/21/2010 15:50	9/25/2010 16:00	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	9/20/2010	9/21/2010 16:30	9/28/2010 18:30	Survival	Ceriodaphnia dubia	100%	1
EFF-001	9/20/2010	9/21/2010 16:30	9/28/2010 18:30	Reproduction	Ceriodaphnia dubia	100%	1

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Form 2A Part E - Chronic Toxicity

Location	Sample date	Start date	End date	Test type	Species	NOEC	Result (TUc)
EFF-001	9/21/2010	9/21/2010 15:00	9/28/2010 9:50	Survival	Pimephales promelas	100%	1
EFF-001	9/21/2010	9/21/2010 15:00	9/28/2010 9:50	Growth	Pimephales promelas	100%	1
EFF-001	12/6/2010	12/7/2010 16:00	12/11/2010 16:30	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	12/6/2010	12/7/2010 14:30	12/13/2010 16:00	Survival	Ceriodaphnia dubia	100%	1
EFF-001	12/6/2010	12/7/2010 14:30	12/13/2010 16:00	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	12/6/2010	12/7/2010 13:45	12/14/2010 9:50	Survival	Pimephales promelas	100%	1
EFF-001	12/6/2010	12/7/2010 13:45	12/14/2010 9:50	Growth	Pimephales promelas	100%	1
EFF-001	3/7/2011	3/8/2011 16:30	3/12/2011 15:00	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	3/7/2011	3/8/2011 13:00	3/14/2011 16:15	Survival	Ceriodaphnia dubia	100%	1
EFF-001	3/7/2011	3/8/2011 13:00	3/14/2011 16:15	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	3/7/2011	3/8/2011 13:55	3/15/2011 15:00	Survival	Pimephales promelas	100%	1
EFF-001	3/7/2011	3/8/2011 13:55	3/15/2011 15:00	Growth	Pimephales promelas	100%	1
EFF-001	6/14/2011	6/16/2011 11:06	6/20/2011 12:40	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	6/14/2011	6/15/2011 15:45	6/21/2011 13:00	Survival	Ceriodaphnia dubia	50%	2
EFF-001	6/14/2011	6/15/2011 15:45	6/21/2011 13:00	Reproduction	Ceriodaphnia dubia	50%	2
EFF-001	6/14/2011	6/16/2011 11:30	6/23/2011 10:00	Survival	Pimephales promelas	100%	1
EFF-001	6/14/2011	6/16/2011 11:30	6/23/2011 10:00	Growth	Pimephales promelas	100%	1
EFF-001	7/5/2011	7/6/2011 16:16	7/12/2011 13:45	Survival	Ceriodaphnia dubia	100%	1
EFF-001	7/5/2011	7/6/2011 16:16	7/12/2011 13:45	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	8/7/2011	8/9/2011 16:15	8/15/2011 14:30	Survival	Ceriodaphnia dubia	100%	1
EFF-001	8/7/2011	8/9/2011 16:15	8/15/2011 14:30	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	8/21/2011	8/23/2011 11:00	8/29/2011 15:30	Survival	Ceriodaphnia dubia	100%	1
EFF-001	8/21/2011	8/23/2011 11:00	8/29/2011 15:30	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	9/6/2011	9/7/2011 15:00	9/11/2011 13:35	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	9/6/2011	9/7/2011 14:30	9/13/2011 13:45	Survival	Ceriodaphnia dubia	100%	1
EFF-001	9/6/2011	9/7/2011 14:30	9/13/2011 13:45	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	9/7/2011	9/7/2011 15:45	9/13/2011 15:25	Survival	Pimephales promelas	100%	1
EFF-001	9/7/2011	9/7/2011 15:45	9/13/2011 15:25	Growth	Pimephales promelas	100%	1
EFF-001	12/6/2011	12/7/2011 13:40	12/11/2011 13:30	Cell growth	Selenastrum capricornutum	50%	2
EFF-001	12/6/2011	12/7/2011 18:00	12/13/2011 15:30	Survival	Ceriodaphnia dubia	100%	1
EFF-001	12/6/2011	12/7/2011 18:00	12/13/2011 15:30	Reproduction	Ceriodaphnia dubia	50%	2
EFF-001	12/6/2011	12/7/2011 18:00	12/14/2011 10:45	Survival	Pimephales promelas	100%	1
EFF-001	12/6/2011	12/7/2011 18:00	12/14/2011 10:45	Growth	Pimephales promelas	100%	1

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Location	Sample date	Start date	End date	Test type	Species	NOEC	Result (TUc)
EFF-001	12/11/2011	12/13/2011 10:10	12/17/2011 10:15	Cell growth	Selenastrum capricornutum	50%	2
EFF-001	12/22/2011	12/23/2011 11:20	12/27/2011 11:20	Cell growth	Selenastrum capricornutum	50%	2
EFF-001	1/5/2012	1/6/2012 14:15	1/10/2012 15:50	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	1/8/2012	1/10/2012 10:45	1/16/2012 16:00	Survival	Ceriodaphnia dubia	100%	1
EFF-001	1/8/2012	1/10/2012 10:45	1/16/2012 16:00	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	1/22/2012	1/24/2012 11:20	1/28/2012 12:10	Cell growth	Selenastrum capricornutum	75%	1
EFF-001	1/22/2012	1/24/2012 11:00	1/31/2012 16:40	Survival	Ceriodaphnia dubia	100%	1
EFF-001	1/22/2012	1/24/2012 11:00	1/31/2012 16:40	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	2/5/2012	2/7/2012 11:29	2/11/2012 11:30	Cell growth	Selenastrum capricornutum	75%	1
EFF-001	2/5/2012	2/7/2012 10:30	2/13/2012 15:30	Survival	Ceriodaphnia dubia	100%	1
EFF-001	2/5/2012	2/7/2012 10:30	2/13/2012 15:30	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	2/21/2012	2/23/2012 11:05	2/27/2012 10:55	Cell growth	Selenastrum capricornutum	50%	2
EFF-001	2/21/2012	2/23/2012 10:00	2/29/2012 14:30	Survival	Ceriodaphnia dubia	100%	1
EFF-001	2/21/2012	2/23/2012 10:00	2/29/2012 14:30	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	2/21/2012	2/23/2012 11:15	3/1/2012 9:45	Survival	Pimephales promelas	100%	1
EFF-001	2/21/2012	2/23/2012 11:15	3/1/2012 9:45	Growth	Pimephales promelas	100%	1
EFF-001	3/5/2012	3/6/2012 15:05	3/10/2012 14:30	Cell growth	Selenastrum capricornutum	50%	2
EFF-001	4/2/2012	4/3/2012 14:50	4/7/2012 15:45	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	4/15/2012	4/17/2012 11:25	4/21/2012 12:45	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	4/29/2012	5/1/2012 11:25	5/5/2012 11:25	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	4/29/2012	5/1/2012 11:00	5/7/2012 15:15	Survival	Ceriodaphnia dubia	100%	1
EFF-001	4/29/2012	5/1/2012 11:00	5/7/2012 15:15	Reproduction	Ceriodaphnia dubia	13%	8
EFF-001	4/29/2012	5/1/2012 11:25	5/8/2012 9:20	Survival	Pimephales promelas	100%	1
EFF-001	4/29/2012	5/1/2012 11:25	5/8/2012 9:20	Growth	Pimephales promelas	100%	1
EFF-001	5/20/2012	6/14/2012 10:30	6/21/2012 16:30	Survival	Ceriodaphnia dubia	100%	1
EFF-001	5/20/2012	6/14/2012 10:30	6/21/2012 16:30	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	9/4/2012	9/5/2012 16:00	9/9/2012 14:00	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	9/4/2012	9/5/2012 16:40	9/12/2012 10:30	Survival	Pimephales promelas	100%	1
EFF-001	9/4/2012	9/5/2012 16:40	9/12/2012 10:30	Growth	Pimephales promelas	100%	1
EFF-001	9/18/2012	9/19/2012 13:50	9/25/2012 16:15	Survival	Ceriodaphnia dubia	100%	1
EFF-001	9/18/2012	9/19/2012 13:50	9/25/2012 16:15	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	12/2/2012			Cell growth	Selenastrum capricornutum	100%	1
EFF-001	12/2/2012			Survival	Ceriodaphnia dubia	100%	1

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Location	Sample date	Start date	End date	Test type	Species	NOEC	Result (TUc)
EFF-001	12/2/2012			Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	12/2/2012			Survival	Pimephales promelas	100%	1
EFF-001	12/2/2012			Growth	Pimephales promelas	100%	1
EFF-001	2/4/2013	2/5/2013 12:20	2/9/2013 11:45	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	2/4/2013	2/5/2013 11:00	2/11/2013 16:00	Survival	Ceriodaphnia dubia	100%	1
EFF-001	2/4/2013	2/5/2013 11:00	2/11/2013 16:00	Reproduction	Ceriodaphnia dubia	12.5%	8
EFF-001	2/4/2013	2/5/2013 11:45	2/12/2013 8:30	Survival	Pimephales promelas	100%	1
EFF-001	2/4/2013	2/5/2013 11:45	2/12/2013 8:30	Growth	Pimephales promelas	100%	1
EFF-001	2/25/2013	2/26/2013 11:30	3/4/2013 16:10	Survival	Ceriodaphnia dubia	100%	1
EFF-001	2/25/2013	2/26/2013 11:30	3/4/2013 16:10	Reproduction	Ceriodaphnia dubia	12.5%	8
EFF-001	3/11/2013	3/12/2013 16:00	3/18/2013 16:45	Survival	Ceriodaphnia dubia	100%	1
EFF-001	3/11/2013	3/12/2013 16:00	3/18/2013 16:45	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	3/25/2013	3/26/2013 13:00	4/2/2013 16:00	Survival	Ceriodaphnia dubia	100%	1
EFF-001	3/25/2013	3/26/2013 13:00	4/2/2013 16:00	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	4/8/2013	4/9/2013 11:00	4/15/2013 16:00	Survival	Ceriodaphnia dubia	100%	1
EFF-001	4/8/2013	4/9/2013 11:00	4/15/2013 16:00	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	4/22/2013	4/23/2013 17:00	4/27/2013 16:30	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	4/22/2013	4/23/2013 11:30	4/29/2013 17:00	Survival	Ceriodaphnia dubia	100%	1
EFF-001	4/22/2013	4/23/2013 11:30	4/29/2013 17:00	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	4/22/2013	4/23/2013 14:50	4/30/2013 10:50	Survival	Pimephales promelas	100%	1
EFF-001	4/22/2013	4/23/2013 14:50	4/30/2013 10:50	Growth	Pimephales promelas	100%	1
EFF-001	9/9/2013	9/10/2013 16:16	9/14/2013 18:00	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	9/9/2013	9/10/2013 13:30	9/16/2013 16:00	Survival	Ceriodaphnia dubia	100%	1
EFF-001	9/9/2013	9/10/2013 13:30	9/16/2013 16:00	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	9/10/2013	9/10/2013 15:45	9/16/2013 15:30	Survival	Pimephales promelas	100%	1
EFF-001	9/10/2013	9/10/2013 15:45	9/16/2013 15:30	Growth	Pimephales promelas	100%	1
EFF-001	12/2/2013	12/3/2013 14:15	12/7/2013 14:00	Cell growth	Selenastrum capricornutum	100%	1
EFF-001	12/2/2013	12/3/2013 11:15	12/9/2013 17:25	Survival	Ceriodaphnia dubia	100%	1
EFF-001	12/2/2013	12/3/2013 11:15	12/9/2013 17:25	Reproduction	Ceriodaphnia dubia	100%	1
EFF-001	12/2/2013	12/3/2013 15:20	12/10/2013 9:00	Survival	Pimephales promelas	100%	1
EFF-001	12/2/2013	12/3/2013 15:20	12/10/2013 9:00	Growth	Pimephales promelas	100%	1

Analysis method: EPA-821-R-02-013 (2002)

SUPPLEMENTAL APPLICATION INFORMATION

PART F. INDUSTRIAL USER DISCHARGES AND RCRA/CERCLA WASTES

All treatment works receiving discharges from significant industrial users or which receive RCRA, CERCLA, or other remedial wastes must complete Part F.

GENERAL INFORMATION:

F.1. **Pretreatment Program.** Does the treatment works have, or is it subject to, an approved pretreatment program?

__X__ Yes _____ No

F.2. **Significant Industrial Users (SIUs) and Categorical Industrial Users (CIUs).** Provide the number of each of the following types of industrial users that discharge to the treatment works.

a. Number of non-categorical SIUs. 1

b. Number of CIUs. 2

SIGNIFICANT INDUSTRIAL USER INFORMATION:

Supply the following information for each SIU. If more than one SIU discharges to the treatment woks, copy question F.3 through F.8 and provide the information requested for each SIU.

F.3. **Significant Industrial User Information.** Provide the name and address of each SIU discharging to the treatment works. Submit additional pages as necessary.

Name: San Joaquin Cogen

Mailing Address: 17200 Murphy Parkway, Lathrop, CA 95330

F.4. **Industrial Processes.** Describe all the industrial processes that affect or contribute to the SIU's discharge.

Power generating facility via natural gas powered turbine.

F.5. **Principal Product(s) and Raw Material(s).** Describe all of the principal processes and raw materials that affect or contribute to the SIU's discharge.

Principal product(s) Electricity and steam

Raw material(s) Natural gas

F.6. **Flow Rate.**

a. Process wastewater flow rate. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

40,000 gpd (__ continuous or X intermittent)

b. Non-process wastewater flow rate. Indicate the average daily volume of non-process wastewater flow discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

_____ gpd (__ continuous or __ intermittent)

F.7. **Pretreatment Standards.** Indicate whether the SIU is subject to the following:

a. Local limitsYes X No _____

b. Categorical pretreatment standards X Yes _____ No

If subject to categorical pretreatment standards, which category and subcategory?

40 CFR 423.17(d)(1) Steam Electric Power

F.8. Problems at the Treatment Works Attributed to Waste Discharged by the SIU. has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?

_____ Yes X No

If yes, describe each episode.

F.3. Significant Industrial User Information. Provide the name and address of each SIU discharging to the treatment works. Submit additional pages as necessary.

Name: GB Industrial Spray, Inc.

Mailing Address: 1140-I Bessemer Ave., Manteca, CA 95337

F.4. Industrial Processes. Describe all the industrial processes that affect or contribute to the SIU's discharge.

Phosphate coating.

F.5. Principal Product(s) and Raw Material(s). Describe all of the principal processes and raw materials that affect or contribute to the SIU's discharge.

Principal product(s) Products coated with phosphate

Raw material(s)

F.6. Flow Rate.

a. Process wastewater flow rate. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

6,000 gpd (___ continuous or X intermittent)

b. Non-process wastewater flow rate. Indicate the average daily volume of non-process wastewater flow discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

400 gpd (___ continuous or X intermittent)

F.7. Pretreatment Standards. Indicate whether the SIU is subject to the following:

a. Local limits	___	Yes	X	No
b. Categorical pretreatment standards	X	Yes	___	No

If subject to categorical pretreatment standards, which category and subcategory?

Metal finishing

F.8. Problems at the Treatment Works Attributed to Waste Discharged by the SIU. has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?

___ Yes X No

If yes, describe each episode.

F.3. Significant Industrial User Information. Provide the name and address of each SIU discharging to the treatment works. Submit additional pages as necessary.

Name: California Natural Products

Mailing Address: 1250 E. Lathrop Rd, Lathrop, CA 95330

F.4. Industrial Processes. Describe all the industrial processes that affect or contribute to the SIU's discharge.

Food processing, manufacturing natural food ingredients

F.5. Principal Product(s) and Raw Material(s). Describe all of the principal processes and raw materials that affect or contribute to the SIU's discharge.

Principal product(s) Processed food products

Raw material(s) Unprocessed food products

F.6. Flow Rate.

a. Process wastewater flow rate. Indicate the average daily volume of process wastewater discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

50,000 gpd (___ continuous or X intermittent)

b. Non-process wastewater flow rate. Indicate the average daily volume of non-process wastewater flow discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

_____ gpd (___ continuous or ___ intermittent)

F.7. Pretreatment Standards. Indicate whether the SIU is subject to the following:

a. Local limits X Yes _____ No

b. Categorical pretreatment standards _____ Yes X No

If subject to categorical pretreatment standards, which category and subcategory?

F.8. Problems at the Treatment Works Attributed to Waste Discharged by the SIU. has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?

_____ Yes X No

If yes, describe each episode.

RCRA HAZARDOUS WASTE RECEIVED BY TRUCK, RAIL, OR DEDICATED PIPELINE:

F.9. **RCRA Waste.** Does the treatment works receive or has it in the past three years received RCRA hazardous waste by truck, rail, or dedicated pipe?

_____ Yes ___X___ No (go to F.12.)

F.10. **Waste Transport.** Method by which RCRA waste is received (check all that apply):

_____ Truck _____ Rail _____ Dedicated Pipe

F.11. **Waste Description.** Give EPA hazardous waste number and amount (volume or mass, specify units).

EPA Hazardous Waste Number	Amount	Units

CERCLA (SUPERFUND) WASTEWATER, RCRA REMEDIATION/CORRECTIVE ACTION WASTEWATER, AND OTHER REMEDIAL ACTIVITY WASTEWATER:

F.12. **Remediation Waste.** Does the treatment works currently (or has it been notified that it will) receive waste from remedial activities?

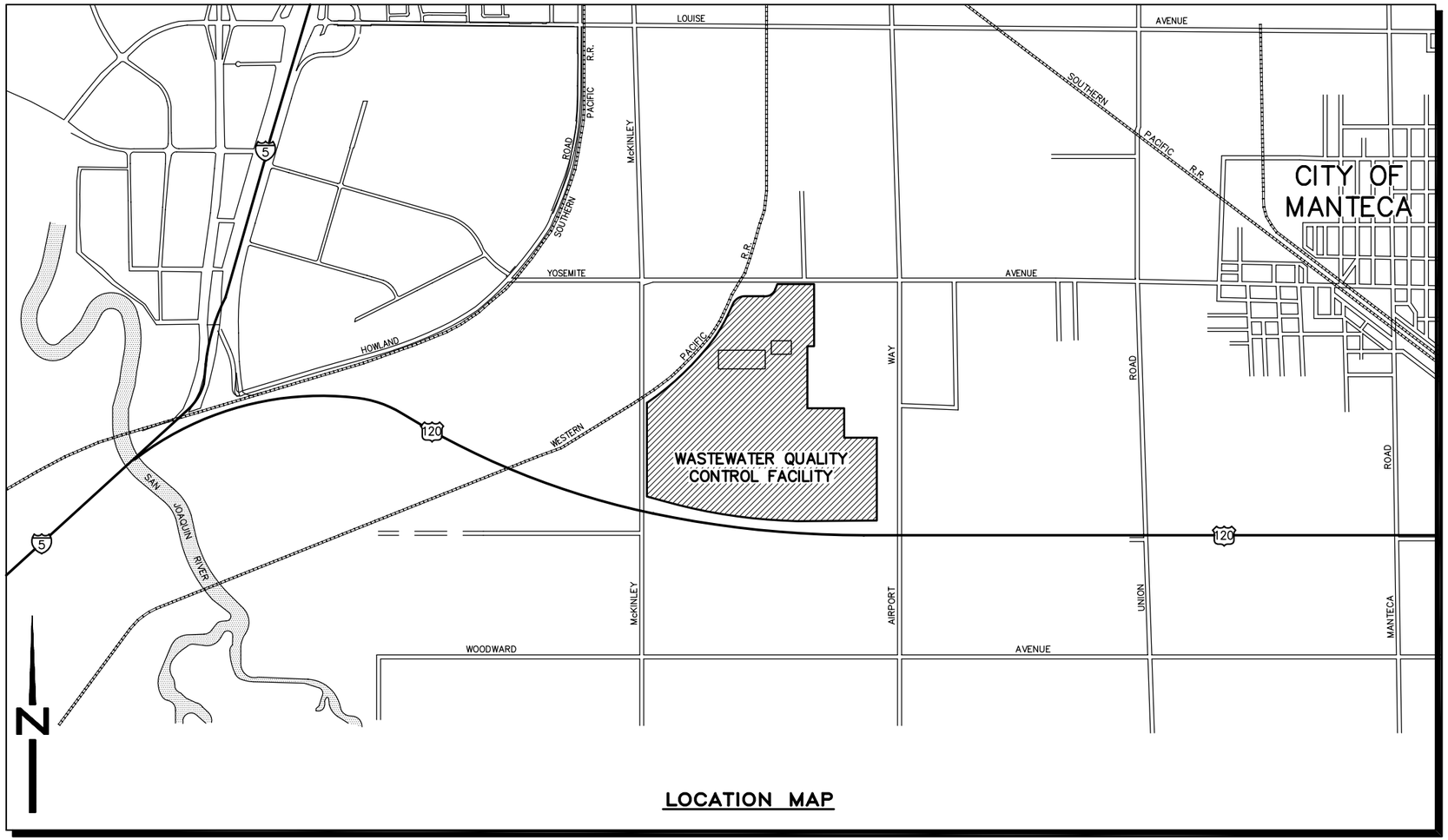
_____ Yes (complete F.13 through F.15. X_____ No

Provide a list of sites and the requested information (F.13. - F.15.) for each current and future site.

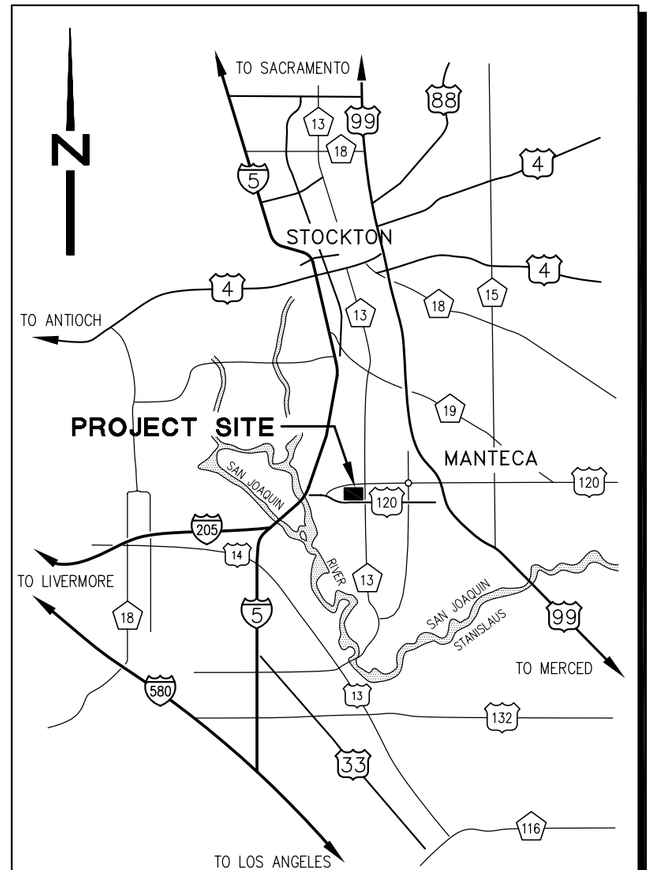
END OF PART F.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

Section IV - Location Maps

1. Location map
2. Vicinity map



LOCATION MAP



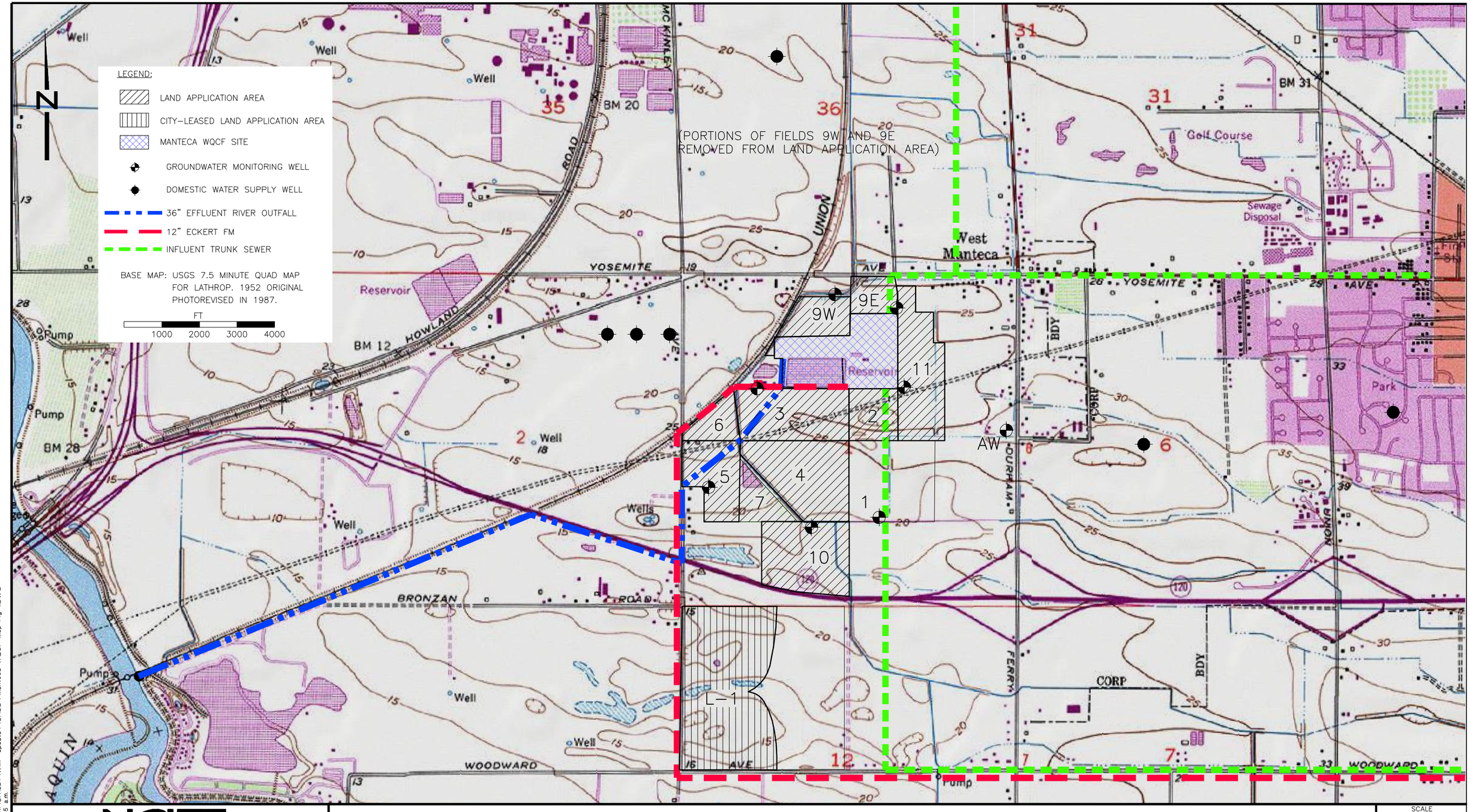
VICINITY MAP

FIGURE 1-1

MANTECA WASTEWATER QUALITY CONTROL FACILITY
PHASE IV EXPANSION PROJECT
BASIS OF DESIGN REPORT

LOCATION OF MANTECA WQCF

NOLTE
BEYOND ENGINEERING



NOLTE
BEYOND ENGINEERING
DENVER MANTECA ORANGE COUNTY SACRAMENTO SAN JOSE SAN DIEGO WALNUT CREEK
1215 WEST CENTER STREET SUITE 201 MANTECA, CA 95337 (209) 239-9080

WASTEWATER MANAGEMENT PLAN FOR MANTECA WQCF PHASE IV EXPANSION PROJECT

MANTECA WQCF AND VICINITY

SCALE
1" = 1440'
DRAWING NUMBER
FIG. 1
SHEET NUMBER
OF SHEETS

\\SAS1\PROJECT\N\SA1224\WMP update4\CADD\Manteca WQCF Map Fig 1.DWG
9/24/07
11:55 a.m.

Section V - Treatment **Facilities**

1. Treatment process narrative
2. Schematic flow diagram
3. Site plans

WATER TREATMENT PROCESS NARRATIVE

The City of Manteca's Wastewater Quality Control Facility treatment process is divided into two parallel treatment systems, the north and south treatment systems. Primary treatment is identical in both systems and consists of mechanical screening, aerated grit removal, and primary sedimentation. At the north plant, the primary effluent undergoes additional treatment through two biotowers with high-rate plastic media. The secondary treatment systems for both treatment systems are the same, consisting of conventional activated sludge, including nitrification-denitrification, followed by secondary sedimentation. Grit and screenings are hauled offsite to a landfill for disposal.

SLUDGE AND BIOSOLIDS TREATMENT PROCESS NARRATIVE

Sludge removed from primary and secondary sedimentation is thickened by dissolved air floatation, and then pumped to anaerobic digesters. After digestion, the treated sludge is dewatered by centrifuge, and then removed offsite for disposal in a privately-owned (not municipal) solid waste landfill.

NORTHSIDE FACILITIES
(SCHEDULE A)

BIOTOWER NO. 1
BIOTOWER NO. 2
GRIT TANK NO. 1
GRIT TANK NO. 2
PRIMARY SEDIMENTATION NO. 1
PRIMARY SEDIMENTATION NO. 2
PRIMARY SEDIMENTATION NO. 3
HYDROGRITTER
DUMPSTER
GRIT TO LANDFILL
SEPTAGE RECEIVING
INFLUENT PUMP STATION
SCREENING TO LANDFILL
WASHER COMPACTOR
NORTH TRUNK SS
SOUTH TRUNK SS
MECH. SCREENS
WET WELL
GRIT TANK NO. 3
GRIT TANK NO. 4
GRIT TANK NO. 5
GRIT TANK NO. 6
GRIT TANK NO. 7
PRIMARY SEDIMENTATION NO. 4
PRIMARY SEDIMENTATION NO. 5
PRIMARY SEDIMENTATION NO. 6
PRIMARY SEDIMENTATION NO. 7
PRIMARY SEDIMENTATION NO. 8
PRIMARY SEDIMENTATION NO. 9
PRIMARY SEDIMENTATION NO. 10
PRIMARY SEDIMENTATION NO. 11
CLASSIFIER
AERATION BASIN NO. 4
AERATION BASIN NO. 1
AERATION BASIN NO. 2
AERATION BASIN NO. 3
AERATION BASIN NO. 5
AERATION BASIN NO. 6
AERATION BASIN NO. 7
AERATION BASIN NO. 8
AERATION BASIN NO. 9
AERATION BASIN NO. 10
AERATION BASIN NO. 11
AERATION BASIN NO. 12
AERATION BASIN NO. 13
AERATION BASIN NO. 14
SC NO. 1
SC NO. 2
SC NO. 3
SC NO. 4
SC NO. 5
SC NO. 6
SC NO. 7
SC NO. 8
SC NO. 9
SPLIT BOX
RAS/WAS PUMP STATION
RAS
WAS
DAF NO. 1
DAF NO. 2
DAF NO. 3
DAF NO. 4
DAF NO. 5
DAF NO. 6
DIGEST. NO. 1
DIGEST. NO. 2
DIGEST. NO. 3
DIGEST. NO. 4
DIGEST. NO. 5
EXISTING SLUDGE CONTROL BUILDING
NEW SLUDGE CONTROL BUILDING
COGENERATION
BOILERS
FLARE
TRANSFER STRUCTURE
SLUDGE BLENDING TANK NO. 1
SLUDGE BLENDING TANK NO. 2
DEWATERING BUILDING
LAND FILL
ODOR CONTROL BIOFILTER
BACKWASH TO INFLUENT PUMP STATION
FILTER FEED PUMP STATION
RAPID MIX FLOCCULATION
TERTIARY FILTRATION
UV CHANNEL NO. 1
UV CHANNEL NO. 2
UV CHANNEL NO. 3
UV CHANNEL NO. 4
UV CHANNEL NO. 5
EFFLUENT PUMP STATION
TO CCT
OUTFALL TO RIVER
SECONDARY EFFLUENT EQUALIZATION POND NO. 1
SECONDARY EFFLUENT EQUALIZATION POND NO. 2
SECONDARY EFFLUENT STORAGE POND
IRRIGATION PUMP STATION
ECKERT COLD STORAGE FOOD PROCESSING WASTEWATER
INDUSTRIAL STORAGE POND
BYPASS
TO CITY–OWNED FIELDS
TO CITY–LEASED FIELDS
JUNCTION BOX
STORM WATER
CONCRETE SUMP

KEY

- LIQUID STREAM
- SOLID STREAM
- GAS STREAM
- SS = SANITARY SEWER
- PE = PRIMARY EFFLUENT
- SE = SECONDARY EFFLUENT
- FA = FOUL AIR
- FE = FINAL EFFLUENT
- PS = PRIMARY SLUDGE
- SC = SCUM
- RAS= RETURN ACTIVATED SLUDGE
- WAS= WASTE ACTIVATED SLUDGE

DIGEST. EXISTING FACILITES
DIGEST. NEW FACILITIES

- TS = THICKENED SLUDGE
- TSO= THICKENED SLUDGE OVERFLOW
- DSL= DIGESTED SLUDGE
- DG = DIGESTER GAS
- PD = PLANT DRAIN
- HW = HOT WATER
- BFV = BUTTERFLY VALVE
- WIRG = WEIR GATE
- GATE
- (M) = MOTORIZED OPERATOR

NOLTE
BEYOND ENGINEERING
DENVER (303) 790-0466 · MANTECA (209) 239-9080 · ORANGE COUNTY (714) 283-9435 · SACRAMENTO (916) 641-9420 · SAN JOSE (408) 287-2420 · SAN DIEGO (619) 278-8382 · WALNUT CREEK (925) 934-8300
1215 WEST CENTER STREET SUITE 201 MANTECA, CA 95337 (209) 239-9080

WASTEWATER MANAGEMENT PLAN FOR MANTECA WQCF PHASE IV EXPANSION PROJECT

SCHEMATIC FLOW DIAGRAM

SCALE: NOT TO SCALE
DRAWING NUMBER
SHEET NUMBER
OF SHEETS

\\SAS1\PROJECT\ N:\SA1224\WMP update4\CADD\ SCHEMATIC-FLOW.DWG
1:00 p.m.
9/24/07

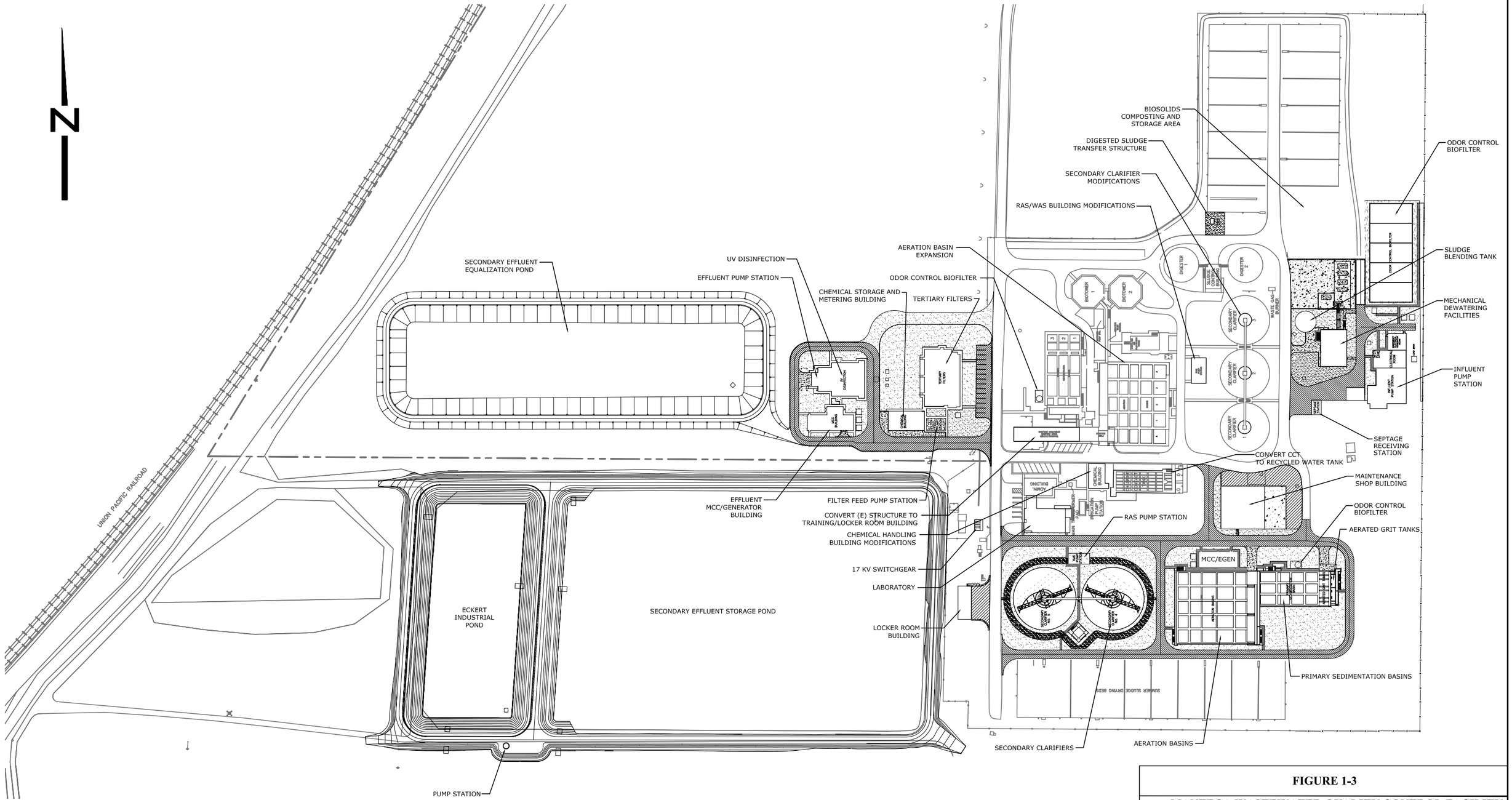
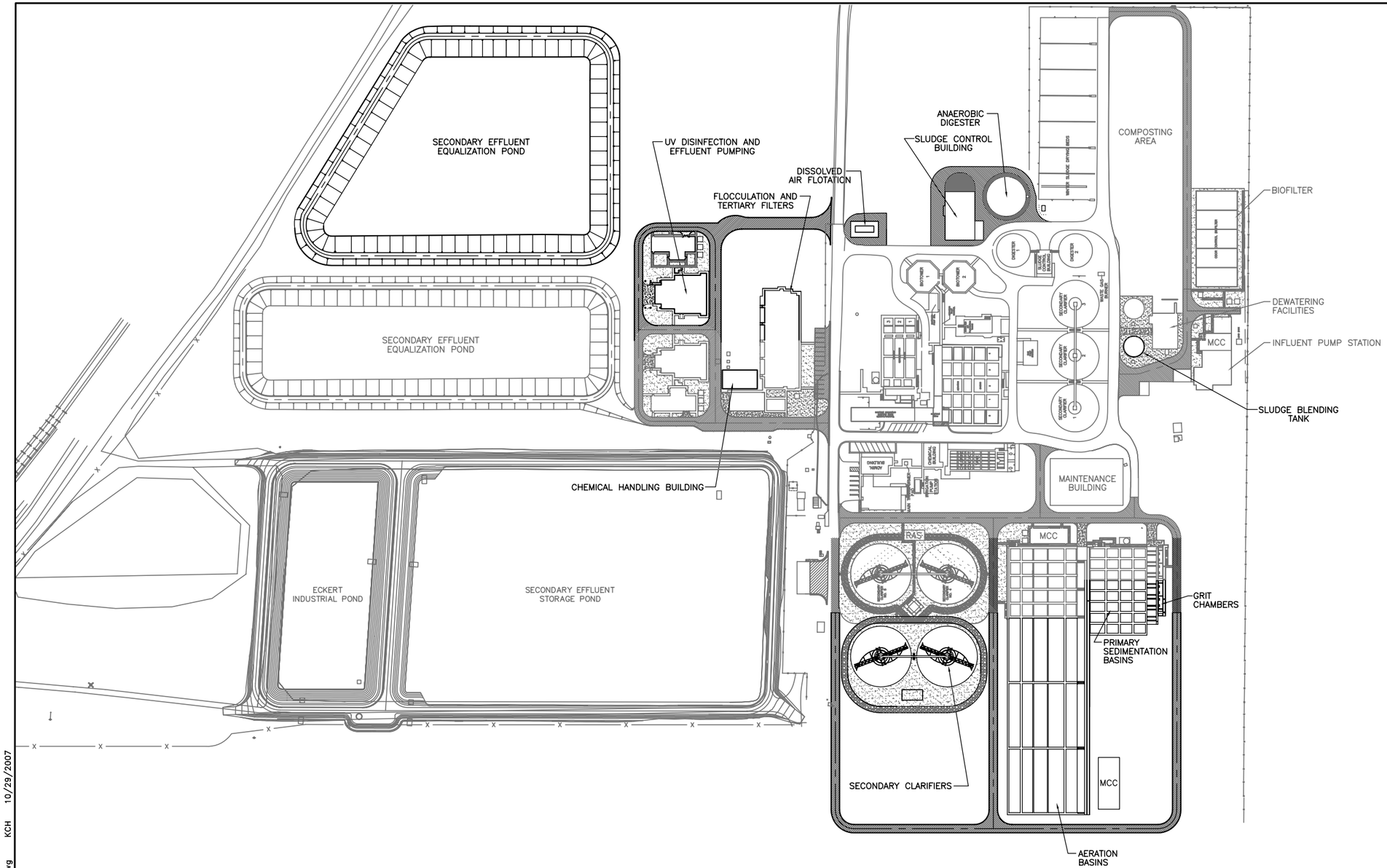


FIGURE 1-3

MANTECA WASTEWATER QUALITY CONTROL FACILITY
PHASE IV EXPANSION PROJECT
BASIS OF DESIGN REPORT

SITE PLAN PRIOR TO PHASE IV EXPANSION PROJECT

NOLTE
BEYOND ENGINEERING



SA1224\EXPANSION\BODR-Phase IV 2007\CADD\Site Plan.dwg KCH 10/29/2007

FIGURE 4-1

MANTECA WASTEWATER QUALITY CONTROL FACILITY
PHASE IV EXPANSION PROJECT
BASIS OF DESIGN REPORT

SITE PLAN AT PHASE IV

NOLTE
BEYOND ENGINEERING

Section VI - NPDES Form 2S Part 2 - Biosolids

1. Section A - General information
2. Section B - Biosolids generation

Attachment – Biosolids paint filter liquids and TCLP test results

Form Approved 1/14/99
OMB Number 2040-0086

PART 2: PERMIT APPLICATION INFORMATION

Complete this part if you have an effective NPDES permit or have been directed by the permitting authority to submit a full permit application at this time. In other words, complete this part if your facility has, or is applying for, an NPDES permit.

For purposes of this form, the term "you" refers to the applicant. "This facility" and "your facility" refer to the facility for which application information is submitted.

APPLICATION OVERVIEW - SEWAGE SLUDGE USE OR DISPOSAL INFORMATION

Part 2 is divided into five sections (A-E). Section A pertains to all applicants. The applicability of Sections B, C, D, and E depends on your facility's sewage sludge use or disposal practices. The information provided on this page indicates which sections of Part 2 to fill out.

1. SECTION A: GENERAL INFORMATION

Section A must be completed by all

2. SECTION B: GENERATION OF SEWAGE SLUDGE OR PREPARATION OF A MATERIAL DERIVED FROM SEWAGE SLUDGE

Section B must be completed by applicants who either:

1) Generate sewage sludge, or
2) Derive a material from sewage sludge

3. SECTION C: LAND APPLICATION OF BULK SEWAGE SLUDGE

Section C must be completed by applicants who either:

1) Apply sewage to the land, or
2) Generate sewage sludge which is applied to the land by others

NOTE: Applicants who meet either or both of the two above criteria are exempted from this requirement if all sewage sludge from their facility falls into one of the following three categories:

1) The sewage sludge from this facility meets the ceiling and pollutant concentrations, Class A pathogen reduction requirements, and one of vector attraction reduction options 1-8, as identified in the instructions, or
2) The sewage sludge from this facility is placed in a bag or other container for sale or give-away for application to the land, or
3) The sewage sludge from this facility is sent to another facility for treatment or blending.

4. SECTION D: SURFACE DISPOSAL

Section D must be completed by applicants who own or operate a surface disposal site.

5. SECTION E: INCINERATION

Section E must be completed by applicants who own or operate a sewage sludge incinerator.

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A. GENERAL INFORMATION

All applicants must complete this section.

A.1. Facility Information

a. Facility Name: City of Manteca Wastewater Quality Control Facility

b. Mailing Address: 1001 West Center Street
Manteca, CA 95337

c. Contact Person: Margaret L. Ramirez
Title: Wastewater Systems Superintendent
Telephone Number: (209) 456-8478

d. Facility Address (not PO Box): 2450 West Yosemite Avenue
Manteca, CA 95337

e. Is this facility a Class I sludge management facility? ____ Yes X No

f. Facility design flow rate: 9.87 mgd (current) 17.5 mgd (planned)

g. Total population served: est. 87,000

e. Indicate the type of facility

X	Publicly owned treatment works (POTW)	____	Privately owned treatment works
____	Federally owned treatment works	____	Blending or treatment operation
____	Surface disposal site	____	Sewage sludge incinerator
____	Other (describe)	____	

A.2. Applicant Information If the applicant is different from above, provide the following:

a. Applicant Name: City of Manteca

b. Mailing Address: 1001 West Center Street
Manteca, CA 95337

c. Contact Person: Phil Govea
Title: Deputy Director Public Works
Telephone Number: (209) 456-8415

d. Is the applicant the owner and operator (or both) of this facility?

X Owner X Operator

e. Should correspondence regarding this permit be directed to the facility or the applicant?

____ Facility X Applicant

A.3. Permit Information

a. Facility's NPDES permit number (if applicable): CA0081558

b. List, on this form or an attachment, all other Federal, State, and local permits or construction approvals received or applied for that regulate this facility's sewage sludge management practices:

Permit Number	Type of Permit

A.4. Indian Country. Does any generation, treatment storage, application to the land, or disposal of sewage sludge from this facility occur in Indian Country?

____ Yes X No

If yes, describe:

A.5. Topographic Map. Provide a topographic map or maps (or other appropriate map(s) if a topographic map is unavailable) that show the following information. Map(s) should include the area one mile beyond all property boundaries of the facility: Attached.

a. Location of all sewage sludge management facilities, including locations where sewage sludge is stored, treated, or disposed.

b. Location of all wells, springs, and other surface water bodies, listed in public records or otherwise known to the applicant within 1/4 mile of the facility property boundaries.

A.6. Line Drawing. Provide a line drawing and/or a narrative description that identifies all sewage sludge processes that will be employed during the term of the permit, including all processes used for collecting, dewatering, storing, or treating sewage sludge, the destination(s) of all liquids and solids leaving each unit, and all methods used for pathogen reduction and vector attraction reduction. Process narrative attached.

A.7. Contractor Information. Are any operational or maintenance aspects of this facility related to sewage sludge generation, treatment, use or disposal the responsibility of a contractor?

_____ Yes X No

A.8. Pollution Concentrations: Using the table below or a separate attachment, provide sewage sludge monitoring data for the pollutants for which limits in sewage sludge have been established in 40 CFR Part 503 for this facility's expected use or disposal practices. All data must be based on three or more samples taken at least one month apart and must be no more than four and one-half years old.

POLLUTANT	CONCENTRATION (mg/kg dry weight)	ANALYTICAL METHOD	DETECTION LEVEL FOR ANALYSIS
ARSENIC	6.48 mg	6010B	1
CADMIUM	0.65 mg	6010B	0.4
CHROMIUM	7.35 mg	6010B	0.4
COPPER	83.76 mg	6010B	0.2
LEAD	3.53 mg	6010B	0.5
MERCURY	0.17 mg	Manual CVT, 7471A	0.0083
MOLYBDENUM	3.25 mg	6010B	1
NICKEL	4.46 mg	6010B	0.5
SELENIUM	6.16 mg	6010B	2
ZINC	277.5 mg	6010B	2

Concentrations are an average of data collected between September 2010 and September 2013 (13 data points each).

FACILITY NAME AND PERMIT NUMBER:

City of Manteca Wastewater Quality Control Facility CA00815

Form Approved 1/14/99
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A.9. Certification. Read and submit the following certification statement with this application. Refer to the instructions to determine who is an officer for purposes of this certification. Indicate which parts of Form 2S you have completed and are submitting:

_____ Part 1 Limited Background Information Packet	X Section A (General Information)
	X Section B (Generation of Sewage Sludge or Preparation of a Material Derived from Sewage Sludge)
	_____ Section C (Land Application of Bulk Sewage Sludge)
	_____ Section D (Surface Disposal)
	_____ Section E (Incineration)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with the system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name and official title Phil Govea (Deputy Director Public Works)

Signature Phil Govea Date Signed 4/8/14

Telephone number (209) 456-8415

Upon request of the permitting authority, you must submit any other information necessary to assess sewage sludge use or disposal practices at your facility or identify appropriate permitting requirements.

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B. GENERATION OF SEWAGE SLUDGE OR PREPARATION OF A MATERIAL DERIVED FROM SEWAGE SLUDGE

Complete this section if your facility generates sewage sludge or derives a material from sewage sludge.

B.1. Amount Generated on Site

Total dry metric tons per 365-day period generated at your facility: 1240 dry metric tons
Average generated in 2011, 2012, and 2013.

B.2. Amount Received from Off Site. If your facility receives sewage sludge from another facility for treatment, use, or disposal, provide the following information for each facility from which sewage sludge is received. If you receive sewage sludge from more than one facility, attach additional pages as necessary.

a. Facility name _____

b. Mailing address _____

_____

c. Contact person _____

Title _____

Telephone number _____

d. Facility address (not P.O. Box) _____

_____

e. Total dry metric tons per 365-day period received from this facility: _____ dry metric tons

f. Describe, on this form or on another sheet of paper, any treatment processes known to occur at the off-site facility, including blending activities and treatment to reduce pathogens or vector attraction characteristics.

B.3. Treatment Provided At Your Facility

a. Which class of pathogen reduction does the sewage sludge meet at your facility?

____ Class A X Class B ____ Neither or unknown

b. Describe, on this form or another sheet of paper, any treatment processes used at your facility to reduce pathogens in sewage sludge:

Anaerobic digestion at 35ºC (95ºF) for a minimum of 15-days.

c. Which vector attraction reduction option is met for the sewage sludge at your facility?

X Option 1 (Minimum 38 percent reduction in volatile solids)

____ Option 2 (Anaerobic process, with bench-scale demonstration)

____ Option 3 (Aerobic process, with bench-scale demonstration)

____ Option 4 (Specific oxygen uptake rate for aerobically digested sludge)

____ Option 5 (Aerobic processes plus raised temperature)

____ Option 6 (Raise pH to 12 and retain at 11.5)

____ Option 7 (75 percent solids with no unstabilized solids)

____ Option 8 (90 percent solids with unstabilized solids)

____ None or unknown

d. Describe, on this form or another sheet of paper, any treatment processes used at your facility to reduce vector attraction properties of sewage sludge:

Anaerobic digestion at 35ºC (95ºF) for a minimum of 15-days.

e. Describe, on this form or another sheet of paper, any other sewage sludge treatment or blending activities not identified in (a) - (d) above:

Sludge thickening by dissolved air floatation (prior to digestion), and solids dewatering by centrifuge (following digestion).

Complete Section B.4 if sewage sludge from your facility meets the ceiling concentrations in Table 1 of 40 CFR 503.13, the pollutant concentrations in Table 3 of §503.13, the Class A pathogen reduction requirements in §503.32(a), and one of the vector attraction reduction requirements in § 503.33(b)(1)-(8) and is land applied. Skip this section if sewage sludge from your facility does not meet all of these criteria.

B.4. Preparation of Sewage Sludge Meeting Ceiling and Pollutant Concentrations, Class A Pathogen Requirements, and One of Vector Attraction Reduction Options 1-8.

a. Total dry metric tons per 365-day period of sewage sludge subject to this section that is applied to the land:

0 dry metric tons

b. Is sewage sludge subject to this section placed in bags or other containers for sale or give-away for application to the land?

____ Yes X No

Complete Section B.5. if you place sewage sludge in a bag or other container for sale or give-away for land application. Skip this section if the sewage sludge is covered in Section B.4.

B.5. Sale or Give-Away in a Bag or Other Container for Application to the Land.

a. Total dry metric tons per 365-day period of sewage sludge placed in a bag or other container at your facility for sale or give-away for application to the land:

0 dry metric tons

b. Attach, with this application, a copy of all labels or notices that accompany the sewage sludge being sold or given away in a bag or other container for application to the land.

Complete Section B.6. if sewage sludge from your facility is provided to another facility that provides treatment or blending. This section does not apply to sewage sludge sent directly to a land application or surface disposal site. Skip this section if the sewage sludge is covered in Sections B.4 or B.5. If you provide sewage sludge to more than one facility, attach additional pages as necessary.

B.6. Shipment for Treatment or Blending.

Complete Section B.7 if sewage sludge from your facility is applied to the land, <u>unless</u> the sewage sludge is covered in:

- **Section B.4 (it meets Table 1 ceiling concentrations, Table 3 pollutant concentrations, Class A pathogen requirements, and one of vector attraction reduction options 1-8); <u>or</u>**
- **Section B.5 (you place it in a bag or other container for sale or give-away for application to the land); <u>or</u>**
- **Section B.6 (you send it to another facility for treatment or blending).**

B.7. Land Application of Bulk Sewage Sludge.

a. Total dry metric tons per 365-day period of sewage sludge applied to all land application sites: N/A dry metric tons

b. Do you identify all land application sites in Section C of this application? _____ Yes _____ No
If no, submit a copy of the land application plan with application (see instructions).

c. Are any land application sites located in States other than the State where you generate sewage sludge or derive a material from sewage sludge?

_____ Yes _____ No

If yes, describe, on this form or another sheet of paper, how you notify the permitting authority for the States where the land application sites are located. Provide a copy of the notification.

Complete Section B.8 if sewage sludge from your facility is placed on a surface disposal site.

B.8. Surface Disposal.

a. Total dry metric tons of sewage sludge from your facility placed on all surface disposal sites per 365-day period:

N/A dry metric tons

b. Do you own or operate all surface disposal sites to which you send sewage sludge for disposal?

____ Yes ____ No

If no, answer B.8.c through B.8.f for each surface disposal site that you do not own or operate. If you send sewage sludge to more than one such surface disposal site, attach additional pages as necessary.

Complete Section B.9 if sewage sludge from your facility is fired in a sewage sludge Incinerator.

B.9. Incineration.

a. Total dry metric tons of sewage sludge from your facility fired in all sewage sludge incinerators per 365-day period:

N/A dry metric tons

b. Do you own or operate all sewage sludge incinerators in which sewage sludge from your facility is fired?

____ Yes ____ No

If no, complete B.9.c through B.9.f for each sewage sludge incinerator that you do not own or operate. If you send sewage sludge to more than one such sewage sludge incinerator, attach additional pages as necessary.

Complete Section B.10 if sewage sludge from this facility is placed on a municipal solid waste landfill.

B.10. Disposal in a Municipal Solid Waste Landfill. Provide the following information for each municipal solid waste landfill on which sewage sludge from your facility is placed. If sewage sludge is placed on more than one municipal solid waste landfill, attach additional pages as necessary.

a. Name of landfill: Allied Waste (Forward Landfill)

b. Contact person: Susan Allala

Title: Customer Service Manager

Telephone number: (800) 204-4242

Contact is: X Landfill owner ____ Landfill operator

c. Mailing address: 1145 West Charter Way

Stockton, CA 95206

d. Location of municipal solid waste landfill:

Street or route #: 9999 South Austin Road

County: San Joaquin

City or Town: Manteca State: CA Zip: 95336

e. Total dry metric tons of sewage sludge from your facility placed in this municipal solid waste landfill per 365-day period:

1,240 dry metric tons

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OMB Number 2040-0086

f. List, on this form or an attachment, the numbers of all other Federal, State, and local permits that regulate the operation of this municipal solid waste landfill.

Permit Number	Type of Permit
39-AA-0015	Solid Waste Facility Permit
R5-2003-0049	Waste Discharge Permit
N-339	San Joaquin County Air Pollution Control Permit

g. Submit, with this application, information to determine whether the sewage sludge meets applicable requirements for disposal of sewage sludge in a municipal solid waste landfill (e.g., results of paint filter liquids test and TCLP test) See Attachment A.

h. Does the municipal solid waste landfill comply with applicable criteria set forth in 40 CFR Part 258?

X Yes _____ No

SECTION VI - ATTACHMENT

U.S. EPA Form 2S Part 2B.10.g. Landfill Disposal

Biosolids Paint Filter Liquids and TCLP Tests

basic laboratory
www.basiclab.com
2218 Railroad Avenue
Redding, California 96001
voice 530.243.7234
fax 530.243.7494
3860 Morrow Lane, Suite F
Chico, California 95928
voice 530.894.8966
fax 530.894.5143

Report To: CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
Attention: HEATHER GROVE
Project: BIOSOLIDS 1ST QUARTER
Description: BIOSOLIDS
Matrix: Solid

Lab No: 3030358
Reported: 04/08/13
Phone: (209) 456-8473
P.O. # 037062

Lab ID: 3030358-01
Received Temp (C): 7.4

Sampled: 03/06/13 13:30
Received: 03/08/13 11:30

General Chemistry - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
% Moisture	%	**79.9**		0.02	0.06	SM 2540G	03/27/13	03/27/13	B3D0028
Cyanide - Total	mg/kg	ND		0.75	2.50	SW 9014	03/11/13	03/11/13	B3C0241

Metals - TTLC

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Antimony	mg/kg	ND		2.0	8.0	EPA 6010B	03/21/13	03/18/13	B3C0436
Arsenic	"	**1.9**	J	1.6	8.0	"	"	"	"
Barium	"	**101**		0.8	4.0	"	"	"	"
Beryllium	"	ND		0.8	4.0	"	"	"	"
Cadmium	"	ND		0.8	4.0	"	"	"	"
Chromium	"	**4.6**		0.8	4.0	"	"	"	"
Cobalt	"	ND		4.00	20.0	"	"	"	"
Copper	"	**47.0**		0.4	2.0	"	"	"	"
Lead	"	**2.1**	J	1.0	5.0	"	"	"	"
Mercury	"	**0.1**	J	0.07	0.3	EPA 7471A	03/26/13	03/26/13	B3C0670
Molybdenum	"	ND		2.0	10.0	EPA 6010B	03/21/13	03/18/13	B3C0436
Nickel	"	**3.0**	J	1.0	4.0	"	"	"	"
Selenium	"	**1.7**	J	1.0	4.0	"	"	"	"
Silver	"	ND		1.6	8.0	"	"	"	"
Thallium	"	ND		2.0	8.0	"	"	"	"
Vanadium	"	**16.3**	J	8.0	40.0	"	"	"	"
Zinc	"	**132**		4.0	20.0	"	"	"	"

Metals - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Tin	mg/kg	ND		10.0	20.0	EPA 6010B	03/21/13	"	B3C0436

Approved By
Basic Laboratory, Inc.
California ELAP Cert #1677 and #2718

basic laboratory
www.basiclab.com
2218 Railroad Avenue
Redding, California 96001
voice 530.243.7234
fax 530.243.7494
3860 Morrow Lane, Suite F
Chico, California 95928
voice 530.894.8966
fax 530.894.5143

Report To: CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
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Description: BIOSOLIDS
Matrix: Solid

Lab ID: 3030358-01
Received Temp (C): 7.4

Lab No: 3030358
Reported: 04/08/13
Phone: (209) 456-8473
P.O. # 037062

Sampled: 03/06/13 13:30
Received: 03/08/13 11:30

Volatile Organic Compounds - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Acetone	ug/kg	ND		12.5	50.0	EPA 8260B	03/18/13	03/18/13	B3C0452
Acetonitrile	"	ND		25.0	50.0	"	"	"	"
Acrolein	"	ND		15.0	25.0	"	"	"	"
Acrylonitrile	"	ND		5.0	10.0	"	"	"	"
Allyl chloride	"	ND		15.0	25.0	"	"	"	"
Benzene	"	ND		4.0	10.0	"	"	"	"
Bromobenzene	"	ND		4.0	10.0	"	"	"	"
Bromochloromethane	"	ND		4.0	10.0	"	"	"	"
Bromodichloromethane	"	ND		4.0	10.0	"	"	"	"
Bromoform	"	ND		3.0	10.0	"	"	"	"
Bromomethane	"	ND		5.0	10.0	"	"	"	"
2-Butanone (MEK)	"	ND		15.0	25.0	"	"	"	"
n-Butylbenzene	"	ND		4.0	10.0	"	"	"	"
sec-Butylbenzene	"	ND		4.0	10.0	"	"	"	"
tert-Butylbenzene	"	ND		4.0	10.0	"	"	"	"
Carbon disulfide	"	ND		4.0	10.0	"	"	"	"
Carbon tetrachloride	"	ND		4.0	10.0	"	"	"	"
Chlorobenzene	"	ND		4.0	10.0	"	"	"	"
Chloroethane	"	ND		4.0	10.0	"	"	"	"
2-Chloroethylvinyl ether	"	ND		4.0	10.0	"	"	"	"
Chloroform	"	ND		4.0	10.0	"	"	"	"
Chloromethane	"	ND		4.0	10.0	"	"	"	"
2-Chlorotoluene	"	ND		4.0	10.0	"	"	"	"
4-Chlorotoluene	"	ND		4.0	10.0	"	"	"	"
Dibromochloromethane	"	ND		4.0	10.0	"	"	"	"
1,2-Dibromo-3-chloropropane (DBCP)	"	ND		4.0	10.0	"	"	"	"
1,2-Dibromoethane (EDB)	"	ND		4.0	10.0	"	"	"	"
Dibromomethane	"	ND		4.0	10.0	"	"	"	"
1,2-Dichlorobenzene (o-DCB)	"	ND		4.0	10.0	"	"	"	"
1,3-Dichlorobenzene (m-DCB)	"	ND		4.0	10.0	"	"	"	"
1,4-Dichlorobenzene (p-DCB)	"	ND		4.0	10.0	"	"	"	"
Dichlorodifluoromethane (CFC 12)	"	ND		4.0	10.0	"	"	"	"
1,1-Dichloroethane (1,1-DCA)	"	ND		4.0	10.0	"	"	"	"
1,2-Dichloroethane (1,2-DCA)	"	ND		4.0	10.0	"	"	"	"
1,1-Dichloroethene (1,1-DCE)	"	ND		4.0	10.0	"	"	"	"
cis-1,2-Dichloroethene (c-1,2-DCE)	"	ND		4.0	10.0	"	"	"	"
trans-1,2-Dichloroethene (t-1,2-DCE)	"	ND		4.0	10.0	"	"	"	"
1,2-Dichloropropane	"	ND		4.0	10.0	"	"	"	"
1,3-Dichloropropane	"	ND		4.0	10.0	"	"	"	"
2,2-Dichloropropane	"	ND		4.0	10.0	"	"	"	"
1,1-Dichloropropene	"	ND		4.0	10.0	"	"	"	"
cis-1,3-Dichloropropene	"	ND		4.0	10.0	"	"	"	"
trans-1,3-Dichloropropene	"	ND		4.0	10.0	"	"	"	"
1,4-Dioxane	"	ND		200	500	"	"	"	"
Ethylbenzene	"	ND		4.0	10.0	"	"	"	"
Ethyl tert-Butyl Ether (ETBE)	"	ND		4.0	10.0	"	"	"	"
Hexachlorobutadiene	"	ND		4.0	10.0	"	"	"	"

Approved By
Basic Laboratory, Inc.
California ELAP Cert #1677 and #2718

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Report To: CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
Attention: HEATHER GROVE
Project: BIOSOLIDS 1ST QUARTER
Description: BIOSOLIDS
Matrix: Solid

Lab No: 3030358
Reported: 04/08/13
Phone: (209) 456-8473
P.O. # 037062

Lab ID: 3030358-01
Received Temp (C): 7.4

Sampled: 03/06/13 13:30
Received: 03/08/13 11:30

Volatile Organic Compounds - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
2-Hexanone	"	ND		20.0	50.0	"	"	03/18/13	"
Isobutanol	"	ND		40.0	50.0	"	"	"	"
Isopropylbenzene	"	ND		4.0	10.0	"	"	"	"
Di-Isopropyl Ether (DIPE)	"	ND		4.0	10.0	"	"	"	"
p-Isopropyltoluene	"	**48.4**		4.0	10.0	"	"	"	"
4-Methyl-2-pentanone (MIBK)	"	ND		10.0	50.0	"	"	"	"
Methacrylonitrile	"	ND		35.0	50.0	"	"	"	"
Dichloromethane (Methylene Chloride)	"	**26.4**	J	10.0	50.0	"	"	"	"
Methyl methacrylate	"	ND		15.0	25.0	"	"	"	"
Methyl tert-Butyl Ether (MTBE)	"	ND		4.0	10.0	"	"	"	"
Naphthalene	"	ND		4.0	10.0	"	"	"	"
Propionitrile	"	ND		30.0	50.0	"	"	"	"
n-Propylbenzene	"	ND		4.0	10.0	"	"	"	"
Styrene	"	ND		4.0	10.0	"	"	"	"
tert-Amyl Methyl Ether (TAME)	"	ND		4.0	10.0	"	"	"	"
1,1,1,2-Tetrachloroethane	"	ND		4.0	10.0	"	"	"	"
1,1,2,2-Tetrachloroethane	"	ND		4.0	10.0	"	"	"	"
Tetrachloroethene (PCE)	"	ND		4.0	10.0	"	"	"	"
Tetrahydrofuran	"	ND		40.0	100	"	"	"	"
tert-Butyl Alcohol (TBA)	"	ND		30.0	100	"	"	"	"
Toluene	"	ND		4.0	10.0	"	"	"	"
1,2,3-Trichlorobenzene	"	ND		4.0	10.0	"	"	"	"
1,2,4-Trichlorobenzene	"	ND		4.0	10.0	"	"	"	"
1,1,1-Trichloroethane (1,1,1-TCA)	"	ND		4.0	10.0	"	"	"	"
1,1,2-Trichloroethane (1,1,2-TCA)	"	ND		4.0	10.0	"	"	"	"
Trichloroethene (TCE)	"	ND		4.0	10.0	"	"	"	"
Trichlorotrifluoroethane (Freon 113)	"	ND		4.0	10.0	"	"	"	"
Trichlorofluoromethane (Freon 11)	"	ND		4.0	10.0	"	"	"	"
1,2,3-Trichloropropane	"	ND		4.0	10.0	"	"	"	"
1,2,4-Trimethylbenzene	"	ND		4.0	10.0	"	"	"	"
1,3,5-Trimethylbenzene	"	ND		4.0	10.0	"	"	"	"
Vinyl acetate	"	ND		4.0	10.0	"	"	"	"
Vinyl chloride	"	ND		10.0	50.0	"	"	"	"
Xylenes (total)		*110 %*		*53.6-162*		"	"	"	"
Surrogate: 1,2-Dichloroethane-d4		*104 %*		*51.2-146*		"	"	"	"
Surrogate: Toluene-d8		*98.9 %*		*50.2-117*					
Surrogate: 4-Bromofluorobenzene									

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Report To: CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
Attention: HEATHER GROVE
Project: BIOSOLIDS 1ST QUARTER
Description: BIOSOLIDS
Matrix: Solid

Lab ID: 3030358-01
Received Temp (C): 7.4

Lab No: 3030358
Reported: 04/08/13
Phone: (209) 456-8473
P.O. # 037062

Sampled: 03/06/13 13:30
Received: 03/08/13 11:30

Semi Volatile Organic Compounds

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Acenaphthene	mg/kg	ND	R-08	0.99	9.90	EPA 8270C	03/12/13	03/12/13	B3C0266
Acenaphthylene	"	ND	R-08	0.99	9.90	"	"	"	"
Acetophenone	"	ND	R-08	0.99	9.90	"	"	"	"
2-Acetylaminofluorene	"	ND	R-08	0.99	9.90	"	"	"	"
Alachlor (ALANEX)	"	ND	R-08	0.99	9.90	"	"	"	"
4-Aminobiphenyl	"	ND	R-08	0.99	9.90	"	"	"	"
Anthracene	"	ND	R-08	0.99	9.90	"	"	"	"
Atrazine (AATREX)	"	ND	R-08	0.99	9.90	"	"	"	"
Benzidine	"	ND	R-08	0.99	9.90	"	"	"	"
Benzo (a) anthracene	"	ND	R-08	0.99	9.90	"	"	"	"
Benzo (a) pyrene	"	ND	R-08	0.99	9.90	"	"	"	"
Benzo (b) fluoranthene	"	ND	R-08	0.99	9.90	"	"	"	"
Benzo (g,h,i) perylene	"	ND	R-08	0.99	9.90	"	"	"	"
Benzo (k) fluoranthene	"	ND	R-08	1.98	9.90	"	"	"	"
Benzoic acid	"	ND	R-08	0.99	9.90	"	"	"	"
Benzyl alcohol	"	ND	R-08	0.99	9.90	"	"	"	"
Bis(2-chloroethyl)ether	"	ND	R-08	0.99	9.90	"	"	"	"
Bis(2-chloroethoxy)methane	"	ND	R-08	0.99	9.90	"	"	"	"
Bis(2-chloroisopropyl)ether	"	ND	R-08	0.99	9.90	"	"	"	"
Bis(2-ethylhexyl)adipate	"	**2.44**	R-08, J	0.99	9.90	"	"	"	"
Bis(2-ethylhexyl)phthalate (DEHP)	"	ND	R-08	0.99	9.90	"	"	"	"
4-Bromophenyl phenyl ether	"	ND	R-08	0.99	9.90	"	"	"	"
Butyl benzyl phthalate	"	ND	R-08	0.99	9.90	"	"	"	"
4-Chloro-3-methylphenol	"	ND	R-08	0.99	9.90	"	"	"	"
4-Chloroaniline	"	ND	R-08	0.99	9.90	"	"	"	"
Chlorobenzilate	"	ND	R-08	0.99	9.90	"	"	"	"
2-Chloronaphthalene	"	ND	R-08	0.99	9.90	"	"	"	"
2-Chlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
4-Chlorophenyl phenyl ether	"	ND	R-08	0.99	9.90	"	"	"	"
Chrysene	"	ND	R-08	0.99	9.90	"	"	"	"
Diallate (cis or trans)	"	ND	R-08	0.99	9.90	"	"	"	"
Dibenz (a,h) anthracene	"	ND	R-08	0.99	9.90	"	"	"	"
Dibenzofuran	"	ND	R-08	0.99	9.90	"	"	"	"
1,2-Dichlorobenzene (o-DCB)	"	ND	R-08	0.99	9.90	"	"	"	"
1,3-Dichlorobenzene (m-DCB)	"	ND	R-08	0.99	9.90	"	"	"	"
1,4-Dichlorobenzene (p-DCB)	"	ND	R-08	0.99	9.90	"	"	"	"
3,3´-Dichlorobenzidine	"	ND	R-08	0.99	9.90	"	"	"	"
2,4-Dichlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
2,6-Dichlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
Dimethylaminoazobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
7,12-Dimethylbenz (a) anthracene	"	ND	R-08	0.99	9.90	"	"	"	"
3,3´-Dimethylbenzidine	"	ND	R-08	0.99	9.90	"	"	"	"
Diethyl phthalate	"	ND	R-08	0.99	9.90	"	"	"	"
2,4-Dimethylphenol	"	ND	R-08	0.99	9.90	"	"	"	"
Dimethyl phthalate	"	ND	R-08	0.99	9.90	"	"	"	"
Di-n-butyl phthalate	"	ND	R-08	0.99	9.90	"	"	"	"
Di-n-octyl phthalate	"	ND	R-08	0.99	9.90	"	"	"	"

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Report To: CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
Attention: HEATHER GROVE
Project: BIOSOLIDS 1ST QUARTER
Description: BIOSOLIDS
Matrix: Solid

Lab ID: 3030358-01
Received Temp (C): 7.4

Lab No: 3030358
Reported: 04/08/13
Phone: (209) 456-8473
P.O. # 037062

Sampled: 03/06/13 13:30
Received: 03/08/13 11:30

Semi Volatile Organic Compounds

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
4,6-Dinitro-2-methylphenol	"	ND	R-08	0.99	9.90	"	"	03/12/13	"
1,3-Dinitrobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
2,4-Dinitrophenol	"	ND	R-08	0.99	9.90	"	"	"	"
2,4-Dinitrotoluene	"	ND	R-08	0.99	9.90	"	"	"	"
2,6-Dinitrotoluene	"	ND	R-08	0.99	9.90	"	"	"	"
Diphenylamine	"	ND	R-08	0.99	9.90	"	"	"	"
1,2-Diphenylhydrazine	"	ND	R-08	0.99	9.90	"	"	"	"
Ethyl methanesulfonate	"	ND	R-08	0.99	9.90	"	"	"	"
Fluoranthene	"	ND	R-08	0.99	9.90	"	"	"	"
Fluorene	"	ND	R-08	0.99	9.90	"	"	"	"
Hexachlorobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
Hexachlorobutadiene	"	ND	R-08	0.99	9.90	"	"	"	"
Hexachlorocyclopentadiene	"	ND	R-08	0.99	9.90	"	"	"	"
Hexachloroethane	"	ND	R-08	0.99	9.90	"	"	"	"
Hexachloropropene	"	ND	R-08	0.99	9.90	"	"	"	"
Indeno (1,2,3-cd) pyrene	"	ND	R-08	0.99	9.90	"	"	"	"
Isodrin	"	ND	R-08	0.99	9.90	"	"	"	"
Isophorone	"	ND	R-08	0.99	9.90	"	"	"	"
Isosafrole	"	ND	R-08	0.99	9.90	"	"	"	"
Methoxychlor	"	ND	R-08	0.99	9.90	"	"	"	"
Methyl methanesulfonate	"	ND	R-08	0.99	9.90	"	"	"	"
3-Methylcholanthrene	"	ND	R-08	0.99	9.90	"	"	"	"
2-Methylnaphthalene	"	ND	R-08	0.99	9.90	"	"	"	"
2-Methylphenol	"	ND	R-08	0.99	9.90	"	"	"	"
3 & 4-Methylphenol	"	ND	R-08	0.99	9.90	"	"	"	"
Naphthalene	"	ND	R-08	0.99	9.90	"	"	"	"
1,4-Naphthoquinone	"	ND	R-08	0.99	9.90	"	"	"	"
1-Naphthylamine	"	ND	R-08	0.99	9.90	"	"	"	"
2-Naphthylamine	"	ND	R-08	0.99	9.90	"	"	"	"
5-Nitro-o-toluidine	"	ND	R-08	0.99	9.90	"	"	"	"
2-Nitroaniline	"	ND	R-08	0.99	9.90	"	"	"	"
3-Nitroaniline	"	ND	R-08	0.99	9.90	"	"	"	"
4-Nitroaniline	"	ND	R-08	0.99	9.90	"	"	"	"
Nitrobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
2-Nitrophenol	"	ND	R-08	0.99	9.90	"	"	"	"
4-Nitrophenol	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosodiethylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosodi-n-propylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosodimethylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosomethylethylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosodi-n-butylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosodiphenylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosopiperidine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosopyrrolidine	"	ND	R-08	0.99	9.90	"	"	"	"
Pentachlorobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
Pentachloronitrobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
Pentachlorophenol (PCP)	"	ND	R-08	0.99	9.90	"	"	"	"

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Report To: CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
Attention: HEATHER GROVE
Project: BIOSOLIDS 1ST QUARTER
Description: BIOSOLIDS
Matrix: Solid

Lab No: 3030358
Reported: 04/08/13
Phone: (209) 456-8473
P.O. # 037062

Lab ID: 3030358-01
Received Temp (C): 7.4

Sampled: 03/06/13 13:30
Received: 03/08/13 11:30

Semi Volatile Organic Compounds

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Phenacetin	"	ND	R-08	0.99	9.90	"	"	03/12/13	"
Phenanthrene	"	ND	R-08	0.99	9.90	"	"	"	"
Phenol	"	ND	R-08	0.99	9.90	"	"	"	"
1,4-Phenylenediamine	"	ND	R-08	0.99	9.90	"	"	"	"
Pronamide	"	ND	R-08	0.99	9.90	"	"	"	"
Pyrene	"	ND	R-08	0.99	9.90	"	"	"	"
Pyridine	"	ND	R-08	0.99	9.90	"	"	"	"
Safrole	"	ND	R-08	0.99	9.90	"	"	"	"
Simazine (PRINCEP)	"	ND	R-08	0.99	9.90	"	"	"	"
1,2,4,5-Tetrachlorobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
2,3,4,6-Tetrachlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
o-Toluidine	"	ND	R-08	0.99	9.90	"	"	"	"
1,2,4-Trichlorobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
2,4,6-Trichlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
2,4,5-Trichlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
1,3,5-Trinitrobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
Surrogate: 2-Fluorophenol		*45.0 %*	*R-08*	*18-97.9*		"	"	"	"
Surrogate: Phenol-d5		*55.0 %*	*R-08*	*30.8-106*		"	"	"	"
Surrogate: 2,4,6-Tribromophenol		*86.5 %*	*R-08*	*48.6-152*		"	"	"	"
Surrogate: Nitrobenzene-d5		*51.0 %*	*R-08*	*17.7-119*		"	"	"	"
Surrogate: 2-Fluorobiphenyl		*57.0 %*	*R-08*	*26.2-110*		"	"	"	"
Surrogate: Terphenyl-dl4		*82.0 %*	*R-08*	*31.7-134*		"	"	"	"

TPH Diesel & Motor Oil - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Diesel	mg/kg	**2420**	D-02	30	300	EPA 8015 MOD	03/27/13	03/20/13	B3C0472
Motor Oil	"	**2970**	D-02, D-03	30	300	"	"	"	"
Surrogate: Octacosane		*95.7 %*		*46.6-128*		"	"	"	"

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California ELAP Cert #1677 and #2718

Weck Laboratories, Inc.
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Certificate of Analysis

Report Date: 04/05/13 12:36
Received Date: 03/15/13 10:25
Turnaround Time: Normal

Project: 3030358

Phones: (530) 243-7234
Fax: (530) 243-7494

P.O. #:

Attn: Nathan Hawley

Client: Basic Laboratory
2218 Railroad Ave.
Redding, CA 96001-2504

Dear Nathan Hawley :

Enclosed are the results of analyses for samples received 3/15/2013 with the Chain of Custody document. The samples were received in good condition, at 1.0 °C and on ice. All analysis met the method criteria except as noted below or in the report with data qualifiers.

Lab Sample ID: 3C15040-01 **Sample ID: 3030358-01** **Matrix:** Solid
Sampled by: Client **Sampled: 03/06/13 13:30**

Analyte	Result	MDL	MRL	Units	Dil	Method	Prepared	Analyzed	Batch	Qualifier
4,4'-DDD	ND	4.0	21	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
4,4'-DDE	ND	6.4	21	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
4,4'-DDT	ND	4.5	21	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
Aldrin	ND	9.6	21	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
alpha-BHC	ND	12	21	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
alpha-Chlordane	ND	11	21	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
beta-BHC	ND	6.5	21	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
Chlordane (tech)	ND	84	410	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
delta-BHC	ND	4.7	21	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
Dieldrin	ND	6.2	21	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
Endosulfan I	ND	4.7	21	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
Endosulfan II	ND	2.6	21	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
Endosulfan sulfate	ND	4.5	21	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
Endrin	ND	11	21	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
Endrin aldehyde	ND	5.8	21	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
gamma-BHC (Lindane)	ND	11	21	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
gamma-Chlordane	ND	8.3	21	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
Heptachlor	ND	11	21	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
Heptachlor epoxide	ND	7.5	21	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
Methoxychlor	ND	4.5	21	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
Toxaphene	ND	71	620	ug/kg	1	EPA 8081A	3/18/13	4/2/13 6:04	W3C0719	
Surrogate: Decachlorobiphenyl	*74 %*		*16-167*	%		Concentration: *152*				
Surrogate: Tetrachloro-meta-xylene	*83 %*		*0.2-151*	%		Concentration: *172*				
Aroclor 1016	ND	140	410	ug/kg	1	EPA 8082	3/18/13	3/20/13 4:54	W3C0718	M-02
Aroclor 1221	ND	250	410	ug/kg	1	EPA 8082	3/18/13	3/20/13 4:54	W3C0718	M-02
Aroclor 1232	ND	170	410	ug/kg	1	EPA 8082	3/18/13	3/20/13 4:54	W3C0718	M-02
Aroclor 1242	ND	200	410	ug/kg	1	EPA 8082	3/18/13	3/20/13 4:54	W3C0718	M-02

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Certificate of Analysis

Lab Sample ID: 3C15040-01 **Sample ID:** 3030358-01 **Matrix:** Solid
Sampled by: Client **Sampled:** 03/06/13 13:30

Analyte	Result	MDL	MRL	Units	Dil	Method	Prepared	Analyzed	Batch	Qualifier
Aroclor 1248	ND	310	410	ug/kg	1	EPA 8082	3/18/13	3/20/13 4:54	W3C0718	M-02
Aroclor 1254	ND	210	410	ug/kg	1	EPA 8082	3/18/13	3/20/13 4:54	W3C0718	M-02
Aroclor 1260	ND	36	410	ug/kg	1	EPA 8082	3/18/13	3/20/13 4:54	W3C0718	M-02
Surrogate: Decachlorobiphenyl	*68 %*		*26-171*	%		Concentration: *140*				*M-02*
Surrogate: Tetrachloro-meta-xylene	*56 %*		*28-143*	%		Concentration: *115*				*M-02*

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July 01, 2013

Lab ID: 13F0335

HEATHER GROVE
CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
RE: BIOSOLIDS 2ND QUARTER 2013

Dear HEATHER GROVE ,

Enclosed are the analysis results for Work Order number 13F0335. All analysis were performed under strict adherence to our established Quality Assurance Plan. Any abnormalities are listed in the qualifier section of this report.

If you have any questions regarding these results, please feel free to contact us at any time. We appreciate the opportunity to service your environmental testing needs.

Sincerely,

For

Ricky D. Jensen
Laboratory Director
California ELAP Certification Number 1677

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Report To: CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
Attention: HEATHER GROVE
Project: BIOSOLIDS 2ND QUARTER 2013
Description: BIOSOLIDS
Matrix: Solid

Lab ID: 13F0335-01
Received Temp (C):

Lab No: 13F0335
Reported: 07/01/13
Phone: (209) 456-8473
P.O. # 037062

Sampled: 06/05/13 16:15
Received: 06/07/13 11:49

General Chemistry - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Cyanide - Total	mg/kg	ND		0.75	2.50	SW 9014	06/19/13	06/18/13	B3F0819

Metals - TTLC

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Mercury	mg/kg	**0.08**	J	0.07	0.30	EPA 7471A	06/17/13	06/17/13	B3F0817

Metals - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Tin	mg/kg	ND		10.0	20.0	EPA 6010B	06/13/13	06/06/13	B3F0523

Volatile Organic Compounds - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Acetone	ug/kg	**2890**	R-01, R-08	250	1000	EPA 8260B	06/19/13	06/19/13	B3F0846
Acetonitrile	"	ND	R-08	25.0	50.0	"	"	"	"
Acrolein	"	ND	R-08	15.0	25.0	"	"	"	"
Acrylonitrile	"	ND	R-08	5.0	10.0	"	"	"	"
Allyl chloride	"	ND	R-08	15.0	25.0	"	"	"	"
Benzene	"	ND	R-08	4.0	10.0	"	"	"	"
Bromobenzene	"	ND	R-08	4.0	10.0	"	"	"	"
Bromochloromethane	"	ND	R-08	4.0	10.0	"	"	"	"
Bromodichloromethane	"	ND	R-08	4.0	10.0	"	"	"	"
Bromoform	"	ND	R-08	3.0	10.0	"	"	"	"
Bromomethane	"	ND	R-08	5.0	10.0	"	"	"	"
2-Butanone (MEK)	"	**629**	R-08	15.0	25.0	"	"	"	"
n-Butylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
sec-Butylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
tert-Butylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
Carbon disulfide	"	ND	R-08	4.0	10.0	"	"	"	"
Carbon tetrachloride	"	ND	R-08	4.0	10.0	"	"	"	"
Chlorobenzene	"	ND	R-08	4.0	10.0	"	"	"	"
Chloroethane	"	ND	R-08	4.0	10.0	"	"	"	"
2-Chloroethylvinyl ether	"	ND	R-08	4.0	10.0	"	"	"	"
Chloroform	"	ND	R-08	4.0	10.0	"	"	"	"
Chloromethane	"	ND	R-08	4.0	10.0	"	"	"	"
Chloroprene	"	ND	R-08	15.0	25.0	"	"	"	"
2-Chlorotoluene	"	ND	R-08	4.0	10.0	"	"	"	"
4-Chlorotoluene	"	ND	R-08	4.0	10.0	"	"	"	"
Dibromochloromethane	"	ND	R-08	4.0	10.0	"	"	"	"
1,2-Dibromo-3-chloropropane (DBCP)	"	ND	R-08	4.0	10.0	"	"	"	"
1,2-Dibromoethane (EDB)	"	ND	R-08	4.0	10.0	"	"	"	"
Dibromomethane	"	ND	R-08	4.0	10.0	"	"	"	"

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Basic Laboratory, Inc.
California ELAP Cert #1677 and #2718

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Report To: CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
Attention: HEATHER GROVE
Project: BIOSOLIDS 2ND QUARTER 2013
Description: BIOSOLIDS
Matrix: Solid

Lab ID: 13F0335-01
Received Temp (C):

Lab No: 13F0335
Reported: 07/01/13
Phone: (209) 456-8473
P.O. # 037062

Sampled: 06/05/13 16:15
Received: 06/07/13 11:49

Volatile Organic Compounds - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
1,2-Dichlorobenzene (o-DCB)	"	ND	R-08	4.0	10.0	"	"	06/19/13	"
1,3-Dichlorobenzene (m-DCB)	"	ND	R-08	4.0	10.0	"	"	"	"
1,4-Dichlorobenzene (p-DCB)	"	ND	R-08	4.0	10.0	"	"	"	"
Dichlorodifluoromethane (CFC 12)	"	ND	R-08	4.0	10.0	"	"	"	"
1,1-Dichloroethane (1,1-DCA)	"	ND	R-08	4.0	10.0	"	"	"	"
1,2-Dichloroethane (1,2-DCA)	"	ND	R-08	4.0	10.0	"	"	"	"
1,1-Dichloroethene (1,1-DCE)	"	ND	R-08	4.0	10.0	"	"	"	"
cis-1,2-Dichloroethene (c-1,2-DCE)	"	ND	R-08	4.0	10.0	"	"	"	"
trans-1,2-Dichloroethene (t-1,2-DCE)	"	ND	R-08	4.0	10.0	"	"	"	"
1,2-Dichloropropane	"	ND	R-08	4.0	10.0	"	"	"	"
1,3-Dichloropropane	"	ND	R-08	4.0	10.0	"	"	"	"
2,2-Dichloropropane	"	ND	R-08	4.0	10.0	"	"	"	"
1,1-Dichloropropene	"	ND	R-08	4.0	10.0	"	"	"	"
cis-1,3-Dichloropropene	"	ND	R-08	4.0	10.0	"	"	"	"
trans-1,3-Dichloropropene	"	ND	R-08	4.0	10.0	"	"	"	"
1,4-Dioxane	"	ND	R-08	200	500	"	"	"	"
Ethylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
Ethyl tert-Butyl Ether (ETBE)	"	ND	R-08	4.0	10.0	"	"	"	"
Hexachlorobutadiene	"	ND	R-08	4.0	10.0	"	"	"	"
2-Hexanone	"	ND	R-08	20.0	50.0	"	"	"	"
Isobutanol	"	ND	R-08	40.0	50.0	"	"	"	"
Isopropylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
Di-Isopropyl Ether (DIPE)	"	ND	R-08	4.0	10.0	"	"	"	"
p-Isopropyltoluene	"	ND	R-08	4.0	10.0	"	"	"	"
4-Methyl-2-pentanone (MIBK)	"	ND	R-08	10.0	50.0	"	"	"	"
Methacrylonitrile	"	ND	R-08	35.0	50.0	"	"	"	"
Dichloromethane (Methylene Chloride)	"	ND	R-08	10.0	50.0	"	"	"	"
Methyl methacrylate	"	ND	R-08	15.0	25.0	"	"	"	"
Methyl tert-Butyl Ether (MTBE)	"	ND	R-08	4.0	10.0	"	"	"	"
Naphthalene	"	ND	R-08	4.0	10.0	"	"	"	"
Propionitrile	"	ND	R-08	30.0	50.0	"	"	"	"
n-Propylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
Styrene	"	ND	R-08	4.0	10.0	"	"	"	"
tert-Amyl Methyl Ether (TAME)	"	ND	R-08	4.0	10.0	"	"	"	"
1,1,1,2-Tetrachloroethane	"	ND	R-08	4.0	10.0	"	"	"	"
1,1,2,2-Tetrachloroethane	"	ND	R-08	4.0	10.0	"	"	"	"
Tetrachloroethene (PCE)	"	ND	R-08	4.0	10.0	"	"	"	"
Tetrahydrofuran	"	ND	R-08	40.0	100	"	"	"	"
tert-Butyl Alcohol (TBA)	"	ND	R-08	30.0	100	"	"	"	"
Toluene	"	**12.0**	R-08	4.0	10.0	"	"	"	"
1,2,3-Trichlorobenzene	"	ND	R-08	4.0	10.0	"	"	"	"
1,2,4-Trichlorobenzene	"	ND	R-08	4.0	10.0	"	"	"	"
1,1,1-Trichloroethane (1,1,1-TCA)	"	ND	R-08	4.0	10.0	"	"	"	"
1,1,2-Trichloroethane (1,1,2-TCA)	"	ND	R-08	4.0	10.0	"	"	"	"
Trichloroethene (TCE)	"	ND	R-08	4.0	10.0	"	"	"	"
Trichlorotrifluoroethane (Freon 113)	"	ND	R-08	4.0	10.0	"	"	"	"
Trichlorofluoromethane (Freon 11)	"	ND	R-08	4.0	10.0	"	"	"	"

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Report To: CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
Attention: HEATHER GROVE
Project: BIOSOLIDS 2ND QUARTER 2013
Description: BIOSOLIDS
Matrix: Solid

Lab No: 13F0335
Reported: 07/01/13
Phone: (209) 456-8473
P.O. # 037062
Lab ID: 13F0335-01
Received Temp (C):
Sampled: 06/05/13 16:15
Received: 06/07/13 11:49

Volatile Organic Compounds - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
1,2,3-Trichloropropane	"	ND	R-08	4.0	10.0	"	"	06/19/13	"
1,2,4-Trimethylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
1,3,5-Trimethylbenzene	"	ND	R-08	4.0	10.0	"	"	"	"
Vinyl acetate	"	ND	R-08	4.0	10.0	"	"	"	"
Vinyl chloride	"	ND	R-08	4.0	10.0	"	"	"	"
Xylenes (total)	"	ND	R-08	10.0	50.0	"	"	"	"
Surrogate: 1,2-Dichloroethane-d4		*100 %*		*53.6-162*		"	"	"	"
Surrogate: Toluene-d8		*98.9 %*		*51.2-146*		"	"	"	"
Surrogate: 4-Bromofluorobenzene		*121 %*	*S-DUP*	*50.2-117*		"	"	"	"

Semi Volatile Organic Compounds

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Acenaphthene	mg/kg	ND	R-08	0.99	9.90	EPA 8270C	06/20/13	06/10/13	B3F0585
Acenaphthylene	"	ND	R-08	0.99	9.90	"	"	"	"
Acetophenone	"	ND	R-08	0.99	9.90	"	"	"	"
2-Acetylaminofluorene	"	ND	R-08	0.99	9.90	"	"	"	"
Alachlor (ALANEX)	"	ND	R-08	0.99	9.90	"	"	"	"
4-Aminobiphenyl	"	ND	R-08	0.99	9.90	"	"	"	"
Anthracene	"	ND	R-08	0.99	9.90	"	"	"	"
Atrazine (AATREX)	"	ND	R-08	0.99	9.90	"	"	"	"
Benzidine	"	ND	R-08	0.99	9.90	"	"	"	"
Benzo (a) anthracene	"	ND	R-08	0.99	9.90	"	"	"	"
Benzo (a) pyrene	"	ND	R-08	0.99	9.90	"	"	"	"
Benzo (b) fluoranthene	"	ND	R-08	0.99	9.90	"	"	"	"
Benzo (g,h,i) perylene	"	ND	R-08	0.99	9.90	"	"	"	"
Benzo (k) fluoranthene	"	ND	R-08	0.99	9.90	"	"	"	"
Benzoic acid	"	ND	R-08	1.98	9.90	"	"	"	"
Benzyl alcohol	"	ND	R-08	0.99	9.90	"	"	"	"
Bis(2-chloroethyl)ether	"	ND	R-08	0.99	9.90	"	"	"	"
Bis(2-chloroethoxy)methane	"	ND	R-08	0.99	9.90	"	"	"	"
Bis(2-chloroisopropyl)ether	"	ND	R-08	0.99	9.90	"	"	"	"
Bis(2-ethylhexyl)adipate	"	ND	R-08	0.99	9.90	"	"	"	"
Bis(2-ethylhexyl)phthalate (DEHP)	"	**6.32**	R-08, J	0.99	9.90	"	"	"	"
4-Bromophenyl phenyl ether	"	ND	R-08	0.99	9.90	"	"	"	"
Butyl benzyl phthalate	"	ND	R-08	0.99	9.90	"	"	"	"
4-Chloro-3-methylphenol	"	ND	R-08	0.99	9.90	"	"	"	"
4-Chloroaniline	"	ND	R-08	0.99	9.90	"	"	"	"
Chlorobenzilate	"	ND	R-08	0.99	9.90	"	"	"	"
2-Chloronaphthalene	"	ND	R-08	0.99	9.90	"	"	"	"
2-Chlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
4-Chlorophenyl phenyl ether	"	ND	R-08	0.99	9.90	"	"	"	"
Chrysene	"	ND	R-08	0.99	9.90	"	"	"	"
Diallate (cis or trans)	"	ND	R-08	0.99	9.90	"	"	"	"
Dibenz (a,h) anthracene	"	ND	R-08	0.99	9.90	"	"	"	"
Dibenzofuran	"	ND	R-08	0.99	9.90	"	"	"	"

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Report To: CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
Attention: HEATHER GROVE
Project: BIOSOLIDS 2ND QUARTER 2013
Description: BIOSOLIDS
Matrix: Solid

Lab ID: 13F0335-01
Received Temp (C):

Lab No: 13F0335
Reported: 07/01/13
Phone: (209) 456-8473
P.O. # 037062

Sampled: 06/05/13 16:15
Received: 06/07/13 11:49

Semi Volatile Organic Compounds

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
1,2-Dichlorobenzene (o-DCB)	"	ND	R-08	0.99	9.90	"	"	06/10/13	"
1,3-Dichlorobenzene (m-DCB)	"	ND	R-08	0.99	9.90	"	"	"	"
1,4-Dichlorobenzene (p-DCB)	"	ND	R-08	0.99	9.90	"	"	"	"
3,3´-Dichlorobenzidine	"	ND	R-08	0.99	9.90	"	"	"	"
2,4-Dichlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
2,6-Dichlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
Dimethylaminoazobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
7,12-Dimethylbenz (a) anthracene	"	ND	R-08	0.99	9.90	"	"	"	"
3,3´-Dimethylbenzidine	"	ND	R-08	0.99	9.90	"	"	"	"
Diethyl phthalate	"	ND	R-08	0.99	9.90	"	"	"	"
2,4-Dimethylphenol	"	ND	R-08	0.99	9.90	"	"	"	"
Dimethyl phthalate	"	ND	R-08	0.99	9.90	"	"	"	"
Di-n-butyl phthalate	"	ND	R-08	0.99	9.90	"	"	"	"
Di-n-octyl phthalate	"	ND	R-08	0.99	9.90	"	"	"	"
4,6-Dinitro-2-methylphenol	"	ND	R-08	0.99	9.90	"	"	"	"
1,3-Dinitrobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
2,4-Dinitrophenol	"	ND	R-08	0.99	9.90	"	"	"	"
2,4-Dinitrotoluene	"	ND	R-08	0.99	9.90	"	"	"	"
2,6-Dinitrotoluene	"	ND	R-08	0.99	9.90	"	"	"	"
Diphenylamine	"	ND	R-08	0.99	9.90	"	"	"	"
1,2-Diphenylhydrazine	"	ND	R-08	0.99	9.90	"	"	"	"
Ethyl methanesulfonate	"	ND	R-08	0.99	9.90	"	"	"	"
Fluoranthene	"	ND	R-08	0.99	9.90	"	"	"	"
Fluorene	"	ND	R-08	0.99	9.90	"	"	"	"
Hexachlorobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
Hexachlorobutadiene	"	ND	R-08	0.99	9.90	"	"	"	"
Hexachlorocyclopentadiene	"	ND	R-08	0.99	9.90	"	"	"	"
Hexachloroethane	"	ND	R-08	0.99	9.90	"	"	"	"
Hexachloropropene	"	ND	R-08	0.99	9.90	"	"	"	"
Indeno (1,2,3-cd) pyrene	"	ND	R-08	0.99	9.90	"	"	"	"
Isodrin	"	ND	R-08	0.99	9.90	"	"	"	"
Isophorone	"	ND	R-08	0.99	9.90	"	"	"	"
Isosafrole	"	ND	R-08	0.99	9.90	"	"	"	"
Methapyrilene	"	ND	R-08	0.99	9.90	"	"	"	"
Methoxychlor	"	ND	R-08	0.99	9.90	"	"	"	"
Methyl methanesulfonate	"	ND	R-08	0.99	9.90	"	"	"	"
3-Methylcholanthrene	"	ND	R-08	0.99	9.90	"	"	"	"
2-Methylnaphthalene	"	ND	R-08	0.99	9.90	"	"	"	"
2-Methylphenol	"	ND	R-08	0.99	9.90	"	"	"	"
3 & 4-Methylphenol	"	ND	R-08	0.99	9.90	"	"	"	"
Naphthalene	"	ND	R-08	0.99	9.90	"	"	"	"
1,4-Naphthoquinone	"	ND	R-08	0.99	9.90	"	"	"	"
1-Naphthylamine	"	ND	R-08	0.99	9.90	"	"	"	"
2-Naphthylamine	"	ND	R-08	0.99	9.90	"	"	"	"
5-Nitro-o-toluidine	"	ND	R-08	0.99	9.90	"	"	"	"
2-Nitroaniline	"	ND	R-08	0.99	9.90	"	"	"	"
3-Nitroaniline	"	ND	R-08	0.99	9.90	"	"	"	"

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MANTECA, CA 95337
Attention: HEATHER GROVE
Project: BIOSOLIDS 2ND QUARTER 2013
Description: BIOSOLIDS
Matrix: Solid

Lab ID: 13F0335-01
Received Temp (C):

Lab No: 13F0335
Reported: 07/01/13
Phone: (209) 456-8473
P.O. # 037062

Sampled: 06/05/13 16:15
Received: 06/07/13 11:49

Semi Volatile Organic Compounds

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
4-Nitroaniline	"	ND	R-08	0.99	9.90	"	"	06/10/13	"
Nitrobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
2-Nitrophenol	"	ND	R-08	0.99	9.90	"	"	"	"
4-Nitrophenol	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosodiethylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosodi-n-propylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosodimethylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosomethylethylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosodi-n-butylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosodiphenylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosopiperidine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosopyrrolidine	"	ND	R-08	0.99	9.90	"	"	"	"
Pentachlorobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
Pentachloronitrobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
Pentachlorophenol (PCP)	"	ND	R-08	0.99	9.90	"	"	"	"
Phenacetin	"	ND	R-08	0.99	9.90	"	"	"	"
Phenanthrene	"	ND	R-08	0.99	9.90	"	"	"	"
Phenol	"	**2.00**	QR-04, R-08, J	0.99	9.90	"	"	"	"
1,4-Phenylenediamine	"	ND	R-08	0.99	9.90	"	"	"	"
Pronamide	"	ND	R-08	0.99	9.90	"	"	"	"
Pyrene	"	ND	R-08	0.99	9.90	"	"	"	"
Pyridine	"	ND	R-08	0.99	9.90	"	"	"	"
Safrole	"	ND	R-08	0.99	9.90	"	"	"	"
Simazine (PRINCEP)	"	ND	R-08	0.99	9.90	"	"	"	"
1,2,4,5-Tetrachlorobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
2,3,4,6-Tetrachlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
o-Toluidine	"	ND	R-08	0.99	9.90	"	"	"	"
1,2,4-Trichlorobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
2,4,6-Trichlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
2,4,5-Trichlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
1,3,5-Trinitrobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
Surrogate: 2-Fluorophenol		*88.0 %*		*18-97.9*		"	"	"	"
Surrogate: Phenol-d5		*94.0 %*		*30.8-106*		"	"	"	"
Surrogate: 2,4,6-Tribromophenol		*100 %*		*48.6-152*		"	"	"	"
Surrogate: Nitrobenzene-d5		*96.0 %*		*17.7-119*		"	"	"	"
Surrogate: 2-Fluorobiphenyl		*81.0 %*		*26.2-110*		"	"	"	"
Surrogate: Terphenyl-dl4		*94.0 %*		*31.7-134*		"	"	"	"

Approved By
Basic Laboratory, Inc.
California ELAP Cert #1677 and #2718

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Report To: CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
Attention: HEATHER GROVE
Project: BIOSOLIDS 2ND QUARTER 2013
Description: BIOSOLIDS
Matrix: Solid

Lab ID: 13F0335-01
Received Temp (C):

Lab No: 13F0335
Reported: 07/01/13
Phone: (209) 456-8473
P.O. # 037062

Sampled: 06/05/13 16:15
Received: 06/07/13 11:49

Pesticides

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
alpha-BHC	mg/kg	ND	R-08	0.0150	0.0600	EPA 8081	06/21/13	06/14/13	B3F0728
beta-BHC	"	ND	R-08	0.0150	0.0600	"	"	"	"
gamma-BHC (Lindane)	"	ND	R-08	0.0150	0.0600	"	"	"	"
delta-BHC	"	ND	R-08	0.0150	0.0600	"	"	"	"
Aldrin	"	ND	R-08	0.0150	0.0600	"	"	"	"
Chlordane (tech)	"	ND	R-08	0.0300	0.0600	"	"	"	"
Dieldrin	"	ND	R-08	0.0180	0.0600	"	"	"	"
Endosulfan I	"	ND	R-08	0.0150	0.0600	"	"	"	"
Endosulfan II	"	ND	R-08	0.0300	0.0600	"	"	"	"
Endosulfan sulfate	"	ND	R-08	0.0150	0.0600	"	"	"	"
Endrin	"	ND	R-08	0.0240	0.0600	"	"	"	"
Endrin aldehyde	"	ND	R-08	0.0150	0.0600	"	"	"	"
Heptachlor	"	ND	R-08	0.0150	0.0600	"	"	"	"
Heptachlor epoxide	"	ND	R-08	0.0150	0.0600	"	"	"	"
Methoxychlor	"	ND	R-08	0.0180	0.0600	"	"	"	"
4,4'-DDT	"	ND	R-08	0.0150	0.0600	"	"	"	"
4,4'-DDE	"	ND	R-08	0.0150	0.0600	"	"	"	"
4,4'-DDD	"	ND	R-08	0.0240	0.0600	"	"	"	"
Toxaphene	"	ND	R-08	0.0270	0.0600	"	"	"	"
alpha-Chlordane	"	ND	R-08	0.0150	0.0600	"	"	"	"
Endrin ketone	"	ND	R-08	0.0150	0.0600	"	"	"	"
gamma-Chlordane	"	ND	R-08	0.0150	0.0600	"	"	"	"
Surrogate: Tetrachloro-meta-xylene		*%*	*R-08, S-01*	*25.4-110*		"	"	"	"
Surrogate: Decachlorobiphenyl		*%*	*R-08, S-01*	*33.8-153*		"	"	"	"

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Report To: CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
Attention: HEATHER GROVE
Project: BIOSOLIDS 2ND QUARTER 2013
Description: BIOSOLIDS
Matrix: Solid

Lab ID: 13F0335-01
Received Temp (C):

Lab No: 13F0335
Reported: 07/01/13
Phone: (209) 456-8473
P.O. # 037062

Sampled: 06/05/13 16:15
Received: 06/07/13 11:49

Polychlorinated Byphenols (PCBs)

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
PCB-1260	mg/kg	ND	R-08	0.900	3.00	EPA 8082	06/21/13	06/14/13	B3F0728
PCB-1254	"	ND	R-08	0.900	3.00	"	"	"	"
PCB-1248	"	ND	R-08	0.900	3.00	"	"	"	"
PCB-1242	"	ND	R-08	0.900	3.00	"	"	"	"
PCB-1232	"	ND	R-08	0.900	3.00	"	"	"	"
PCB-1221	"	ND	R-08	0.900	3.00	"	"	"	"
PCB-1016	"	ND	R-08	0.900	3.00	"	"	"	"
Total PCBs	"	ND	R-08	0.900	3.00	"	"	"	"
Surrogate: Tetrachloro-meta-xylene		*%*	*R-08, S-01*	*25.4-110*		"	"	"	"
Surrogate: Decachlorobiphenyl		*%*	*R-08, S-01*	*33.8-153*		"	"	"	"

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October 11, 2013

Lab ID: 13I0523

HEATHER GROVE
CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
RE: BIOSOLIDS 3RD QUARTER

Dear HEATHER GROVE ,

Enclosed are the analysis results for Work Order number 13I0523. All analysis were performed under strict adherence to our established Quality Assurance Plan. Any abnormalities are listed in the qualifier section of this report.

If you have any questions regarding these results, please feel free to contact us at any time. We appreciate the opportunity to service your environmental testing needs.

Sincerely,

For

Ricky D. Jensen
Laboratory Director
California ELAP Certification Number 1677

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Report To: CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
Attention: HEATHER GROVE
Project: BIOSOLIDS 3RD QUARTER
Description: BIOSOLIDS
Matrix: Solid

Lab No: 13I0523
Reported: 10/11/13
Phone: (209) 456-8473
P.O. # 037062

Lab ID: 13I0523-01
Received Temp (C): 17.9

Sampled: 09/10/13 15:00
Received: 09/12/13 11:16

General Chemistry - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Cyanide - Total	mg/kg	ND		0.75	2.50	SW 9014	09/21/13	09/21/13	B3I1149

Metals - TTLC

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Mercury	mg/kg	**0.18**	J	0.07	0.33	EPA 7471A	09/17/13	09/17/13	B3I0995

Metals - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Tin	mg/kg	ND		10.0	20.0	EPA 6010B	09/23/13	09/16/13	B3I0955

Volatile Organic Compounds - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Acetone	ug/kg	**4480**		500	2000	EPA 8260B	09/19/13	09/19/13	B3I1110
Acetonitrile	"	ND		25.0	50.0	"	"	"	"
Acrolein	"	ND		15.0	25.0	"	"	"	"
Acrylonitrile	"	ND		5.0	10.0	"	"	"	"
Allyl chloride	"	ND		15.0	25.0	"	"	"	"
Benzene	"	ND		4.0	10.0	"	"	"	"
Bromobenzene	"	ND		4.0	10.0	"	"	"	"
Bromochloromethane	"	ND		4.0	10.0	"	"	"	"
Bromodichloromethane	"	ND		4.0	10.0	"	"	"	"
Bromoform	"	ND		3.0	10.0	"	"	"	"
Bromomethane	"	ND		5.0	10.0	"	"	"	"
2-Butanone (MEK)	"	**956**	J	600	1000	"	"	"	"
n-Butylbenzene	"	ND		4.0	10.0	"	"	"	"
sec-Butylbenzene	"	ND		4.0	10.0	"	"	"	"
tert-Butylbenzene	"	ND		4.0	10.0	"	"	"	"
Carbon disulfide	"	ND		4.0	10.0	"	"	"	"
Carbon tetrachloride	"	ND		4.0	10.0	"	"	"	"
Chlorobenzene	"	ND		4.0	10.0	"	"	"	"
Chloroethane	"	ND		4.0	10.0	"	"	"	"
2-Chloroethylvinyl ether	"	ND		4.0	10.0	"	"	"	"
Chloroform	"	ND		4.0	10.0	"	"	"	"
Chloromethane	"	ND		4.0	10.0	"	"	"	"
Chloroprene	"	ND		15.0	25.0	"	"	"	"
2-Chlorotoluene	"	ND		4.0	10.0	"	"	"	"
4-Chlorotoluene	"	ND		4.0	10.0	"	"	"	"
Dibromochloromethane	"	ND		4.0	10.0	"	"	"	"
1,2-Dibromo-3-chloropropane (DBCP)	"	ND		4.0	10.0	"	"	"	"
1,2-Dibromoethane (EDB)	"	ND		4.0	10.0	"	"	"	"
Dibromomethane	"	ND		4.0	10.0	"	"	"	"

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Report To: CITY OF MANTECA
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Attention: HEATHER GROVE
Project: BIOSOLIDS 3RD QUARTER
Description: BIOSOLIDS
Matrix: Solid

Lab No: 13I0523
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Phone: (209) 456-8473
P.O. # 037062

Lab ID: 13I0523-01
Received Temp (C): 17.9

Sampled: 09/10/13 15:00
Received: 09/12/13 11:16

Volatile Organic Compounds - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
1,2-Dichlorobenzene (o-DCB)	"	ND		4.0	10.0	"	"	09/19/13	"
1,3-Dichlorobenzene (m-DCB)	"	ND		4.0	10.0	"	"	"	"
1,4-Dichlorobenzene (p-DCB)	"	ND		4.0	10.0	"	"	"	"
Dichlorodifluoromethane (CFC 12)	"	ND		4.0	10.0	"	"	"	"
1,1-Dichloroethane (1,1-DCA)	"	ND		4.0	10.0	"	"	"	"
1,2-Dichloroethane (1,2-DCA)	"	ND		4.0	10.0	"	"	"	"
1,1-Dichloroethene (1,1-DCE)	"	ND		4.0	10.0	"	"	"	"
cis-1,2-Dichloroethene (c-1,2-DCE)	"	ND		4.0	10.0	"	"	"	"
trans-1,2-Dichloroethene (t-1,2-DCE)	"	ND		4.0	10.0	"	"	"	"
1,2-Dichloropropane	"	ND		4.0	10.0	"	"	"	"
1,3-Dichloropropane	"	ND		4.0	10.0	"	"	"	"
2,2-Dichloropropane	"	ND		4.0	10.0	"	"	"	"
1,1-Dichloropropene	"	ND		4.0	10.0	"	"	"	"
cis-1,3-Dichloropropene	"	ND		4.0	10.0	"	"	"	"
trans-1,3-Dichloropropene	"	ND		4.0	10.0	"	"	"	"
1,4-Dioxane	"	ND		200	500	"	"	"	"
Ethylbenzene	"	ND		4.0	10.0	"	"	"	"
Ethyl tert-Butyl Ether (ETBE)	"	ND		4.0	10.0	"	"	"	"
Hexachlorobutadiene	"	ND		4.0	10.0	"	"	"	"
2-Hexanone	"	ND		20.0	50.0	"	"	"	"
Isobutanol	"	ND		40.0	50.0	"	"	"	"
Isopropylbenzene	"	ND		4.0	10.0	"	"	"	"
Di-Isopropyl Ether (DIPE)	"	ND		4.0	10.0	"	"	"	"
p-Isopropyltoluene	"	ND		4.0	10.0	"	"	"	"
4-Methyl-2-pentanone (MIBK)	"	ND		10.0	50.0	"	"	"	"
Methacrylonitrile	"	ND		35.0	50.0	"	"	"	"
Dichloromethane (Methylene Chloride)	"	ND		10.0	50.0	"	"	"	"
Methyl methacrylate	"	ND		15.0	25.0	"	"	"	"
Methyl tert-Butyl Ether (MTBE)	"	ND		4.0	10.0	"	"	"	"
Naphthalene	"	ND		4.0	10.0	"	"	"	"
Propionitrile	"	ND		30.0	50.0	"	"	"	"
n-Propylbenzene	"	ND		4.0	10.0	"	"	"	"
Styrene	"	ND		4.0	10.0	"	"	"	"
tert-Amyl Methyl Ether (TAME)	"	ND		4.0	10.0	"	"	"	"
1,1,1,2-Tetrachloroethane	"	ND		4.0	10.0	"	"	"	"
1,1,2,2-Tetrachloroethane	"	ND		4.0	10.0	"	"	"	"
Tetrachloroethene (PCE)	"	ND		4.0	10.0	"	"	"	"
Tetrahydrofuran	"	ND		40.0	100	"	"	"	"
tert-Butyl Alcohol (TBA)	"	ND		30.0	100	"	"	"	"
Toluene	"	ND		4.0	10.0	"	"	"	"
1,2,3-Trichlorobenzene	"	ND		4.0	10.0	"	"	"	"
1,2,4-Trichlorobenzene	"	ND		4.0	10.0	"	"	"	"
1,1,1-Trichloroethane (1,1,1-TCA)	"	ND		4.0	10.0	"	"	"	"
1,1,2-Trichloroethane (1,1,2-TCA)	"	ND		4.0	10.0	"	"	"	"
Trichloroethene (TCE)	"	ND		4.0	10.0	"	"	"	"
Trichlorotrifluoroethane (Freon 113)	"	ND		4.0	10.0	"	"	"	"
Trichlorofluoromethane (Freon 11)	"	ND		4.0	10.0	"	"	"	"

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Volatile Organic Compounds - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
1,2,3-Trichloropropane	"	ND		4.0	10.0	"	"	09/19/13	"
1,2,4-Trimethylbenzene	"	ND		4.0	10.0	"	"	"	"
1,3,5-Trimethylbenzene	"	ND		4.0	10.0	"	"	"	"
Vinyl acetate	"	ND		4.0	10.0	"	"	"	"
Vinyl chloride	"	ND		4.0	10.0	"	"	"	"
Xylenes (total)	"	ND		10.0	50.0	"	"	"	"
Surrogate: 1,2-Dichloroethane-d4		*101 %*		*53.6-162*		"	"	"	"
Surrogate: Toluene-d8		*92.4 %*		*51.2-146*		"	"	"	"
Surrogate: 4-Bromofluorobenzene		*114 %*		*50.2-117*		"	"	"	"

Semi Volatile Organic Compounds

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Acenaphthene	mg/kg	ND	R-08	0.99	9.90	EPA 8270C	09/24/13	09/20/13	B3I1122
Acenaphthylene	"	ND	R-08	0.99	9.90	"	"	"	"
Acetophenone	"	ND	R-08	0.99	9.90	"	"	"	"
2-Acetylaminofluorene	"	ND	R-08	0.99	9.90	"	"	"	"
Alachlor (ALANEX)	"	ND	R-08	0.99	9.90	"	"	"	"
4-Aminobiphenyl	"	ND	R-08	0.99	9.90	"	"	"	"
Anthracene	"	ND	R-08	0.99	9.90	"	"	"	"
Atrazine (AATREX)	"	ND	R-08	0.99	9.90	"	"	"	"
Benzidine	"	ND	R-08	0.99	9.90	"	"	"	"
Benzo (a) anthracene	"	ND	R-08	0.99	9.90	"	"	"	"
Benzo (a) pyrene	"	ND	R-08	0.99	9.90	"	"	"	"
Benzo (b) fluoranthene	"	ND	R-08	0.99	9.90	"	"	"	"
Benzo (g,h,i) perylene	"	ND	R-08	0.99	9.90	"	"	"	"
Benzo (k) fluoranthene	"	ND	R-08	0.99	9.90	"	"	"	"
Benzoic acid	"	ND	R-08	1.98	9.90	"	"	"	"
Benzyl alcohol	"	ND	R-08	0.99	9.90	"	"	"	"
Bis(2-chloroethyl)ether	"	ND	R-08	0.99	9.90	"	"	"	"
Bis(2-chloroethoxy)methane	"	ND	R-08	0.99	9.90	"	"	"	"
Bis(2-chloroisopropyl)ether	"	ND	R-08	0.99	9.90	"	"	"	"
Bis(2-ethylhexyl)adipate	"	ND	R-08	0.99	9.90	"	"	"	"
Bis(2-ethylhexyl)phthalate (DEHP)	"	**2.82**	R-08, J	0.99	9.90	"	"	"	"
4-Bromophenyl phenyl ether	"	ND	R-08	0.99	9.90	"	"	"	"
Butyl benzyl phthalate	"	ND	R-08	0.99	9.90	"	"	"	"
4-Chloro-3-methylphenol	"	ND	R-08	0.99	9.90	"	"	"	"
4-Chloroaniline	"	ND	R-08	0.99	9.90	"	"	"	"
Chlorobenzilate	"	ND	R-08	0.99	9.90	"	"	"	"
2-Chloronaphthalene	"	ND	R-08	0.99	9.90	"	"	"	"
2-Chlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
4-Chlorophenyl phenyl ether	"	ND	R-08	0.99	9.90	"	"	"	"
Chrysene	"	ND	R-08	0.99	9.90	"	"	"	"
Diallate (cis or trans)	"	ND	R-08	0.99	9.90	"	"	"	"
Dibenz (a,h) anthracene	"	ND	R-08	0.99	9.90	"	"	"	"
Dibenzofuran	"	ND	R-08	0.99	9.90	"	"	"	"

Approved By

Basic Laboratory, Inc.
California ELAP Cert #1677 and #2718

basic laboratory

www.basiclab.com

2218 Railroad Avenue
Redding, California 96001
voice 530.243.7234
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3860 Morrow Lane, Suite F
Chico, California 95928
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Report To: CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
Attention: HEATHER GROVE
Project: BIOSOLIDS 3RD QUARTER
Description: BIOSOLIDS
Matrix: Solid

Lab No: 13I0523
Reported: 10/11/13
Phone: (209) 456-8473
P.O. # 037062

Lab ID: 13I0523-01
Received Temp (C): 17.9

Sampled: 09/10/13 15:00
Received: 09/12/13 11:16

Semi Volatile Organic Compounds

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
1,2-Dichlorobenzene (o-DCB)	"	ND	R-08	0.99	9.90	"	"	09/20/13	"
1,3-Dichlorobenzene (m-DCB)	"	ND	R-08	0.99	9.90	"	"	"	"
1,4-Dichlorobenzene (p-DCB)	"	ND	R-08	0.99	9.90	"	"	"	"
3,3'-Dichlorobenzidine	"	ND	R-08	0.99	9.90	"	"	"	"
2,4-Dichlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
2,6-Dichlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
Dimethylaminoazobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
7,12-Dimethylbenz (a) anthracene	"	ND	R-08	0.99	9.90	"	"	"	"
3,3'-Dimethylbenzidine	"	ND	R-08	0.99	9.90	"	"	"	"
Diethyl phthalate	"	ND	R-08	0.99	9.90	"	"	"	"
2,4-Dimethylphenol	"	ND	R-08	0.99	9.90	"	"	"	"
Dimethyl phthalate	"	ND	R-08	0.99	9.90	"	"	"	"
Di-n-butyl phthalate	"	ND	R-08	0.99	9.90	"	"	"	"
Di-n-octyl phthalate	"	ND	R-08	0.99	9.90	"	"	"	"
4,6-Dinitro-2-methylphenol	"	ND	R-08	0.99	9.90	"	"	"	"
1,3-Dinitrobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
2,4-Dinitrophenol	"	ND	R-08	0.99	9.90	"	"	"	"
2,4-Dinitrotoluene	"	ND	R-08	0.99	9.90	"	"	"	"
2,6-Dinitrotoluene	"	ND	R-08	0.99	9.90	"	"	"	"
Diphenylamine	"	ND	R-08	0.99	9.90	"	"	"	"
1,2-Diphenylhydrazine	"	ND	R-08	0.99	9.90	"	"	"	"
Ethyl methanesulfonate	"	ND	R-08	0.99	9.90	"	"	"	"
Fluoranthene	"	ND	R-08	0.99	9.90	"	"	"	"
Fluorene	"	ND	R-08	0.99	9.90	"	"	"	"
Hexachlorobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
Hexachlorobutadiene	"	ND	R-08	0.99	9.90	"	"	"	"
Hexachlorocyclopentadiene	"	ND	R-08	0.99	9.90	"	"	"	"
Hexachloroethane	"	ND	R-08	0.99	9.90	"	"	"	"
Hexachloropropene	"	ND	R-08	0.99	9.90	"	"	"	"
Indeno (1,2,3-cd) pyrene	"	ND	R-08	0.99	9.90	"	"	"	"
Isodrin	"	ND	R-08	0.99	9.90	"	"	"	"
Isophorone	"	ND	R-08	0.99	9.90	"	"	"	"
Isosafrole	"	ND	R-08	0.99	9.90	"	"	"	"
Methapyrilene	"	ND	R-08	0.99	9.90	"	"	"	"
Methoxychlor	"	ND	R-08	0.99	9.90	"	"	"	"
Methyl methanesulfonate	"	ND	R-08	0.99	9.90	"	"	"	"
3-Methylcholanthrene	"	ND	R-08	0.99	9.90	"	"	"	"
2-Methylnaphthalene	"	ND	R-08	0.99	9.90	"	"	"	"
2-Methylphenol	"	ND	R-08	0.99	9.90	"	"	"	"
3 & 4-Methylphenol	"	ND	R-08	0.99	9.90	"	"	"	"
Naphthalene	"	ND	R-08	0.99	9.90	"	"	"	"
1,4-Naphthoquinone	"	ND	R-08	0.99	9.90	"	"	"	"
1-Naphthylamine	"	ND	R-08	0.99	9.90	"	"	"	"
2-Naphthylamine	"	ND	R-08	0.99	9.90	"	"	"	"
5-Nitro-o-toluidine	"	ND	R-08	0.99	9.90	"	"	"	"
2-Nitroaniline	"	ND	R-08	0.99	9.90	"	"	"	"
3-Nitroaniline	"	ND	R-08	0.99	9.90	"	"	"	"

Approved By

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Report To: CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
Attention: HEATHER GROVE
Project: BIOSOLIDS 3RD QUARTER
Description: BIOSOLIDS
Matrix: Solid

Lab No: 13I0523
Reported: 10/11/13
Phone: (209) 456-8473
P.O. # 037062

Lab ID: 13I0523-01
Received Temp (C): 17.9

Sampled: 09/10/13 15:00
Received: 09/12/13 11:16

Semi Volatile Organic Compounds

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
4-Nitroaniline	"	ND	R-08	0.99	9.90	"	"	09/20/13	"
Nitrobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
2-Nitrophenol	"	ND	R-08	0.99	9.90	"	"	"	"
4-Nitrophenol	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosodiethylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosodi-n-propylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosodimethylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosomethylethylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosodi-n-butylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosodiphenylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosopiperidine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosopyrrolidine	"	ND	R-08	0.99	9.90	"	"	"	"
Pentachlorobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
Pentachloronitrobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
Pentachlorophenol (PCP)	"	ND	R-08	0.99	9.90	"	"	"	"
Phenacetin	"	ND	R-08	0.99	9.90	"	"	"	"
Phenanthrene	"	ND	R-08	0.99	9.90	"	"	"	"
Phenol	"	ND	R-08	0.99	9.90	"	"	"	"
1,4-Phenylenediamine	"	ND	R-08	0.99	9.90	"	"	"	"
Pronamide	"	ND	R-08	0.99	9.90	"	"	"	"
Pyrene	"	ND	R-08	0.99	9.90	"	"	"	"
Pyridine	"	ND	R-08	0.99	9.90	"	"	"	"
Safrole	"	ND	R-08	0.99	9.90	"	"	"	"
Simazine (PRINCEP)	"	ND	R-08	0.99	9.90	"	"	"	"
1,2,4,5-Tetrachlorobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
2,3,4,6-Tetrachlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
o-Toluidine	"	ND	R-08	0.99	9.90	"	"	"	"
1,2,4-Trichlorobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
2,4,6-Trichlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
2,4,5-Trichlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
1,3,5-Trinitrobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
Surrogate: 2-Fluorophenol		*63.5 %*	*R-08*	*18-97.9*		"	"	"	"
Surrogate: Phenol-d5		*70.0 %*	*R-08*	*30.8-106*		"	"	"	"
Surrogate: 2,4,6-Tribromophenol		*110 %*	*R-08*	*48.6-152*		"	"	"	"
Surrogate: Nitrobenzene-d5		*66.0 %*	*R-08*	*17.7-119*		"	"	"	"
Surrogate: 2-Fluorobiphenyl		*65.0 %*	*R-08*	*26.2-110*		"	"	"	"
Surrogate: Terphenyl-dl4		*94.0 %*	*R-08*	*31.7-134*		"	"	"	"

Approved By
Basic Laboratory, Inc.
California ELAP Cert #1677 and #2718

Weck Laboratories, Inc.
Analytical Laboratory Service - Since 1964

Certificate of Analysis

Report Date: 10/09/13 16:24
Received Date: 09/20/13 09:10
Turnaround Time: Normal

Project: 13I0523

Phones: (530) 243-7234
Fax: (530) 243-7494

P.O. #:

Attn: Nathan Hawley

Client: Basic Laboratory
2218 Railroad Ave.
Redding, CA 96001-2504

Dear Nathan Hawley :

Enclosed are the results of analyses for samples received 9/20/2013 with the Chain of Custody document. The samples were received in good condition, at 2.9 °C and on ice. All analysis met the method criteria except as noted below or in the report with data qualifiers.

Lab Sample ID: 3I20008-01 **Sample ID:** 13I0523-01 **Matrix:** Solid
Sampled by: Client **Sampled:** 09/10/13 15:00

Analyte	Result	MDL	MRL	Units	Dil	Method	Prepared	Analyzed	Batch	Qualifier
4,4'-DDD	ND	4.3	22	ug/kg	1	EPA 8081A	9/23/13	10/8/13 23:35	W3I1009	M-02
4,4'-DDE	ND	6.8	22	ug/kg	1	EPA 8081A	9/23/13	10/8/13 23:35	W3I1009	M-02
4,4'-DDT	ND	4.9	22	ug/kg	1	EPA 8081A	9/23/13	10/8/13 23:35	W3I1009	M-02
Aldrin	ND	10	22	ug/kg	1	EPA 8081A	9/23/13	10/8/13 23:35	W3I1009	M-02
alpha-BHC	ND	13	22	ug/kg	1	EPA 8081A	9/23/13	10/8/13 23:35	W3I1009	M-02
beta-BHC	ND	7.0	22	ug/kg	1	EPA 8081A	9/23/13	10/8/13 23:35	W3I1009	M-02
Chlordane (tech)	ND	91	440	ug/kg	1	EPA 8081A	9/23/13	10/8/13 23:35	W3I1009	M-02
delta-BHC	ND	5.1	22	ug/kg	1	EPA 8081A	9/23/13	10/8/13 23:35	W3I1009	M-02
Dieldrin	ND	6.7	22	ug/kg	1	EPA 8081A	9/23/13	10/8/13 23:35	W3I1009	M-02
Endosulfan I	ND	5.1	22	ug/kg	1	EPA 8081A	9/23/13	10/8/13 23:35	W3I1009	M-02
Endosulfan II	ND	2.8	22	ug/kg	1	EPA 8081A	9/23/13	10/8/13 23:35	W3I1009	M-02
Endosulfan sulfate	ND	4.9	22	ug/kg	1	EPA 8081A	9/23/13	10/8/13 23:35	W3I1009	M-02
Endrin	ND	12	22	ug/kg	1	EPA 8081A	9/23/13	10/8/13 23:35	W3I1009	M-02
Endrin aldehyde	ND	6.2	22	ug/kg	1	EPA 8081A	9/23/13	10/8/13 23:35	W3I1009	M-02
gamma-BHC (Lindane)	ND	12	22	ug/kg	1	EPA 8081A	9/23/13	10/8/13 23:35	W3I1009	M-02
Heptachlor	ND	12	22	ug/kg	1	EPA 8081A	9/23/13	10/8/13 23:35	W3I1009	M-02
Heptachlor epoxide	ND	8.1	22	ug/kg	1	EPA 8081A	9/23/13	10/8/13 23:35	W3I1009	M-02
Methoxychlor	ND	4.9	22	ug/kg	1	EPA 8081A	9/23/13	10/8/13 23:35	W3I1009	M-02
Toxaphene	ND	76	670	ug/kg	1	EPA 8081A	9/23/13	10/8/13 23:35	W3I1009	M-02
Surrogate: Decachlorobiphenyl	*74 %*		*21-125*	%	Concentration: *164*					*M-02*
Surrogate: Tetrachloro-meta-xylene	*81 %*		*18-112*	%	Concentration: *181*					*M-02*
Aroclor 1016	ND	150	440	ug/kg	1	EPA 8082	9/23/13	9/28/13 14:08	W3I1016	M-02
Aroclor 1221	ND	270	440	ug/kg	1	EPA 8082	9/23/13	9/28/13 14:08	W3I1016	M-02
Aroclor 1232	ND	190	440	ug/kg	1	EPA 8082	9/23/13	9/28/13 14:08	W3I1016	M-02
Aroclor 1242	ND	210	440	ug/kg	1	EPA 8082	9/23/13	9/28/13 14:08	W3I1016	M-02
Aroclor 1248	ND	340	440	ug/kg	1	EPA 8082	9/23/13	9/28/13 14:08	W3I1016	M-02
Aroclor 1254	ND	230	440	ug/kg	1	EPA 8082	9/23/13	9/28/13 14:08	W3I1016	M-02

Weck Laboratories, Inc 14859 East Clark Avenue, City of Industry, California 91745-1396 (626) 336-2139 FAX (626) 336-2634
www.wecklabs.com

Certificate of Analysis

Lab Sample ID: 3I20008-01 **Sample ID:** 13I0523-01 **Matrix:** Solid
Sampled by: Client **Sampled:** 09/10/13 15:00

Analyte	Result	MDL	MRL	Units	Dil	Method	Prepared	Analyzed	Batch	Qualifier
Aroclor 1260	ND	38	440	ug/kg	1	EPA 8082	9/23/13	9/28/13 14:08	W3I1016	M-02
Surrogate: Decachlorobiphenyl	*85 %*		*18-131*	%	Concentration: *188*					*M-02*
Surrogate: Tetrachloro-meta-xylene	*70 %*		*21-119*	%	Concentration: *156*					*M-02*

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Chico, California 95928
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fax 530.894.5143

December 12, 2013

Lab ID: 13K0768

HEATHER GROVE
CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
RE: BIOSOLIDS 4TH QUARTER

Dear HEATHER GROVE ,

Enclosed are the analysis results for Work Order number 13K0768. All analysis were performed under strict adherence to our established Quality Assurance Plan. Any abnormalities are listed in the qualifier section of this report.

If you have any questions regarding these results, please feel free to contact us at any time. We appreciate the opportunity to service your environmental testing needs.

Sincerely,

For

Ricky D. Jensen
Laboratory Director
California ELAP Certification Number 1677

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fax 530.243.7494
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Chico, California 95928
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fax 530.894.5143

Report To: CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
Attention: HEATHER GROVE
Project: BIOSOLIDS 4TH QUARTER
Description: BIOSOLIDS
Matrix: Solid

Lab No: 13K0768
Reported: 12/12/13
Phone: (209) 456-8473
P.O. # 037062

Lab ID: 13K0768-01
Received Temp (C): 19.1

Sampled: 11/19/13 14:20
Received: 11/20/13 11:53

General Chemistry - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Cyanide - Total	mg/kg	ND		0.75	2.50	SW 9014	12/03/13	12/02/13	B3L0682

Metals - TTLC

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Mercury	mg/kg	**0.21**	J	0.07	0.33	EPA 7471A	11/26/13	11/26/13	B3K1131

Metals - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Tin	mg/kg	ND		10.0	20.0	EPA 6010B	12/03/13	12/02/13	B3K1092

Volatile Organic Compounds - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Acetone	ug/kg	ND	R-08	250	1000	EPA 8260B	11/30/13	11/30/13	B3L0624
Acetonitrile	"	ND	R-08	500	1000	"	"	"	"
Acrolein	"	ND	R-08	300	500	"	"	"	"
Acrylonitrile	"	ND	R-08	100	200	"	"	"	"
Allyl chloride	"	ND	R-08	300	500	"	"	"	"
Benzene	"	ND	R-08	80.0	200	"	"	"	"
Bromobenzene	"	ND	R-08	80.0	200	"	"	"	"
Bromochloromethane	"	ND	R-08	80.0	200	"	"	"	"
Bromodichloromethane	"	ND	R-08	80.0	200	"	"	"	"
Bromoform	"	ND	R-08	60.0	200	"	"	"	"
Bromomethane	"	ND	R-08	100	200	"	"	"	"
2-Butanone (MEK)	"	ND	R-08	300	500	"	"	"	"
n-Butylbenzene	"	ND	R-08	80.0	200	"	"	"	"
sec-Butylbenzene	"	ND	R-08	80.0	200	"	"	"	"
tert-Butylbenzene	"	ND	R-08	80.0	200	"	"	"	"
Carbon disulfide	"	ND	R-08	80.0	200	"	"	"	"
Carbon tetrachloride	"	ND	R-08	80.0	200	"	"	"	"
Chlorobenzene	"	ND	R-08	80.0	200	"	"	"	"
Chloroethane	"	ND	R-08	80.0	200	"	"	"	"
2-Chloroethylvinyl ether	"	ND	R-08	80.0	200	"	"	"	"
Chloroform	"	ND	R-08	80.0	200	"	"	"	"
Chloromethane	"	ND	R-08	80.0	200	"	"	"	"
Chloroprene	"	ND	R-08	300	500	"	"	"	"
2-Chlorotoluene	"	ND	R-08	80.0	200	"	"	"	"
4-Chlorotoluene	"	ND	R-08	80.0	200	"	"	"	"
Dibromochloromethane	"	ND	R-08	80.0	200	"	"	"	"
1,2-Dibromo-3-chloropropane (DBCP)	"	ND	R-08	80.0	200	"	"	"	"
1,2-Dibromoethane (EDB)	"	ND	R-08	80.0	200	"	"	"	"
Dibromomethane	"	ND	R-08	80.0	200	"	"	"	"

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California ELAP Cert #1677 and #2718

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Report To: CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
Attention: HEATHER GROVE
Project: BIOSOLIDS 4TH QUARTER
Description: BIOSOLIDS
Matrix: Solid

Lab No: 13K0768
Reported: 12/12/13
Phone: (209) 456-8473
P.O. # 037062

Lab ID: 13K0768-01
Received Temp (C): 19.1

Sampled: 11/19/13 14:20
Received: 11/20/13 11:53

Volatile Organic Compounds - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
1,2-Dichlorobenzene (o-DCB)	"	ND	R-08	80.0	200	"	"	11/30/13	"
1,3-Dichlorobenzene (m-DCB)	"	ND	R-08	80.0	200	"	"	"	"
1,4-Dichlorobenzene (p-DCB)	"	ND	R-08	80.0	200	"	"	"	"
Dichlorodifluoromethane (CFC 12)	"	ND	R-08	80.0	200	"	"	"	"
1,1-Dichloroethane (1,1-DCA)	"	ND	R-08	80.0	200	"	"	"	"
1,2-Dichloroethane (1,2-DCA)	"	ND	R-08	80.0	200	"	"	"	"
1,1-Dichloroethene (1,1-DCE)	"	ND	R-08	80.0	200	"	"	"	"
cis-1,2-Dichloroethene (c-1,2-DCE)	"	ND	R-08	80.0	200	"	"	"	"
trans-1,2-Dichloroethene (t-1,2-DCE)	"	ND	R-08	80.0	200	"	"	"	"
1,2-Dichloropropane	"	ND	R-08	80.0	200	"	"	"	"
1,3-Dichloropropane	"	ND	R-08	80.0	200	"	"	"	"
2,2-Dichloropropane	"	ND	R-08	80.0	200	"	"	"	"
1,1-Dichloropropene	"	ND	R-08	80.0	200	"	"	"	"
cis-1,3-Dichloropropene	"	ND	R-08	80.0	200	"	"	"	"
trans-1,3-Dichloropropene	"	ND	R-08	80.0	200	"	"	"	"
1,4-Dioxane	"	ND	R-08	4000	10000	"	"	"	"
Ethylbenzene	"	ND	R-08	80.0	200	"	"	"	"
Ethyl tert-Butyl Ether (ETBE)	"	ND	R-08	80.0	200	"	"	"	"
Hexachlorobutadiene	"	ND	R-08	80.0	200	"	"	"	"
2-Hexanone	"	ND	R-08	400	1000	"	"	"	"
Isobutanol	"	ND	R-08	800	1000	"	"	"	"
Isopropylbenzene	"	ND	R-08	80.0	200	"	"	"	"
Di-Isopropyl Ether (DIPE)	"	ND	R-08	80.0	200	"	"	"	"
p-Isopropyltoluene	"	**238**	R-08	80.0	200	"	"	"	"
4-Methyl-2-pentanone (MIBK)	"	ND	R-08	200	1000	"	"	"	"
Methacrylonitrile	"	ND	R-08	700	1000	"	"	"	"
Dichloromethane (Methylene Chloride)	"	ND	R-08	200	1000	"	"	"	"
Methyl methacrylate	"	ND	R-08	300	500	"	"	"	"
Methyl tert-Butyl Ether (MTBE)	"	ND	R-08	80.0	200	"	"	"	"
Naphthalene	"	ND	R-08	80.0	200	"	"	"	"
Propionitrile	"	ND	R-08	600	1000	"	"	"	"
n-Propylbenzene	"	ND	R-08	80.0	200	"	"	"	"
Styrene	"	ND	R-08	80.0	200	"	"	"	"
tert-Amyl Methyl Ether (TAME)	"	ND	R-08	80.0	200	"	"	"	"
1,1,1,2-Tetrachloroethane	"	ND	R-08	80.0	200	"	"	"	"
1,1,2,2-Tetrachloroethane	"	ND	R-08	80.0	200	"	"	"	"
Tetrachloroethene (PCE)	"	ND	R-08	80.0	200	"	"	"	"
Tetrahydrofuran	"	ND	R-08	800	2000	"	"	"	"
tert-Butyl Alcohol (TBA)	"	ND	R-08	600	2000	"	"	"	"
Toluene	"	ND	R-08	80.0	200	"	"	"	"
1,2,3-Trichlorobenzene	"	ND	R-08	80.0	200	"	"	"	"
1,2,4-Trichlorobenzene	"	ND	R-08	80.0	200	"	"	"	"
1,1,1-Trichloroethane (1,1,1-TCA)	"	ND	R-08	80.0	200	"	"	"	"
1,1,2-Trichloroethane (1,1,2-TCA)	"	ND	R-08	80.0	200	"	"	"	"
Trichloroethene (TCE)	"	ND	R-08	80.0	200	"	"	"	"
Trichlorotrifluoroethane (Freon 113)	"	ND	R-08	80.0	200	"	"	"	"
Trichlorofluoromethane (Freon 11)	"	ND	R-08	80.0	200	"	"	"	"

Approved By

Basic Laboratory, Inc.
California ELAP Cert #1677 and #2718

basic laboratory
www.basiclab.com
2218 Railroad Avenue, Redding, California 96001, voice 530.243.7234, fax 530.243.7494
3860 Morrow Lane, Suite F, Chico, California 95928, voice 530.894.8966, fax 530.894.5143

Report To: CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
Attention: HEATHER GROVE
Project: BIOSOLIDS 4TH QUARTER
Description: BIOSOLIDS
Matrix: Solid

Lab ID: 13K0768-01
Received Temp (C): 19.1

Lab No: 13K0768
Reported: 12/12/13
Phone: (209) 456-8473
P.O. # 037062
Sampled: 11/19/13 14:20
Received: 11/20/13 11:53

Volatile Organic Compounds - Solid

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
1,2,3-Trichloropropane	"	ND	R-08	80.0	200	"	"	11/30/13	"
1,2,4-Trimethylbenzene	"	ND	R-08	80.0	200	"	"	"	"
1,3,5-Trimethylbenzene	"	ND	R-08	80.0	200	"	"	"	"
Vinyl acetate	"	ND	R-08	80.0	200	"	"	"	"
Vinyl chloride	"	ND	R-08	80.0	200	"	"	"	"
Xylenes (total)	"	ND	R-08	200	1000	"	"	"	"
Surrogate: 1,2-Dichloroethane-d4		*94.2 %*		*53.6-162*		"	"	"	"
Surrogate: Toluene-d8		*93.6 %*		*51.2-146*		"	"	"	"
Surrogate: 4-Bromofluorobenzene		*100 %*		*50.2-117*		"	"	"	"

Semi Volatile Organic Compounds

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
Acenaphthene	mg/kg	ND	R-08	0.99	9.90	EPA 8270C	11/25/13	11/22/13	B3K1043
Acenaphthylene	"	ND	R-08	0.99	9.90	"	"	"	"
Acetophenone	"	ND	R-08	0.99	9.90	"	"	"	"
2-Acetylaminofluorene	"	ND	R-08	0.99	9.90	"	"	"	"
Alachlor (ALANEX)	"	ND	R-08	0.99	9.90	"	"	"	"
4-Aminobiphenyl	"	ND	R-08	0.99	9.90	"	"	"	"
Anthracene	"	ND	R-08	0.99	9.90	"	"	"	"
Atrazine (AATREX)	"	ND	R-08	0.99	9.90	"	"	"	"
Benzidine	"	ND	R-08	0.99	9.90	"	"	"	"
Benzo (a) anthracene	"	ND	R-08	0.99	9.90	"	"	"	"
Benzo (a) pyrene	"	ND	R-08	0.99	9.90	"	"	"	"
Benzo (b) fluoranthene	"	ND	R-08	0.99	9.90	"	"	"	"
Benzo (g,h,i) perylene	"	ND	R-08	0.99	9.90	"	"	"	"
Benzo (k) fluoranthene	"	ND	R-08	0.99	9.90	"	"	"	"
Benzoic acid	"	ND	R-08	1.98	9.90	"	"	"	"
Benzyl alcohol	"	ND	R-08	0.99	9.90	"	"	"	"
Bis(2-chloroethyl)ether	"	ND	R-08	0.99	9.90	"	"	"	"
Bis(2-chloroethoxy)methane	"	ND	R-08	0.99	9.90	"	"	"	"
Bis(2-chloroisopropyl)ether	"	ND	R-08	0.99	9.90	"	"	"	"
Bis(2-ethylhexyl)adipate	"	ND	R-08	0.99	9.90	"	"	"	"
Bis(2-ethylhexyl)phthalate (DEHP)	"	**5.21**	R-08, J	0.99	9.90	"	"	"	"
4-Bromophenyl phenyl ether	"	ND	R-08	0.99	9.90	"	"	"	"
Butyl benzyl phthalate	"	ND	R-08	0.99	9.90	"	"	"	"
4-Chloro-3-methylphenol	"	ND	R-08	0.99	9.90	"	"	"	"
4-Chloroaniline	"	ND	R-08	0.99	9.90	"	"	"	"
Chlorobenzilate	"	ND	R-08	0.99	9.90	"	"	"	"
2-Chloronaphthalene	"	ND	R-08	0.99	9.90	"	"	"	"
2-Chlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
4-Chlorophenyl phenyl ether	"	ND	R-08	0.99	9.90	"	"	"	"
Chrysene	"	ND	R-08	0.99	9.90	"	"	"	"
Diallate (cis or trans)	"	ND	R-08	0.99	9.90	"	"	"	"
Dibenz (a,h) anthracene	"	ND	R-08	0.99	9.90	"	"	"	"
Dibenzofuran	"	ND	R-08	0.99	9.90	"	"	"	"

Approved By
Basic Laboratory, Inc.
California ELAP Cert #1677 and #2718

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Chico, California 95928
voice 530.894.8966
fax 530.894.5143

Report To: CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
Attention: HEATHER GROVE
Project: BIOSOLIDS 4TH QUARTER
Description: BIOSOLIDS
Matrix: Solid

Lab No: 13K0768
Reported: 12/12/13
Phone: (209) 456-8473
P.O. # 037062

Lab ID: 13K0768-01
Received Temp (C): 19.1

Sampled: 11/19/13 14:20
Received: 11/20/13 11:53

Semi Volatile Organic Compounds

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
1,2-Dichlorobenzene (o-DCB)	"	ND	R-08	0.99	9.90	"	"	11/22/13	"
1,3-Dichlorobenzene (m-DCB)	"	ND	R-08	0.99	9.90	"	"	"	"
1,4-Dichlorobenzene (p-DCB)	"	ND	R-08	0.99	9.90	"	"	"	"
3,3´-Dichlorobenzidine	"	ND	R-08	0.99	9.90	"	"	"	"
2,4-Dichlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
2,6-Dichlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
Dimethylaminoazobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
7,12-Dimethylbenz (a) anthracene	"	ND	R-08	0.99	9.90	"	"	"	"
3,3´-Dimethylbenzidine	"	ND	R-08	0.99	9.90	"	"	"	"
Diethyl phthalate	"	ND	R-08	0.99	9.90	"	"	"	"
2,4-Dimethylphenol	"	ND	R-08	0.99	9.90	"	"	"	"
Dimethyl phthalate	"	ND	R-08	0.99	9.90	"	"	"	"
Di-n-butyl phthalate	"	ND	R-08	0.99	9.90	"	"	"	"
Di-n-octyl phthalate	"	ND	R-08	0.99	9.90	"	"	"	"
4,6-Dinitro-2-methylphenol	"	ND	R-08	0.99	9.90	"	"	"	"
1,3-Dinitrobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
2,4-Dinitrophenol	"	ND	R-08	0.99	9.90	"	"	"	"
2,4-Dinitrotoluene	"	ND	R-08	0.99	9.90	"	"	"	"
2,6-Dinitrotoluene	"	ND	R-08	0.99	9.90	"	"	"	"
Diphenylamine	"	ND	R-08	0.99	9.90	"	"	"	"
1,2-Diphenylhydrazine	"	ND	R-08	0.99	9.90	"	"	"	"
Ethyl methanesulfonate	"	ND	R-08	0.99	9.90	"	"	"	"
Fluoranthene	"	ND	R-08	0.99	9.90	"	"	"	"
Fluorene	"	ND	R-08	0.99	9.90	"	"	"	"
Hexachlorobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
Hexachlorobutadiene	"	ND	R-08	0.99	9.90	"	"	"	"
Hexachlorocyclopentadiene	"	ND	R-08	0.99	9.90	"	"	"	"
Hexachloroethane	"	ND	R-08	0.99	9.90	"	"	"	"
Hexachloropropene	"	ND	R-08	0.99	9.90	"	"	"	"
Indeno (1,2,3-cd) pyrene	"	ND	R-08	0.99	9.90	"	"	"	"
Isodrin	"	ND	R-08	0.99	9.90	"	"	"	"
Isophorone	"	ND	R-08	0.99	9.90	"	"	"	"
Isosafrole	"	ND	R-08	0.99	9.90	"	"	"	"
Methapyrilene	"	ND	R-08	0.99	9.90	"	"	"	"
Methoxychlor	"	ND	R-08	0.99	9.90	"	"	"	"
Methyl methanesulfonate	"	ND	R-08	0.99	9.90	"	"	"	"
3-Methylcholanthrene	"	ND	R-08	0.99	9.90	"	"	"	"
2-Methylnaphthalene	"	ND	R-08	0.99	9.90	"	"	"	"
2-Methylphenol	"	ND	R-08	0.99	9.90	"	"	"	"
3 & 4-Methylphenol	"	ND	R-08	0.99	9.90	"	"	"	"
Naphthalene	"	ND	R-08	0.99	9.90	"	"	"	"
1,4-Naphthoquinone	"	ND	R-08	0.99	9.90	"	"	"	"
1-Naphthylamine	"	ND	R-08	0.99	9.90	"	"	"	"
2-Naphthylamine	"	ND	R-08	0.99	9.90	"	"	"	"
5-Nitro-o-toluidine	"	ND	R-08	0.99	9.90	"	"	"	"
2-Nitroaniline	"	ND	R-08	0.99	9.90	"	"	"	"
3-Nitroaniline	"	ND	R-08	0.99	9.90	"	"	"	"

Approved By

Basic Laboratory, Inc.
California ELAP Cert #1677 and #2718

basic laboratory
www.basiclab.com
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3860 Morrow Lane, Suite F, Chico, California 95928, voice 530.894.8966, fax 530.894.5143

Report To: CITY OF MANTECA
1001 WEST CENTER STREET
MANTECA, CA 95337
Attention: HEATHER GROVE
Project: BIOSOLIDS 4TH QUARTER
Description: BIOSOLIDS
Matrix: Solid

Lab ID: 13K0768-01
Received Temp (C): 19.1

Lab No: 13K0768
Reported: 12/12/13
Phone: (209) 456-8473
P.O. # 037062

Sampled: 11/19/13 14:20
Received: 11/20/13 11:53

Semi Volatile Organic Compounds

Analyte	Units	Results	Qualifier	MDL	RL	Method	Analyzed	Prepared	Batch
4-Nitroaniline	"	ND	R-08	0.99	9.90	"	"	11/22/13	"
Nitrobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
2-Nitrophenol	"	ND	R-08	0.99	9.90	"	"	"	"
4-Nitrophenol	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosodiethylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosodi-n-propylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosodimethylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosomethylethylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosodi-n-butylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosodiphenylamine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosopiperidine	"	ND	R-08	0.99	9.90	"	"	"	"
N-Nitrosopyrrolidine	"	ND	R-08	0.99	9.90	"	"	"	"
Pentachlorobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
Pentachloronitrobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
Pentachlorophenol (PCP)	"	ND	R-08	0.99	9.90	"	"	"	"
Phenacetin	"	ND	R-08	0.99	9.90	"	"	"	"
Phenanthrene	"	ND	R-08	0.99	9.90	"	"	"	"
Phenol	"	ND	R-08	0.99	9.90	"	"	"	"
1,4-Phenylenediamine	"	ND	R-08	0.99	9.90	"	"	"	"
Pronamide	"	ND	R-08	0.99	9.90	"	"	"	"
Pyrene	"	ND	R-08	0.99	9.90	"	"	"	"
Pyridine	"	ND	R-08	0.99	9.90	"	"	"	"
Safrole	"	ND	R-08	0.99	9.90	"	"	"	"
Simazine (PRINCEP)	"	ND	R-08	0.99	9.90	"	"	"	"
1,2,4,5-Tetrachlorobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
2,3,4,6-Tetrachlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
o-Toluidine	"	ND	R-08	0.99	9.90	"	"	"	"
1,2,4-Trichlorobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
2,4,6-Trichlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
2,4,5-Trichlorophenol	"	ND	R-08	0.99	9.90	"	"	"	"
1,3,5-Trinitrobenzene	"	ND	R-08	0.99	9.90	"	"	"	"
Surrogate: 2-Fluorophenol		*82.5 %*	*R-08*		*18-97.9*	"	"	"	"
Surrogate: Phenol-d5		*76.5 %*	*R-08*		*30.8-106*	"	"	"	"
Surrogate: 2,4,6-Tribromophenol		*118 %*	*R-08*		*48.6-152*	"	"	"	"
Surrogate: Nitrobenzene-d5		*110 %*	*R-08*		*17.7-119*	"	"	"	"
Surrogate: 2-Fluorobiphenyl		*73.0 %*	*R-08*		*26.2-110*	"	"	"	"
Surrogate: Terphenyl-dl4		*104 %*	*R-08*		*31.7-134*	"	"	"	"

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Basic Laboratory, Inc.
California ELAP Cert #1677 and #2718

Weck Laboratories, Inc.
Analytical Laboratory Service - Since 1964

Certificate of Analysis

Report Date: 12/12/13 10:53
Received Date: 11/21/13 10:00
Turnaround Time: Normal

Project: 13K0768

Phones: (530) 243-7234
Fax: (530) 243-7494

P.O. #:

Attn: Nathan Hawley

Client: Basic Laboratory
2218 Railroad Ave.
Redding, CA 96001-2504

Dear Nathan Hawley :

Enclosed are the results of analyses for samples received 11/21/2013 with the Chain of Custody document. The samples were received in good condition, at 2.9 °C and on ice. All analysis met the method criteria except as noted below or in the report with data qualifiers.

Lab Sample ID: 3K21045-01 **Sample ID: 13K0768-01** **Matrix:** Solid
Sampled by: Client **Sampled: 11/19/13 14:20**

Analyte	Result	MDL	MRL	Units	Dil	Method	Prepared	Analyzed	Batch	Qualifier
4,4'-DDD	ND	22	110	ug/kg	5	EPA 8081A	11/21/13	12/7/13 15:19	W3K0959	M-02, M-04
4,4'-DDE	ND	35	110	ug/kg	5	EPA 8081A	11/21/13	12/7/13 15:19	W3K0959	M-02, M-04
4,4'-DDT	ND	25	110	ug/kg	5	EPA 8081A	11/21/13	12/7/13 15:19	W3K0959	M-02, M-04
Aldrin	ND	52	110	ug/kg	5	EPA 8081A	11/21/13	12/7/13 15:19	W3K0959	M-02, M-04
alpha-BHC	ND	66	110	ug/kg	5	EPA 8081A	11/21/13	12/7/13 15:19	W3K0959	M-02, M-04
beta-BHC	ND	36	110	ug/kg	5	EPA 8081A	11/21/13	12/7/13 15:19	W3K0959	M-02, M-04
Chlordane (tech)	ND	460	2300	ug/kg	5	EPA 8081A	11/21/13	12/7/13 15:19	W3K0959	M-02, M-04
delta-BHC	ND	26	110	ug/kg	5	EPA 8081A	11/21/13	12/7/13 15:19	W3K0959	M-02, M-04
Dieldrin	ND	34	110	ug/kg	5	EPA 8081A	11/21/13	12/7/13 15:19	W3K0959	M-02, M-04
Endosulfan I	ND	26	110	ug/kg	5	EPA 8081A	11/21/13	12/7/13 15:19	W3K0959	M-02, M-04
Endosulfan II	ND	14	110	ug/kg	5	EPA 8081A	11/21/13	12/7/13 15:19	W3K0959	M-02, M-04
Endosulfan sulfate	ND	25	110	ug/kg	5	EPA 8081A	11/21/13	12/7/13 15:19	W3K0959	M-02, M-04
Endrin	ND	61	110	ug/kg	5	EPA 8081A	11/21/13	12/7/13 15:19	W3K0959	M-02, M-04
Endrin aldehyde	ND	32	110	ug/kg	5	EPA 8081A	11/21/13	12/7/13 15:19	W3K0959	M-02, M-04
gamma-BHC (Lindane)	ND	59	110	ug/kg	5	EPA 8081A	11/21/13	12/7/13 15:19	W3K0959	M-02, M-04
Heptachlor	ND	62	110	ug/kg	5	EPA 8081A	11/21/13	12/7/13 15:19	W3K0959	M-02, M-04
Heptachlor epoxide	ND	41	110	ug/kg	5	EPA 8081A	11/21/13	12/7/13 15:19	W3K0959	M-02, M-04

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Certificate of Analysis

Lab Sample ID: 3K21045-01 **Sample ID:** 13K0768-01 **Matrix:** Solid
Sampled by: Client **Sampled:** 11/19/13 14:20

Analyte	Result	MDL	MRL	Units	Dil	Method	Prepared	Analyzed	Batch	Qualifier
Methoxychlor	ND	25	110	ug/kg	5	EPA 8081A	11/21/13	12/7/13 15:19	W3K0959	M-02, M-04
Toxaphene	ND	390	3400	ug/kg	5	EPA 8081A	11/21/13	12/7/13 15:19	W3K0959	M-02, M-04
Surrogate: Decachlorobiphenyl	*76 %*		*21-125*	%	Concentration: *171*					*M-02, M-04*
Surrogate: Tetrachloro-meta-xylene	*81 %*		*18-112*	%	Concentration: *184*					*M-02, M-04*
Aroclor 1016	ND	770	2300	ug/kg	5	EPA 8082	11/21/13	12/7/13 15:19	W3K0958	M-02, M-04
Aroclor 1221	ND	1400	2300	ug/kg	5	EPA 8082	11/21/13	12/7/13 15:19	W3K0958	M-02, M-04
Aroclor 1232	ND	950	2300	ug/kg	5	EPA 8082	11/21/13	12/7/13 15:19	W3K0958	M-02, M-04
Aroclor 1242	ND	1100	2300	ug/kg	5	EPA 8082	11/21/13	12/7/13 15:19	W3K0958	M-02, M-04
Aroclor 1248	ND	1700	2300	ug/kg	5	EPA 8082	11/21/13	12/7/13 15:19	W3K0958	M-02, M-04
Aroclor 1254	ND	1200	2300	ug/kg	5	EPA 8082	11/21/13	12/7/13 15:19	W3K0958	M-02, M-04
Aroclor 1260	ND	190	2300	ug/kg	5	EPA 8082	11/21/13	12/7/13 15:19	W3K0958	M-02, M-04
Surrogate: Decachlorobiphenyl	*58 %*		*18-131*	%	Concentration: *131*					*M-02, M-04*
Surrogate: Tetrachloro-meta-xylene	*76 %*		*21-119*	%	Concentration: *172*					*M-04, M-02*

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Section VII

WQCF Phase IV Expansion Project Basis of Design Report

CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
PHASE IV EXPANSION PROJECT
BASIS OF DESIGN REPORT

DRAFT

October 2007

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CITY OF MANTECA

WASTEWATER QUALITY CONTROL FACILITY
PHASE IV EXPANSION PROJECT
BASIS OF DESIGN REPORT

DRAFT

October 2007

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LIST OF ABBREVIATIONS

The following abbreviations are used in this report:

ADWF	average dry weather flow
BDCM	Bromodichloromethane
BOD	Biochemical Oxygen Demand
BODR	Basis of Design Report
BP	Basin Plan
CIP	capital improvement plan
CS	combined sludge (primary sludge and thickened waste activated sludge)
CTR	California Toxic Rule
DAF	Dissolved air flotation
DPH	California Department of Public Health
DO	dissolved oxygen
DWR	Department of Water Resources
EC	electrical conductivity
HRT	hydraulic retention time
I-5	Interstate 5
IPP	Industrial Pipeline Project
IPS	influent pump station
LAA	Land Application Area
MBAS	Methylene Blue Active Substances
MCL	maximum contaminant level
MCRT	mean cell residence time
MDF	maximum daily flow
mgd	million gallons per day
MHF	maximum hourly flow
MLE	modified Ludzack-Ettinger
MLSS	mixed liquor suspended solids concentration
MUN	Municipal
NSF	Northside facilities
NTU	nephelometric turbidity unit
NPDES	National Pollutant Discharge Elimination System
NWRI	National Water Research Institute
OEHHA	California Office of Environmental Health Hazard Assessment
PFIP	Public Facilities Implementation Plan
PPP	pollution prevention programs
PS	Primary sludge

PSB	primary sedimentation basin
RAS	return activated sludge
RWQCB	Regional Water Quality Control Board
SEEP	Secondary Effluent Equalization Pond
SIP	State Implementation Policy
SR-120	State Route 120
SSF	Southside facilities
SSJID	South San Joaquin Irrigation District
TMDL	total maximum daily load
TN	total nitrogen
TSS	Total Suspended Solids
TTHM	Total trihalomethanes
TTF	Tertiary treatment facilities
TWAS	thickened waste activated sludge
UMP	updated master plan
VSS	volatile suspended solids
WAS	waste activated sludge
WGF	Wastewater generation factors
WQCF	Manteca Wastewater Quality Control Facility

1 Background

In support of a new General Plan and updated Public Facilities Implementation Plan (PFIP), an expansion of the Manteca Wastewater Quality Control Facility is proposed (Phase IV Expansion Project). Background information; highlights of facility operational history; a description of the treatment facility; a discussion of the recent Phase III Expansion Project; a summary of effluent quality requirements; and a review of historical performance are presented in this chapter.

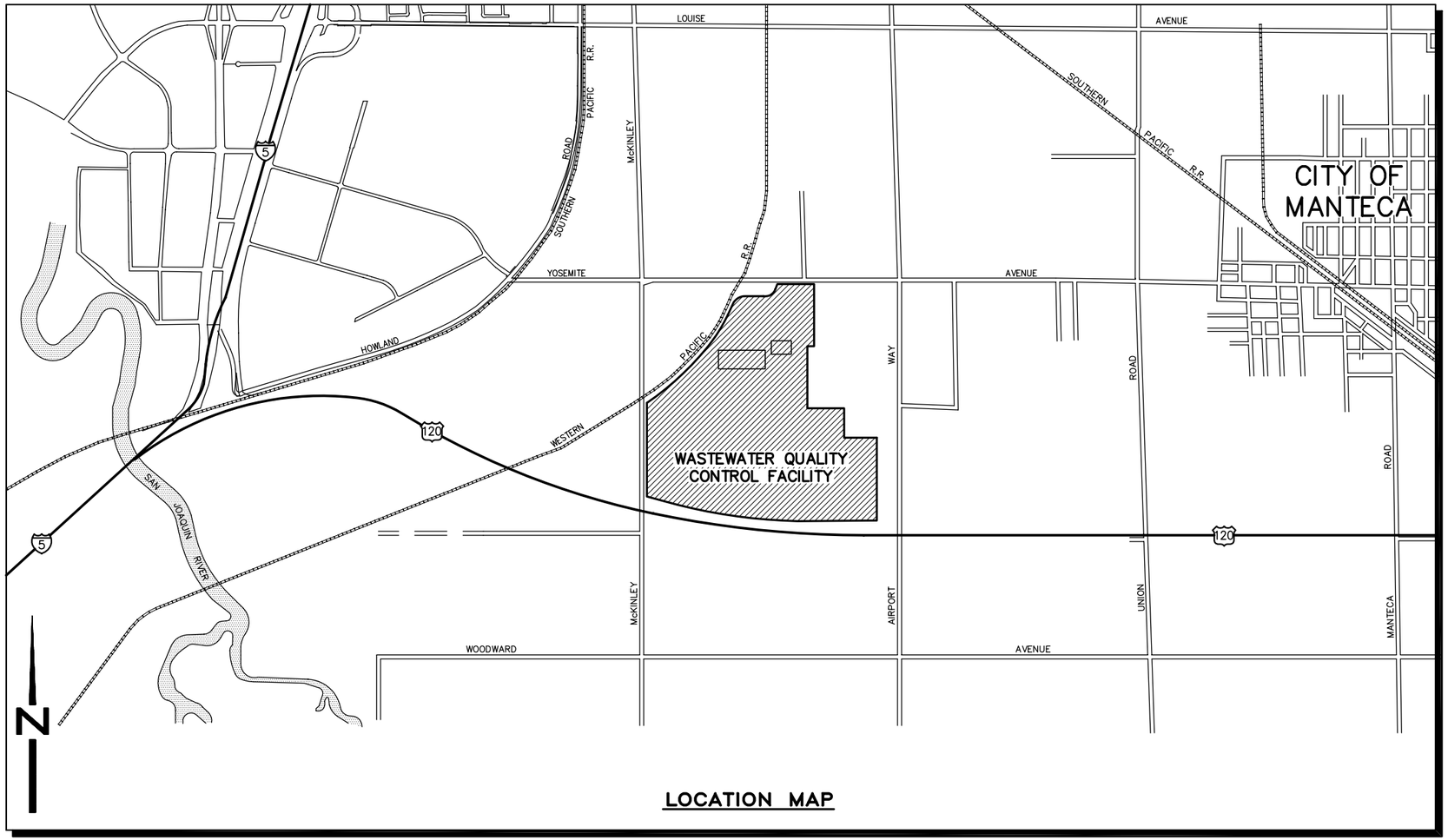
1.1 Purpose

The Manteca Wastewater Quality Control Facility (WQCF) is a 9.87 million gallons per day (mgd) rated combined biofilter-activated sludge tertiary treatment plant. Secondary effluent is land applied during the spring and summer (flood irrigation for agricultural production) and tertiary effluent is discharged to the San Joaquin River during the winter (October-March). In the future, year-round discharge to the river is anticipated because of the limited capacity of City-owned land for wastewater applications. In conjunction with the development of the City of Manteca Public Facilities Implementation Plan (PFIP), a master plan for the Manteca WQCF was prepared in 2007 [1]. The master plan included an analysis of existing unit processes, an evaluation of expansion options for the facility, a discussion of disposal alternatives, and a description of phased improvements. The Phase IV Expansion Project incorporates the recommendations of the 2007 Master Plan and reflects the current needs and operating requirements for the plant. The capacity of the Manteca WQCF will increase from 9.87 mgd to 17.50 mgd (average dry weather flow) following completion of the Phase IV expansion project in 2012. This capacity is anticipated to support City-wastewater requirements for approximately 5-10 years.

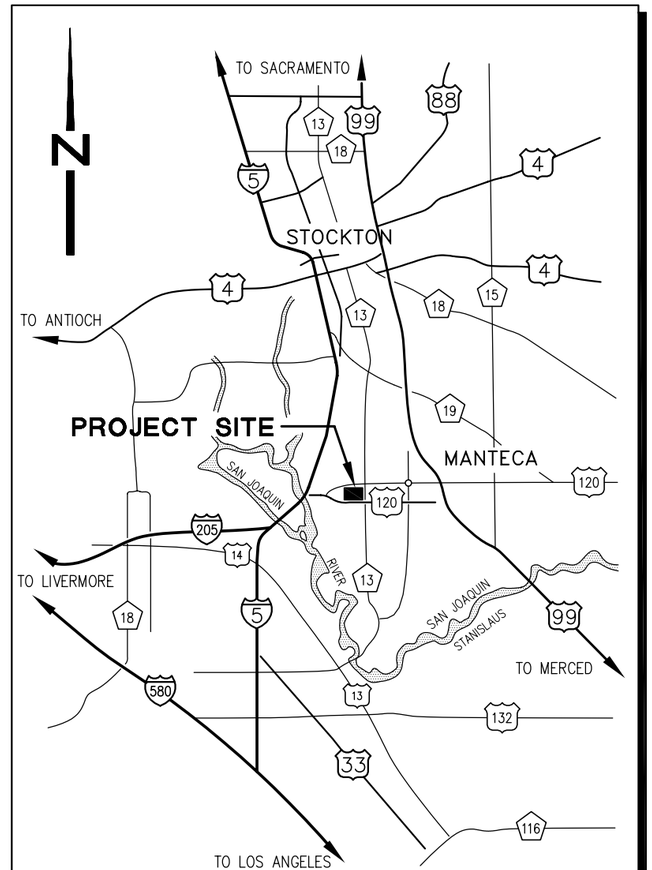
As part of the implementation of the Phase IV Expansion Project, an application for revised NPDES permit requirements will be prepared by the City. An integral element of the NPDES permit application documentation is a Basis of Design Report (BODR) summarizing the proposed Phase IV improvements. The BODR presented in this technical document includes an analysis of projected flows and loadings, a summary of wastewater treatment and disposal strategies, and a description of unit process design criteria. Treatment process selection and sizing is predicated upon satisfying anticipated effluent quality requirements.

1.2 Facility Operational History

The Manteca WQCF is located on 210 acres of City owned property southwest of downtown Manteca at 2450 West Yosemite Avenue (see Figure 1-1). The WQCF treats typical municipal wastewater generated in the City of Manteca and the neighboring City of Lathrop. The plant also receives seasonal discharges from a local food processor (Eckert Cold Storage) for direct application to land.



LOCATION MAP



VICINITY MAP

FIGURE 1-1

MANTECA WASTEWATER QUALITY CONTROL FACILITY
PHASE IV EXPANSION PROJECT
BASIS OF DESIGN REPORT

LOCATION OF MANTECA WQCF

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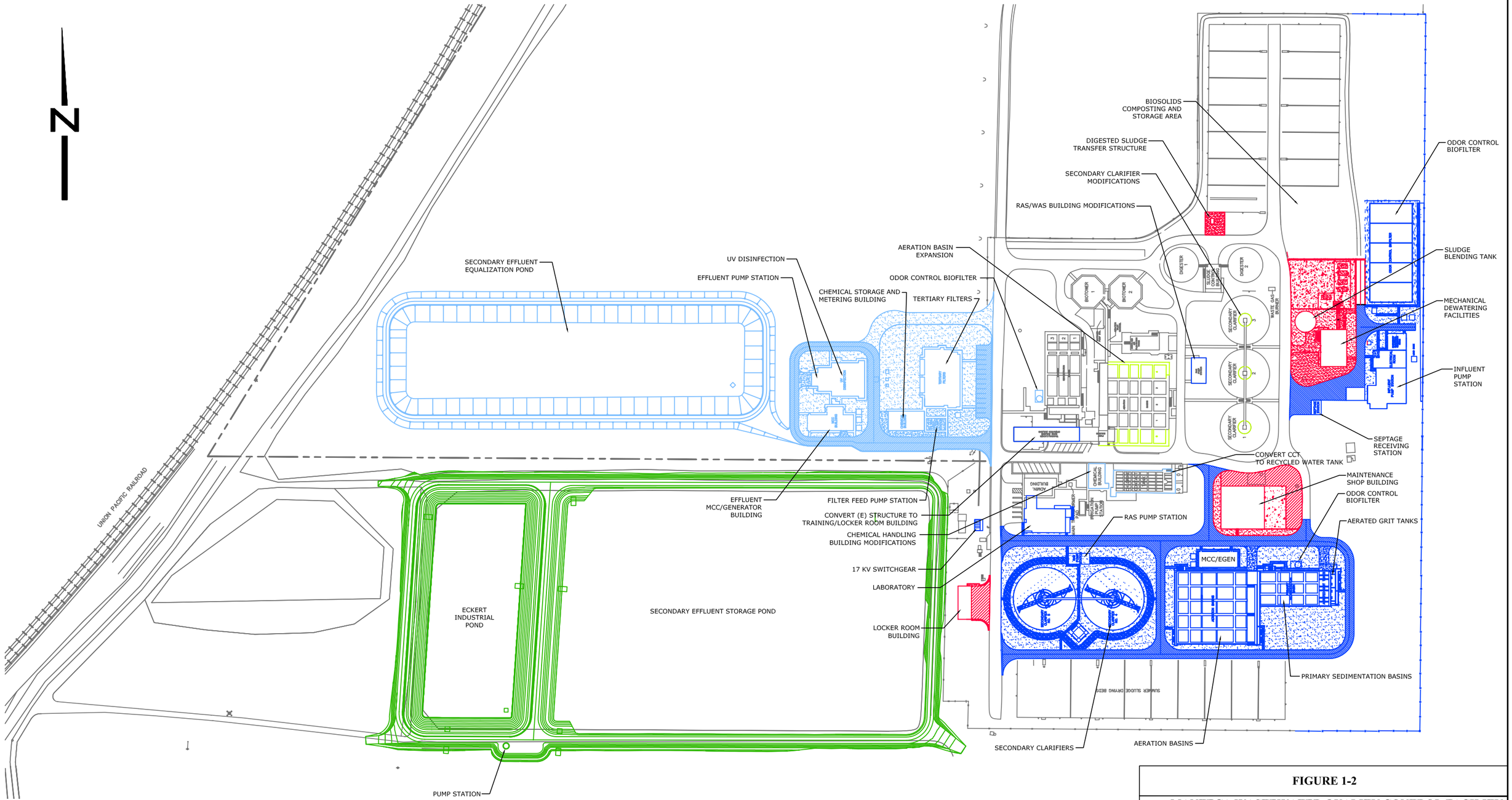
The Manteca WQCF began operation in 1959. At that time the facility consisted solely of an oxidation pond. Pond effluent was discharged to the surrounding land. In 1970, the first major upgrade to the plant occurred. This upgrade included the construction of preliminary and primary treatment facilities and aerobic sludge digestion. Effluent continued to be discharged to the land for agricultural applications. In 1986-1988, as part of the Clean Water Grant Program, a major expansion to the plant was constructed. This Phase I Expansion Project included the construction of secondary treatment facilities, anaerobic sludge digesters, sludge drying beds, a chlorine disinfection system, and an outfall to the San Joaquin River. Design capacity of the plant following the Phase I project was 5.45 mgd (ADWF). The Phase II Expansion Project in 1992-1993 added a primary sedimentation basin, secondary clarifier, and four sludge drying beds, increasing the facility capacity to 6.95 mgd (ADWF). Most recently, during the 2002-2007 period, the Phase III Expansion Project converted the plant to full tertiary treatment while increasing the capacity to 9.87 mgd (ADWF). A more detailed discussion of the Phase III improvements is provided below.

a. Overview of Phase III Expansion Project

The Phase III Expansion Project was divided into four Schedules: A, B, C, and D, respectively (see Figure 1-2).

Schedule A improvements included the construction of two new aeration basins, modifications to three existing secondary clarifier sludge collection mechanisms, and replacement of two existing centrifugal blowers with larger and more energy efficient units within the northside facilities (NSF). Schedule A improvements resulted in an increase in plant capacity from 6.95 to 7.5 mgd (ADWF). Improvements also resulted in the production of a nitrified effluent. As part of the Schedule A improvements, the City also procured a skid-mounted centrifugal dewatering system to dewater anaerobically digested primary and secondary sludges to augment the existing drying bed facilities.

Schedule B improvements included the construction of a new influent pump station, two aerated grit tanks, three primary sedimentation basins, five aeration basins, two secondary clarifiers, and an odor control biofilter. These primary and secondary treatment facilities are referred to as the southside facilities (SSF). Schedule B improvements also included the expansion of the existing laboratory and administration building. Schedule B improvements increased the treatment capacity of the plant from 7.5 mgd to 9.87 mgd (ADWF). Effluent, at the completion of Schedule B, was fully nitrified and denitrified.



LEGEND

- SCHEDULE A
- SCHEDULE B
- SCHEDULE C
- SCHEDULE D
- INDUSTRIAL PIPELINE PROJECT

FIGURE 1-2

MANTECA WASTEWATER QUALITY CONTROL FACILITY
PHASE IV EXPANSION PROJECT
BASIS OF DESIGN REPORT

PHASE III EXPANSION PROJECT - SITE PLAN

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The improvements proposed under Schedule C primarily involved solids handling. Under Schedule C, a mechanical dewatering facility was planned. The skid-mounted centrifugal dewatering system acquired under Schedule A will be relocated to a new dewatering building. Additional improvements to occur under Schedule C include the construction of a Shop/Maintenance Building and a Locker Room Building.

Schedule D improvements included the construction of a secondary effluent equalization pond (SEEP), filter feed pump station, coagulation and flocculation facilities, tertiary filters, a chemical storage and handling facility, a UV disinfection system, an effluent pumping station, and two odor control biofilters. In addition to flow attenuation, the SEEP will store water during periods of reverse river flow due to tidal influence in the San Joaquin River. With the Schedule D improvements, the plant is capable of producing tertiary-disinfected recycled water suitable for unrestricted use.

b. Industrial Pipeline Phase 3

Although not part of the Phase III Expansion Project, the City has initiated additional efforts to improve plant operations and effluent quality. Under the Industrial Pipeline Project Phase 3 (IPP-3), the existing secondary effluent storage pond (SESP) was modified to create a second lined pond for food processing wastewater from Eckert Cold Storage (Eckert). In the past, high-strength Eckert wastewater has been co-mingled with domestic wastewater and processed through the WQCF prior to disposal. IPP-3 is the final component in a source separation program designed to allow independent treatment of Eckert wastewater prior to land application at the WQCF. By segregating industrial wastewater, the operation of the plant facilities are optimized with less risk of potential process upsets.

1.3 Description of Existing Facilities

Currently (at the completion of the Phase III Expansion Project), the Manteca WQCF consists of an influent pump station with two mechanical screens that serves two parallel secondary treatment facilities. The two treatment trains are designated as the Northside Facilities (NSF) and the Southside Facilities (SSF) . The NSF includes two aerated grit tanks, three primary sedimentation basins, a biotower feed pump station, two biotowers, five fine-bubble activated sludge aeration basins, and three secondary clarifiers. The SSF includes two aerated grit tanks, three primary sedimentation basins, five fine-bubble activated sludge aeration basins, and two secondary clarifiers. Downstream of the NSF and SSF, tertiary treatment facilities (TTF) include the 6.0 MG SEEP, one rapid-mix tank, three flocculation basins, six cloth-disk filters, two UV disinfection channels, and a 15 MG SESP. Solid handling facilities include two dissolved air flotation units, two anaerobic digesters, one centrifugal dewatering system, and drying beds. Undisinfected secondary effluent is used to irrigate approximately 190 acres of City-owned land surrounding the plant. Flows in excess of crop demands are filtered and UV-disinfected prior to discharge to the San Joaquin River.

Anaerobically digested sludge is dewatered, dried, stored on-site, and then transported to a local landfill. A site plan of the existing treatment plant can be seen in Figure 1-3.

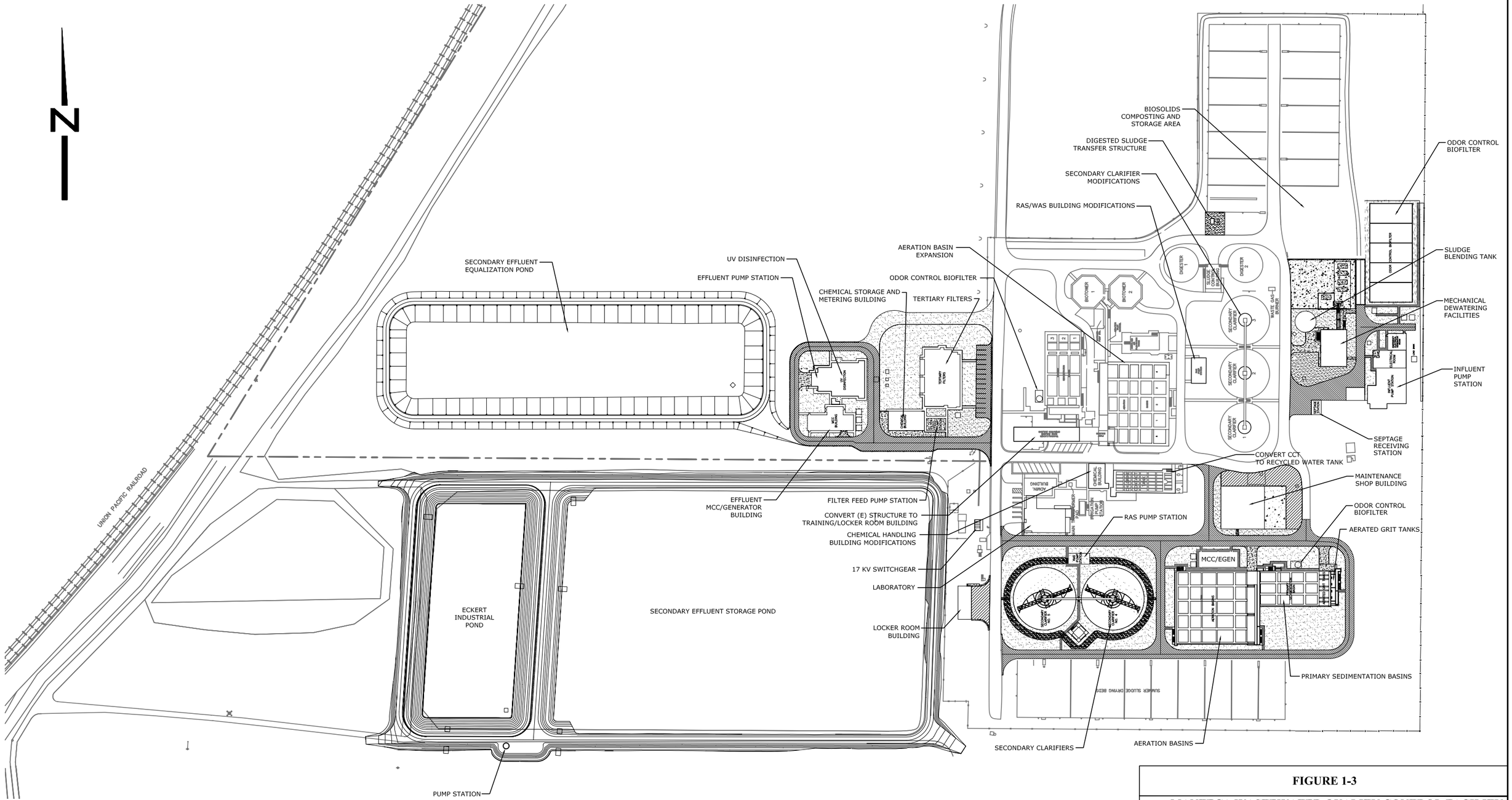

FIGURE 1-3

MANTECA WASTEWATER QUALITY CONTROL FACILITY
PHASE IV EXPANSION PROJECT
BASIS OF DESIGN REPORT

SITE PLAN PRIOR TO PHASE IV EXPANSION PROJECT

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1.4 Discussion of Effluent Quality Requirements

The Manteca WQCF operates under Regional Board Order No. R5-2004-0028 (NPDES Permit No. CA0081558) issued by the State of California Regional Quality Control Board (RWQCB) [2]. Water quality parameters for river discharge are summarized in Table 1-1. As seen in Table 1-1, beyond February 2009, water quality limitations will become more stringent for BOD, TSS, total coliform, and turbidity.

TABLE 1-1
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
SUMMARY OF CURRENT WATER QUALITY REQUIREMENTS
FOR RIVER DISCHARGE

Constituent	Units	Requirement[a] (Effective through January 31, 2009)	Requirement (Effective as of February 1, 2009)
BOD	mg/L	20	10
TSS	mg/L	20	10
Total Coliform	MPN/100 mL	23[b]	2.2[b]
Turbidity	NTU	--	2[c]
Settleable Solids	mg/L	0.1	0.1
Chlorine Residual	mg/L	0.01[db]	0.01[d]
Oil and Grease	mg/l	10	10
Aluminum	µg/L	71	71
Conductivity	µmhos/cm	1,000	1,000
Ammonia (as N)			
June through September	mg/L	2.1	2.1
October through May	mg/L	2.8	2.8
Arsenic	µg/L	10	10
Copper	µg/L	7.9	7.9
Cyanide	µg/L	3.7	3.7
Iron	µg/L	300	300
Manganese	µg/L	50	50
Methylene Blue Active Substances (MBAS)	µg/L	500	500
Nitrate (as N)	mg/L	10	10
Nitrite (as N)	mg/L	1	1
Bis (2-ethylhexyl) phthalate	µg/L	22	22

Table 1-1 (continued)
City of Manteca
Wastewater Quality Control Facility
Summary of Current Water Quality Requirements
for River Discharge

Constituent	Units	Requirement[a] (Effective through January 31, 2009)	Requirement (Effective as of February 1, 2009)
Bromodichloromethane	µg/L	5	5
Dibromochloromethane	µg/L	1.4	1.4
Mercury	lb/yr	0.69[e]	0.69[e]
2,4,6-Trichlorophenol	µg/L	34	34

[a] Monthly average, unless noted otherwise
[b] Weekly median
[c] 24-hour average
[d] 4 day average
[e] Corresponds to 0.028 µg/L for the average treatment design capacity of 8.11 mgd

1.5 Historical Performance

Construction of the Phase III Expansion Project has contributed significantly to a marked improvement in effluent quality. With the completion of the Schedule A and Schedule B improvements at the Manteca WQCF, increased removals of organics (BOD_5) and nutrients (ammonia) have occurred. Specifically, for the year 2006, average effluent BOD_5, Ammonia-nitrogen, and suspended solids concentrations were less than 3 mg/L, 0.2 mg/L, and 10 mg/L respectively [3].

2 Projected Flow and Loadings

Anticipated future flow rates and loadings to the Manteca WQCF are presented below. Future average daily WQCF flows are predicted using General Plan land use information [4] and wastewater generation factors established for specific land uses. Future peak daily and peak hourly WQCF flows are projected using peaking factors based on WQCF flow data from August 2006 to September 2007. Projected flows are presented for Year 2023 (General Plan 20-year horizon) and buildout ultimate conditions.

2.1 Projected Flow

Wastewater generation factors (WGF) for various land uses are summarized in Table 2-1. Residential WGFs were calculated using the dwelling densities adopted in October 2003 [4]. Future average daily flows for each land use area are projected by multiplying the appropriate WGF with the land use area. As presented in Table 2-2, flows predicted for various land uses are then totaled to estimate the future contribution from the City of Manteca. Because of a contractual agreement between the Cities of Manteca and Lathrop, 14.7 percent of the WQCF capacity is made available for the treatment of Lathrop wastewater. Combined future Manteca and Lathrop flows are summarized in Table 2-3.

As presented in Table 2-3, future average wastewater flows for Manteca and Lathrop are anticipated at 19.5 mgd and 3.5 mgd in Year 2023, and 23 mgd and 4 mgd, at buildout, respectively. The total projected average wastewater flow to the WQCF is 23 mgd at Year 2023 and 27 mgd at buildout. Differences in flow from Year 2023 to buildout represent development within the Urban Reserve areas as detailed in the General Plan [4]. For project planning purposes, a target capacity of 17.5 mgd was selected for Phase IV. Buildout capacity would subsequently be available through the construction of Phase V facilities.

TABLE 2-1
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
WASTEWATER GENERATION FACTORS

Land Use	Designation	Density[a] (dwelling units/acre)	Wastewater Generation Factor[b] (gpd/acre)
Very low density residential	VLDR	Less than 2	530[c]
Low density residential	LDR	2.1-8	1,338[d]
Medium density residential	MDR	8.1-15	2,183[e]
High density residential	HDR	15.1-25	3,789[f]
Commercial mixed use	CMU	--	2,473
General commercial	GC	--	1,120
Heavy industrial	HI	--	2,010
Light industrial	LI	--	2,010
Public/Quasi-Public (P/QP)	PQP	--	425
Park	P	--	400
Agriculture	AG	--	0
Open space	OS	--	0
Neighborhood commercial	NC	--	1,120
Business industrial park	BIP	--	1,330[g]
Urban reserve	UR	--	0
Very low density residential – urban reserve	UR-VLDR	--	530
Low density residential – urban reserve	UR-LDR	--	1,338
Medium density residential – urban reserve	UR-MDR	--	2,183
Commercial mixed use – urban reserve	UR-CMU	--	2,473
General commercial – urban reserve	UR-GC	--	1,120
Light industrial – urban reserve	UR-LI	--	2,010
Public/Quasi-Public – urban reserve	UR-PQP	--	425
Park – urban reserve	UR-P	--	400
Agriculture – urban reserve	AG-UR	--	0
Business industrial park – urban reserve	UR-BIP	--	1,330

[a] Based on the adopted 2003 General Plan [4]
[b] Nonresidential generation factors based on the 1993 Wastewater Collection Master Plan [5]
[c] Generation rate based on 265 gpd/edu [6] and density of 2 dwelling units per acre
[d] Generation rate based on 265 gpd/edu [6] and density of 5.05 dwelling units per acre
[e] Generation rate based on 189 gpd/edu [6] and density of 11.55 dwelling units per acre
[f] Generation rate based on 189 gpd/edu [6] and density of 20.05 dwelling units per acre
[g] Generation rate assumed comparable to business park (office professional)

TABLE 2-2
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
PROJECTED WASTEWATER FLOWS – MANTECA ONLY
YEAR 2023 AND BUILDOUT CONDITIONS

Land Use	Area, Acres	Wastewater Generation Factor[a] (gpd/acre)	Wastewater Flow, mgd
VLDR	928	530	0.49
LDR	6,474	1,338	8.66
MDR	462	2,183	1.01
HDR	420	3,789	1.59
CMU	532	2,473	1.31
GC	893	1,120	1.00
HI	953	2,010	1.92
LI	1,048	2,010	2.11
PQP	1,124	425	0.48
P	536	400	0.21
AG	3,956	0	0
OS	438	0	0
NC	153	1,120	0.17
BIP	211	1,330	0.28
UR	1,758	0	0
Year 2023 (rounded)	**19,890**		**19.5**
UR-VLDR	996	530	0.53
UR-LDR	1,432	1,325	1.92
UR-MDR	20	1,701	0.04
UR-CMU	43	2,473	0.11
UR-GC	43	1,120	0.05
UR-LI	115	2,010	0.23
UR-PQP	12	425	0.005
UR-P	65	400	0.03
UR-AG	1789	0	0
UR-BIP	425	1,330	0.57
Buildout (rounded)	**24,830**		**23.0**

TABLE 2-3
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
PROJECTED WASTEWATER FLOWS

	Year 2023	Buildout
City of Manteca	19.5	23.0
City of Lathrop[a]	3.5	4.0
Total	23.0	27.0

[a] Based on contractual agreement for 14.7% of total plant capacity.

Hydraulic peaking factors were estimated using WQCF flow data from August 2006 to September 2007. Average daily total plant flows are shown in Figure 2-1. For reference, the average annual flow (AAF) was 6.30 mgd. The peak daily flow (PDF) was observed on May 24, 2007 at 8.14 mgd. This represents a daily peaking factor (PDF/AAF) of 1.29.

Instantaneous flow rates recorded in 10 minute increments for the period August 1, 2006 through September 30, 2007 were used to establish a peak hour factor. The highest peak hourly flow (PHF) was observed on August 20, 2006 at 1:30 PM. The observed PHF of 12.19 mgd corresponds to a 99.938 percentile (percent of measured values equal to or less than PHF). For reference, a log-probability plot of the flow data in 10 minute increments is shown in Figure 2-2.

Based on the 2006/2007 PHF of 12.19 mgd, the recommended Phase IV hourly peaking factor (PHF/AAF) is 1.93. For reference, the design peak hour flow factor for the Phase III Expansion Project was 1.94.

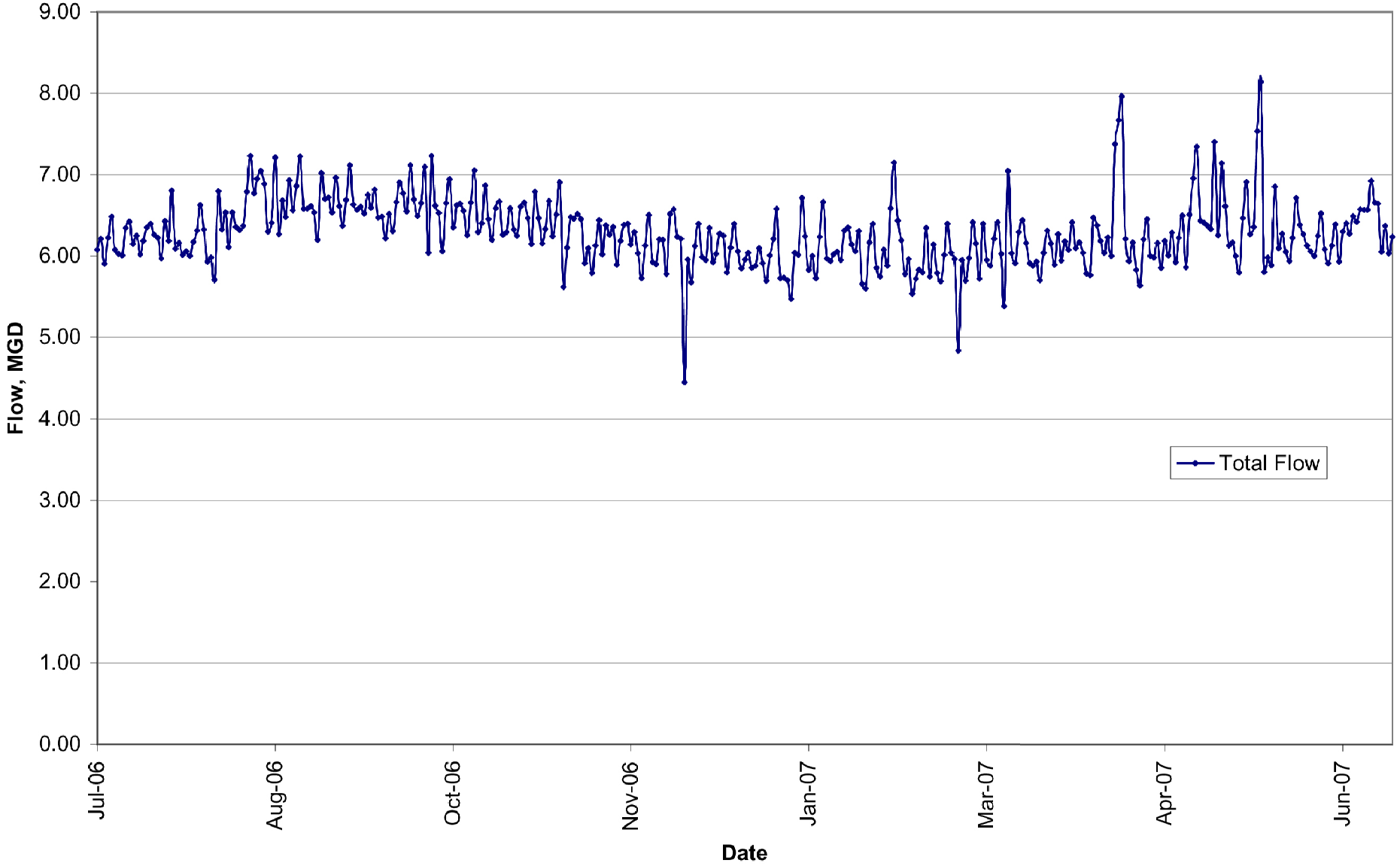

FIGURE 2-1

MANTECA WASTEWATER QUALITY CONTROL FACILITY
PHASE IV EXPANSION PROJECT - BASIS OF DESIGN REPORT

AVERAGE DAILY FLOW FOR 2006/2007

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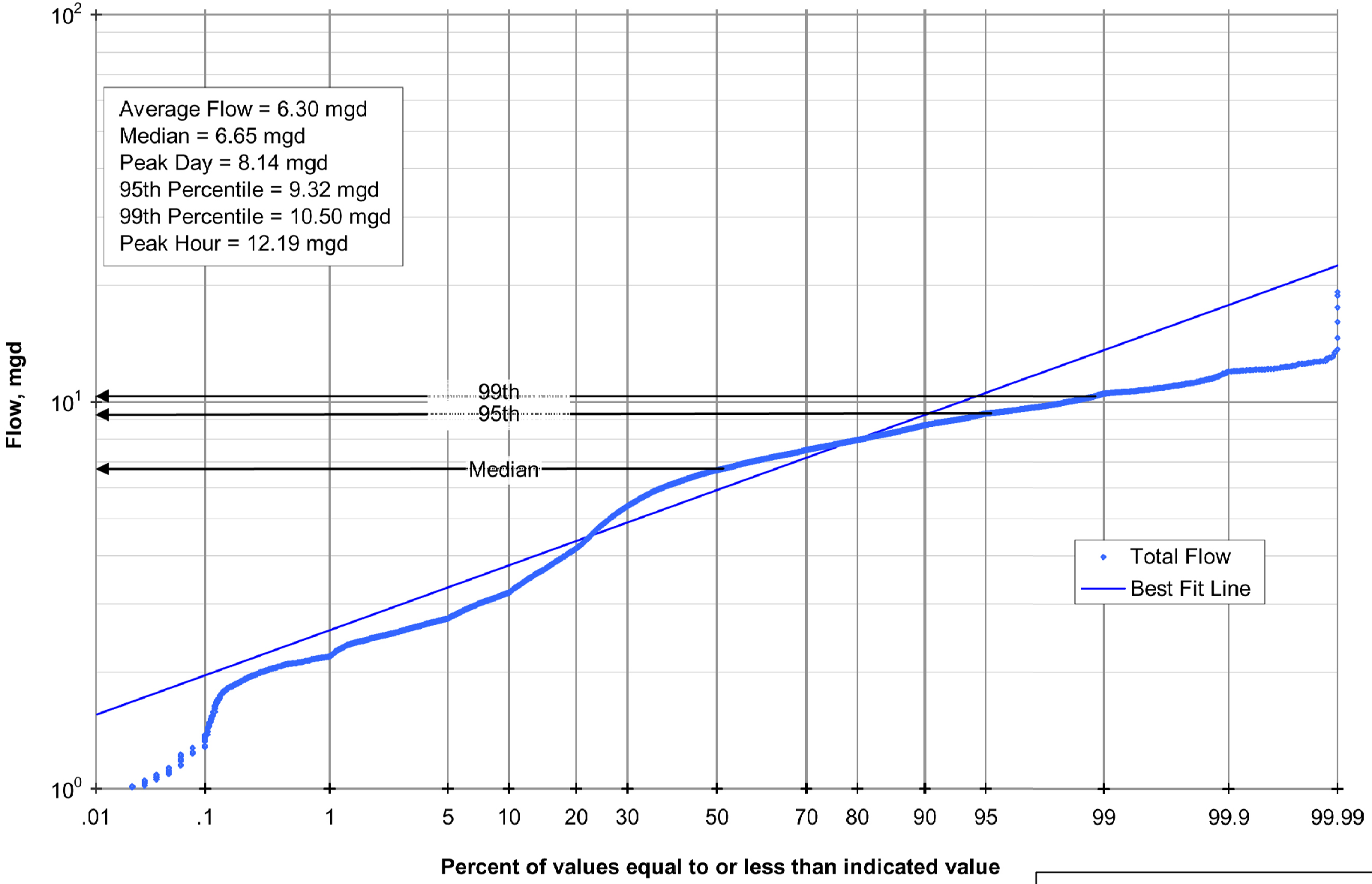

FIGURE 2-2

MANTECA WASTEWATER QUALITY CONTROL FACILITY
PHASE IV EXPANSION PROJECT - BASIS OF DESIGN REPORT

LOG PROBABILITY PLOT
FOR FLOWS DURING 2006/2007

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Future peak day and peak hour flows are estimated using the anticipated future average flows and the peaking factors discussed above. Influent flow rates observed in 2006/2007 and anticipated Phase IV and buildout flow rates are summarized in Table 2-4.

TABLE 2-4
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
SUMMARY OF WASTEWATER FLOWS (MGD)

Parameter	2006/2007	Phase IV	Buildout
Average annual flow	6.30	17.5	27.0
Peak daily flow	8.14	22.6	34.9
Peak hourly flow	12.09	33.9	52.2

[a] Flows from cities of Manteca and Lathrop.

2.2 Projected Loadings

Wastewater loadings are a key parameter in the development of design criteria for a wastewater treatment plant. For the Manteca WQCF, wastewater loadings used in design are summarized in Table 2-5. Future average and peak organics (BOD), TSS, and ammonia loadings (loadings) are based on plant influent data from July 2006 through June 2007 and the anticipated future AAF to the plant. Wastewater loadings are then compared with design criteria for the Phase III Expansion Project.

TABLE 2-5
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
SUMMARY OF WASTEWATER LOADINGS USED FOR DESIGN PURPOSES

Loading Parameter	Design Purpose
Average value	Quantify annual sludge production. Seasonal sludge production can also be estimated using average values.
	Estimate annual operational and maintenance requirements and costs.
Maximum monthly	Design of biological treatment processes such as aeration basins considering 30-day NPDES permit requirements.
Maximum weekly	Check secondary treatment design criteria (developed based on maximum monthly) and determine weekly effluent quality. Compare with 7-day NPDES permit requirements.
Maximum daily	Design of waste activated sludge (WAS) thickening facilities.
	Design of secondary clarifiers and filtration facilities.
	Check secondary treatment design criteria (developed based on maximum monthly) and determine daily effluent quality. Compare with maximum daily NPDES permit requirements. Maximum daily values would be used in design of secondary treatment facilities, if the ratio of maximum daily to maximum monthly (or 95th percentile) values exceed three for BOD and TSS loading, and two for ammonia loading, respectively.

a. Future Average WQCF Loadings

Influent BOD, TSS, and ammonia concentrations from July 2006 through June 2007 are shown in Figures 2-3, 2-4, and 2-5, respectively. Average BOD, TSS, and ammonia concentrations during this period are 298 mg/L BOD, 333 mg/L TSS, and 30 mg/L ammonia, respectively. As a comparison, the design values for the Phase III Expansion Project are 310 mg/L BOD, 315 mg/L TSS, and 35 mg/L TKN. For reference, the Phase III Expansion Project design criteria reflect influent quality data for the period 1995-2000.

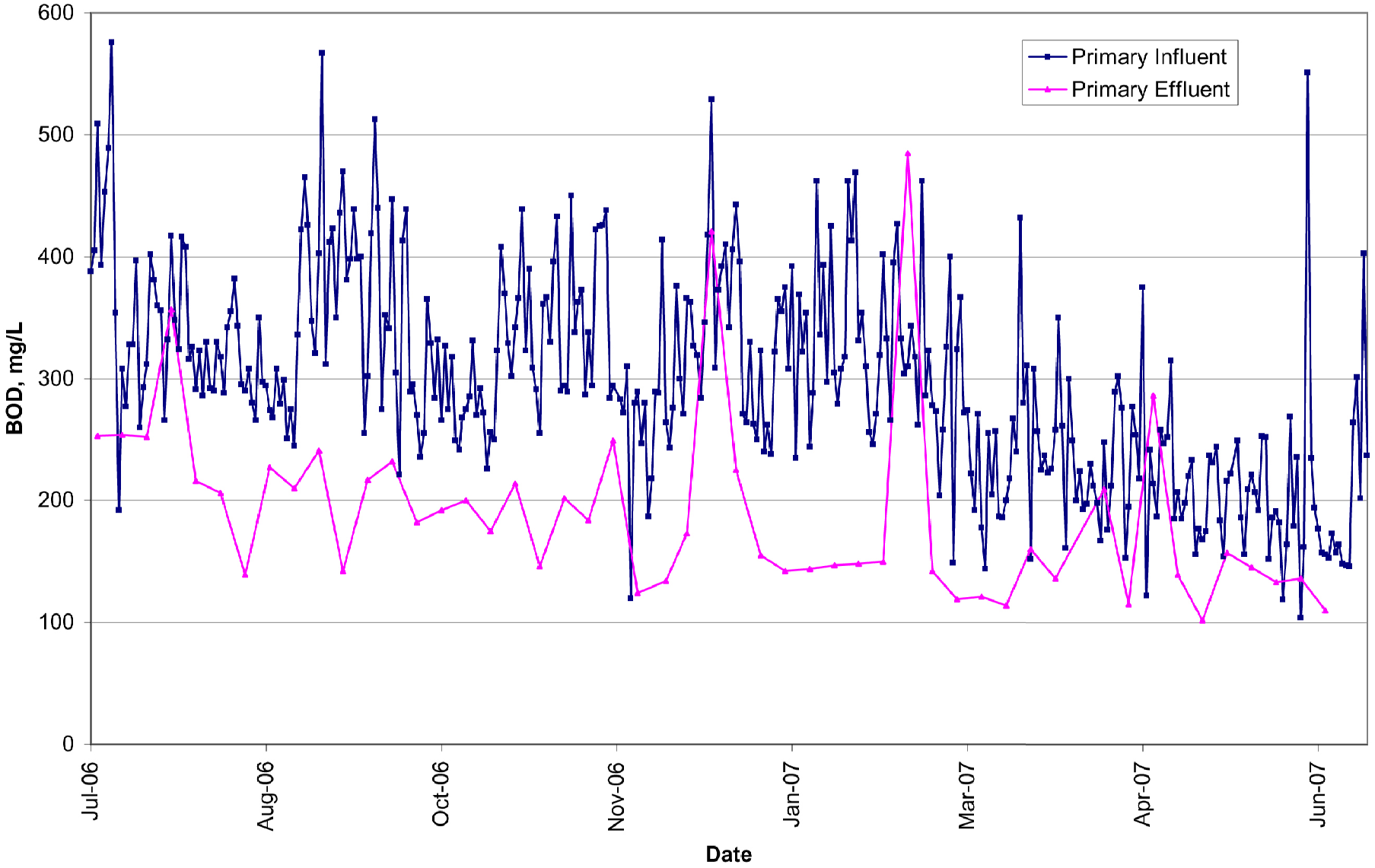

FIGURE 2-3

MANTECA WASTEWATER QUALITY CONTROL FACILITY PHASE IV EXPANSION PROJECT - BASIS OF DESIGN REPORT

AVERAGE DAILY PRIMARY INFLUENT AND PRIMARY EFFLUENT BOD FOR 2006/2007

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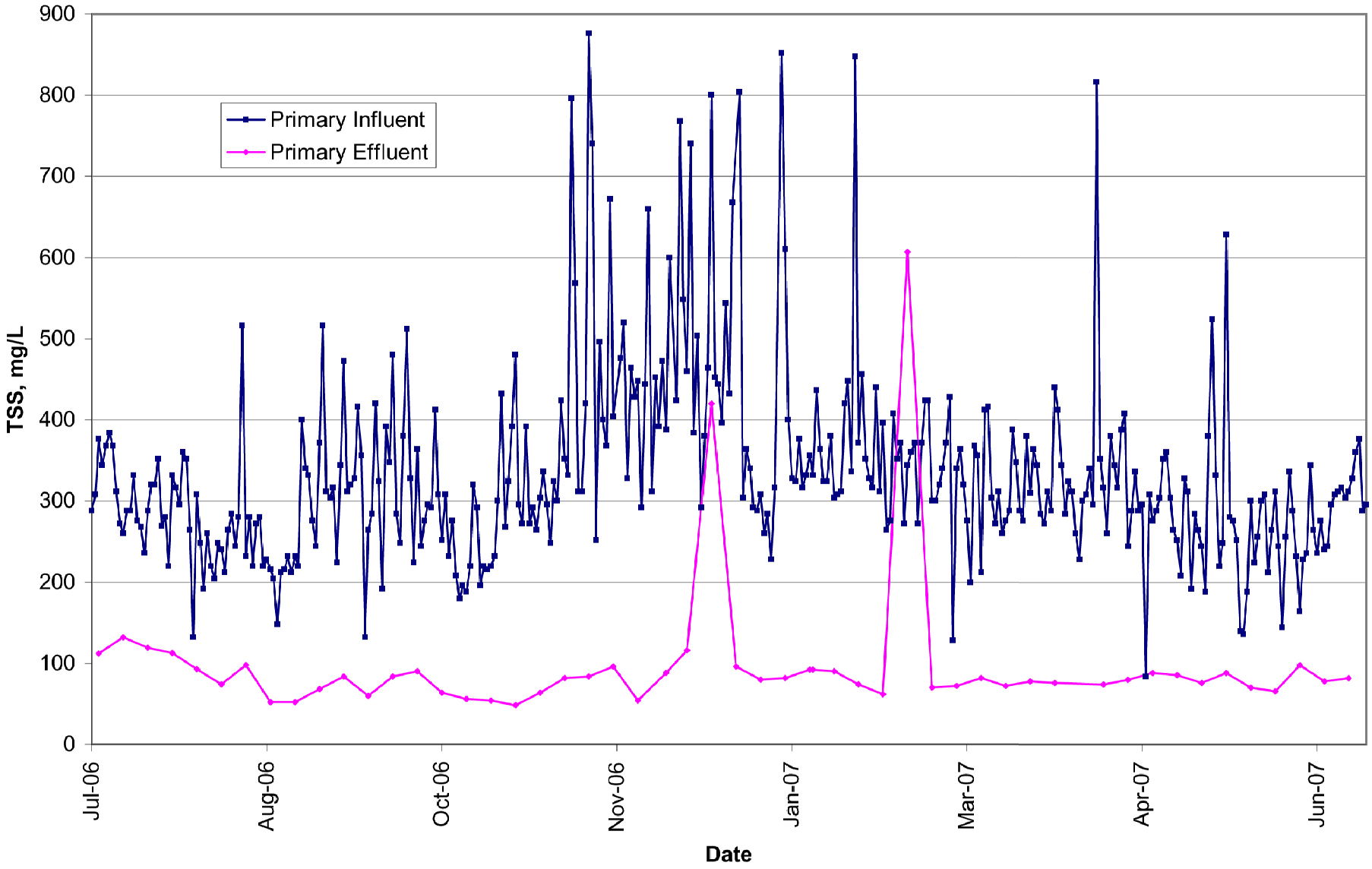

FIGURE 2-4

MANTECA WASTEWATER QUALITY CONTROL FACILITY
PHASE IV EXPANSION PROJECT - BASIS OF DESIGN REPORT

AVERAGE DAILY PRIMARY INFLUENT AND
PRIMARY EFFLUENT TSS FOR 2006/2007

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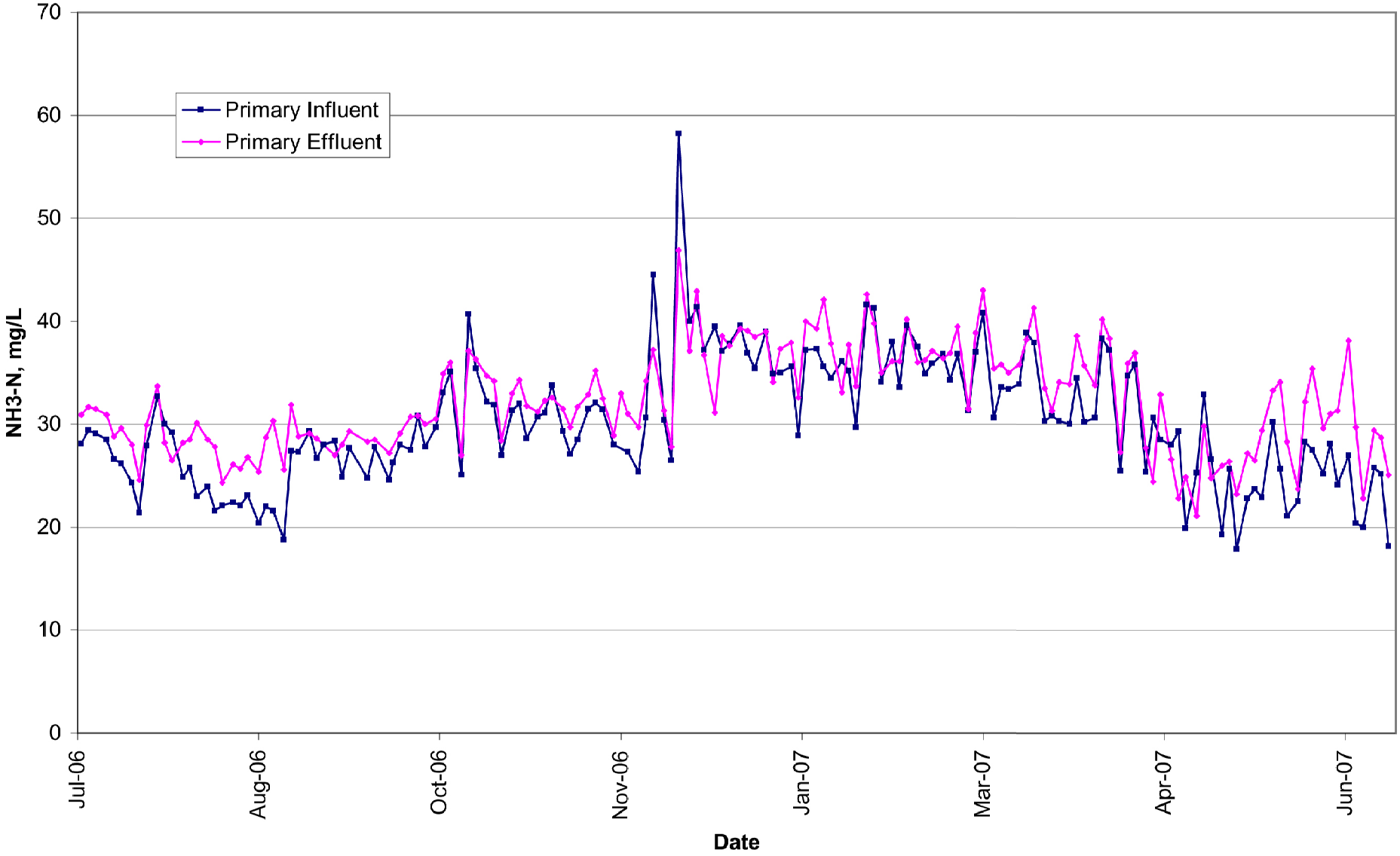

FIGURE 2-5

MANTECA WASTEWATER QUALITY CONTROL FACILITY
PHASE IV EXPANSION PROJECT - BASIS OF DESIGN REPORT

AVERAGE DAILY PRIMARY INFLUENT AND
PRIMARY EFFLUENT NH3-N FOR 2006/2007

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The average influent BOD were observed to decrease four percent and TSS values were observed to increase six percent (compared to the Phase III Expansion Project design values), respectively in 2006/2007. Changes in TSS and BOD values are summarized in Table 2-6.

TABLE 2-6
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
COMPARISON OF HISTORICAL TSS AND BOD INFLUENT AND PRIMARY EFFLUENT VALUES

	Average TSS (mg/L)			Average BOD (mg/L)		
Period	Influent	Primary Effluent	Primary Removal Efficiency	Influent	Primary Effluent	Primary Removal Efficiency
1991 - 1992	221	68	69%	262	178	32%
2001	278	105	62%	319	229	28%
July 2006 – June 2007	333	97	71%	298	194	35%

The following conclusions are offered from a review of the results presented in Table 2-6:

1. The BOD concentration in the primary effluent has decreased; however, the TSS concentration has increased. This change in loading characteristics is probably a function of the newly constructed pond for food processing wastewater from Eckert Cold Storage. Food processing wastewater is now being diverted from the treatment plant headworks into a pond and subsequently disposed through land application. The diversion may have a significant impact on BOD strength because the average BOD concentration of the food processing wastewater is 1,600 mg/L.

2. The increased BOD and TSS removal efficiency may be a function of the new primary sedimentation basin design and reduced loading on all of the primary sedimentation basins as part of the Schedule B, Phase III Expansion Project.

b. Peaking Factors

Concentration peaking factors were calculated using influent BOD, TSS, and ammonia concentrations from July 2006 through June 2007 (see Figures 2-3, 2-4, and 2-5). Loading peaking factors were also calculated using the influent concentrations and flow rates observed in 2006/2007. Loading peaking factors were greater than concentration peaking factors. Therefore, for the Phase IV Expansion Project, concentration peaking factors will be used for facility sizing. These peaking factors are shown in Table 2-7.

TABLE 2-7
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
ANTICIPATED FUTURE LOADING FOR PHASE IV EXPANSION

	BOD	TSS	Ammonia
Influent Concentrations, mg/L [a]			
Average	298	333	30
Maximum monthly	389	499	40
Maximum weekly	459	590	46
Maximum daily	576	876	58
Influent Loads, lb/day [b]			
Average	43,500	48,600	4,400
Maximum monthly	56,800	72,800	5,800
Maximum weekly	67,000	86,100	6,700
Maximum daily	84,100	127,900	8,500
Peaking Factors			
Maximum monthly / average	1.31	1.50	1.33
Maximum weekly / average	1.54	1.77	1.53
Maximum daily / average	1.93	2.63	1.93

[a] Based on WQCF data from July 2006 through June 2007
[b] Based on WQCF influent concentration data and anticipated future Phase IV AAF of 17.5 mgd

A summary of peaking factors is presented in Table 2-8. As a comparison, the design peaking factors for the Phase III Expansion Project are 1.4 and 1.8 for BOD and TSS respectively. As discussed above, peaking factors based on July 2006 – June 2007 influent values are 1.31 and 1.50 for BOD and TSS, respectively. Monthly peaking factors based on primary effluent values are also presented in Table 2-8. The recommended peaking factors for the design of secondary treatment facilities for Phase IV are then given in Table 2-8. These peaking factors represent a conservative approach to facility sizing without excessive oversizing of individual unit processes.

TABLE 2-8
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
SUMMARY OF PEAKING FACTORS TO BE USED IN THE
DESIGN OF SECONDARY TREATMENT FACILITIES FOR THE PHASE IV EXPANSION

	Phase III Expansion-Peaking Factors	Influent Peaking Factors[a]	Primary Effluent Peaking Factors[b]	Recommended Secondary Treatment Design Peaking Factor[c]
BOD	1.4	1.31	1.40	1.4
TSS	1.5	1.50	2.14	1.8

[a] Based on 2006/2007 influent BOD and TSS data
[b] Based on 2006/2007 primary effluent BOD and TSS data
[c] Obtained by averaging the influent and primary effluent peaking factors. Peaking factors are then rounded.

c. Future Peak WQCF Loadings

Recommended peaking factors and anticipated future average loadings discussed previously are used to estimate the Phase IV peak loadings. As presented in Table 2-9, future maximum monthly BOD, TSS, and ammonia loadings are expected to be 58,800 lb/day, 22,800 lb/day, and 5,800 lb/day, respectively. Maximum daily BOD, TSS, and ammonia loadings are anticipated to be 84,100 lb/day, 127,100 lb/day, and 8,500 lb/day, respectively. As mentioned above, maximum daily values are considered in design of waste activated sludge (WAS) thickening and solids handling facilities. Design values for primary and secondary treatment processes are summarized in Table 2-9.

TABLE 2-9
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
SUMMARY OF ANTICIPATED FUTURE LOADINGS AT PHASE IV

Constituent	Peaking Factor	Loading	
		Average	Peak
Primary Treatment Processes			
BOD	1.31	43,500	56,800
TSS	1.50	48,600	72,800
Ammonia	1.33	4,400	5,800
Secondary Treatment Processes			
BOD	1.40[a]	43,500	56,800
TSS	1.80[a]	48,600	87,500
Ammonia	1.33	4,600	5,800
WAS Thickening/Solids Handling			
BOD	1.93[b]	43,500	84,100
TSS	2.63[b]	48,600	127,900
Ammonia	1.93[b]	4,400	8,500

[a] Obtained from Table 2-8
[b] Maximum daily

3 Wastewater Treatment and Disposal Strategy

Multiple options exist at the City WQCF for wastewater treatment and effluent disposal. Specific strategies are presented in this chapter as follows.

3.1 Strategy for Wastewater Treatment

As described in Chapter One, the WQCF is configured currently with an influent pump station with fine mechanical screens, two parallel secondary treatment trains (NSF and SSF), and tertiary facilities capable of producing recycled water for unrestricted reuse. Secondary treatment is designed for full nitrification-denitrification to minimize impacts from discharges to local water resources. Operationally, the WQCF is managed to maximize land application of undisinfected secondary effluent to City-owned parcels at the treatment plant site. In the future, a greater emphasis will be placed on producing disinfected tertiary effluent for increased discharges to the San Joaquiin River or to an expanded urban reclamation system. In terms of facility expansion, the NSF are limited to a treatment capacity of 5 mgd (ADWF). As such, a significant number of improvements are recommended for the SSF and the TTF to increase overall capacity from approximately 10 mgd to 17.5 mgd (ADWF).

3.2 Effluent Disposal Strategy

The long-term recommended disposal strategy for the City WQCF is presented below. Treated effluent from the WQCF would be disposed of by three methods: 1) on-site land application; 2) urban landscape irrigation; and 3) discharge to the San Joaquin River. Off-site land application through an expanded agricultural irrigation program is not considered feasible because of the magnitude of the required land acquisition (greater than 5,000 ac) and the potential distance from the plant. The WQCF currently discharges to the San Joaquin River or on-site land application. A combination of the three disposal methods will be utilized to discharge the Phase IV design flow of 17.5 mgd. Each disposal strategy, and the amount of treated effluent that can be discharged by that method, are described below and summarized in Table 3-1.

a. <u>On-Site Land Application</u>

The City currently discharges approximately 1030 ac-ft/yr (0.87 mgd) of undisinfected secondary effluent to 190-ac of City-owned land. An existing 9-ac, 15-MG storage pond (SESP) located on City land immediately west of the WQCF is used in the on-site land application system. The permeability of soils identified at the on-site land application area ranges from moderately rapid to rapid [7]. The hydraulic loading at the WQCF is generally between 65 and 70 inches per year. Assuming an application rate of 65 inches per year on the remaining 190-ac of City-owned land, approximately 0.73 mgd of treated effluent can be disposed of by on-site land application.

b. Urban Landscape Irrigation

The technical memorandum *Evaluation of Urban Water Recycling Opportunities from the Manteca Wastewater Quality Control Facility* [8] investigates the use of urban landscape irrigation to dispose of treated effluent from the WQCF. The technical memorandum identifies 741-ac of irrigable urban land. This information has subsequently been updated, and a total of 817-ac of irrigable urban land have been identified, including parks, schools, cemeteries, and golf courses [9]. Assuming an application rate of 54 in/yr, 3.28 mgd of recycled water would be discharged for urban landscape irrigation.

c. River Discharge

The City is currently permitted to discharge 8.11 mgd to the San Joaquin River under NPDES Permit No. CA0081558 [2]. The permit allows the monthly average discharge to increase to 9.87 mgd in February 2009, provided that additional water quality requirements are satisfied by the WQCF. The increase in flow to 9.87 mgd will be discharged to the San Joaquin River through the existing 36-inch outfall. Beyond 9.87 mgd ADWF, a second parallel 36-inch outfall will be constructed to convey the balance of WQCF effluent either not land applied on-site or pumped off-site for urban irrigation.

TABLE 3-1
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
RECOMMENDED PHASE IV DISPOSAL STRATEGY

Disposal Option	Average Discharge Rate, mgd	Annual Volume, ac-ft/yr	Percentage of Total Discharge
On-Site Land Application	0.73	870	5%
River Discharge	13.49	15,165	77%
Urban Landscape Irrigation	3.28	3,640	18%
Total	17.50[a]	19.675	100%

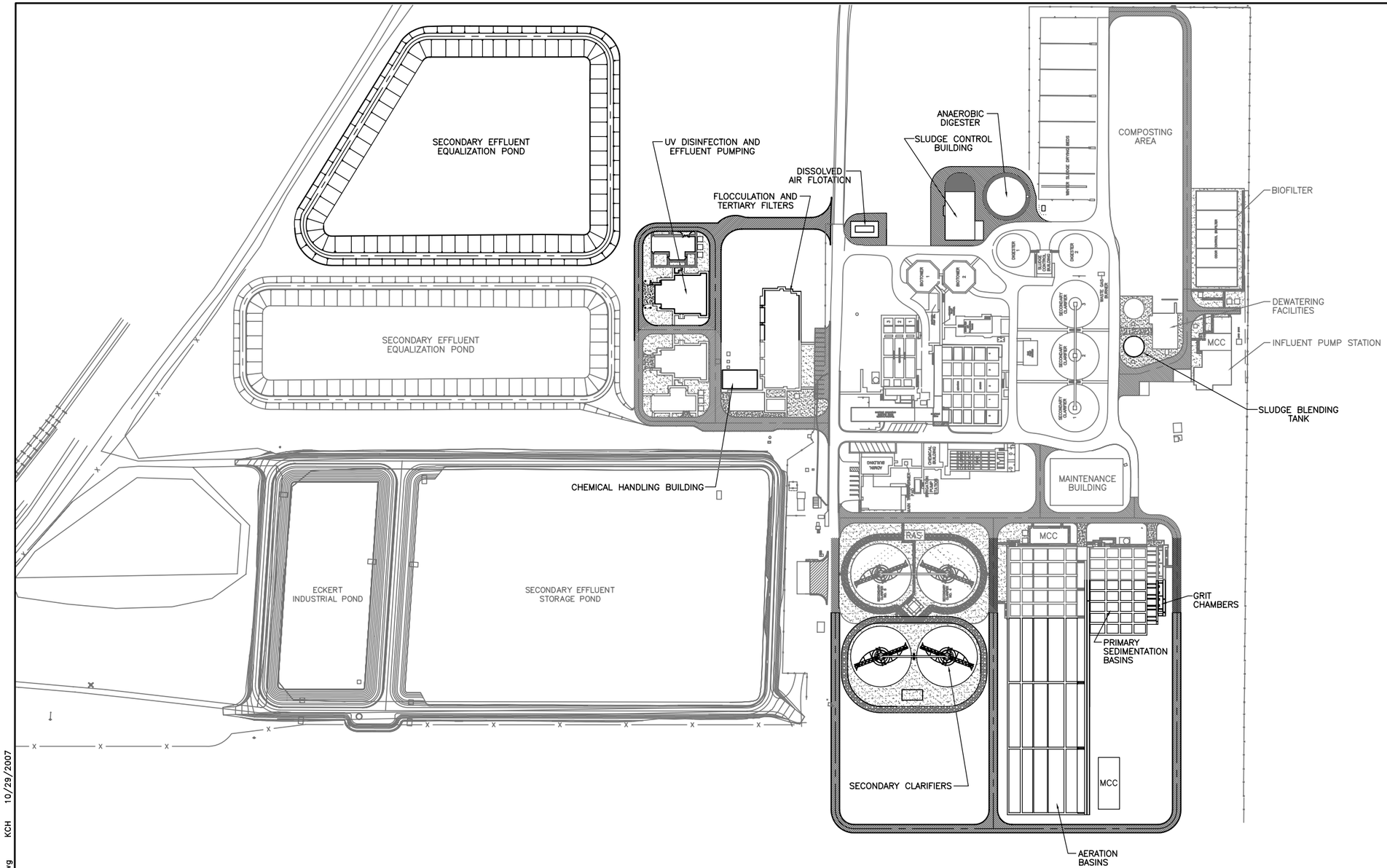
[a] Based on anticipated wastewater flow to Manteca WQCF, see Chapter 2.

4 Description of Phase IV Expansion Treatment Processes

Wastewater treatment facilities designed to meet water quality objectives under Regional Board Order No. R5-2004-0028 (NPDES Permit No. CA0081558) are discussed in this chapter. A site plan for Phase IV is included as Figure 4-1. Design criteria are presented for the incremental expansion required to increase the facility capacity from 10.0 to 17.5 mgd. Overall hydraulic loading and solids loading criteria are summarized in Tables 4-1 and 4-2. Individual unit processes and design criteria are discussed as follows.

TABLE 4-1
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
DESIGN CRITERIA FOR PHASE IV EXPANSION PROJECT
HYDRAULIC LOADING

Parameter	Unit	Phase IV
Flow		
Average annual flow	mgd	17.5
Peak daily flow	mgd	22.6
Peak hourly flow	mgd	33.9



SA1224\EXPANSION\BODR-Phase IV 2007\CADD\Site Plan.dwg KCH 10/29/2007

FIGURE 4-1

MANTECA WASTEWATER QUALITY CONTROL FACILITY
PHASE IV EXPANSION PROJECT
BASIS OF DESIGN REPORT

SITE PLAN AT PHASE IV

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TABLE 4-2
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
DESIGN CRITERIA FOR INCREMENTAL PHASE IV EXPANSION PROJECT
SUMMARY OF INFLUENT LOADINGS

Parameter	Unit	BOD	TSS	Ammonia
Influent Concentrations				
Average	mg/L	298	333	30
Maximum monthly	mg/L	389	499	40
Maximum weekly	mg/L	459	590	46
Maximum daily	mg/L	576	876	58
Influent Loads				
Average	lb/day	43,500	48,600	4,400
Maximum monthly	lb/day	56,800	72,800	5,800
Maximum weekly	lb/day	67,000	86,100	6,700
Maximum daily	lb/day	84,100	127,900	8,500

4.1 Influent Pump Station/Mechanical Screening

The influent pump station is sited on the easterly perimeter of the WQCF property to allow for easy tie-in with the new trunk sewers while minimizing disruption to existing facilities and structures. The station includes two mechanical screens, a wet well, a dry well equipped with four centrifugal pumps, and a flow meter. Two fine mechanical screens (3/8 inch openings) are designed to remove coarse solids and non-biodegradable materials such as plastics. Removal of these materials protects the influent pumps and subsequent downstream equipment as well as improves the quality of the biosolids produced at the plant (i.e., plastics in biosolids are highly undesirable when applied as a soil conditioner). Space is provided for a third mechanical screen for the buildout plant conditions.

Four screw centrifugal pumps deliver screened raw wastewater to the NSF and SSF, respectively. Discharge from two 100-hp pumps is conveyed to the NSF. Discharge from one 200-hp pump is conveyed to the SSF. Through the operation of valves, a standby 200-hp pump can discharge to either the NSF or SSF. Space is provided in the influent pump station to install four additional pumps to handle projected future flows. For the Phase IV Expansion Project two 200-hp pumps will be added. Screw centrifugal pumps were selected because of their ability to pass solids and their high efficiency. Odor control is accomplished by routing foul air to a central biofilter.

4.2 Grit Removal/Primary Sedimentation

Three aerated grit tanks and four primary sedimentation basins are proposed for the incremental expansion of the SSF headworks and primary treatment unit processes.

a. Aerated Grit Tanks

The purpose of the grit tanks is to remove relatively high density inorganic particles (e.g., sand) from the wastewater stream, thus reducing wear and tear on downstream equipment. The grit tanks were sized to provide sufficient detention time to allow the separation of the grit from the wastestream. Typical detention times in aerated grit tanks range from 2 to 5 minutes at peak flow [10].

The proposed grit tanks for the expansion facilities are designed with a 4.5 minute detention time at the peak flow (3.6 minutes with one unit out of service) as summarized in Table 4-3.

TABLE 4-3
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
DESIGN CRITERIA FOR INCREMENTAL PHASE IV EXPANSION PROJECT
AERATED GRIT TANKS

Parameter	Unit	Value	Average Conditions	Peak Conditions
Number of new tanks	no	3		
Number of Phase III SSF tanks	no	2		
Length	ft	24		
Width	ft	8		
Depth (nominal)	ft	10.5		
Detention time	min		8.7	4.5
Detention time (one unit out of service)	min		6.9	3.6
Airflow, total	cfm		360	360

The 3:1 length to width ratio of the grit tanks (24 ft long x 8 ft x 10.5 ft deep) along with the placement of coarse bubble aerators along one side of the tank creates a spiral flow pattern resulting in the separation of the heavy grit particles from the wastewater. Recommended aeration rates in aerated grit tanks range from 3 to 8 cfm/ft of length [10]. An additional airflow of 360 cfm to the grit tanks is suggested to supply an aeration rate of 5 cfm/ft.

Once separated from the wastewater, grit will settle into the hoppers in the bottom of the tanks. Grit collected in the hoppers will be discharged to a grit classifier by gravity for further concentration and washing of light organic material trapped with the grit. Concentrated and washed grit discharged from the classifier will be conveyed into a dumpster and periodically hauled to the landfill for disposal. Wash water from the classifier will be discharged into the plant drain system and returned to the influent pump station (IPS).

b. Primary Sedimentation Basins

The purpose of the primary sedimentation basins (PSBs) is to remove settleable solids and floatable scum, usually oil and grease. This is accomplished by providing a quiescent environment where particles with densities greater than water can settle and those with densities less than water will float to the surface.

The design of PSBs can be based on detention time or overflow rates. Recommended detention times for PSBs are 1.5 to 2.5 hours [11]. Typical overflow rates range from 800 to 1,200 gpd/ft^2 under average flow to 2,000 to 3,000 gpd/ft^2 under peak flow conditions [10]. Detention times and overflow rates for the PSBs are presented in Table 4-4. It can be seen in Table 4-4 that the detention time and overflow rates in the proposed PSBs will range from 1.2 to 2.7 hours and 812

to 1,828 gpd/ft^2 depending upon the flow regime and number of basins in service. While under certain conditions detention times in the PSBs are slightly below recommended values, overflow rates, a more critical indicator of process performance, always fall within the suggested criteria. To mitigate potential odors, the PSBs will be covered, with foul air routed to a local biofilter.

TABLE 4-4
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
DESIGN CRITERIA FOR PHASE IV EXPANSION PROJECT
PRIMARY SEDIMENTATION BASINS

Parameter	Unit	Value	Average Conditions	Peak Conditions
BOD removal in PSBs	percent	30		
TSS removal in PSBs	percent	60		
Overflow rate, all PSBs in service	gpd/ft^2		812	1,700
Overflow rate, one PSB out of service	gpd/ft^2		947	1,842
Number of Phase III SSF PSBs	no	3		
Number of new PSBs	no	4		
Length to width ratio	ratio	5.5		
Length of each PSB	ft	110		
Width of each PSB	ft	20		
Total area of PSBs	ft^2	15,400		
Water depth	ft	12		
Detention time	hr		2.7	1.4
Detention time (one PSB out of service)	hr		2.3	1.2

4.3 Aeration Basins with Anoxic Zone

Three new aeration basins, each rated for an average flow rate of 2.50 mgd, are proposed. Each basin is approximately 128 ft long, 124 ft wide, with a side water depth of 17 ft. Each basin is divided into five zones, separated by baffle walls. The baffle walls create a serpentine flow pattern reducing the potential for hydraulic short-circuiting. The basins will be operated in a plug flow fashion with an initial anoxic zone, followed by four aerated zones. The ratio of the anoxic zone to the total volume is approximately 26 percent.

Carbonaceous BOD removal and nitrification will be accomplished in the aerated zones. Nitrified wastewater will be recirculated back to the first anoxic zone for nitrate removal, which is known as the modified Ludzack-Ettinger (MLE) process. Without aeration, the first zone in each basin will become anoxic. Under anoxic conditions, nitrate produced in the aerated zones will be reduced to nitrogen gas to achieve the required degree of total nitrogen removal. Other

benefits of an initial anoxic zone include the recovery of alkalinity consumed during nitrification and suppressing the growth of filamentous bacteria. The design of the aeration basin is based on cold weather conditions to consider worst case conditions. As seen in Table 4-5 for cold weather conditions, internal recirculation ratio varies between approximately 270 percent for average load conditions to 410 percent during peak load conditions. Typical internal recirculation ratios for MLE processes vary between 200 and 400 percent. Internal recirculation pumps are sized for a flow rate of 15 MGD for each aeration basin to accommodate peak flow rates.

Other important criteria for the design of BOD and nitrogen removal facilities include hydraulic retention time (HRT), mean cell residence time (MCRT), activated sludge production, mixed liquor suspended solids concentration (MLSS), and specific denitrification rate. As seen in Table 4-5, the HRT values range from 6.1 to 15.6 hours (depending on the flow regime and number of basins in service), are within the recommended range of 5 to 15 hours for MLE processes. The minimum suggested MCRT values to achieve complete nitrification for the temperatures observed at WQCF are 6 days and 12 days during warm weather and cold weather, respectively. As presented in Table 4-5, the MCRT value is 15 days, which satisfies the minimum suggested values for cold weather period. The sludge yield coefficient during cold weather was estimated to be approximately 0.28 and was used to calculate the activated sludge production in the aeration basins. Average activated sludge production (during cold weather) in the aeration basins varies between approximately 15,000 lb/day and 24,000 lb/day depending on loading conditions. Typical MLSS concentration in MLE processes ranges between 3,000 and 4,000 mg/L. The MLSS concentration is assumed to vary between 3,000 mg/L and 4,300 mg/L for average and peak loading conditions, respectively at Manteca WQCF. The specific denitrification rate was calculated to be 0.30 lb of nitrate conversion for lb of active MLSS concentration in the anoxic zone (in a day). Active MLSS concentration in the anoxic zone was calculated to vary between approximately 570 mg/L and 690 mg/L for the other MLE process design criteria presented above. Total oxygen requirement was calculated to vary between approximately 39,800 lb/day and 53,700 lb/day (depending on the loading conditions) as presented in Table 4-5.

TABLE 4-5
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
DESIGN CRITERIA FOR PHASE IV EXPANSION PROJECT
AERATION BASIN

Parameter	Unit	Value	Average Conditions	Peak Conditions
Aerated Zone				
BOD design peaking factor	ratio			1.4
TSS design peaking factor	ratio			1.7
Ammonia design peaking factor	ratio			1.33
Organic nitrogen conversion factor	ratio	1.15		
BOD concentration to aeration basin	mg/L		209	292
TSS concentration to aeration basin	mg/L		133	240
Ammonia concentration to aeration basin	mg/L		35	46
BOD filtrate return concentration	mg/L	600		
Ammonia filtrate return concentration	mg/L	100		
Assumed sludge filtrate return flow	gpm	200		
BOD to aeration basins	lb/day		22,800	31,500
Ammonia to aeration basins	lb/day		3,800	5,100
BOD removal in secondary	percent	97		
Ammonia removal in secondary	percent	100		
TSS removal in secondary	percent	80		
Solids retention time	day		15.0	15.0
MLSS concentration	mg/L		3,000	4,300
Return activated sludge ratio	percent		60	60
TSS volatile fraction	percent	80		
TSS volatile biodegradable fraction	percent	67		
Yield coefficient-heterotrophic	gVSS/gBOD	0.30		
Decay coefficient-heterotrophic	1/day	0.18		
Yield coefficient-autotrophic	gVSS/gAmmonia	0.12		
Decay coefficient-autotrophic	1/day	0.14		
Fraction cell debris	percent	0.15		
Total activated sludge production	lb/day		9,300	15,400
Nonbiodegradable VSS and inert TSS portion	lb/day		5,200	9,300
Aerated volume	MG	6.5		
Detention time (aerated zone)	hr		12.4	6.4
Number of aerated compartments	no	4		

TABLE 4-5 (CONTINUED)
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
DESIGN CRITERIA FOR PHASE IV EXPANSION PROJECT
AERATION BASIN

Parameter	Unit	Value	Average Conditions	Peak Conditions
Aerated Zone (cont.)				
Oxygen requirement				
For BOD	lb-oxygen/lb-load	1.0		
For Ammonia	lb-oxygen/lb-load	4.6		
Total oxygen requirement	lb/day		39,800	53,700
Volumetric BOD loading	lb BOD/1,000 ft^3-day		21	29
Food to microorganism ratio	1/day		0.17	0.16
Anoxic zone				
Ratio of anoxic zone volume	percent	26		
Volume	MG	1.7		
Detention time	hr		3.2	1.7
Nitrate to anoxic zone	mg/L		34.3	45.7
Effluent nitrate	mg/L		5.0	8.0
Internal recycle ratio for denitrification	percent		270	410
Influent nitrate load to the anoxic zone	lb/day		2,740	3,930
Anoxic zone active biomass, mg/L	mg/L		570	690
Food to active microorganism ratio	1/day		2.7	3.2
Specific denitrification rate	lb NO_3/lb MLVSS -day		0.28	0.32
Amount of nitrate that can be reduced	lb/day		2,740	3,840
Combined (aerated and anoxic zones)				
Total volume	MG	8.1		
Number of new basins	no	3		
Number of Phase III SSF basins	no	5		
Length to width ratio	ratio	1.0		
Depth, each	ft	17.0		
Width, each	ft	124		
Length, each	ft	128		
Volume, each	MG	2.0		
Detention time	hr		15.6	8.1
Detention time, with one basin out of service	hr		11.7	6.1

4.4 Secondary Clarification

Mixed liquor from the aeration basins will be conveyed to secondary clarifiers for sludge separation before filtration and disinfection. Some of the settled sludge will be recycled back to the aeration basins to maintain the desired MLSS concentration levels in the aeration basins. Suggested recycle ratios for MLE processes are from 50 to 100 percent of the influent flow. The design criteria presented in Table 4-5 is for a recycle ratio of 60 percent. The amount of sludge wasted from the secondary clarifiers to the solids handling facilities will be approximately equal to the amount of sludge produced in the aeration basins to maintain the desired MCRT values.

Two new 110-ft secondary clarifiers with water depths of 16 ft are proposed for the incremental plant expansion. The secondary clarifiers are sized based on recommended overflow rates and solids loading rates for nitrifying activated sludge systems. The overflow rates and solids loading rates in these clarifiers are presented in Table 4-6. Typical overflow rates for secondary clarifiers range from 400 to 700 gpd/ft^2 and from 1,000 to 1,600 gpd/ft^2 at average and peak flow, respectively [11]. As presented in Table 7-6 the overflow rates vary between approximately 329 and 846 gpd/ft^2 depending on the number of clarifiers in service and the flow regime. Typical solids loading rates for secondary clarifiers are from 1.0 to 1.5 lb/ft^2·hr and less than 1.8 lb/ft^2·hr at average and peak flow, respectively [_]. As presented in Table 4-6 the solids loading rates vary between 0.8 and 2.0 lb/ft^2·hr depending on the number of clarifiers in service and loading conditions. Typical depths range from 12 to 20 feet. Deeper depths are recommended for improved performance and a larger margin of safety when upsets occur in the activated-sludge system.

TABLE 4-6
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
DESIGN CRITERIA FOR PHASE IV EXPANSION PROJECT
SECONDARY CLARIFICATION

Parameter	Unit	Value	Average Conditions	Peak Conditions
Overflow rate	gpd/ft^2		329	635
Overflow rate, one clarifier out of service	gpd/ft^2		438	846
Number of new clarifiers	no	2		
Number of Phase III SSF clarifiers	no	2		
Diameter of each clarifier	ft	110		
Total area of new clarifiers	ft^2	38,000		
Water depth, ft	ft	16		
Solids loading rate	lb/hr-ft^2		0.8	1.5
Solids loading rate, with one clarifier out of service	lb/ft^2-hr		1.0	2.0

4.5 Return Activated Sludge/Waste Activated Sludge Handling

A return activated sludge (RAS) pumping station consisting of three 10-hp RAS pumps (two duty and one standby) will provide RAS pumping for the two new clarifiers (see Table 4-7). Each RAS pump is sized to provide a recycle flow up to 2.5 mgd at 10 ft total dynamic head (TDH). The total design RAS flow of approximately 14.7 mgd is equal to 60 percent of the peak design flow of 24.1 mgd to the SSF.

WAS will be conveyed to seven DAF units for thickening prior to anaerobic digestion. WAS will be directed to the DAF units from the discharge side of the RAS pumps. Under average conditions, the RAS pumps will provide sufficient pressure to convey WAS to the DAF units without supplemental pumping. However, under periods of increased wasting, booster pumps will be required to convey the WAS to the DAF units. Three one-hp inline booster pumps will be used for this purpose.

TABLE 4-7
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
DESIGN CRITERIA FOR PHASE IV EXPANSION PROJECT
RETURN ACTIVATED SLUDGE PUMPING FOR TWO PROPOSED CLARIFIERS

Parameter	Unit	Average Conditions	Peak Conditions
Maximum design return ratio	percent	50	60
Maximum design return flow rate	mgd	6.3	14.7
Pump TDH	ft	10	10
Number of duty pumps	no	2	2
Pump efficiency	percent	70	70
Pump horsepower, each	hp	10	10

4.6 Secondary Effluent Equalization

As part of the Phase III Expansion Project, the SEEP was built to dampen diurnal peak and low flow conditions to the TTF, and to store effluent when discharge to the San Joaquin River was restricted. For Phase IV, a second SEEP with a capacity of 5.4 MG will be constructed. The volume of the second SEEP includes 1.5 MG of storage for diurnal flow equalization, 2.6 MG of storage of hold-back during restricted discharge to the San Joaquin River, and an additional 30 percent contingency for operational flexibility (1.3 MG).

Design criteria for the 5.4 MG SEEP are summarized in Table 4-8. An area of 3.3 ac will be needed for the pond. The pond will be both lined and covered to mitigate sedimentation and water quality issues.

TABLE 4-8
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
DESIGN CRITERIA FOR PHASE IV EXPANSION PROJECT
SECONDARY EFFLUENT EQUALIZATION

Parameter	Unit	Value
Total required volume of SEEP	MG	5.4
Berm interior side slope (h:v)	ratio	3
Berm exterior side slope (h:v)	ratio	2
Required freeboard	ft	2
Crest width	ft	15
Maximum water depth	ft	10
Pond outer area	ac	3.3
Total water surface area	ac	2.1
Liner area	ac	2.3

4.7 Effluent Filtration

Five effluent filters are proposed for the incremental plant expansion (beyond Phase III) to remove the remaining total suspended solids in the secondary effluent. Filters will be cloth disk type, designed to comply with the turbidity requirements of the Title 22 wastewater reuse criteria. The daily average filtered effluent turbidity will be less than 2 nephelometric turbidity unit (NTU). Filter effluent turbidity objectives in accordance with the Title 22 requirements are summarized in Table 4-9. Filtration will also increase the downstream disinfection efficiency by removing the suspended solid particles that are disinfection obstacles.

TABLE 4-9
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
TERTIARY FILTRATION AND UV DISINFECTION OBJECTIVES
AS DEFINED IN TITLE 22 CRITERIA

Parameter	Value
Turbidity	24 hour average ≤ 2 NTU 95 percent of values ≤ 5 NTU At any time < 10 NTU
Total coliform bacteria	Running 7 day median ≤ 2.2 MPN/100 mL No more than one event in 30 days ≥ 23 MPN/100 mL At any time < 240 MPN/100 mL

The total filtration surface area for the incremental expansion is approximately 2,970 ft^2. As presented in Table 4-10 filtration rate varies between 1.6 and 4 gpm/ft^2 depending on the flow regime and number of filters in service. Typical maximum filtration rate for cloth type disk filters is between 2 and 4 gpm/ft^2. The backwash reject rate is anticipated to be between three and five percent.

TABLE 4-10
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
DESIGN CRITERIA FOR PHASE IV EXPANSION PROJECT
FILTRATION

Parameter	Unit	Value	Average Conditions	Peak Conditions
Incremental filtration area required	ft^2	2,970		
Total number of Phase III units	no	6		
Total number of new units	no	5		
Number of filter disks per unit	no	12		
Diameter of individual filter disk	ft	6		
Filtration Rate	gpm/ft^2		1.6	3.2
Filtration rate during one filter out of service	gpm/ft^2		2	4.0
Backwash water reject ratio	percent		5	5

4.8 Rapid Mixing and Flocculation

Chemical addition prior to filtration may be necessary especially during high solids loading conditions to achieve the Title 22 turbidity requirements. Therefore, chemical addition facilities

are included to add coagulants and polymers prior to the filters. One rapid mixing tank and three flocculation tanks will be constructed to provide efficient mixing of chemicals and to form larger size flocs that are easily filterable. As seen in Table 4-11, the rapid mix tank will be square in shape, 6 ft by 6 ft. The flocculation tanks will also be square in shape, 26.5 ft by 26.5 ft.

TABLE 4-11
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
DESIGN CRITERIA FOR PHASE IV EXPANSION PROJECT
RAPID MIX AND FLOCCULATION

Parameter	Unit	Value	Average Conditions	Peak Conditions
Rapid Mix Tank				
Detention Time	sec		39	20
Number of new tanks	no	1		
Volume per tank	gal	3,390		
Sidewater depth	ft	16.5		
Required surface area per tank	ft^2	36		
Length	ft	6		
Width	ft	6		
Flocculation Tanks				
Detention Time	min		49	25
Number of new tanks	no	3		
Volume per tank	gal	84,800		
Sidewater depth	ft	16.5		
Required surface area per tank	ft^2	690		
Length	ft	26.5		
Width	ft	26.5		

4.9 UV Disinfection/Effluent Pumping

Filtered effluent must be disinfected to comply with the Title 22 wastewater reuse criteria for unrestricted reuse. Disinfected effluent coliform objectives in accordance with the Title 22 requirements are summarized in Table 4-9. For reasons of worker safety, environmental protection, and operational flexibility, an ultraviolet light disinfection system is used. The installation is a low-pressure high-intensity UV system. The pressure and intensity refer to the type of UV lamps used. Design criteria for the UV disinfection system are summarized in Table 4-12. Sizing of the UV system is based on guidelines published by NWRI as implemented by the California Department of Public Health (DPH). Two new UV channels (beyond Phase III)

are proposed for the Phase IV Expansion. Similar to the initial UV disinfection/effluent pumping facility, the expanded system will also include effluent pumps to convey tertiary-treated wastewater through a new parallel 36-inch outfall.

TABLE 4-12
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
DESIGN CRITERIA FOR PHASE IV EXPANSION PROJECT
UV DISINFECTION

Parameter	Unit	Value	Average Conditions	Peak Conditions
UV transmittance	%	55		
Minimum dose	uWs/cm^2	100,000		
Number of Phase III channels	no	2		
Number of new channels	no	2		
Banks, per channel	no	4		
Lamps, total	no	1,792		
Output, per lamp	W	150		
Power consumption	kW		264	516

4.10 Sludge Thickening (Dissolved Air Flotation)

Dissolved air flotation (DAF) will be used for the thickening of the waste activated sludge (WAS) produced in the secondary treatment facilities. The primary purpose of DAF is to reduce the liquid volume of WAS. Waste activated sludge and thickened waste activated sludge (TWAS) data observed at the Manteca WQCF between July 2006 and June 2007 were used to project the WAS and TWAS rates at buildout conditions. Dissolved air flotation units are designed for the observed WAS flow daily peaking factor of 1.58. Average WAS and TWAS production at buildout is approximately 16,200 lb/day and 12,600 lb/day, respectively. Projected average and peak WAS and TWAS rates are summarized in Table 4-13. Peaking factors observed for the WAS rates were lower than the peaking factors observed for the TWAS rates. Observed TWAS peaking factors are used for planning purposes.

TABLE 4-13
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
PROJECTED SOLIDS LOADING AT PHASE IV

		Primary Sludge (PS)	Waste Activated Sludge (WAS)	Thickened Waste Activated Sludge (TWAS)	Combined PS & TWAS (CS)
Peaking Factors					
Peak day	ratio	1.74	1.58	2.05	1.39
15 day peak	ratio	1.44	1.31	1.42	1.34
Production					
Average	lb/day	22,500	16,200	12,600	35,300
Daily peak	lb/day	39,100	25,600	25,800	49,100
15 day peak	lb/day	32,300	21,300	17,900	47,400
Flow					
Average	gpd	84,700	148,100	33,000	117,900
Daily Peak	gpd	155,800	194,800	75,100	197,500
15-Day Peak	gpd	148,800	169,700	44,500	191,200

4.11 Anaerobic Digestion and Cogeneration

As discussed previously, wastewater sludge generated in the primary sedimentation basins and activated sludge process will be anaerobically digested. New anaerobic digester facilities proposed as part of the incremental expansion include one digester. The new digester will be 74 ft in diameter and 45 ft in height. The minimum effective volume is 0.95 MG. Sizing of the new digester is based upon solids loading and hydraulic detention time criteria. Recommended values for solids loading are between 0.1 and 0.3 lb VSS/ft^3·d [10]. The average and peak (based on 15 day peaking factor) CS loadings to the anaerobic digesters are approximately 35,300 lb/day and 47,400 lb/day, respectively. Based on historical data, approximately 85 percent of the solids are volatile. Therefore, the volatile solids loadings will be approximately 30,000 lb/day and 40,300 lb/day for average and peak conditions, respectively. As seen in Table 4-14, volatile suspended solids (VSS) loading will range from 0.10 to 0.14 lb VSS/ft^3·d depending on the loading conditions. Typical values for hydraulic detention time are between 10 and 20 days [10]. Detention time will vary between 10 and 24 days depending on the loading conditions and the number of the digesters in service.

Anaerobic sludge digestion requires heating. The microorganisms responsible for the anaerobic digestion process operate most effectively at temperatures between 90 and 95ºF. Sludge heating in the new digester will occur in a similar fashion to the existing digesters. Sludge will be drawn

off the digester mixing pipeline with a booster pump, conveyed through a spiral heat exchanger, and discharged back into the mixing pipeline.

TABLE 4-14
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
DESIGN CRITERIA FOR PHASE IV EXPANSION PROJECT
ANAEROBIC DIGESTION (SLUDGE DIGESTION)

Parameter	Unit	Value	Average Conditions	Peak Conditions
15 day peaking Factor				1.34
CS loading	lb/day		35,300	47,400
Flow, gal/day	gpd		117,900	191,200
Volatile solids percentage	percent	85		
Dry volatile solids loading	lb/day		30,000	40,300
Number of new digesters	no	1		
Diameter of each digester	ft	74		
Effective minimum depth	ft	30		
Volume, total	MG	0.95		
Volume, each	MG	2.87		
Detention time (all digesters in service)	days		24.3	15.0
Detention time (with one digester out of service)	days		16.3	10.0
Volatile solids loading	lb VSS/day-ft^3		0.10	0.14
Volatile solids destruction, percent	percent		63	56

4.12 Mechanical Dewatering

Anaerobically digested sludge will be dewatered in high solids centrifugal systems. Design criteria for the dewatering process are summarized in Table 4-15. As a part of the Phase IV improvements, a new centrifuge unit will be installed within the dewatering building. The dewatering building accommodates three 100-hp centrifuges mounted on a platform within the building. To enhance the dewatering process, polymer is injected into the sludge feed line.

Dewatered cake from the centrifuges will be discharged at a solids content of approximately 22 percent onto a solids handling conveyor. The conveyor will discharge cake outside the building onto a biosolids composting and storage area. As noted earlier, the centrifuges will be operated approximately 10 hr/day Monday through Friday for average conditions, and approximately 16 hr/day Monday through Saturday during peak sludge production. To store

digester effluent generated during the weekends and non-working weekday hours, construction of an equalization tank is required. The size of the equalization tank is based on the need to store digested sludge from 5:00 p.m. on Friday to 8:00 a.m. on Monday or 63 hours. At the projected expansion CS flow rate of approximately 117,900 gal/day, the equalization tank requires a volume of 310,000 gal. An additional 15 percent storage volume is recommended as a factor of safety bringing the size of the equalization tank to 356,000 gal (see Table 4-15).

TABLE 4-15
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
DESIGN CRITERIA FOR PHASE IV EXPANSION PROJECT
CENTRIFUGE (SLUDGE DEWATERING)

Parameter	Unit	Value	Average Conditions	Peak Conditions
Weekly peaking factor				1.34
Total number of Phase III units	no	2		
Number of new units	no	1		
Conveyor belt width	ft	2		
Hours of operation in a day	hr		10	16
Days of operation in a week	days		5	6
Centrifuge flow rate	gpm/unit		166	116
Centrifuge solids loading	lb/unit-hour		1,664	1,161
Dewatered solids content	Percent	22		

4.13 Chemical Handling, Storage, and Metering

A chemical handling, storage, and metering facility is required to support the tertiary filtration process as coagulant and polymer may be needed occasionally for filter aids. The equipment in the facility will include three bulk tanks and one day-tank for coagulant, metering pumps for the coagulant, space for three polymer tanks or totes, and a polymer dilution unit. Sizing of the metering pumps will accommodate peak dosing conditions. Suggested chemical doses are presented in Table 4-16. All tanks and metering pumps will be installed indoors, in a CMU building to prevent damage due to sunlight and temperature extremes.

TABLE 4-16
CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
SUGGESTED CHEMICAL DOSAGES FOR FILTER AIDS

		Dosage	
Chemical	**Unit**	**Typical**	**Maximum**
Coagulant	mg/L	5-15	25
Polymer	mg/L	0.05-0.10	0.20

REFERENCES

[1] *City of Manteca, Public Facilities Implementation Plan*, prepared by Nolte and Associates, December 1993.

[2] California Regional Water Quality Control Board, Central Valley Region, *Waste Discharge Requirements for City of Manteca, City of Lathrop and Dutra Farms Wastewater Quality Control Facility, San Joaquin County*, March 2004.

[3] *City of Manteca Wastewater Quality Control Facility, Wastewater Management Plan for Phase IV Expansion Project*, Draft, prepared by Nolte Associates, September 2007.

[4] *City of Manteca General Plan 2023*, adopted October 6, 2003.

[5] *Sewer Master Plan for City of Manteca Public Facilities Implementation Plan*, prepared by Nolte and Associates, December 1993.

[6] *City of Manteca, Wastewater Collection System Master Plan Wastewater Generation Factor Technical Memorandum*, prepared by Nolte Associates, February 2004.

[7] *Technical Memorandum 3-4, Evaluation of Rapid Infiltration on City-Owned Land Surrounding the Manteca Wastewater Quality Control Facility*, prepared by Nolte Associates, March 2002.

[8] *Technical Memorandum No. 3-2, Evaluation of Urban Water Recycling Opportunities from the Manteca Wastewater Quality Control Facility,* prepared by Nolte Associates, February 2002.

[9] *Technical Memorandum, Update of Urban Water Recycling Opportunities, City of Manteca Wastewater Quality Control Facility Master Plan Update*, prepared by Nolte Associates, September 2004.

[10] Metcalf and Eddy, Inc., Wastewater Engineering: Treatment, Disposal, and Reuse, Third Edition, McGraw-Hill, 1991.

[11] Water Environment Federation, Design of Municipal Wastewater Treatment Plants, Manual of Practice No. 8, 1992.

Section VIII

WQCF Phase IV Expansion Project Wastewater Management Plan

CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY

WASTEWATER MANAGEMENT PLAN FOR THE PHASE IV EXPANSION PROJECT

DRAFT

SEPTEMBER 2007

NOLTE

BEYOND ENGINEERING

CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY

WASTEWATER MANAGEMENT PLAN
FOR PHASE IV EXPANSION PROJECT

DRAFT

SEPTEMBER 2007

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Central Valley Region
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CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY
WASTEWATER MANAGEMENT PLAN FOR PHASE IV EXPANSION PROJECT

DRAFT
SEPTEMBER 2007

1.0 INTRODUCTION

The Manteca Wastewater Quality Control Facility (WQCF) receives, treats, and disposes wastewater generated in the City of Manteca and surrounding areas, including the City of Lathrop. Treated effluent is disposed by a combination of land application to irrigated fields and discharge to the San Joaquin River. The location of the Manteca WQCF and land application fields is presented in Figure 1. Under the recent Phase III Expansion Project, improvements to the Manteca WQCF have been implemented to provide a treatment capacity of 9.87 million gallons per day (Mgal/d). As part of the Phase III Project, nitrogen removal and tertiary filtration processes have been implemented, resulting in improved effluent quality. The Phase IV Expansion Project will increase treatment capacity to 17.5 Mgal/d. An NPDES permit application will be submitted to the Regional Water Quality Control Board (Regional Board) in support of the expansion project. The permit application package includes a wastewater management plan. This wastewater management plan has been prepared to reflect an increase in treatment capacity from 9.87 Mgal/d to 17.5 Mgal/d.

In addition to sanitary wastes that are discharged to the Manteca WQCF, the facility also receives food-processing wastewater from Eckert Cold Storage (Eckert), a bell pepper processor. Because the Eckert wastewater does not include sanitary wastes, it can be used directly for irrigation of the land application area after blending with treated effluent from the Manteca WQCF. As shown in this management plan, the blended water will be applied at agronomic rates to irrigate a fodder crop in the land application area. Although biosolids from the Manteca WQCF were previously applied to the land application area, they are now landfilled. Consequently, nutrient and metals loading resulting from land application of biosolids are not considered in this report.

2.0 BACKGROUND INFORMATION

In this section, a description of soil types identified within the land application area is presented. A characterization of groundwater quality, based on groundwater samples collected from monitoring wells in the land application area, is also provided.

2.1 Description of Soils

The land application area consists of ten fields located on land owned by the City of Manteca (Fields 2 through 11), plus one field located on property owned by Dutra Farms, Inc (Field L-1).

A summary of field areas is provided in Table 1. As indicated in Table 1, the total area available for wastewater application is 260.6 ac.

Based on the USDA Soil Survey of San Joaquin County [1], seven soil types can be identified in the land application area. The soil types, ranging from loamy coarse sand to fine sandy loam, are described in Table 2. The approximate percent coverage for each soil type is provided in Table 2, along with the permeability class, permeability rate, and intake rate. As seen in Table 2, the permeability of the identified soils ranges from moderately slow (1 type) to rapid (5 types, or approximately 74 percent of the total area). The area-weighted average permeability rate is 4.5 in/hr, and the area-weighted intake rate is 2.6 in/hr. In summary, the soils at the land application area can be characterized as generally coarse, with relatively high permeability and intake rates.

2.2 Groundwater Elevation and Quality

Seven groundwater monitoring wells are located in the land application area, in Fields 1 (no longer used), 3, 5, 9W, 9E (well 9E was abandoned), 10 and the Airport Way (AW) well, located along Airport Way. The locations of the monitoring wells are depicted in Figure 1, and well log data are included in the Appendix (Tables A-1 thru A-5). Groundwater from each well is monitored for groundwater depth, Nitrate-Nitrogen (Nitrate-N), Chemical Oxygen Demand (COD), Total Dissolved Solids (TDS), and pH. A brief discussion of each parameter monitored is presented below.

Groundwater Elevation

Groundwater elevation measurements taken at each of the monitoring wells over the past ten years are presented in Figure 2. In general, the groundwater levels in all monitoring wells have remained relatively stable. In wells 1, 3, 9E, 9W, 10, and AW, the groundwater elevation averages approximately 16 ft with a seasonal variation of plus or minus 3 ft. At well 5, the groundwater elevation averages approximately 12 ft with a similar seasonal variation. Based on these data, it appears that the groundwater gradient is from east to west toward the San Joaquin River.

Nitrate-Nitrogen

Groundwater Nitrate-N concentrations observed in the monitoring wells over the past ten years are presented in Figure 3. Nitrate-N concentrations in the wells typically range from 0 to 30 mg/L and exhibit a great deal of variability, except for well 10 where Nitrate-N concentrations are generally below 1.0 mg/L. No seasonal or long-term trends in groundwater Nitrate-N concentrations are observable from the data.

COD

Groundwater COD concentrations are presented in Figure 4. COD concentrations are typically below 15 mg/L and do not exceed 30 mg/L. No seasonal or long-term trends are observable from

the data. The current wastewater permit does not include COD monitoring, and COD monitoring was discontinued after March 2004.

TDS

Groundwater TDS concentrations for the past ten years are presented in Figure 5. It can be seen that TDS concentrations generally range from approximately 200 to 1000 mg/L. Each well exhibits a different pattern of TDS concentrations, but the overall pattern appears to be stable over time.

pH

Groundwater pH values in each monitoring well over the past ten years are presented in Figure 6. In general, pH values range between 6 and 8. No seasonal or long-term pH trends are apparent from the data, nor does there appear to be any trend associated with gradient.

3.0 IRRIGATION OF LAND APPLICATION AREA

In this section, the irrigation distribution and tailwater collection system for the land application area are described. Additionally, the proposed irrigation rates for the land application area are presented. As described above, irrigation water will consist of a blend of Eckert food-processing wastewater and treated effluent from the Manteca WQCF. Based on monthly historical precipitation and evapotranspiration data, water balances for both 100-year and normal-year precipitation conditions are provided. Water balances are presented for the proposed Manteca WQCF treatment capacity of 17.5 Mgal/d.

3.1 Irrigation Distribution and Tailwater Collection System

Secondary effluent and Eckert food-processing wastewater are applied to 260.6 acres of City-owned and City-leased land via an irrigation pipe network. The irrigation pipe network is connected through a series of concrete distribution boxes. Fields are irrigated by ridge and check method. Tailwater is managed to fully contain flows on the designated property and to prevent surface ponding. Fields are surrounded by perimeter berms to prevent surface run-off. The City has an active rodent control program to ensure the integrity of the levees surrounding the irrigation fields. The irrigation distribution and tailwater management system are depicted in Figure 7.

As can be seen in Figure 7, tailwater is managed by a variety of methods. In fields 2, 4, 5, 10, and L-1, tailwater is collected in a sump and pumped back to the irrigation supply system via one of the irrigation distribution boxes. Tailwater from field 3 drains by gravity back to the sump adjacent to the irrigation pond, where it is pumped back into the pond for irrigation. Tailwater from fields 6 and 9E is percolated into the soil. Application rates to these fields are adjusted to prevent the accumulation of standing water. Field 7 drains by gravity to Field 10. Finally, tailwater from Field 9W flows by gravity into an un-used area of land adjacent to Field 9W. This

un-used area has no outlet. Permission to use the wetland for tailwater management was granted previously by the Regional Board.

3.2 Industrial and Municipal Wastewater Flow Rates

In Table 3, historical and projected industrial wastewater flow rates from Eckert are summarized. As seen in Table 3, wastewater flow generally begins around April, reaches a peak in August through October, and concludes by November. The peak monthly average flow is 0.31 Mgal/d. The current flow limit for Eckert wastewater, based on the industrial wastewater discharge permit, is 0.55 Mgal/d. Therefore, for planning purposes, a peaking factor is used in Table 3 to increase the projected average flows so that the peak value reaches 0.55 Mgal/d. It is assumed that operations at Eckert will increase until the maximum flow limit is reached.

3.3 Water Balances for 100-Year and Normal-Year Precipitation

In Tables 4 and 5, water balances are presented to demonstrate the monthly volumes of water that can be applied to the land application area. In Table 4, it can be seen that for 100-year precipitation conditions the annual irrigation depth is 67.4 in. This agronomic rate is based on climatic and soil conditions, and is designed to meet crop moisture needs while providing an adequate leaching fraction. Of the applied annual volume, 18 percent is applied by Eckert wastewater (all of the Eckert flow), and 82 percent consists of Manteca WQCF effluent (6 percent of the total annual Manteca WQCF flow). The remaining flow from the Manteca WQCF is discharged to the San Joaquin River.

For normal precipitation years (Table 5) the annual irrigation depth is 64.8 in. Of the applied annual volume, 19 percent is applied by Eckert wastewater (all of the Eckert flow), and 81 percent consists of Manteca WQCF effluent (6 percent of the total annual Manteca WQCF flow). The remaining flow from the Manteca WQCF is discharged to the San Joaquin River.

The annual disposed wastewater volumes for the 100-year and normal-year water balance scenarios are summarized in Table 6. As indicated in Table 6, a total of 477 Mgal is discharged to the land application area annually during 100-year precipitation conditions, while a total of 459 Mgal is discharged to the land application area each year during normal-year precipitation conditions. The annual volumes discharged to the San Joaquin River during 100-year and normal-year precipitation conditions are 5998 and 6017 Mgal, respectively.

4.0 ORGANIC AND NUTRIENT LOADING OF LAND APPLICATION AREA

Historical and future estimated water quality values for the Eckert and Manteca effluent streams are presented in this section. Based on the wastewater quality values and the flow rates described above, organic and nutrient loading rates for the land application area are estimated.

4.1 Industrial and Municipal Wastewater Quality

In Table 7, average monthly Biochemical Oxygen Demand (BOD) values for Eckert wastewater are presented. As shown in Table 7, BOD concentrations tend to be higher at the beginning and end of the season (from 1600 to 2000 mg/L) when flows are lower. Average BOD concentrations for Eckert wastewater decrease to about 1000 mg/L during the middle of the Eckert operating season, when flows are higher.

In Table 8, Total Nitrogen (TN) values for Eckert wastewater are presented, consisting of Nitrite-N, Nitrate-N, and Total Kjeldahl Nitrogen (TKN). As shown in Table 8, the average TN concentration is 35.9 mg/L. For the purposes of analyzing TN loading, an assumed Eckert wastewater TN concentration value of 40 mg/L is used.

Wastewater quality values for Manteca WQCF effluent are presented in Table 9. BOD concentrations in Manteca WQCF effluent over the period considered average 18 mg/L, with improved quality in the last years due to recent improvements. Ammonia concentrations in Manteca WQCF effluent average 3.4 mg/L, again with improved quality in the last years due to recent improvements. Due to the level of treatment received at the Manteca WQCF, nearly all of the nitrogen is present in the form of ammonia (i.e., Nitrate-N and organic nitrogen concentrations are negligible), thus Manteca WQCF ammonia concentrations are expected to be equivalent to TN.

4.2 Organic and Nutrient Loading Rates

Based on the wastewater quality values provided above, and the applied wastewater volumes discussed earlier, organic (BOD) and nutrient (TN) loading rates to the land application area may be determined. In Table 10, wastewater volume and quality values for normal-year precipitation conditions and the proposed Manteca WQCF effluent flow (17.5 Mgal/d) are used to determine the quality of the blended irrigation water. In Table 11 the blended quality values are used to estimate monthly BOD and TN loading rates. As seen in Table 11, the peak BOD loading rate of 28 lb/ac·d occurs in October. It is expected that actual BOD loading rates will be lower, because Eckert wastewater will be stored in an aerated pond before application, where partial treatment will occur. The annual TN loading rate is 136 lb/ac·yr, which is less than the amount of expected nitrogen uptake from the alfalfa crop that will be planted in the land application area (crop nitrogen uptake of up to 480 lb/ac·yr) [2].

5.0 NUTRIENT UPTAKE FROM FORAGE CROPS

As discussed above, forage crops will be grown and harvested in the land application area. Historically, alfalfa has been grown in all of the fields owned by the City of Manteca except Fields 5 and 6, where corn is grown in the summer and wheat in the winter. The nitrogen uptake values associated with alfalfa and corn/wheat are 480 and 425 lb/ac·yr, respectively [2]. Because the estimated TN loading rate is well below published crop nitrogen uptake rates, it is expected that all the applied nitrogen will be assimilated by the crop.

6.0 REFERENCES

[1] U.S. Department of Agriculture Soil Conservation Service (now Natural Resources Conservation Service), *Soil Survey of San Joaquin County, California*, USDA, 1992.

[2] California Fertilizer Association Soil Improvement Committee, *Western Fertilizer Handbook*, Interstate Publishers, Inc., 1995.

LEGEND:

LAND APPLICATION AREA

MANTECA WQCF SITE

GROUNDWATER MONITORING WELL

BASE MAP: USGS 7.5 MINUTE QUAD MAP FOR LATHROP. 1952 ORIGINAL PHOTOREVISED IN 1987.

FT
1000 2000 3000 4000

(PORTIONS OF FIELDS 9W AND 9E REMOVED FROM LAND APPLICATION AREA)

9W
9E
11
3
2
6
5
4
7
1
10
L-1
AW

\\SAS\PROJECT\N\SA1224\WMP update4\CADD\ Manteca WQCF Map.DWG
9/20/07
11:55 a.m.

NOLTE
BEYOND ENGINEERING
DENVER MANTECA ORANGE COUNTY SACRAMENTO SAN JOSE SAN DIEGO WALNUT CREEK
1215 WEST CENTER STREET SUITE 201 MANTECA, CA 95337 (209) 239-9080

WASTEWATER MANAGEMENT PLAN FOR MANTECA WQCF PHASE IV EXPANSION PROJECT

MANTECA WQCF LAND APPLICATION AREAS AND GROUNDWATER MONITORING WELLS

SCALE
1" = 1440'

DRAWING NUMBER
FIG. 1

SHEET NUMBER
OF SHEETS

FIGURE 2
GROUNDWATER ELEVATION DATA
AT MANTECA WQCF, 1997 - 2006

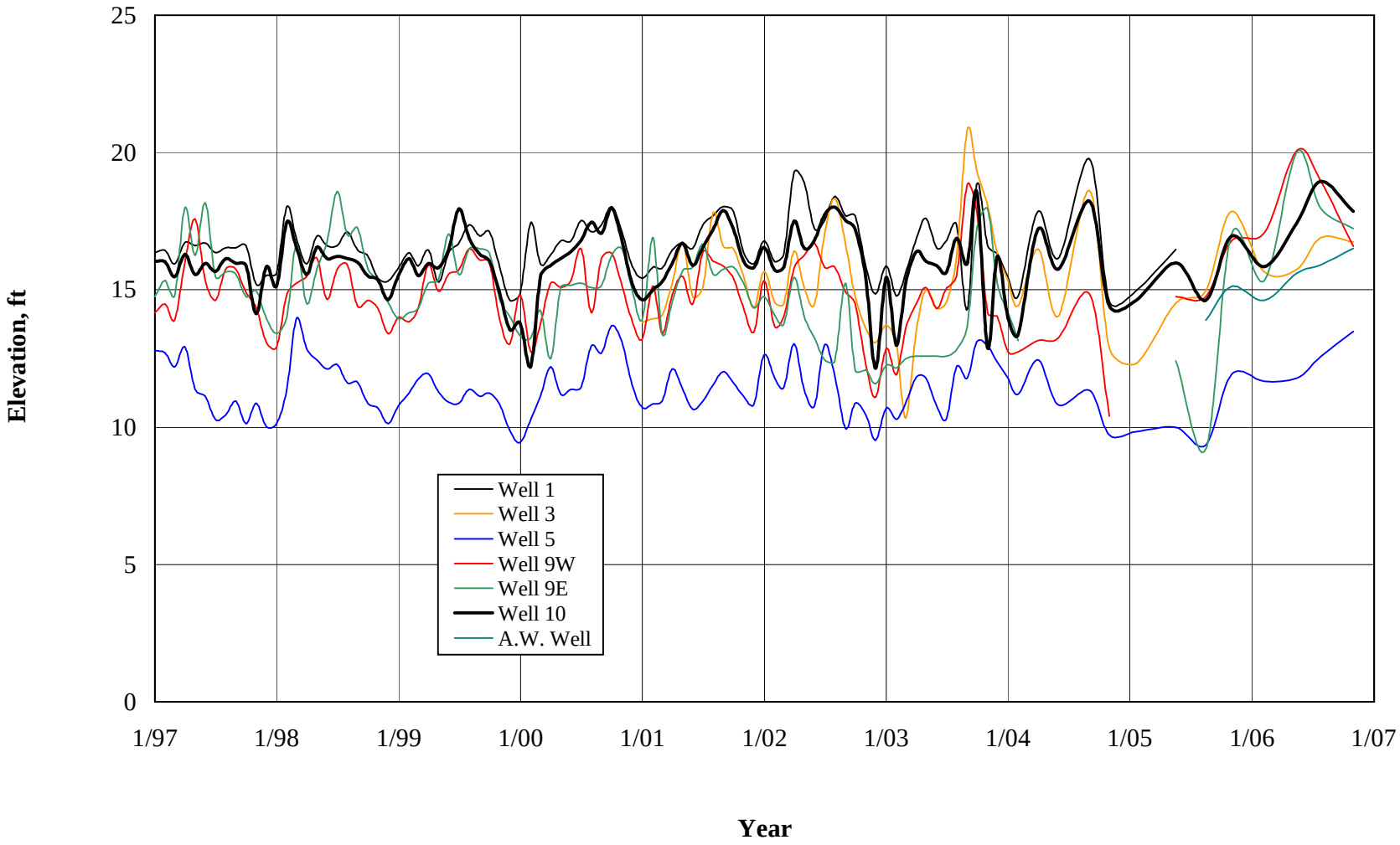

FIGURE 3
GROUNDWATER NITRATE-N CONCENTRATIONS
AT MANTECA WQCF, 1997 - 2006

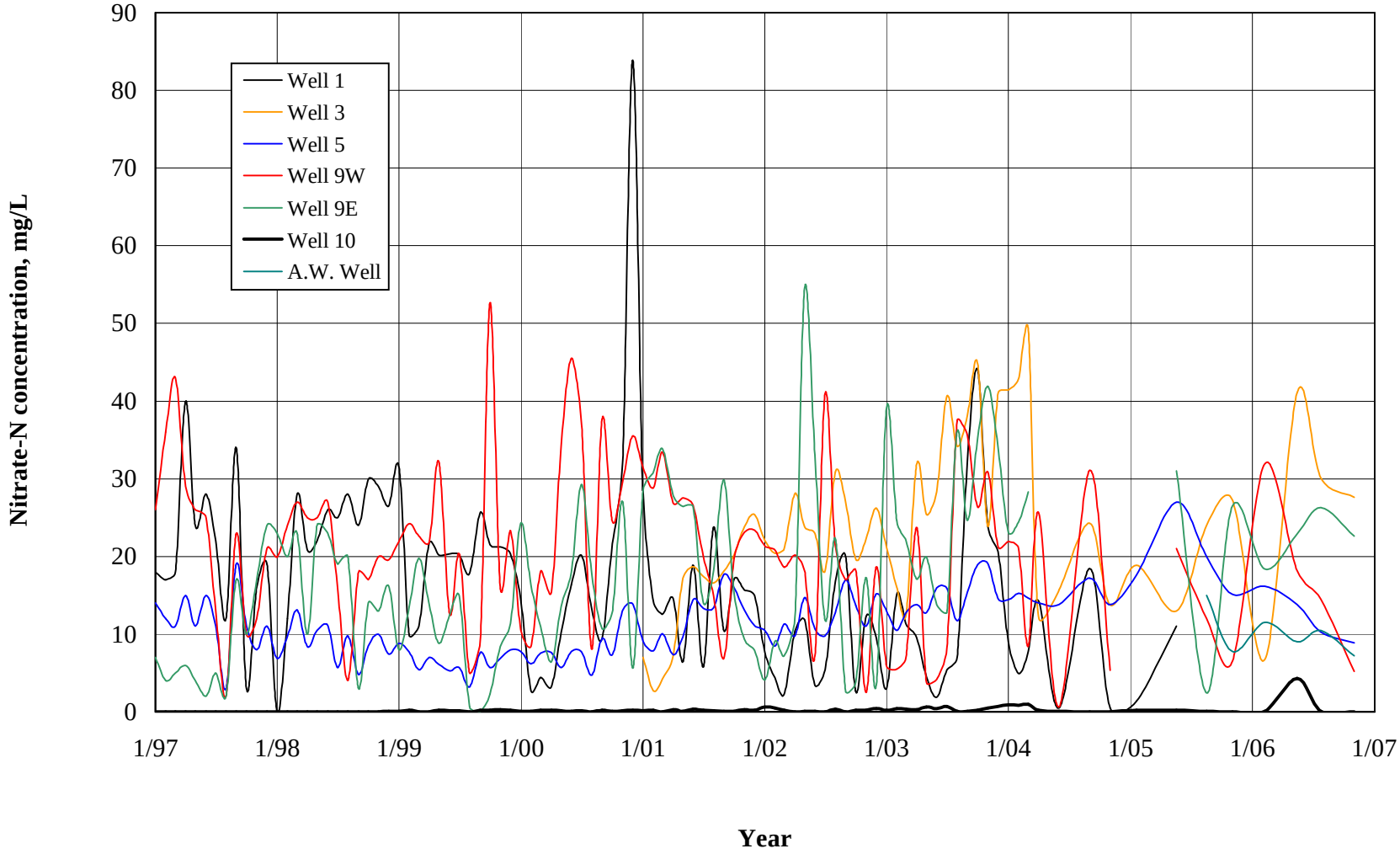

FIGURE 4
GROUNDWATER COD CONCENTRATIONS
AT MANTECA WQCF, 1997 - 2004

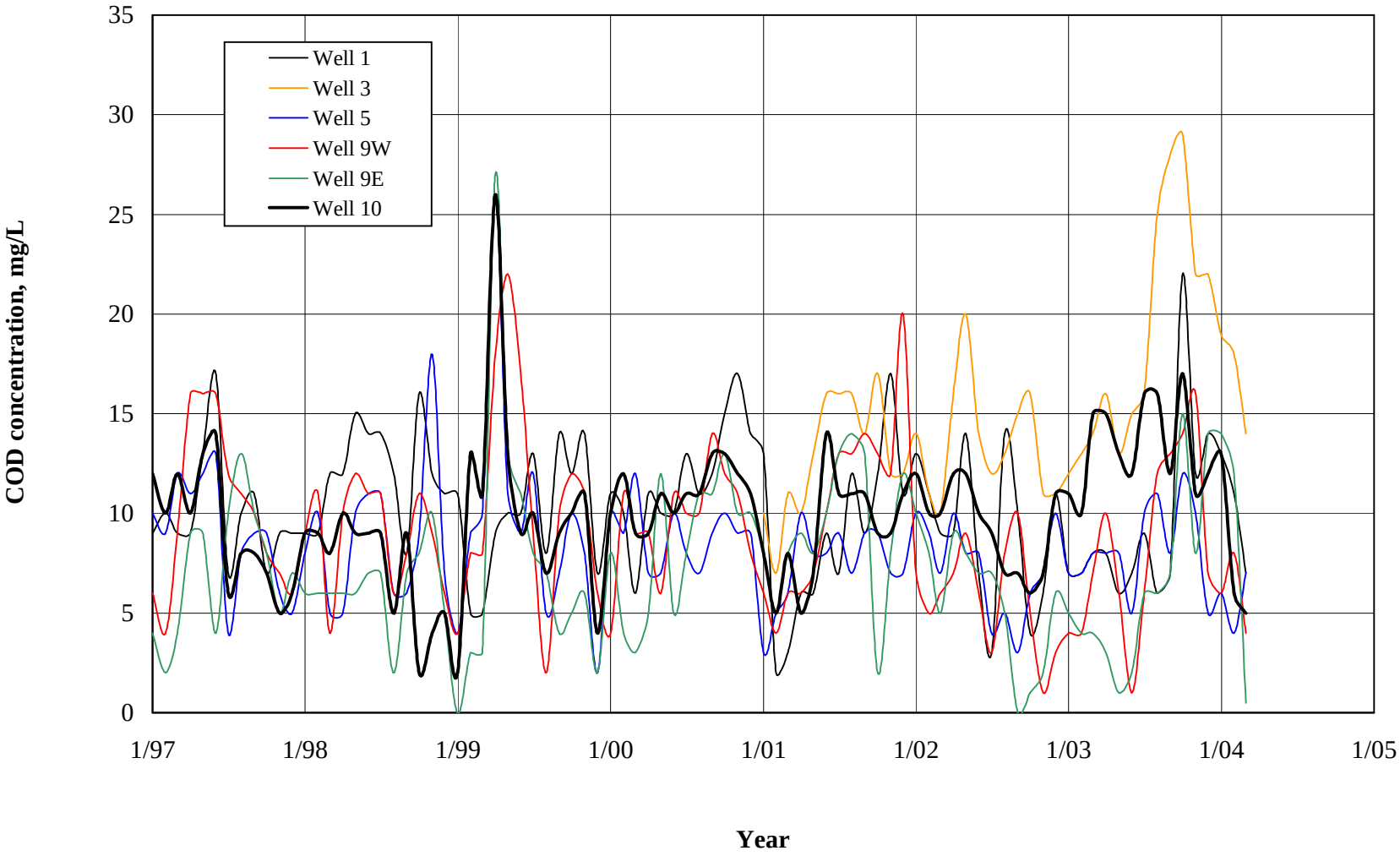

FIGURE 5
GROUNDWATER TDS CONCENTRATIONS
AT MANTECA WQCF, 1997 - 2006

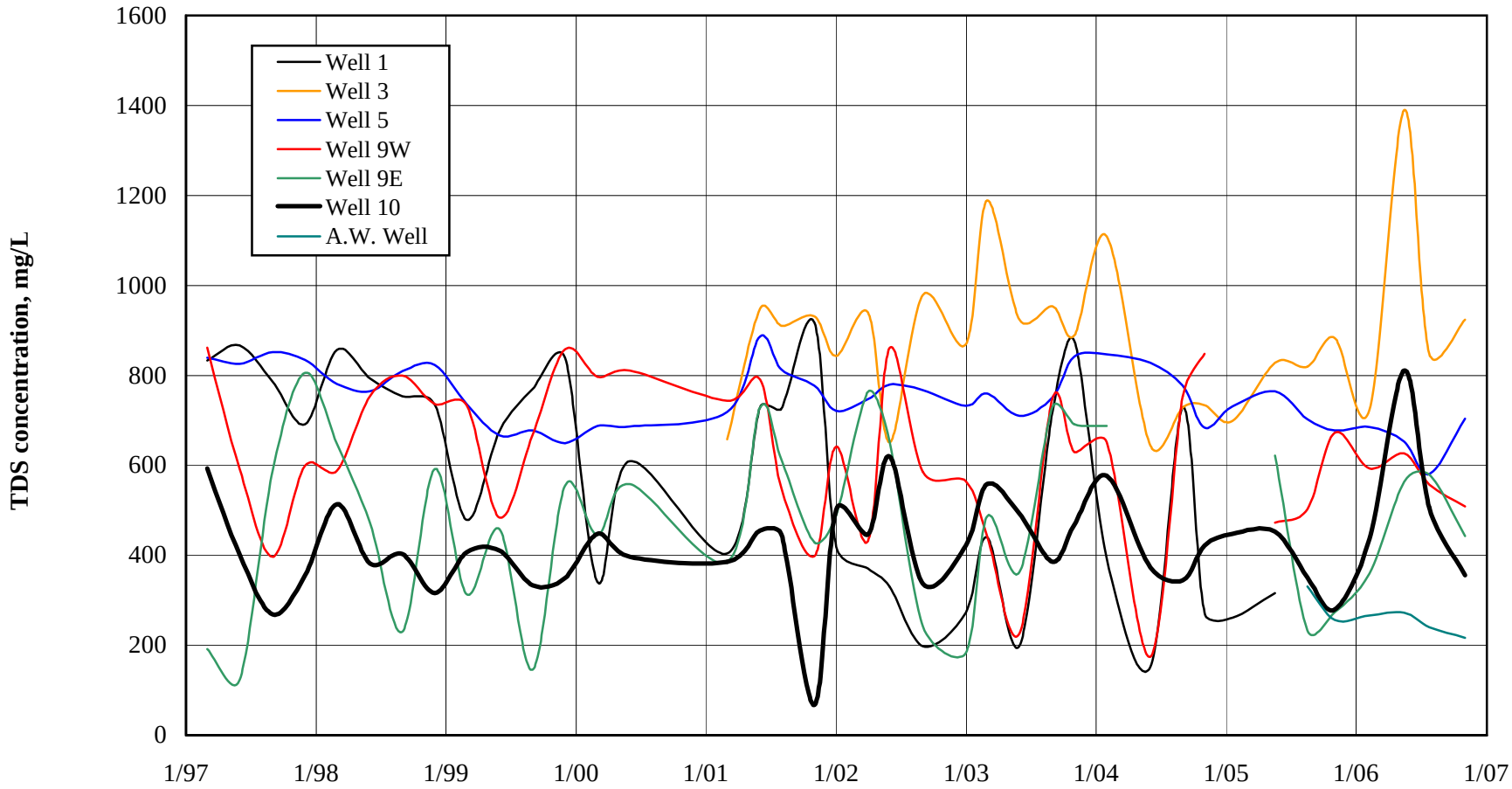

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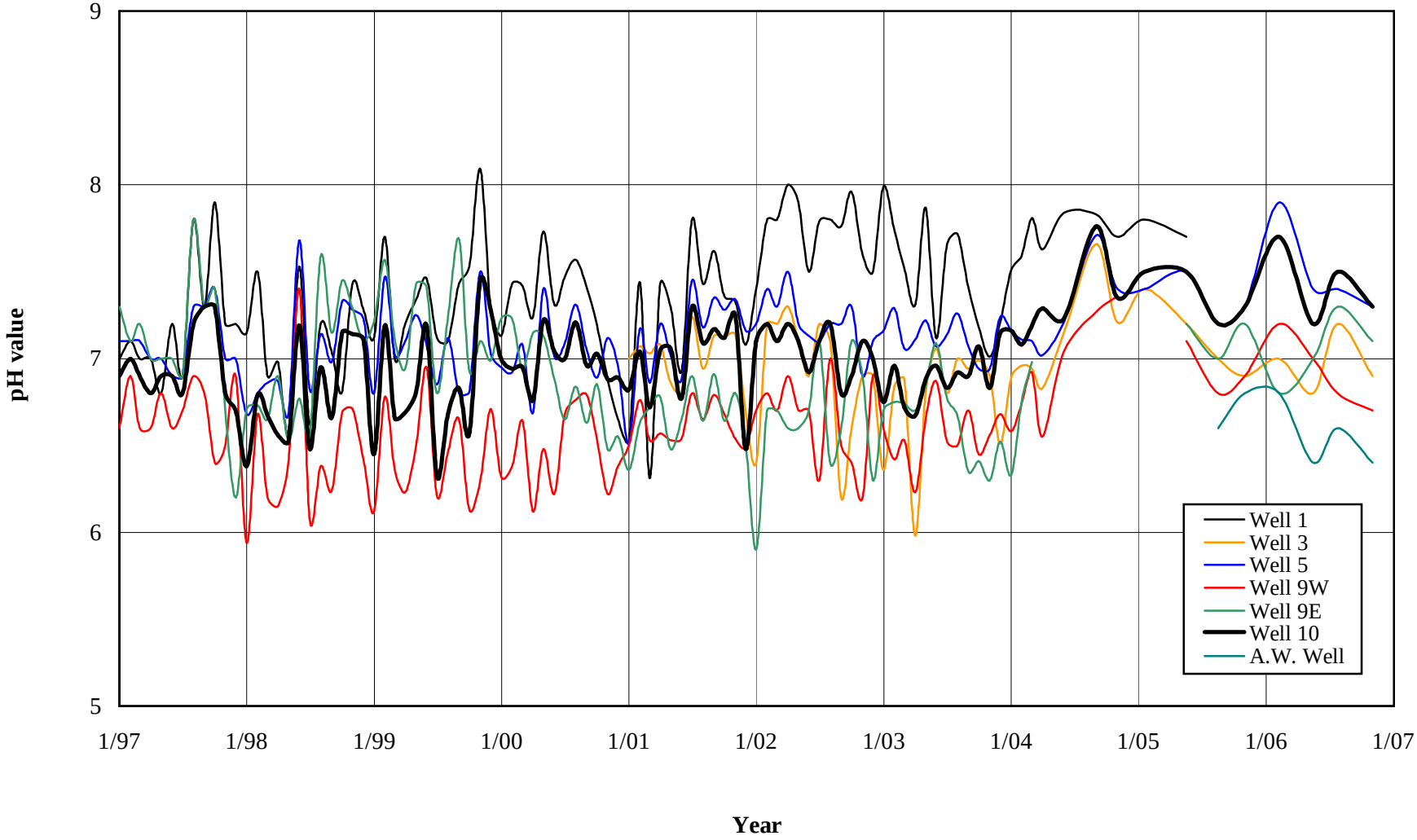
FIGURE 6
GROUNDWATER pH VALUES
AT MANTECA WQCF, 1997 - 2006



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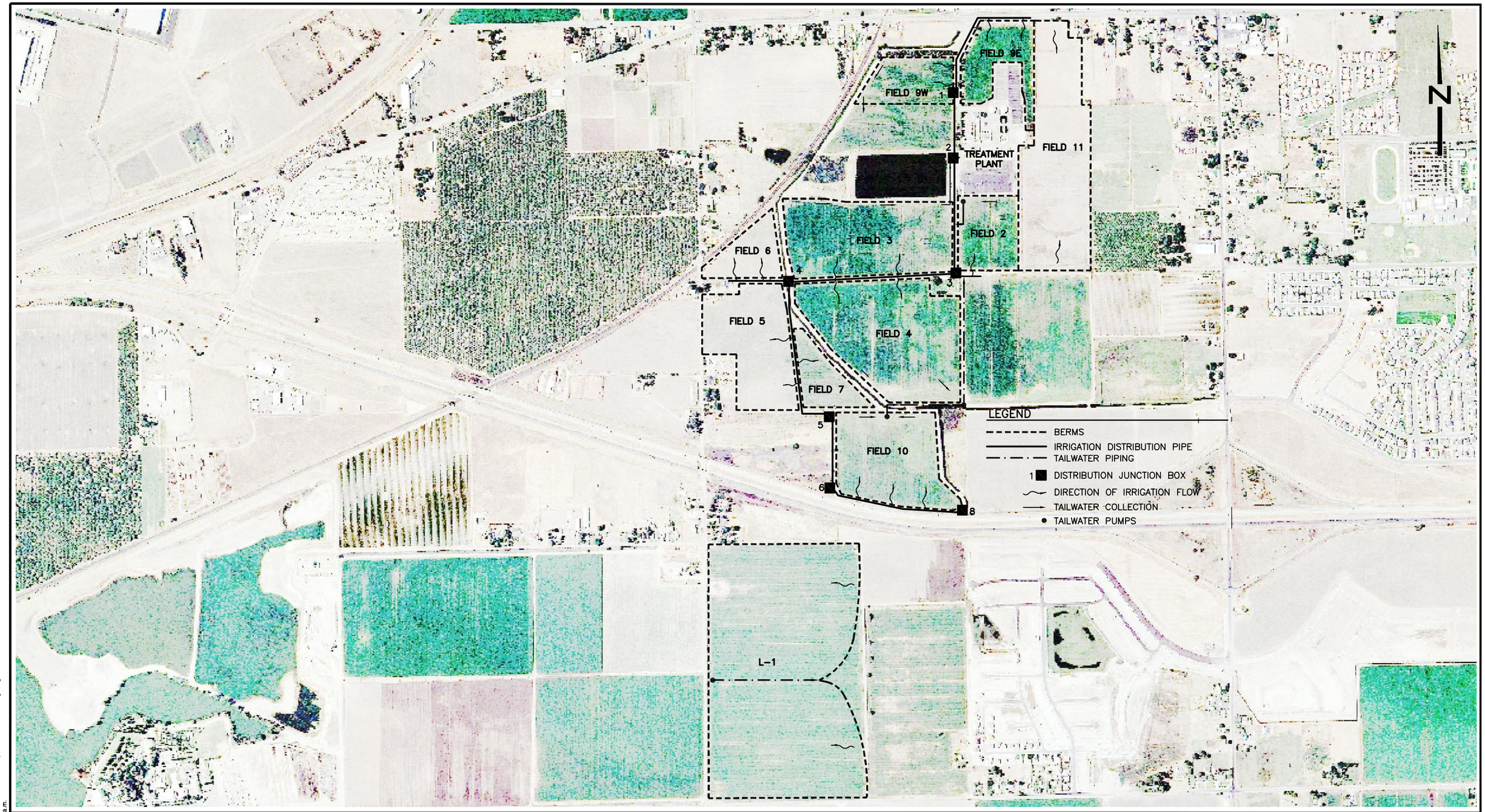

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WASTEWATER MANAGEMENT PLAN FOR MANTECA WQCF PHASE IV EXPANSION PROJECT

IRRIGATION DISTRIBUTION AND TAILWATER COLLECTION SYSTEM

SCALE
NOT TO SCALE
DRAWING NUMBER
FIG. 7
SHEET NUMBER
OF SHEETS

TABLE 1
SUMMARY OF LAND APPLICATION
AREAS FOR MANTECA WQCF[a]

Field	Field area, ac	APN	Parcel area, ac
2	10.3	241-300-48	10.66
3	30.5	241-310-16	37.14
4	37.9	241-310-44	40.14
5	20.2	241-310-32	35.11
6	7.4	241-310-18	7.86
7	8.1	241-310-32	35.11
9W	9.1	241-310-58	31.07
9E	9.9	241-310-58	-
10	23.5	241-310-53	30.53
11	33.7	241-300-61 and 62	33.7
L-1 (Dutra)	70.0	241-320-47	83.73
Total	260.6	-	345.05

[a] Added areas include Field 11 and L-1 (leased from Dutra Farms, Inc.).

TABLE 2

SUMMARY OF SOIL TYPES AT MANTECA WQCF[a]

Soil No.	Soil name	Percent of area	Permeability	Permeability rate, in/hr	Intake rate, in/hr
108	Arents, saline-sodic	24%	Moderately slow	0.2 - 0.6	1.5
109	Bisgani loamy coarse sand	39%	Rapid	6 - 20	3.0
142	Delhi loamy sand	14%	Rapid	6 - 20	3.0
145	Dello loamy sand	1%	Rapid	6 - 20	3.0
254	Timor loamy sand	7%	Rapid	6 - 20	3.0
255	Tinnin loamy coarse sand	13%	Rapid	6 - 20	3.0
266	Veritas fine sandy loam	2%	Mod. rapid	2 - 6	1.5
Total	-	100%	-	-	-

Area-weighted permeability rate[b], in/hr:	4.5
Area-weighted intake rate, in/hr:	2.6

[a] Soil information from Soil Survey of San Joaquin County, California, USDA, 1992.

[b] Area-weighted permeability rate based on low end of permeability rate range.

TABLE 3
HISTORICAL AND ESTIMATED FUTURE WASTEWATER FLOWS FOR ECKERT COLD STORAGE

	Eckert wastewater flow[a], Mgal/d										
Month	1998	1999	2000	2001	2002	2003	2004	2005	2006	Avg.[b]	Future[c]
Jan	-	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	0.04	0.00	0.01
Apr	-	-	0.03	-	-	-	-	0.04	0.03	0.01	0.02
May	0.15	0.14	0.19	0.07	0.08	0.12	0.10	0.06	0.07	0.11	0.20
Jun	0.30	0.17	0.23	0.14	0.14	0.12	0.17	0.12	0.09	0.16	0.29
Jul	0.32	0.26	0.37	0.27	0.20	0.19	0.20	0.20	0.06	0.23	0.42
Aug	0.35	0.39	0.36	0.35	0.31	0.20	0.25	0.26	0.27	0.30	0.55
Sep	0.37	0.42	0.41	0.30	0.12	0.24	0.24	0.27	0.29	0.29	0.53
Oct	0.38	0.45	0.40	0.24	0.25	0.23	0.24	0.27	0.29	0.31	0.55
Nov	0.30	0.22	-	0.08	0.24	0.19	-	0.26	0.20	0.17	0.30
Dec	0.09	-	-	-	-	-	-	-	-	0.01	0.02

Eckert flow peaking factor: 1.80

[a] Values provided by Manteca Wastewater Quality Control Facility.

[b] Average over nine-year period.

[c] Equals average Eckert flow times peaking factor. Peaking factor chosen so that maximum flow equals 0.55 Mgal/d (flow limit for current Eckert wastewater permit).

TABLE 4
DETERMINATION OF WASTEWATER VOLUMES DISPOSED TO LAND AND TO THE SAN JOAQUIN RIVER FROM ECKERT AND THE MANTECA WQCF
(100-YEAR PRECIPITATION CONDITIONS, WITH MANTECA WQCF FLOW = 17.5 MGD)

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
		Precip.,	ET,	Percolation, in			Net ET,	Applied WW		Applied WW, Mgal			WQCF WW, Mgal			
Month	Days	in	in	Natural	Applied	Total	in	in	Mgal	Eckert	WQCF	Total	Land	River	Total	Land %
Jan	31	4.75	0.98	3.77	0.00	3.77	0.00	0.00	0.0	-	0.0	0.0	0.0	542.5	542.5	0.0
Feb	28	3.93	1.81	2.12	0.70	2.82	0.00	0.70	5.0	-	5.0	5.0	5.0	485.0	490.0	1.0
Mar	31	3.12	3.51	0.00	3.12	3.12	0.39	3.51	24.9	0.2	24.7	24.9	24.7	517.8	542.5	4.5
Apr	30	1.64	4.94	0.00	3.02	3.02	3.30	6.33	44.8	0.6	44.2	44.8	44.2	480.8	525.0	8.4
May	31	1.16	6.67	0.00	3.12	3.12	5.51	8.64	61.1	6.1	55.0	61.1	55.0	487.5	542.5	10.1
Jun	30	0.21	7.52	0.00	3.02	3.02	7.31	10.33	73.1	8.8	64.3	73.1	64.3	460.7	525.0	12.2
Jul	31	0.04	8.03	0.00	3.12	3.12	8.00	11.12	78.7	12.9	65.8	78.7	65.8	476.7	542.5	12.1
Aug	31	0.20	7.09	0.00	3.12	3.12	6.89	10.02	70.9	17.0	53.9	70.9	53.9	488.6	542.5	9.9
Sep	30	0.26	5.24	0.00	3.02	3.02	4.98	8.00	56.6	15.9	40.8	56.6	40.8	484.2	525.0	7.8
Oct	31	0.94	3.42	0.00	3.12	3.12	2.48	5.60	39.6	17.1	22.6	39.6	22.6	519.9	542.5	4.2
Nov	30	2.16	1.65	0.51	2.51	3.02	0.00	2.51	17.8	9.0	8.8	17.8	8.8	516.2	525.0	1.7
Dec	31	3.44	0.98	2.46	0.67	3.12	0.00	0.67	4.7	0.5	4.2	4.7	4.2	538.3	542.5	0.8
Total	365	21.83	51.84	8.86	28.58	37.43	38.86	67.44	477.3	88.1	389.1	477.3	389.1	5,998.4	6,387.5	-

WQCF flow, mgd:	17.5
Land application area, ac:	260.6
Hydraulic conductivity, in/hr:	0.06
Percolation safety factor, %:	7.0

(1) 100-year annual precipitation data for Manteca divided into monthly values using precipitation data from 1988 to 2006 from Manteca CIMIS station.
(2) Average monthly reference evapotranspiration data from 1988 to 2006 from Manteca CIMIS station.
(3) Natural percolation equals precipitation (1) - evapotranspiration (2); zero when negative.
(4) Applied water percolation equals total percolation (5) - natural percolation (3).
(5) Total percolation equals safety factor times hydraulic conductivity times 24 hrs times days per month, or natural percolation, whichever is higher.
(6) Net ET equals evapotranspiration (2) - precipitation (1); zero when negative.
(7) Applied wastewater equals applied percolation (4) + net ET (6).
(8) Equals applied wastewater (7) times land application area.
(9) Estimated monthly Eckert wastewater flow times days per month (i.e., flow assumed to occur each day).
(10) Manteca WQCF wastewater volume equals total (11) minus Eckert wastewater volume (9).
(11) Total applied wastewater equals applied wastewater depth (7) times land application area; same as (8).
(12) Manteca WQCF wastewater volume applied to land; same as (10).
(13) Manteca WQCF wastewater volume to river equals total (14) minus wastewater volume to land (12).
(14) Total Manteca WQCF wastewater flow equals 17.5 Mgal/d times days per month.
(15) Equals percent of Manteca WQCF wastewater applied to land out of total Manteca WQCF wastewater volume.

TABLE 5
DETERMINATION OF WASTEWATER VOLUMES DISPOSED TO LAND AND TO THE SAN JOAQUIN RIVER FROM ECKERT AND THE MANTECA WQCF
(NORMAL-YEAR PRECIPITATION CONDITIONS, WITH MANTECA WQCF FLOW = 17.5 MGD)

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
		Precip.,	ET,	Percolation, in			Net ET,	Applied WW		Applied WW, Mgal			WQCF WW, Mgal			
Month	Days	in	in	Natural	Applied	Total	in	in	Mgal	Eckert	WQCF	Total	Land	River	Total	Land %
Jan	31	2.90	0.98	1.91	0.32	2.23	0.00	0.32	2.2	-	2.2	2.2	2.2	540.3	542.5	0.4
Feb	28	2.40	1.81	0.59	1.43	2.02	0.00	1.43	10.1	-	10.1	10.1	10.1	479.9	490.0	2.1
Mar	31	1.90	3.51	0.00	2.23	2.23	1.61	3.84	27.2	0.2	26.9	27.2	26.9	515.6	542.5	5.0
Apr	30	1.00	4.94	0.00	2.16	2.16	3.94	6.10	43.2	0.6	42.6	43.2	42.6	482.4	525.0	8.1
May	31	0.71	6.67	0.00	2.23	2.23	5.96	8.19	58.0	6.1	51.9	58.0	51.9	490.6	542.5	9.6
Jun	30	0.13	7.52	0.00	2.16	2.16	7.39	9.55	67.6	8.8	58.7	67.6	58.7	466.3	525.0	11.2
Jul	31	0.02	8.03	0.00	2.23	2.23	8.01	10.24	72.5	12.9	59.6	72.5	59.6	482.9	542.5	11.0
Aug	31	0.12	7.09	0.00	2.23	2.23	6.97	9.20	65.1	17.0	48.1	65.1	48.1	494.4	542.5	8.9
Sep	30	0.16	5.24	0.00	2.16	2.16	5.08	7.24	51.2	15.9	35.4	51.2	35.4	489.6	525.0	6.7
Oct	31	0.57	3.42	0.00	2.23	2.23	2.84	5.08	35.9	17.1	18.9	35.9	18.9	523.6	542.5	3.5
Nov	30	1.32	1.65	0.00	2.16	2.16	0.33	2.49	17.6	9.0	8.7	17.6	8.7	516.3	525.0	1.7
Dec	31	2.10	0.98	1.12	1.11	2.23	0.00	1.11	7.9	0.5	7.4	7.9	7.4	535.1	542.5	1.4
Total	365	13.31	51.84	3.62	22.66	26.28	42.14	64.80	458.6	88.1	370.4	458.6	370.4	6,017.1	6,387.5	-

WQCF flow, mgd:	17.5
Land application area, ac:	260.6
Hydraulic conductivity, in/hr:	0.06
Percolation safety factor, %:	5

(1) Average monthly precipitation data from 1988 to 2006 from Manteca CIMIS station.
(2) Average monthly reference evapotranspiration data from 1988 to 2006 from Manteca CIMIS station.
(3) Natural percolation equals precipitation (1) - evapotranspiration (2); zero when negative.
(4) Applied water percolation equals total percolation (5) - natural percolation (3).
(5) Total percolation equals safety factor times hydraulic conductivity times 24 hrs times days per month, or natural percolation, whichever is higher.
(6) Net ET equals evapotranspiration (2) - precipitation (1); zero when negative.
(7) Applied wastewater equals applied percolation (4) + net ET (6).
(8) Equals applied wastewater (7) times land application area.
(9) Estimated monthly Eckert wastewater flow times days per month (i.e., flow assumed to occur each day).
(10) Manteca WQCF wastewater volume equals total (11) minus Eckert wastewater volume (9).
(11) Total applied wastewater equals applied wastewater depth (7) times land application area; same as (8).
(12) Manteca WQCF wastewater volume applied to land; same as (10).
(13) Manteca WQCF wastewater volume to river equals total (14) minus wastewater volume to land (12).
(14) Total Manteca WQCF wastewater flow equals 17.5 Mgal/d times days per month.
(15) Equals percent of Manteca WQCF wastewater applied to land out of total Manteca WQCF wastewater volume.

TABLE 6
ANNUAL VOLUMES OF WASTEWATER
APPLIED TO LAND AND DISCHARGED TO RIVER

WQCF flow, Mgal/d	Wastewater discharged, million gallons/yr					
	100-year precipitation			Normal-year precipitation		
	Land		River	Land		River
	Eckert	WQCF	WQCF	Eckert	WQCF	WQCF
17.5	88	389	5,998	88	370	6,017

TABLE 7

SUMMARY OF AVERAGE BOD VALUES FROM ECKERT COLD STORAGE[a]

	Average monthly BOD[b], mg/L									
Month	1998	1999	2000	2001	2002	2003	2004	2005	2006	Average
Jan	-	-	-	-	-	-	-	-	-	-
Feb	-	-	-	-	-	-	-	-	-	-
Mar	-	-	-	-	-	-	-	-	-	-
Apr	-	-	1,687	-	-	-	-	2,018	2,655	2,120
May	453	1,234	784	1,675	1,693	2,337	1,358	2,289	2,677	1,611
Jun	1,038	2,194	1,114	2,536	2,143	1,960	2,291	2,679	2,861	2,091
Jul	1,134	864	939	892	1,004	770	1,743	1,647	2,602	1,288
Aug	956	837	894	866	1,040	986	996	1,015	2,569	1,129
Sep	929	914	1,011	988	1,189	945	1,502	1,222	1,171	1,097
Oct	868	1,579	1,636	1,472	1,879	1,770	1,680	1,918	1,214	1,557
Nov	940	2,203	-	-	1,905	1,815	-	2,259	1,025	1,691
Dec	1,578	-	-	-	-	-	-	-	1,651	1,615
Average[c]	987	1,404	1,152	1,405	1,550	1,512	1,595	1,881	2,047	1,578

[a] Values provided by Manteca Wastewater Quality Control Facility.

[b] Biochemical Oxygen Demand.

[c] Average for months when flow occurs.

TABLE 8
SUMMARY OF AVERAGE NITROGEN VALUES FROM ECKERT COLD STORAGE[a]

Month	Nitrogen value, mg/L			
	NO_2-N	NO_3-N	TKN[b]	TN[c]
May-00	2.9	3.2	14.6	20.6
Jun-00	2.4	9.4	28.2	40.0
Aug-00	1.3	7.1	28.2	36.6
Sep-00	5.2	4.4	34.0	43.7
Oct-00	12.4	1.6	36.0	50.1
Sep-01	0.5	3.5	20.6	24.7
Oct-01	0.4	3.4	31.9	35.6
Oct-06	1.0	1.7	-	-
Average	3.3	4.3	27.7	35.9

[a] Values provided by Manteca Wastewater Quality Control Facility.

[b] TKN values for June and August unavailable, so average values from the year 2000 were used.

[c] Total Nitrogen (TN) = nitrite nitrogen (NO_2-N) + nitrate nitrogen (NO_3-N) + Total Kjeldahl Nitrogen (TKN). Ammonia nitrogen (NH_3-N) is included in TKN value.

TABLE 9
CONCENTRATIONS OF BOD AND AMMONIA
NITROGEN IN EFFLUENT FROM MANTECA WQCF[a]

	BOD, mg/L					Ammonia-N, mg/L				
Month	2003	2004	2005	2006	Avg.	2003[b]	2004	2005	2006	Avg.
Jan	51	14	5	3	18	20	0.2	0.3	0.2	5.3
Feb	47	17	5	4	18	15	0.2	0.3	0.1	3.8
Mar	51	12	4	4	18	17	0.1	0.3	0.2	4.4
Apr	48	13	3	4	17	19	0.2	0.2	0.2	4.9
May	52	16	3	3	19	18	0.1	0.3	0.2	4.7
Jun	55	13	3	3	19	19	0.1	0.2	0.2	4.9
Jul	51	14	3	3	18	18	0.1	0.1	0.2	4.6
Aug	66	14	4	3	22	16	0.2	0.2	0.2	4.2
Sep	46	18	7	2	18	4.8	0.2	0.2	0.2	1.4
Oct	63	13	6	2	21	5.7	0.1	0.1	0.1	1.5
Nov	31	13	5	2	13	0.5	0.1	0.2	0.2	0.3
Dec	17	18	4	2	10	0.2	0.2	0.2	0.7	0.3
Avg.	48	15	4	3	18	13	0.2	0.2	0.2	3.4

[a] Values provided by Manteca Wastewater Quality Control Facility.

[b] Manteca WQCF began nitrification in late 2003, reducing effluent ammonia concentrations.

TABLE 10
ESTIMATED CONCENTRATIONS FOR BOD AND TN IN BLENDED WASTEWATER
(NORMAL-YEAR PRECIPITATION CONDITIONS, WQCF FLOW = 17.5 MGD)

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		Wastewater volume, Mgal			BOD concentration, mg/L			TN concentration, mg/L		
Month	Days	Eckert	WQCF	Blended	Eckert	WQCF	Blended	Eckert	WQCF	Blended
Jan	31	-	2.2	2.2	-	10	10	-	2.0	2.0
Feb	28	-	10.1	10.1	-	10	10	-	2.0	2.0
Mar	31	0.2	26.9	27.2	-	10	10	-	2.0	2.0
Apr	30	0.6	42.6	43.2	2,120	10	39	40	2.0	2.5
May	31	6.1	51.9	58.0	1,611	10	179	40	2.0	6.0
Jun	30	8.8	58.7	67.6	2,091	10	282	40	2.0	7.0
Jul	31	12.9	59.6	72.5	1,288	10	238	40	2.0	8.8
Aug	31	17.0	48.1	65.1	1,129	10	302	40	2.0	11.9
Sep	30	15.9	35.4	51.2	1,097	10	347	40	2.0	13.8
Oct	31	17.1	18.9	35.9	1,557	10	744	40	2.0	20.0
Nov	30	9.0	8.7	17.6	1,691	10	866	40	2.0	21.3
Dec	31	0.5	7.4	7.9	1,615	10	119	40	2.0	4.6
Total	365	88.1	370.4	458.6	-	-	-	-	-	-
Avg.	-	-	-	-	1,578	10	262	40	2.0	8.5

(1) Estimated monthly wastewater volumes from Eckert.
(2) Manteca WQCF estimated monthly wastewater volumes applied to land.
(3) Volume of blended wastewater equals sum of Eckert (1) + Manteca WQCF (2) wastewater.
(4) Eckert wastewater monthly average BOD concentrations.
(5) Conservative assumption for Manteca WQCF wastewater BOD concentration.
(6) Blended wastewater BOD concentrations equal flow-weighted averages of Eckert and Manteca WQCF BOD concentrations.
(7) Assumed value for Eckert wastewater Total Nitrogen concentration.
(8) Conservative assumption for Manteca WQCF wastewater TN concentration.
(9) Blended wastewater TN concentrations equal flow-weighted averages of Eckert and Manteca WQCF TN concentrations.

TABLE 11
ESTIMATED LOADING RATES FOR LAND APPLICATION OF BLENDED WASTEWATER
(NORMAL-YEAR PRECIPITATION, WQCF FLOW = 17.5 MGD)

		Applied	Blended wastewater		Loading	
		WW vol.[a],	quality[b], mg/L		BOD[c]	TN[d]
Month	Days	Mgal	BOD	TN	lb/ac·d	lb/ac
Jan	31	2.2	10	2.0	0.0	0.1
Feb	28	10.1	10	2.0	0.1	0.6
Mar	31	27.2	10	2.0	0.3	1.7
Apr	30	43.2	39	2.5	1.8	3.5
May	31	58.0	179	6.0	10.7	11.2
Jun	30	67.6	282	7.0	20.4	15.1
Jul	31	72.5	238	8.8	17.8	20.3
Aug	31	65.1	302	11.9	20.3	24.9
Sep	30	51.2	347	13.8	19.0	22.6
Oct	31	35.9	744	20.0	27.6	23.0
Nov	30	17.6	866	21.3	16.3	12.1
Dec	31	7.9	119	4.6	1.0	1.2
Total	365	458.6	-	-	-	136.3

Land application area, ac: 260.6

[a] Applied wastewater volumes from Table 10.

[b] Blended wastewater quality values from Table 10.

[c] BOD loading equals wastewater volume times BOD concentration divided by land application area divided by days per month.

[d] TN loading equals wastewater volume times TN concentration divided by land application area.

APPENDIX

GROUNDWATER MONITORING DATA

TABLE A-1
MONTHLY GROUNDWATER ELEVATION VALUES AT
MANTECA WASTEWATER QUALITY CONTROL FACILITY

Date	Well 1	Well 3	Well 5	Well 9W	Well 9E	Well 10	Well 11	AW Well
1/97	16.36	-	12.78	14.16	14.75	16.05	-	-
2/97	16.43	-	12.70	14.48	15.33	16.02	-	-
3/97	15.95	-	12.20	13.91	14.79	15.47	-	-
4/97	16.72	-	12.91	16.00	18.00	16.30	-	-
5/97	16.61	-	11.37	17.58	16.25	15.55	-	-
6/97	16.70	-	11.12	15.33	18.16	15.97	-	-
7/97	16.36	-	10.28	14.62	15.48	15.68	-	-
8/97	16.53	-	10.45	15.75	15.66	16.14	-	-
9/97	16.53	-	10.95	15.75	15.58	15.97	-	-
10/97	16.61	-	10.12	14.91	14.75	15.89	-	-
11/97	15.20	-	10.87	14.35	14.96	14.12	-	-
12/97	15.53	-	10.01	13.08	13.96	15.85	0.00	-
1/98	15.61	-	10.12	12.91	13.41	15.14	-	-
2/98	18.03	-	11.37	14.83	14.00	17.47	-	-
3/98	16.86	-	13.95	15.25	16.66	16.55	-	-
4/98	15.95	-	12.87	15.50	14.50	15.55	-	-
5/98	16.95	-	12.45	16.16	15.75	16.55	-	-
6/98	16.61	-	12.12	14.66	16.75	16.14	-	-
7/98	16.61	-	12.28	15.75	18.58	16.22	-	-
8/98	17.11	-	11.62	15.91	17.00	16.14	-	-
9/98	16.45	-	11.63	14.41	17.25	16.01	-	-
10/98	16.24	-	10.87	14.62	15.79	15.51	-	-
11/98	15.41	-	10.70	14.33	15.33	15.35	-	-
12/98	15.32	-	10.12	13.41	14.54	14.64	0.00	-
1/99	15.78	-	10.78	14.00	13.96	15.51	-	-
2/99	16.36	-	11.24	13.83	14.16	16.14	-	-
3/99	15.86	-	11.74	14.33	14.33	15.51	-	-
4/99	16.45	-	11.95	15.91	15.25	15.97	-	-
5/99	15.28	-	11.28	14.95	15.37	15.80	-	-
6/99	16.36	-	10.91	15.58	17.04	16.47	-	-
7/99	16.70	-	10.87	15.73	15.55	17.95	-	-
8/99	17.36	-	11.37	16.50	16.50	16.89	-	-
9/99	16.95	-	11.12	16.08	16.50	16.30	-	-
10/99	17.11	-	11.24	16.00	16.33	16.05	-	-
11/99	15.82	-	10.83	13.91	14.66	14.89	-	-
12/99	14.61	-	9.87	13.04	14.04	13.55	0.00	-
1/00	14.86	-	9.45	14.83	13.33	13.80	-	-
2/00	17.45	-	10.28	12.75	13.25	12.22	-	-
3/00	15.95	-	11.12	13.75	14.25	15.47	-	-
4/00	16.28	-	12.20	15.25	12.50	15.89	-	-
5/00	16.78	-	11.20	15.08	15.08	16.14	-	-
6/00	16.78	-	11.37	15.33	15.16	16.39	-	-
7/00	17.53	-	11.45	16.50	15.25	16.80	-	-
8/00	17.11	-	12.95	14.16	15.08	17.47	-	-
9/00	17.36	-	12.70	16.16	15.16	17.05	-	-
10/00	18.03	-	13.70	16.33	16.25	17.97	-	-
11/00	17.11	-	13.12	15.16	16.50	16.80	-	-
12/00	15.86	-	11.53	13.88	15.00	15.22	0.00	-
1/01	15.41	13.81	10.71	13.21	13.93	14.64	-	-
2/01	15.82	13.96	10.85	15.14	16.91	15.01	-	-
3/01	15.78	14.08	10.95	13.41	13.41	15.30	-	-
4/01	16.45	15.25	12.12	14.83	14.58	15.97	-	-

TABLE A-1
MONTHLY GROUNDWATER ELEVATION VALUES AT
MANTECA WASTEWATER QUALITY CONTROL FACILITY

Date	Well 1	Well 3	Well 5	Well 9W	Well 9E	Well 10	Well 11	AW Well
5/01	16.70	16.70	11.40	15.50	15.70	16.70	-	-
6/01	16.51	14.75	10.66	14.48	15.83	15.89	-	-
7/01	17.36	15.08	10.95	16.37	16.66	16.55	-	-
8/01	17.70	17.80	11.53	16.04	15.58	17.20	-	-
9/01	18.03	16.58	12.03	15.87	15.75	17.89	-	-
10/01	17.86	16.50	11.62	15.41	15.83	17.22	-	-
11/01	16.36	15.50	11.12	14.33	15.25	16.05	-	-
12/01	15.95	14.35	10.83	13.46	14.35	15.80	15.80	-
1/02	16.78	15.67	12.62	15.33	14.75	16.55	-	-
2/02	16.03	14.54	11.78	13.66	14.08	15.72	-	-
3/02	16.32	14.50	11.45	14.04	13.75	15.82	-	-
4/02	19.28	16.42	13.03	15.79	15.46	17.51	-	-
5/02	18.91	15.09	11.35	16.25	14.04	16.51	-	-
6/02	17.24	14.48	10.78	16.71	13.25	16.80	-	-
7/02	17.53	17.04	12.99	15.83	12.46	17.74	-	-
8/02	18.41	18.33	11.87	15.83	12.41	18.01	-	-
9/02	17.70	16.67	9.95	14.91	15.25	17.53	-	-
10/02	17.70	14.75	10.87	14.50	12.08	17.22	-	-
11/02	15.82	13.58	10.45	12.25	12.08	15.39	-	-
12/02	14.86	13.08	9.53	11.08	11.58	12.14	12.14	-
1/03	15.86	13.71	10.70	12.87	12.25	15.45	-	-
2/03	14.78	13.08	10.28	11.91	12.16	12.97	-	-
3/03	15.61	10.33	10.87	13.58	12.50	15.22	-	-
4/03	16.86	13.50	11.83	14.50	12.58	16.39	-	-
5/03	17.61	15.00	11.78	15.08	12.58	16.05	-	-
6/03	16.53	14.33	10.78	14.33	12.58	15.89	-	-
7/03	16.78	14.54	10.30	15.04	12.58	15.64	-	-
8/03	17.36	16.17	12.20	15.50	12.83	16.89	-	-
9/03	14.28	20.83	11.78	18.83	13.66	15.97	-	-
10/03	18.86	19.33	13.12	17.83	17.25	18.55	-	-
11/03	16.61	18.08	12.95	14.16	17.96	12.89	-	-
12/03	16.32	16.33	12.37	14.04	15.25	16.22	16.22	-
1/04	15.45	15.33	11.78	12.75	14.16	13.97	-	-
2/04	14.78	14.42	11.20	12.75	13.16	13.39	-	-
4/04	17.86	16.50	12.45	13.16	-	17.22	-	-
6/04	16.16	14.05	10.80	13.25	-	15.76	-	-
9/04	19.77	18.62	11.34	14.85	-	18.22	-	-
11/04	14.57	12.89	9.72	10.41	-	14.42	14.42	-
1/05	14.97	12.32	9.84	-	-	14.62	-	-
5/05	16.48	14.52	9.99	14.75	12.41	15.99	-	-
8/05	-	14.97	9.34	14.75	9.21	14.62	-	13.90
11/05	-	17.85	11.93	16.78	17.03	16.95	-	15.12
2/06	-	15.65	11.68	17.08	15.33	15.85	-	14.62
5/06	-	15.75	11.78	20.08	20.03	17.45	-	15.62
7/06	-	16.90	12.56	18.96	17.98	18.95	-	15.90
11/06	-	16.75	13.48	16.58	17.23	17.85	-	16.52

TABLE A-2
MONTHLY GROUNDWATER NITRATE-N CONCENTRATIONS
AT MANTECA WASTEWATER QUALITY CONTROL FACILITY

Date	Well 1	Well 3	Well 5	Well 9W	Well 9E	Well 10	AW Well
1/97	18.00	-	14.00	26.00	7.00	0.00	-
2/97	17.00	-	12.00	36.00	4.00	0.00	-
3/97	18.00	-	11.00	43.00	5.00	0.00	-
4/97	40.00	-	15.00	29.00	6.00	0.00	-
5/97	24.00	-	11.00	26.00	4.00	0.00	-
6/97	28.00	-	15.00	25.00	2.00	0.00	-
7/97	22.00	-	11.00	13.00	5.00	0.00	-
8/97	12.00	-	3.00	2.00	2.00	0.00	-
9/97	34.00	-	19.00	23.00	17.00	0.00	-
10/97	3.00	-	11.00	10.00	10.00	0.00	-
11/97	16.00	-	8.00	12.00	17.00	0.00	-
12/97	19.00	-	11.00	21.00	24.00	0.00	-
1/98	0.00	-	6.90	19.90	23.00	0.00	-
2/98	12.00	-	9.70	24.00	20.00	0.00	-
3/98	28.00	-	13.10	27.00	23.00	0.00	-
4/98	20.80	-	8.40	25.00	10.00	0.00	-
5/98	22.00	-	10.50	25.00	24.00	0.00	-
6/98	26.00	-	11.10	27.00	23.00	0.00	-
7/98	25.00	-	5.70	16.00	19.00	0.00	-
8/98	28.00	-	9.80	4.00	20.00	0.00	-
9/98	24.00	-	4.80	18.00	3.00	0.00	-
10/98	29.90	-	8.50	17.00	14.00	0.00	-
11/98	29.00	-	10.00	20.00	13.00	0.00	-
12/98	26.50	-	7.40	19.60	16.20	0.04	-
1/99	31.50	-	8.80	21.90	8.00	0.04	-
2/99	9.90	-	7.70	24.20	13.50	0.18	-
3/99	11.00	-	5.40	22.60	19.80	0.01	-
4/99	21.70	-	7.00	21.80	13.90	0.02	-
5/99	20.20	-	6.10	32.20	8.80	0.23	-
6/99	20.30	-	5.30	12.60	12.50	0.14	-
7/99	20.20	-	5.70	20.30	14.90	0.15	-
8/99	17.80	-	3.20	5.00	0.70	0.03	-
9/99	25.70	-	7.60	9.30	0.10	0.19	-
10/99	21.50	-	5.70	52.70	2.30	0.24	-
11/99	21.20	-	6.90	16.10	8.40	0.31	-
12/99	20.30	-	8.00	23.30	11.40	0.18	-
1/00	14.44	-	7.78	10.55	24.29	0.08	-
2/00	2.69	-	6.19	8.43	16.28	0.06	-
3/00	4.44	-	7.58	18.12	10.99	0.21	-
4/00	3.23	-	7.63	15.41	6.46	0.19	-
5/00	10.19	-	5.70	34.21	13.54	0.15	-
6/00	16.36	-	7.76	45.50	17.94	0.05	-
7/00	20.15	-	7.71	36.94	29.25	0.16	-
8/00	13.20	-	4.71	8.08	17.72	0.03	-
9/00	9.46	-	9.41	37.65	10.67	0.20	-
10/00	21.65	-	7.39	24.53	12.87	0.08	-
11/00	31.96	-	13.06	29.53	27.09	0.12	-
12/00	83.90	-	13.90	35.50	5.60	0.19	-
1/01	28.50	6.99	9.11	31.41	28.45	0.12	-
2/01	14.26	2.71	7.84	28.81	30.81	0.24	-
3/01	12.54	4.23	10.07	33.44	33.87	-	-
4/01	14.58	7.23	7.37	26.84	27.85	0.30	-
5/01	6.48	17.23	9.62	27.58	26.43	0.04	-

TABLE A-2
MONTHLY GROUNDWATER NITRATE-N CONCENTRATIONS
AT MANTECA WASTEWATER QUALITY CONTROL FACILITY

Date	Well 1	Well 3	Well 5	Well 9W	Well 9E	Well 10	AW Well
6/01	18.90	18.70	14.40	26.60	26.40	0.32	-
7/01	5.76	17.40	13.32	20.01	14.05	0.22	-
8/01	23.80	16.60	13.40	14.90	18.20	0.15	-
9/01	10.51	18.13	17.70	6.84	29.83	0.04	-
10/01	17.06	20.17	15.94	19.75	15.24	0.10	-
11/01	15.70	23.80	13.10	23.10	9.40	0.30	-
12/01	15.00	25.40	11.10	23.40	7.90	0.24	-
1/02	7.70	22.10	10.50	21.40	4.10	0.60	-
2/02	4.40	20.40	8.50	20.80	9.10	0.50	-
3/02	2.31	21.00	11.30	18.60	7.20	0.20	-
4/02	10.40	28.10	9.80	20.20	12.30	0.00	-
5/02	11.90	23.80	14.70	18.10	54.60	0.10	-
6/02	3.40	23.00	10.70	7.20	33.10	0.10	-
7/02	5.40	18.20	9.80	41.00	11.80	0.00	-
8/02	16.80	30.90	12.80	21.40	22.30	0.35	-
9/02	20.00	27.00	17.00	17.00	2.70	0.00	-
10/02	2.57	19.64	13.69	18.15	3.90	0.20	-
11/02	12.30	22.30	11.00	2.50	17.30	0.20	-
12/02	9.50	26.20	15.20	18.70	3.50	0.39	-
1/03	2.96	21.19	13.00	5.87	39.14	0.24	-
2/03	15.10	16.00	10.50	5.50	24.60	0.39	-
3/03	11.30	12.40	12.80	7.00	22.10	0.36	-
4/03	9.53	31.90	13.80	23.70	17.10	0.30	-
5/03	4.50	25.40	12.80	3.80	19.90	0.60	-
6/03	1.88	28.29	15.93	4.13	13.83	0.44	-
7/03	5.39	40.63	15.91	8.23	12.92	0.67	-
8/03	7.00	34.20	11.70	37.40	36.10	0.06	-
9/03	32.29	38.18	15.42	35.63	24.65	0.08	-
10/03	44.04	44.81	18.91	26.36	35.20	0.18	-
11/03	23.90	23.90	19.10	30.87	41.90	0.47	-
12/03	20.60	41.00	14.60	21.20	34.00	0.68	-
1/04	9.01	41.40	14.40	21.95	23.14	0.87	-
2/04	4.93	42.90	15.30	21.00	24.40	0.87	-
3/04	7.77	49.12	14.64	8.44	28.30	0.97	-
4/04	14.32	12.26	14.03	25.66	-	0.18	-
6/04	0.47	15.70	13.80	0.61	-	0.04	-
9/04	18.48	24.31	17.21	31.08	-	0.01	-
11/04	0.46	13.76	13.80	5.32	-	0.03	-
1/05	1.40	18.90	17.60	-	-	0.20	-
5/05	11.00	13.00	27.00	21.00	31.00	0.20	-
8/05	-	24.00	20.00	12.00	2.40	0.04	15.00
11/05	-	27.30	15.10	6.50	26.50	0.03	7.80
2/06	-	6.70	16.20	31.90	18.40	0.10	11.50
5/06	-	41.10	13.80	18.20	22.90	4.30	9.00
7/06	-	30.10	10.30	14.50	26.30	0.04	10.50
11/06	-	27.60	8.90	5.20	22.60	ND	7.20

TABLE A-3
MONTHLY GROUNDWATER COD CONCENTRATIONS
AT MANTECA WASTEWATER QUALITY CONTROL FACILITY

Date	Well 1	Well 3	Well 5	Well 9W	Well 9E	Well 10	AW Well
1/97	9	-	10	6	4	12	-
2/97	10	-	9	4	2	10	-
3/97	9	-	12	9	4	12	-
4/97	9	-	11	16	9	10	-
5/97	13	-	12	16	9	13	-
6/97	17	-	13	16	4	14	-
7/97	7	-	4	12	10	6	-
8/97	10	-	8	11	13	8	-
9/97	11	-	9	10	10	8	-
10/97	7	-	9	8	8	7	-
11/97	9	-	6	7	5	5	-
12/97	9	-	5	6	7	6	-
1/98	9	-	8	9	6	9	-
2/98	9	-	10	11	6	9	-
3/98	12	-	5	4	6	8	-
4/98	12	-	5	10	6	10	-
5/98	15	-	10	12	6	9	-
6/98	14	-	11	11	7	9	-
7/98	14	-	11	11	7	9	-
8/98	12	-	6	6	2	5	-
9/98	8	-	6	8	7	9	-
10/98	16	-	9	11	8	2	-
11/98	12	-	18	9	10	4	-
12/98	11	-	7	6	5	5	-
1/99	11	-	4	4	0	2	-
2/99	5	-	9	8	3	13	-
3/99	5	-	10	8	3	11	-
4/99	9	-	26	18	27	26	-
5/99	10	-	11	22	13	13	-
6/99	10	-	9	17	11	9	-
7/99	13	-	12	9	8	10	-
8/99	8	-	5	2	7	7	-
9/99	14	-	7	10	4	9	-
10/99	12	-	10	12	5	10	-
11/99	14	-	8	11	6	11	-
12/99	7	-	2	6	2	4	-
1/00	11	-	10	4	8	10	-
2/00	10	-	9	11	4	12	-
3/00	6	-	12	9	3	9	-
4/00	11	-	7	9	5	9	-
5/00	10	-	7	6	12	11	-
6/00	10	-	10	11	5	10	-
7/00	13	-	8	10	8	11	-
8/00	11	-	7	10	11	11	-
9/00	12	-	9	14	11	13	-
10/00	15	-	10	12	13	13	-
11/00	17	-	9	11	10	12	-
12/00	14	-	9	8	10	11	-
1/01	13	10	3	6	8	8	-
2/01	2	7	5	4	5	5	-

TABLE A-3
MONTHLY GROUNDWATER COD CONCENTRATIONS
AT MANTECA WASTEWATER QUALITY CONTROL FACILITY

Date	Well 1	Well 3	Well 5	Well 9W	Well 9E	Well 10	AW Well
3/01	3	11	6	6	8	8	-
4/01	6	10	10	6	9	5	-
5/01	6	13	8	7	8	7	-
6/01	9	16	8	10	10	14	-
7/01	7	16	9	13	13	11	-
8/01	12	16	7	13	14	11	-
9/01	9	14	9	14	13	11	-
10/01	12	17	9	13	2	9	-
11/01	17	12	7	12	8	9	-
12/01	11	12	7	20	12	11	-
1/02	13	14	10	7	10	12	-
2/02	11	11	9	5	8	10	-
3/02	9	10	7	6	5	10	-
4/02	9	16	10	7	9	12	-
5/02	14	20	8	9	8	12	-
6/02	7	14	8	6	7	10	-
7/02	3	12	4	3	7	9	-
8/02	14	13	5	8	5	7	-
9/02	10	15	3	10	0	7	-
10/02	4	16	6	5	1	6	-
11/02	6	11	7	1	2	7	-
12/02	11	11	10	3	6	11	-
1/03	7	12	7	4	5	11	-
2/03	7	13	7	4	4	10	-
3/03	8	14	8	7	4	15	-
4/03	8	16	8	10	3	15	-
5/03	6	13	8	6	1	13	-
6/03	7	15	5	1	2	12	-
7/03	9	16	10	6	6	16	-
8/03	6	25	11	12	6	16	-
9/03	7	28	8	13	7	12	-
10/03	22	29	12	14	15	17	-
11/03	12	22	10	16	8	11	-
12/03	14	22	5	7	14	12	-
1/04	13	19	6	6	14	13	-
2/04	11	18	4	8	12	6	-
3/04	7	14	7	4	1	5	-

TABLE A-4
QUARTERLY GROUNDWATER TDS CONCENTRATIONS
AT MANTECA WASTEWATER QUALITY CONTROL FACILITY

Date	Well 1	Well 3	Well 5	Well 9W	Well 9E	Well 10	AW Well
3/97	833	-	839	862	192	593	-
6/97	867	-	826	592	123	401	-
9/97	786	-	851	397	588	268	-
12/97	691	-	834	599	805	356	-
3/98	857	-	781	588	648	514	-
6/98	793	-	764	753	472	382	-
9/98	753	-	809	799	230	403	-
12/98	735	-	823	736	592	316	-
3/99	479	-	736	733	313	407	-
6/99	676	-	666	483	457	410	-
9/99	769	-	678	668	146	333	-
12/99	839	-	649	858	555	349	-
3/00	341	-	687	797	445	448	-
6/00	609	-	686	810	558	397	-
3/01	404	658	718	744	386	386	-
6/01	728	949	886	791	729	455	-
8/01	726	910	813	549	613	446	-
11/01	917	931	777	398	429	67	-
1/02	419	843	721	642	489	501	-
4/02	371	940	747	431	763	446	-
6/02	329	652	779	861	650	619	-
9/02	198	978	767	585	243	337	-
1/03	272	869	732	565	183	421	-
3/03	440	1189	759	443	486	558	-
6/03	199	924	710	226	363	492	-
9/03	719	953	751	748	730	386	-
11/03	876	889	842	629	691	467	-
2/04	393	1109	846	651	688	577	-
6/04	152	644	828	174	-	373	-
9/04	729	729	777	754	-	344	-
11/04	272	734	684	848	-	421	-
1/05	261	699	731	-	-	447	-
5/05	316	828	764	473	621	453	-
8/05	-	819	703	502	233	351	331
11/05	-	883	677	673	273	280	256
2/06	-	724	685	593	359	436	266
5/06	-	1390	653	626	563	811	272
7/06	-	848	580	557	579	506	240
11/06	-	924	704	508	443	355	216

TABLE A-5
MONTHLY GROUNDWATER pH VALUES AT
MANTECA WASTEWATER QUALITY CONTROL FACILITY

Date	Well 1	Well 3	Well 5	Well 9W	Well 9E	Well 10	AW Well
1/97	7.0	-	7.1	6.6	7.3	6.9	-
2/97	7.1	-	7.1	6.9	7.1	7.0	-
3/97	7.0	-	7.1	6.6	7.2	6.9	-
4/97	7.0	-	7.0	6.6	7.0	6.8	-
5/97	6.8	-	7.0	6.8	7.0	6.9	-
6/97	7.2	-	6.9	6.6	7.0	6.9	-
7/97	6.9	-	6.9	6.7	6.9	6.8	-
8/97	7.8	-	7.3	6.9	7.8	7.2	-
9/97	7.3	-	7.3	6.8	7.3	7.3	-
10/97	7.9	-	7.4	6.4	7.4	7.3	-
11/97	7.2	-	7.0	6.5	6.7	6.8	-
12/97	7.2	-	7.0	6.9	6.2	6.7	-
1/98	7.15	-	6.68	5.94	6.71	6.38	-
2/98	7.50	-	6.80	6.68	6.73	6.79	-
3/98	6.90	-	6.86	6.20	6.65	6.67	-
4/98	6.98	-	6.87	6.15	6.90	6.56	-
5/98	6.58	-	6.68	6.40	6.53	6.52	-
6/98	7.53	-	7.68	7.40	6.77	7.19	-
7/98	6.62	-	6.82	6.07	6.56	6.48	-
8/98	7.20	-	7.14	6.38	7.59	6.95	-
9/98	7.04	-	6.98	6.24	7.15	6.66	-
10/98	6.81	-	7.33	6.69	7.45	7.15	-
11/98	7.43	-	7.28	6.71	7.29	7.14	-
12/98	7.28	-	7.23	6.42	7.10	7.11	-
1/99	7.12	-	6.80	6.12	7.21	6.45	-
2/99	7.70	-	7.47	6.78	7.57	7.19	-
3/99	7.00	-	7.02	6.36	7.11	6.66	-
4/99	7.20	-	7.10	6.23	6.94	6.69	-
5/99	7.34	-	7.25	6.50	7.43	6.81	-
6/99	7.46	-	7.08	6.95	7.41	7.19	-
7/99	7.12	-	6.85	6.21	6.80	6.32	-
8/99	7.10	-	7.12	6.46	7.24	6.68	-
9/99	7.43	-	6.80	6.65	7.69	6.83	-
10/99	7.53	-	6.81	6.13	6.93	6.57	-
11/99	8.09	-	7.50	6.30	7.10	7.45	-
12/99	7.29	-	7.03	6.71	6.99	7.28	-
1/00	7.13	-	6.95	6.32	7.23	7.00	-
2/00	7.43	-	6.92	6.38	7.23	6.94	-
3/00	7.42	-	7.08	6.64	6.94	6.95	-
4/00	7.24	-	6.69	6.12	7.15	6.76	-
5/00	7.73	-	7.40	6.48	7.13	7.22	-
6/00	7.31	-	7.01	6.22	6.88	7.04	-
7/00	7.47	-	7.09	6.68	6.65	7.00	-
8/00	7.57	-	7.31	6.76	6.84	7.21	-
9/00	7.41	-	7.05	6.79	6.63	6.96	-
10/00	7.19	-	6.89	6.53	6.85	7.03	-
11/00	6.88	-	7.12	6.22	6.48	6.88	-
12/00	6.65	-	6.96	6.38	6.55	6.89	-
1/01	6.53	7.00	6.51	6.50	6.36	6.82	-
2/01	7.44	7.07	7.17	6.76	6.63	7.04	-
3/01	6.31	7.03	6.86	6.53	6.72	6.72	-
4/01	7.43	7.08	7.20	6.57	6.78	7.05	-
5/01	7.30	6.86	7.02	6.53	6.48	7.06	-

TABLE A-5
MONTHLY GROUNDWATER pH VALUES AT
MANTECA WASTEWATER QUALITY CONTROL FACILITY

Date	Well 1	Well 3	Well 5	Well 9W	Well 9E	Well 10	AW Well
6/01	6.93	6.81	6.88	6.54	6.65	6.77	-
7/01	7.80	7.24	7.45	6.80	6.90	7.30	-
8/01	7.43	6.94	7.18	6.65	6.64	7.09	-
9/01	7.62	7.13	7.35	6.79	6.91	7.17	-
10/01	7.36	7.12	7.28	6.68	6.64	7.12	-
11/01	7.33	7.14	7.34	6.54	6.80	7.25	-
12/01	7.08	6.69	7.16	6.49	6.51	6.48	-
1/02	7.40	6.40	7.20	6.70	5.90	7.10	-
2/02	7.80	7.20	7.40	6.80	6.70	7.20	-
3/02	7.80	7.20	7.30	6.70	6.70	7.10	-
4/02	8.00	7.30	7.50	6.90	6.60	7.20	-
5/02	7.90	7.10	7.20	6.70	6.60	7.10	-
6/02	7.50	6.90	7.13	6.70	6.70	6.92	-
7/02	7.79	7.20	7.10	6.30	7.10	7.10	-
8/02	7.80	7.10	7.20	7.00	6.40	7.20	-
9/02	7.76	6.20	7.20	6.50	6.60	6.80	-
10/02	7.96	6.60	7.30	6.40	7.10	6.90	-
11/02	7.60	6.90	6.90	6.20	6.90	7.10	-
12/02	7.50	6.90	7.10	6.90	6.30	7.00	-
1/03	7.99	6.36	7.16	6.60	6.70	6.75	-
2/03	7.74	6.84	7.29	6.42	6.75	6.96	-
3/03	7.52	6.88	7.06	6.53	6.74	6.72	-
4/03	7.31	5.98	7.11	6.23	6.70	6.67	-
5/03	7.87	6.80	7.22	6.65	6.84	6.88	-
6/03	7.12	7.06	7.07	6.87	7.09	6.96	-
7/03	7.66	6.80	7.14	6.52	6.77	6.83	-
8/03	7.72	7.00	7.26	6.50	6.67	6.92	-
9/03	7.41	6.94	7.07	6.70	6.35	6.90	-
10/03	7.18	6.99	6.94	6.45	6.41	7.07	-
11/03	7.01	6.90	6.94	6.56	6.30	6.83	-
12/03	7.21	6.51	7.24	6.68	6.52	7.15	-
1/04	7.51	6.89	7.16	6.58	6.33	7.16	-
2/04	7.59	6.96	7.11	6.74	6.75	7.08	-
3/04	7.81	6.94	7.10	6.92	6.98	7.19	-
4/04	7.63	6.83	7.02	6.55	-	7.29	-
6/04	7.84	7.15	7.21	7.04	-	7.23	-
9/04	7.83	7.66	7.71	7.27	-	7.76	-
11/04	7.70	7.21	7.40	7.36	-	7.35	-
1/05	7.8	7.4	7.4	-	-	7.5	-
5/05	7.7	7.2	7.5	7.1	7.2	7.5	-
8/05	-	7.0	7.2	6.8	7.0	7.2	6.6
11/05	-	6.9	7.3	6.9	7.2	7.3	6.8
2/06	-	7.0	7.9	7.2	6.8	7.7	6.8
5/06	-	6.8	7.4	7.0	7.0	7.2	6.4
7/06	-	7.2	7.4	6.8	7.3	7.5	6.6
11/06	-	6.9	7.3	6.7	7.1	7.3	6.4