



CITY OF MANTECA

PUBLIC WORKS DEPARTMENT

April 9, 2014

Mr. Jim Marshall
Senior Water Resources Control Engineer
Water Quality Control Board
Central Valley Region
11020 Sun Center Drive
Rancho Cordova, California 95670

**SUBJECT: NPDES PERMIT RENEWAL FOR CITY OF MANTECA
WASTEWATER QUALITY CONTROL FACILITY (CA0081558)**

Dear Mr. Marshall:

The City of Manteca (City) hereby transmits its Report of Waste Discharge (ROWD) and NPDES renewal application for its Wastewater Quality Control Facility (WQCF). The City has prepared U.S. Environmental Protection Agency (U.S. EPA) forms 1, 2A and 2S, and California EPA form 200. In addition to the information contained in the ROWD, the City would like to provide an update on facility upgrades that have recently been completed or are in progress, address specific constituents that may be of concern, and summarize findings from related special studies.

MAJOR FACILITY UPGRADES

The City is currently permitted to discharge 9.87 MGD (ADWF) to the San Joaquin River under Order No. R5-2009-0095 and NPDES Permit No. CA0081558 (Permit). The Permit allows the WQCF's average dry weather flow (ADWF) to increase to 17.5 MGD, provided the facility meets all its effluent and receiving water limitations and the expansion project known as Phase IV Construction is completed. However, previous projections of population growth in the area have not materialized and the City has not pursued this project yet. The City asks that the new permit carry over the provision allowing for the conditional increase in flow should the need arise in the future.

The most recent plant upgrades were part of the Phase III Upgrade and Expansion Project; Phase III commenced in 2006 and was completed in late 2009. Biological nitrification-denitrification was added to the secondary treatment process in May 2006. Once the process was fully stabilized, ammonia and nitrate effluent levels were greatly reduced. Treatment plant modifications have also been made to fully separate the food-processing waste received from Eckert Cold Storage, a food processor with seasonal discharge, from the rest of the plant flows. Starting in May 2007, Eckert's flows have been used directly for irrigation of the City's land application area after blending with

WQCF secondary effluent. Tertiary filters and UV disinfection system were also constructed under Phase III and became operational in September 2007. Filtration has reduced the total recoverable metal concentrations in WQCF effluent and UV disinfection has eliminated chlorine-disinfection byproducts in the effluent. Other major Phase III upgrades included a secondary effluent equalization pond, a filter-feed pump station, coagulation and flocculation facilities, tertiary filters, a chemical storage and handling facility, an effluent pumping station, a recycled water pumping station, a groundwater well for plant process water, a construction truck recycled water filling station, a sludge-control building, a mechanical dewatering building, and a shop maintenance building.

When the WQCF expansion to 17.5 MGD is pursued, it is not expected to add new treatment processes; rather it would expand the capacity of existing processes. The WQCF water quality treatment performance following Phase IV expansion is expected to continue to produce the same high-quality effluent as has been generated by the plant since the completion of Phase III improvements. The construction associated with the Phase IV Expansion Project is described in the Basis of Design Report and in the Wastewater Management Plan incorporated into the ROWD submittal. In addition, the City prepared and approved a Final Environmental Impact Report that addressed the proposed Phase V WQCF expansion to 27 MGD (ADWF).¹ Phase V expansion is not expected to begin for another 10 years following completion of Phase IV and is not of concern during the next permit cycle.

In conjunction with the recent WQCF upgrades, the City has been actively pursuing opportunities for the reuse of our high-quality effluent. Reuse represents an integral element of the City's wastewater management strategy. The City is operating a recycled water truck filling station at the WQCF and is planning a recycled water distribution system to the municipal golf course, regional softball complex, community parks in South Manteca, and major commercial centers along State Route 120. Along with many agencies in the recycled water industry, the City is closely following the State Water Resources Control Board (State Water Board) proposal for a Recycled Water General Permit. We look forward to obtaining coverage under such a permit and moving forward with our planned recycled water projects.

POTENTIAL ISSUES OF CONCERN

The City has identified a number of constituents that may be of concern in the permit renewal process. These constituents were identified based on provisions in the City's current permit and a review of monitoring data as contained in the ROWD. Below is a list of the parameters that the City has identified as potential constituents of concern and a summary of activities conducted to address these constituents.

¹ EDAW, *Final Environmental Impact Report – City of Manteca Wastewater Quality Control Facility and Collection System Master Plans Update Project*. January 2008.

Salinity

Effluent salinity has decreased over historical levels and leveled off in the past four years. Prior to mid-2005, the City used groundwater as its sole potable water source. Beginning in July and August 2005, the City started substituting a portion of its potable water supply from groundwater to surface water from the South San Joaquin Irrigation District's South County Surface Water Supply Project. Annual average electrical conductivity (EC) levels in the WQCF effluent for the past ten years are presented in Figure 1. As illustrated, the EC levels in the WQCF effluent decreased significantly since the City has augmented the potable water sources. In recent years conductivity levels averaged around 750 $\mu\text{mhos/cm}$, a 25% improvement over levels in 2004-2005.

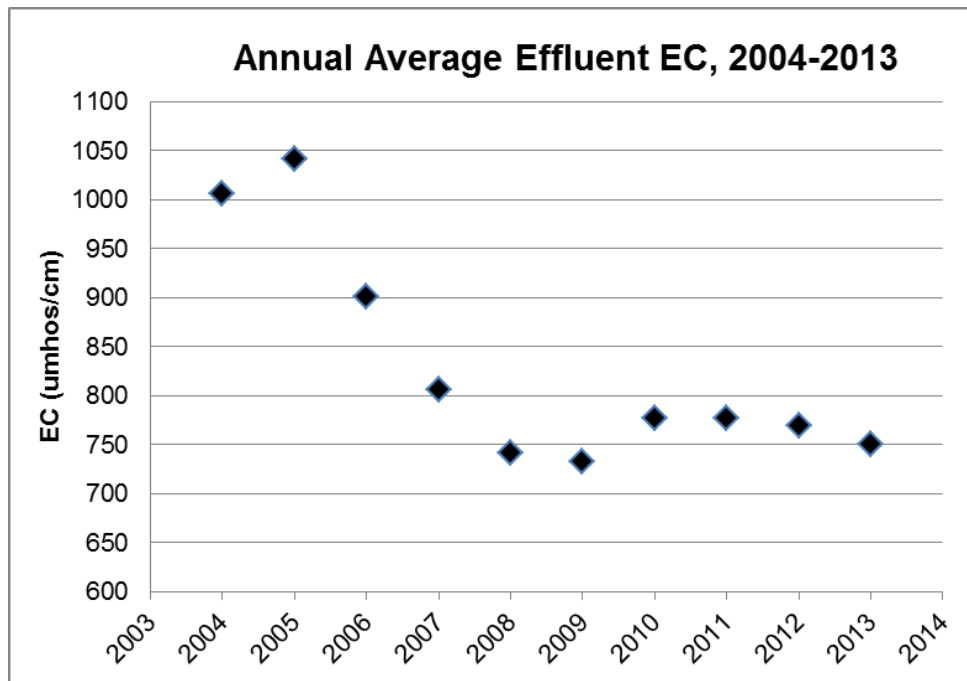


Figure 1. Historical Effluent Conductivity Levels

The Bay-Delta Plan includes water quality objectives at three locations in the South Delta for EC. The water quality objectives protective of agricultural uses are a 14-day running average EC of 700 $\mu\text{mhos/cm}$ from April through August and a 14-day running average EC of 1000 $\mu\text{mhos/cm}$ from September through March. Despite recent improvements, the WQCF would have difficulty complying with the 700 $\mu\text{mhos/cm}$ April through August objective. To this end, we urge the Regional Water Board to consider the following issues:

Salinity Objectives

On June 1, 2011, the Superior Court for Sacramento County entered a judgment and peremptory writ of mandate in the matter of *City of Tracy v. State Water Resources Control Board* (Case No. 34-2009-80000392-CU-WM-GDS), ruling that the South Delta EC objectives shall not apply to the City of Tracy and other municipal dischargers

pending reconsideration of the South Delta EC objectives and adoption of a program of implementation that includes municipal dischargers. In response to the Court's order, the State Water Board is currently revising the South Delta EC objectives.

The City also has an action pending in Sacramento County Superior Court, *City of Manteca v. State Water Resources Control Board* (Case No. 34-2011-80000831-CU-WM-GDS), challenging effluent limitations for EC based on the South Delta salinity objectives as well as other provisions of the current permit. On April 15, 2011, the Court issued an order, staying the final EC limitation of 700 $\mu\text{mhos/cm}$ until resolution of the case on the merits. The parties have discussed the need to resolve this lawsuit, informally, in recognition that the South Delta EC objectives may not lawfully be applied to the City. In any event, and as reflected in the tentative permit renewal that the Regional Water Board has released for the City of Stockton, it would be inappropriate to apply the South Delta EC objectives in the next Permit. The tentative permit for Stockton also recognizes that, until the State Water Board has revised the Bay-Delta Plan, the Regional Water Board is unable to conduct a reasonable potential analysis for salinity for the discharge.

To the extent that, the Regional Water Board may consider effluent limitations for EC on another basis, the City asks the Regional Water Board to consider a study, commissioned by the State Water Board as part of its review of the Bay-Delta Plan, on appropriate EC objectives for irrigation water used in the South Delta. In January 2010 Dr. Glenn J. Hoffman et al. developed a report (Hoffman Report)² including an initial review of available literature on crop salt tolerances in the South Delta, an identification of data gaps, and a review of available data related to determining crop salt tolerances (e.g. precipitation, crop surveys, leaching fractions, etc.). Using this base of knowledge, Dr. Hoffman developed a steady-state model to determine the allowable EC levels in irrigation water that are protective of agricultural uses in the South Delta. The report concluded:

All of the models presented in this report predict that the water quality standard could be increased to as high as 0.9 to 1.1 dS/m [equal to 900 – 1100 $\mu\text{mhos/cm}$] and all of the crops normally grown in the South Delta would be protected.

If the Hoffman Report findings are used to develop new Basin Plan objectives in the future, the WQCF's effluent discharge at average levels of 750 $\mu\text{mhos/cm}$ would be in compliance. In fact, the City submits that its discharge is fully protective of agricultural uses in the area. Per requirements in its current permit, in 2012, the City developed a study to determine appropriate site-specific salinity objectives (SSO) for the protection of groundwater agricultural uses³. The SSO Study followed the crop yield models in the Hoffman Report and calculated SSOs sufficiently protective of almonds, the most sensitive crop of interest to the WQCF zone of influence. The Study concluded that salinity levels from 950 $\mu\text{mhos/cm}$ to 1,700 $\mu\text{mhos/cm}$ (depending on varying soil

² Hoffman, Glenn J., *Salt Tolerance of Crops in the Southern Sacramento-San Joaquin Delta*. January 2010

³ Larry Walker Associates, *Report on Site-Specific Salinity Objectives for the Protection of Groundwater Agricultural Uses*. October 2012.

leaching fractions and precipitation conditions) would be an appropriate site-specific goal for irrigation water in the area. The City urges the Regional Water Board to take into account these findings and avoid setting unnecessarily restrictive limits for the WQCF effluent.

Long-Term Salinity Management and Short-Term Regulatory Solutions

We recognize that the issue of salinity in effluent and receiving waters extends beyond the City. In addition to the efforts initiated at the local level, major planning efforts undertaken through the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) and the Central Valley Salts Coalition (CVSC) are underway. The City is an active participant in both of these regional efforts. CV-SALTS is working to develop regional salt and nutrient management plans (SNMPs) required by the State Water Board *Recycled Water Policy*⁴. The SNMPs will provide a framework to address problems with salinity and nitrates in the groundwater and surface waters of the Central Valley; these plans are to become the basis for basin plan amendments to be considered by the Regional Water Board in May 2017⁵.

In the meantime, the City supports the Regional and State Water Boards' efforts to develop an interim salinity program, including a water quality standards variance policy. Such a policy, now in draft form and expected to be adopted in June 2014, would allow the City to obtain a short term exception from meeting water quality based salinity limits in its NPDES permit. This exception is a necessary short-term regulatory tool while long-term holistic solutions and revised standards and effluent limits are under development through CV-SALTS. The need for this variance policy is extensively illustrated in the key supporting document for establishing the policy⁶; the Manteca WQCF is one of several case studies detailed in the supporting document. In consultation with Regional Water Board staff, the City plans to apply for a variance for salinity constituents when the variance policy becomes effective, *i.e.*, shortly after the anticipated June 2014 adoption.

Ammonia

Biological nitrification-denitrification was added to the secondary treatment process in May 2006. Once the process was fully stabilized, ammonia and nitrate effluent levels were greatly reduced. In the past four years, effluent ammonia has averaged below 0.5 mg/L. Nevertheless, occasional levels over 1 mg/L have been observed with a daily

⁴ State Water Resources Control Board. Resolution No. 2009-0011 *Adoption of Policy for Water Quality Control for Recycled Water*. May 2009 and updated April 2013.

⁵ Regional Water Board. Draft Staff Report for *Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins and the Water Quality Control Plan for the Tulare Lake Basin to add Policies for Variances from Surface Water Quality Standards for Point Source Discharges, Variance Program for Salinity and Exception for Implementation of Water Quality Objectives for Salinity*. March 2014.

⁶ Larry Walker Associates. *Memorandum regarding Technical Evaluation of a Variance Policy and Interim Salinity Program for the Central Valley Region*. December 2012.

maximum of 5.4 mg/L on September 7, 2010, and a monthly average of 1.65 mg/L in that same month. The City is aware of the EPA's recently updated 2013 National Ambient Water Quality Criteria for the protection of freshwater aquatic life for total ammonia. We believe the WQCF would have difficulty complying with year-round effluent limits derived from the updated criteria in the effluent. The City would like to bring forth the following issues with respect to ammonia effluent limits:

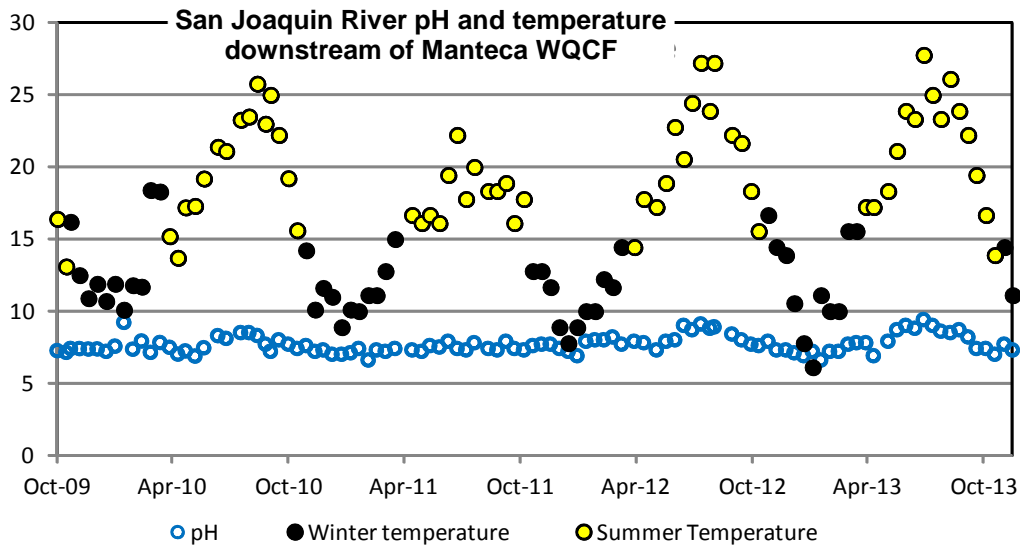
Mussels presence/absence

The City's evaluation of compliance (as outlined below) assumes the new ammonia limits would be based on the US EPA's new ammonia criteria and on the premise that freshwater mussels are the most ammonia-sensitive species in the receiving water. The City is hopeful that the new ammonia limits would be reasonable and an avenue for compliance with these strict criteria will be found. However, if a determination is made that the WQCF is at risk of non-compliance, ultimately it may be necessary to conduct a study to establish whether or not these organisms are present in the plant's area of influence. Such a determination would be critical before embarking on any costly and perhaps unnecessary plant upgrades (especially since the WQCF is already operating nitrification-denitrification facilities). The City is aware of the recent Regional Water Board letter regarding ammonia effluent limits and technical reports on presence/absence of mussels⁷. The City appreciates the Regional Water Board's effort to organize a workshop on these issues on April 23, 2014; we intend to participate. At this time, we are still evaluating whether to conduct a mussels presence/absence study (whether individually or as a group) for the WQCF receiving water. As we learn more information and upon further consultation with Regional Water Board staff and stakeholders in the area, we will decide the issue and respond to the Regional Water Board's letter in the requested timeframe.

Seasonal Temperature Variations

The ammonia criteria are dependent on pH and temperature and since temperatures in the receiving water vary seasonally, the City believes it is appropriate to set seasonal ammonia limits to account for these temperature variations. Based on variability in the temperature of the receiving water (shown in Figure 1 below) it appears that an appropriate seasonal split is from April 1 to October 31 and November 1 to March 31.

⁷ Regional Water Board. *California Water Code Section 13267 Order for Information: 2013 Final Ammonia Criteria for Protection of Freshwater Aquatic Life*. April 2014.



**Figure 2. pH and Temperature Levels
in the San Joaquin River Downstream of Manteca WQCF**

Based on this seasonal variability, ammonia criteria and WQCF-appropriate limits were calculated for acute and chronic conditions and are shown in Table 1.

Table 1. Derivation of Seasonal Ammonia Limits

	April 1 - October 31			November 1 – March 31		
	Acute CMC	4-day CCC	30-day CCC	Acute CMC	4-day CCC	30-day CCC
pH ^[a]	8.0	7.9	7.9	8.0	7.4	7.4
Temperature (C)	27.8	20.0	20.0	18.4	11.9	11.9
2013 Criteria (mg/L)	2.0	2.3	0.90	4.5	6.2	2.5
Dilution factor (9.87 MGD) ^[b]	0	1.3	1.3	0	1.3	1.3
Ambient concentration (mg/L)	0.2	0.2	0.2	0.2	0.2	0.2
ECA	2.05	4.92	1.81	4.46	13.90	5.40
Coefficient of variation	1.58	1.58	1.58	0.83	0.83	0.83
ECA Multiplier	0.14	0.25	0.54	0.24	0.43	0.71
LTA	0.28	1.24	0.98	1.07	5.95	3.85
Monitoring frequency	4			4		
AMEL Multiplier	2.46			1.78		
MDEL Multiplier	7.20			4.15		
AMEL (mg/L as N)	0.70			1.9		
MDEL (mg/L as N)	2.0			4.5		

[a] The acute pH is set equal to the maximum permitted pH.

[b] Current Permit allowance.

The maximum observed effluent concentration of 5.4 mg/L and the highest monthly average of 1.65 mg/L (both observed in September 2010) would exceed the proposed 2.0 mg/L MDEL and 0.70 mg/L AMEL ‘summer’ limits derived in Table 1, but overall the WQCF is more likely to comply with these seasonal limits than with year-round limits. Graphical representation of the WQCF ammonia data overlaid with the proposed MDEL and AMEL limits are shown in Figure 3 and Figure 4 below.

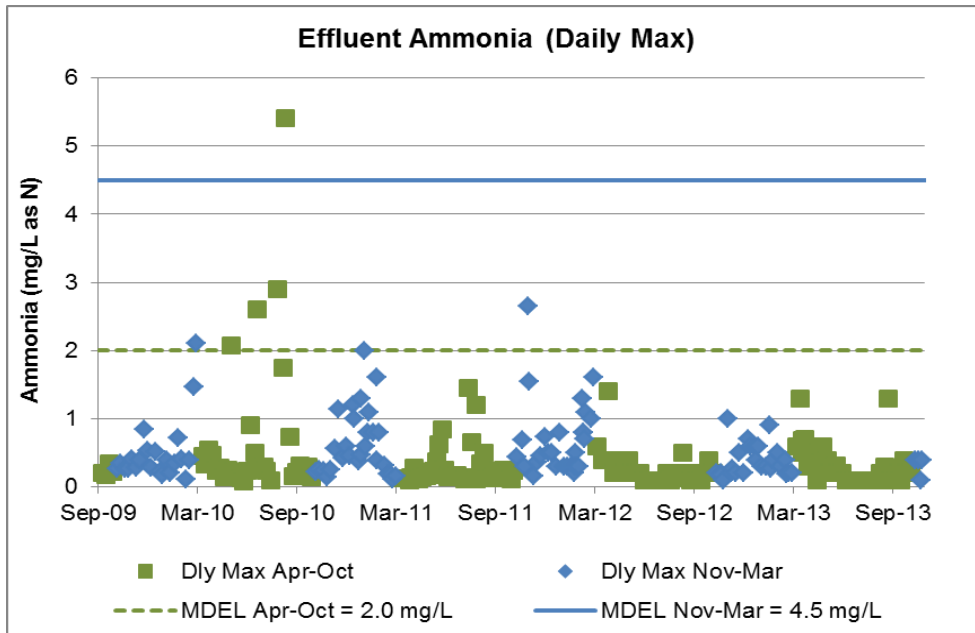


Figure 3. Daily Maximum Ammonia Results vs. Proposed Seasonal MDELs

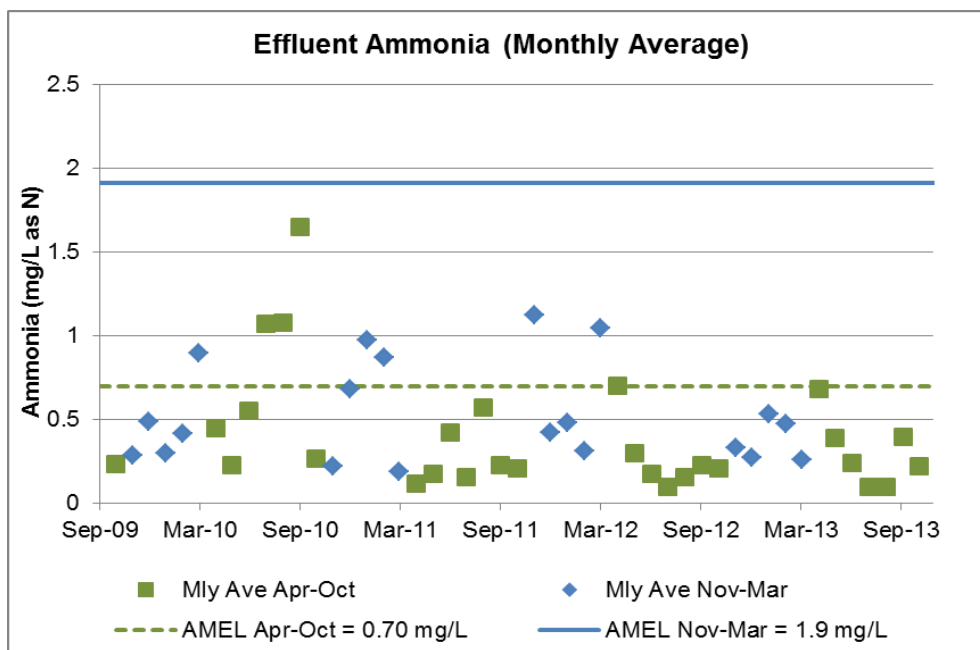


Figure 4. Average Monthly Ammonia Results vs. Proposed Seasonal AMELs

Dilution

As noted in Table 1 above, the City believes dilution credits are appropriate when deriving criteria based on chronic conditions. The proposed ammonia limits are ultimately based on acute conditions for which no dilution applies, but in case the Regional Water Board uses another derivation methodology where chronic conditions would be more stringent than acute conditions, we believe dilution credits should apply based on findings of a dilution study that the City conducted and submitted to the Regional Water Board in 2006⁸. The study findings indicated that under worst case conditions there was virtually no dilution for acute criteria, but dilution was available for chronic and human health criteria. Table 2 below presents a summary of lowest dilution credits from this study.

Table 2. Summary of Lowest Dilution Credits

Criterion	Distance Downstream (feet)	Side Bank Dilution ¹ (parts river water:1part wastewater)			Diffuser Dilution ¹ (parts river water:1part wastewater)		
		9.87 MGD	17.5 MGD	27 MGD	9.87 MGD	17.5 MGD	27 MGD
Acute	45	0.35	0.19	0.17	13.3	7.3	4.6
Chronic	4,100 ²	2.4	1.3	0.90	11.8	6.4	4.0
Human Health	5,280	92.9	52.2	32.5	119	66.7	43.4

(1) Values are presented with the dilution credit, D, for direct use in effluent limit calculation:

$$D = \frac{C_{eff} - C_{plume}}{C_{plume} - C_{up}}$$

where C_{eff} = effluent concentration, C_{plume} = plume concentration, and

C_{up} = upstream concentration, which is zero.

(2) Minimum dilution occurs at 4,100 ft downstream of discharge. These dilution values are appropriate for use in evaluating Chronic objectives.

Considering the low ambient ammonia levels in the San Joaquin River, there is assimilative capacity in the receiving water at the point of discharge. As such, based on the findings in the dilution study, the City believes that it is appropriate to use the allowable dilution of 2.4:1 and 1.3:1 for 9.87 MGD and 17.5 MGD, respectively, when deriving ammonia limits for chronic conditions.

Aluminum

Aluminum has previously been identified as a potential constituent of concern and assigned effluent limitations in the WQCF current permit. Those limitations are partially based on findings from a Final Aluminum Water Effect Ratio (WER) Study completed

⁸ Resource Management Associates. *Near and Far Field Dilution Analysis of the Manteca Wastewater Discharge*. October 2006.

by the City in 2007⁹. The WER Study recommended a WER of 22.7 applicable to both the acute and chronic objectives. When in issuing the current permit, the Regional Water Board applied the 22.7 WER to chronic conditions only. The resulting effluent limitations were 407 µg/L and 750 µg/L for average monthly and maximum daily, respectively. An annual average limitation of 200 µg/L was also included based on the secondary maximum contaminant level (MCL) for drinking water. The WQCF is in compliance with these limitations. We respectfully request that the Regional Water Board continue use of the aluminum WER in determining reasonable potential and if necessary in deriving effluent limits for the next permit cycle.

Copper

Copper was also identified as a potential constituent of concern and assigned effluent limitations in the WQCF current permit. The City submitted the results of a site-specific copper translator study to the Regional Water Board in April 2007¹⁰. Based on the results from this study and upon subsequent discussion with the Regional Water Board, the acute and chronic translators of 0.78 and 0.70 were used to convert the copper dissolved criteria to total recoverable criteria in deriving the current effluent limitations for copper. We respectfully request that the Regional Water Board continue use of these copper translators in determining reasonable potential and if necessary in deriving effluent limits for the next permit cycle.

Bis(2-ethylhexyl) phthalate, heptachlor, and 1,2-diphenyl hydrazine

In anticipation of the new permit, the City conducted a preliminary Reasonable Potential Analysis. Bis(2-ethylhexyl) phthalate, heptachlor, and 1,2-diphenyl hydrazine were identified as potential constituent of concerns based on occasional detections at levels above their respective water quality objectives in the WQCF effluent. The most stringent applicable objectives for these three constituents are based on protection of human health. As previously mentioned, the City conducted a dilution study in 2006. The study found dilution of 93:1 and 52:1 is appropriate for human health criteria at 17.5 MGD and 27.5 MGD discharge levels, respectively (see Table 2). The City's current permit takes into consideration these dilution credits on a case-by-case basis (p. F-32, R5-2009-0095). We respectfully request that the Regional Water Board uses appropriate dilution credits in determining reasonable potential and deriving effluent limits (if needed) for bis(2-ethylhexyl) phthalate, heptachlor, and 1,2-diphenyl hydrazine and other constituents of concern for human health.

Title 27

The City's existing permit states or implies that the Secondary Effluent Storage Pond (SESP) at the WQCF does not meet the preconditions for an exemption from the

⁹ Larry Walker Associates. *City of Manteca Aluminum Water-Effects Ratio Study*. March 2007

¹⁰ Larry Walker Associates, *City of Manteca Copper Monitoring Study Results (Copper Translator Study)*. April 2007.

requirements of Title 27 of the California Code of Regulations (Title 27).¹¹ Based on the State Water Board's Order concerning a permit for the City of Lodi, this is not accurate. Post-treatment storage facilities are associated with municipal wastewater treatment and included within Title 27's sewage treatment plant exemption if the facilities (1) are used to store treated municipal wastewater prior to ultimate disposal or reuse, (2) do not receive any other wastes other than on-site stormwater flows, and (3) are under the control of the municipal treatment plant.¹² The SESP meets these three requirements. For the permit renewal, the City asks that the Regional Water Board recognize that the SESP is exempt from the requirements of Title 27, pursuant to section 20090(a) of Title 27.

Although we have tried to identify the critical issues with the new Permit, this letter does not necessarily address all the issues that may require attention and dialogue with the Regional Water Board staff. The City respectfully requests that it be allowed to provide further technical information or comment as necessary and appropriate in the course of the permitting process.

The City looks forward to continue working with Regional Water Board staff during the course of the permit renewal.

Sincerely,



Phil Govea, P.E.
Deputy Director of Public Works – Engineering

cc: Mark Houghton, Public Works Director
John Clymo, Deputy Director of Public Works – Utility Operations
Laurie Ramirez, Wastewater Systems Superintendent
Mack Walker, Larry Walker Associates
Alina Constantinescu, Larry Walker Associates
Paul Simmons, Somach, Simmons & Dunn

¹¹ In the pending action in Sacramento County Superior Court, the City also challenges the Regional Water Board's determination in the existing permit that the SESP is not exempt from Title 27. The parties recognize the State Water Board's interpretation of Title 27's sewage treatment plant exemption in the City of Lodi Order, and have discussed the need to resolve this issue in the lawsuit in addition to the challenges to the effluent limitations for EC.

¹² *In the Matter of Own Motion Review of City of Lodi Waste Discharge Requirements and Master Reclamation Order No. R5-2007-0113 [NPDES No. CA0079243]*, Order WQ 2012-0001 (Feb. 7, 2012) at pp. 8-9.