ATTACHMENT E
CDPH Approval and Comment Letters

1. March 5, 2009 Letter
2. May 15, 2009 Letter

MARCH 5, 2009 LETTER

State of California—Health and Human Services Agency
California Department of Public Health

MARK B HORTON, MD, MSPH
Director

ARNOLD SCHWARZENEGGER
Governor

March 5, 2009

Mr. Mike Plaziak, Supervising Engineer
California Regional Water Quality Control Board - Lahontan Region
Victorville Branch Office
14440 Civic Drive, Suite 200
Victorville, CA 92392-2306

SYSTEM NO. 1990005 – (REVISED) COMMISSIONING TESTS SUMMARY REPORT FOR WEDECO TAK-55HP ULTRAVIOLET LIGHT (UV) DISINFECTION SYSTEM OF THE MEMBRANE BIO-REACTOR (MBR) PLANT, LANCASTER, CALIFORNIA (REVISED)

Dear Mr. Plaziak:

We have received comments from Mr. Phil Ackman of the Sanitation Districts of Los Angeles County (District) regarding the Department's letter dated December 2, 2008. The letter refers to the District's Lancaster UV Field Commissioning Tests Summary Report (Report) for the Wedeco TAK-55HP UV Reactor prepared by Carollo Engineers, dated September 2008. The Department has reviewed the District's comments to the recommended provision provided in the Department's letter and determines that they are reasonable. Therefore, the Department has incorporated the District's comments to the following recommended provisions (changes are in *italic*):

1. These recommendations are based on the equipment cited in the Report. No equivalents or substitutions will be accepted without a demonstration of equivalent disinfection performance.

2. Since the LWWTP uses a membrane filter, the UV system must be operated to deliver a minimum UV dose of 80 mJ/cm^2 at all times.

3. The equations from the Report are to be used as part of the automatic UV disinfection control system for calculating UV dose and should be specified as a permit provision. They are:

Southern California Drinking Water Field Operations Branch, Southern California Section
1449 West Temple St., Room 202, Los Angeles, CA 90026
Telephone: (213)580-5723 Fax: (213)580-5711
Internet Address: www.cdph.ca.gov

Equation 3

$$Dose = (S/ (0.8*S_0))*10^{-2.2548 - 0.8538 * \log Flow + 2.9182 * \log UVT}$$

Equation 4

$$S_0 = -0.046359*UVT+0.001476*UVT^2$$

Where:

Dose = Delivered UV dose per bank (mJ/cm^2);

UVT = % UV transmittance at 254 nm (%);

Flow = Flow rate per lamp [gallons per minute (gpm)/lamp], with gpm/lamp calculated as gpm divided by the number of lamps in one bank;

S = UV intensity as measured by the UV sensor, mW/cm^2;

S_0 = Expected UV intensity of a new lamp at 100 percent output and unfouled conditions, mW/cm^2;

4. The LWWTP Wedeco UV Reactor is limited to the following operational parameter ranges:

   a. Permit only flows from 230 to 866 gpm (0.3 to 1.2 MGD). The actual capacity of the Wedeco UV system for the design conditions of 65 % UVT, 80 mJ/cm^2 dose, end-of-lamp-life (EOLL) of 0.88, and fouling factor (FF) of 0.8, using Equations ES-1 and ES-2 of the Report, results in a capacity of 0.91 MGD (630 gpm). If the design capacity is to be based on 66.6 percent UVT, the system capacity using Equations ES-1 and ES-2 from this report meets the 1.0 mgd design objective with a delivered dose of 80.1 mJ/cm^2.

   b. Under worse-case conditions, assume end-of-lamp-life (EOLL) of 0.88, and fouling factor (FF) of 0.8; however, proper operation and maintenance should produce more favorable conditions and this may be monitored by UV intensity sensors.

c. UVTs should be maintained at or above 67 percent[1], unless the EOLL and FF can be demonstrated to be better than the assumed worst case factors, as measured by properly calibrated UV intensity sensors;

d. The water level in the Wedeco UV Reactor is maintained below the maximum value of 19.13 inches.

5. In all cases, the UV intensity sensors must monitor the combined effect of UVT, lamp aging and sleeve fouling to ensure that the target UV dose is being met at all times.

6. Flow meters, UV intensity sensors, and UVT monitors must be properly calibrated to ensure proper disinfection.

7. UV intensity sensors (duty sensors) must be checked against a reference sensor at least monthly.

8. For all UV intensity sensors in use, the ratio of the duty UV sensor intensity to the reference UV sensor intensity must be less than or equal to 1.2. If the calibration ratio is >1.2, the failed duty UV sensor must be replaced by a properly calibrated sensor and recalibrated by a qualified facility. The reference UV intensity sensors shall be recalibrated at least annually by a qualified facility using a National Institute of Standards and Technology (NIST) traceable standard.

9. UVT meter must be inspected and checked against a reference bench-top unit weekly to document accuracy.

10. *If the on-line analyzer UVT reading varies from the bench-top spectrophotometer UVT reading by 2% or more, the on-line UVT analyzer must be recalibrated by a procedure recommended by the manufacturer.*

11. *Flow meters measuring the flow through a UV reactor must be verified to determine accuracy at least monthly via checking the flow reading against other flow determination methods.*

12. The facility should be operated in accordance with an approved operations plan, which specifies clearly the operational limits and responses required for critical alarms.

13. These applicable recommendations should be incorporated into the final permit for the UV system. Approval for the use of any and all water recycling

[1] At UVT values below 67 percent, the validated and checked equations state that the Wedeco TAK-55HP can deliver 80 mJ.cm2 at a flow rate of 0.91 MGD, assuming the EOLL and FF.

applications is granted through the Regional Water Quality Control Board's Water Reclamation permitting process.

If you have questions regarding this letter, please contact Mr. Chi Diep at (213) 580-5727 or myself at (213) 580-3127.

Sincerely,

Stefan Cajina, P.E.
District Engineer
Central District

cc: Curt Shifrer
California Regional Water Quality Control Board - Lahontan Region
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MAY 15, 2009 LETTER

State of California—Health and Human Services Agency
California Department of Public Health

MARK B HORTON, MD, MSPH
Director

ARNOLD SCHWARZENEGGER
Governor

May 15, 2009

Mr. Mike Plaziak, Supervising Engineer
California Regional Water Quality Control Board - Lahontan Region
Victorville Branch Office
14440 Civic Drive, Suite 200
Victorville, CA 92392-2306

Dear Mr. Plaziak:

SYSTEM NO. 1990005 – COMMISSIONING TESTS SUMMARY REPORT FOR TROJAN 3000PLUS ULTRAVIOLET LIGHT (UV) DISINFECTION SYSTEM OF THE MEMBRANE BIO-REACTOR (MBR) PLANT, LANCASTER, CALIFORNIA

We were recently informed that there was an error on the letter dated April 15, 2009 regarding the above subject that was sent to your office. The dose equation under recommendation 5b has been corrected. Please replace the April 15, 2009 letter with the corrected version attached.

If you have questions regarding this letter, please contact Mr. Chi Diep at (213) 580-5727 or myself at (213) 580-3127.

Sincerely,

Stefan Cajina, P.E.
District Engineer
Central District

Enclosure

MAY 19 2009 AM09:45
DOC #
TREMBLAY R

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State of California—Health and Human Services Agency
California Department of Public Health

MARK B HORTON, MD, MSPH
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April 15, 2009

Mr. Mike Plaziak, Supervising Engineer
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SYSTEM NO. 1990005 – COMMISSIONING TESTS SUMMARY REPORT FOR TROJAN 3000PLUS ULTRAVIOLET LIGHT (UV) DISINFECTION SYSTEM OF THE MEMBRANE BIO-REACTOR (MBR) PLANT, LANCASTER, CALIFORNIA

Dear Mr. Plaziak:

We have reviewed the Sanitation Districts of Los Angeles County (District) Lancaster UV Field Commissioning Tests Summary Report (Report) for the Trojan 3000Plus UV Reactor prepared by Carollo Engineers, dated December 2008 – revised February 2009. The Trojan UV Reactor is being evaluated as a primary disinfection process for the District's Membrane Bio-Reactor (MBR) treatment process at the Lancaster Waste Water Treatment Plant (LWWTP). UV disinfection systems designed and tested following the National Water Research Institute/American Water Works Association's UV Disinfection Guidelines (2003), when combined with accepted filtration technologies, should adequately achieve the microbiological water quality objectives of the California Code of Regulations, Title 22, Chapter 3, Article 1, Section 60301.230 (a)(2).

The Report documented the performance verification testing for the Trojan UV Reactor at Lancaster. The verification process included an on-site checkpoint bioassay using seeded MS2 applied over a range of flows. Results documenting virus disinfection performance of the UV system compared to the standards found in Title 22 CCR were submitted in the Report for review by the Department. The Department has completed its review and recommends the approval of the Trojan 3000Plus UV Reactor for the LWWTP with the following recommendations:

1. The following recommendations are based on the equipment cited in the report. No equivalents or substitutions will be accepted without a demonstration of equivalent disinfection performance.

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2. Since the District's Lancaster plant uses a membrane filter, the UV system must be operated to deliver a minimum UV dose of 80 mJ/cm^2 at all times. The equation from the February 2006 validation report is to be used as part of the automatic UV disinfection control system for calculating UV dose and should be specified as a permit provision. This equation must be verified or modified via the on-site bioassay.

3. The District's Lancaster UV system has a sixteen-bulb array, rather than the twenty-four-bulb array configuration that was validated in 2005 and documented in "UV3000Plus Validation Report, Final" (Carollo Engineers, February 2006). Therefore, the hydraulic characteristics and ability to inactivate MS-2 must be *re*-validated.

4. The Report has the following issues delineated below.

    a. Tests were conducted at six flow rates in May and July 2007 (T1-T6), ranging from 164 to 830 gpm (the plant is rated at a maximum of one MGD or 694 gpm). These "check-points" were compared to the dose predicted by the operating equation developed and documented in the validation report of February 2006. Comparing the "Lower 75% Confidence Interval UV Dose/Bank mJ/cm^2", which is recommended by the NWRI guidance[1], the District's Lancaster UV system tests were from 49% less to 17% more dose delivered than predicted by the equation from the February 2006 validation report. Three of the six tests were below what the validated operational equation predicted.

        i. T4 was conducted at 830 gpm and the average dose measured was 34 mJ/cm2 with a Lower 75% Confidence Interval (CI) of 32.7 mJ/cm2 . This was 49% less dose delivered than predicted. An explanation for this poor performance postured by Carollo is that the hydraulics were poor because the water level was 0.25 inches too high at 17.25 inches.

        ii. Carollo proposes a maximum water level of 17 inches. It should be clarified whether the control system can ensure that the water level will not exceed 17.0 inches.

        iii. Test T4 should be disregarded because it was above the acceptable highest flow.

[1] 2003 Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse published by the National Water Research Institute/AWWA Research Foundation.

b. Tests were conducted at three flow rates in April 2008 (T7-T9), ranging from 396 to 719 gpm.

c. Seven more tests were conducted in July 2008 (C1-C7), at flow rates ranging from 389 to 700 gpm.

d. The District proposed development of a unique, site-specific UV dose equation for the Lancaster Trojan 3000Plus UV system. Analysis and incorporation of these results in development of a site-specific UV dose equation has the following issues:

   i. Tests were conducted by District.

   ii. Only two effluent samples were collected per tests C1-C7 as opposed to five for tests T1-T9.

   iii. Lower 75% Confidence Interval (CI) calculations raise questions because there are only two numbers rather than five.

   iv. The two samples for test C5 resulted in the same log inactivation and delivered dose.

   v. The two samples for test C5 resulted in a Lower 75% CI that is higher than the delivered dose - opposite to what is expected and confirmed in the other tests.

   vi. The two samples for test C6 also resulted in the same log inactivation and delivered dose.

e. To address the uncertainties of the C1-C7 tests, an additional dose response correction factor of 0.95 should be incorporated in the District's site-specific UV dose equation for the Lancaster Trojan UV3000Plus.

DISTRICT'S LANCASTER PERMIT FOR TROJAN 3000PLUS

5. **The following recommendations should be incorporated into the final permit for the UV system.** Approval for the use of any and all water recycling applications is granted through the Regional Water Quality Control Board's Water Reclamation permitting process.

   a. Since the LWWTP uses a membrane filter, the UV system must be operated to deliver a minimum UV dose of 80 mJ/cm^2 at all times.

b. A modification of the District proposed unique, site-specific UV dose equation for the Lancaster Trojan UV3000Plus is to be used as part of the automatic UV disinfection control system for calculating UV dose and should be specified as a permit provision. This equation was developed based on the on-site bioassay. In order to correct for uncertainties of the dose response curve during the on-site tests, an additional uncertainty correction factor of 0.95 should be incorporated in the District's site-specific UV dose equation for the Lancaster Trojan UV3000Plus.

The equations to be used as part of the automatic UV disinfection control system for calculating UV dose should be specified as a permit provision. They are:

$$\text{Dose} = (U_{DR})*(FF)*(LHF)*10^{-6.3547 - 0.98208 * \log \text{Flow} + 4.0824 * \log \text{UVT} + 1.0396 * \log P}$$

and

$$\text{LHF} = \text{lamp hour factor} = 1-[\text{operational lamp hours} * (1-\text{EOLL})/9{,}000]$$

Where:

Dose = Delivered UV dose per bank (mJ/cm^2);

U_{DR} = Uncertainty of dose response curve = 0.95;

FF = Fouling Factor = 0.95;

UVT = % UV transmittance at 254 nm (%);

Flow = Flow rate per lamp [gallons per minute (gpm)/lamp], with gpm/lamp calculated as gpm divided by the number of lamps in one bank;

EOLL = End of Lamp Life = 0.98 at 9000 hours; and

P = percent power.

c. The Trojan 3000plus low-pressure high-output (LPHO) UV disinfection system reactor is limited to the following operational parameter ranges:

i. Permit flow up to 1.0 MGD (694 gpm).

ii. Minimum UVT = 64%.

iii. Minimum one of the four banks in redundant standby mode. If during short-term, unexpected conditions the UVT is less than 64 percent, the redundant bank would need to be utilized in order to maintain the required 80-mJ/cm2 dose, otherwise, the flow must be diverted.

iv. The water level in the Trojan reactor is maintained below the maximum value of 17 inches.

d. Flow meters and UVT monitors must be properly calibrated to ensure proper disinfection.

e. UVT meter must be inspected and checked against a reference bench-top unit weekly to document accuracy.

f. If the on-line analyzer UVT reading varies from the bench-top spectrophotometer UVT reading by 2% or more, the on-line UVT analyzer must be recalibrated by a procedure recommended by the manufacturer.

g. Flow meters measuring the flow through a UV reactor must be verified to determine accuracy at least monthly via checking the flow reading against other flow determination methods.

h. The Trojan 3000Plus system has an automated mechanical wiping mechanism to reduce sleeve fouling. A minimum frequency of wiping should be developed specific to the District's Lancaster UV system. This should then be correlated to the proposed 0.95 fouling factor, which is incorporated into the UV dose equation above.

i. The facility should be operated in accordance with an approved operations plan, which specifies clearly the operational limits and responses required for critical alarms.

If you have questions regarding this letter, please contact Mr. Chi Diep at (213) 580-5727 or myself at (213) 580-3127.

Sincerely,

Stefan Cajina, P.E.
District Engineer
Central District

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TrojanUV(005).doc
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ATTACHMENT F
Monitoring and Reporting Program No. R6V-2009-0141

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

MONITORING AND REPORTING PROGRAM NO. R6V-2009-0141
WDID NO. 6B190501001

MASTER WATER RECYCLING REQUIREMENTS AND
WASTE DISCHARGE REQUIREMENTS
COUNTY SANITATION DISTRICT NO. 14 OF LOS ANGELES COUNTY
(LANCASTER)
DISINFECTED TERTIARY RECYCLED WATER

Los Angeles County

I. MONITORING

A. Flow Monitoring

1. County Sanitation District No. 14 of Los Angeles County (District) shall record the total volume, in million gallons, and the average flow rate, in million gallons per day (mgd), of recycled water provided by the District to each Authorized Water Use site (including Apollo Park and Fox Airfield sites). This information must be recorded and reported for each calendar month.

2. The District shall record the total volume, in million gallons, and the monthly average 24-hour flow rate, in mgd, of recycled water supplied by the Antelope Valley Tertiary Treatment Plant into the North Los Angeles/Kern County Regional Recycled Water Project distribution system. This information must be recorded and reported for each calendar month.

3. The District shall record the total volume, in million gallons, and the monthly average 24-hour flow rate, in mgd, of recycled water supplied by the Membrane Bioreactor Plant into the North Los Angeles/Kern County Regional Recycled Water Project distribution system. This information must be recorded and reported for each calendar month.

4. The District shall record the total volume, in million gallons, and the monthly average 24-hour flow rate, in mgd, of recycled water supplied by the Activated Sludge/Nitrification-Denitrification Plant (Stage V Tertiary Treatment Plant) into the North Los Angeles/Kern County Regional Recycled Water Project distribution system. This information must be recorded and reported for each calendar month.

B. Agronomic Application Rate Monitoring for Fertilizers and Recycled Water

1. For each calendar month, the District shall record, and provide a tabular comparison of, the:

   a. agronomic rate (volume of water) of each irrigated area;
   b. volume of recycled water (and non-recycled supplemental water) applied to each irrigated area; and
   c. number of acres for each irrigated area.

2. For each calendar month, the District shall record, and provide a tabular comparison of, the:

   a. agronomic rate of nitrogen (N) for each landscape and agricultural area;
   b. total amount of N applied to each area, including the amount of N in the recycled water and the amount of N in any fertilizer applied;
   c. total amount of N applied to each area, including the amount of N in the recycled water and the amount of N in any fertilizer applied; and
   d. number of acres for each area.

C. Recycled Water Quality Monitoring

The District must collect and analyze samples of the recycled water supplied by the (1) Antelope Valley Tertiary Treatment Plant, (2) Membrane Bioreactor Plant, and (3) Stage V Tertiary Treatment Plant for reuse by recycled water users in accordance with the following table:

Parameter	Units	Type	Minimum Frequency
Turbidity[1]	NTU	Recorder	Continuous
Total Chlorine Residual	mg/L	Recorder	Continuous (When chlorine is used as disinfectant)
Modal Contact Time[2]	minutes	Calculated	Daily (When chlorine is used as disinfectant)
CT Value[3]	mg-minutes/L	Calculated	Daily (When chlorine is used as disinfectant)
Total Coliform	MPN/100mL	Grab	Daily
Kjeldahl Nitrogen	mg/L	Composite	Monthly
Ammonia Nitrogen	mg/L	Composite	Monthly
Nitrate Nitrogen	mg/L	Composite	Monthly
Total Dissolved Solids	mg/L	Composite	Quarterly
Sulfate	mg/L	Composite	Quarterly
Chloride	mg/L	Composite	Quarterly

Table Continued:

Total Trihalomethanes	µg/L	Grab	Quarterly
n-nitrosodimethylamine	µg/L	Composite	Quarterly
Priority Pollutants, excluding asbestos (Appendix A to 40 CFR part 423)	as specified	Grab or composite	Semi Annually

[1]For each 24-hour period, record and report the following:

a. Antelope Valley Tertiary Treatment Plant: average turbidity, amount of time (minutes) the turbidity exceeded five (5) NTUs (if any), and the maximum turbidity.
b. Membrane Bioreactor Plant: amount of time (minutes the turbidity exceeded 0.2 NTUs (if any) and the maximum turbidity.
c. Stage V Tertiary Treatment Plant: average turbidity, amount of time (minutes) the turbidity exceeded five (5) NTUs (if any), and the maximum turbidity.

[2]The modal contact time at the highest and lowest flows must be recorded and reported for each 24-hour period, where there is production of disinfected tertiary recycled water. The "modal contact time" is the amount of time elapsed between the time that a tracer, such as salt or dye, is injected into the influent at the entrance to a chamber and the time that the highest concentration of the tracer is observed in the effluent from the chamber. For the purpose of this determination, modal contact time shall be derived from a predetermined plot correlating modal contact times to varying flow conditions. (CCR, title 22, sec 60301.600)

[3]When chlorine is used as the disinfectant in production of disinfected tertiary recycled water, the lowest CT value must be calculated for each 24-hour period. CT (mg-minutes per liter) = chlorine residual (mg/L) × modal contact time (minutes). To calculate the lowest value, first record the following data for the 24-hour period:

a. Modal contact time under highest flow and corresponding total chlorine residual at that time.
b. Lowest total chlorine residual and corresponding modal contact time.
c. Highest total chlorine residual and corresponding modal contact time.
d. Modal contact time under lowest flow and corresponding total chlorine residual at that time.

Next, calculate CT values for each of the four conditions, above. The lowest of the four calculated CT values is the lowest CT for the period.

D. Quarterly Recycled Water Use Monitoring

The District must record the following information each quarter (quarters defined in Requirement No. II.B, below) in accordance with Water Code section 13523.1(b)(4):

1. Total amount of recycled water supplied into the North Los Angeles/Kern County Regional Recycled Water Project distribution system during the quarter.

2. Total amount of recycled water supplied to the Apollo Park and Fox Airfield sites.

3. The total number of sites that received recycled water during the quarter.

4. A list of all recycled water use sites. For each site, the list must include:

   a. site name,
   b. site location
   c. name of underlying hydrologic area
   d. user name
   e. type of use
   f. site area (acres)
   g. date of District recycled water use approval

5. A map of suitable scale showing the boundary of the Permit Area (as defined by Finding No. 9 of Board Order R6V-2009-0141 and showing the approved recycled water use site locations.

E. Inspections and Enforcement Monitoring

1. The District must provide in its annual report (see Requirement No. II.D, below) an inspection schedule for all recycled water use facilities. The inspection schedule shall document the date of each facility's prior inspection and its respective compliance status. Any facility with a reported incidence of noncompliance in its most recent inspection report must be re-inspected no later than one year from its prior inspection. Any facility that was in compliance during its most recent inspection must be scheduled for a re-inspection no later than three years from its prior inspection.

2. The District must record and report on a quarterly basis all recycled water use sites inspected pursuant to Requirement No. I.B.4 of Board Order No. R6V-2009-0141 during each respective quarter (See Requirement No. II.B, below). The list of sites inspected must include the following information for each recycled water use site:

   a. Date of inspection, name of recycled water use site, user name, and type of use.
   b. A description of all noted violations (including compliance with Requirement Nos. I.C.1 through I.C.15 of Board Order No. R6V-2009-0141).
   c. The date compliance was achieved and the respective corrective action taken, if applicable.
   d. A description of enforcement action taken (if any), including any schedule for achieving compliance.
   e. Date of prior compliance inspection.

3. The District must ensure that monthly inspections of all signage informing the public that recycled water is currently being used at the artificial lakes at Apollo Park and for irrigation purposes at each irrigation recycled water use

facility are completed. Maintenance of this signage is required. The results of such inspections must be reported by the District in its quarterly report (see Requirement No. II.B, below).

4. The District must ensure that monthly inspections of all Best Management Practices (BMPs) in place to prevent contamination of potable water supplies (including groundwater) are completed. The results of such inspections and measures taken to maintain and repair these BMPs must be reported by the District in its quarterly report (see Requirement No. II.B, below).

5. The District must ensure that annual visual inspections of the recycled water distribution system for cross connections with the potable water supply are completed.

6. The District must ensure that the recycled water distribution system is annually inspected for leaks or drops in pressure, and that pressure tests are conducted at a minimum once every three years.

F. Operation and Maintenance Monitoring

The District must record and maintain records of all actions and analytical results necessary to demonstrate compliance with California Department of Public Health conditions identified in Board Order No. R6V-2009- 0141, Requirement No. II.B. and to document any operational problems and maintenance activities with the recycled water treatment facilities, distribution system, and user sites. The District must submit a brief summary of its findings to the California Regional Water Quality Control Board, Lahontan Region (Lahontan Water Board) with each quarterly monitoring report. This summary must discuss the elements listed below.

1. All modifications or additions to the recycled water treatment facilities, distribution systems, and user sites;

2. Test results of all backflow prevention devices at each recycled water use site.

3. The results of cross connection inspections at each authorized recycled water use site.

4. Test results of the District's recycled water distribution system pressure testing.

5. Any non-routine maintenance conducted on the recycled water treatment facilities, distribution system, and user systems.

6. Any major problems occurring to the recycled water treatment facilities, distribution system, and user systems.

7. Calibration results of any recycled water flow measuring devices.

II. REPORTING

A. General Provisions

1. The District must comply with the "General Provisions for Monitoring and Reporting," dated September 1, 1994, which is attached to and made part of this Monitoring and Reporting Program (Attachment A).

2. The District must comply with the Sampling and Analysis Plan that was submitted on September 8, 2009, which is attached to and made part of this Monitoring and Reporting Program (Attachment B).

B. Quarterly Reports

Beginning on **December 1, 2009**, quarterly monitoring reports including the preceding information must be submitted to the Lahontan Water Board by the first day of the third month following each quarterly monitoring period [Water Code section 13523.1, subdivision (b)(4)].

Quarterly monitoring periods are defined as follows:

First Quarter	January 1 - March 31
Second Quarter	April 1 - June 30
Third Quarter	July 1 - September 30
Fourth Quarter	October 1 - December 31

C. Semi-Annual Report

Beginning on **March 1, 2010**, semi-annual monitoring data including the preceding information must be submitted to the Lahontan Water Board by the first day of the third month following each semi-annual monitoring period [Water Code section 13523.1, subdivision (b)(6)]. Data that are required on a semi-annual basis will be incorporated into the quarterly report that coincides with the period for which the analyses are required.

Semi-annual monitoring periods are defined as follows:

First half	January 1 - June 30
Second half	July 1 – December 31

D. Annual Report

Beginning on **April 1, 2010** and continuing thereafter, the District must submit an annual report to the Lahontan Water Board with the information listed.

1. Documentation of the District's compliance status with Board Order No. R6V-2009-0141, including progress made towards developing the salt/nutrient management plan that is required by Board Order No. R6V-2009-0141, Requirement No. III.A.

2. The compliance record and the corrective actions taken or scheduled/planned to return the District into full compliance with Board Order No. R6V-2009- 0141.

3. The District's time schedule for completing corrective actions needed to achieve compliance.

Ordered by: Harold J. Singer Dated: Dec 9, 2009
HAROLD J. SINGER
EXECUTIVE OFFICER

Attachment A: General Provisions for Monitoring and Reporting Program
Attachment B: Sampling and Analysis Plan, dated September 8, 2009

ATTACHMENT A

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

GENERAL PROVISIONS
FOR MONITORING AND REPORTING

1. SAMPLING AND ANALYSIS

a. All analyses shall be performed in accordance with the current edition(s) of the following documents:

   i. Standard Methods for the Examination of Water and Wastewater
   ii. Methods for Chemical Analysis of Water and Wastes, EPA

b. All analyses shall be performed in a laboratory certified to perform such analyses by the California State Department of Health Services or a laboratory approved by the Regional Board. Specific methods of analysis must be identified on each laboratory report.

c. Any modifications to the above methods to eliminate known interferences shall be reported with the sample results. The method used shall also be reported. If methods other than USEPA approved methods or Standard Methods are used, the exact methodology must be submitted for review and must be approved by the Regional Board prior to use.

d. The Discharger shall establish chain-of-custody procedures to ensure that specific individuals are responsible for sample integrity from commencement of sample collection through delivery to an approved laboratory. Sample collection, storage and analysis shall be conducted in accordance with an approved Sampling and Analysis Plan (SAP). The most recent version of the approved SAP shall be kept at the facility.

e. The Discharger shall calibrate and perform maintenance procedures on all monitoring instruments and equipment to ensure accuracy of measurements, or shall ensure that both activities will be conducted. The calibration of any wastewater flow measuring device shall be recorded and maintained in the permanent log book described in 2.b, below.

f. A grab sample is defined as an individual sample collected in fewer than 15 minutes.

g. A composite sample is defined as a combination of no fewer than eight individual samples obtained over the specified sampling period at equal intervals. The volume of each individual sample shall be proportional to the discharge flow rate at the time of sampling. The sampling period shall equal the discharge period, or 24 hours, whichever period is shorter.

2. OPERATIONAL REQUIREMENTS

a. Sample Results

Pursuant to California Water Code Section 13267(b), the Discharger shall maintain all sampling and analytical results including: strip charts; date, exact place, and time of sampling; date analyses were performed; sample collector's name; analyst's name; analytical techniques used; and results of all analyses. Such records shall be obtained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.

b. Operational Log

Pursuant to California Water Code Section 13267(b), an operation and maintenance log shall be maintained at the facility. All monitoring and reporting data shall be recorded in a permanent log book.

3. REPORTING

a. For every item where the requirements are not met, the Discharger shall submit a statement of the actions undertaken or proposed which will bring the discharge into full compliance with requirements at the earliest time and submit a timetable for correction.

b. Pursuant to California Water Code Section 13267(b), all sampling shall be made available to the Regional Board upon request. Results shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Regional Board.

c. The Discharger shall provide a brief summary of any operational problems and maintenance activities to the Regional Board with each monitoring report. Any modifications or additions to, or any major maintenance conducted on, or any major problems occurring to the wastewater conveyance system, treatment facilities, or disposal facilities shall be included in this summary.

d. Monitoring reports shall be signed by:

i. In the case of a corporation, by a principal executive officer at least of the level of vice-president or his duly authorized representative, if such representative is responsible for the overall operation of the facility from which the discharge originates;

ii. In the case of a partnership, by a general partner;

iii. In the case of a sole proprietorship, by the proprietor;

iv. In the case of a municipal, state or other public facility, by either a principal executive officer, ranking elected official, or other duly authorized employee.

e. Monitoring reports are to include the following:

i. Name and telephone number of individual who can answer questions about the report.

ii. The Monitoring and Reporting Program Number.

iii. WDID Number.

f. Modifications

This Monitoring and Reporting Program may be modified at the discretion of the Regional Board Executive Officer.

4. NONCOMPLIANCE

Under Section 13268 of the Water Code, any person failing or refusing to furnish technical or monitoring reports or falsifying any information provided therein, is guilty of a misdemeanor and may be liable civilly in an amount of up to one thousand dollars ($1,000) for each day of violation under Section 13268 of the Water Code.

ATTACHMENT B

SANITATION DISTRICTS OF LOS ANGELES COUNTY

Master Water Recycling Monitoring and Reporting Program

SELF-MONITORING SAMPLING AND ANALYSIS PLAN (SAP)

September 8, 2009

Lancaster Water Reclamation Plant
County Sanitation District No. 14 of Los Angeles County

DOC #: 13848201

TABLE OF CONTENTS

Overview

This document describes the self-monitoring sampling and analysis plan (SAP) proposed by County Sanitation District No. 14 of Los Angeles County (Sanitation District No. 14) for the Lancaster Water Reclamation Plant (LWRP). This SAP is compiled in accordance with Board Order No. R6V-2009-0034 (Master Permit), adopted on June 10, 2009 by the California Regional Water Quality Control Board, Lahontan Region (Regional Board). The Master Permit includes Water Recycling Requirements (WRRs), Waste Discharge Requirements (WDRs), and the Monitoring and Reporting Program (MRP) for the LWRP's water recycling program.

Constituent concentrations will be monitored under the conditions specified in the MRP and this document at the following locations:

- Effluent from the LWRP membrane bioreactor facility (MBR), after chlorination disinfection and after ultraviolet light (UV) disinfection
- Effluent from the Antelope Valley Tertiary Treatment Plant (AVTTP)
- Effluent from the LWRP Stage V Activated Sludge /Nitrification-Denitrification (AS/NDN) Plant

Locations for effluent monitoring points are shown in Figures 2 and 3. The Stage V AS/NDN Plant is currently under construction; therefore, the exact location where the effluent samples will be sampled will be determined after facility completion.

Sampling Schedule

The complete self-monitoring sampling schedule is shown in Table 1. This schedule is a compilation of all the monitoring outlined in the MRP. In some cases the annual monitoring events will be conducted along with a quarterly and/or monthly event.

Sampling Constituents, Analytical Methods and Schedule

Table 2 provides a compilation of the sampling and analytical protocols for all constituents requiring self-monitoring. The analytical methods and sampling techniques used may change if alternative methods are found to provide better results. The Sanitation District will seek Regional Board staff's approval for any changes in analytical methods and sampling techniques prior to implementation.

Quality Assurance/Quality Control (QA/QC)

The Quality Assurance (QA) Group of the Sanitation Districts of Los Angeles County (Sanitation Districts, or LACSD) Laboratories Section is responsible for monitoring the validity and quality of analytical data produced in all laboratories operated by the Sanitation Districts. In order to accomplish this goal, a quality assurance plan prepared by the QA Group is strictly followed. The plan includes routine QA activities that are performed in the laboratories in order to assure the defensibility of data reported.

1. A routine practice of running laboratory control samples, duplicates and matrix spikes or duplicate spikes for every ten samples, or every analytical batch of less than ten samples, is maintained. Control limits have been established for both precision and accuracy, and quality control data are plotted on control charts for trend analyses. For situations where the data are outside of the control limits, corrective action is initiated and maintained at the bench level until the problems are solved.

2. A reagent or method blank is routinely run with each batch of samples as a contamination check.

3. Calibration standards are analyzed as required. For some tests, a daily calibration verification standard is used to check the initial calibration curve. For other tests, a multi-point calibration curve is prepared on each day of analysis.

4. For most organic constituents, surrogate standards are added to every sample, duplicate, spike, and blank. The results are compared to established acceptance limits. When unacceptable results are obtained, corrective action is performed.

5. Instrument QA is also performed (e.g., for GC/MS, mass calibration and tuning are performed to meet ion abundance criteria).

6. The Sanitation Districts laboratories supply data for NPDES monitoring programs and must participate in the United Sates Environmental Protection Agency's (EPA) annual Discharge Monitoring Report – Quality Assurance (DMR-QA) study. This requires the successful analysis of blind chemistry and toxicity samples obtained from one of the EPA certified suppliers.

7. All ten Sanitation Districts' laboratories are accredited by the California Department of Public Health Environmental Laboratory Accreditation Program (ELAP). To retain their certification, each laboratory must successfully analyze blind samples on an annual basis through Proficiency Testing studies. ELAP staff also performs site inspections of each laboratory.

8. Quality control samples in the form of blind check standards, either prepared in-house or purchased from commercial sources, are issued by the QA Group to all Los Angeles County Sanitation Districts' laboratories. In situations where the results are not acceptable, the analysts and their supervisors are informed and error resolutions are performed. This consists of checking calculations, data transcription, instrumentation, methodology, etc. Follow-up check samples are issued to verify that the analyses are back in control.

9. The QA Group also issues split samples collected from one of the water reclamation plants to each laboratory to assess their analysis with an actual environmental matrix. Results of these analyses are statistically evaluated for outliers.

Sampling Procedures

Samples are collected and handled in the manner specified in the analytical method. Table 2 provides additional sampling information for the monitoring crew including sample bottle material, holding times, and sample preservation.

Time-based 24-hour composite samples are currently utilized by LWRP and are preferred whenever possible. However, there are situations where grab samples are more appropriate or specified by standard procedures (e.g., total cyanide).

Two sampling procedures are attached:

1. Appendix 1 – Standard Operating Procedure for Daily Sample Collection (Without Custody Transfer)
2. Appendix 2 – Standard Operating Procedure for Collection of Samples for Priority Pollutant Analysis

Sample Chain of Custody

Chain of custody forms (COCs) using names of specific individuals are used to track the handling of samples. The COCs also contain the complete analytical request and full documentation of the sample origin including sample date, sample time, sample location, preservation, and sampler's name. An example of the COC form is attached (Appendix 3). This paper trail is archived along with the sample analytical results.

Results Reporting

Analytical results are reported following a review of the QA/QC data. Monitoring reports are to be submitted according to the due dates specified in the permit.

Table 1. Recycled Water Quality Self-Monitoring Schedule

Parameter	Units	Sample Type	Minimum Frequency
Flow	million gallons per day	Recorder	Continuous
Turbidity[1]	NTU	Recorder	Continuous
Total Chlorine Residual	mg/L	Recorder	Continuous[4]
Modal Contact Time[2]	minutes	Calculated	Daily[4]
CT Value[3]	mg-minutes/L	Calculated	Daily[4]
Total Coliform	MPN/100mL	Grab	Daily
Kjeldahl Nitrogen	mg/L	Composite	Monthly
Ammonia Nitrogen	mg/L	Composite	Monthly
Nitrate Nitrogen	mg/L	Composite	Monthly
Total Dissolved Solids	mg/L	Composite	Monthly
Sulfate	mg/L	Composite	Monthly
Chloride	mg/L	Composite	Monthly
Total Trihalomethanes	µg/L	Grab	Quarterly
n-nitrosodimethylamine	µg/L	Grab / Composite (as specified)	Quarterly
Priority Pollutants, excluding asbestos (Appendix A to 40CFR part 423)	as specified	Grab / Composite (as specified)	Semiannually

[1] For each 24-hour period, record and report the following:
   a. AVTTP: average turbidity, amount of time (minutes) the turbidity exceeded five (5) NTUs (if any), and the maximum turbidity.
   b. MBR: amount of time (minutes) the turbidity exceeded 0.2 NTUs (if any), and the maximum turbidity
   c. Stage V AS/NDN Plant: average turbidity, amount of time (minutes) the turbidity exceeded five (5) NTUs (if any), and the maximum turbidity.

[2] The modal contact time at the highest and lowest flows must be recorded and reported for each 24-hour period, where there is production of disinfected tertiary recycled water. The "modal contact time" is the amount of time elapsed between the time that a tracer, such as salt or dye, is injected into the influent at the entrance to a chamber and the time that the highest concentration of the tracer is observed in the effluent from the chamber. For the purpose of this determination, modal contact time shall be derived from a predetermined plot correlating modal contact times to varying flow conditions. (CCR, title 22, sec 60301.600)

[3] When chlorine is used as the disinfectant in production of disinfected tertiary recycled water, the lowest CT value must be calculated for each 24-hour period. CT (mg-minutes per liter) = chlorine residual (mg/L) × modal contact time (minutes). To calculate the lowest value, first record the following data for the 24-hour period:
   a. Modal contact time under highest flow and corresponding total chlorine residual at that time.
   b. Lowest total chlorine residual and corresponding modal contact time.
   c. Highest total chlorine residual and corresponding modal contact time.
   d. Modal contact time under lowest flow and corresponding total chlorine residual at that time.

   Next, calculate CT values for each of the four conditions, above. The lowest of the four calculated CT values is the lowest CT for the period.

[4] When chlorine is used as disinfectant.

Table 2. Sampling Handling, Analytical Methods and Detection Limits

Constituent	Method	Preservative	Holding Time	Reporting Limit	Units	Sample Type	Sample Bottle	Analytical Lab
Total Dissolved Solids	SM 2540C	Cool, 4°C	7 days	7 - 10	mg/L	composite	P/G	LACSD
Nitrate Nitrogen	SM 4500 NO_3-F / EPA 300.0	Cool, 4°C	48 hours	0.2 / 0.05	mg/L as N	composite	P/G	LACSD
Nitrite Nitrogen	SM 4500-NO_2B	Cool, 4°C	48 hours	0.03	mg/L as N	composite	P/G	LACSD
Total Kjeldahl Nitrogen	EPA 351.2	H_2SO_4 to pH<2; Cool, 4°C	28 days	0.2	mg/L as N	composite	P/G	LACSD
Ammonia Nitrogen	SM 4500-NH_3G	H_2SO_4 to pH<2; Cool, 4°C	28 days	0.1 as N	mg/L	composite	P/G	LACSD
Chloride	EPA 300.0	Cool, 4°C	28 days	0.2	mg/L	composite	P/G	LACSD
Sulfate	EPA 300.0	Cool, 4°C	28 days	0.5	mg/L	composite	P/G	LACSD
Heavy Metals (5)	EPA 200.8 + see Notes (5)	HNO_3 to pH<2; Cool, 4°C	6 months	0.25 - 10	µg/L	composite	P/G	LACSD
Mercury	EPA 245.1 / EPA 1631	HNO_3 to pH<2; Cool, 4°C	28 days	0.04 / 0.0005	µg/L	composite	G	LACSD
Hexavalent Chromium	SM 3500-CrB / EPA 218.6	Cool, 4°C	24 hours	10 / 0.1	µg/L	grab	P/G	LACSD
Total Cyanides	SM 45900-CNC, E	Sodium thiosulfate in presence of chlorine NaOH pH>12; Cool, 4°C	14 days	5	µg/L	grab	P/G	LACSD
Total Phenols	EPA 420.1	H_2SO_4 to pH<4; Cool, 4°C	28 days	0.006	µg/L	composite	G	LACSD
Bromoform	EPA 624	sodium thiosulfate in presence of chlorine; HCl to pH<2; Cool, 4°C	14 days	0.5	µg/L	grab	G, TFE lined cap	LACSD
Chloroform	EPA 624	sodium thiosulfate in presence of chlorine; HCl to pH<2; Cool, 4°C	14 days	0.5	µg/L	grab	G, TFE lined cap	LACSD
Dibromochloromethane	EPA 624	sodium thiosulfate in presence of chlorine; HCl to pH<2; Cool, 4°C	14 days	0.5	µg/L	grab	G, TFE lined cap	LACSD

Table 2. Sampling Handling, Analytical Methods and Detection Limits (continued)

Constituent	Method	Preservative	Holding Time (1)	Reporting Limit (2)	Units	Sample Type	Sample Bottle (3)	Analytical Lab (4)
Dichlorobromomethane	EPA 624	sodium thiosulfate in presence of chlorine; HCl to pH<2; Cool, 4°C	14 days	0.5	µg/L	grab	G, TFE lined cap	LACSD
Volatile Organics (5)	EPA 624	sodium thiosulfate in presence of chlorine; HCl to pH<2; Cool, 4°C	14 days	0.5 - 2	µg/L	grab	G, TFE lined cap (zero headspace)	LACSD
Acid Extractable Organics (5)	EPA 625	sodium thiosulfate in presence of chlorine; Cool, 4°C	7 days; 40 days	1 - 10	µg/L	composite	Amber G, TFE lined cap	LACSD
Base/Neutral Extractable Organics (5)	EPA 625	sodium thiosulfate in presence of chlorine; Cool, 4°C	7 days; 40 days	1 - 10	µg/L	composite	Amber G, TFE lined cap	LACSD
Pesticides and PCBs (5)	EPA 608	sodium sulfite in presence of chlorine; Cool, 4°C	7 days; 40 days	0.01 - 0.5	µg/L	composite	Amber G, TFE lined cap	LACSD
Turbidity	SM 2130B	Cool, 4°C	48 hours	0.1	NTU	grab	P/G	LACSD
Chlorine Residual	SM 4500-CL C	None	immediately	0.05	mg/L	grab	P/G, zero headspace	LACSD
Total Coliform	SM 9222B	sodium thiosulfate in presence of chlorine	6 hours	1	cfu/100mL	grab	Sterile plastic	LACSD

Notes:

(1) Maximum holding times from Standard Methods/EPA specifications
(2) Reporting limit refers to the lowest quantifiable concentration in a sample based on the proper application of all method-based analytical procedures and incorporates all dilution/concentration factors if any.
(3) G = glass; P = plastic; types of glass/plastic containers and rinsing techniques will vary depending on types of constituents being analyzed.
(4) In general, LACSD laboratories will perform all the analyses. However, LACSD will occasionally send samples to commercial laboratories for analysis.
(5) Please see Appendix 4 for specific Reporting Limits for individual parameters.

Figure 1: Lancaster Water Reclamation Plant Facilities

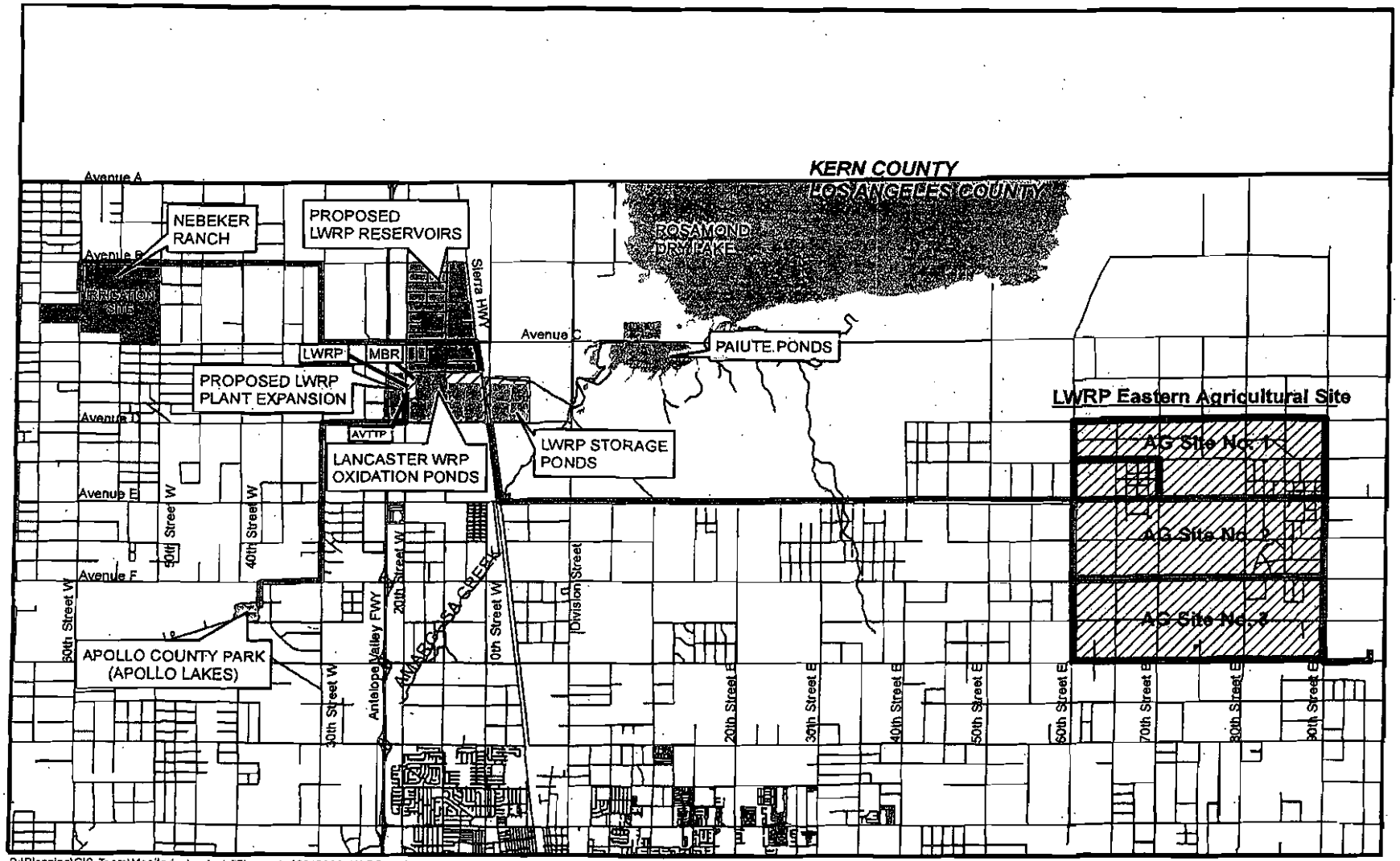
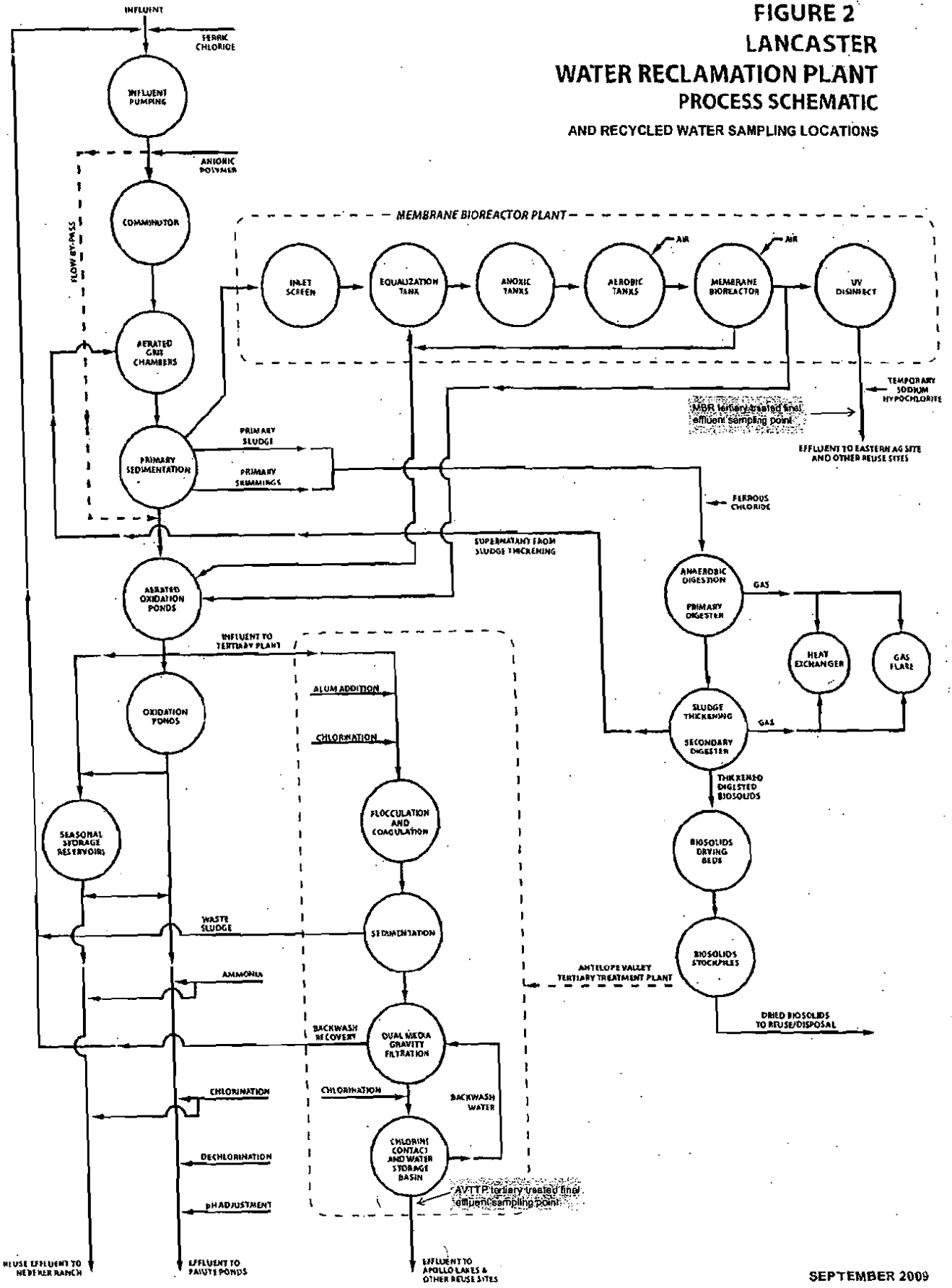
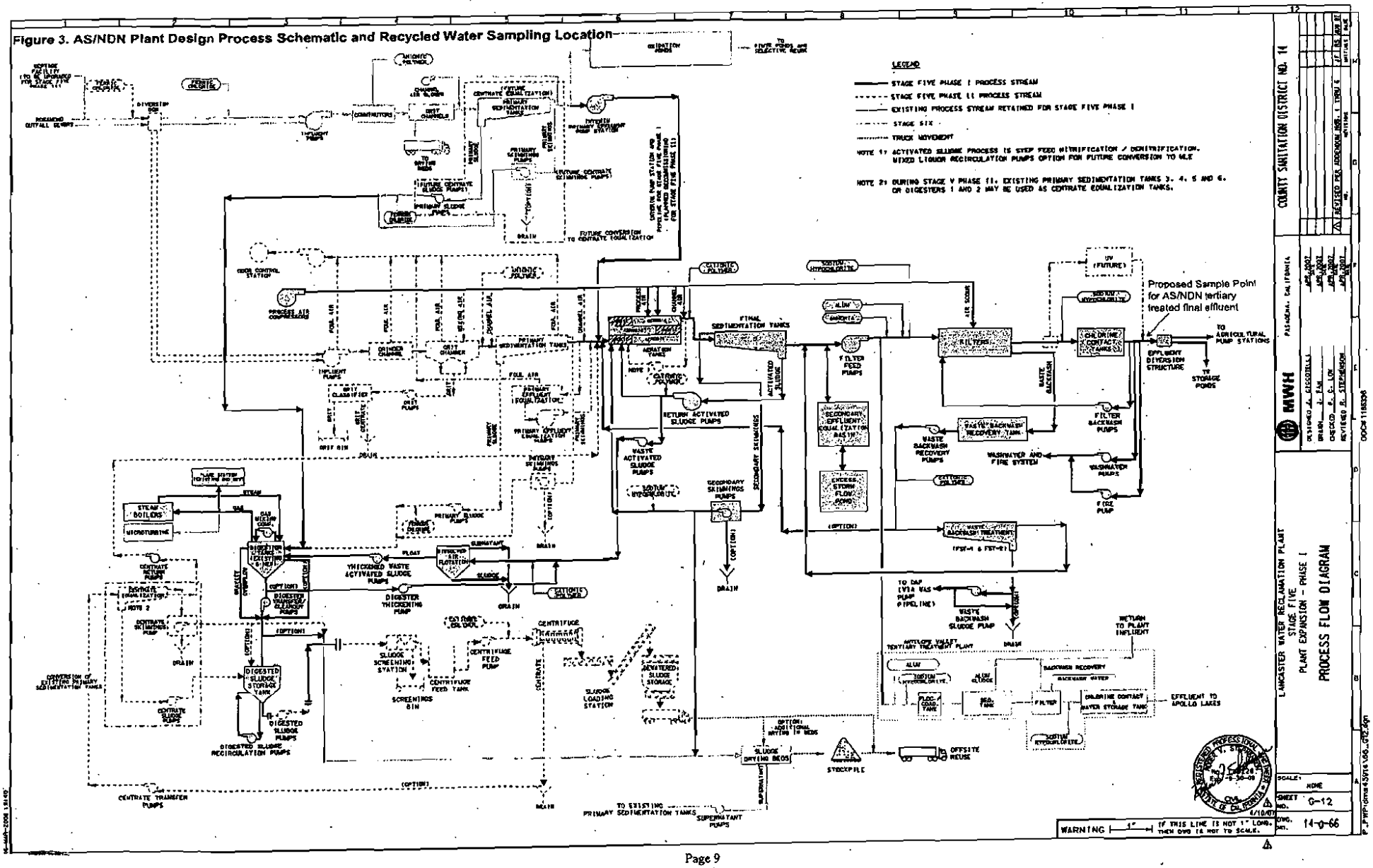


FIGURE 2
LANCASTER
WATER RECLAMATION PLANT
PROCESS SCHEMATIC
AND RECYCLED WATER SAMPLING LOCATIONS



SEPTEMBER 2009

Figure 3. AS/NDN Plant Design Process Schematic and Recycled Water Sampling Location



Lancaster Water Reclamation Plant
Standard Operating Procedure for
Daily Sample Collection (Without Custody Transfer)

Introduction

This procedure is to be used when there is no custody transfer and the analyses are performed by the same person(s) responsible for collection of the sample(s). Typically, this type of operation is associated with water reclamation plant site laboratories, which are defined as Treatment Plant Laboratories. Samples collected in this manner are securely maintained on site until analyses have been completed, after which the same person(s) discard the sample(s).

Equipment, Materials and Supplies

- Automated samplers with programmable controls to allow for flow weighted compositing (SIGMA 900 Max or similar samplers).
- Paddle made of polypropylene for mixing collected sample.
- Large mouth glass sample container for sampler.
- Sample bottles which have been pre-cleaned and are compatible with constituents to be analyzed.
- Ice to be used in sampler if it is not refrigerated.
- Sample logbook.

Setting & Initiating Sampling

1. Position the sampler at a location representative of effluent being discharged from the WRP after completion of all treatment processes, or before treatment processes if influent untreated wastewater is desired.
2. Obtain typical plant flow data for influent or effluent streams covering a 24-hour period.
3. Establish numerical values that correspond to sample volumes to be collected at intervals that result in a flow weighted composite sample.
4. Enter sampling parameters along with numerical values into the sampler programming unit using the manufacturer's guidelines.
5. Install a clean sample collection container in the sampler and ice if it is not refrigerated.
6. Initiate the start of the sampler program (confirm the first sample in the sequence is collected).
7. Let sampler run.

Retrieval & Collection

1. At the end of the sample collection period, check the sampler to confirm that there was no malfunction and that the appropriate volume of sample was collected.
2. Visually inspect the area around the sample collection point to determine if any conditions exist that may lead to unusual analytical results. If the sampler malfunctioned or other conditions prevail that may contribute to unusual results, then record these observations in the sample logbook.
3. Pre-label clean bottles designated for specific constituent analyses. Sample dates, times, location, and type are to be recorded along with the name of the individual collecting the sample.
4. Take out sample container from sampler, and in a mix-pour manner, pour aliquots of the sample into pre-labeled bottles that are compatible with constituents to be analyzed.

5. Bottles are to be iced from this point until arrival at the laboratory.
6. Upon arrival at the laboratory, immediately commence with analysis of the sample(s) or proper preservation if the sample(s) is to be held.

Sampler Maintenance

- The sampler and its container are to be cleaned with water, detergent, acid and a solvent as necessary for its next use.
- If batteries are used, they are to be re-charged.

Lancaster Water Reclamation Plant Standard Operation Procedure for Collection of Samples for Priority Pollutant Analysis

Introduction

For compliance purposes, samples must be collected and analyzed for priority pollutants. Effluent samples are collected downstream of all treatment. 24-hour composite samples are generally representative of a Lancaster Water Reclamation Plant's (LWRP's) average discharge; however, there are times when a grab sample is more appropriate or specified by standard procedures (e.g., hexavalent chromium, volatile organic contaminants).

Time-Weighted Composite Sample Collection

A composite sample is composed of eight sub-samples (aliquots) collected over a 24-hour period. The volume of each aliquot is fixed, but sampling times are staggered to achieve flow-weighted proportions. Sampling is accomplished with automated equipment – a hard plumbed SIGMA 900 Max Refrigerated Sampler with 2.5 gal glass bottle reservoir, a Teflon-lined sample in-take line with stainless steel strainer probe, and silicone tubing for the peristaltic pump. Equipment is routinely maintained according to manufacturer's instructions, and specially cleaned according to a strict protocol using non-phosphate detergent, 1:1 nitric acid, methanol, and reagent-grade water.

SIGMA samplers are programmed and set up at the specific sampling location with the 2.5 gal glass reservoir set in an environmental chamber. After 24 hours of sampling, the site is physically inspected to check for any disturbance to the samplers. The SIGMA display is also reviewed for any inconsistencies, and any observations are recorded in a field notebook. The resulting composite sample is mixed and poured on-site into the appropriate sample bottles along with the required preservation method as noted in Table 2 of the Sample and Analysis Plan (pages 4-5).

Grab Sample Collection

To collect a representative grab sample, containers are directly lowered beneath the surface of the wastewater stream. For some samples, a small headspace allows better mixing and pouring of the sample (e.g., hexavalent chromium), but to minimize volatilization of organic compounds, septum vials are filled with zero headspace. Again, appropriate bottles and exact preservation methods are listed in Table 2 of the Sample and Analysis Plan.

Processing of Samples

After all grab and composite samples are collected and preserved, they are transported in ice chests back to Sample Receiving Group for processing. Each sample is given a unique ID number and all relevant information from the chain-of-custody form is entered into the laboratory's electronic data system. The samples are then ready for distribution to the laboratory for analysis.

County Sanitation District of Los Angeles County
Sample Request Form / Chain of Custody

LAB JOB NOS.: 1) SJ _____ 2) SJ _____ 3) SJ _____ 4) SJ _____

CHARGE NOS.: 1: _____ B_____ 2: _____ B_____ 3: _____ B_____

REQUESTED BY: _____ SAMPLED BY: _____

REPORT TO: 1) _____ 2) _____ 3) _____

DATE AND TIME - GRAB SAMPLES: 1) / / : 2) / / :
3) / / : 4) / / :

COMPOSITE SAMPLES:
1) FROM: / / : TO: / / :
2) FROM: / / : TO: / / :
3) FROM: / / : TO: / / :
4) FROM: / / : TO: / / :

SAMPLE LOCATION:
1) - - TYPE: VOLUME LITER
2) - - TYPE: VOLUME LITER
3) - - TYPE: VOLUME LITER
4) - - TYPE: VOLUME LITER

DESCRIPTION:
1) _____
2) _____
3) _____
4) _____

PROJ. NO.: NO. OF SAMPLES: LOCATIONS: 1) 2) 3) 4)
PROJECT TITLE:

TESTS REQUIRED:

	CODE:	TEST NAME:		CODE:	TEST NAME:
1)	_____ -	_____	16)	_____ -	_____
2)	_____ -	_____	17)	_____ -	_____
3)	_____ -	_____	18)	_____ -	_____
4)	_____ -	_____	19)	_____ -	_____
5)	_____ -	_____	20)	_____ -	_____
6)	_____ -	_____	21)	_____ -	_____
7)	_____ -	_____	22)	_____ -	_____
8)	_____ -	_____	23)	_____ -	_____
9)	_____ -	_____	24)	_____ -	_____
10)	_____ -	_____	25)	_____ -	_____
11)	_____ -	_____	26)	_____ -	_____
12)	_____ -	_____	27)	_____ -	_____
13)	_____ -	_____	28)	_____ -	_____
14)	_____ -	_____	29)	_____ -	_____
15)	_____ -	_____	30)	_____ -	_____

NOTES TO ANALYST:

CUSTODY RECORD

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
	/ / AM/PM	

Sanitation Districts of Los Angeles County
Laboratory Detection and Reporting Limits for Individual Constituents

Name of Constituent	Approved Method	ML	MDL	RL	Units
pH	SM 4500-HB	*	*	1	pH
Conductivity	SM 2510B	*	*	*	µs/cm
Turbidity	SM 2130B	*	0.1	0.1	NTU
Temperature	SM 2550B	*	*	*	°F
Dissolved Oxygen	SM 4500-OG	*	*	1.0	mg/L
Total Dissolved Solids	SM 2540C	*	2.69 - 7	7 - 10	mg/L
Ammonia Nitrogen	SM 4500-NH3G	*	0.02	0.1	mg/L
Organic Nitrogen	By Calculation	*	0.05	0.2	mg/L
Total Kjeldahl Nitrogen (TKN)	EPA 351.2	*	0.135	0.2	mg/L
Nitrate Nitrogen	SM 4500-NO3-F / EPA 300.0	*	0.03 / 0.027	0.2 / 0.05	mg/L
Nitrite Nitrogen	SM 4500-NO2B	*	0.003	0.03	mg/L
Total Cyanide	SM4500-CN E	5	1	5	µg/L
Total Nitrogen	By Calculation	*	*	0.2	mg/L
Sulfate	EPA 300.0	*	0.09	0.5	mg/L
Chloride	EPA 300.0	*	0.11	2.0	mg/L
Chlorine Residual	SM 4500-CLC	*	0.05	0.05	mg/L
Total Hardness	SM 2340C / EPA 200.8	*	0.66 / 0.039	5 / 0.26	mg/L
Phenols	EPA 420.1	*	0.002	0.006	mg/L
Total Coliform (MF)	SM 9222B	*	*	1	CFU/0.1L
Total Coliform (MTF)	SM 9221B	*	*	1.8	MPN/0.1L
Fecal Coliform (MTF)	SM 9221E	*	*	1.8	MPN/0.1L
Fecal Coliform (MF)	SM 9222D	*	*	1	CFU/0.1L
4,4'-DDE	EPA 608	0.005	0.001 - 0.002	0.01	µg/L
4,4'-DDD	EPA 608	0.005	0.002	0.01	µg/L
4,4'-DDT	EPA 608	0.005	0.001	0.01	µg/L
Alpha-BHC	EPA 608	0.005	0.001	0.01	µg/L
gamma-BHC	EPA 608	0.005	0.001	0.01	µg/L
Heptachlor	EPA 608	0.005	0.0009 - 0.001	0.01	µg/L
Heptachlor Epoxide	EPA 608	0.005	0.001	0.01	µg/L
Aldrin	EPA 608	0.005	0.002	0.01	µg/L
Dieldrin	EPA 608	0.005	0.001	0.01	µg/L
Endrin	EPA 608	0.005	0.001 - 0.002	0.01	µg/L
Toxaphene	EPA 608	0.2	0.04 - 0.05	0.5	µg/L
Methoxichlor	EPA 608	0.005	0.001 - 0.002	0.01	µg/L
2,4-D	EPA 8151A	0.5	0.21	0.50	µg/L
2,4,5 -TP (Silvex)	EPA 8151A	0.25	0.11	0.25	µg/L
PCB 1242	EPA 608	0.08	0.04 - 0.08	0.1	µg/L
PCB 1254	EPA 608	0.05	0.02 - 0.03	0.05	µg/L
beta-BHC	EPA 608	0.005	0.003 - 0.004	0.01	µg/L
delta-BHC	EPA 608	0.005	0.001 - 0.003	0.01	µg/L
Alpha-Endosulfan	EPA 608	0.005	0.001	0.01	µg/L
Beta-Endosulfan	EPA 608	0.005	0.003	0.01	µg/L
Endosulfan Sulfate	EPA 608	0.005	0.002	0.01	µg/L
Endrin Aldehyde	EPA 608	0.005	0.001	0.01	µg/L

Name of Constituent	Approved Method	ML	MDL	RL	Units
PCB 1016	EPA 608	0.1	0.03 - 0.04	0.1	µg/L
PCB 1221	EPA 608	0.5	0.2	0.5	µg/L
PCB 1232	EPA 608	0.3	0.1 - 0.2	0.3	µg/L
PCB 1248	EPA 608	0.1	0.03 - 0.04	0.1	µg/L
PCB 1260	EPA 608	0.1	0.02 - 0.05	0.1	µg/L
Chlordane	EPA 608	0.04	0.02 - 0.03	0.05	µg/L
Methylene Chloride	EPA 624	0.5	0.13 - 0.20	0.5	µg/L
Chloroform	EPA 624	0.5	0.09 - 0.13	0.5	µg/L
1,1,1 Trichloroethane	EPA 624	0.5	0.07 - 0.18	0.5	µg/L
Carbon Tetrachloride	EPA 624	0.5	0.09 - 0.2	0.5	µg/L
1,1 Dichloroethylene	EPA 624	0.5	0.10 - 0.22	0.5	µg/L
Trichloroethylene	EPA 624	0.5	0.12 - 0.17	0.5	µg/L
Tetrachloroethylene	EPA 624	0.5	0.14 - 0.5	0.5	µg/L
Dichlorobromomethane	EPA 624	0.5	0.09 - 0.12	0.5	µg/L
Chlorodibromomethane	EPA 624	0.5	0.08 - 0.11	0.5	µg/L
Bromoform	EPA 624	0.5	0.07 - 0.19	0.5	µg/L
Chlorobenzene	EPA 624	0.5	0.08 - 0.12	0.5	µg/L
Vinyl Chloride	EPA 624	0.5	0.17 - 0.37	0.5	µg/L
1,2 Dichlorobenzene	EPA 624	0.5	0.07- 0.23	0.5	µg/L
1,3 Dichlorobenzene	EPA 624	0.5	0.07 - 0.26	0.5	µg/L
1,4 Dichlorobenzene	EPA 624	0.5	0.07 - 0.32	0.5	µg/L
1,1 Dichloroethane	EPA 624	0.5	0.07 - 0.14	0.5	µg/L
1,1,2 Trichloroethane	EPA 624	0.5	0.09 - 0.10	0.5	µg/L
1,2 Dichloroethane	EPA 624	0.5	0.09 - 0.12	0.5	µg/L
Benzene	EPA 624	0.5	0.10 - 0.15	0.5	µg/L
Toluene	EPA 624	0.5	0.06 - 0.18	0.5	µg/L
Ethylbenzene	EPA 624	0.5	0.12 - 0.19	0.5	µg/L
O-Xylene	EPA 624	0.5	0.10 - 0.16	0.5	µg/L
Trans 1,2-Dichloroethylene	EPA 624	0.5	0.09 - 0.17	0.5	µg/L
Methyl Bromide	EPA 624	0.5	0.07 - 0.34	0.5	µg/L
Chloroethane	EPA 624	0.5	0.16 - 0.32	0.5	µg/L
2-Chloroethyl vinyl ether	EPA 624	0.5	0.07 - 0.18	0.5	µg/L
Chloromethane	EPA 624	0.5	0.06 - 0.20	0.5	µg/L
1,2 Dichloropropane	EPA 624	0.5	0.09 - 0.17	0.5	µg/L
Cis-1,3 Dichloropropene	EPA 624	0.5	0.11 - 0.13	0.5	µg/L
Trans-1,3-Dichloropropene	EPA 624	0.5	0.07 - 0.11	0.5	µg/L
1,1,2,2 Tetrachloroethane	EPA 624	0.5	0.08 - 0.16	0.5	µg/L
Acrolein	EPA 624	2.0	0.49 - 0.52	2.0	µg/L
Acrylonitrile	EPA 624	2.0	0.2 - 0.54	2.0	µg/L
Methyl-t-butyl ether (MTBE)	EPA 624	0.5	0.11 - 0.21	0.5	µg/L
M+P-Xylene	EPA 624	1.0	0.21 - 0.51	1.0	µg/L
1,4-Dioxane	EPA 8270 M	0.5	0.13	0.5	µg/L
1,2,3-Trichloropropane	EPA 524.2 M (SIM)	0.005	0.0012	0.005	µg/L
Total Arsenic	EPA 200.8	1	0.04	1	µg/L
Barium	EPA 200.8	0.5	0.02 - 0.1	0.5	µg/L
Cadmium	EPA 200.8	0.2	0.01 - 0.03	0.2	µg/L

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Total Chromium	EPA 200.8	0.5	0.02 - 0.05	0.5	µg/L
Hexavalent Chromium	SM 3500 CrB / EPA 218.6	10 / 0.1	0.30 - 2.94 / 0.047	10 / 0.1	µg/L
Copper	EPA 200.8	0.5	0.04 - 0.22	0.5	µg/L
Iron	EPA 200.8	20	5.8 - 8	20	µg/L
Lead	EPA 200.8	0.25	0.02 - 0.17	0.25	µg/L
Mercury	EPA 245.1 / EPA 1631	0.025 / 0.0005	0.01 / 0.000157	0.04 / 0.0005	µg/L
Nickel	EPA 200.8	1.0	0.02 - 0.13	1.0	µg/L
Selenium	EPA 200.8	1.0	0.09 - 0.18	1.0	µg/L
Silver	EPA 200.8	0.2	0.01 - 0.07	0.2	µg/L
Sodium	EPA 200.8	0.2	0.0052 - 0.026	0.2	mg/L
Zinc	EPA 200.8	1.0	0.38 - 0.48	1	µg/L
Antimony	EPA 200.8	0.5	0.14 - 0.16	0.5	µg/L
Beryllium	EPA 200.8	0.25	0.05 - 0.07	0.25	µg/L
Thallium	EPA 200.8	0.25	0.05 - 0.06	0.25	µg/L
Acenaphthene	EPA 625	1	0.15	1	µg/L
Acenaphthylene	EPA 625	10	0.14	10	µg/L
Anthracene	EPA 625	10	0.18	10	µg/L
Benzidine	EPA 625	5	1.67	5	µg/L
Benzo (a) Anthracene	EPA 625	5	0.19	5	µg/L
Benzo (a) Pyrene	EPA 625 / EPA 610	10 / 0.02	0.15 / 0.0089	10 / 0.02	µg/L
Benzo (b) Fluoranthene	EPA 625 / EPA 610	10 / 0.02	0.13 / 0.0082	10 / 0.02	µg/L
Benzo (g,h,i) Perylene	EPA 625 / EPA 610	5 /-0.02	0.19 / 0.009	5 / 0.02	µg/L
Benzo (k) Fluoranthene	EPA 625 / EPA 610	10 / 0.02	0.23 / 0.0084	10 / 0.02	µg/L
Bis (2-Chloroethoxyl) methane	EPA 625	5	0.13	5	µg/L
Bis(2-Chloroethyl) ether	EPA 625	1	0.19	1	µg/L
Bis(2-Chloroisopropyl) ether	EPA 625	2	0.16	2	µg/L
Bis(2-Ethylhexyl) phthalate	EPA 625	2	0.25	5	µg/L
4-Bromophenyl phenyl ether	EPA 625	5	0.21	5	µg/L
Butyl benzyl phthalate	EPA 625	10	0.16	10	µg/L
2-Chloronaphthalene	EPA 625	10	0.16	10	µg/L
4-Chlorophenyl phenyl ether	EPA 625	5	0.17	5	µg/L
Chrysene	EPA 625 / EPA 610	10 / 0.02	0.17 / 0.0093	10 / 0.02	µg/L
Dibenzo(a,h)-anthracene	EPA 625 / EPA 610	10 / 0.02	0.15 / 0.0089	10 / 0.02	µg/L
3,3' Dichlorobenzidine	EPA 625	5	1.16	5	µg/L
Diethyl phthalate	EPA 625	2	0.21	2	µg/L
Dimethyl phthalate	EPA 625	2	0.19	2	µg/L
di-n-Butyl phthalate	EPA 625	10	0.16	10	µg/L
2,4 Dinitrotoluene	EPA 625	5	0.20	5	µg/L
2,6 Dinitrotoluene	EPA 625	5	0.22	5	µg/L
di-n-Octyl phthalate	EPA 625	10	0.16	10	µg/L
1,2 Diphenylhydrazine	EPA 625	1	0.13	1	µg/L
Fluoranthene	EPA 625	1	0.19	1	µg/L
Fluorene	EPA 625	10	0.18	10	µg/L
Hexachlorobenzene	EPA 625	1	0.18	1	µg/L

Name of Constituent	Approved Method	ML	MDL	RL	Units
Hexachlorobutadiene	EPA 625	1	0.14	1	µg/L
Hexachloro-cyclopentadiene	EPA 625	5	0.75	5	µg/L
Hexachloroethane	EPA 625	1	0.14	1	µg/L
Indeno(1,2,3,cd)-pyrene	EPA 625 / EPA 610	10 / 0.02	0.14 / 0.0084	10 / 0.02	µg/L
Isophorone	EPA 625	1	0.13	1	µg/L
Naphthalene	EPA 625	1	0.18	1	µg/L
Nitrobenzene	EPA 625	1	0.22	1	µg/L
N-Nitrosodimethyl amine	EPA 625 / EPA 1625M	5 / 0.002	0.14 / 0.0005	5 / 0.002	µg/L
N-Nitroso-di-n-propyl amine	EPA 625	5	0.12	5	µg/L
Phenanthrene	EPA 625	5	0.19	5	µg/L
Pyrene	EPA 625	10	0.19	10	µg/L
2,3,7,8-TCDD (Dioxin b)	EPA 1613B	*	*	*	pg/L
2 Chlorophenol	EPA 625	5	0.15	5	µg/L
1,2,4 Trichlorobenzene	EPA 625	5	0.17	5	µg/L
2,4 Dichlorophenol	EPA 625	5	0.15	5	µg/L
2,4 Dimethylphenol	EPA 625	2	0.11	2	µg/L
2,4 Dinitrophenol	EPA 625	5	1.73	5	µg/L
2-Methyl-4,6-Dinitrophenol	EPA 625	5	1.31	5	µg/L
2-Nitrophenol	EPA 625	10	0.20	10	µg/L
4-Nitrophenol	EPA 625	10	1.37	10	µg/L
3-Methyl-4-Chlorophenol	EPA 625	1	0.13	1	µg/L
Pentachlorophenol	EPA 625 / 625-SIM	5 / 1	0.38	5 / 1	µg/L
Phenol	EPA 625	1	0.14	1	µg/L
2,4,6 Trichlorophenol	EPA 625	10	0.12	10	µg/L
N-Nitrosodiphenyl amine	EPA 625	1	0.15	1	µg/L
Nitrite-N + Nitrate-N	By Calculation	*	*	0.04	mg/L

* Not applicable or sample specific.