

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2015-0130

WASTE DISCHARGE REQUIREMENTS

FOR
CITY OF WEST SACRAMENTO
GEORGE KRISTOFF WATER TREATMENT PLANT
YOLO COUNTY

The California Regional Water Quality Control Regional Board, Central Valley Region, (hereafter Central Valley Water Board) finds that:

1. The City of West Sacramento submitted a *Monitoring Well Installation, Baseline Groundwater Quality, and Groundwater Degradation Assessment Report* dated 3 November 2011 and *Additional Requirements for RWD Report* dated 13 January 2013, for the land discharge of wastewater generated at the George Kristoff Water Treatment Plant in the City of West Sacramento. Additional information was submitted during the months of July 2015 and August 2015.
2. The City of West Sacramento (hereafter "Discharger") owns and operates the facility that generates the waste and the land discharge areas and is responsible for compliance with these Waste Discharge Requirements (WDRs).
3. The facility is at 400 North Harbor Blvd in West Sacramento (Section 29 and 32, T9N, R4E, MDB&M). The facility occupies Assessor's Parcel Numbers (APN) 014-791-002 and 014-792-003, as shown on Attachment A, which is attached hereto and made part of this Order by reference.

Existing Facility and Discharge

4. The George Kristoff Water Treatment Plant (WTP), formerly the Bryte Bend Water Treatment Plant, has been in operation since 1988 and has not previously been regulated under WDRs. Raw water from the Sacramento River is treated at the WTP prior to distribution to the City of West Sacramento as a potable water supply. The WTP has a design capacity of 58 million gallons per day (mgd) and operates between 5 to 27 mgd.
5. The average raw water quality based on five samples collected between July 2006 and December 2009 is presented below for select constituents. The treated water data are based on the City's 2014 Consumer Confidence Report.

Constituents	Units	Concentration		
		Potential WQO	Raw Water	Treated Water
TDS	mg/L	450 ¹ - 1,000 ⁴	100	84
Nitrate as N	mg/L	10 ²	NA	NA ⁸
Chloride	mg/L	106 ¹ – 500 ⁴	6	7
Sodium	mg/L	69 ¹	10	14
Iron	µg/L	300 ³	370 ⁹	NA
Manganese	µg/L	50 ³	20 ⁹	NA
Arsenic	µg/L	10 ²	2.0 ⁹	1.2
Lead	µg/L	15 ²	< 1.0 ^{5,6,9}	NA
Nickel	µg/L	100 ²	< 2.0 ^{5,6,9}	NA
Bromoform	µg/L	none	< 1.0 ^{5,7}	NA
Bromodichloromethane	µg/L	none	< 1.0 ^{5,7}	NA
Chloroform	µg/L	none	< 1.0 ^{5,7}	NA
Dibromochloromethane	µg/L	none	< 1.0 ^{5,7}	NA
Total Trihalomethanes	µg/L	80	< 4.0 ^{5,7}	34 (average)

WQO denotes Water Quality Objective. NA denotes data not available or not provided.

- ¹ Lowest Agricultural Water Quality Goal.
- ² Primary Maximum Contaminant Level.
- ³ Secondary Maximum Contaminant Recommended Level.
- ⁴ Secondary Maximum Contaminant Upper Level.
- ⁵ Non-detect at or above the laboratory reporting limit.
- ⁶ Based on a sample obtained on 10 December 2009.
- ⁷ Based on a sample obtained on 28 September 2009.
- ⁸ Results for nitrate were non-detectable, laboratory reporting limit not provided.
- ⁹ Total concentration (unfiltered).

6. The WTP provides treatment by settling, coagulation, filtration, and chlorine disinfection. Treated water is stored in two clear wells prior to distribution to users. There are two Actiflo® pretreatment trains (water clarification process that combines microsand enhanced flocculation with tube settling), eight dual media gravity filters using granular activated carbon, and associated chemical feed systems to add treatment chemicals. A process flow diagram is shown on Attachment B, which is attached hereto and made part of this Order by reference.
7. Chemicals used in the water treatment process are summarized below. Location of injection points are shown on Attachment B.

Parameters	Primary Use	Application Points
Poly Aluminum	Primary coagulant	- Raw water
Polyaluminum Chloride (PACL)	Primary coagulant	- Raw water
Anionic Polymer	Coagulant	- Raw water (at the flocculation/ sedimentation process)
Chlorine Gas	Disinfection	- Raw water (pre-disinfection) - Filter effluent line (post disinfection)
Hydrofluosilicic Acid (HFS)	Fluoride	- Filter effluent line (post disinfection)
Sodium Hydroxide	Corrosion	- Treated water

8. Wastewater generated at the WTP is composed of wastewater and sludge from the Actiflo® settling basins, spent water from the filter backwash operations (filter backwash water), and any water that has gone through analyzers for process control (process wastewater). Approximately 100,000 gallons per day (gpd) of backwash water is generated. The wastewater is collected in two concrete basins (Recycled Water Basin 1 and 2), where a portion of the decant water (less than ten percent of influent raw water flow rate) is returned to the treatment process. The remaining wastewater in the basins is discharged to the sanitary sewer that is managed by the Sacramento Regional County Sanitation District and sometimes discharged to three existing unlined sludge drying ponds.
9. Characterization of the filter backwash and process wastewater is based on a 15 August 2012 sample. The filter backwash and process wastewater were analyzed for total metals. Characterization of the wastewater (referred to as the liquid waste sludge in the table below) discharged to the sewer and/or the sludge drying ponds is an average based on five samples taken between May 2008 and April 2010. Sludge samples historically have not been filtered prior to analysis; therefore may include metals present as suspended solids. The analytical results are presented below for select constituents.

Constituents	Units	Concentrations			
		Potential WQO	Filter Backwash	Process Wastewater	Liquid Waste Sludge
Total Dissolved Solids	mg/L	450 ¹ - 1,000 ⁴	80	90	NA
Nitrate as N	mg/L	10 ¹	< 0.1 ⁵	< 0.1 ⁵	NA
Chloride	mg/L	106 ¹ - 500 ⁴	5	9	NA
Sodium	mg/L	69 ¹	8	8	NA
Iron	mg/L	0.3 ³	NA	NA	NA
Manganese	mg/L	0.05 ³	NA	NA	NA
Total Arsenic	µg/L	10 ²	30	73	310
Total Lead	µg/L	15 ²	5	42	80
Total Nickel	µg/L	100 ²	17	189	440
Bromoform	µg/L	none	< 0.5 ⁵	< 0.5 ⁵	NA
Bromodichloromethane	µg/L	none	3	2	NA
Chloroform	µg/L	none	23	57	NA
Dibromochloromethane	µg/L	none	0.5	< 0.5 ⁵	NA
TTHM ⁶	µg/L	80 ³	30	60	NA
Total Coliform	MPN/100 mL	2.2	NA	NA	NA

WQO denotes Water Quality Objective. "NA" denotes data not available or not provided. TTHM denotes total trihalomethanes.

¹ Lowest Agricultural Water Quality Goal.

² Primary Maximum Contaminant Level.

³ Secondary Maximum Contaminant Recommended Level.

⁴ Secondary Maximum Contaminant Upper Level.

⁵ Non-detect at or above the laboratory reporting limit.

⁶ The sum of bromoform, bromodichloromethane, chloroform, and dibromochloromethane.

10. Approximately 50,000 gpd of wastewater is discharged to the municipal sewer system. Wastewater discharges to the sludge drying ponds vary from 60,000 to 120,000 gpd. Wastewater discharge volumes from 2010 through 2014 are summarized in the table below.

Month	Monthly Wastewater Flows, mgal									
	2010		2011		2012		2013		2014	
	Sewer	Ponds	Sewer	Ponds	Sewer	Ponds	Sewer	Ponds	Sewer	Ponds
January	1.30	0.16	0	1.43	1.50	0	0	1.70	1.37	0.32
February	0.90	0.11	0	1.45	1.41	0	0	1.41	1.26	0
March	1.38	0.04	0	2.92	1.46	0.44	0	1.37	1.11	0.46
April	1.29	0.19	0	2.08	1.22	0	0	2.06	1.80	0
May	1.38	0.45	0	2.00	1.38	0	0	1.75	1.62	0
June	0	1.62	0	2.48	1.42	0.48	0	1.51	1.29	0
July	0	1.55	0	2.29	1.32	0	0.42	1.45	1.35	0
August	0	2.70	0	1.88	1.37	0	1.48	0	1.31	0
September	0	1.50	0	2.12	1.36	0.47	1.20	0	1.21	0.17
October	0	1.50	0	2.49	1.60	0.58	2.35	0.04	1.64	0.05
November	0	1.90	1.44	0	0	1.91	1.66	0	1.42	0
December	0	1.45	1.24	1.90	0	1.82	1.42	0	0.35	1.89
Average, gpd:	46,000	64,000	48,000	101,000	49,000	107,000	49,000	58,000	47,000	122,000

11. The existing unlined sludge drying ponds (Sludge Pond 1, Sludge Pond 2, and Sludge Pond 3) are located northeast of the WTP, on city owned property south of North Harbor Boulevard and east of Interstate 80 as shown on Attachment C, which is attached hereto and made part of this Order by reference. The ponds were excavated and constructed using native onsite soils. Each pond has a surface area of approximately 11,000 square feet and approximately five feet deep. At two feet of freeboard, each pond has a storage capacity of approximately 33,000 cubic feet (cu ft) or approximately 247,000 gallons.
12. The sludge drying ponds are used for wastewater disposal on an as needed basis. The wastewater is allowed to dry, evaporate, and infiltrate over time. When in use, wastewater is discharged to one drying pond at a time and pond selection is determined by the WTP operator. Visual monitoring is used to prevent overfilling/overflow of the drying ponds.
13. Dried sludge accumulated in the ponds is excavated on an as needed basis. Approximately 3,900 cu ft of dried sludge was last removed in 2012. Dried sludge has historically been stockpiled at the WTP and taken to an adjacent city owned property for use as landscaping topsoil.
14. The Discharger has not characterized the dried sludge, determined the sludge mass that will be generated, or developed an operations plan for onsite dried sludge application or temporary onsite storage.

Site-Specific Conditions

15. Surficial soils near the sludge drying ponds consists of sandy silt extending to depths of approximately 5 to 10 feet below ground surface followed by 5 to 10 feet of silty sand.
16. The water treatment plant is currently within the 100-year Federal Emergency Management Agency (FEMA) floodplain designation but protected by levees, dikes, or other structures subject to possible failure or overtopping during larger floods.
17. Based on data from California Irrigation Management Information System (CIMIS) Station 155, the City has an average annual precipitation approximately 18 inches and the reference evapotranspiration rate is approximately 51 inches per year. The 100-year precipitation within the area is approximately 31 inches.
18. The land use in the WTP area is zoned water front, with adjacent property to the west zoned as commercial/water front. The sludge drying ponds lie just southwest of the Sacramento River, bounded on the north by North Harbor Boulevard, on the southwest by the WTP, on the south by railroad tracks, and on the east/southeast by undeveloped land.

Groundwater Conditions

19. According to the Web Soil Survey published by the United States Department of Agricultural Natural Resources Conservation Service, the site is located in an area predominately in the Sycamore silt loam soil series. The Sycamore silt loam series consists of silt loam and a moderately high to high saturated hydraulic conductivity (0.57 to 1.98 inch/hour).
20. Three groundwater monitoring wells (MW-1, MW-2, and MW-3) were installed on 24 August 2011 and sampled on 26 August 2011 to determine groundwater quality near the existing sludge drying ponds. Well locations are shown on Attachment C.
21. Based on one monitoring event in 2011, groundwater was encountered at approximately 17 to 19 feet below existing site grade and the downgradient direction is towards the southwest. Seasonal fluctuations may occur. Proximity to the Sacramento River may recharge groundwater quality or influence groundwater flow directions.
22. Analytical data from the 26 August 2011 groundwater monitoring event are presented below for select constituents.

		Potential	Groundwater Quality		
			Cross-Gradient	Up-Gradient	Down-Gradient
Constituent	Units	WQO	MW-1	MW-2	MW-3
TDS	mg/L	450 ¹ – 1,000 ⁴	200	180	180
Nitrate as N	mg/L	10 ²	0.8	<0.5 ⁵	<0.5 ⁵
Chloride	mg/L	106 ¹ – 500 ⁴	19	19	27
Sodium	mg/L	69 ¹	19	23	27
Sulfate	mg/L	250 ³ – 500 ⁴	14	10	11
Arsenic ⁶	µg/L	10 ²	<2 ⁵	3.6	2.3
Boron ⁶	µg/L	700 ¹	75	87	91
Iron ⁶	µg/L	300 ³	<100 ⁵	<100 ⁵	<100 ⁵
Lead ⁶	µg/L	15	<5.0 ⁵	<5.0 ⁵	<5.0 ⁵
Manganese	µg/L	50 ³	NA	NA	NA
TTHM	µg/L	80 ³	26	25	13
Total Coliform	MPN/100 mL	2.2	540	1,600	1,600

WQO denotes Water Quality Objective. TDS denotes total dissolved solids. TTHM denotes total trihalomethanes. NA denotes value not available or not provided.

- ¹ Lowest Agricultural Water Quality Goal.
- ² Primary Maximum Contaminant Level.
- ³ Secondary Maximum Contaminant Recommended Level.
- ⁴ Secondary Maximum Contaminant Upper Level.
- ⁵ Non-detect at or above laboratory reporting limits.
- ⁶ Dissolved concentrations (filtered).

23. In general, groundwater quality underlying the sludge drying ponds is of good quality with respect to salinity constituents (TDS, sodium, and chloride) and nitrate as nitrogen concentrations. The overall groundwater quality near the three monitoring wells appears fairly similar. Total trihalomethane (TTHM) concentrations were detected in the underlying groundwater but do not exceed water quality objectives. Analytical data shows total coliform concentrations greater than 2.2 MPN/100 mL, which is the Basin Plan’s numeric water quality objective, in all monitoring wells. Based on a single monitoring event, it is not known whether the groundwater coliform detections are due to cross-contamination of the monitoring wells during construction and/or subsequent sampling. Coliform organisms may be present in the wastewater due to their presence in the source water and dependent on when disinfection is performed prior to discharge. However, there is no apparent reason for total coliform organisms in the groundwater to be at concentrations higher than the raw water supply.

Basin Plan, Beneficial Uses, and Regulatory Considerations

24. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins*, Fourth Edition (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Water Board. Pursuant to Water Code section 13263(a), waste discharge requirements must implement the Basin Plan.

25. Local drainage is to Sacramento River. The facility is within the Sacramento Delta Hydrologic Unit No. 510.00, as depicted on the interagency hydrologic maps prepared by the Department of Water Resources in August 1986. The beneficial uses of Sacramento River, as stated in the Basin Plan, are municipal and domestic supply; agricultural supply; industrial process supply; hydropower generation; water contact recreation; non-contact water recreation; warm freshwater habitat; cold freshwater habitat; wildlife habitat; and spawning, reproduction, and/or early development.
26. The beneficial uses of underlying groundwater as set forth in the Basin Plan are municipal and domestic supply, agricultural supply, industrial service supply and industrial process supply.
27. The Basin Plan establishes narrative water quality objectives for chemical constituents, tastes and odors, and toxicity in groundwater. It also sets forth a numeric objective for total coliform organisms.
28. The Basin Plan's numeric water quality objective for bacteria requires that the most probable number (MPN) of coliform organisms over any seven-day period shall be less than 2.2 per 100 mL in MUN groundwater.
29. The Basin Plan's narrative water quality objectives for chemical constituents, at a minimum, require waters designated as domestic or municipal supply to meet the (Maximum Contaminant Levels (MCLs) specified in Title 22 of the California Code of Regulations (hereafter Title 22). The Basin Plan recognizes that the Central Valley Water Board may apply limits more stringent than MCLs to ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses.
30. The narrative toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, animal, plant, or aquatic life associated with designated beneficial uses.
31. Quantifying a narrative water quality objective requires a site-specific evaluation of those constituents that have the potential to impact water quality and beneficial uses. The Basin Plan states that when compliance with a narrative objective is required to protect specific beneficial uses, the Central Valley Water Board will, on a case-by-case basis, adopt numerical limitations in order to implement the narrative objective.
32. In the absence of specific numerical water quality limits, the Basin Plan methodology is to consider any relevant published criteria. General salt tolerance guidelines, such as *Water Quality for Agriculture* by Ayers and Westcot and similar references indicate that yield reductions in nearly all crops are not evident when irrigation water has an EC less than 700 $\mu\text{mhos/cm}$. There is, however, an eight- to ten-fold range in salt tolerance for agricultural crops and the appropriate salinity values to protect

agriculture in the Central Valley are considered on a case-by-case basis. It is possible to achieve full yield potential with waters having EC up to 3,000 $\mu\text{mhos/cm}$ if the proper leaching fraction is provided to maintain soil salinity within the tolerance of the crop.

Antidegradation Analysis

33. State Water Resources Control Board Resolution 68-16 ("Policy with Respect to Maintaining High Quality Waters of the State") (hereafter Resolution 68-16) prohibits degradation of groundwater unless it has been shown that:
 - a. The degradation is consistent with the maximum benefit to the people of the state.
 - b. The degradation will not unreasonably affect present and anticipated future beneficial uses.
 - c. The degradation does not result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives, and
 - d. The discharger employs best practicable treatment or control (BPTC) to minimize degradation.
34. Degradation of groundwater by some of the typical waste constituents associated with discharges from water treatment processes, after effective source control, treatment, and control measures are implemented, is consistent with the maximum benefit to the people of the state. Water treatment operations present advantages over reliance on numerous domestic water wells, including energy savings, higher quality water, and greater reliability. The economic prosperity of valley communities and associated industry is of maximum benefit to the people of the State, and provides sufficient justification for allowing the limited groundwater degradation that may occur pursuant to this Order.
35. The Discharger has monitored groundwater quality at the site only once. Three monitoring wells were installed and a single monitoring event was performed on 26 August 2011 to determine groundwater conditions. Based on the data available, it is not possible to determine pre-1968 groundwater quality. Therefore, determination of compliance with Resolution 68-16 for this facility must be based on available groundwater data.
36. Constituents of concern that have the potential to degrade groundwater include arsenic, lead, nickel, and TTHM as discussed below.

Constituent	Concentrations. µg/L unless specified					
	Potential WQO	Raw Water ³	Average Current Groundwater ⁴	Filter Backwash Water	Process Wastewater	Liquid Waste Sludge
Arsenic	10 ¹	2.0 ⁷	3.0 ⁸	30 ⁷	73 ⁷	313 ⁷
Lead	15 ¹	< 1.0 ^{2,7}	< 5.0 ^{2,8}	5 ⁷	42 ⁷	80 ⁷
Nickel	100 ¹	< 2.0 ^{2,7}	< 20 ^{2,8}	2 ⁷	189 ⁷	440 ⁷
Bromoform	none	< 1.0 ²	NA	< 0.5 ²	< 0.5 ²	NA
Bromodichloromethane	none	< 1.0 ²	NA	3	2	NA
Chloroform	none	< 1.0 ²	NA	23	57	NA
Dibromochloromethane	none	< 1.0 ²	NA	0.5	< 0.5 ²	NA
TTHM	80 ¹	< 4.0 ²	21	27	59	NA

WQO denotes Water Quality Objective. TTHM denotes total trihalomethanes. NA denotes value not available or not provided.

¹ Primary Maximum Contaminant Level.

² Non-detect at or above the laboratory reporting limit.

³ Average of five sampling events from July 2006 to December 2009.

⁴ Average of the three monitoring wells from the 26 August 2011 monitoring event.

⁵ Based on 15 August 2012 sample.

⁶ Average of five sampling events from May 2008 – April 2010.

⁷ Total concentrations (unfiltered).

⁸ Dissolved concentrations (filtered).

- a. **Arsenic.** Historically, the liquid waste sludge was not filtered prior to analysis, and therefore the analytical data represent total metals. Data show total arsenic concentrations in the liquid waste sludge exceed the water quality objective. Similarly, the filter backwash water and process wastewater were not filtered prior to analysis and the total arsenic concentration in both waste streams exceed the water quality objective. The raw water data represent total arsenic concentrations that do not exceed the water quality objective. The groundwater samples were filtered prior to analysis and arsenic concentrations were below the water quality objective.

In consideration of the high quality source water, the limited discharges to the sludge drying ponds, and operation of the sludge ponds to periodically remove the dried solids, the discharge has minimal potential to cause an exceedance of the water quality objective. However, groundwater monitoring data are needed to verify that unreasonable groundwater degradation is not occurring. This Order requires monitoring the quality of the wastewater discharged to the sludge ponds and sets groundwater limits not to exceed water quality objectives. This Order also sets groundwater trigger concentrations to assess whether the discharge might potentially cause a violation of one or more of the groundwater limitations of the WDR at some later date. Samples for dissolved metal analysis shall be filtered prior to analysis to determine compliance with the groundwater limitations of the WDRs.

- b. **Lead and Nickel.** Similar to arsenic, total lead and total nickel concentrations in the liquid waste sludge and process wastewater exceeded the water quality objective. Total nickel and total lead concentrations in the raw water were non-detectable or below the reporting laboratory detection limit for each constituent. Therefore, concentrations do not exceed the water quality objective. Dissolved nickel and dissolved lead concentrations in the groundwater were non-detectable and do not exceed water quality objectives.

In consideration of the high quality source water, the limited discharges to the sludge drying ponds, and operation of the sludge ponds to periodically remove the dried, the discharge has minimal potential to cause exceedance of the water quality objective. However, groundwater monitoring data are needed to verify that unreasonable groundwater degradation is not occurring. This Order requires monitoring the quality of the wastewater discharged to the sludge ponds and sets groundwater limits not to exceed water quality objectives. This Order also sets groundwater trigger concentrations to assess whether the discharge might potentially cause a violation of one or more of the groundwater limitations of the WDR at some later date.

- c. **TTHM.** TTHM is a chlorine disinfection byproduct and is formed when disinfectants react with naturally-occurring materials in the water. TTHM is the sum of chloroform, bromoform, bromodichloromethane, and dibromochloromethane and has a water quality objective of 80 mg/L. The raw water was analyzed for chloroform, bromoform, bromodichloromethane, and dibromochloromethane and found to be non-detectable for each constituent. TTHM is present in the wastewater because of the use of chlorine for disinfection of the drinking water. Although the liquid waste sludge that is periodically discharged to the sludge drying ponds is not analyzed for TTHM, TTHM concentrations were detected in the filter backwash water and process wastewater but do not exceed the water quality objective. Groundwater data from a single monitoring event show that TTHM concentrations do not exceed the water quality objective.

In consideration of the high quality source water, nature of the treatment process, concentration of the waste, the limited discharges to the sludge drying ponds, and operation of the sludge ponds to periodically remove the dried sludge, the discharge has minimal potential to cause exceedance of the water quality objective. However, groundwater monitoring data are needed to verify that unreasonable groundwater degradation is not occurring. This Order requires monitoring the quality of the wastewater discharged to the sludge ponds and sets groundwater limits not to exceed water quality objectives. This Order also sets groundwater trigger concentrations to assess whether the discharge might potentially cause a violation of one or more of the groundwater limitations of the WDR at some later date.

37. This Order establishes groundwater limitations for the facility that will not unreasonably threaten present and anticipated beneficial uses or result in groundwater quality that exceeds water quality objectives set forth in the Basin Plan as follows:
- a. For arsenic, lead, nickel, and TTHM, the nature of the waste, site-specific conditions, and available groundwater monitoring data indicate that the discharge may cause degradation, but will not cause exceedance of a water quality objective. The Discharger has implemented BPTC, so the degradation is allowable under Resolution 68-16.
38. The Discharger provides treatment and control of the discharge that incorporates:
- a. High quality source water;
 - b. Engineered clay-lined solids drying ponds.
 - c. Limited use of the solids drying ponds.
 - d. Periodic removal of the dried solids from the sludge drying ponds.

These practices are best practicable control for this type of waste. Therefore, the groundwater limitations of this Order allow degradation of groundwater quality, but not pollution.

Other Regulatory Considerations

39. In compliance with Water Code section 106.3, it is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. This order promotes that policy by requiring discharges to meet maximum contaminant levels designed to protect human health and ensure that water is safe for domestic use.
40. Based on the threat and complexity of the discharge, the facility is determined to be classified as 3C as defined below:
- a. Category 3 threat to water quality: "Those discharges of waste that could degrade water quality without violating water quality objectives, or could cause a minor impairment of designated beneficial uses as compared with Category 1 and Category 2."
 - b. Category C complexity, defined as: "Any discharger for which waste discharge requirements have been prescribed pursuant to Section 13263 of the Water Code not included in Category A or Category B as described above. Included are dischargers having no waste treatment systems or that must comply with best management practices, dischargers having passive treatment and disposal systems, or dischargers having waste storage systems with land disposal."

41. Title 27 of the California Code of Regulations (hereafter Title 27) contains regulatory requirements for the treatment, storage, processing, and disposal of solid waste. However, Title 27 exempts certain activities from its provisions. Discharges regulated by this Order are exempt from Title 27 pursuant to provisions that exempt domestic sewage, wastewater, and reuse. Title 27, section 20090 states in part:

The following activities shall be exempt from the SWRCB-promulgated provisions of this subdivision, so long as the activity meets, and continues to meet, all preconditions listed:

...(b) Wastewater - Discharges of wastewater to land, including but not limited to evaporation ponds, percolation ponds, or subsurface leachfields if the following conditions are met:

- (1) the applicable RWQCB has issued WDRs, reclamation requirements, or waived such issuance;
- (2) the discharge is in compliance with the applicable water quality control plan; and
- (3) the wastewater does not need to be managed according to Chapter 11, Division 4.5, Title 22 of this code as a hazardous waste...

42. The discharge authorized herein, and the treatment and storage facilities associated with the discharge, are exempt from the requirements of Title 27 as follows:

- a. Discharges to Sludge Ponds 1, 2, and 3 are exempt pursuant to Title 27, section 20090(b) because they are discharge of wastewater to land and:
 - i. The Central Valley Water Board is issuing WDRs.
 - ii. The discharge is in compliance with the Basin Plan, and;
 - iii. The treated effluent discharged to the ponds does not need to be managed as hazardous waste.

43. The U.S. EPA published *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance* (hereafter "Unified Guidance") in 2009. As stated in the Unified Guidance, the document:

...is tailored to the context of the RCRA groundwater monitoring regulations ... [however, t]here are enough commonalities with other regulatory groundwater monitoring programs ... to allow for more general use of the tests and methods in the Unified Guidance... Groundwater detection monitoring involves either a comparison between different monitoring stations ... or a contrast between past and present data within a given station... The Unified Guidance also details methods to compare background data against measurements from regulatory compliance points ... [as well as] techniques for comparing datasets against fixed

numerical standards ... [such as those] encountered in many regulatory programs.

The statistical data analysis methods in the Unified Guidance are appropriate for determining whether the discharge complies with Groundwater Limitations of this Order.

44. The State Water Board adopted Order 2014-0057-DWQ (NPDES General Permit CAS000001) specifying waste discharge requirements for discharges of storm water associated with industrial activities, and requiring submittal of a Notice of Intent by all affected industrial dischargers. Based on their Standard Industrial Classification (SIC) code 4941, the Discharger is exempt from coverage under NPDES General Permit CAS000001. All storm water at the WTP is collected in the City's storm drain system. The City has submitted a Notice of Intent for regulatory coverage under the NPDES General Permit to Discharge Storm Water Associated with Small MS4s, WQ Order No. 2013-0001-DWQ.

45. Water Code section 13267(b)(1) states:

In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region ... shall furnish, under penalty of perjury, technical or monitoring program reports which the board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.

The technical reports required by this Order and the attached Monitoring and Reporting Program R5-2015-0130 are necessary to ensure compliance with these waste discharge requirements. The Discharger owns and operates the facility that discharges the waste subject to this Order.

46. The California Department of Water Resources sets standards for the construction and destruction of groundwater wells (hereafter DWR Well Standards), as described in *California Well Standards Bulletin 74-90* (June 1991) and *Water Well Standards: State of California Bulletin 94-81* (December 1981). These standards, and any more stringent standards adopted by the state or county pursuant to Water Code section 13801, apply to all monitoring wells used to monitor the impacts of wastewater storage or disposal governed by this Order.

47. Construction of the facility was initially reviewed under an Environmental Impact Report (EIR) developed by the East Yolo Community Services District. The project analyzed in the EIR was the "East Yolo Water Intake-Treatment-Storage Project", which included the water intake site, the water treatment plant site, and the site of

two storage reservoirs. The Final EIR was certified by the City Council of the City of West Sacramento on 7 January 1987.

48. The action to adopt waste discharge requirements for the existing facility is exempt from the provisions of the California Environmental Quality (CEQA), in accordance with the California Code of Regulations, title 14, section 15301.
49. Pursuant to Water Code section 13263(g), discharge is a privilege, not a right, and adoption of this Order does not create a vested right to continue the discharge.

Public Notice

50. All the above and the supplemental information and details in the attached Information Sheet, which is incorporated by reference herein, were considered in establishing the following conditions of discharge.
51. The Discharger and interested agencies and persons have been notified of the Central Valley Water Board's intent to prescribe waste discharge requirements for this discharge, and they have been provided an opportunity to submit written comments and an opportunity for a public hearing.
52. All comments pertaining to the discharge were heard and considered in a public hearing.

IT IS HEREBY ORDERED that pursuant to Water Code sections 13263 and 13267, the City of West Sacramento, its agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the Water Code and regulations adopted hereunder, shall comply with the following:

A. Discharge Prohibitions

1. Discharge of wastes to surface waters or surface water drainage courses is prohibited.
2. Discharge of waste classified as 'hazardous', as defined in the California Code of Regulations, title 23, section 2510 et seq., is prohibited.
3. Discharge of waste classified as 'designated', as defined in Water Code section 13173, in a manner that causes violation of groundwater limitations, is prohibited.
4. Treatment system bypass of untreated or partially treated waste is prohibited, except as allowed by Standard Provision E.2 of the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements*.

5. Discharge of waste at a location or in a manner different from that described in the Findings is prohibited.
6. Discharge of toxic substances into any wastewater treatment system or land application area such that biological treatment mechanisms are disrupted is prohibited.
7. Temporary storage of dried water treatment sludge on WTP property is prohibited until and unless the Discharger has submitted the report required pursuant to Provision E.1.C.
8. Application of dried water treatment sludge on WTP property is prohibited until and unless the Discharger has submitted the report required pursuant to Provision E.2. or alternatively, applies for coverage under the Statewide General Waste Discharge Requirements for Discharges to Land with a Low Threat to Water Quality, Water Quality Order 2003-0003-DWQ or other applicable Order.

B. Discharge Specifications

1. No waste constituent shall be released, discharged, or placed where it will cause a violation of the Groundwater Limitations of this Order.
2. Wastewater treatment, storage, and disposal shall not cause pollution or a nuisance as defined by Water Code section 13050.
3. The discharge shall remain within the permitted waste treatment/containment structures at all times.
4. The Discharger shall operate all systems and equipment to optimize the quality of the discharge.
5. All conveyance, treatment, storage, and disposal systems shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.
6. The Discharger shall operate and maintain all ponds sufficiently to protect the integrity of containment dams and berms and prevent overtopping and/or structural failure. Unless a California-registered civil engineer certifies (based on design, construction, and conditions of operation and maintenance) that less freeboard is adequate, the operating freeboard in any pond shall never be less than two feet (measured vertically from the lowest possible point of overflow). As a means of management and to discern compliance with this requirement, the Discharger shall install and maintain in each pond a permanent staff gauge with calibration marks that clearly show the water level at design capacity and enable determination of available operational freeboard.

7. Wastewater treatment, storage, and disposal ponds or structures shall have sufficient capacity to accommodate allowable wastewater flow, design seasonal precipitation, and ancillary inflow and infiltration during the winter while ensuring continuous compliance with all requirements of this Order. Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns.
8. On or about **1 October** of each year, available capacity shall at least equal the volume necessary to comply with Discharge Specifications B.6 and B.7.
9. All ponds and open containment structures shall be managed to prevent breeding of mosquitoes. Specifically:
 - a. An erosion control program shall be implemented to ensure that small coves and irregularities are not created around the perimeter of the water surface.
 - b. Weeds shall be minimized through control of water depth, harvesting, or herbicides.
 - c. Dead algae, vegetation, and debris shall not accumulate on the water surface.
 - d. The Discharger shall consult and coordinate with the local Mosquito Abatement District to minimize the potential for mosquito breeding as needed to supplement the above measures.
10. Newly constructed or rehabilitated berms or levees (excluding internal berms that separate ponds or control the flow of water within a pond) shall be designed and constructed under the supervision of a California Registered Civil Engineer.
11. Wastewater contained in any unlined pond shall not have a pH less than 6.0 or greater than 9.0.
12. The Discharger shall monitor sludge accumulation in the wastewater treatment/storage ponds at least every **five years** beginning in **2016** and shall periodically remove sludge as necessary to maintain adequate storage capacity. Specifically, if the estimated volume of sludge in the ponds exceeds **five percent** of the permitted pond capacity, the Discharger shall complete sludge cleanout within **12 months** after the date of the estimate.

C. Groundwater Limitations

Release of waste constituents from any portion of the facility shall not cause groundwater to:

1. Contain constituents in concentrations that exceed either the Primary or Secondary MCLs established in Title 22 of the California Code of Regulations.
2. Contain taste or odor-producing constituents, toxic substances, or any other constituents in concentrations that cause nuisance or adversely affect beneficial uses.

Compliance with these limitations shall be determined annually based on intra-well analysis of data from the monitoring wells as specified in the Monitoring and Reporting Program using approved statistical methods.

D. Solids Disposal Specifications

Sludge, as used in this document, means the solid, semisolid, and liquid organic matter removed from wastewater and water treatment, settling, and storage vessels or ponds. Solid waste refers to solid inorganic matter removed by screens and soil sediments from washing of unprocessed fruit or vegetables. Except for waste solids originating from meat processing, residual solids means organic food processing byproducts such as culls, pulp, stems, leaves, and seeds that will not be subject to treatment prior to disposal or land application.

1. Sludge and solid waste shall be removed from screens, sumps, ponds, and clarifiers as needed to ensure optimal operation and adequate storage capacity.
2. Any handling and storage of sludge, solid waste, and residual solids on WTP property shall be temporary (i.e. no longer than 2 years) and shall be controlled and contained in a manner that minimizes leachate formation and precludes infiltration of waste constituents into soils in a mass or concentration that will violate the groundwater limitations of this Order.
3. Residual sludge, solid waste, and residual solids shall be disposed of in a manner approved by the Executive Officer and consistent with Title 27, division 2. Removal for reuse as animal feed or land disposal at facilities (i.e., landfills, composting facilities, soil amendment sites) operated in accordance with valid waste discharge requirements issued by a Regional Water Board will satisfy this specification.
4. Any proposed change in solids use or disposal practice shall be reported in writing to the Executive Officer at least 90 days in advance of the change.

E. Provisions

1. The following reports shall be submitted pursuant to Water Code section 13267 and shall be prepared as described in Provision E.5:
 - a. By **1 March 2016**, the Discharger shall submit a *Groundwater Limitations Compliance Assessment Plan*. The plan shall propose and justify the

statistical methods used to evaluate compliance with the Groundwater Limitation of this Order for the compliance wells and constituents specified in the MRP. Compliance shall be determined based on an intra-well statistical analysis using appropriate statistical methods that have been selected based on site-specific information and the U.S. EPA Unified Guidance document cited in Finding 43 of this Order. The report shall explain and justify the selection of the appropriate statistical methods.

- b. By **1 April 2016**, the Discharger shall submit a *Groundwater Monitoring Well Disinfection Workplan and Sampling and Analysis Plan*. The disinfection workplan shall provide detailed procedures for well disinfection and include a schedule to complete the work by **1 June 2016**. The Sampling and Analysis Plan (SAP) shall be utilized as a guidance document that is referred to by individuals responsible for conducting groundwater monitoring and sampling activities. The SAP shall provide groundwater sampling techniques designed to minimize cross-contamination of the monitoring wells and water samples and shall include a written description of standard operation procedures for the following:
 - i. Equipment to be used during sampling;
 - ii. Equipment decontamination procedures;
 - iii. Water level measurement procedures;
 - iv. Well purging;
 - v. Purge water disposal;
 - vi. Analytical methods and required reporting limits;
 - vii. Sample containers and preservatives;
 - viii. Sampling techniques, including general sampling techniques, record keeping during sampling, and QA/QC samples;
 - ix. Chain of Custody; and
 - x. Sample handling and transport.
- c. By **1 July 2016**, The Discharger shall submit a *Sludge Management Plan*. The plan shall include a detailed plan for sludge removal from any wastewater treatment/storage basin or pond (i.e. setting basin, recycled basin, or sludge drying pond); sludge drying operations; temporary on-site storage, and off-site disposal practices. The plan shall specifically describe measures to be used to minimize leachate formation and to control runoff or percolate from the

sludge as it is drying or stockpiled and a schedule that shows how and when all dried sludge will be removed from the site.

- d. By **1 August 2016**, the Discharger shall submit a report documenting completion of monitoring well disinfection in accordance with the approved Disinfection Workplan and implementation of the approved Sampling and Analysis Plan.
2. If the Discharger wishes to land apply dried water treatment sludge onsite, the Discharger shall submit a new Report of Waste Discharge (RWD) for revised Waste Discharge Requirements or apply for coverage under a Statewide General Order for low threat discharges, if applicable. The RWD shall include information on dried sludge reuse and contain the following information:
 - a. Evaluation and determination that the dried sludge is not hazardous, include the results of the California Code of Regulations, title 22, section 66261 hazardous waste evaluation;
 - b. Additional chemical characterization for classifying designated (as defined in Water Code section 13173) and inert waste and determining adequate site-specific reuse;
 - c. Description of the proposed reuse, specific mass, BOD and nitrogen loading rates, temporary storage, management and application practices, application area(s) including a map to show location, and operational procedures that will be used to ensure that the land application of dried sludge does not cause nutrient overloading, nuisance odors, or promote vector breeding;
 - d. If proposed use is for berm, cover and/or fill material, include a physical and geotechnical evaluation performed by a registered Geotechnical Engineer characterizing the appropriate residual/soil blend that will be suitable for berm construction and fill and cover material; and
 - e. Provide documentation that the land application of dried water treatment sludge is in accordance with CEQA.
 3. If groundwater monitoring results show that the discharge of waste is causing groundwater to contain any waste constituents in concentrations statistically greater than the Groundwater Limitations of this Order, **within 120 days** of the request of the Executive Officer, the Discharger shall submit a BPTC Evaluation Workplan that sets forth the scope and schedule for a systematic and comprehensive technical evaluation of each component of the facility's waste treatment and disposal system to determine best practicable treatment and control for each waste constituent that exceeds a Groundwater Limitation. The workplan shall contain a preliminary evaluation of each component of the wastewater treatment, storage and disposal system and propose a time schedule for

completing the comprehensive technical evaluation. The schedule to complete the evaluation shall be as short as practicable, and shall not exceed one year.

4. A discharger whose waste flow has been increasing, or is projected to increase, shall estimate when flows will reach hydraulic and treatment capacities of its treatment, collection, and disposal facilities. The projections shall be made in January, based on the last three years' average dry weather flows, peak wet weather flows and total annual flows, as appropriate. When any projection shows that capacity of any part of the facilities may be exceeded in four years, the discharger shall notify the Central Valley Water Board by **31 January**.
5. In accordance with California Business and Professions Code sections 6735, 7835, and 7835.1, engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. All technical reports specified herein that contain workplans for investigations and studies, that describe the conduct of investigations and studies, or that contain technical conclusions and recommendations concerning engineering and geology shall be prepared by or under the direction of appropriately qualified professional(s), even if not explicitly stated. Each technical report submitted by the Discharger shall bear the professional's signature and stamp.
6. The Discharger shall submit the technical reports and work plans required by this Order for consideration by the Executive Officer, and incorporate comments the Executive Officer may have in a timely manner, as appropriate. Unless expressly stated otherwise in this Order, the Discharger shall proceed with all work required by the foregoing provisions by the due dates specified.
7. The Discharger shall comply with Monitoring and Reporting Program R5-2015-0130, which is part of this Order, and any revisions thereto as ordered by the Executive Officer. The submittal dates of Discharger self-monitoring reports shall be no later than the submittal date specified in the MRP.
8. The Discharger shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements", dated 1 March 1991, which are attached hereto and made part of this Order by reference. This attachment and its individual paragraphs are commonly referenced as "Standard Provision(s)."
9. The Discharger shall comply with all conditions of this Order, including timely submittal of technical and monitoring reports. On or before each report due date, the Discharger shall submit the specified document to the Central Valley Water Board or, if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is being reported, then the Discharger shall state the reasons for such noncompliance and provide an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Central Valley Water Board in writing when it returns to compliance

with the time schedule. Violations may result in enforcement action, including Central Valley Water Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.

10. The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by the Discharger when the operation is necessary to achieve compliance with the conditions of this Order.
11. The Discharger shall use the best practicable cost-effective control technique(s) including proper operation and maintenance, to comply with this Order.
12. As described in the Standard Provisions, the Discharger shall report promptly to the Central Valley Water Board any material change or proposed change in the character, location, or volume of the discharge.
13. The Discharger shall report to the Central Valley Water Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act of 1986."
14. In the event of any change in control or ownership of the facility, the Discharger must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Central Valley Water Board.
15. To assume operation as Discharger under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Central Valley Water Board, and a statement. The statement shall comply with the signatory paragraph of Standard Provision B.3 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the CWC. If approved by the Executive Officer, the transfer request will be submitted to the Central Valley Water Board for its consideration of transferring the ownership of this Order at one of its regularly scheduled meetings.
16. A copy of this Order including the MRP, Information Sheet, Attachments, and Standard Provisions, shall be kept at the discharge facility for reference by operating personnel. Key operating personnel shall be familiar with its contents.

17. The Central Valley Water Board will review this Order periodically and will revise requirements when necessary.

If, in the opinion of the Executive Officer, the Discharger fails to comply with the provisions of this Order, the Executive Officer may refer this matter to the Attorney General for judicial enforcement, may issue a complaint for administrative civil liability, or may take other enforcement actions. Failure to comply with this Order may result in the assessment of Administrative Civil Liability of up to \$10,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268, 13350 and 13385. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

http://www.waterboards.ca.gov/public_notices/petitions/water_quality

or will be provided upon request.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify that the foregoing is a full true, and correct copy of an Order adopted by the California Regional Water Quality Control Board on 11 December 2015.

- Original signed by -

PAMELA C. CREEDON, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM R5-2015-0130

FOR
CITY OF WEST SACRAMENTO
GEORGE KRISTOFF WATER TREATMENT PLANT
YOLO COUNTY

This Monitoring and Reporting Program (MRP) is issued pursuant to Water Code section 13267. The Discharger shall not implement any changes to this MRP unless and until the Central Valley Water Board adopts, or the Executive Officer issues, a revised MRP.

All samples shall be representative of the volume and nature of the discharge or matrix of material sampled. Except as specified otherwise in this MRP, grab samples will be considered representative of water, wastewater, soil, solids/sludges, and groundwater.

The time, date, and location of each sample shall be recorded on the sample chain of custody form. All analyses shall be performed in accordance with the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements*, dated 1 March 1991 (Standard Provisions). Field test instruments (such as those used to measure pH electrical conductivity, dissolved oxygen, wind speed, and precipitation) may be used provided that:

1. The operator is trained in proper use and maintenance of the instruments;
2. The instruments are field calibrated at the frequency recommended by the manufacturer;
3. The instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and
4. Field calibration reports are submitted as described in the "Reporting" section of the MRP.

Laboratory analytical procedures shall comply with the methods and holding times specified in the following (as applicable to the medium to be analyzed):

- *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater* (EPA);
- *Test Methods for Evaluating Solid Waste* (EPA);
- *Methods for Chemical Analysis of Water and Wastes* (EPA);
- *Methods for Determination of Inorganic Substances in Environmental Samples* (EPA);
- *Standard Methods for the Examination of Water and Wastewater* (APHA/AWWA/WEF); and
- *Soil, Plant and Water Reference Methods for the Western Region* (WREP 125).

Approved editions shall be those that are approved for use by the United States Environmental Protection Agency or the California Department of Public Health's Environmental Laboratory Accreditation Program (ELAP). The Discharger may propose alternative methods for approval by the Executive Officer. Where technically feasible, laboratory reporting limits shall be lower than the applicable water quality objectives for the constituents to be analyzed.

If monitoring consistently shows no significant variation in a constituent concentration or parameter after at least 8 consecutive monitoring events, the Discharger may request this MRP be revised to reduce monitoring frequency. The proposal must include adequate technical justification for reduction in monitoring frequency. The Discharger shall not implement any changes to this MRP unless and until the Central Valley Water Board adopts, or the Executive Officer issues, a revised MRP.

A glossary of terms used in this MRP is included on the last page.

WASTEWATER FLOW MONITORING

The Discharger shall monitor wastewater flow as follows.

Flow Source	Units	Sample Type	Monitoring Frequency	Reporting Frequency
Wastewater discharged to the sanitary sewers	gpd	Meter	Daily	Quarterly
Wastewater discharged to the sludge drying ponds	gpd	Meter	Daily ¹	Quarterly

¹ Report as total daily flow to each sludge drying pond.

WASTEWATER MONITORING

Wastewater samples shall be collected upstream of the point of discharge to the sludge drying ponds as shown on Attachment B. At a minimum, effluent shall be monitored as specified below:

Constituent/Parameter	Units	Sample Type	Monitoring Frequency	Reporting Frequency
Total Nitrogen	mg/L	Grab	Quarterly	Quarterly
Total Dissolved Solids	mg/L	Grab	Quarterly	Quarterly
Dissolved Arsenic ¹	µg/L	Grab	Quarterly	Quarterly
Dissolved Lead ¹	µg/L	Grab	Quarterly	Quarterly
Dissolved Nickel ¹	µg/L	Grab	Quarterly	Quarterly
Total Trihalomethanes	µg/L	Grab	Quarterly	Quarterly

¹ Samples for dissolved metals shall be filtered prior to preservation and digestion using a 0.45-micron filter.

SLUDGE DRYING POND MONITORING

The sludge drying ponds shall be monitored as specified below. Dissolved oxygen monitoring applies to any drying pond containing more than two feet of standing water.

Constituent/Parameter	Units	Sample Type	Monitoring Frequency	Reporting Frequency
Dissolved Oxygen ¹	mg/L	Grab	Weekly	Quarterly
Freeboard ²	0.1 feet	Measurement	Weekly	Quarterly
pH ¹	Standard	Grab	Weekly	Quarterly
Odors	--	Observation	Weekly	Quarterly
Berm Condition	--	Observation	Weekly	Quarterly

¹ Samples shall be collected opposite the drying bed inlet at a depth of one foot.

² Freeboard shall be measured vertically from the surface of the bed water to the lowest elevation of the surrounding berm and shall be measured to the nearest 0.1 feet.

In addition, when wastewater is being discharged to the sludge drying ponds or when there is wastewater in the sludge drying ponds, the Discharger shall inspect the condition of the drying ponds once per week and document visual observations. Notations shall include observations of:

- a. Presence of weeds in the water or along the berm;
- b. Accumulations of dead algae, vegetation, scum, or debris on the drying pond surface;
- c. Animal burrows in the berms;
- d. Evidence of seepage from the berms or downslope of the drying ponds;
- e. Evidence of tears, abrasions, cracks, and holes in geosynthetic liners.

GROUNDWATER MONITORING

The Discharger shall maintain the groundwater monitoring well network. If a groundwater monitoring well is dry for more than four consecutive sampling events or is damaged, the Discharger shall submit a work plan and proposed time schedule to replace the well. The well shall be replaced following approval of the work plan.

Applicability of Groundwater Limitations

Prior to construction and/or sampling of any groundwater monitoring wells, the Discharger shall submit plans and specifications for approval. Once installed, all new wells shall be added to the groundwater monitoring network. The following table lists all existing monitoring wells and designates the purpose of each well:

MW-1 ² MW-2 ¹ MW-3 ²

¹ Background well not used for compliance monitoring.

² Compliance well.

The Groundwater Limitations set forth in Section C of the WDRs shall apply to the specific compliance monitoring wells tabulated below. This table is subject to revision by the Executive Officer following construction of any new compliance monitoring wells.

Constituent	Groundwater Limitation	Compliance Wells to which Limitation Applies
All	Concentrations that exceed either the Primary or Secondary MCL. ¹	MW-1 and MW-3
All	Taste or odor-producing constituents, toxic substances, or any other constituents in concentrations that cause nuisance or adversely affect beneficial uses.	MW-1 and MW-3

¹ Compliance with this requirement shall be determined on an intra-well basis for each of the specified wells using approved statistical methods.

Groundwater Trigger Concentrations

The following groundwater trigger concentrations are intended only to serve as a means of assessing whether the discharge might potentially cause a violation of one or more of the Groundwater Limitations of the WDRs at some later date.

Constituent	Trigger Concentration, µg/L
Dissolved Arsenic	6.0
Dissolved Lead	9.0
Dissolved Nickel	60
Total Trihalomethanes	50

If the annual evaluation of groundwater quality performed pursuant to the Annual Monitoring Report section of this MRP shows that the annual average of one or more of the trigger concentrations has been exceeded in any compliance well during the calendar year, the Discharger shall submit one or both of the following technical reports, as applicable, by **1 May of the following calendar year** (e.g., if one or more trigger concentrations are exceeded for calendar year 2020, the appropriate report is due by 1 May 2021):

1. A technical evaluation of the reason[s] for the concentration increase[s] and a technical demonstration on a constituent-by-constituent basis that, although the concentration has increased more than expected in one or more compliance wells, continuing the discharge without additional treatment or control will not result in exceedance of the applicable groundwater limitation.
2. An *Action Plan* that presents a systematic technical evaluation of each component of the facility's waste treatment and disposal system to determine whether additional treatment or control is feasible for each constituent that exceeds a trigger concentration. The plan shall:

- a. Evaluate each component of the wastewater treatment, storage, and disposal system (as applicable);
- b. Describe available treatment and/or control technologies that have not yet been implemented;
- c. Provide preliminary capital and operation/maintenance cost estimates for each technology;
- d. Designate the preferred option[s] for implementation; and
- e. Specify a proposed implementation schedule. The schedule for full implementation shall not exceed one year, and the Discharger shall immediately implement the proposed improvements.

Groundwater Sampling and Analysis

Prior to purging or sampling, the groundwater depth shall be measured in each well to the nearest 0.01 feet. Groundwater elevations shall then be calculated to determine groundwater gradient and flow direction.

Low or no-purge sampling methods are acceptable, if described in an approved *Sampling and Analysis Plan*. Otherwise, each monitoring well shall be purged of at least 3 to 5 casing volumes until pH, electrical conductivity and turbidity have stabilized prior to sampling. Groundwater monitoring for all monitoring wells shall include, at a minimum, the following:

Constituent/Parameter	Units	Sample Type	Monitoring Frequency	Reporting Frequency
Depth to Groundwater ¹	0.01 feet	Measurement	Quarterly	Quarterly
Groundwater Elevation ¹	0.01 feet	Calculation	Quarterly	Quarterly
Gradient ¹	feet/feet	Calculation	Quarterly	Quarterly
Gradient Direction ¹	degrees	Calculation	Quarterly	Quarterly
pH	standard	Grab	Quarterly	Quarterly
Nitrate as Nitrogen	mg/L	Grab	Quarterly	Quarterly
Total Dissolved Solids	mg/L	Grab	Quarterly	Quarterly
Dissolved Arsenic ³	µg/L	Grab	Quarterly	Quarterly
Dissolved Lead ³	µg/L	Grab	Quarterly	Quarterly
Dissolved Nickel ³	µg/L	Grab	Quarterly	Quarterly
Total Trihalomethanes ²	µg/L	Grab	Quarterly	Quarterly

¹ Groundwater elevations shall be determined based on depth-to-water measurements using a surveyed elevation reference point on the well casing.

² Individual trihalomethane constituent concentrations shall be reported (EPA Method 8260B or equivalent).

³ Samples for metals shall be filtered prior to preservation and digestion using a 0.45-micron filter.

SOLIDS/SLUDGE DISPOSAL MONITORING

The Discharger shall implement the *Sludge Management Plan* required by Provision E.1.c. The Discharger shall keep records regarding all solids disposal activities. For each discrete quality of solids removed from the facility, record keeping shall include the following information:

1. Annual production totals in dry tons or cubic yards;
2. A description of disposal methods, including the name of the hauling company and the following information related to the disposal methods used. If more than one method is used, include the percentage disposed of by each method:
 - a. For landfill disposal, include: the name, disposal date, location of the landfill, and the Order number of WDRs that regulate the disposal facility.
 - b. For land application, include: the location of the site, application date, and the Order number of any WDRs that regulate the disposal facility.
 - c. For composting, include: the location the site and the Order number of any WDRs that regulate the disposal facility.
 - d. For temporary storage, include: the location of the site, description of best management practices (BMPs), and anticipated date when material will be disposed of off-site.
3. Analytical results for any solids monitoring conducted at the request of the disposal facility.

The records shall also indicate steps taken to monitor and reduce odor and other nuisance conditions. Records shall be stored onsite and available for review during inspections. A summary of the solids disposal activities for the calendar year shall be submitted as part of the Annual Monitoring Report.

REPORTING

All monitoring reports should be converted to a searchable Portable Document Format (PDF) and submitted electronically. Documents that are less than 50MB should be emailed to: centralvalleysacramento@waterboards.ca.gov.

To ensure that your submittal is routed to the appropriate staff person, the following information should be included in the body of the email:

Attention: Compliance/Enforcement Section
City of West Sacramento
George Kristoff Water Treatment Plant
Yolo County
Place ID: 815290

Documents that are 50 MB or larger should be transferred to a CD, DVD, or flash drive and mailed to the following address:

Central Valley Regional Water Quality Control Board
ECM Mailroom
11020 Sun Center Drive, Suite 200
Rancho Cordova, California 95670

Please include a transmittal sheet that includes the following:

Attention: Compliance/Enforcement Section
City of West Sacramento
George Kristoff Water Treatment Plant
Yolo County
Place ID: 815290

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type (e.g., wastewater, groundwater, etc.), and reported analytical result for each sample are readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with waste discharge requirements and spatial or temporal trends, as applicable. The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall be reported in the next scheduled monitoring report.

Laboratory analysis reports do not need to be included in the monitoring reports; however, all laboratory reports must be retained for a minimum of three years in accordance with Standard Provision C.3.

In addition to the requirements of Standard Provision C.3, monitoring information shall include the method detection limit (MDL) and the Reporting limit (RL) or practical quantitation limit (PQL). If the regulatory limit for a given constituent is less than the RL (or PQL), then any analytical results for that constituent that are below the RL (or PQL) but above the MDL shall be reported and flagged as estimated. For a Discharger conducting any of its own analyses, reports must also be signed and certified by the chief of the laboratory.

All monitoring reports that involve planning, investigation, evaluation or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code sections 6735, 7835, and 7835.1.

A. Quarterly Monitoring Reports

Quarterly monitoring reports shall be submitted to the Board by the **1st day of the second month after the quarter** (i.e. the January-March quarterly report is due by **May 1st**). Each Quarterly Monitoring Report shall include the following:

1. Results of Wastewater Flow Monitoring. Wastewater flow monitoring to the sanitary sewer and each sludge drying pond shall be arranged in tabular format for each month during the quarter and include cumulative flow to date. If no wastewater was discharged to the sludge drying ponds or sanitary sewers, the report shall so state.
2. Results of Wastewater Monitoring for wastewater discharged to the sludge drying ponds.
3. Results of Sludge Drying Pond Monitoring. Dissolved oxygen, freeboard, and pH monitoring shall be arranged in tabular format for each month during the quarter. Include a summary of the sludge drying bed inspection and any corrective actions performed during the quarter.
4. Results of Groundwater Monitoring, including:
 - a. A narrative description of all preparatory, monitoring, sampling, and sample handling for groundwater monitoring.
 - b. A field log for each well documenting depth to groundwater; method of purging; parameters measured before, during, and after purging; sample preparation (e.g., filtering); and sample preservation.
 - c. Calculation of the groundwater elevation at each monitoring well, and determination of groundwater flow direction and gradient on the date of measurement.
 - d. Summary data tables of historical and current water table elevations and analytical results.
 - e. A scaled map showing relevant structures and features of the facility, the locations of monitoring wells, surface waters, and groundwater elevation contours referenced to an appropriate datum (e.g., NGVD).
5. A comparison of monitoring data to the discharge specifications and an explanation of any violation of those requirements.
6. If requested by staff, copies of laboratory analytical report(s).
7. The most recent calibration log sheet(s) verifying calibration of any field monitoring instruments (e.g., DO and pH meters) used to obtain data.

B. Annual Monitoring Reports

An Annual Monitoring Report shall be submitted to the Central Valley Water Board by **1 February** of each year. The report shall include the following:

1. Concentration versus time graphs for each monitored constituent using all historic groundwater monitoring data. Each graph shall show the current groundwater concentration range, the trigger concentration specified above, and the Groundwater Limitation as horizontal lines at the applicable concentration.
2. An evaluation of the groundwater quality beneath the site and determination whether any trigger concentrations were exceeded in any compliance well at any time during the calendar year. This shall be determined by comparing the annual average concentration for each well during the calendar year to the corresponding trigger concentration specified above. If any groundwater trigger concentrations were exceeded, include acknowledgment that the technical report(s) described in the Groundwater Trigger Concentrations section of this MRP will be submitted in accordance with the specified schedule.
3. An evaluation of the wastewater quality and comparison to the groundwater quality. Determination of whether the results reveal a previously undetected threat to water quality or indicate a change in waste character such that the discharge poses a threat to water quality. This shall be determined by comparing the annual average concentration of the effluent quality during the calendar year to the corresponding concentration of the groundwater.
4. A narrative description and summary of solids/sludge management and disposal practices.
5. A discussion of compliance and the corrective action taken, as well as any planned or proposed actions needed to bring the discharge into full compliance with the waste discharge requirements.
6. An evaluation of the performance of the treatment facility, including discussion of capacity issues, system problems, and a forecast of the flows anticipated in the next year.
7. A discussion of the following:
 - a. Waste constituent reduction efforts implemented in accordance with any required workplan;
 - b. Other treatment or control measures implemented during the calendar year either voluntarily or pursuant to the WDRs, this MRP, or any other Order;
 - c. Based on monitoring data, an evaluation of the effectiveness of the treatment or control measures implemented to date.

8. A discussion of any data gaps and potential deficiencies or redundancies in the monitoring system or reporting program.
9. Monitoring equipment maintenance and calibration records, as described in Standard Provision C.4.

A transmittal letter shall accompany each monitoring report. The letter shall include a discussion of all violations of the WDRs and this MRP during the reporting period and actions taken or planned for correcting each violation. If the Discharger has previously submitted a report describing corrective actions taken and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. Pursuant to Section B.3 of the Standard Provisions and General Reporting Requirements, the transmittal letter shall contain a statement by the Discharger or the Discharger's authorized agent certifying under penalty of perjury that the report is true, accurate and complete to the best of the signer's knowledge.

The Discharger shall implement the above monitoring program as of the date of this Order.

- Original signed by -
Ordered by: _____
PAMELA C. CREEDON, Executive Officer

11 December 2015

(Date)

GLOSSARY

BOD ₅	Five-day biochemical oxygen demand
CaCO ₃	Calcium carbonate
DO	Dissolved oxygen
EC	Electrical conductivity at 25° C
FDS	Fixed dissolved solids
NTU	Nephelometric turbidity unit
TKN	Total Kjeldahl nitrogen
TDS	Total dissolved solids
TSS	Total suspended solids
Continuous	The specified parameter shall be measured by a meter continuously.
24-hr Composite	Samples shall be a flow-proportioned composite consisting of at least eight aliquots over a 24-hour period.
Daily	Every day except weekends or holidays.
Twice Weekly	Twice per week on non-consecutive days.
Weekly	Once per week.
Twice Monthly	Twice per month during non-consecutive weeks.
Monthly	Once per calendar month.
Bimonthly	Once every two calendar months (i.e., six times per year) during non-consecutive months.
Quarterly	Once per calendar quarter.
Semiannually	Once every six calendar months (i.e., two times per year) during non-consecutive quarters.
Annually	Once per year.
mg/L	Milligrams per liter
mL/L	Milliliters [of solids] per liter
µg/L	Micrograms per liter
µmhos/cm	Micromhos per centimeter
gpd	Gallons per day
mgd	Million gallons per day
MPN/100 mL	Most probable number [of organisms] per 100 milliliters
MTF	Multiple tube fermentation

INFORMATION SHEET

ORDER R5-2015-0130
CITY OF WEST SACRAMENTO
GEORGE KRISTOFF WATER TREATMENT PLANT
YOLO COUNTY

Facility Description

The City of West Sacramento owns and operates the George Kristoff Water Treatment Plant (WTP) that treats Sacramento River water for distribution to the City of West Sacramento as a potable water supply. The WTP has a design capacity of 58 mgd and operates between 5 to 27 mgd. The WTP has been in operation since 1988 and has not previously been regulated under WDRs. A Report of Waste Discharge was submitted for the land discharge of water treatment wastewater.

The WTP provides treatment by settling, coagulation, filtration, and chlorine disinfection. There are two Actiflo® pretreatment trains (water clarification process that combines microsand enhanced flocculation with tube settling); eight dual media gravity filters; and associated chemical feed systems to add treatment chemicals including aluminum, polyaluminum chloride, anionic polymer, chlorine gas, hydrofluosilicic acid, and sodium hydroxide.

Wastewater is composed of sludge from the Actiflo® settling basins, spent water from the filter backwash operations (filter backwash water), and any water that has gone through analyzers for process control (process wastewater). The wastewater is collected in two concrete basins (Recycled Water Basin 1 and 2), where a portion of the decant water (less than ten percent of influent raw water flow rate) is returned to the treatment process. The remaining wastewater in the basins is discharged to the sanitary sewer that is managed by Sacramento Regional County Sanitation District and sometimes discharged to three existing unlined sludge drying ponds.

The sludge drying ponds (Sludge Pond 1, Sludge Pond 2, and Sludge Pond 3) are used for wastewater disposal on an as needed basis. Each drying pond has a storage capacity of approximately 247,000 gallons at 2-feet of freeboard.

Dried sludge accumulated in the drying ponds is excavated as needed. The dried sludge has historically been stockpiled at the WTP and taken to an adjacent city owned property for use as landscaping topsoil. Approximately 3,900 cubic feet of dried sludge was removed in 2012.

The Discharger has not characterized the dried sludge, determined the sludge mass that will be generated, or developed an operations plan for onsite dried sludge application or temporary onsite storage.

Site-Specific Conditions

Surficial soils near the sludge drying ponds consists of sandy silt extending to depths of approximately 5 to 10 feet below ground surface followed by 5 to 10 feet of silty sand.

The WTP is currently within the 100-year Federal Emergency Management Agency (FEMA) floodplain designation but protected by levees, dikes, or other structures subject to possible failure or overtopping during larger floods.

Based on data from California Irrigation Management Information System (CIMIS) Station 155, the average annual precipitation for the City is approximately 18 inches and the reference evapotranspiration rate is approximately 51 inches per year. The 100-year precipitation within the area is approximately 31 inches.

The land use in the WTP area is zoned water front, with adjacent property to the west zoned as commercial/water front. The sludge drying ponds lie just southwest of the Sacramento River, bounded on the north by North Harbor Boulevard, on the southwest by the water treatment plant, on the south by railroad tracks, and on the east/southeast by undeveloped land.

Groundwater Conditions

According to the Web Soil Survey published by the United States Department of Agricultural Natural Resources Conservation Service, the site is located in an area predominately in the Sycamore silt loam soil series, consisting of silt loam and a moderately high to high saturated hydraulic conductivity (0.57 to 1.98 inch/hour).

Three groundwater monitoring wells (MW-1, MW-2, and MW-3) were installed on 24 August 2011 and sampled on 26 August 2011 to determine groundwater quality near the existing sludge drying ponds. Based on the one monitoring event, groundwater was encountered at approximately 17.0 to 19.0 feet below existing site grade and the down gradient direction is towards the southwest. Seasonal fluctuations may occur. Proximity to the Sacramento River may recharge groundwater quality or influence groundwater flow direction.

In general, groundwater quality underlying the sludge drying ponds is of good quality with respect to salinity constituents (TDS, sodium, and chloride) and nitrate as nitrogen concentrations. The overall groundwater quality near the three monitoring wells appears fairly similar. Total trihalomethane (TTHM) concentrations were detected in the underlying groundwater but do not exceed the water quality objective. Analytical data show total coliform concentrations greater than 2.2 MPN/100 mL, which is the Basin Plan's numeric water quality objective, in all monitoring wells. Based on a single monitoring event, it is not known whether the groundwater coliform detections are due to cross-contamination of the monitoring wells during construction and/or subsequent sampling.

Basin Plan, Beneficial Uses, and Regulatory Considerations

Local drainage is to Sacramento River. The beneficial uses of Sacramento River, as stated in the Basin Plan, are municipal and domestic supply; agricultural supply; industrial process supply; hydropower generation; water contact recreation; non-contact water recreation; warm freshwater habitat; cold freshwater habitat; wildlife habitat; and spawning, reproduction, and/or early development. The beneficial uses of underlying groundwater as set forth in the Basin Plan are municipal and domestic supply, agricultural supply, industrial service supply and industrial process supply.

Antidegradation Analysis

Constituents of concern that have the potential to degrade groundwater include arsenic, lead, nickel, and TTHM. In consideration of the high quality source water, nature of the treatment process, concentration of the waste, the limited discharges to the sludge drying ponds, and operation of the sludge ponds to periodically remove the dried sludge, the discharge has minimal potential to cause exceedances of the water quality objectives. However, groundwater monitoring data is needed to verify that unreasonable groundwater degradation is not occurring. This Order requires monitoring the quality of the wastewater discharged to the sludge ponds and sets groundwater limits not to exceed water quality objectives. This Order also sets groundwater trigger concentrations to assess whether the discharge might potentially cause a violation of one or more of the groundwater limitations of the WDR at some later date.

For arsenic, lead, nickel, and TTHM, the nature of the waste, site-specific conditions, and current groundwater monitoring data indicate that the discharge may cause degradation, but will not cause exceedance of a water quality objective. The Discharger has implemented BPTC, so the degradation is allowable under Resolution 68-16.

The Discharger provides treatment and control of the discharge that incorporates:

- a. High quality source water;
- b. Engineered clay-lined solids drying ponds.
- c. Limited use of the solids drying ponds.
- d. Periodic removal of the dried solids from the sludge drying ponds.

Discharge Prohibitions, Specifications, Limitations and Provisions

This Order prohibits temporary storage of dried water treatment sludge on WTP property until and unless the Discharger has submitted the report required pursuant to Provision E.1.c.

This Order prohibits the land application of dried water treatment sludge on WTP property. This Order may be revised to allow land application of dried water treatment sludge onsite if the Discharger submits a new Report of Waste Discharge or alternatively, applies for coverage under the Statewide General Waste Discharge Requirements for Discharges to

Land with a Low Threat to Water Quality, Water Quality Order 2003-0003-DWQ or other applicable Order.

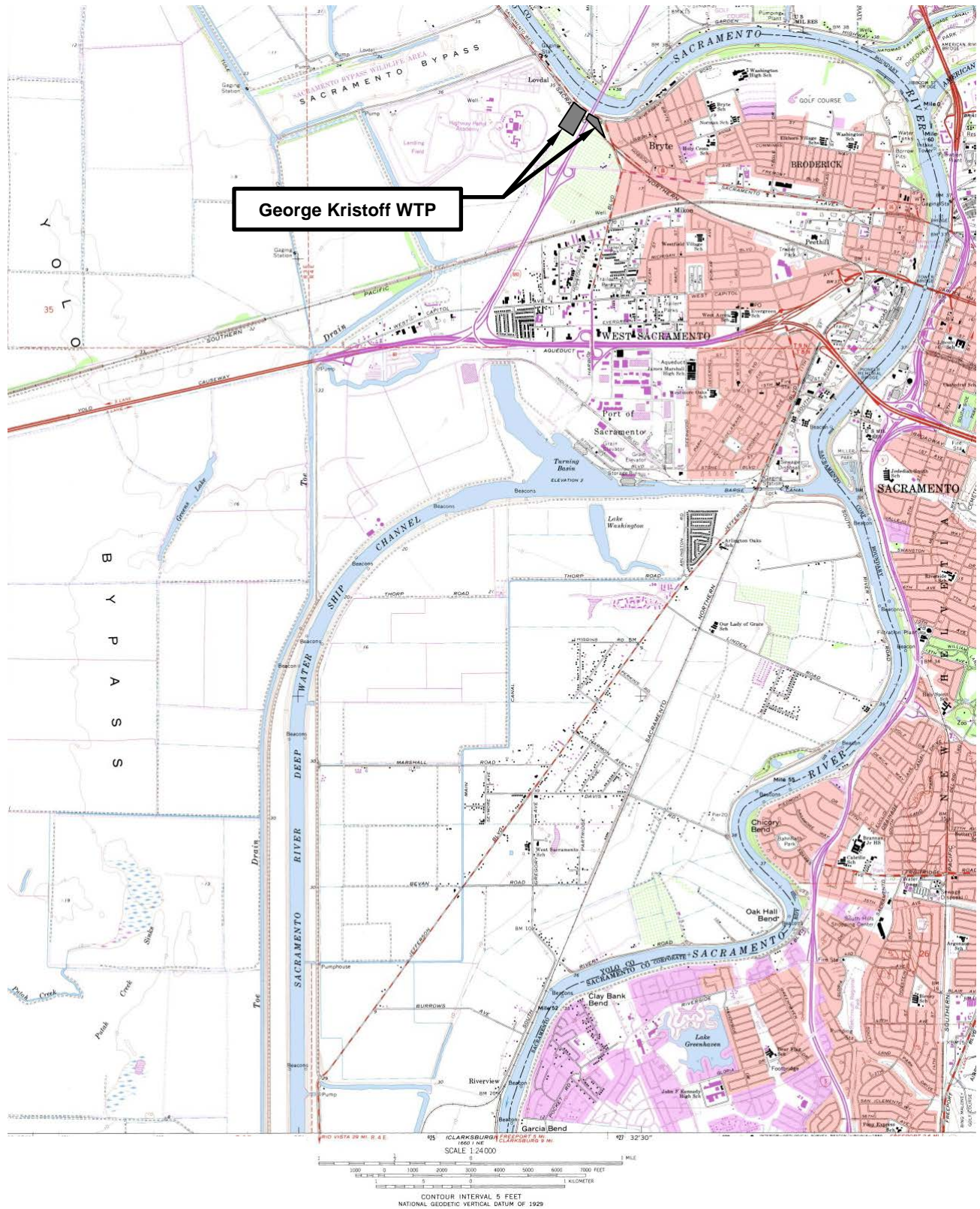
The Discharger shall operate and maintain all ponds sufficiently to protect the integrity of containment dams and berms and prevent overtopping and/or structural failure. Unless a California-registered civil engineer certifies (based on design, construction, and conditions of operation and maintenance) that less freeboard is adequate, the operating freeboard in any pond shall never be less than two feet (measured vertically from the lowest possible point of overflow).

This Order establishes groundwater limitations for the facility that will not unreasonably threaten present and anticipated beneficial uses or result in groundwater quality that exceeds water quality objectives set forth in the Basin Plan.

Groundwater trigger limits have been established to assess whether the discharge might potentially cause a violation of one or more of the groundwater limitations.

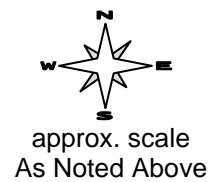
The Provisions section of this Order requires submittal of certain technical reports by the dates provided in the Order.

The Monitoring and Reporting Program is designed to ensure and verify compliance with the limitations and requirements in this Order.

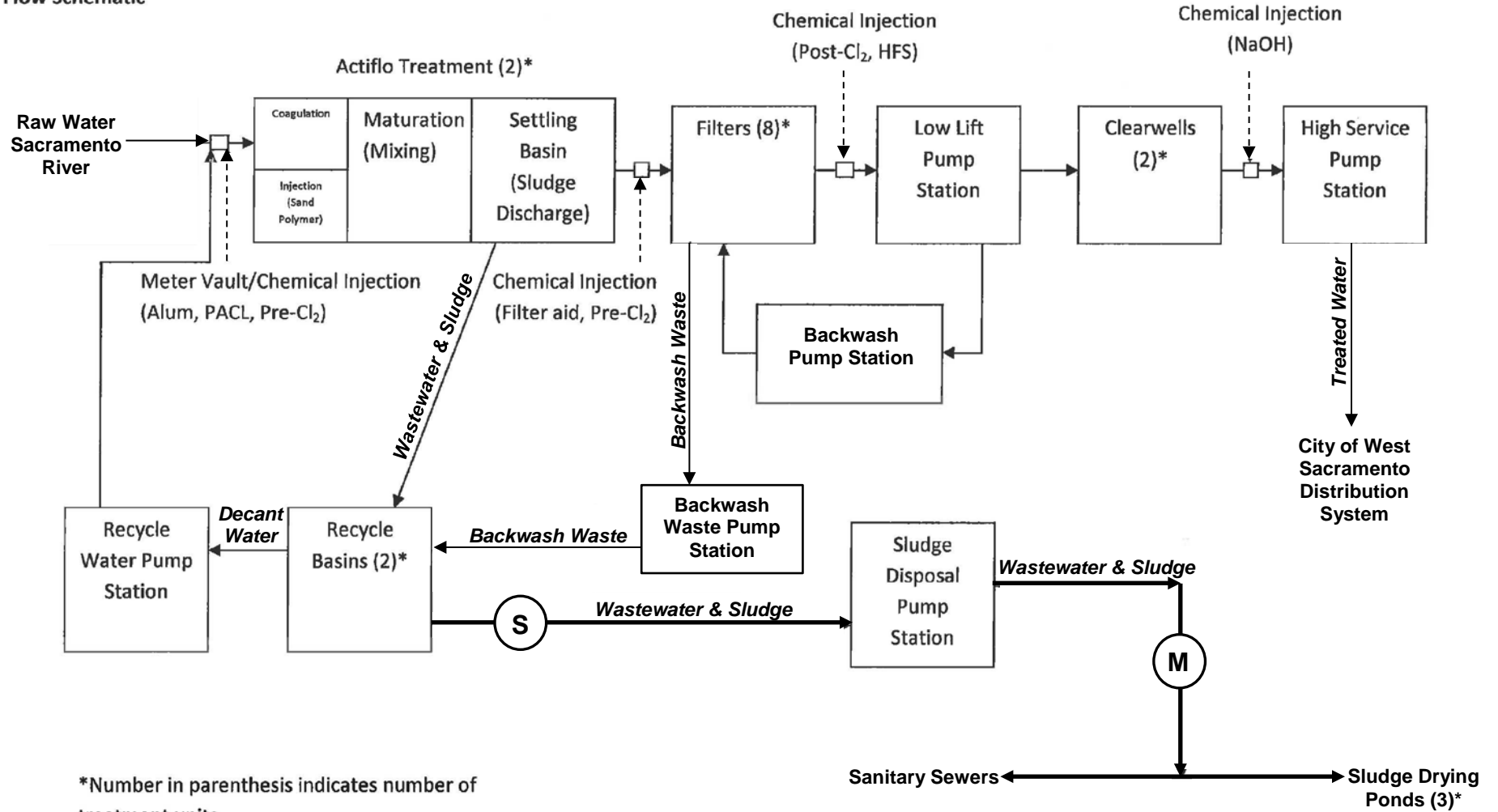


Drawing Reference:
U.S.G.S
Sacramento West
TOPOGRAPHIC MAP
7.5 MINUTE QUAD

SITE LOCATION MAP
CITY OF WEST SACRAMENTO
GEORGE KRISTOFF WATER TREATMENT PLANT
YOLO COUNTY



Flow Schematic



*Number in parenthesis indicates number of treatment units.

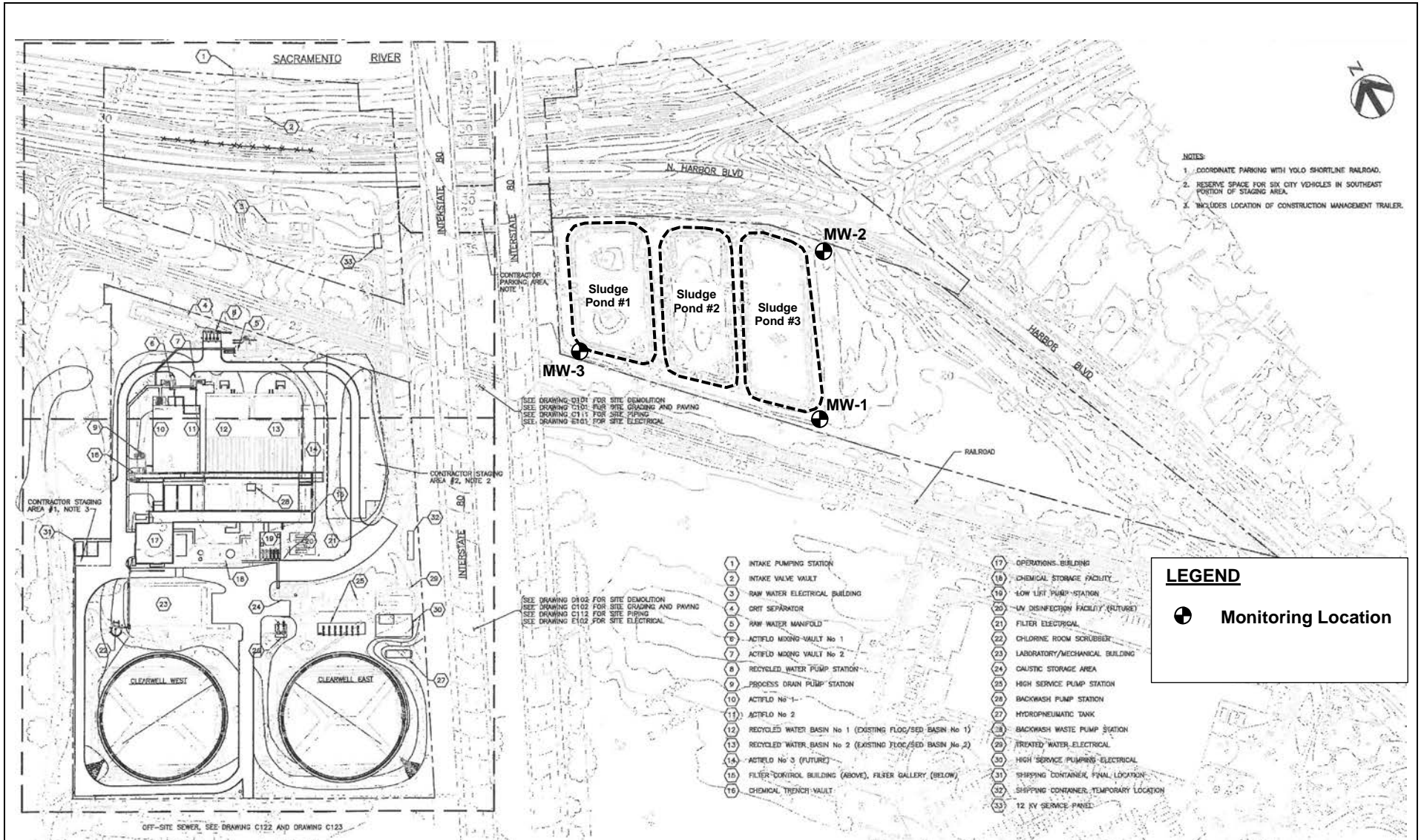
- (M)** Metering Location
- (S)** Sampling Location

Approximate Scale
Not to Scale



Drawing Reference:
Report of Waste Discharge
15 January 2013

PROCESS FLOW SCHEMATIC
CITY OF WEST SACRAMENTO
GEORGE KRISTOFF WATER TREATMENT PLANT
YOLO COUNTY



Approximate Scale
Not to Scale

Drawing Reference:
Report of Waste Discharge
15 January 2013

SITE FACILITY MAP
CITY OF WEST SACRAMENTO
GEORGE KRISTOFF WATER TREATMENT PLANT
YOLO COUNTY