6 October 2015

Mr. Dustin Fuller, Assistant Manager
Tulare Lake Drainage District
P.O. Box 985 (1107 Norboe Avenue)
Corcoran, CA 93212

CERTIFIED MAIL
7013 2630 0001 5236 2317

TENTATIVE WASTE DISCHARGE REQUIREMENTS
FOR
TULARE LAKE DRAINAGE DISTRICT
MID EVAPORATION BASIN
KINGS COUNTY

TO ALL CONCERNED PERSONS AND AGENCIES:

Enclosed are tentative Waste Discharge Requirements (WDRs) for the Tulare Lake Drainage District's proposed Mid Evaporation Basin. To be given full consideration, any comments or recommendations you may have concerning the tentative WDRs must be submitted in writing to the Central Valley Regional Water Quality Control Board (Central Valley Water Board) office by **5:00 pm on 6 November 2015**. Absent a showing of good cause and lack of prejudice to other parties, the Board Chair may exclude comments and evidence received after this deadline.

In order to conserve paper and reduce mailing costs, a paper copy of the tentative WDRs has been sent only to the Discharger. Others are advised that the tentative WDRs are available on the Central Valley Water Board's web site at:

http://www.waterboards.ca.gov/centralvalley/board_decisions/tentative_orders/

under the heading "Discharger-Specific Orders for Future Board Meetings."

The Central Valley Water Board meeting where the above matter will be considered is scheduled for the following time and location:

DATE:	10/11 December 2015
TIME:	8:30 a.m.
PLACE:	California Regional Water Quality Control Board, Central Valley Region 11020 Sun Center Drive, Suite 200 Sacramento, CA

Persons wishing to make non-evidentiary policy statements at the Board meeting (such statements will generally be limited to 3 minutes) are ***not*** required to submit written comments,

but the Board appreciates receiving those comments in writing by the due date listed above so that they may be included in the packages that the Board members will receive ahead of the meeting.

Anyone without access to the Internet who needs a paper copy of the tentative WDRs should contact Jeff Pyle at (559) 445-5145 or jpyle@waterboards.ca.gov.

SCOTT J. HATTON
Senior Engineer
RCE No. 67889

Attachment: Native American Tribal Government Consultation List, Kings County

Enclosures: Tentative Waste Discharge Requirements (Discharger only)
Standard Provisions and Reporting Requirements, March 1991 (Discharger only)

cc w/o enc.: Patrick Pulupa, State Water Resources Control Board, OCC, Sacramento (via email)
Andrew Deeringer, State Water Resources Control Board, OCC, Sacramento (via email)
Scott Couch, State Water Resources Control Board, DWQ, Sacramento (via email)
Timothy O'brien, State Water Resources Control Board, DWQ, Sacramento (via email)
Julie Vance, California Department of Fish and Wildlife, Region IV, Fresno
U.S. Fish and Wildlife Service, Sacramento
California Department of Toxic Substances Control, Clovis
California Department of Water Resources, San Joaquin District, Fresno
San Joaquin Valley Air Pollution Control District, Fresno
Kings County Environmental Health Services Department, Hanford
Tulare Irrigation District, Tulare
Bill Jennings, California Sportfishing Protection Alliance, Stockton
Mike Nordstrom, Attorney, Corcoran

Native American Tribal Government Consultation List
Kings County
January 13, 2015

Santa Rosa Rancheria Tachi Yokut Tribe
Rueben Barrios Sr., Chairperson
P.O. Box 8 Tache
Lemoore , CA 93245 Tachi
Yokut
(559) 924-1278
(559) 924-3583 Fax

Table Mountain Rancheria
Leanne Walker-Grant, Chairperson
P.O. Box 410 Yokuts
Friant , CA 93626
(559) 822-2587
(559) 822-2693 Fax

Tule River Indian Tribe
Neil Peyron, Chairperson
P.O. Box 589 Yokuts
Porterville , CA 93258
chairman@tulerivertribe-nsn.gov
(559) 781-4271
(559) 781-4610 Fax

Table Mountain Rancheria
Bob Pennell, Cultural Resources Director
P.O. Box 410 Yokuts
Friant , CA 93626
(559) 325-0351
(559) 217-9718 - cell

Wuksache Indian Tribe/Eshom Valley Band
Kenneth Woodrow, Chairperson
1179 Rock Haven Ct. Foothill Yokuts
Salinas , CA 93906 Mono
kwood8934@aol.com Wuksache
(831) 443-9702

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is applicable only for consultation with Native American tribes under Government Code Section 65352.3 and 65362.4. et seq.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2015-XXXX

WASTE DISCHARGE REQUIREMENTS
FOR
TULARE LAKE DRAINAGE DISTRICT MID EVAPORATION BASIN
KINGS COUNTY

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

1. In 1973, Tulare Lake Drainage District (District or Discharger) certified a Negative Declaration under the California Environmental Quality Act, Public Resources Code section 21000, et seq. (CEQA) for construction and operation of a North Evaporation Basin (North Basin) to receive sub-surface agricultural drainwater. Construction of the North Basin began in 1974. In 1979, the District prepared and submitted an Environmental Impact Report (EIR) for the construction of the South Evaporation Basin (South Basin) and the Hacienda Evaporation Basins (Hacienda Basin). Also in 1979, the Central Valley Water Board adopted Waste Discharge Requirements (WDRs) Order No. 79-252 for the regulation of the North, Hacienda, and South evaporation basins.

2. In 1983 high rates of water bird mortalities and deformities were discovered at Kesterson Reservoir. These discoveries led the Central Valley Water Board to notify (1989) all evaporation basin owners/operators within the Tulare Lake Basin that new WDRs would be prepared for their operations including those owners/operators who had previously received Orders or Waivers of WDRs from the Central Valley Water Board.

3. Also in 1989, the California State Department of Fish and Wildlife (DFW) identified a need to analyze the cumulative impacts of evaporation pond operations within the Tulare Lake Basin on wildlife in order to satisfy the requirements of CEQA. A Cumulative Impacts Report (Report) for the evaporation basins was developed for the Central Valley Water Board under contract for the State Department of Water Resources (DWR) by private consultants. The Report was completed in November 1992. Among other things, the Report (1993) concluded that the ponds have significant and cumulative adverse impacts on bird reproduction. The most significant risks posed by the ponds include exposure to high salinity and selenium levels. Evaporation basins provide significant water bird habitat for the area, and are used particularly by waterfowl and shorebirds that feed on invertebrates and plants found within the ponds.

4. On 6 August 1993, the Central Valley Water Board adopted Order 93-136 that regulates the Districts North, Hacienda, and South Evaporation Basins, which together receive sub-surface agricultural drainwater from 34,693 acres of farmland installed with subsurface tile drain lines.

5. On 31 January 2014, the District submitted a Report of Waste Discharge (RWD) and Form 200 to the Central Valley Water Board for construction and operation of a new evaporation basin, the proposed Mid Evaporation Basin (Middle Basin).

6. The RWD specified a need to install additional subsurface drainage systems on several thousand acres within the District and determined that although the District has participated in and supported a number of research projects on alternate means of agricultural drainage water disposal, a viable option to evaporation basins has yet to be discerned. Without a viable option, the RWD stated that the District's ability to dispose of additional drainage water beyond that received from its current 34,693 drained acres could only be achieved through construction of the Middle Basin.

7. The proposed Middle Basin property is owned by the District (purchased in 2007) and has been either continuously farmed or routinely disked to maintain it vegetation-free since it was acquired. The property is underlain by an existing tile drainage system that was installed by a prior landowner to control the level of shallow groundwater beneath the agricultural cropland.

8. The District and the proposed 1,800 acre (±) Middle Basin is shown on Attachment A, which is attached hereto and made part of this Order by reference, and will be constructed on portions of three adjoining sections (three square miles) of agricultural land in the south central portion of the Tulare Lake Bed, Kings County (Township 23 South, Range 21 East, Sections 24, 25, and 36).

9. When operational, the Middle Basin will allow for an estimated 18,500 acres of agricultural lands within the Tulare Lake Bed to be drained of shallow saline drainage water.

10. The Middle Basin will consist of six (6) contiguous ponds constructed to a height of approximately seven feet utilizing native silt/clay soils excavated from within the ponds interior. Each pond will be approximately 310 acres in size. The Middle Basin will have a drainage water inlet capacity of between 50 to 75 cubic feet per second (cfs). When in full operation drainage water will be diverted into the Middle Basin to achieve a maximum evaporation surface area during peak evaporative periods while allowing pond water levels to be maintained above the minimum depth requirement. Interior levee side slopes will be constructed at 3:1 to minimize shallow foraging areas for water birds. All exterior levees will be constructed with a 4:1 side slope. All levees will be compacted to 90% of the American Society for Testing and Materials (ASTM) method D 1557 to reduce horizontal permeability. Two regulating structures will be positioned between each pond to facilitate the operator's ability to quickly fill or dewater a given pond and thus minimize the times when pond water depths would be less than 2 feet in depth.

11. The existing subsurface tile drainage system consisting of a series of perforated drainage lines set 7 to 9 feet below site grade and spaced on approximately 500 feet centers will be utilized to intercept vertical and horizontal seepage from the basin as shown on Attachment B, which is attached hereto and made part of this Order by reference. The subsurface tile drainage lines will discharge the existing sumps, one at the northwest corner of Section 24 and the other at the northwest corner of Section 36. Automated pumps will be installed in the sumps with their discharge directed back into the evaporation basin.

12. Drainage water will be pumped into the evaporation basin through one of two inlet structures that will be connected to the Main Pipeline. Inlet #1 will be the primary or normal delivery point that will discharge into Pond 1. Inlet #2, which discharges into Pond 4, will only be operated for short periods of time to allow the use of the northern half of the evaporation basin should Ponds 1, 2, or 3 need to be dewatered for maintenance purposes. Under normal operations, drainage water can be pumped into Pond 1 up to a height of approximately 5 feet above the pond bottom. At this height, drainage water will begin to spill from Pond 1 into Pond 2 through a regulating structure. To facilitate this flow, Pond 1 will have the highest water elevation with each successive pond having a slightly lower water level elevation at each regulating structure. This system will allow drainage water to flow at a very slow velocity through the various ponds within the basin until reaching the final or crystallization pond.

13. Each regulating structure will be fitted with a control gate that can be used to increase flows between ponds to facilitate the ability to quickly fill or dewater a given pond and thus minimize the times when pond water depths would be less than 2 feet in depth. The Discharger shall not take more than one week to fill or drain a pond. Except when filling or draining a pond, the evaporation basin water levels will be kept greater than or equal to 2 feet in depth to minimize the opportunity for waterfowl to wade and forage in the ponds. If dewatering occurs during the bird nesting season, the District shall conduct hazing activities

14. In order to discourage and prevent birds from seeking to nest on the evaporation basin areas, the District proposed to use propane cannons, wind-activated mylar tape set on lines between stakes, ground-disturbing activities by tractors dragging "floats", shotgun cracker-shells fired overhead (3-4 seasonal personnel depending on bird activity) and normal workday vehicle traffic (4 regular full-time employees). Hazing and maintenance activities shall not be conducted within 50 feet of any active nest, with the exception of those activities on top of the levees, which can be conducted within 15 feet of any active nest. During the winter months, monitoring and additional hazing activities together with an avoidance plan were proposed to be implemented to address potential salt encrustation issues related to wintering waterbirds.

Comments received during the CEQA process from the DFW, questioned the effectiveness of the District's proposed hazing operations and plans for handling salt encrusted birds. Consequently, this Order requires that the Discharger, in conjunction with the DFW and the United States Fish and Wildlife Service, to prepare and agree to a protocol(s) for avoidance

(hazing) procedures and for assessing mitigation for unavoidable losses to breeding and non-breeding avian species that may result from the of operations of the Mid Evaporation Basin.

Discharge of Wastewater

15. Subsurface agricultural drainage water is a combination of shallow groundwater and irrigation/rain water that has infiltrated through the croplands and is being collected into a sub-surface drainage system (tile drain).

16. The District conveys subsurface agricultural drainage water via a 14-mile long subsurface pipeline (Main Pipeline) and 17.7 miles of open ditch to its existing evaporation basins. Main Pipeline water represents the quality of the wastewater flowing from existing agricultural drained lands in the District and serves to provide an indication of the water quality that will be discharged into the new Middle Basin.

17. Two drainage water samples collected from the Main Pipeline in May 2013 were submitted to a State of California accredited laboratory for chemical analysis. The results of the chemical analysis are presented in Table 1.

Table 1

Source Water Chemical Analyses

Constituent	Main Pipeline @ Outlet Structure	Main Pipeline @ Tule River	Units[1]
Electrical Conductivity	8,900	7,200	umhos/cm
Total Dissolved Solids	6,400	5,000	mg/L
Chloride	1,200	690	mg/L
Nitrate as N03	110	100	mg/L
Sulfate as S04	2,700	2,400	mg/L
Hexavalent Chromium	0.8	nd[2]	ug/L
Aluminum	0.88	1.9	mg/L
Arsenic	110	110	ug/L
Cadmium	1.7	nd[2]	ug/L
Calcium	200	150	mg/L
Copper	nd[2]	nd[2]	mg/L
Hardness CaCO3	1,200	920	mg/L
Lead	nd[2]	nd[2]	ug/L
Magnesium	170	130	mg/L
Manganese	0.22	0.27	mg/L
Potassium	18	12	mg/L
Selenium	37	15	ug/L
Silver	nd[2]	nd[2]	mg/L

Constituent	Main Pipeline @ Outlet Structure	Main Pipeline @ Tule River	Units[1]
Sodium	2,000	1,600	mg/L
Uranium	390	84	ug/L
Uranium, Radiological	260	57	pCi/L
Zinc	nd[2]	nd[2]	mg/L

1 Units - umhos/cm = micromhos per centimeter; mg/L = Milligrams per liter; ug/L = micrograms per liter; pCi/L = picocuries per liter.

2. nd = not detected by the laboratory above the practical quantitation limit.

18. The agricultural drainage water is not a hazardous waste within the meaning of California Health and Safety Code section 25117 or, California Code of Regulations (Cal. Code Regs.) title 22 section 66261.3. The drainage water does not meet any of the criteria used for the identification of hazardous wastes (Cal. Code Regs., title. 22, section 66261.20 and following). The drainage water, when managed properly pursuant to these requirements, will not pose a substantial present or potential hazard to the environment, including wildlife.

Site-Specific Conditions

19. The proposed Middle Basin is to be located in the south central portion of the Tulare Lake Bed, a former fresh water lake that went dry in at the beginning of the 20 century in response to diversion of its tributary rivers (Kings, Kaweah, Tule, and Kern Rivers) for irrigation. Extending outward from beneath the margins of the former Tulare Lake Bed are lacustrine and marsh deposits that form a series of silt and clay-rich zones that interfinger with more permeable beds of the continental deposits. These lacustrine and marsh deposits include a series of clay units that were designated as the A through F clays (youngest to oldest) by Croft (1972). These clay zones are low permeability horizons that locally separate the alluvial sequence into several aquifers (Page, 1986). The most prominent of these clay zones is the E Clay of Pleistocene age, which is equivalent to the Corcoran Clay Member of the Tulare Formation (Croft, 1972).

20. Geotechnical investigations performed in 1979, 1988, 2006, and 2013 (a series of soil borings and backhoe excavations) established that the sediments encountered in the shallow subsurface beneath the proposed Middle Basin consisted primarily of fine-grained silts, clays, and silt-clay mixtures, with varying amounts of sand or silty sands. The subsurface geology varies rapidly in both a lateral and vertical sense in response to changes in the depositional environment.

21. Area soils at the Middle Basin are primarily the Gepford clay, sandy substratum, partially drained and the Westcamp loam, partially drained with lesser amounts of the Armona loam according to the USDA Natural Resources Conservation Service. These soils are all listed as having very slow permeability and are calcareous, saline-alkaline. The soils are known

to have high pH and are typically treated with soil amendments (gypsum, sulfur, and acid forming fertilizers) to improve drainage, salinity, and excess alkali conditions.

22. The Middle Basin is within a 100-year floodplain according to Federal Emergency Management Agency (FEMA) maps (Map No. 06031C0675C). However, inundation of the Middle Basin with storm water would not pose a threat to the underlying groundwater quality.

23. The San Andreas Fault that marks the divide between the North American and the Pacific Tectonic Plates is located approximately 35 miles southwest of the proposed site. Potential peak ground acceleration measured as percent gravity (% G) is estimated to be 30-40% G by the State of California, Department of Conservation's Ground Motion Interpolator.

24. Land use in the vicinity of the Middle Basin is agricultural. No water supply wells or domestic wells have been identified within 3 miles of the project site.

25. According to DWR land use data for Kings County published in 2003, the primary crops grown within five miles of the proposed facility are pasture crops such as alfalfa, grain, cotton, and hay crops.

26. Annual mean precipitation over the last 56 years based on the Corcoran Irrigation District weather station located in Corcoran approximately 15 miles to the northeast of the site is 7.35 inches.

Surface Water Considerations

27. There are no named streams or rivers within approximately five miles of the proposed Middle Basin. Surface water conveyance structures that are present within one mile of the proposed facility include: the Homeland Canal, the Liberty Farms South Canal, and the Kings County Canal Company, Lateral A.

Groundwater Considerations

28. Regional groundwater is contained within a series of aquifers separated by low permeability clay deposits. These aquifers are generally separated into a lower confined aquifer, a series of semi-confined aquifers, and an upper unconfined aquifer. The lower confined aquifer is situated beneath the E-Clay or Corcoran Clay of the Tulare Formation at a depth of approximately 1,000 feet below the proposed Middle Basin. Water quality in the deeper confined aquifer is described to be good with total dissolved solids (TDS) of approximately 500 milligrams per liter (mg/L).

29. Groundwater quality in the intermediate semiconfined aquifers is unknown beneath the proposed facility. Electrical Conductivity (EC) values have been measured in monitoring wells along the southern end of the Hacienda evaporation basin (2.5 to 3 miles southeast of the the southern end of the proposed Middle Basin). The groundwater EC at a depth of 35 feet was measered at 33,400 umhos/cm in a test hole 3 miles to the west in section 33,

T23S, R21E. EC values in monitoring well 18-1A (depth of 80-100 feet below site grade) averaged approximately 13,000 umhos/cm for the period 1979 to 2013.

30. Shallow unconfined groundwater varies beneath the site from a depth of 3 to 7.5 feet in 1979 to between 10.5 and 13 feet in 2014. The shallow groundwater quality was investigated in the area of the proposed facility by installing four groundwater monitoring wells along the northern and western sides of the proposed basin into first encountered groundwater (Attachment B). The analytical results from four monitoring events (September, December 2014 and March, June 2015) are presented in Table 2 below. The first value shown is the average and the range of the values is shown in the parentheses below. Also listed in Table 2 are the California Department of Public Health's (CDPH) Maximum Contaminant Levels (MCLs) for Drinking Water, CDPH's Secondary MCLs, and Cal/EPA's Office of Environmental Health Hazard Assessment, Public Health Goals.

Table 2

Middle Basin Groundwater Results
2014 & 2015

	Well Number							
Constituent	**24-1A**	**24-1B**	**25-1A**	**36-1A**	**Units[1]**	**Primary MCL**	**Secondary MCL[2]**	**PHG[3]**
Electrical Conductivity	5075 (4500 - 5600)	5175 (2800 – 7500)	4825 (3800 – 6000)	18950 (8800 – 27000)	umhos/ cm		2,200	
Total Dissolved Solids	3675 (3400 – 4100)	2300 (1700 – 3300)	3050 (2500 – 3700)	15600 (6400 – 25000)	mg/L		1,500	
Ammonia as N	0.26 (0.15 - 0.49)	0.28 (0.22 – 0.31)	0.28 (0.22 – 0.32)	0.16 (0.14 – 0.18)	mg/L			
Chloride	670 (560 – 790)	415 (250 – 740)	488 (290 – 720)	2850 (1300 – 4600)	mg/L		600	
Nitrate as N03	16 (1.0 – 26)	nd[4]	18 (1.0 – 67)	nd[4]	mg/L	45		45
Sulfate as S04	1775 (1600 – 2000)	805 (450 – 1500)	1205 (930 – 1600)	7525 (3300 – 11000)	mg/L		600	
Fluoride	1.0 (1.0 – 1.1)	5.0 (1.0 – 9.8)	3.0 (2.7 – 3.4)	1.0 (1.0 – 1.3)	mg/L			
Arsenic	27 (2.0 – 87)	184 (20 – 410)	107 (2.0 – 210)	40 (2.0 – 100)	ug/L	10		0.004
Alkalinity as CaCO3	313 (300 – 320)	615 (500 – 710)	658 (580 – 720)	505 (340 – 610)	mg/L			
Boron	1.1 (0.1 – 1.6)	3.0 (2.1 – 3.9)	3.6 (3.2 – 3.9)	9.2 (5.0 – 12)	mg/L			
Calcium	468 (410 – 500)	95 (43 – 130)	110 (59 – 160)	530 (490 – 590)	mg/L			
Magnesium	158 (120 – 200)	111 (25 – 200)	116 (34 – 200)	313 (220 – 390)	mg/L			
Molybdenum	63 (10 – 86)	285 (10 – 440)	465 (10 – 820)	1553 (10 – 4000)	ug/L			
Potassium	23 (nd[4] – 54)	48 (4.3 – 90)	53 (2.1 – 110)	40 (11 – 80)	mg/L			
Sodium	663 (580 – 750)	795 (750 – 890)	1078 (880 – 1230)	4000 (2000 – 5400)	mg/L			
Selenium	3.4 (2.7 - 4.1)	5.3 (2.2 – 9.1)	1.1 (0.4 – 2.5)	1.1 (0.4 – 1.6)	ug/L	50		30
Uranium	210 (1.0 – 310)	184 (66 – 270)	345 (70 – 620)	1400 (700 – 2000)	ug/L		0.5	

	Well Number							
Constituent	**24-1A**	**24-1B**	**25-1A**	**36-1A**	**Units[1]**	**Primary MCL**	**Secondary MCL[2]**	**PHG[3]**
Uranium, Radiological	143 (1.0 – 210)	122 (44 – 180)	230 (47 – 410)	945 (470 – 1400)	pCi/L	20		0.43

1. Units - umhos/cm = micromhos per centimeter; mg/L = Milligrams per liter; ug/L = micrograms per liter; pCi/L = picocuries per liter.
2. The maximum contaminant level shown for EC, TDS, chloride, and sulfate are short term limits
3. PHG = Primary health goal. Action level only. Not a Maximum contaminant level.
4. nd = not detected.

31. Shallow groundwater samples were also collected from two existing tile drainage sumps along the western edge of the site in 2013. These sumps are part of a subsurface drainage system (tile drain) installed by a previous landowner. The chemical analyses of these samples are presented on Table 3.

Table 3

Middle Basin Tile Drainage Water Analyses
Sampled May 2013

	Tile Drainage System Groundwater				
Constituent	**Middle Basin North Sump NW Corner Section 24**	**Middle Basin South Sump NW Corner Section 36**	**Units[1]**	**Primary MCL**	**Secondary MCL[2]**
Electrical Conductivity	15,000	9,800	umhos/cm		2,200
Total Dissolved Solids	12,000	6,600	mg/L		1,500
Chloride	2,500	1,500	mg/L		600
Nitrate as N03	220	120	mg/L	45	
Sulfate as S04	5,300	3,000	mg/L		600
Hexavalent Chromium	1.2	0.8	ug/L	10	
Aluminum	0.98	0.2	mg/L		1.0
Arsenic	36	51	ug/L	10	
Cadmium	2.4	2.6	ug/L		
Calcium	390	290	mg/L		
Copper	0.27	0.086	mg/L		0.5
Hardness CaCO3	2,100	1,500	mg/L		
Lead	10	ND	ug/L		
Magnesium	270	180	mg/L		
Manganese	0.22	0.13	mg/L		
Potassium	24	17	mg/L		
Selenium	86	56	ug/L	50	
Silver	nd[3]	nd[3]	mg/L		
Sodium	3,200	2,100	mg/L		
Uranium	590	570	ug/L		0.5
Uranium, Radiological	390	380	pCi/L	20	
Zinc	0.11	ND	mg/L		5.0

1. Units - umhos/cm = micromhos per centimeter; mg/L = Milligrams per liter; ug/L = micrograms per liter; pCi/L = picocuries per liter.
2. The maximum contaminant level shown for EC, TDS, chloride and sulfate are the short term limits.
3. nd = not detected.

32. The six ambient groundwater samples analyzed (two in 2013, four in 2014, and two in 2015; see Tables 2 & 3) demonstrate that the proposed site's shallow groundwater quality exceeded the Primary MCL values for arsenic and uranium and the short term Secondary MCLs for EC, TDS, chloride, and sulfate. Additionally, both tile drainage sumps contained water that exceeded the Primary MCL value for selenium, arsenic, nitrate and uranium and the Secondary MCLs for EC, TDS, chloride and sulfate.

Basin Plan, Beneficial Uses, and Water Quality Objectives

33. The Water Quality Control Plan for the Tulare Lake Basin, Second 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.

34. The proposed Middle Basin is situated within the South Valley Floor Hydrologic Unit, in the Lake Sump Hydrologic Area 558.30 as depicted on interagency hydrologic maps prepared by the Department of Water Resources in August 1986. Pursuant to Chapter II of the Basin Plan, the beneficial uses of surface water for the Lake Sump Hydrologic Area include: agricultural supply; industrial process supply; industrial service supply; water contact recreation; non-contact water recreation; warm freshwater habitat; wildlife habitat; rare, threatened, or endangered species; and groundwater recharge.

35. The Middle Basin is in Detailed Analysis Unit (DAU) 241 within the Tulare Lake Basin hydrologic unit. The Basin Plan designates the beneficial uses of underlying groundwater as municipal and domestic supply; agricultural supply; and industrial service supply.

36. The Basin Plan establishes narrative water quality objectives for chemical constituents, tastes and odors, and toxicity in groundwater. The toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated 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.

37. In the absence of specific numerical water quality limits, objectives for receiving waters must be considered case-by-case. General salt tolerance guidelines, such as Water Quality for

Agriculture by Ayers and Westcot (1985)[1] and similar references indicate that yield reductions in nearly all crops are not evident when irrigation water has an EC less than 700 umhos/cm. It is, however possible to achieve full yield potential for a large variety of crops with waters having EC up to 3,000 umhos/cm if the proper leaching fraction is provided to maintain soil salinity within the tolerance of the crop.

38. 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 MCLs specified in Cal. Code Regs. 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. 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.

39. The Basin Plan identifies the greatest long-term problem facing the Tulare Lake Basin as the increase in salinity in groundwater, which has accelerated due to the intensive use of soil and water resources by irrigated agriculture. The Tulare Lake Bed is unique with its highly elevated salts in the soils and shallow groundwater due to natural conditions,

40. The Basin Plan includes criteria for granting exceptions to municipal and domestic supply designations based on the Sources of Drinking Water Policy. The Basin Plan also includes criteria for granting exceptions to the designation of beneficial uses for agricultural supply and industrial supply. Exceptions to the Sources of Drinking Water Policy are not self-implementing, but must be established in an amendment to the Basin Plan.

Title 27 of the California Code of Regulations

41. Cal. Code Regs. title 27 contains regulatory requirements for the treatment, storage, processing, and disposal of solid waste, which includes designated waste, as defined by Water Code section 13173. However, title 27 exempts certain activities from its provisions. Discharges regulated by this Order are exempt from title 27 pursuant to a provision that exempts wastewater under specific conditions. This exemption, found at title 27, section 20090, is described below:

(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 regional water quality control board has issued WDRs, reclamation requirements, or waived such issuance;

(2) The discharge is in compliance with the applicable water quality control plan; and

[1] Ayers, R.S., and Westcott, D.W., 1985, *Water Quality for Agriculture*: FAO Irrigation and Drainage Paper # 29 Rev 1, Food and Agricultural Organization of the United Nations. Available at: http://www.fao.org/docrep/003/t0234e/t0234E00.htm

(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 by this Order are exempted from the requirements of title 27 as follows:

    a. The discharge is agricultural wastewater placed into an evaporation pond.
        1) The Central Valley Water Board is issuing WDRs via this Order;
        2) The discharge is in compliance with the Basin Plan; and
        3) The subsurface agricultural drain water does not need to be managed as hazardous waste.

43. Although the facility is exempt from title 27, the statistical data analysis methods of title 27, 20415(e) are appropriate for determining whether the discharge complies with Groundwater Limitations specified in this Order. Intrawell comparision is necessary given the wide range of water quality exibited in the site monitoring wells and tile drainage sumps

State Water Board Resolution 88-63 (The Sources of Drinking Water Policy)

44. The Sources of Drinking Water Policy states that all surface waters and groundwaters of the state are considered to be suitable, or potentially suitable, for municipal or domestic water supply, except where the groundwater meets one or more of the criteria specified in the Basin Plan, including:

    a. The TDS exceeds 3,000 mg/L (5,000 micromhos per centimeter (umhos/cm) EC) and the aquifer cannot reasonably be expected by the Central Valley Water Board to supply a public water system;

    b. Both tile drainage sumps contained water that exceeded the Primary MCL value for selenium and the sump at the northwest corner of Section 24 exceeded Primary MCL values for aluminum and lead.

    c. The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day; or.

    d. The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 CFR, section 146.4. for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, section 261.3.

45. Current groundwater data show that the water quality in the site wells and in the two tile drainage sumps exceeds the Primary MCL values for arsenic, selenium, nitrate, and uranium and Secondary MCLs for conductivity, TDS, chloride and sulfate . There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best

Management Practices or best economically achievable treatment practices. Based upon current and historic groundwater data, the quality of the shallow groundwater beneath the proposed facility is insufficient to support the Tulare Lake Basin Plan, Municipal and Domestic Supply (MUN) beneficial use (uses of water for community, military, or individual water supply systems, including, but not limited to, drinking water supply).

State Anti-Degradation Policy (Resolution 68-16)

46. State Water Resources Control Board Resolution 68-16 ("Policy with Respect to Maintaining High Quality Waters of the State") (hereafter Resolution 68-16 or "Anti-Degradation Policy") prohibits degradation of groundwater unless it has been shown that:

    a. 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;

    b. The degradation will not unreasonably affect present and anticipated future beneficial uses;

    c. The discharger employs best practicable treatment or control (BPTC) to minimize degradation; and

    d. The degradation is consistent with the maximum benefit of the people of the State.

47. This Order places restrictions on the discharge of sub-surface agricultural drainwater into the Middle Basin that are intended to prevent pollution and nuisance conditions from occurring or persisting. Though the Board recognizes that degradation of high-quality groundwater may still occur pursuant to this Order, the implementation of laterial and vertical seepage control measures (perimeter and sub-surface drains) will limit the amount of degradation that will occur under this Order. Degradation will be limited so that discharges from the Middle Basin will not cause long-term impacts to beneficial uses of groundwater.

48. Consistent with the State Anti-Degradation Policy, this Order establishes requirements and standards that will result in the implementation of BPTC measures to limit the degradation caused by discharges from the Middle Basin. The following is a general description of what the Board considers to be BPTC for the Middle Basin construction and operation:

    a. Engineering drawings/plans must be prepared and signed by a California Registered Civil Engineer, or Engineering Geologist for the proposed ponds, control structures, and piping design. The submittal must include a seismic stability analysis of the final levee design.

    b. The Discharger must submit and implement a construction quality assurance/quality control plan (QA/QC Plan). The QA/QC Plan will describe the process of additional field review to be conducted at locations within the proposed pond bottoms where visual observation, test borings, and/or excavation pits indicate a significant presence of shallow sandy soil layers. Location specific analysis of these areas dictate whether it is

feasible to disk, regrade, and then compact the soil layer to reduce seepage losses versus removing and replacing it.

c. Levee construction (both perimeter and internal) will be performed using acceptable silt/clay fill material (per the QA/QC Plan) that is excavated from within ponds and placed in compacted lifts to the required levee height. Similar to the pond bottoms investigations, areas below the Middle Basin levees where the scarifying process identifies significant sandy intervals will be investigated to determine if it is feasible to disk, regrade, and then compact the soil layer to reduce seepage losses versus removing and replacing it.

d. The existing subsurface tile drainage system will be utilized to intercept vertical and horizontal seepage from the basin. The subsurface tile drainage lines will discharge into two pump sumps fitted with automated pumps with their discharge being directed back into the evaporation basin.

e. The Middle Basin will be operated using two pump stations for delivery of drainage water to the ponds. Drain water will flow by gravity from the existing Main Pipeline into the pump sumps and the drainage water would then be pumped to the respective delivery points. Inlet #1 will be the primary or normal delivery point. Inlet #2 will provide operational flexibility to allow drainage water to continue to be diverted into the north half of the Middle Basin if for any reason there is a desire or need to dewater Ponds 1, 2, or 3 for operational purposes or necessary maintenance work. The use of Inlet #2 will only occur for short periods of time, as necessary, to accommodate maintenance operations. It will not be routinely used to fill the last three ponds.

f. Flow meters will be installed to measure the drainage water discharged into the Middle Basin at both inlets and discharges from the tile drainage system. Inlet pump flow rate will be controlled to insure the ponds are kept above a minimum water depth of 2 feet up to a depth of approximately 5 feet with a required 2-foot freeboard.

g. Daily review of pump operations and pond water level elevations (staff gauges will be set in each pond) will verify if acceptable water depths are being maintained. Water depths less than 2 feet can encourage certain avian species to wade and feed on the invertebrate organisms within the ponds. A minimum depth of 2 feet is required to minimize this possibility.

49. This Order also contains closure requirements that specify that the Discharger must maintain coverage under this Order or a subsequent revision to this Order until all waste and waste impacted soil (including soil within the pond(s)), is disposed of or utilized in a manner that does not pose a threat to surface water or groundwater quality or create a condition of nuisance.

50. To assess compliance with the State Anti-Degradation Policy, this Order requires groundwater monitoring of first encounterd groundwater (the point in the aquifer where

typically detection of changes to groundwater quality, caused by the facility, would be first detected) and deeper groundwater (below first encountered) to monitor for the vertical migration of waste constituents. This Order also prohibits discharge of waste to surface waters and requires monitoring of any surface water discharge that does occur to ensure that it does not pose a threat to surface water or groundwater quality or create a condition of nuisance. The purpose of monitoring is to confirm that the discharges are effectively controlled by management practices and to evaluate compliance with this Order.

51. When a Regional Water Quality Control Board prescribes waste discharge requirements that will result in the degradation of high-quality waters, the State Anti-Degradation Policy requires that the Board first make a determination that the authorized degradation is consistent with the maximum benefit to the people of the State. Consistent with the evaluation contained in the Information Sheet and considering the economic significance of the Tulare Lake Bottom agricultural industry and the important role that the Tulare Lake Bottom agricultural industry plays in providing food and fiber supplies to the nation, the Central Valley Water Board finds that maintaining the Tulare Lake Bottom agricultural industry is consistent with the maximum benefit to the people of the state. To maintain the industry and to prevent the loss of jobs and the impacts to the local economy that might otherwise occur, some degradation to high quality waters must be allowed. However, this degradation will be limited by this Order so that there will not be long-term impacts to beneficial uses, thereby allowing the full utilization of the aquifer.

California Environmental Quality Act (CEQA)

52. In 2012, the District prepared and circulated a Mitigated Negative Declaration (MND) entitled "Construction and Operation of the Mid Evaporation Basin for Management and Disposal of Sub-Surface Agricultural Drainwater". A Notice of Determination and Final Document were filed with the State Clearinghouse (SCH #20121057) and the County of Kings on 22 May 2013.

53. Comments were received from the CDF&W, Region 4, and the Native American Heritage Commission. Both the California DFW (23 January 2013) and the Central Valley Water Board (9 May 2013) submitted late comments. Fish and Wildlife's comments were addressed in the final MND that was received at the State Clearinghouse on 22 May 2013 and a Notice of Determination filed on the same day. Central Valley Water Board staff comments regarding the MND have been incorporated into this Order.

GENERAL FINDINGS

54. This Order does not authorize violation of any federal, state, or local law or regulation.

55. As stated in Water Code section 13263(g), the discharge of waste into waters of the state is a privilege, not a right, and this Order does not create a vested right to continue the discharge of waste. Failure to prevent conditions that create or threaten to create pollution

or nuisance will be sufficient reason to modify, revoke, or enforce this Order, as well as prohibit further discharge.

56. In compliance with Water Code section106.3, 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.

57. This Order is not a National Pollutant Discharge Elimination System Permit issued pursuant to the Federal Clean Water Act. Coverage under this Order does not exempt a facility from the Clean Water Act. Any facility required to obtain such a permit must notify the Central Valley Water Board.

58. The Findings of this Order, supplemental information and details in the attached Information Sheet were considered in establishing the conditions of discharge.

59. In 2006, the Central Valley Water Board, the State Water Board, and Regional stakeholders began a joint effort to address salinity and nitrate problems in the region and adopt long-term solutions that will lead to enhanced water quality and economic sustainability. Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is a collaborative basin planning effort aimed at developing and implementing a comprehensive salinity and nitrate management program. The Central Valley Water Board intends to coordinate all such actions with the CV-SALTS initiative.

    The District and the Tulare Lake Basin Water Storage District are currently engaged in such an action with CV-SALTS (an evaluation of the MUN and AGR beneficial uses in the Tulare Lake Bottom area). The CEQA process is underway for the Basin Plan amendment for the de-designation of these beneficial uses from a segment of the groundwater beneath a portion of the Tulare Lake Bed. The de-designation of a beneficial use is a multipart process that involves a significant commitment of time and resources. Should such an effort prove successful, this Order can be amended in the future to reflect the de-designations and to implement any policies or requirements established by the Central Valley Water Board as a result of the CV-SALTS process.

Public Notice

60. All of the above and the supplemental information and details in the attached Information Sheet, which is incorporated herein, were considered in establishing the following conditions of discharge.

61. The Discharger and interested agencies and persons have been notified of the Central Valley Water Board's intent to issue this Order for discharges of wastes to the Middle Basin and the Board has provided them with an opportunity for a public hearing and an opportunity to submit written comments.

62. The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to the proposal to regulate discharges of wastes to the Middle Basin under this Order.

IT IS HEREBY ORDERED that, pursuant to Water Code section 13263, and 13267 and in order to meet the provisions contained in Division 7 of the California Water Code and regulations and policies adopted thereunder, the Tulare Lake Drainage District, its agents, successors, and assigns, in order to meet the provisions of the Water Code and regulations and policies adopted hereunder, shall comply with the following:

A. Prohibitions

1. The discharge of hazardous wastes, as that term is defined in California Code of Regulations, title 22, section 66261.1 et seq., is prohibited.
2. Discharge of wastewater in a manner or location other than that described herein or in the Report of Waste Discharge is prohibited.
3. The discharge of agricultural drainage water from the Middle Basin to surface waters or surface drainage courses is prohibited.
4. Except when authorized by a National Pollutant Discharge Elimination System (NPDES) permit, the direct or indirect discharge of storm water from the Middle Basin to surface waters is prohibited[a].

   a. Discharges of pollutants from the evaporation basin to waters of the United States may not lawfully occur except in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. NPDES permit coverage is not provided by this Order, but must be obtained separately.

5. Discharge of other than subsurface agricultural drainage water to the Middle Basin is prohibited.
6. Levees, earthen windbreaks or islands within any pond/cell that contains waste water are prohibited.
7. Tires, riprap, or other materials and artificial structures along any cell bank that could entrap young birds are prohibited.
8. Unless an emergency exists, construction, modification, and maintenance of levees and ponds and removal of vegetation is prohibited when active nesting is occurring. In event of emergency, the Discharger shall complete levee maintenance immediately and notify the Board and the CDF&W within 24 hours thereafter of the circumstances and action taken.
9. Soil borings or earthwork conducted in a manner that creates hydraulic continuity between the shallow aquifer and any underlying useable aquifer is prohibited.
10. Under this Order, the expansion of the Middle Basin beyond the design capacity identified in the 2012 ROWD for the Middle Basin (9,250 acre/foot) is prohibited [b].

b. Dischargers must submit a RWD, document compliance with CEQA, and be issued new or revised waste discharge requirements before any material facility expansion.

B. Discharge Specifications

1. The Middle Basin and its component ponds or cells shall be constructed and operated to maintain a minimum freeboard of 2 feet as recorded by permanent depth markers to be located within each cell, unless levees are certified in writing by a registered civil engineer or geotechnical engineer as structurally sound and capable of preventing overtopping at a specific lesser freeboard.

2. The Discharger shall operate and maintain the subsurface tile drainage system, and the associated sumps, piping, and automated pumps to minimize lateral and vertical seepage from the basin. The subsurface tile drains are considered Best Practicable Treatment or Control Measures and are herein designated as part of the Middle Basin.

3. The Discharger shall install and maintain flowmeters on all discharges into the Middle Basin (inflow from the main drain pipeline, tile drainage inflow, and perimeter drain inflow) in order to facilitate water balance calculations for the Middle Basin. Flowmeters must be capable of providing accurate flow measurements and be periodically calibrated per the manufactures' recommendation (maximum period between calibrations is to be one year unless a longer period is specified by the manufacture).

4. The Discharger shall prepare a ground surface topography map showing property lines, ground surface contours, and locations of all existing canals, pipelines, levees, drainage sumps, and the District Main Pipeline Outlet Structure.

5. The waste shall be contained within the Middle Basin's designated disposal ponds (cells) at all times. No waste constituent shall be released, discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of the Groundwater Limitations of this Order.

6. The collection, treatment, storage, discharge or disposal of wastes at the Middle Basin shall not cause a violation of water quality objectives or result in the creation of a condition of pollution or nuisance as defined by Water Code section 13050.

7. The discharge shall not cause or contribute to a condition of pollution or result in the loss of existing beneficial uses.

8. The Middle Basin shall be operated and maintained to prevent inundation or washout due to floods with up to a 100-year return period.

9. Weeds and aquatic plants shall be minimized through the control of water depth, harvesting, and/or herbicides.

10. When filling a cell, the Discharger shall employ all feasible measures to attain the required 2- foot minimum depth as quickly as feasible. If the drainage flows diminish and the pond

cannot be maintained at a depth of 2 feet, then the pond will be pumped dry with portable pumps until increased drainage flows occur and additional storage is needed.

11. Should nests be identified below the high water level of a cell, water levels in that cell shall be managed to the extent practicable to minimize flooding of eggs.

C. Groundwater Limitations

1. Discharge of waste at the Middle Basin shall not cause the underlying groundwater to exceed background levels or where specific constituents are below water quality objectives, to unreasonably affect beneficial uses, or cause a condition of pollution or nuisance. The appropriate water quality objectives are summarized in the Information Sheet, which is attached to and part of this Order, and can be found in the Central Valley Water Board's Water Quality Control Plan for the Tulare Lake Basin.

   a. Release of waste constituents from any portion of the Middle Basin shall not cause groundwater in any monitoring well to contain waste constituents in concentrations statistically greater than current groundwater quality.

   Compliance with these limitations shall be determined annually based on comparison of data for each well with the groundwater limitations using approved intra-well statistical methods.

D. Provisions

1. The Discharger shall comply with the Standard Provisions and Reporting Requirements for Waste Discharge Requirements, dated 1 March 1991 (Standard Provisions), which are part of this Order.

2. Prior to construction, the Discharger shall submit for Central Valley Water Board's Executive Officer for approval:

   a. Final engineering design drawings and construction details signed by a California Registered Civil Engineer or Registered Geotechnical Engineer for the pond levees, erosion control devices, pump stations, drainage sumps, regulating structures, inlet pipelines, and pipelines between basins.

   b. The Engineering design drawings and construction details signed by a California Registered Civil Engineer or Registered Geotechnical Engineer for construction of a perimeter drain system drain (size of piping, necessary pumps, sump size, depth installed, etc.) installed into first encountered groundwater below site grade around the entire footprint of the Middle Basin. The perimeter drain will be connected to a concrete floored drainage sump(s) that is fitted with an automated pumping system that will discharge back into only those Middle Basin cells that contain 2 feet or greater water depths.

c. A construction quality assurance/quality control plan (QA/QC Plan) that includes a description of the process for identifying and testing of soils to be used for levee construction (field identification, laboratory testing, or combination), the levee compaction testing method(s) and testing frequency, identification of barrow areas, and a description of the process used for certification of final grade, slope and elevations. The QA/QC Plan must also describe the process to be used for additional field review where visual observation, scarifying process, test borings, and/or excavation pits indicate a significant presence of shallow sandy soil layers and the testing methods used for determining whether it is feasible to disk, regrade, and then compact the suspect soil layer to reduce seepage losses versus removing and replacing it with acceptable silt/clay fill material.

3. Interior side slopes of all pond or cell levees at the Middle Basin shall be graded and maintained at slopes of 3:1 or steeper with sufficient top width to permit safe vehicular access around the perimeter of each pond or cell.

4. Prior to discharge of waste into the Middle Basin, the Discharger shall:

   a. Submit a plan for approval by the Central Valley Water Board Executive Officer for a groundwater quality monitoring system. The system shall be capable of monitoring first encountered groundwater beneath the perimeter of the proposed Middle Basin (all four sides) and include a related monitoring well system capable of assessing vertical migration of waste below the base elevation of the wells that monitor first encountered groundwater. Additional discussion regarding the components of the groundwater monitoring plan are provided in the attached MRP. Requirements for groundwater monitoring well workplans and installation are included as Attachment C, which is attached hereto and made part of this Order by reference;

   b. Install an approved groundwater quality monitoring system;

   c. Establish background groundwater quality for the monitoring system wells through the collection of a minimum of eight sampling events (minimum number of samples required to develop statistical values for inorganic constituents of concern); and

   d. Submit a report proposing background constituent levels to be used for the intra-well statistical evaluation.

5. The Discharger, in conjunction with the DFW and the United States Fish and Wildlife Service, prepared and agreed to protocols for avoidance (hazing) procedures and for assessing mitigation for unavoidable losses to breeding and non-breeding avian species (Wildlife Protocol) as a result of operations of the District's Middle Basin. The Wildlife Protocols are included as Attachment D, which is attached hereto and made part of this Order by reference. Additionally, the DFW has provided a Survey Methods document to provide guidance for biologists conducting waterbird usage surveys. The Survey Methods

are included as Attachment E, which is attached hereto and made part of this Order by reference.

6. 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 and submit a ROWD to the Central Valley Water Board to address the change.

7. The Discharger must 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. This Provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by the Discharger only when the operation is necessary to achieve compliance with the conditions of this Order.

8. The Wildlife Protocol(s) shall utilize all of the District's available wildlife monitoring data for the South Evaporation Basin and the Hacienda Evaporation Basin to assess numbers of avian species and predation rates and to determine the amount of alternative/mitigation habitat necessary to offset impacts to avian species.

9. Based on results of monitoring at the Middle Basin and Compensation Habitat, the DFW may request a review and redrafting of the Compensation Habitat protocols at a frequency of approximately every five years. The District will work collaboratively with the Central Valley Water Board and DFW staff to incorporate any changes into the Monitoring and Reporting Program and/or WDR if needed.

10. This Order is conditional upon the implementation of the Wildlife Protocols included herein as Attachment D and the District maintaining sufficient habitat to satisfy the required mitigation under the protocols.

11. **By (one year from adoption of this Order)**, the Discharger shall submit an adequate written technical report prepared by a qualified wildlife biologist assessing whether mitigation measures have been fully implemented and whether the measures, as implemented and perhaps modified to improve effectiveness, fully compensate for all existing and potential impacts on target species. The report shall be sufficiently comprehensive and statistically sound to determine whether complete mitigation has been, and can continue to be, achieved. The Board, after review of this report, may amend this Order to prohibit further discharge or modify mitigations.

12. Bird carcasses shall be burned or buried unless an unusual number (more than 15) is found in a 24-hour period. Upon finding an unusual amount, the DFW shall be notified at the Fresno office at (559) 243-4005 within 24 hours and a bird carcass shall, at the DFW's discretion, be held for diagnosis.

13. If a significant fish population develops within a cell(s), the Discharger shall implement a fish control and removal program.

14. Operation of the basin shall not cause violation of the Migratory Bird Treaty Act and California Fish and Game Codes 3503, 3503.5 and 3511.

15. Subject to prior notice, employees of the DFW and USFWS shall be granted access to the Middle Basin and mitigation habitat to the extent necessary to monitor compliance with mitigation measures specified in this Order.

16. This Order requires the Discharger to report any noncompliance that endangers human health or the environment, or any noncompliance with the Prohibitions contained in the Order within 24 hours of becoming aware of its occurrence.

17. Solids removed from the basins shall be disposed of in a manner that is consistent with title 27 and approved by the Executive Officer.

18. The Discharger shall properly destroy all abandoned wells, boreholes, and other potential vertical conduits within the footprint of the Middle Basin in accordance with the Department of Water Resources' Bulletin 74, Water Well Standards: State of California or the appropriate Kings County ordinance, whichever is more stringent.

19. The Discharger shall maintain all devices or designed features, installed in accordance with this Order, such that they continue to operate as intended without interruption.

20. In the event of any change in ownership or responsibility for construction or operation of the evaporation basin, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office.

21. To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of this Order a minimum of 120 days prior to the transfer. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, the name, address, and telephone number of the persons responsible for contact with the 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 of waste without requirements on the part of the new owner, a violation of the California Water Code. Transfer shall be approved or disapproved by the Executive Officer.

22. The Discharger shall develop and submit a complete Financial Assurance and Closure Plan (Closure Plan) with a schedule for decommissioning the drainage system and closing the evaporation basin. The Closure Plan shall assure fiscal capability to properly close the basins, and relocate any wastes disposed in violation of these requirements. The Closure Plan must include proposed drainage plans, grading plans, and disposal plans for the sediments containing elevated levels of minerals and trace elements per the requirements of title 27.

23. The Discharger shall develop and submit annually a drainage operation plan (Drainage Plan) to minimize drainage for the calendar year. The Discharger shall also submit annually a summary of the previous calendar year's actual water use and produced drainage water and evaluate it relative to the Drainage Plan prepared for that year and to goals set by San Joaquin Valley Drainage Program. The Drainage Plan and summary, at a minimum, shall include acreage of each crop type, amount of water to be applied per crop type, and the amount of drainage per acre of irrigated land.

24. 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 Dischargers shall submit a BPTC Evaluation Workplan that sets forth the scope and schedule for a systematic and comprehensive technical evaluation of each component of Middle Basin's waste containment system (berms, levees, perimeter drain, and subsurface drainage system) to determine best practicable treatment or control or best practices for each waste constituent that exceeds a Groundwater Limitation.

25. The Discharger shall comply with the attached Monitoring and Reporting Program R5-2015-XXXX, which is part of this Order, and any revisions thereto as ordered by the Central Valley Water Board or the Executive Officer.

26. Discharger shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements," dated 1 March 1991, which are attached hereto and by reference a part of this Order. This attachment and its individual paragraphs are commonly referenced as "Standard Provision(s)."

27. The Discharger must comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer. 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.

28. All technical reports and work plans required herein 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. As required by these laws, completed technical reports and work plans must bear the signature(s) and seal(s) of the registered professionals(s) in a manner such that all work can be clearly attributed to the professional responsible for the work. All reports required herein are required pursuant to Water Code section 13267.

29. The discharger shall permit representatives of the Central Valley Water Board and the State Water Resources Control Board, upon presentations of credentials, to:

    a. Enter premises where wastes are treated, stored, or disposed of and facilities in which any records are kept,

b. Copy any records required to be kept under terms and conditions of this Order,

c. Inspect at reasonable hours, monitoring equipment required by this Order, and

d. Sample, photograph and video tape any discharge, waste, waste management unit, or monitoring device.

30. The Board will review this Order periodically and revise requirements when necessary.

E. Permit Reopening, Revision, Revocation, And Re-Issuance

1. If more stringent applicable water quality standards are adopted in the Basin Plan, the Central Valley Water Board may revise and modify this Order in accordance with such standards.

2. This Order may be reopened to address any changes in state plans, policies, or regulations that would affect the water quality requirements for the discharges and as authorized by state law. This includes regulatory changes that may be brought about by the CV-SALTS planning efforts.

F. Required Reports And Notices

1. By **(6 months from adoption of this Order)**, the Discharger shall submit a Groundwater Limitations Compliance Assessment Plan. The plan shall describe and justify the statistical methods used to demonstrate compliance with the Groundwater Limitations of the Order for the constituents listed in the Monitoring and Reporting Program. Compliance shall be determined annually based on an intra-well statistical analysis described in title. 27, section 20415(e)(10) to compare monitoring data collected at each compliance well.

2. The Discharger shall annually, by **1 February**, submit
   a. A facility operations and maintenance plan,
   b. Financial Assurance and Closure Plan
   c. A Drainage Operation and Management Plan (Only if there have been significant changes in the operations or management).
   d. Annual Monitoring Reports

3. The Discharger shall notify the Central Valley Water Board immediately of any failure that threatens the integrity of containment or control features or structures at the basin.

G. Time Schedule for Compliance

1. The Discharger will have five (5) years from adoption of this Order to complete a Basin Plan Amendment for granting an exception to the Municipal and Domestic Supply beneficial use based on the *Sources of Drinking Water Policy*.

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 section13320 and California Code of Regulations, title 23, section 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.

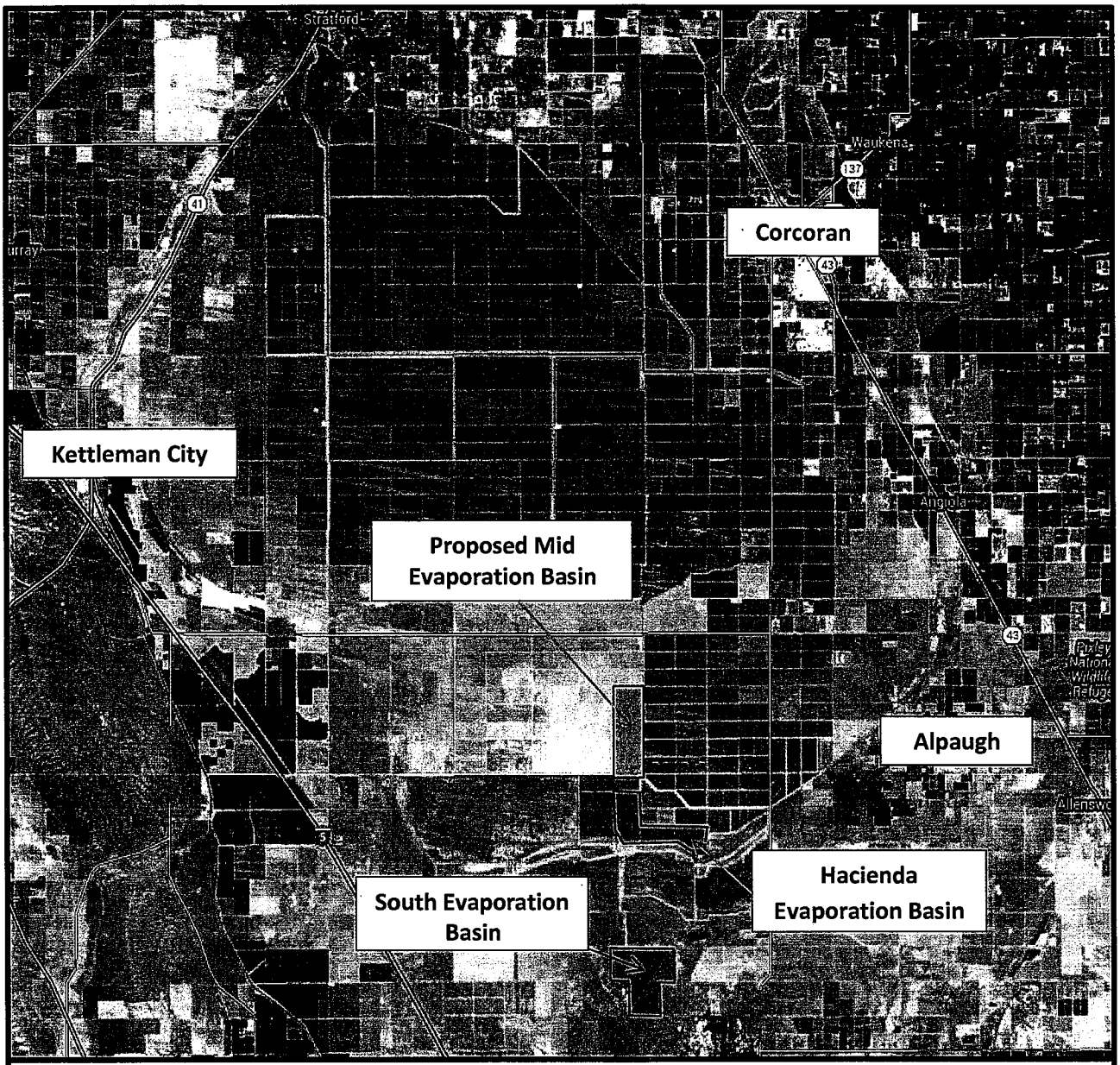
I, PAMELA C. CREEDON, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on XX XXXX 2014.

PAMELA C. CREEDON, Executive Officer

Order Attachments:

A Site Location Map
B Existing Subsurface Drainage System
C Requirements for Monitoring Well Installation Workplans and Monitoring Well Installation Reports
D Protocol for Assessing Mitigation for Unavoidable Losses to Non-breeding Birds as a Result of Operations of the TLDD Mid Evaporation Basin
E Survey Methods

Monitoring and Reporting Program R5-2015-XXXX
Information Sheet
Standard Provisions (1 March 1991)



SITE LOCATION MAP

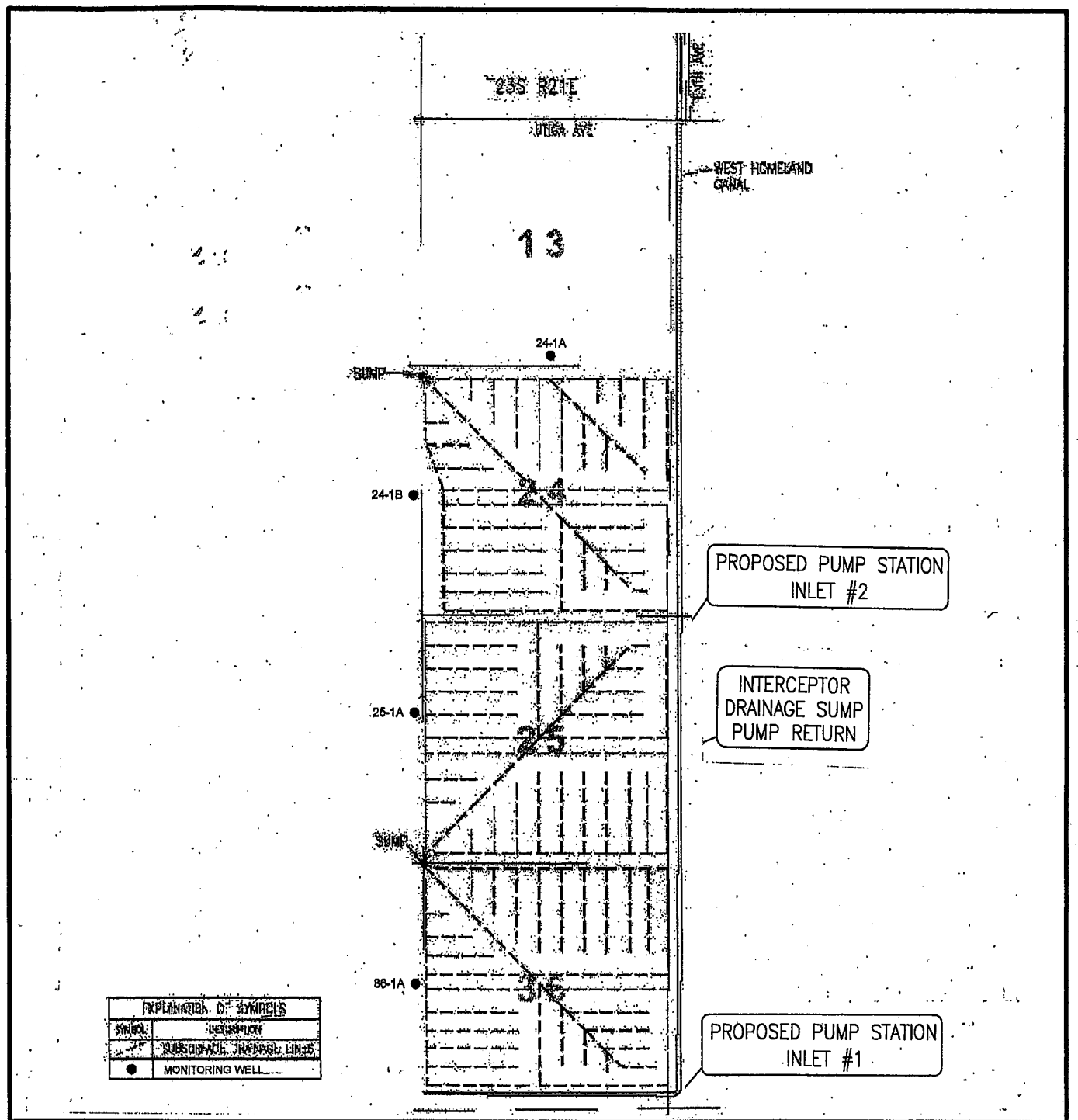
ORDER R5-2015-XXXX
WASTE DISCHARGE REQUIREMENTS

FOR
TULARE LAKE DRAINAGE DISTRICT
MID EVAPORATION BASIN

0 1 2 3 4 5
Approximate Scale in Miles

N
W E
S

ATTACHMENT A



EXISTING SUBSURFACE DRAINAGE SYSTEM

ORDER R5-2015-XXXX

WASTE DISCHARGE REQUIREMENTS

FOR

TULARE LAKE DRAINAGE DISTRICT, MID EVAPORATION BASIN

KINGS COUNTY

ATTACHMENT B

ATTACHMENT C

REQUIREMENTS FOR MONITORING WELL INSTALLATION WORKPLANS AND MONITORING WELL INSTALLATION REPORTS

Prior to installation of any additional groundwater monitoring wells, the Discharger shall submit an updated workplan containing, at a minimum, the information listed in Section 1, below. Wells may only be installed after Central Valley Water Board staff approves the workplan. Upon installation of the monitoring wells, the Discharger shall submit a well installation report which includes the information contained in Section 2, below. All workplans and reports must be prepared under the direction of, and signed by, a registered geologist or civil engineer licensed by the State of California.

SECTION 1 - Monitoring Well Installation Workplan and Groundwater Sampling and Analysis Plan

The monitoring well installation workplan shall contain the following minimum information:

A. General Information:
   A discussion of the purpose of the well installation project;
   A brief description of local geologic and hydrogeologic conditions;
   The proposed monitoring well locations and rationale for well locations;
   A topographic map showing facility location, roads, and surface water bodies; and
   A large scaled site map showing all existing on-site wells, proposed wells, surface drainage courses, surface water bodies, buildings, waste handling facilities, utilities, and major physical and man-made features.

B. Drilling Details:
   The person responsible for on-site supervision of drilling and well installation activities;
   A description of the drilling method/equipment and techniques to be used;
   A description of the equipment decontamination procedures to be used; and
   A description of the soil sampling methods to be used, the intervals sampled, and soil logging methods.

C. Monitoring Well Design (in narrative and/or graphic form) including:
   A diagram of the proposed well construction details;
   - Borehole diameter;
   - Casing and screen material, diameter, and centralizer spacing (if needed);
   - Type of well caps (bottom cap either screw on or secured with stainless steel screws);
   - Anticipated depth of well, length of well casing, and length and position of perforated interval;
   - Thickness, position and composition of surface seal, sanitary seal, and sand pack; and
   - Anticipated screen slot size and filter pack.

D. Well Development (not to be performed until at least 48 hours after sanitary seal placement):
   Method of development to be used (i.e., surge, bail, pump, etc.);
   Parameters to be monitored during development and record keeping technique;
   Method of determining when development is complete; and
   The method used to dispose development water.

E. Well Survey (precision of vertical survey data shall be at least 0.01 foot):
   Identify the Licensed Land Surveyor or Civil Engineer that will perform the survey;
   The datum used for survey measurements; and
   A discussion/list of well features to be surveyed (i.e. top of casing, horizontal and vertical coordinates, etc.).

F. Schedule for Completion of Work

G. Appendix: Groundwater Sampling and Analysis Plan (SAP)
   The Groundwater SAP shall be included as an appendix to the workplan, and 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 a detailed written description of standard operating procedures for the following:
   Equipment to be used during sampling;
   Equipment decontamination procedures;
   Water level measurement procedures;
   Well purging (include a discussion of procedures to follow if three casing volumes cannot be purged);
   Monitoring and record keeping during water level measurement and well purging (include copies of record keeping logs to be used);
   Purge water disposal;
   Analytical methods and required reporting limits;
   Sample containers and preservatives;
   Sampling;
   - General sampling techniques
   - Record keeping during sampling (include copies of record keeping logs to be used)
   - QA/QC samples

   Chain of Custody; and
   Sample handling and transport.

SECTION 2 - Monitoring Well Installation Completion Report

The monitoring well installation report must provide the information listed below. In addition, the report must also clearly identify, describe, and justify any deviations from the approved workplan.

A. General Information:
The purpose of the well installation project;
A Brief description of local geologic and hydrogeologic conditions encountered during installation of the wells;
The number of monitoring wells installed and copies of County Well Construction Permits;
A topographic map showing facility location, roads, and surface water bodies; and
A scaled site map showing all previously existing wells, newly installed wells, surface water bodies, buildings, waste handling facilities, utilities, and other major physical and man-made features.

B. Drilling Details (in narrative and/or graphic form) including:
The individual responsible for on-site supervision of drilling and well installation activities;
The drilling contractor and driller's name;
A description of drilling equipment and techniques used;
The equipment decontamination procedures used;
The soil sampling intervals and logging methods; and
Well boring logs depicting/describing:
- Well boring number and date drilled;
- Borehole diameter and total depth;
- Total depth of open hole (same as total depth drilled if no caving or back-grouting occurs);
- Depth to first encountered groundwater and stabilized groundwater depth;
- Detailed description of soils encountered, using the Unified Soil Classification System.

C. A description of the Well Construction Details (in narrative and/or graphic form):
A well construction diagram, including:
- Monitoring well number and date constructed;
- Casing and screen material, diameter, and centralizer spacing (if needed);
- Length of well casing, and length and position of perforated interval;
- Thickness, position and composition of surface seal, sanitary seal, and sand pack;
- Type of well caps (bottom cap slotted or not).

D. A description of the Well Development performed:
The date(s) of development and method(s) of development used;
How well development completion was determined;

ATTACHMENT D

Protocol for Assessing Mitigation for Unavoidable Losses to Non-breeding Birds as a Result of Operations of the TLDD Mid Evaporation Basin

Tulare Lake Drainage District
January 2014

The proposed TLDD Mid Evaporation Basin (MEB) would encompass an area of approximately 1,800-acres that has been in agricultural production for a century. Observation and wildlife monitoring at the existing TLDD South and Hacienda evaporation basins has shown relatively high number of waterbirds use the evaporation basins for foraging, resting and loafing, and for some species reproduction. Although a number of modifications and activities have been undertaken by TLDD over the past two decades to reduce and minimize bird use and potential risk of adverse effects at the evaporation basins substantial numbers of non-breeding waterbirds continue to seasonally inhabit the evaporation basins. Similar patterns of seasonal use of the proposed MEB by non-breeding water birds are expected. Operation of the MEB has the potential to attract and adversely affect non-breeding birds through:

- Reproductive impairment resulting from selenium (Se) exposure;
- Risk of predation;
- Risk of salt and selenium ingestion resulting in sublethal effects;
- Hazing disturbance resulting in increased energy expenditure;
- Risk of disease; and
- Risk of salt encrustation and handling stress.

As part of the California Environmental Quality Act (CEQA) and Regional Water Quality Control Board (Regional Board) permitting for the proposed MEB TLDD has committed to providing mitigation habitat for adverse effects to shorebirds. Mitigation for unavoidable impacts to shorebirds at the proposed MEB is included as a mitigation commitment in the Final Mitigated Negative Declaration certified by TLDD (State Clearing House No. 2012121057), prepared to comply with CEQA. Mitigation for shorebirds would occur at the TLDD Compensation Habitat (T21S R21E Section 3 South Half; Appendix A) and TLDD Winter Wetland Habitat (T21S R21S Section 3 North Half; Appendix A and B) as part of the Regional Board Waste Discharge Requirements (WDR) for the proposed project. A separate protocol has been developed for estimating mitigation of unavoidable losses to non-breeding shorebirds as

a consequence of MEB operations (compensation for nonbreeding shorebird impacts would be 77 acres of habitat at the TLDD Winter Wetland Habitat). The mitigation for unavoidable losses at the proposed MEB for avocets, stilts, and other breeding shorebirds outlined below would occur at the TLDD Compensation Habitat. The Compensation Habitat has been designed specifically to provide high quality habitat (e.g., large areas of open water, shallow water depths, high food production, nesting areas, etc.) for breeding shorebirds (Appendix A). The Compensation Habitat has been in operation since 1995 providing approximately 307 acres of open shallow water and nesting habitat during the late winter-summer (late February-August). The WDR for the TLDD South and Hacienda evaporation basins requires 207 acres of habitat for breeding waterbirds at the Compensation Habitat.

Under the proposed project TLDD would commit and be obligated to operate an additional 3.6 acres of habitat at the Compensation Habitat (the total acres of habitat required by the WDRs is 210.6 acres out of the 307 acre Compensation Habitat) to compensate for effects of MEB operations in accordance with the conditions outlined below and included in the WDR for the MEB. Figure 1 shows the locations of the TLDD proposed project, Compensation Habitat, and Winter Waterfowl Habitat.

In addition to providing shorebird habitat as part of the proposed MEB project, TLDD has also committed to implement a number of avoidance and minimization measures to reduce the potential for adverse effects to breeding shorebirds. Despite implementation of these avoidance measures it is anticipated that unavoidable effects on breeding shorebirds may result from operations of the MEB. To mitigate for these potential adverse effects to breeding birds the following protocol has been developed to identify the mitigation habitat that would be required to compensate for unavoidable effects.

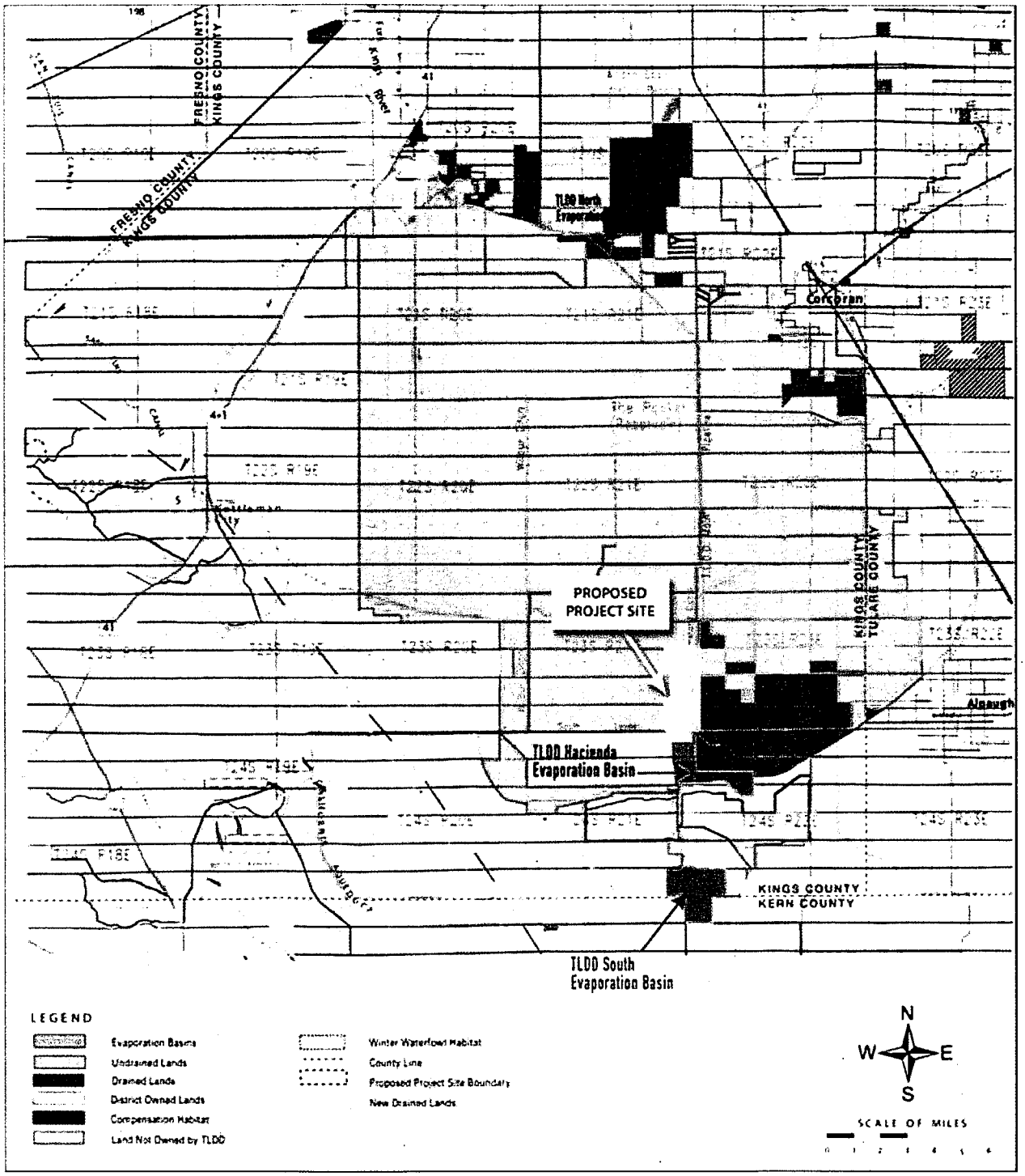


Figure 1. Tulare Lake Drainage District service area boundaries showing the location of the Proposed MEB, TLDD Compensation Habitat, and Winter Waterfowl Habitat.

Compensation Habitat Design

To offset potential unavoidable impacts to nesting shorebirds from use of the proposed MEB, and in compliance with the WDR for its other evaporation basins, TLDD operates a Compensation Wetland Habitat to offset impacts on nesting shorebird species (American avocet and black-necked stilt) resulting from existing and proposed evaporation basin operations. The Compensation Wetland Habitat is flooded during the nesting season (late February -August). The seasonal Compensation Wetland Habitat has been designed to mitigate for unavoidable losses to nesting shorebirds resulting from evaporation basin operations. TLDD constructed the 307 acres of wetland habitat to insure adequate compensation for unavoidable losses to shorebirds as a result of operation of the South and Hacienda evaporation basins. The habitat is to the east of the North Evaporation Basin (Figure 1). The habitat was established on property that had been farmed since the early 1900's. As part of compensating for unavoidable losses of nesting shorebirds as a result of operations and maintenance of the MEB, TLDD will commit to allocating acreage at the Compensation Habitat to mitigate impacts at the MEB.

The area of Compensation Habitat required by the Regional Board for the existing TLDD evaporation basins (South and Hacienda ponds) was originally calculated using a protocol, data and assumptions developed by Hanson (1993) as presented in the 1993 TLDD technical report. Based on results of compensation habitat calculations presented in the 1993 technical report, which were considered to be conservative, the TLDD WDR required construction and operation of a 207-acre Compensation Habitat. TLDD subsequently voluntarily constructed a seasonal wetland habitat totaling 307 acres, specifically designed and managed to provide nesting and foraging habitat for American avocet and black-necked stilts. The Compensation Wetland Habitat initiated operations in 1995. The entire 307 acre area within the Compensation Habitat has been flooded for use as breeding and foraging habitat every spring since 1995 when it was constructed. The Compensation Habitat includes low-profile lanes immediately adjacent to extensive shallow-water areas that support macroinvertebrate production and provide extensive foraging habitat. Each lane has a gentle sloping shoreline, with 12:1 slope, to encourage shorebird foraging and nesting. The Compensation Habitat is operated to maintain a water depth of 4 to 6 inches, the preferred foraging water depth for shorebirds.

The Compensation Habitat was designed specifically to provide foraging and nesting habitat for American avocets and black-necked stilts. General guidelines for developing foraging and nesting habitat included a wetted foraging area to nest area ratio of approximately two to one and a preferred foraging water depth of four to six inches with a high level of invertebrate production. Studies indicated avocets and stilts prefer a gradually sloped shoreline to a more abrupt shoreline. American avocet and black-necked stilts inhabit saline areas where production and abundance of macroinvertebrate prey species is high.

The Compensation Habitat has been designed to use a variety of alternative water supply sources. Distribution and control structures have been included to allow for the

use of freshwater, low selenium saline drainage water, or a blend of freshwater and saline waters. The selection of a water supply or a blending between supplies is based, in part, upon selenium concentrations within drainage water sources. Water quality samples are collected to monitor selenium concentrations and electrical conductivity when drainage water is being used. Monitoring results are used to manage water quality conditions within the Compensation Habitat within acceptable limits.

The Compensation Habitat has a flow-through design with no terminal ponding. This allows a constant flow of water through the system, thereby reducing the impact of evaporation on water quality. The entire habitat can also be flushed seasonally on an as-needed basis.

Predation of eggs and chicks was also considered in the design of the Compensation Habitat. The primary predator of concern is the coyote, although raccoon, opossum, skunk, and badger are also known predators in the area. The Compensation Habitat is completely surrounded by an electrified predator-exclusion fence. The primary predator of concern in the area is the coyote, although raccoon, opossum, snakes, various avian predators, skunk, and badger are also known predators in the area. Although fencing does not inhibit predation from birds, it does inhibit larger mammalian predators. Results of the biological monitoring program indicate that predation losses at the Compensation Habitat were very low. The average predation loss over the period from 2004 through 2014 was 8.4%.

The 307-acre Compensation Habitat has been operated in 1996-2015 in accordance with the design criteria established to provide maximum effective shallow-water foraging areas and suitable nesting habitat. The water supply for the Compensation Habitat has been provided exclusively by suitable (see criteria below) agricultural drainage water. The water supply to the Compensation Habitat was routinely monitored at the inlet and at various locations within the Compensation Habitat for both waterborne selenium concentrations and electrical conductance.

Biological monitoring is performed at the Compensation Habitat each year to assess bird use, nesting, and nesting success. High densities of nesting avocets and stilts have been documented each year (TLDD 2012; Davis *et al.,* 2008). High rates of nesting success (hatching) and low rates of predation and other sources of mortality have also been documented (TLDD 2012; Davis *et al.,* 2008).

Compensation Habitat Water Supplies

The development of wetland habitat within the southern San Joaquin Valley to mitigate for adverse effects on shorebirds, particularly species such as American avocet and blacknecked stilt, has been constrained by the availability of a reliable water supply source. Many of the shorebird species of interest inhabit coastal marine areas. Macroinvertebrates, which provide the forage base for many of these species, also occur in relatively high abundance in saline waters. Based on these and other considerations, saline agricultural drainage water, having low selenium concentrations,

has been used by TLDD as a water supply source for the wetland habitat. Saline drainwater has been used as the sole water supply source for the TLDD Compensation Wetland Habitat since 1999. The WDR issued for TLDD evaporation basin operations and Compensation Habitat permitted the use of low-selenium saline drainwater as a water supply for the Compensation Habitat. The WDR identifies selenium criteria for water use at the Compensation Habitat as having a geometric mean selenium concentration of 2.7 □g/L or less (based on six consecutive samples) with no single sample exceeding 3.5 □g/L. TLDD routinely monitors selenium, arsenic, and boron concentrations monthly (April-June) in the water supply to the Compensation Habitat during the spring and summer period of operation. During the late summer, fall, and winter the habitat is dry and TLDD conducts vegetation control and other maintenance at the Compensation Habitat. Results of egg selenium and embryo condition at the TLDD Compensation Habitat provide information on the relationship between water quality meeting the WDR selenium criteria and selenium in eggs of American avocet and black-necked stilts. The TLDD Compensation Habitat has been operated using lowselenium water supplies for breeding shorebirds for a number of years. The geometric mean egg selenium concentration and embryo condition from previous monitoring as reported in the TLDD annual compliance reports and the evaluation of the Compensation Habitat performance (Appendix A) are summarized below.

Geometric Mean Egg Se Concentrations ug/g dry weight	Waterborne Se Concentration Geometric Mean ug/L	Waterborne Se Concentration Min ug/L	Waterborne Se Concentration Max ug/L	American Avocet	Blacknecked Stilt
1995	1.1	<0.05	23.0[a]	5.3	4.1
1996	0.9	<0.05	3.0	2.7	3.1
1997	1.4	<0.05	3.3	3.0	3.5
1998	2.0	1.2	4.2	2.8	2.4
1999	1.2	0.7	2.7	2.0	5.1
2000	1.4	1.2	1.8	2.0	2.4
2001	1.9	<0.05	3.2	2.7	2.2
2002	2.0	1.3	3.0	2.2	2.3
2003	1.2	0.8	1.9	4.5	3.0
2004	1.6	1.4	2.2	2.7	2.5
2005	0.9	<0.5	1.0	2.13	2.65
2006	1.3	0.5	2.2	2.54	
2007	0.9	0.5	1.2	2.49	
2008	2.2	1.8	2.6	2.95	2.69
2009	2.2	1.7	2.9	4.62	3.75
2010	1.4	1.2	1.6	2.39	3.58
2011	1.2	1.2	1.3	2.35	
2012	0.7	<0.5	1.4	1.04	1.16
2013	0.8	<0.5	1.5	2.04	3.17
Geometric Mean				2.60	2.84

a. Based on other data the maximum recorded in 1995 appears to be a sampling error.

The water quality criteria included in the WDR for Compensation Habitat water supplies were developed through discussions with the Regional Board, US Fish and Wildlife

Service, and California Department of Fish and Wildlife. Annual monitoring of egg selenium concentrations and embryo condition for evidence of terrata at the Compensation Habitat described in Davis et al. (2008) and TLDD annual monitoring reports has shown no adverse impacts to nesting shorebirds as a result of operating the Compensation Habitat in accordance with these water quality criteria.

Protocol of Assessing Mitigation for Mid-Evaporation Basin Impacts to Breeding Shorebirds

Various approaches have been proposed for calculating compensation habitat required to mitigate for unavoidable shorebird losses as a result of evaporation basin operations (Hanson 1993; USFWS 1995; Hanson 1995). Data collected at the existing TLDD evaporation basins on water quality, shorebird abundance, nesting and nest fate, and the relative habitat utility and use between evaporation basins and TLDD Compensation Habitat provide empirical information useful in the calculation of compensation habitat to mitigate unavoidable losses to breeding birds for the proposed MEB. Information collected in compliance with monitoring requirements of the existing TLDD WDR have been used to update and refine assumptions regarding the performance of avoidance actions in reducing the risks of adverse effects on shorebirds at the South and Hacienda evaporation basins as well as the performance of the TLDD Compensation Habitat in attracting birds and providing suitable habitat for breeding birds. Information from biological monitoring at the existing evaporation basins (1999-2013) and Compensation Habitat over the period from 1995 through 2013 have been used to develop the proposed mitigation protocol. Current monitoring data at the evaporation basins reflects the implementation of avoidance measures and modifications to the facilities as required by the existing TLDD WDR, which also represent the design criteria for construction and operation of the proposed MEB.

The mitigation protocol for breeding birds uses monitoring data presented in the TLDD annual monitoring reports for the 1996-2011 period on breeding bird counts at the Hacienda Evaporation Basin, located approximately 2 miles from the proposed MEB, to estimate the average density (number of birds per acre) of nest attempts at the evaporation basin during the April-July nest monitoring period. The average density of avocet and stilt nests observed at the evaporation basin is then multiplied by the acreage of the proposed MEB (1800 acres) to estimate the number of avocet and stilt nests that would be expected at the MEB. Estimates and assumptions were then developed to assess the potential losses or adverse sublethal effects on breeding avocets and stilts associated with the potential impact mechanisms resulting from operations and maintenance of the MEB. Based on the instantaneous estimated losses or sublethal effects to breeding birds at the proposed evaporation basin, and the average density of breeding avocet and stilt nests estimated from nest surveys at the TLDD Compensation Habitat reflecting the habitat utility of the managed wetland for breeding birds, an estimate was calculated of the wetland habitat area (acres of suitable habitat) that would be required to compensate for the estimated adverse effects to breeding avocets and stilts resulting from MEB operations. The basis for the key assumptions used in developing the protocol are briefly discussed below.

Selenium Exposure

Information on the effects of dietary exposure to elevated selenium concentrations within an evaporation basin on stilt and avocet reproductive impairment used in the mitigation protocols was developed by USFWS. The relationships developed by USFWS were included in the 1995 USFWS Henwise and Eggwise model calculations and subsequently in the Hanson 1995 protocol. Results of more recent investigations and analyses of the relationship between selenium exposure and reproductive impairment in shorebirds have been developed by Adams *et al.* (1998, 2000), Fairbrother *et al.* (1999, 2000) and Ohlendorf (2003). Results of these more recent investigations have shown that threshold levels of selenium resulting in reproductive impairment are substantially higher than the levels originally estimated by USFWS. The higher selenium thresholds for reproductive impairment established in the recent scientific literature would result in a reduction in the risk of adverse impacts to shorebird reproductive success at the proposed MEB when compared to that estimated using the 1995 USFWS assumptions. For purposes of this mitigation assessment the more conservative selenium thresholds for reproductive impairment developed by USFWS (1995) have been used to calculate a worst-case scenario for estimating habitat requirements at the Compensation Habitat to mitigate for unavoidable impacts to shorebird nesting and reproduction at the proposed evaporation basin.

Predation

The MEB is anticipated to attract shorebirds resulting in a local increase in bird abundance at the evaporation basin. Increased abundance of shorebirds at the basin is expected to result in attraction and increased abundance of terrestrial and avian predators (e.g., raptors). The incremental effect of shorebird attraction to an evaporation basin on the increased risk of predation mortality has not been quantified. Predation by raptors on breeding shorebirds has, however, been observed at other TLDD evaporation basins. As part of developing the 1995 TLDD compensation habitat protocol for reproducing stilts and avocets it was assumed that predation mortality would be 5%. Predation mortality at the TLDD evaporation basins has been high (typically over 50% or more) on shorebird eggs and chicks by predators such as raccoon, coyotes, skunks, snakes, and other terrestrial predators. Predation mortality at the TLDD Compensation Habitat was reduced substantially (typically to 5% or less) by use of an electrified fence that surrounds the habitat and effectively excludes ground-based predators. Breeding shorebirds have the ability to actively avoid predators thereby reducing predation risk, especially when compared to non-mobile eggs and chicks that showed evidence of high predation levels at the evaporation basins in the past. In the absence of additional information on the increased risk of predation on breeding shorebirds at the proposed MEB 21% level of effect was assumed in the protocol.

Salt Ingestion

Agricultural drainage water is characterized by elevated concentrations of salts. As a result of evaporation, salt concentrations increase within individual basin cells, reaching highest concentrations, which may be hypersaline (e.g., having salt concentrations greater than seawater), in the terminal evaporation basin cells. Concern has been expressed regarding the potential for adverse effects on shorebirds resulting from salt ingestion or salt encrustation (CH2M Hill *et al.* 1993; Euliss *et al.* 1989; Barnum 1992; Gordus *et al.* 2002).

Exposure of shorebirds to high salinity has been documented to have adverse effects on shorebirds (CH2M Hill *et al.* 1993, Gordus *et al.* 2002). Ingestion of highly saline water can cause elevated sodium levels within the brain, reduced growth rates, and higher mortality of ducklings (Mitcham and Wobeser 1988, Swanson *et al.* 1994 in CH2M Hill *et al.* 1993). Gordus *et al.* (2002) also observed high sodium concentrations in ruddy ducks found dead within an evaporation basin. Reduced growth rates associated with exposure to high salinity levels have been documented for mallard ducklings (Mitcham and Wobeser 1988), a species found more often in freshwater environments than in saline habitats; similar studies have not been conducted for avian species that typically use saline environments for a portion of their life cycles (e.g., eared grebes, snowy plovers).

Lethal and sublethal effects on breeding birds from salt ingestion at the TLDD evaporation basins have not been documented, but the potential for impacts exists given the high levels of salinity anticipated to occur in the terminal cells of the proposed MEB evaporation basin. Water salinity (EC) levels in the terminal cells of the South and Hacienda Evaporation Basins have been greater than levels identified by CH2M Hill *et al.* (1993) to cause lethal and sublethal effects on ducklings. As a result of water management practices, salinities vary substantially among individual cells within an evaporation basin. Therefore, ducklings and other shorebirds could be exposed to a wide range of salinity conditions from brackish water to hypersaline, depending upon their exposure to an individual cell. Because of the close proximity among evaporation basin cells at the proposed MEB, shorebirds have the opportunity to readily move from one pond cell to another, thereby having the potential to avoid adverse salinity conditions and/or dilute the effects of adverse salinity by preferentially moving to cells having lower salt concentrations. Water conveyance and supply canals (e.g., West Homeland Canal) also exist within the immediate vicinity of the proposed MEB cells, providing additional opportunities for shorebirds to utilize lower saline waters when compared to the hypersaline conditions observed in evaporation basin terminal cells where the risk of salt ingestion impacts are greatest. Observations made during wildlife abundance and nest surveys have shown that waterfowl may move from higher salinity cells to lower salinity areas within an evaporation basin in response to hazing activity and/or habitat preference. Movement of shorebirds from hypersaline cells to areas of lower salinity serves to reduce the potential for adverse impacts associated with salt ingestion.

Hazing Disturbance

In addition to structural and operational modifications to the evaporation basins, TLDD conducts intensive hazing at both the South and Hacienda evaporation basins. The hazing program has been modified and improved based upon results of biological monitoring used to evaluate the success of the hazing effort each year. The hazing program is focused on reducing shorebird foraging and nesting during early spring and summer. The hazing program includes the use of all-terrain vehicles (ATV) and cracker shells to facilitate hazing within both the South and Hacienda evaporation basins from perimeter and interior levees. To augment hazing, TLDD uses foil reflector tape on stakes placed at approximately 10-15 foot intervals in areas of observed pre-nesting and nesting attempt activities at both the South and Hacienda evaporation basins. TLDD also uses portable propane cannons to augment the basic hazing program. Hazing and maintenance activities shall not be conducted within 50 feet of any active nest, with the exception of those activities on the top of the basin levees, which can be conducted within 15 feet of any active nest.

Hazing using a variety of methods outlined above will be used as part of standard operations at the MEB.

Hazing activities are included as a routine measure to avoid, reduce and minimize shorebird use of the TLDD evaporation basins and are included in the operations of the MEB. There is also some disturbance due to operation and maintenance activities on the ponds. Although hazing contributes to reduced bird abundance and potential exposure of shorebirds to adverse effects, hazing also results in disturbance of birds resulting in increased energy expenditure and potentially sublethal effects to health and fitness. Hazing and increased shorebird movement may also contribute to increased risk of predation as birds move from one area to another. No data are available, however, to quantify the sublethal effects of hazing activity on health or condition of shorebirds or increased predation risk. For purposes of estimating a hazing effect it was assumed that each individual bird present at the MEB would be disrupted and experience increased energy expenditure over a period of 30 minutes within a 24 hour day. Based on the assumed level of potential effect the protocol includes a 2% level of effect on breeding shorebirds as a result of hazing activity.

Disease

Shorebirds using the TLDD evaporation basins, and other water bodies in the San Joaquin Valley, have the potential to transmit and be adversely affected by diseases such as avian cholera and botulism. The risk of disease transmission and infection is increased in areas where the density of shorebirds is greatest. As part of routine hazing and maintenance activities at the South and Hacienda evaporation basins, observations are made of the occurrence of dead or dying birds as a result of disease. TLDD routinely accesses the evaporation basins year-round using a variety of methods such as tractors and four-wheel drive vehicles ("gators") during periods when the soils are wet and slick. As part of accessing the evaporation basin to check water levels, control

gates, perform maintenance activities, and monitor basin water quality and groundwater depths and quality as required by the WDR observations are also made of locations, abundance, occurrence of sick or dead shorebirds, etc. These observations have shown that the frequency and magnitude of dead birds at the evaporation basins is very low in comparison to bird abundance. In recognition of a low level of disease outbreaks the protocol assumes that disease would adversely affect 0.2% of the birds present at the proposed MEB. The estimated level of disease effect (0.2%) represents an average loss of 15 shorebirds per year which is greater than the number of dead or dying shorebirds observed at the existing TLDD evaporation basins.

Compensation Habitat Estimates

Compensation habitat required to mitigate for unavoidable evaporation basin losses to blacknecked stilt and American avocet has been estimated for the proposed MEB using the protocol included in the TLDD 1993 EIR (Hanson 1993), the U.S. Fish and Wildlife Service Henwise and Eggwise protocols (USFWS 1995), and the modified protocol developed by Hanson (1995) as updated to reflect results of current biological monitoring at the existing evaporation basins and Compensation Habitat. As noted above, the conservative assumptions regarding the relationship between selenium exposure and reproductive impairment developed by USFWS (1995) have been used in the calculations to reflect the worst-case conditions. These different analyses yield different compensation requirements; for purposes of mitigation, TLDD has performed the various analyses and will implement mitigation based on the analysis that yields the highest mitigation requirement. Results of calculating compensation habitat requirements using each of these alternative methods, based on data from recent surveys, are summarized below.

Compensation Habitat based on 1993 EIR Compensation Protocol

As part of the TLDD technical report prepared in 1993, a protocol was developed and used for calculating compensation habitat (Hanson 1993). The protocol includes consideration of the anticipated numbers of American avocet and black-necked stilt nests at the proposed evaporation basin based on results of recent monitoring at the TLDD Hacienda Evaporation Basin (nesting is assumed to be proportional to evaporation basin surface area and design and implementation of the same facilities and avoidance measures at the proposed basin as required under the current WDR), an assumed safety factor (assumed to be 50%) to account for undetected nests during nesting surveys (the safety factor was used to avoid underestimating total nesting activity at the basin), reductions in nest exposure attributable to mitigation actions implemented at the MEB, losses of shorebirds associated with exposure to elevated selenium concentrations (reproductive impairment), losses due to predation, and losses due to nest flooding to calculate an estimate of the total number of unavoidable nest losses resulting from proposed evaporation basin operations. For purposes of this analysis, it has been assumed that nesting at the existing Hacienda Evaporation Basin after modifications in 1995 (1996-2011) would be representative of the nesting and vulnerability of shorebirds to adverse impacts at the proposed evaporation basin.

Results of nest monitoring at the existing Compensation Habitat (1996-2011) have been used to estimate performance of the mitigation facility to calculate the compensation habitat required to mitigate for unavoidable losses at the proposed evaporation basin.

Results of these calculations are summarized in Tables 1 and 2, using the average number of nests observed at the Hacienda Evaporation Basins (mean 13 nests from 1996-2011) and the more conservative estimate (worst-case condition) based on the highest observed nesting between 1996 and 2011 (65 nests in 1996), respectively. Based on the ratio of existing evaporation size (1,110 acres) and the area of the proposed evaporation basin (1,800 acres at the proposed MEB) the projected number of nests at the proposed facility is 21 nests based on the average density and 105 nests based on the 1996 peak density. The estimated compensation habitat required to mitigate for unavoidable losses to American avocet and black-necked stilts as a result of operation and exposure to water quality constituents at the proposed TLDD evaporation basin was 0.4 acres, based on results of 1996-2011 average (Table 1) surveys, and 3.0 acres based on results of the 1996 surveys (Table 2).

Table 1. Avocet and stilt Compensation Habitat calculation based on the 1993 EIR protocol as revised using the *average* number of nests observed from 1996- 2011.

LOSSES DUE TO REPRODUCTIVE IMPAIRMENT	AVERAGE NESTING
Nest Attempts (Predicted)	21
Total Estimated Nests	32
Nests Subject to Reproductive Impairment (13%)[1]	5
Predation Loss (21%)	(1)
Unavoidable Loss	4
Losses Due to Flooding/Vehicles (2%)	0
Combined Loss (nests)	4

1. Based on USFWS (1995) Henwise egg selenium impairment (0.781 x 0.17) = 0.13. See discussion above regarding selenium thresholds assumed in these analyses. Reproductive impairment was estimated based on the proportion of randomly sampled eggs collected from the South and Hacienda Evaporation Basins between 1995 and 2001 (insufficient numbers of nests have occurred in later years to assess egg selenium concentrations) having selenium concentrations ranging from 5.1 to 20 ppm as outlined in the USFWS protocol.

1996-2011 average number of nests hatched and presumed hatched at the TLDD Compensation Habitat = 3,271 nests.

3,271 nests/307 acres = 10.66 nests/acres
4 nests lost/10.66 nests/acre = 0.4 acres

Table 2. Avocet and stilt Compensation Habitat calculation based on the 1993 EIR protocol and the *highest* observed nesting at the Hacienda Evaporation Basin, 1996-2011.

LOSSES DUE TO REPRODUCTIVE IMPAIRMENT	1996 NESTING
Nest Attempts (Predicted)	105
Total Estimated Nests	158
Nests Subject to Reproductive Impairment (13%)[1]	21
Predation Loss (21%)	(4)

LOSSES DUE TO REPRODUCTIVE IMPAIRMENT	1996 NESTING
Unavoidable Loss	17
Losses Due to Flooding/Vehicles (2%)	0
Combined Loss (nests)	17

1. Based on USFWS (1995) Henwise egg selenium impairment (0.781 x 0.17) = 0.13. See discussion above regarding selenium thresholds assumed in these analyses

The 1996 nest fates classified as hatched and presumed hatched at the TLDD Compensation
Habitat = 1,771 nests.

1,771 nests/307 acres = 5.77 nests/acres
17 nests lost/5.77 nests/acre = 3.0 acres

Compensation Habitat based on U.S. Fish and Wildlife Service Henwise Basis

The U.S. Fish and Wildlife Service (1995) developed a proposed protocol for calculating compensation habitat using the following equations:

$$CC = HU * [(F1 * L1) + (F2 * L2) + (F3 * L3) + (F4 * L4) + (F5 * L5)]$$

Where:

CC = compensation coefficient = the multiple of an evaporation basin's acreage that, on average, would be required in predominantly shallow wetland acreage to replace lost production;

F1 = the proportion of randomly sampled eggs containing 0 to 5 ppm selenium;

F2 = the proportion of randomly sampled eggs containing 5.1 to 20 ppm selenium;

F3 = the proportion of randomly sampled eggs containing 21 to 40 ppm selenium;

F4 = the proportion of randomly sampled eggs containing 41 to 70 ppm selenium;

F5 = the proportion of randomly sampled eggs containing 71 or more ppm selenium;

L1 = proportion of production lost when egg contamination is from 0 to 5 ppm selenium (L1 = 0.0 from USFWS 1995);

L2 = proportion of production lost when egg contamination is from 5.1 to 20 ppm selenium (L2 = 0.17 from USFWS 1995);

L3 = proportion of production lost when egg contamination is from 21 to 40 ppm selenium (L3 - 0.26 from USFWS 1995);

L4 = proportion of production lost when egg contamination is from 41 to 70 ppm selenium (L4 = 0.52 from USFWS 1995);

L5 = proportion of production lost when egg contamination is 71 or more ppm selenium (L5 = 0.93 from USFWS 1995);

HU = the relative habitat utility for evaporation basins.

Results of the calculation of compensation habitat using data collected at the evaporation basins and Compensation Habitat during 1996-2011 are presented in Table 3. The resulting estimate of habitat to compensate for unavoidable losses at the proposed MEB using the USFWS Henwise method is 2.3 acres.

Table 3. Calculation of TLDD Compensation Habitat using the USFWS (1995) Henwise protocol and 1996-2011 monitoring data.

CC = HU * [(F1 x L1) + (F2 + L2)]
Where: F1 = 0.135(1) F2 = 0.781(1) L1 = 0 (2) L2 = 0.17 (2) HU = 0.01(3))
Then: CC = 0.01 [(0.135 * 0) + (0.781 * 0.17)] = 0.0013
Compensation habitat = (1,800 acres at the proposed TLDD evaporation basin)*(0.0013) = 2.3 acres

Notes:
(1) Selenium data is from 1995-2001 egg sampling at the South and Hacienda Evaporation Basins since an insufficient number of nests have been detected at the South and Hacienda Evaporation Basins in recent years to assess egg selenium concentrations;
(2) From USFWS 1995 (See discussion above regarding selenium thresholds assumed in these analyses); and
(3) HU was calculated based on the average stilt and avocet nesting predicted on the proposed TLDD evaporation basin (32 nests from Table 2-8) and the average nesting in 1996-2011 at the Compensation Habitat (3,271 nests).

Compensation Habitat based on U.S. Fish and Wildlife Service Eggwise Basis

The U.S. Fish and Wildlife Service (1995) has proposed an alternative protocol for calculating compensation habitat, using the following equation:

$$CC = HU * [(F1 * L1) + (F2 * L2)]$$

Where:

CC = compensation coefficient = the multiple of an evaporation basin's acreage that, on average, would be required in predominantly shallow wetland acreage to replace lost production;

F1 = the weighted proportion of randomly sampled eggs containing 3.9 to 9.9 ppm selenium;

F2 = the weighted proportion of randomly sampled eggs containing 10 or more ppm selenium;

L1 = proportion of production lost when egg contamination is from 3.9 to 9.9 ppm selenium
(L1 = 0.10 from USFWS 1995);

L2 = proportion of production lost when egg contamination is 10 ppm selenium or more
(L2 = 0.30 from USFWS 1995); and

HU = The relative habitat utility of evaporation basins.

Results of the Eggwise calculation of compensation habitat, using data collected from the evaporation basins during 1996-2011 (after the majority of actions had been implemented at the Hacienda Evaporation Basin to reduce shorebird usage) are summarized in Table 4. The estimated habitat required to compensate for unavoidable losses at the proposed MEB using the USFWS Eggwise Protocol is 3.6 acres.

Table 4. Calculation of TLDD Compensation Habitat using the USFWS Eggwise Protocol and 1996-2011 monitoring data.

CC = HU [(F1 * L1) + (F2 * L2)]
Where: F1 = 0.406(1) F2 = 0.531(1) L1 = 0.10(2) L2 = 0.30 (2) HU = 0.01(3)) Then: CC = 0.01 [(0.406 * 0.1) + (0.531 * 0.3)] = 0.002 Compensation habitat = (1,800 acres at the proposed TLDD evaporation basin)*(0.002) = 3.6 acres

Notes:

(1) Selenium data is from 1995-2001 egg sampling at the South and Hacienda Evaporation Basins since an insufficient number of nests have been detected at the South and Hacienda Evaporation Basins in recent years to assess egg selenium concentrations;

(2) From USFWS 1995 (See discussion above regarding selenium thresholds assumed in these analyses); and

(3) HU was calculated based on the average stilt and avocet nesting predicted to nest at the proposed TLDD evaporation basin (32 nests from Table 2-8) and the average nesting in 1996 - 2011 at the Compensation Habitat (3,271 nests).

Compensation Habitat based on 1995 Compensation Protocol

The protocol developed and presented in the 1993 EIR was revised in 1995 to reflect the availability of new information and to address issues and concerns in the assumptions and application of the 1993 protocol. The revised protocol (Hanson 1995) combined approaches from the 1993 TLDD technical report, and the compensation protocols developed by the U.S. Fish and Wildlife Service (1995). The 1995 protocol also refined assumptions and relationships regarding factors such as predation mortality on shorebird nests, water level fluctuations, maintenance activity, and biological observer disruption as factors affecting nesting and nest success at the evaporation basins. The revised protocol relied on the numbers of American avocet and black-necked stilts observed in nest surveys at the South and Hacienda evaporation basins, a risk of reproductive impairment based on exposure to selenium as determined by the relative proportion of eggs sampled from the population at the evaporation basins having different concentrations of selenium (see discussion above regarding selenium thresholds assumed in these analyses), a 21% loss resulting from predation, and a 75% effectiveness of mitigation measures implemented at the evaporation basins in reducing exposure of shorebirds to adverse effects (since the proposed evaporation basin has been designed and will be operated to meet the avoidance criteria outlined in the current WDR the effectiveness is reflected in the nesting data for the Hacienda Evaporation Basin after modification and no further adjustment to the compensation calculation is needed). Nest flooding and maintenance vehicle losses were also considered as part of the calculation of unavoidable impacts. The equation used for calculating compensation habitat is:

Unavoidable nest loss = (number of nests predicted at the proposed MEB) ((F1 x L1) + (F2 x L2) + (F3 x L3) + (F4 x L4) + (F5 x L5)) x (1 - effectiveness of site-specific actions)/(1 – predation loss), where:

> *F* and *L* are described in the U.S. Fish and Wildlife Service (1995) Henwise Basis for calculating compensation habitat.

Then:

> Compensation habitat acres = number of unavoidable nest losses predicted at the proposed evaporation basins/nest density observed at the TLDD Compensation Habitat.

Based on these calculations (Table 5), using results of the 1996-2011 average nesting, the estimated acreage of compensation habitat for the proposed TLDD evaporation basin is 0.5 acres. Assuming nesting abundance of 105 nests, based on results of the 1996 surveys (worstcase condition), the estimated Compensation Habitat requirement is 3.0 acres.

Table 5. Alternative protocol for calculating Compensation Habitat requirements (Hanson 1995) based on 1996-2011 monitoring data.

Nest Loss = (Number nests predicted at the proposed evaporation basin)[(F1 x L1) + (F2 + L2) + (F3 + L3) + (F4 + L4) + (F5 + L5)] (1-effectiveness of site actions) / (1-predation loss)

Where:

Number of nests = 21[(1)]

F1 = 0.33[(2)]
F2 = 0.67
F3 = 0
F4 = 0
F5 = 0
L1 = 0
L2 = 0.17
L3 = 0.26
L4 = 0.52
L5 = 0.93

Predation loss at the MEB is assumed to be 21% based on nest fate monitoring at the South and Hacienda Evaporation Basins. Effectiveness of actions is assumed to be 0 since all measures are anticipated to be implemented as part of the proposed evaporation basin design and construction.

Then:

Nest loss = (21 nests)[(0.33 x 0)+ (0.67 x 0.26)] (1.0) / (0.79) = 4.6 nests (assume 5 nests)

Based on the 1996-2011 Compensation Habitat (hatched/presumed hatched) nesting density of 10.66 nests/acre, the Compensation Habitat requirement is:

Compensation Habitat (acres) = 5 nests/10.66 nests/acre = 0.5 acres

Assuming 105 nests based on 1996 results at the evaporation basins (Table 2-9) and Compensation Habitat, the compensation habitat requirement would be 17 nests/5.77 nests/acre = 3.0 acres

Notes:
(1) Predicted nests at the proposed MEB is based on the average density of stilt and avocet nests observed at the Hacienda Evaporation Basin in 1996-2011 assuming the MEB has a surface area of 1,800 acres.
(2) *F* and *L* are calculated using the USFWS (1995) Henwise Protocol. See discussion above regarding selenium thresholds assumed in these analyses

Summary of Compensation Habitat Estimates

Four separate protocols were used to estimate the compensation habitat required to mitigate for unavoidable impacts to nesting shorebirds as a result of operation of the proposed MEB. The protocols were originally developed as part of the 1993 site-specific technical report for TLDD evaporation operations by Hanson and subsequently updated and refined in 1995, and by the USFWS in 1995 for application to evaporation basins within the San Joaquin Valley. The four protocols were used to assess habitat requirements to compensate for unavoidable losses at the MEB based on a proportional

estimate of the average nest densities at the Hacienda Evaporation Basin (closest evaporation basin location to the proposed MEB) over the period 1996-2011 and for a worst-case condition based on the peak density of nesting shorebirds (1996). Results of the estimates of compensation habitat for the MEB are summarized below:

Estimated compensation habitat acres for nesting shorebirds:

Protocol	Acreage based on 1996-2005 average density	Acreage based on the 1997 peak density	Acreage based on egg selenium concentration
1993 Hanson Protocol	0.4	3.0	
1995 USFWS Henwise Protocol			2.3
1995 USFWS Eggwise Protocol			3.6
1995 Hanson Revised Protocol	0.5	3.0	

Based on results of the compensation habitat calculations presented above, it was concluded that 3.6 acres of habitat would need to be dedicated at the existing TLDD Compensation Habitat to mitigate for unavoidable impacts to shorebirds associated with operation of the proposed evaporation basin. The 3.6 acre habitat estimate was chosen as the compensation requirement since it represents the highest (most conservative) estimate for the MEB using any of the available protocols. TLDD has also developed and operates a winter waterfowl habitat that will further contribute habitat in the area. Based on the formulation of the mitigation protocol for breeding birds as a result of MEB operations it was estimated that the mitigation habitat requirement would total 3.6 acres of suitable wetland habitat for shorebirds in addition to the current compensation requirement of 207 acres for compensation of effects of South and Hacienda evaporation basin operations at the TLDD Compensation Habitat. The wetland habitat would be operated to provide a minimum of 210.6 acres (based on the current requirement of 207 acres to compensate for effects of South and Hacienda evaporation basin operations and 3.6 acres to compensate for MEB operations) of habitat during the seasonal period of greatest abundance of breeding shorebirds extending from late February through August each year. The habitat may be dewatered during the fall and winter months (September-early February) for maintenance and vegetation control. As with the existing TLDD evaporation maintenance activities best management practices would be employed to avoid impacts of maintenance activity on birds and nests that may occur adjacent to the Compensation Habitat. As part of future monitoring, shorebird abundance surveys would be routinely conducted at the MEB as currently required for the South and Hacienda evaporation basins, and at the Compensation Habitat, to further assess the performance of the mitigation measure in providing suitable habitat for breeding shorebirds to offset potential unavoidable effects of MEB operations. Nest surveys at the MEB and Compensation Habitat will be conducted at least every other week from April through July. In addition, if new nests are observed by field biologists when conducting the bird surveys, those nests shall be flagged and included in the nest survey counts.

Performance Review

TLDD routinely conducts annual monitoring of bird abundance and species composition, nesting, and nest fate monitoring at the evaporation basins and Compensation Habitat. Water quality sampling for electrical conductivity, selenium concentrations, and other constituents in compliance with monitoring requirements of the WDR is also performed. TLDD anticipates that the WDR issued for the MEB will also require wildlife and water quality monitoring that will be reported in quarterly and annual reports. The annual monitoring reports will be provided to the Regional Board and California Department of Fish and Wildlife for review. The compensation protocols presented above are based on results of water selenium concentrations, avocet and stilt abundance, nest fate, and egg selenium concentrations from the TLDD South and Hacienda Evaporation Basins and Compensation Habitat. For purposes of estimating compensation habitat for breeding stilts and avocets at the MEB the protocols assume that selenium concentrations in the South and Hacienda Evaporation Basins water and waterbird eggs is representative of selenium exposure in the MEB. As part of monitoring at the MEB water quality samples will be collected for selenium analysis monthly from April through June and up to five each of stilt and /avocets eggs if available (for a maximum of ten total eggs) will be collected each year for egg selenium analysis. Results of these collections will be compared to the South and Hacienda basin results in each annual monitoring report. In addition, the annual monitoring reports for the MEB will also re-calculate compensation habitat using each of the protocols outlined above. The annual monitoring reports will be distributed to both CDFW and the Regional Board for review. In the event that monitoring results at the MEB show greater impacts to breeding birds than those estimated above, the MEB compensation habitat requirement will be revised accordingly and additional minimization and avoidance actions may be implemented by TLDD to reduce unavoidable impacts to breeding waterbirds.

Based on results of monitoring at the MEB and Compensation Habitat, CDFW may request a review of the Compensation Habitat protocols at a frequency of approximately every five years. TLDD will work collaboratively with the Regional Board and CDFW staff to incorporate these any changes into the WDR monitoring and reporting program and/or WDR if needed.

ATTACHMENT E

SURVEY METHODS

Waterbird Usage: Bird Surveys

Bird surveys will be conducted by field biologists with experience and training in conducting surveys for ground nesting avian species at the evaporation basins, Compensation Habitat, and Winter Waterfowl Habitat. All surveys will be conducted between sunrise and sunset. Levee routes, locations of survey points, and data forms will be standardized. Field data forms will be divided into columns for each cell in the MEB and each lane at the Compensation Habitat. Observers, using 20X-60X spotting scopes and 8X-10X binoculars, will identify all birds to species when possible. Some grouping categories (dabbling duck species, Western/Least sandpiper, dowitcher species, gull species, etc.) will be used when species identification is not possible.

A survey of the Compensation Habitat requires that a vehicle with one observer who will record the data, drives up the east side of the Compensation Habitat with the early morning sun shining from behind the observer as they look west across the habitat. The observer will stop the vehicle at the end of the lane; using the vehicle as a blind, counts will be made of the birds on the lane and in the adjacent channel on the north side of the lane. The observer will use a tripod-mounted spotting scope and binoculars to locate, identify, and tally all of the birds seen on the eastern half of the one-mile long lane. When the lane has been counted from the east observation point, the process will be repeated from the west when the angle of the rising sun allows for clear viewing and accurate color differentiation. All data will be recorded and tallied.

All waterbirds and land birds (terrestrial upland species) will be recorded on survey data sheets. This includes individuals that are nesting, foraging (on, in, or over), roosting, or loafing on MEB cells, and at the edges of the levees that surround them.

Selenium Exposure and Contamination: Egg Selenium Concentrations and Condition of Collected Embryos

Compensation Habitat

A total of five American avocet (*Recurvirostra americana*) five black-necked stilt (*Himantopus mexicanus*) eggs (if available, for a total of ten eggs) will be collected from the MEB and five additional eggs will be collected from the Compensation Habitat each year (typically in June). The geometric mean selenium concentration for the ten MEB recurvirostrid embryos will be calculated (dry wt.). The embryo age will be estimated and their condition described (e.g., alive, normal, too young to determine condition, etc.).

The eggs will be analyzed for embryological abnormalities (avian teratogenesis) by a qualified laboratory (e.g., South Dakota Agricultural Laboratories). Data on embryological abnormalities will be compiled and summarized in the TLDD quarterly and annual compliance monitoring reports and submitted to the Regional Board and California Department of Fish and Wildlife.

Nesting Activity and Success: Semi-monthly (April through July) Nest Monitoring Surveys

Semi-monthly nest monitoring surveys will be conducted by field biologists at the MEB and Compensation Habitat. Before conducting any nest surveys, observers will review the latest bird count data (from the previous surveys) to determine where the majority of activity by potential breeding species is taking place. Observers will also regularly consult with hazers at the MEB for current information about centers of nesting activity and locations of potential nest starts.

A stratified sampling design will be used for conducting water bird nesting surveys at the MEB. Nesting surveys at the MEB will include (1) specific levee areas to be surveyed by the observer traveling by vehicle during each of the scheduled surveys. The observer will stops at set points on all levees and exposed channel margins to observe sitting birds, then they will proceed to drive all levees on the MEB; (2) surveys conducted within specific areas of the MEB where results of previous abundance monitoring or observations during hazing suggest that potential accumulations of birds and nesting activity may be occurring; and (3) reaches of interior and exterior levees randomly selected for nesting observations during each scheduled survey. At the MEB all levees will be selected for inclusion in nest monitoring during the initial survey. Nest surveys will be conducted, to the extent possible, during morning and evening hours to reduce the potential effects to nesting birds and incubating eggs as a result of survey activities.

Nest monitoring at the Compensation Habitat will be done consistently during each survey on one selected lane. As with previous surveys, each individual nest observed will be flagged and nest fate for the sub-sampled population monitored using established protocol and criteria developed in previous TLDD nest fate surveys. The modifications to nest monitoring were developed in 1998 and have been refined in more recent years in an effort to reduce disturbance of nesting water birds at the Compensation Habitat, while continuing to provide estimates of the species composition and numbers of nesting birds, in addition to estimates of nest fate. Results of the subsampled nest monitoring at the Compensation Habitat will then be expanded to account for the area of the habitat actually surveyed in developing estimates of the total numbers of American avocet, black-necked stilts, and other birds nesting at the Compensation Habitat.

Estimates of nesting water birds at the Compensation Habitat will be further modified to account for potential nest survey bias using Mayfield corrections based upon results of

nest fate monitoring, and nest survey frequency. Mayfield adjustments will also be made for MEB survey results if a sufficient number of nests are detected.

During nest surveys, the trained observer will search for nest cups and eggs of stilt, avocet, snowy plover, killdeer, duck, grebes, coots, terns, mourning dove, horned lark, blackbirds, and other species. During each nest monitoring visit at the Compensation Habitat, the entire width of the selected lane will be walked in such a way that the maximum number of detectable nests will be discovered and the nests will be subsequently rechecked on any survey visit thereafter. Observers will vary the direction of lane checks and levee surveys in order to provide a varied perspective for nest discovery. When nests are located, a color-coded wire pin flag will be placed approximately two feet from the nest (yellow for stilt, orange for avocet, and blue for other species). Each flag will be numbered to identify a given nest. At the MEB, cell number, nest strata (such as interior levee, windbreak, etc.), and nest location grid numbers will be recorded. Lane number and position on the lane will be recorded for nests at the Compensation Habitat. At the Compensation Habitat, most nests are relatively easy to find early in the nest season (April through May). Despite the application of pre-emergent herbicides prior to the breeding season, annual weedy vegetation may be dense in some areas by June and especially in July, making it difficult to discover new nests and to relocate old ones. Weed and vegetation control at the MEB however, is expected to be extremely effective, further reducing the risk that nests at the evaporation basin are not detected in these surveys.

When a clutch hatches or when it is determined that eggs are abandoned, the identifying flag will not be removed, but rather will be "retired"; it will be angled into the ground to signify the location of a previously active nest. This will be done to determine when new nests are established in old cups. In addition to the location of nests, observations will be recorded during each survey regarding the fate of eggs and chicks when possible.

The field biologist will use the following criteria for classifying nest fates. Nests classified as "hatched" will be those where (1) live chicks were seen in the nest cup or (2) a clean empty cup with no signs of disturbance or predation was seen subsequent to a nest check where pipping eggs were observed. Nests classified as "presumed hatched" will be those where a full clutch of eggs (3-4 eggs) had been recorded on one or more field surveys but for which no pipping or chicks were seen prior to finding a clean, empty nest cup (with no signs of disturbance or predation).

Nests classified as "abandoned" will be those where one to four eggs were laid in a cup but were no longer being incubated. Evidence for abandonment will be either (1) incomplete clutch (only one or two eggs present in cup six or more days after first egg was found in a cup) or (2) eggs no longer being tended. Abandoned eggs may be cold or extremely hot when touched, sunburned (bleached pale above with darkest colored markings beneath because eggs are not being turned regularly), or else they will be stuck to the substrate or covered with spider silk (both are additional signs that eggs are no longer being turned). Untended nests (eggs and the soil in the cup) are often dry on

hot days when active nests in the area are being kept damp with water brought to the nest site in the soaked breast feathers of a sitting bird. Whenever an egg is first presumed to be abandoned, a single line inside a circle will be drawn on the uppermost surface of the egg with a permanent marker pen. If, on a subsequent visit, the egg(s) had not been turned by a sitting bird, the mark will be changed to an "X" inside a circle and the nest will then be classified as abandoned. Any clutches that are classified as abandoned will be additionally classified as "abandoned unknown", since an accurate determination of the cause (the agent) of the abandonment cannot be made with certainty. For example, whether a sitting bird abandoned its nest because it was killed at an unknown location by a predator, affected by a severe weather event, or disturbed by the presence and activities of the survey crew (observer impact), there would be no visible signs at the nest to make a reliable determination of the agent of abandonment.

Nests classified as "lost" are those, which during the time period of a normal incubation cycle (21-24 days) are simply unable to be physically relocated. As with all newly discovered nests, a colorcoded pin flag will be placed approximately two feet from the nest and its position will be accurately described on a data sheet. On the following visit(s) if the nest itself is not found because the flag has been destroyed (a few tear off in strong winds leaving only a thin, nearly invisible wire) or because the flag is obscured by growing vegetation, the observer will do his or her best to locate the nest cup by referring to the location notes on the data sheet. If it simply cannot be relocated, such a nest will be classified as "lost".

Most nests classified as fate "unknown" on the evaporation basin will be those which had three to four eggs on an initial visit but are found empty on a subsequent visit with no clear sign of whether the eggs hatched (usually only tiny chips of egg shell from hatched eggs remain in the cup since large pieces of shell from hatched eggs are removed by adult birds) or were taken by a predator. In nests with "unknown" fates the nest cup (and its associated soil, plant stem, and clam shell decorations) are still intact, no large shell fragments or damaged eggs are present in the nest vicinity, and there is no sign of yolk in or just outside of the nest cup). Nests at the MEB and at the Compensation Habitat will also be classified as fate "unknown" if the nest cup contains a full clutch (three to four eggs) but does not show any clear signs of being abandoned (since these clutches could be abandoned or may be past term/nonviable).

Nests classified as fate "destroyed/predator" will be those where a clutch with anywhere from one to four (or occasionally more) eggs shows clear signs of damage by mammal or bird predators. Damage may be (1) whole eggs cracked open with large shell fragments present and yolk either licked clean or spilled about the nest cup (typical of mammal predation), (2) whole eggs with puncture entries and some yolk in the nest vicinity (typical of the damage left by the beaks of gulls, ravens, or herons), or (3) extensive physical disturbance of the nest cup (nest construction material usually strewn about) and yolk either in the nest cup or in close proximity to the cup (spilled yolk often "glues" together bits of soil and organic matter used by adults to camouflage the nest cup).

Nests classified as fate "destroyed/flooding" will be those where (1) the nest cup, at a land-water interface, is inundated or saturated with water and wet eggs are still in the cup or are floating nearby, (2) where a nest is inundated but the eggs are absent (having presumably floated away) before the clutch was due to hatch, or (3) where a very muddy clutch, is present near the water's edge when revisited and does not hatch.

Nests classified as "destroyed/Levee slump" will be those which (1) had been located on a wave-cut "beach terrace" at the toe of a steep levee which is subsequently weakened by wave action and falls on the nest or (2) had been located at the "cliff-top" edge of a steep levee and is subsequently undermined by wave action, dropping the nest and/or eggs to the beach below.

Nests classified as "destroyed/observer" will be those where an observer either dropped or stepped on an egg(s).

Nests classified as "destroyed/unknown" will be those where none of the eggs in a full clutch hatched but where (1) one or more eggs exhibited non-predatory damage to the shell or (2) chicks began to pip but died before hatching. In such a case it is difficult to know whether the presence of a predator, a combination of extreme heat and absent or inattentive parents or simply exhausted or otherwise compromised chicks may have resulted in the destroyed clutch.

Nests classified as "past-term/nonviable" will be those with a full clutch (three to four eggs) that are still being actively tended (eggs are being turned regularly and/or are being kept wet) by an adult bird beyond the normal incubation period (usually well beyond 24 days). These birds may be inexperienced or naive first-year parents, they may be tending infertile eggs, which fail to elicit the proper incubation terminating behavior of the adult, or other unknown factors may be involved. In most cases where a nest is classified as "past-term/nonviable" an adult is usually clearly in attendance and exhibits typical distraction display behavior.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM R5-2015-XXXX
FOR
TULARE LAKE DRAINAGE DISTRICT MID EVAPORATION BASIN
KINGS COUNTY

I. Introduction

This Monitoring and Reporting Program (MRP) is issued pursuant to California Water Code (CWC) Section 13267 that authorizes the California Regional Water Quality Control Board, Central Valley Region (hereafter Central Valley Water Board), to require preparation and submittal of technical and monitoring reports.

This MRP establishes specific surface and groundwater monitoring and reporting requirements for the Tulare Lake Drainage District's (District or Discharger) operation of the Mid Evaporation Basin (Middle Basin) in accordance with Waste Discharge Requirements, Order R5-2015-XXXX. The requirements of this MRP are necessary to monitor Discharger compliance with the provisions of the Order and determine whether state waters accepting discharges from the District are meeting water quality objectives. The MRP Order establishes specific surface water monitoring (visual observations, drain water, groundwater, basin, and sediment), reporting, and electronic data deliverable requirements for the Discharger that are required to determine compliance with the limitations set in the Order.

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. Changes to sample location shall be established with concurrence of Central Valley Water Board staff, and a description of the revised stations shall be submitted for approval by the Executive Officer. All samples should be representative of the volume and nature of the discharge or matrix of material sampled. The time, date, and location of each sample shall be recorded on the sample chain-of-custody form. The results of analyses performed in accordance with specified test procedures, taken more frequently than required at the locations specified in this MRP, shall be reported to the Central Valley Water Board and used in determining compliance.

The Discharger shall conduct monitoring, record-keeping, and reporting as specified below.

II. General Provisions

Monitoring data collected to meet the requirements of the Order must be collected and analyzed in a manner that assures the quality of the data. All technical reports required by this MRP must be submitted electronically in a format specified by the Central Valley Water Board that is reasonably available to the Discharger. Field test instruments (such as pH) may be used provided that:

1. The operator is trained in the proper use of the instrument;

2. The instruments are calibrated prior to each use;

3. 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 this MRP.

Each laboratory report shall clearly identify the following:

1. Analytical method;

2. Constituent analyzed with measured value or concentration;

3. Units;

4. Method detection limit (MDL);

5. Reporting limit (RL) (i.e., a practical quantitation limit or PQL);

6. Documentation of cation/anion balance for general minerals analysis of supply water and groundwater samples.

All laboratory results shall be reported down to the MDL. Non-detect results shall be reported as less than the MDL (<MDL). Results above the MDL, but below the concentration of the lowest calibration standard for multipoint calibration methods or below the reporting limit for other methods, shall be flagged as estimated. Analytical procedures shall comply with the methods and holding times specified in: Methods for Chemical Analysis of Water and Wastes (EPA-600/4-79-020, 1983); Methods for Determination of Inorganic Substances in Environmental Samples (EPA/600/R-93/100, 1993); Standard Methods for the Examination of Water and Wastewater, 20th Edition (WEF, APHA, AWWA); and Soil, Plant and Water Reference Methods for the Western Region, 2003, 2nd Edition (hereafter Western Region Methods).

III. Monitoring Requirements

A. General Monitoring Requirements

1. Dischargers must follow sampling and analytical procedures approved by the Executive Officer. Sample collection and analytical procedure requirements are included in Tables 1 through 5 below.

2. If conditions are not safe for sampling, the Discharger must provide documentation on why samples could not be collected and analyzed (e.g., photo documentation, flow measurements/estimates). For example, the Discharger may be unable to collect samples during dangerous weather conditions. However, once the dangerous

conditions have passed, the Discharger shall collect a sample of the discharge or, if the discharge has ceased, from the next discharge event.

3. The Discharger shall use clean sample containers and sample handling, storage, and preservation methods that are accepted or recommended by the selected analytical laboratory or, as appropriate, in accordance with approved United States Environmental Protection Agency analytical methods.

4. All samples collected shall be representative of the volume and nature of the material being sampled.

5. All sample containers shall be labeled with a unique identifier (e.g., basin/cell number or well number) and records maintained to show the time and date of collection as well as the person collecting the sample, the sample location, and method of sample collection and preservation.

6. The Discharger shall ensure that all sample analyses are conducted by a laboratory certified for such analyses by the California Department of Public Health. The laboratory analyses shall be conducted in accordance with Title 40 Code of Federal Regulations Part 136 (*Guidelines Establishing Test Procedures for the Analysis of Pollutants*) or other test methods approved by the Executive Officer.

7. All samples collected for laboratory analyses shall be preserved and submitted to the laboratory within the required holding time appropriate for the analytical method used and the constituents analyzed.

8. All instruments and devices used by the Discharger for the monitoring program shall be properly maintained and shall be calibrated as recommended by the manufacturer to ensure their continued accuracy.

9. All samples submitted to a laboratory for analyses shall be identified in a properly completed and signed Chain-of-Custody form that must be obtained prior to sample collection from the analytical laboratory to be used.

10. All surface monitoring locations and monitoring wells must be identified with a unique identification (name/number) for the purposes of sample identification and data interpretation.

B. Visual Monitoring

The Discharger shall conduct daily visual inspections of the areas/features listed below to ensure that the Order's required conditions are being met and that monitoring equipment is properly functioning. A record of the inspections shall be generated and the records maintained per the requirements specified in section IV below.

1. Basin/cell water levels as measured by permanent staff gauges located within each cell. If the drainage flows diminish and the basin cannot be maintained at a minimum depth of 2 feet, then the basin will be pumped dry with portable pumps until increased drainage flows occur and additional storage is needed.

2. Identify that subsurface drainage system sumps, piping, and automated pumps used to minimize lateral and vertical seepage from the basin are operational.

3. Identify that flowmeters on all discharges into the Middle Basin including inflow from the main drain pipeline and the subsurface drainage system are operational.

4. Monitor for evidence of discharge from the facility or seepage outside of the footprint of the basin, wildlife nesting or salt encrustation, or the presence of nuisance conditions.

C. Influent Water Monitoring

A monitoring station shall be established at each inlet point (main drain pipeline, subsurface drainage system, and perimeter drain inflow). Samples or required measurements shall be collected from each monitoring station per the frequency identified in Table 1 below.

Table 1 – Influent Water Measurement/Analysis

Parameter	Unit	Detection Limit or Volume	Type of Sample or Method of Collection	Frequency of Sampling or Recording
In Flow	Acre feet	Acre feet or cubic feet	Flow meter	Weekly
Electrical Conductivity	Micromhos per Centimeter (umhos/cm)		Grab	Weekly
pH	Standard pH units		Grab	Weekly
Temperature	Degrees Centigrade (° C)		Grab	Weekly
Total Recoverable Selenium	Micrograms per liter (ug/L)	1.0	Grab	Monthly
Arsenic	ug/L	5.0	Grab	Monthly
Boron	Milligrams per liter (mg/L)	1.0	Grab	Monthly
Molybdenum	ug/L	1.0	Grab	Monthly
Nitrate	mg/L	1.0	Grab	Monthly
Uranium	ug/L	1.0	Grab	Monthly
Cadmium	ug/L	1.0	Grab	Monthly

Parameter	Unit	Detection Limit or Volume	Type of Sample or Method of Collection	Frequency of Sampling or Recording
General Minerals[1]	mg/L		Grab	Quarterly
6800(a) pesticides[2]	ug/L	0.5	Grab	Quarterly

[1] General Minerals to include: Major cations and anions sufficient for an ion balance and at least: bicarbonate, calcium, carbonate, chloride, magnesium, potassium, sodium, sulfate, total dissolved solids (TDS), and pH.
[2] 6800(a) pesticides are described in Title 3, section 6800(a) of the California Code of Regulations. As of the effective date of this MRP, the 6800(a) list includes atrazine, bentazon, bromacil, diuron, norflurazon, prometon, and simazine

D. Pond/Cell Water Monitoring

Discrete water samples shall be collected from each of the evaporation basins/cells containing water a minimum of twice per year on April 30 and September 30 or as near these dates as possible (closest weekday allowing for laboratory delivery). Samples shall be collected from locations on or near those depicted on Attachment B, which is attached hereto and made part of this Order by reference. A permanent marker will be placed on the basin/cell bank to indicate the sampling location. Collected samples shall be submitted for chemical analysis for the parameters listed on Table 2 below.

Table 2 –Basin/Cell Water Measurement/Analysis

Parameter	Unit	Detection Limit	Type of Sample	Frequency
Electrical Conductivity	Micromhos per Centimeter (umhos/cm)		Grab	Biannually
pH	pH units		Grab	Biannually
Temperature	Degrees Centigrade (° C)		In-Situ	Biannually
Total Recoverable Selenium	Micrograms per liter (ug/L)	1.0	Grab	Biannually
Arsenic	ug/L	5.0	Grab	Biannually
Boron	Milligrams per liter (mg/L)	1.0	Grab	Biannually
Molybdenum	ug/L	1.0	Grab	Biannually
Uranium	ug/L	1.0	Grab	Biannually
Cadmium	ug/L	1.0	Grab	Biannually
General	mg/L		Grab	Biannually

Parameter	Unit	Detection Limit	Type of Sample	Frequency
Minerals				

1. General Minerals to include: Major cations and anions sufficient for an ion balance and at least: bicarbonate, calcium, carbonate, chloride, magnesium, potassium, sodium, sulfate, total dissolved solids (TDS), and pH.

E. Basin/Cell Sediment Monitoring

Sediment samples shall be collected from the upper two to three inches in each of the evaporation basins/cell on September 30 or as near to this date as possible (closest weekday allowing for laboratory delivery). Sediment shall be collected from locations on or near those depicted on Attachment B. Collected samples shall be submitted for chemical analysis for the parameters listed on Table 3 below.

Table 3 – Basin/Cell Sediment Analysis

Parameter	Unit	Detection Limit	Type of Sample	Frequency
Total Recoverable Selenium	Milligrams per kilogram (mg/kg)	2.0	Grab	Annually
Arsenic	mg/kg	2.0	Grab	Annually
Boron	mg/kg	1.0	Grab	Annually
Molybdenum	mg/kg	1.0	Grab	Annually
Uranium	mg/kg	1.0	Grab	Annually
Cadmium	mg/kg	1.0	Grab	Annually

F. Groundwater Monitoring

The Discharger shall develop and submit a plan for approval by the Central Valley Water Board Executive Officer for a groundwater quality monitoring system. The system shall be capable of monitoring first encountered groundwater beneath the perimeter of the proposed Middle Basin. A work plan for the installation of groundwater monitoring wells outlined as Phase 1 and Phase 2 was submitted in March 2014 and approved by the Central Valley Water Board staff dated April 25, 2014. When the final Middle Basin design is completed, an updated work plan will be submitted summarizing the proposed location and any modifications for the construction of the remaining Phase 2 monitoring wells.

The monitoring system shall also include deeper monitoring wells designed to assess potential vertical migration of waste constituents below the base elevation of the wells that monitor first encountered groundwater. The construction of the remaining monitoring wells will follow the requirements of the approved workplan. Following approval of the updated groundwater monitoring plan, the remaining monitoring system shall be installed.

Background groundwater quality must be established through the collection of a minimum of eight sampling events conducted prior to discharge of waste into the Middle Basin (a minimum of eight samples are required to develop statistical values for inorganic constituents of concern).

Pre-waste discharge monitoring for the establishment of background groundwater concentrations, as well as subsequent groundwater monitoring to be conducted upon approval to discharge, shall be conducted for the parameters specified in Table 4 below. The frequency of sampling presented on Table 4 only applies following the initiation of the discharge of waste into the Middle Basin (does not apply to the sampling needed to establish background groundwater quality).

Table 4 – Groundwater Analysis

Parameter	Unit	Detection Limit	Type of Sample	Frequency
Water level Elevation	Feet	0.01	Measured	Quarterly
Electrical Conductivity*	Micromhos per Centimeter (umhos/cm)		Grab	Quarterly
pH*	pH units		Grab	Quarterly
Temperature*	Degrees Centigrade (° C)			Quarterly
Total Recoverable Selenium	Micrograms per liter (ug/L)	2.0	Grab	Quarterly
Arsenic	ug/L	2.0	Grab	Quarterly
Boron	Milligrams per liter (mg/L)	1.0	Grab	Quarterly
Molybdenum	ug/L	1.0	Grab	Quarterly
Uranium	ug/L	1.0	Grab	Quarterly
General Minerals[1]	mg/L		Grab	Annually

1. General Minerals to include: major cations and anions sufficient for an ion balance and at least: bicarbonate, calcium, carbonate, chloride, fluoride, magnesium, potassium, nitrate, sodium, sulfate, TDS, and pH.

Prior to sampling, groundwater elevations shall be measured to the nearest 0.01 foot and the wells shall be purged of at least three well volumes or until temperature, pH, and

electrical conductivity have stabilized. Samples shall be collected and analyzed using approved EPA methods or other methods approved by the Central Valley Water Board.

Water table elevations shall be calculated and used to determine groundwater gradient and direction of flow. Groundwater elevation shall be based on depth-to-water measurements using a surveyed measuring point elevation on the well and a surveyed reference elevation.

G. Discharges from the Middle Basin

The Discharger shall monitor any discharges of wastewater from the basin area for the constituents and at the frequencies specified in Table 5 below.

Table 5 - DISCHARGE MONITORING FOR WASTEWATER

Discharges (Off-Property Discharges)
Daily during each discharge:
Record date, time, approximate volume (gallons), duration, location, source, and ultimate destination of the discharge.
Field measurements of the discharge for electrical conductivity, temperature, and pH.
Laboratory analyses of the discharge for arsenic, boron, total recoverable selenium, total dissolved solids, BOD, and general minerals.
Daily during each discharge to surface water:
For surface water upstream and downstream of the discharge:
Field measurements for electrical conductivity, temperature, dissolved oxygen, and pH.
Laboratory analyses for arsenic, boron, total ammonia-nitrogen, un-ionized ammonia-nitrogen, total Kjeldahl nitrogen, total phosphorus, potassium, total dissolved solids, total suspended solids, total recoverable selenium, and general minerals.

H. WILDLIFE MONITORING

Wildlife monitoring shall be conducted as follows at the Middle Basin and the wetland habitat area in Section 3, T21S, R21E, MDB&M. All wildlife monitoring shall be conducted by or under the direct supervision of a qualified wildlife biologist with appropriate theoretical background and/or technical experience with the taxa, communities, ecological processes, and physiological processes common to the tasks performed; and possessing a permit to collect the eggs from the U. S. Fish and Wildlife Service and the DFW.

Bird counts shall be conducted monthly during the period of December to June at the Middle Basin and the wetland habitat. Breeding bird nest surveys such as, but not limited to, American Avocet *(Recurvirostra americana)* and Black-necked Stilt *(Himantopus mexicanus)* shall be conducted semi-monthly from April through June, and include counts of nests and nest fate by species. Nests shall be flagged and five (5) eggs from both the American Avocet and Black-necked Stilt (if available, for a total of 10 eggs) shall be selected

at random from five (5) separate nests from the Middle Basin shall be sampled for selenium, trace elements and constituents of concern identified by DFW.

The Discharger shall inspect each cell of the basins and wetland habitat weekly for dead birds. Inspections shall be increased to daily at any cell while water depth is less than 2 feet and at entire basins while a botulism or fowl cholera outbreak is occurring in the area, as confirmed by the DFW, and reduced when said outbreak is confirmed to be over by the DFW. The Discharger shall consult with the DFW on the best management approach for disposal.

Salt encrustation (Wildlife Protocols) – See protocols in Attachment A of Waste Discharge Requirements Order R5-2015-XXXX.

Prior to burrowing owl breeding season (1 February to 31 August), the Discharger shall survey a minimum of 500 feet from the perimeter of the MEB to determine the potential for burrowing owls. Surveys will be consistent with the Burrowing Owl Consortium's 1993, *Survey Protocol & Mitigation Guidelines* or newer guidance adopted by DFW. The results of the survey shall be included in the bi-annual Wildlife report.

Prior to annual maintenance activities, the Discharger shall conduct surveys for San Joaquin Kit Fox using the "U.S. Fish and Wildlife Service Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox Prior to or During Ground Disturbance (2011)." The surveys must be conducted between 1 May and 1 November. Results of these surveys shall be included in the bi-annual Wildlife report.

IV. RECORD-KEEPING REQUIREMENTS

Dischargers shall maintain the following records on-site for a minimum period of five years from the date they are created for all of the information listed below:

1. Records documenting the inspections required under the Monitoring Requirements above;
2. Analytical records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the Central Valley Water Board Executive Officer at any time. (40 CFR 122.41(j)(2).)
3. Records documenting any corrective actions taken to correct deficiencies noted as a result of the inspections required in the Monitoring Requirements above. Deficiencies not corrected in 30 days must be accompanied by an explanation of the factors preventing immediate correction;

4. Records of wildlife mortality management and practices, including manifests or bills of lading or other documents demonstrating who transported the mortalities and where they were taken for disposal; and
5. Steps and dates when action is taken to correct unauthorized releases as reported in accordance with Priority Reporting of Significant Events below.

V. REPORTING REQUIREMENTS

1. **Priority Reporting of Significant Events (Prompt Action Required)**

   The Discharger shall report any noncompliance that endangers human health or the environment or any noncompliance with Prohibitions A.1 through A.4 and A.7 in the Order, within 24 hours of becoming aware of its occurrence. The incident shall be reported to the Central Valley Water Board's Fresno office ((559) 445-5116), local environmental health department, and to the California Emergency Management Agency (CalEMA). During non-business hours, the Discharger shall leave a message on the Central Valley Water Board, Fresno Office's voice mail. The message shall include the time, date, place, and nature of the noncompliance, the name and number of the reporting person, and shall be recorded in writing by the Discharger. CalEMA is operational 24 hours a day ((916) 845-8911). A written report shall be submitted to the Central Valley Water Board office **within two weeks** of the Discharger becoming aware of the incident. The report shall contain a description of the noncompliance, its causes, duration, and the actual or anticipated time for achieving compliance. The report shall include complete details of the steps that the Discharger has taken or intends to take, in order to prevent recurrence. All intentional or accidental spills shall be reported as required by this provision. The written submission shall contain:

   a. The approximate date, time, and location of the noncompliance including a description of the ultimate destination of any unauthorized discharge and the flow path of such discharge to a receiving water body;
   b. A description of the noncompliance and its cause;
   c. The flow rate, volume, and duration of any discharge involved in the noncompliance;
   d. The amount of precipitation (in inches) the day of any discharge and for each of the seven days preceding the discharge;
   e. A description (location; date and time collected; field measurements of pH, temperature, dissolved oxygen and electrical conductivity; sample identification; date submitted to laboratory; analyses requested) of noncompliance discharge samples and/or surface water samples taken to comply with the Monitoring Requirements above;
   f. The period of noncompliance, including dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue;

g. A time schedule and a plan to implement corrective actions necessary to prevent the recurrence of such noncompliance; and

h. The laboratory analyses of the noncompliance discharge sample and/or upstream and downstream surface water samples shall be submitted to the Central Valley Water Board office within 45 days of the discharge.

2. **Monitoring Reporting**

The Central Valley Water Board has gone to a paperless office system. All regulatory documents, submissions, materials, data, monitoring reports, and correspondences shall be converted to a searchable Portable Document Format (PDF) and submitted electronically. Documents that are less than 50MB shall be emailed to centralvalleyfresno@waterboards.ca.gov . Documents that are 50 MB and larger shall be transferred to a computer disk (CD/DVD) and mailed to the appropriate Central Valley Water Board office, in this instance, to 1685 E Street, Fresno, CA 93706. To ensure that your submittals are routed to the appropriate staff, the following information block should be completed and be included in any email used to transmit documents to this office:

Program: Non-15, WDID 5D160106001, facility name, and WDR Order R5-2015-XXXX

In addition to the required electronic submittal, staff may request some documents be submitted on paper, particularly drawings or maps that require a large size to be readable, or in other electronic formats where evaluation of data is required.

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type (e.g., influent, effluent, pond, 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.

As required by the Business and Professions Code sections 6735, 7835, and 7835.1, all Groundwater Monitoring Reports shall be prepared under the direct supervision of a Registered Engineer or Geologist and signed by the registered professional.

a. **Waste Characterization** (influent monitoring, cell monitoring, and sediment monitoring) - All weekly, monthly, and biannual monitoring data and information from the waste characterization program shall be submitted to the Central Valley Water Board per the following schedule:

Reporting Period	Due Date
January - March	1 May
April – June	1 August (includes biannual monitoring)

July – September	1 November
October – December	1 February (includes biannual monitoring)

In reporting data, the Discharger shall provide the following:

1) Electronic copies of photos from all surface water monitoring sites, labeled with station code and date;
2) Electronic copies of all applicable laboratory analytical reports;
3) For chemistry data, analytical reports must include the following:
   a) A lab narrative describing QC failures;
   b) Analytical problems and anomalous occurrences;
   c) Chain-of-custody and sample receipt documentation;
   d) All sample results for contract and subcontract laboratories with units, reporting limits, and minimum detection levels;
   e) Sample collection, preparation, extraction, and analysis dates;
   f) Results for all quality control samples including all field and laboratory blanks, lab control spikes, matrix spikes, filed and laboratory duplicates, and surrogate recoveries.
4) The names, titles, general responsibilities of persons operating, maintaining, and monitoring the basin;
5) The names and telephone numbers of persons to contact for emergency and routine situations; and
6) If any data are missing from the report, the submittal must include a description of what data are missing and when they will be submitted to the Central Valley Water Board. If data are loaded into the CEDEN comparable database, this shall also be noted with the submittal.

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

1) Results of groundwater monitoring;
2) A narrative description of all preparatory, monitoring, sampling, and analytical testing activities for the groundwater monitoring events. The narrative shall verify compliance with the WDR, this MRP, and the Standard Provisions and Reporting Requirements. The narrative shall be supported by field logs for each well documenting depth to groundwater; parameters measured before, during, and after purging; method of purging; calculation of casing volume; and total volume of water purged;
3) For each monitoring event:
   a) Calculation of groundwater elevations, determination of groundwater flow direction and gradient on the date of measurement, comparison of previous

flow direction and gradient data, and discussion of seasonal trends if any; and

b) A narrative discussion of the analytical results for all groundwater locations monitored including spatial and temporal tends, with reference to summary data tables, graphs, and appended analytical reports (as applicable).

4) Summary data tables and graphs of historical and current water table elevations and analytical results;

5) A scaled map showing relevant structures and features of the facility, the locations of monitoring wells and any other sampling stations, and groundwater elevation contours referenced to mean sea level datum; and

6) Copies of laboratory analytical report(s) for groundwater monitoring.

c. **Annual Reporting** (cell and groundwater mineral analyses and sediment analysis) By **20 February of each year** for the previous annual monitoring period from 1 January through 31 December, the Discharger shall submit an annual monitoring report, with a copy provided to the DFW at 1234 E. Shaw Avenue, Fresno. The annual monitoring report will include all laboratory analyses (including Chain-of-Custody forms and laboratory QA/QC results) and tabular and graphical summaries of the monitoring data. Data shall be tabulated to clearly show the sample dates, constituents analyzed, constituent concentrations, and detection limits.

In addition to the data normally presented, the Annual Report shall include the following:

a. Tabulated results of groundwater monitoring;

b. A narrative description of all preparatory, monitoring, sampling, and analytical testing activities for the groundwater monitoring. The narrative shall be sufficiently detailed to verify compliance with the WDR and this MRP. The narrative shall be supported by field logs for each well documenting depth to groundwater; parameters measured before, during, and after purging; method of purging; calculation of casing volume; and total volume of water purged;

c. Summary data tables of historical and current water table elevations with discussion of changes in groundwater elevations and seasonal trends, if any;

d. A narrative discussion of the analytical results for all groundwater locations monitored, including spatial and temporal tends, with reference to summary data tables, graphs, and appended analytical reports (as applicable);

e. Summary data tables of historical and current analytical results including copies of laboratory analytical report(s);

f. A comparison of the monitoring data to the groundwater limitations and an explanation of any violation of those requirements;

g. A discussion of compliance and the corrective actions taken, as well as any planned or proposed actions needed to bring the discharge into full compliance with the waste discharge requirements; and

h. A discussion of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program.

d. **Wildlife Monitoring/Reporting** – Wildlife monitoring and reporting shall be submitted to the Board as follows:

Reporting Period	**Due Date**
Bird Counts (Dec. to June)	30 April & 31 July
Nest Surveys (April to June)	31 July
Burrowing Owl Surveys (Feb. to Sept)	30 June & 30 Oct.
Kit Fox Surveys (May to Nov.)	31 Aug & 30 Dec.

All wildlife monitoring and reporting shall be conducted by or under the direct supervision of a qualified wildlife biologist with appropriate theoretical background and/or technical experience with the taxa, communities, ecological processes, and physiological processes common to the tasks performed.

The Discharger shall implement the above monitoring program on the first day of the month following the adoption of this

Ordered by:

_____
Pamela C. Creedon, Executive Officer

_____
Date

INFORMATION SHEET

ORDER NO. R5-2015-XXXX
TULARE LAKE DRAINAGE DISTRICT
MID EVAPORATION BASIN
KINGS COUNTY

This Information Sheet provides material to supplement, clarify, and elaborate upon the findings and requirements contained in the Waste Discharge Requirements (Order) for Tulare Lake Drainage District's (District or Discharger) proposed Mid Evaporation Basin (Middle Basin). The Order is not a National Pollutant Discharge Elimination System (NPDES) permit, and does not authorize discharges to surface waters that would otherwise require a NPDES permit. This Information Sheet is considered a part of the Order.
This Order requires the Discharger to:

- Monitor wastewater inflow, evaporation basin water, and basin bottom sediment;
- Monitor surface water and groundwater in accordance with a monitoring and reporting program;
- Keep records for the evaporation basins operation and maintenance;
- Submit annual monitoring reports; and
- Improve or replace operational practices that are found not to be protective of water quality.

Proposed Project
The District is proposing to build and operate a new 1,800 acre (±) agricultural drainage evaporation basin that will be constructed on portions of three sections (three square miles) of agricultural land in the south central portion of the Tulare Lake Bed, Kings County (Figure 1). The proposed evaporation basin will allow for an estimated 18,500 acres of agricultural lands within the Tulare Lake Bed to be drained of shallow saline groundwater.

Background
Soils on the west side of the San Joaquin Valley are principally derived from the marine sediments that make up the Coast Ranges and consequently are high in the salts and trace elements that naturally occurred in the marine environment. Irrigation of these soils dissolves these substances and as the water evaporates and is transpired by plants, salts are further accumulated in the shallow agricultural soils. Unless the salts are leached out of the root zone, they continue to amass in the soil and ultimately obstruct plant germination and impede the adsorption of water and nutrients by plants.

In regions with shallow groundwater with limited lateral movement, salts washed downward from agricultural soils accumulate in the groundwater and as the salty groundwater rises towards land surface, plants begin to show signs of salinity damage

and die from salty water in the root zone and waterlogging. Without a means for removal and disposal of the shallow saline groundwater, agricultural operations are curtailed or cease completely.

The accumulation of saline groundwater beneath irrigated agriculture is particularly severe in the western portion of the Tulare Lake Basin where a shallow groundwater table coupled with the lack of natural drainage outlets from the basin has created drainage problems beneath a large portion of the former Tulare Lake Bed. In response to this problem, landowners within the historic Tulare Lake Bed authorized the formation of the Tulare Lake Drainage District in 1966 and in 1972 authorized the District to acquire lands to be used as evaporation basins.

In 1973, the District certified a Negative Declaration for construction of the North Evaporation Basin and began its construction in 1974. In 1979, the District prepared an Environmental Impact Report (EIR) for the construction of the South Evaporation Basin and the Hacienda Evaporation Basin. Also in 1979, the Central Valley Water Board adopted Waste Discharge Requirements (WDRs) Order No. 79-252 for the regulation of the North, Hacienda, and South evaporation basins.

In 1983 high rates of water bird mortalities and deformities were discovered at Kesterson Reservoir. These discoveries led the Central Valley Water Board in 1989 to notify the District and other basin operators that new WDRs would be prepared for all evaporation basins within the Tulare Lake Basin, including those that had previously received waivers from the Central Valley Water Board. Also in 1989, the State Department of Fish and Game (DFG) identified a need to analyze the cumulative impacts of all evaporation basin operations within the Tulare Lake Basin on wildlife in order to satisfy the requirements of the California Environmental Quality Act, Public Resources Code section 21000, et seq. (CEQA). A Cumulative Impacts Report for the evaporation basins was developed for the Central Valley Water Board under contract for the State Department of Water Resources (DWR) by private consultants. The Cumulative Impacts Report was completed in November 1992. Among other things, the Cumulative Impacts Report concluded that the basins have significant and cumulative adverse impacts on bird reproduction. The most significant risks posed by the ponds include exposure to high salinity and selenium levels. Evaporation ponds provide significant water bird habitat for the area, and are used particularly by avian species that feed on invertebrates and plants found within the ponds.

The Cumulative Impacts Report additionally concluded that site-specific EIRs were needed to clarify the extent of avian impacts due to individual pond operations. Following completion of the Cumulative Impacts Report, consultants hired by the pond operators began preparation of site-specific EIRs that were termed Site-Specific Biological Impact Analysis or Technical Report (Technical Reports). In 1993, the District submitted a draft biological impact analysis evaluating the potential site-specific risk of adverse impacts to wildlife resulting from exposure to selenium, trace elements, physical hazards, and other aspects of evaporation basin operations. The site-specific

Technical Reports, in general, indicated that pond operations place avian species at risk from four general types of impacts; avian disease, salinity, physical hazards, and selenium.

Following public review of the documents, the Technical Reports, in combination with the cumulative impact report were used by the Central Valley Water Board to prepare tentative WDRs. The Central Valley Water Board circulated the tentative WDRs on 16 July 1993 and the final EIRs on 22 July 1993. On 6 August 1993, the Central Valley Water Board certified the EIRs and adopted a series of Orders including Order 93-136, which regulates the District's North, Hacienda, and South Evaporation Basins.

In August and September of 1993, the WDRs were petitioned to the State Water Board (State Board) by the United States Fish and Wildlife Service (USFWS), Patrick Progans and Lloyd Carter, and the Bay Institute of San Francisco. On 21 March 1996, State Water Board adopted Order No. WQ 96-07, which remanded a portion of the waste discharge requirements and EIRs, including the District's, to the Central Valley Water Board for reconsideration and directed the Central Valley Water Board to "consider any relevant information in its CEQA compliance documents."

On 4 December 1996, the Central Valley Water Board entered into a Memorandum of Understanding (MOU) for the Preparation of Environmental Documents with the Tulare Lake Drainage District for their existing evaporation basins. In response to the MOU, the District contracted with Jones & Stokes Associates, Inc. for the preparation of an EIR for the Tulare Lake Drainage District Evaporation Basins, Waste Discharge Requirements. An Administrative Draft EIR was submitted to the Central Valley Water Board on 19 August 1998. It is uncertain what the final determination was regarding this submittal. No record could be found at the State Clearinghouse, Office of Planning & Research regarding the Draft EIR, Final EIR, or Notice of Determination.

In March 2002, TLDD submitted a Draft CEQA Initial Study and Proposed Mitigated Negative Declaration for compliance with CEQA regarding continued operation of the TLDD evaporation basins. The document provided a review of the regulatory history for the TLDD evaporation ponds and CEQA submittals but it did not discuss the 1996 Draft EIR. Similar to the 1996 Draft EIR, no record could be found at the State Clearinghouse, Office of Planning & Research regarding the Draft EIR, Final EIR, or Notice of Determination.

On 15 August 2006, TLDD submitted a draft Mitigated Negative Declaration (MND), Initial Study, and Environmental Checklist for the proposed construction and operation of the Mid-Evaporation Basin for management and disposal of sub-surface agricultural drain water. The documents also included proposed expansion of the Hacienda Evaporation Basin by the addition of 230 acres of new ponds. Comments on the draft MND were submitted to TLDD by the Central Valley Water Board, DFG, Caltrans, and other agencies. Stating that "It is unlikely that the proposed mitigation measures mitigate potential Project-related impacts to less than significant..." DFG stated that

preparation of an EIR for CEQA compliance is warranted. Similarly, Central Valley Water Board staff concluded, "After reviewing your document, staff finds that it does not adequately describe potential water quality issues, and consequently, the proposed mitigation measures may not be sufficient to reduce water quality impacts to less than significant."

The MND was filed with the State Clearinghouse, Office of Planning & Research (SCH Number: 2006081092); however, no record could be found at the State Clearinghouse regarding a Notice of Determination for the project.

In 2012, citing a strong desire by many of its landowners to increase their drained acreage, the District again prepared and submitted a Mitigated Negative Declaration entitled "Construction and Operation of the Mid Evaporation Basin for Management and Disposal of Sub-Surface Agricultural Drainwater". The MND was revised to address comments received and a Notice of Determination and Final Document were filed with the State Clearinghouse (SCH#20121057) and the County of Kings on 22 May 2013. In November 2013, the District submitted a Draft Report of Waste Discharge (RWD) to the California Regional Water Quality Control Board, Central Valley Region (Central Valley Water Board or Board) for the construction and operation of the proposed Middle Basin. The RWD was revised to address comments and resubmitted on 31 January 2014. The resubmitted RWD specified a need to install additional subsurface drainage systems on several thousand acres within the District and determined that although the District has participated in and supported a number of research projects on alternate means of agricultural drainage water disposal, a viable option to evaporation basins has yet to be discerned. Without a viable option, the RWD concluded that the District's ability to dispose of additional drainage water beyond that received from its current 34,693 drained acres can only be achieved through construction of the MEB.

Review of the District's Yearly Evaporation Basin Water Disposal Reports for 2009 to 2012, documents that approximately 71% of the design capacity (13,415 acre feet for the three existing evaporation basins) was utilized during this four year period of time. However, greater than 90% of the design capacity was utilized for 10 months during the same four year period (varied from 91% to 113% of the total design capacity of the three existing basins). Recent drought years (2013 & 2014) have reduced irrigation of croplands within the District resulting in a corresponding reduction in tile drainage water entering the evaporation basins. The highest usage in 2013 occurred in March and April (86%) and in February and March in 2014 (44% and 46%). The reduction in drainage water is deemed to be temporary. The resumption of a normal irrigation water supply and landowners desiring to drain additional lands will again necessitate the need for greater drainage water evaporation capacity.

REGIONAL AND SITE CONDITIONS

The proposed Middle Basin property is owned by the District (purchased in 2007) and has been continuously farmed or routinely disked to maintain it vegetation-free since it was acquired. The property is underlain by an existing subsurface drainage system (tile

drainage system) that was installed by a prior landowner to reclaim the productivity of the lands and to control the level of shallow groundwater beneath the agricultural cropland.

No water supply wells or domestic wells have been identified within three miles of the project site. Annual mean precipitation over the last 56 years is 7.35 inches based on the Corcoran Irrigation District weather station located in the town of Corcoran approximately 15 miles to the northeast of the site. The California Irrigation Management Information System (CIMIS) has developed reference ETo Zone Maps allowing users to view reference evapotranspiration (ETo) based on the long term average monthly ETo for each of 18 zones in California. Kings County is included in Zone 16 and has an average annual ETo of 62.5 inches. The District utilized this average annual ETo value to calculate an approximate annual evaporation rate of 65.6 inches for the proposed Middle Basin. Because ETo includes transpiration by plants as well as evaporation, the calculated approximate annual evaporation rate for the Middle Basin will likely be somewhat different than the District's estimate. An average pan evaporation rate for Kettleman City (approximately eight miles to the northwest) of 99.03 inches is provided by the California Climate Data Archive (CCDA). CCDA recommends adjusting the pan value by multiplying the average by 0.70 or 0.80 to more closely estimate the evaporation from naturally existing surfaces such as a shallow lake, wet soil or other moist natural surfaces. This correction factor results in an evaporation rate of 69.3 to 79.2 inches per year.

Regional Geology

The proposed site is situated in the southwestern portion of the San Joaquin Valley, which is a broad structural trough with the Sierra Nevada Mountains on the east and the Coast Ranges on the west. Rocks of the Sierra Nevada Mountains are composed primarily of consolidated igneous and metamorphic rocks of pre-Tertiary age, which slope south-westward from the foothills and form the basement complex that underlies the valley at depth. The Coast Ranges consist principally of folded and faulted marine and non-marine sedimentary rocks of Jurassic, Cretaceous, and Tertiary age. These deposits slope eastward and overlie the basement complex. Unconsolidated deposits of Late Pliocene to Holocene age, blanket the underlying consolidated rocks in the valley. The Tulare Formation and other continental deposits of Pliocene to Holocene age crop out near Kettleman City and underlie the Tulare Lake Bed at depth. Sediments in the Tulare Formation consist mainly of unconsolidated clays, silts, and sand, which were derived chiefly from the Sierra Nevada on the east and the Coast Ranges on the west and that have been deposited as alluvial-fan, deltaic, flood-plain, lake, and marsh deposits (Croft 1972).

Extending outward from beneath the margins of the Tulare Lake Bed are lacustrine and marsh deposits that form a series of silt and clay-rich zones that interfinger with more permeable beds of the continental deposits. These deposits include a series of clay units that were designated as the A through F clays (youngest to oldest) by Croft (Croft, 1972). These clay zones are low permeability horizons that locally separate the alluvial

sequence into several aquifers (Page, 1986). The most prominent of these clays is the E Clay of Pleistocene age that is equivalent to the Corcoran Clay Member of the Tulare Formation. This clay extended almost the entire length of the San Joaquin Valley (Lettis, 1982). Studies have linked the development of the A-D clays to major lacustrine episodes of post Corcoran Clay age induced by outwash from Sierra Nevada glaciation (Atwater, et, al., 1986, Page, 1986).

Within the boundaries of the Tulare Lake Bed, the majority of Croft's A through F clays are indistinguishable from the variety of lacustrine and marsh deposits that extends to about 3,000 feet below the land surface (Croft and Gordon, 1968). These lacustrine and marsh deposits of Pliocene and Pleistocene age are locally interbedded with alluvium (principally fine-grained sands) derived from the Sierra Nevada and Coast Range Provinces (Atwater, et, al., 1986). Atwater interpreted a portion of these sands to represent a rising, marsh-fringed lake across the toe of an alluvial fan, followed by either drainage of the lake or progradation of a delta. Possible replacement of Tulare Lake by a trunk stream is suggested for a portion of buried soils and sands lenses, which were inferred by Atwater to be channel deposits.

Seismicity

The proposed facility's greatest potential for seismic activity is created by the San Andreas Fault, which is located approximately 35 miles southwest of the proposed site. The San Andreas Fault marks the divide between the North American Plate and the Pacific Plate. Potential peak ground acceleration measured as percent gravity (% G) is estimated to be 30-40% G by the State of California, Department of Conservation's Ground Motion Interpolator and by Kings County Earthquake Hazards map[1].

Site Geology

The proposed site is situated in the southern portion of the former Tulare Lake Bed. The ROWD identifies that various studies and geotechnical investigations performed in 1979, 1988, 2006 and 2013 produced soils information from ninety-nine different excavation pits and twenty-four soils borings conducted at locations depicted on the Figure 2. Not all of the test holes or excavations were located within the proposed Middle Basin site; however, they were all done in the general area (within two miles of the proposed site) and they provide supplemental information on the anticipated shallow soils existing below the proposed evaporation basin.

Sediments encountered in the shallow subsurface beneath the proposed Middle Basin consisted primarily of fine-grained silts, clays, and silt-clay mixtures, with varying amounts of sand or silty sands. The subsurface geology varies rapidly in both a lateral and vertical sense in response to changes in the depositional environment. The most

[1] Figure 4.6-3, of County of Kings, *2035 General Plan Update, Environmental Impact Report, June 2009*, prepared by Rincon Consultants, Inc.

recent of these changes is recorded in the pattern of deposition of the surface and near surface sedimentary deposits.
Review of available aerial photographs for the proposed facility suggests the past presence of a series of anastomosing or braided sand lenses (currently delineated by vegetation or soil color changes) in Section 36 and the southern half of Section 25 of Township 23 South, Range 21 East, Mt. Diablo Baseline and Meridian (Attachment C). No channels are discernable in Section 24 or the northern half of Section 25; however, past channels are visible in the adjacent Sections 23 and 26 and are presumed to have existed at some depth beneath the entire site (presence is likely masked by more intensive cultivation in the northern half of Section 25 and in Section 24). These geomorphic features generally trend in a northward direction (north, northeast, or northwest). The apparent source of these features was erosion resulting from northward directed flow of the historic Kern River followed by subsequent sediment deposition (either by fluvial [river] or eolian [wind]). Eolian deposition into the former channels is suggested by the generally well-sorted, fine grained nature of the sands encountered during the soils investigation of the site.

Site Groundwater Conditions
Regional groundwater is contained within a series of aquifers separated by low permeability clay deposits. These aquifers are generally separated into a lower confined aquifer, a series of semi-confined aquifers, and an upper unconfined aquifer. The lower confined aquifer is situated beneath the E-Clay or Corcoran Clay of the Tulare Formation at a depth of approximately 1,000 feet below the proposed Middle Basin. Water quality in the deeper confined aquifer is described to be good with total dissolved solids of approximately 500 milligrams per liter (mg/L).

Groundwater quality in the intermediate semiconfined aquifers is unknown for the area beneath the proposed facility. Electrical Conductivity values have, however; been measured in monitoring wells along the southern end of the Hacienda Evaporation Basin (2.5 to 3 miles southeast of the southern end of the proposed Middle Basin). EC values in monitoring well 18-1A (depth of 80-100 feet below site grade) averaged approximately 13,000 micromhos per centimeter (umhos/cm) for the period 1979 to 2014.

Shallow unconfined groundwater varies beneath the site from a depth of 3 to 7.5 feet in 1979 to between 10.5 and 13 feet in 2014. In July 2014, the shallow groundwater quality was investigated in the area of the proposed facility by installing four groundwater monitoring wells along the northern and western sides of the proposed basin into first encountered groundwater (Figure 4). Analytical results from four groundwater monitoring events (September, December 2014 and March, June 2015) are presented in Table 1. The first number listed is the average with the range of the detections shown in the parentheses below. Also listed in Table 1 are the California Department of Public Health's (CDPH) Maximum Contaminant Levels (MCLs) for Drinking Water, CDPH's Secondary MCLs, and Cal/EPA's Office of Environmental Health Hazard Assessment, Public Health Goals.

Table 1 - Middle Basin Groundwater Results

Analyte	Well Middle Basin 24-1A	Well Middle Basin 24-1B	Well Middle Basin 25-1A	Well Middle Basin 36-1A	Units[1]	California MCL	California Secondary MCL[2]	PHG[3]
Electrical Conductivity	5075 (4500 - 5600)	5175 (2800 – 7500)	4825 (3800 – 6000)	18950 (8800 – 27000)	umhos/cm		2,200	
Total Dissolved Solids	3675 (3400 – 4100)	2300 (1700 – 3300)	3050 (2500 – 3700)	15600 (6400 – 25000)	mg/L		1,500	
Ammonia as N	0.26 (0.15 - 0.49)	0.28 (0.22 – 0.31)	0.28 (0.22 – 0.32)	0.16 (0.14 – 0.18)	mg/L			
Chloride	670 (560 – 790)	415 (250 – 740)	488 (290 – 720)	2850 (1300 – 4600)	mg/L		600	
Nitrate as N03	16 (1.0 – 26)	nd[4]	18 (1.0 – 67)	nd[4]	mg/L	45		45
Sulfate as S04	1775 (1600 – 2000)	805 (450 – 1500)	1205 (930 – 1600)	7525 (3300 – 11000)	mg/L		600	
Fluoride	1.0 (1.0 – 1.1)	5.0 (1.0 – 9.8)	3.0 (2.7 – 3.4)	1.0 (1.0 – 1.3)	mg/L			
Arsenic	**27** (2.0 – 87)	**184** (20 – 410)	**107** (2.0 – 210)	**40** (2.0 – 100)	ug/L	10		0.004
Alkalinity as CaCO3	313 (300 – 320)	615 (500 – 710)	658 (580 – 720)	505 (340 – 610)	mg/L			
Boron	1.1 (0.1 – 1.6)	3.0 (2.1 – 3.9)	3.6 (3.2 – 3.9)	9.2 (5.0 – 12)	mg/L			
Calcium	468 (410 – 500)	95 (43 – 130)	110 (59 – 160)	530 (490 – 590)	mg/L			
Magnesium	158 (120 – 200)	111 (25 – 200)	116 (34 – 200)	313 (220 – 390)	mg/L			
Molybdenum	63 (10 – 86)	285 (10 – 440)	465 (10 – 820)	1553 (10 – 4000)	ug/L			
Potassium	23 (nd[4] – 54)	48 (4.3 – 90)	53 (2.1 – 110)	40 (11 – 80)	mg/L			
Sodium	663 (580 – 750)	795 (750 – 890)	1078 (880 – 1230)	4000 (2000 – 5400)	mg/L			
Selenium	3.4 (2.7 - 4.1)	5.3 (2.2 – 9.1)	1.1 (0.4 – 2.5)	1.1 (0.4 – 1.6)	ug/L	50		30
Uranium	210 (1.0 – 310)	184 (66 – 270)	345 (70 – 620)	1400 (700 – 2000)	ug/L		0.5	
Uranium, Radiological	143 (1.0 – 210)	122 (44 – 180)	230 (47 – 410)	945 (470 – 1400)	pCi/L[1]	20		0.43

1. Units - umhos/cm = micromhos per centimeter; mg/L = Milligrams per liter; ug/L = micrograms per liter; pCi/L = picocuries per liter.
2. Maximum contaminant level shown is the short term limit.
3. PHG = Primary health goal. Action level only. Not a Maximum contaminant level.
4. nd = not detected.

Shallow groundwater samples were also collected from two existing drainage sumps along the western edge of the site in 2013. These sumps are part of a subsurface drainage system (tile drain) installed by a previous landowner. These sumps are located on the northwest corner of Section 24 and the northwest corner of Section 36 (Figure 1). The sumps were pumped for a period of time to withdraw the existing water

in the subsurface drainage pipelines to allow current ambient groundwater to flow into the sumps. Following purging, single water sample was collected from each of the tile drainage sumps and submitted for chemical analysis. The results are presented on Table 2. Additionally, two samples of drainage water flowing in the District's Main Pipeline were also obtained in 2013, one at the Main Pipeline Outlet Structure and the other from the Main Pipeline adjacent to the Tule River to the northeast of the proposed Middle Basin. The Main Pipeline water samples represent the quality of the water flowing from other drained lands in the District and serve to provide an indication of the water that will be discharged into the new Middle Basin.

Table 2
Middle Basin Tile Groundwater and Source Water Chemical Analyses
Sampled May 2013

	Ambient Groundwater		Source Water					
Analyte	Middle Basin North Sump NW Corner Section 24	Middle Basin South Sump NW Corner Section 36	Main Pipeline @ Outlet Structure	Main Pipeline @ Tule River	Units[1]	California MCL	California Secondary MCL[2]	Public Health Goals[3]
Electrical Conductivity	15,000	9,800	8,900	7,200	umhos/cm		2,200	
Total Dissolved Solids	12,000	6,600	6,400	5,000	mg/L		1,500	
Chloride	2,500	1,500	1,200	690	mg/L		600	
Nitrate	220	120	110	100	mg/L	45		45
Sulfate	5,300	3,000	2,700	2,400	mg/L		600	
Hexavalent Chromium	1.2	0.8	0.8	nd[4]	ug/L	50		0.02
Aluminum	0.98	0.2	0.88	1.9	mg/L	1	0.2	0.6
Arsenic	36	51	110	110	ug/L	10		0.004
Cadmium	2.4	2.6	1.7	ND	ug/L	5		0.04
Calcium	390	290	200	150	mg/L			
Copper	0.27	0.086	nd[4]	nd[4]	mg/L	1.3	1.0	0.3
Hardness CaCO3	2,100	1,500	1,200	920	mg/L			
Lead	10	nd[4]	nd[4]	nd[4]	ug/L	5		0.2
Magnesium	270	180	170	130	mg/L			
Manganese	0.22	0.13	0.22	0.27	mg/L		0.05	
Potassium	24	17	18	12	mg/L			
Selenium	86	56	37	15	ug/L	50		30
Silver	nd[4]	nd[4]	nd[4]	nd[4]	mg/L		0.1	
Sodium	3,200	2,100	2,000	1,600	mg/L			
Uranium	590	570	390	84	ug/L		0.5	
Uranium, Radiological	390	380	260	57	pCi/L	20		0.43
Zinc	0.11	nd[4]	nd[4]	nd[4]	mg/L		5.0	

1. Units - umhos/cm = micromhos per centimeter; mg/L = Milligrams per liter; ug/L = micrograms per liter; pCi/L = picocuries per liter.
2. Maximum contaminant level shown is the short term limit.
3. PHG = Primary health goal. Action level only. Not a Maximum contaminant level.
4. nd = not detected.

The groundwater samples analyzed in 2014 and 2015 demonstrate that conductivity ranging from 2,800 to 27,000 umhos/cm; TDS ranging from 1,700 to 25,000 mg/L; chloride ranged from 250 to 4,600 mg/L; nitrate as Nitrate ranged from non-detect to 67 mg/L; sulfate varied from 450 to 11,000 mg/L, arsenic levels from non-detect to 410 ug/L, selenium from 0.4 to 9.1 ug/L, and uranium from non-detect to 2,000 pCi/L. Water quality in all of the site wells and in the two tile drainage sumps exceeded the Primary MCL values for arsenic and uranium and Secondary MCLs (defined as short term consumer acceptance contaminant levels) for conductivity, TDS, and sulfate. Additionally, both tile drainage sumps contained water that exceeded the Primary MCL value for selenium and the sump at the northwest corner of Section 24 exceeded Primary MCL values for aluminum and lead.

PROPOSED BASIN DESIGN AND CONSTRUCTION

The Discharger has submitted preliminary pond construction details for the proposed Middle Basin in its RWD. The RWD specifies that pond construction will commence with stripping of vegetation and organic topsoil for a distance of five feet beyond the limits of the levee footprint. The levee foundation will then be scarified and the foundation area compacted. Six (6) contiguous ponds or cells will then be constructed to a height of approximately 7 feet utilizing native silt/clay soils excavated from within the ponds interior. Each pond/cell will be approximately 310 acres in size. Interior levee side slopes will be constructed at 3:1 to minimize shallow foraging areas for water birds. All exterior levees would be constructed with a 4:1 side slope. All interior levees will be compacted to 90% of the American Society for Testing and Materials (ASTM) method D 1557 to reduce horizontal permeability. Two regulating structures are proposed between each pond/cell to facilitate the operator's ability to quickly fill or dewater a given pond/cell and thus minimize the times when pond water depths would be less than two (2) feet in depth.

Basin construction will include installation of a primary booster pump station (Inlet #1) at the Main Pipeline Control Structure at the southerly end of the Main Pipeline for discharge of drainage water to the southeast corner of the Middle Basin. A second pump station (Inlet #2) will be constructed two miles to the north, adjacent to the Main Pipeline for discharge into the Middle Basin. Inlet #2 would provide operational flexibility to allow drainage water to continue to be diverted into the north half of the Middle Basin if for any reason there was a need to dewater the south half of the Middle Basin.

The existing subsurface tile drainage system will be utilized to intercept vertical and horizontal seepage from the basin. This system consists of a series of perforated drainage lines that are set 7 to 9 feet below site grade and spaced on approximately 500 feet centers (Figure 5). There are subsurface lines along the perimeter of the basin. The subsurface tile drainage lines discharge into two pump sumps, one at the northwest corner of Section 24 and the other at the northwest corner of Section 36. Automated pumps will be installed in the drainage sumps with their discharge being directed back into the evaporation basin.

This Order requires the Discharger to submit for Executive Officer approval, the final design, plans, and specifications, and a quality assurance plan for the construction of the proposed basin prior to construction.

Basin Operation

Normally, drainage water will be discharged from the primary booster pump station (Inlet #1) at the Main Pipeline Control Structure into Pond 1 that can be filled up to a height of approximately 5 feet above pond bottom. At this point, drainage water will begin to spill through a regulating structure into Pond 2. To facilitate this flow, Pond 1 will have the highest water elevation with each successive pond having a slightly lower water level elevation at each regulating structure. This system will allow drainage water to flow at a very slow velocity through the various ponds within the basin until reaching the final or crystallization pond. Each regulating structure is also fitted with a control gate that will be used to increase flows between ponds to facilitate the ability to quickly fill or dewater a given pond and thus minimize the times when pond water depths would be less than 2 feet in depth. Except when filling or draining a pond, the evaporation basin water levels will be kept greater than or equal to 2 feet in depth to minimize the opportunity for avian species to wade and forage in the ponds.

Drainage water collected by the subsurface tile drainage system will flow by gravity into drainage sumps. The sumps contain storage space for drain water below the drain inverts. Each sump is to be fitted with a pump and automatic control system designed so that the pumps can be cycled and not require continuous operation. Drainage water removed from the sumps will be discharged back into the ponds.

This Order requires the District to submit for Executive Officer approval, an operation and maintenance plan for the Middle Basin prior to discharge of waste.

Wildlife

The RWD proposes a variety of approaches to be used by the District to discourage and prevent avian species from seeking to nest on the evaporation basin areas. These methods include propane cannons, installation of wind-activated mylar tape set on lines between stakes, ground-disturbing activities by tractors dragging "floats", shotgun cracker-shells fired overhead from ATVs (3-4 seasonal personnel depending on bird activity), and continual disturbance by normal workday vehicle traffic (4 regular full-time employees). Hazing and maintenance activities shall not be conducted within 50 feet of any active nest, with the exception of those activities on top of the levees, which can be conducted within 15 feet of any active nest. During the winter months, monitoring and additional hazing activities together with a response plan are proposed be implemented to address potential salt encrustation issues related to wintering waterfowl.

The Discharger, in conjunction with the DFW and the United States Fish and Wildlife Service, prepared and agreed to protocols for avoidance (hazing) procedures and for assessing mitigation for unavoidable losses to breeding and non-breeding avian species

(Wildlife Protocol) as a result of operations of the District's Middle Basin. The Wildlife Protocols are included as Attachment E in WDRs R5-2015-XXXX.

APPLICABLE REGULATIONS, PLANS, AND POLICIES

Water Quality Control Plans

The Central Valley Water Board has adopted the Water Quality Control Plan for the Tulare Lake Basin (2nd ed.) (Basin Plan). The Basin Plan designates the beneficial uses of groundwater and surface waters of the Tulare Lake Basin Region, specifies water quality objectives to protect those uses, and includes implementation programs for achieving water quality objectives. The Basin Plan also incorporates, by reference, plans and policies of the State Water Board, including State Water Board Resolution 68-16 (*State Anti-Degradation Policy*) and State Water Board Resolution 88-63 (*Sources of Drinking Water Policy*). This Order contains requirements for the discharge of waste from proposed Middle Basin to be in compliance with the Basin Plan, including requirements to meet the water quality objectives and protect beneficial uses specified in the Basin Plan, and other applicable plans and policies.

Beneficial Uses of Surface Water and Groundwater

The State Water Board adopted statewide standard definitions for beneficial uses of surface and ground waters. These standard definitions were used to identify the existing and potential future beneficial uses contained in the Basin Plan. Consideration also was given to the practicability of restoring uses that may have been lost because of water quality impairments.

Surface Waters: The Basin Plan contains Table II-1 that lists the surface water bodies within the basin and their beneficial uses. The proposed Middle Basin is situated within the South Valley Floor Hydrologic Unit, in the Lake Sump Hydrologic Area 558.30 as depicted on interagency hydrologic maps prepared by the Department of Water Resources in August 1986. Pursuant to Chapter II of the Basin Plan, the beneficial uses of surface water for the Tulare Sump Hydrologic Area include: agricultural supply; industrial process supply; industrial service supply; water contact recreation; non-contact water recreation; warm freshwater habitat; wildlife habitat; rare, threatened, or endangered species; and groundwater recharge.

Surface waters in the vicinity of the proposed Middle Basin include: the Homeland Canal and the Liberty Farms South Canal. The beneficial uses of these waters are protected by this Order by a prohibition on the direct discharge of waste from the Middle Basin to surface waters and a prohibition on the discharge of waste from Middle Basin to surface waters that causes or contributes to an exceedance of any applicable water quality objective or any applicable state or federal water quality criterion. Indirect discharge from within the Middle Basin to the adjacent West Homeland Canal and/or the Liberty Farms South Canal via lateral seepage will be controlled by the operation of the subsurface tile drain system and compliance with the water quality objectives.

Ground waters: Chapter II of the Tulare Lake Basin Plan designates that the Detailed Analysis Unit (DAU) for the area of the proposed Middle Basin is 241 (Tulare Lake Basin). The identified beneficial uses of groundwater within this DAU are municipal and domestic supply, agricultural supply, and industrial service supply.

These beneficial uses are protected in this Order by requiring the operation of the existing subsurface tile drainage system that will be used to intercept vertical seepage from beneath the basin, coupled with the specification that the discharge of waste at the proposed Middle Basin shall not cause a violation of water quality objectives or cause a condition of pollution or nuisance. Degradation of groundwater is allowed provided it is in accordance with State and Regional Board's plans and policies and this Order.

Water Quality Objectives

Pursuant to Water Code section13263(a), WDRs must implement the Basin Plans, and the Board must consider the beneficial uses of water, the water quality objectives reasonably required to protect those beneficial uses, other waste discharges, and the need to prevent nuisance conditions. Water quality objectives are the limits or levels of water quality constituents or characteristics that are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area. (Wat. Code, section 13050(h)). Water quality objectives apply to all waters within a surface water or groundwater resource, for which beneficial uses have been designated. Water quality objectives are listed separately for surface water and groundwater in Chapter III of the Basin Plan and are either numeric or narrative. The water quality objectives are implemented in WDRs consistent with the Basin Plans' *Policy for Application of Water Quality Objectives*, which specifies that the Central Valley Water Board "will, on a case-by-case basis, adopt numerical limitations in orders that will be used to implement the narrative objectives." To derive numeric limits from narrative water quality objectives, the Board considers relevant numerical criteria and guidelines developed and/or published by other agencies and organizations.

The primary waste constituents of concern (COC's) due to discharges of waste from the Middle Basin with respect to surface waters are: nitrogen, phosphorus, potassium, arsenic, boron, molybdenum, selenium, uranium, total dissolved solids, total suspended solids, and electrical conductivity. In addition, agricultural drainage water may contain a variety of water soluble pesticides.

The COC's due to discharges of waste from the Middle Basin with respect to groundwater are: nitrogen in its various forms (ammonia and un-ionized ammonia, nitrate, nitrite, and total Kjeldahl nitrogen), sulfate, chloride, TDS, E.C., and select minerals (aluminum, arsenic, cadmium, copper, lead, potassium, selenium, and uranium).

The discharge of waste from the Middle Basin must not cause surface water or groundwater to exceed the applicable water quality objectives for those constituents. If compliance cannot be immediately achieved, the Board may set a compliance time

schedule for the discharger to achieve compliance with the water quality objectives. Under the Basin Plans, this time schedule must be "as short as practicable."

Water Quality Objectives and Federal Criteria for Surface Water
Water quality objectives that apply to surface water include, but are not limited to, (1) numeric objectives, including the bacteria objective, the chemical constituents objective (includes listed chemicals and state drinking water standards, i.e., maximum contaminant levels (MCLs) promulgated in Cal. Code Regs., title. 22, sections 64431 and 64444 and are applicable through the Basin Plans to waters designated as municipal and domestic supply), dissolved oxygen objectives, pH objectives, and the salinity objectives; and (2) narrative objectives, including the biostimulatory substances objective, the chemical constituents objective, and the toxicity objective. The Basin Plans also contain numeric water quality objectives that apply to specifically identified water bodies, including for example, electrical conductivity objectives for the Kings and Tule Rivers.

Federal water quality criteria that apply to surface water are contained in federal regulations referred to as the California Toxics Rule and the National Toxics Rule. (See 40 C.F.R. sections 131.36 and 131.38.)

Water Quality Objectives for Groundwater
Water quality objectives that apply to groundwater include, but are not limited to, (1) numeric objectives, including the bacteria objective and the chemical constituents objective (includes state MCLs promulgated in Cal. Code Regs., title. 22, sections 64431 and 64444 and are applicable through the Basin Plan to municipal and domestic supply), and (2) narrative objectives including the chemical constituents, taste and odor, and toxicity objectives. The Tulare Lake Basin Plan also includes numeric salinity limits for groundwater.

State Water Board Resolution 88-63 (The Sources of Drinking Water Policy)
The *Sources of Drinking Water Policy* states that all surface waters and groundwaters of the state are considered to be suitable, or potentially suitable, for municipal or domestic water supply, except where the groundwater meets one or more of the criteria specified in the Basin Plan, including:

a. The TDS exceeds 3,000 milligrams per liter (mg/L) (5,000 micromhos per centimeter (umhos/cm) electrical conductivity) and the aquifer cannot reasonably be expected by the Regional Board to supply a public water system;

b. There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices; or

c. The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day.

d. The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 CFR, section 146.4. for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, section 261.3.

The Basin Plan includes criteria for granting exceptions to municipal and domestic supply designations based on the *Sources of Drinking Water Policy*. The Basin Plan also includes criteria for granting exceptions to the designation of beneficial uses for agricultural supply and industrial supply. Exceptions to the *Sources of Drinking Water Policy* are not self-implementing, but must be established in an amendment to the Basin Plan.

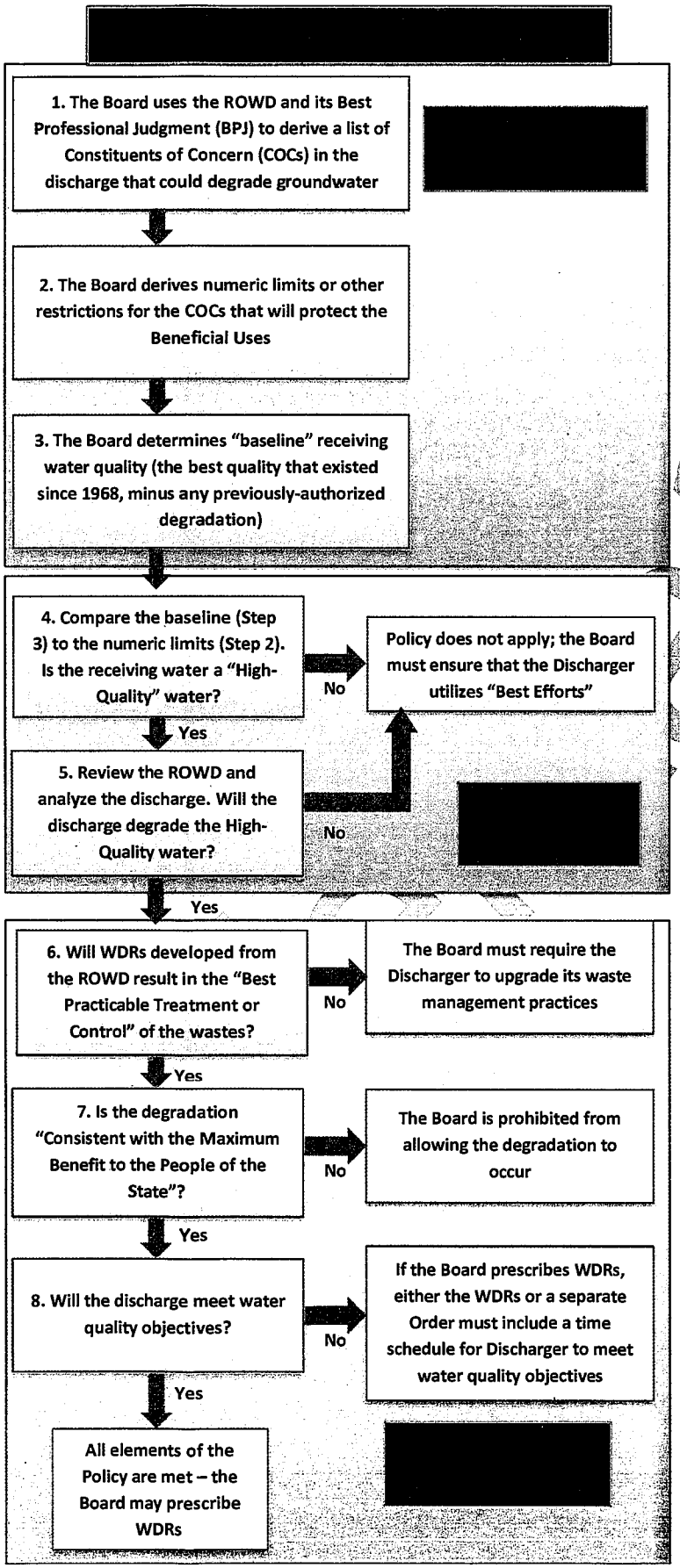
Title 27 of the California Code of Regulations

California Code of Regulations, title 27 contains regulatory requirements for the treatment, storage, processing, and disposal of solid waste, which includes designated waste, as defined by Water Code section 13173. However, title.27 exempts certain activities from its provisions. Discharges regulated by this Order are exempt from title.27 pursuant to a provision that exempts wastewater under specific conditions. This exemption, found at title. 27, section 20090, is described below:

(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 regional water quality control board 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.

In general, the Waste Discharge Requirements (WDRs) Program (sometimes also referred to as the "Non Chapter 15 (Non 15) Program") regulates point discharges that are exempt from title. 27 and not subject to the Federal Water Pollution Control Act.



Resolution 68-16 (State Anti-Degradation Policy) The *State Anti-Degradation Policy*, adopted by the State Water Board in October 1968, limits the Central Valley Water Board's discretion to authorize the degradation of high-quality waters. This policy has been incorporated into the Central Valley Water Board's Basin Plans. High-quality waters are those waters where water quality is more than sufficient to support beneficial uses designated in the Central Valley Water Board's Basin Plan. Whether or not a water is a high-quality water is established on a constituent-by-constituent basis, which means that an aquifer can be considered a high-quality water with respect to one constituent, but not for others. (State Water Board Order WQ 91-10).

The following provisions of the *State Anti-Degradation Policy* are directly applicable to the discharges regulated by this Order:

1. Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water,

and will not result in water quality less than that prescribed in the policies.

2. Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and

(b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

Generally speaking, these provisions require that the Central Valley Water Board adopt standards and requirements to ensure the discharger controls the discharge by employing "best practicable treatment or control" methodologies to limit the extent of the degradation, and that the Central Valley Water Board carefully consider whether the permitted degradation inheres to the maximum benefit to the people of the State when the Central Valley Water Board prescribes waste discharge requirements that will result in the degradation of high-quality waters. The *State Anti-Degradation Policy* also requires that the Central Valley Water Board prohibit waste discharges from resulting in water pollution or nuisance, though this is a requirement that also exists outside the context of the *State Anti-Degradation Policy*. (*see* Wat. Code, section 13263.)

The State Water Board has provided only limited guidance regarding the *State Anti-Degradation Policy*. The State Water Board's Administrative Procedures Update (APU) 90-004 provides guidance for implementing *State Anti-Degradation Policy* and the Clean Water Act's anti-degradation provisions (40 C.F.R. section 131.12.) in the context of NPDES permitting. Although APU 90-004 is not directly applicable to the Order because nonpoint discharges from agriculture are exempt from NPDES permitting requirements, the document is informative for interpreting the *State Anti-Degradation Policy*.

The flow chart on the previous page describes the process that the Central Valley Water Board generally uses to apply the *State Anti-Degradation Policy*, and the following discussion elaborates on how these requirements are applied in the context of the Order.

The following sections describe the step-by-step approach for applying the Anti-Degradation Policy, followed by the direct application of this policy to the Middle Basin Order.

The Initial Water Quality Assessment

Step 1: Due to the constituent-by-constituent nature of an anti-degradation analysis, the Central Valley Water Board must first compile a list of the waste constituents present in the discharge that could degrade groundwater. These constituents are referred to as "constituents of concern," or COCs. The Central Valley Water Board uses its best professional judgment to determine this suite of COCs, which is usually extrapolated

from the Report of Waste Discharge (ROWD) or Notice of Intent (NOI) that was submitted by the discharger.

Step 2: Once the Central Valley Water Board has compiled the list of COCs, it then references numeric limits or other restrictions that would protect the beneficial uses associated with the receiving water. Some constituents, such as those constituents that have Maximum Contaminant Levels established in title. 22 of the California Code of Regulations, have numeric water quality objectives associated with them, while others have only narrative water quality objectives associated with them. For constituents that have only narrative water quality objectives associated with them, the Central Valley Water Board derives numeric limits by considering relevant numerical criteria and guidelines developed and/or published by other agencies and organizations. (e.g., State Water Board, California Department of Health Services, California Office of Environmental Health Hazard Assessment, California Department of Toxic Substances Control, University of California Cooperative Extension, California Department of Fish and Wildlife, U. S. EPA, U. S. Food and Drug Administration, National Academy of Sciences, U. S. Fish and Wildlife Service, Food and Agricultural Organization of the United Nations).

Step 3: The Central Valley Water Board then makes a good-faith effort to determine best water quality that has existed since 1968, the year in which the anti-degradation policy was promulgated (often data from 1968 or earlier are unavailable). The Central Valley Water Board then determines whether any subsequent lowering of water quality was due to a regulatory action taken by the Central Valley Water Board. The best quality that has existed since 1968, minus any authorized degradation, becomes the "baseline" water quality[2].

Determining Whether the Anti-Degradation Policy is Triggered

Step 4: The Central Valley Water Board compares the numeric limits derived in Step 2 with the baseline water quality derived in Step 3. For each constituent, if the baseline water quality is better than the derived limits (i.e., the quality needed to support all of the beneficial uses), then the water is considered a "high-quality water." If the receiving water is not a high-quality water for all of the COCs, then the *State Anti-Degradation Policy* does not apply.

Step 5: The Central Valley Water Board determines whether the discharge will degrade the receiving water. The Central Valley Water Board makes this determination by comparing the information contained in the Discharger's RWD or other applicable information with the baseline water quality. If the discharge will not degrade the receiving water, then the *State Anti-Degradation Policy* does not apply.

Application of the State Anti-Degradation Policy's Requirements

[2] Water quality control policies adopted subsequent to 1968 may alter the calculation of this baseline.

Step 6: If the discharge will degrade a high-quality water, then the *State Anti-Degradation Policy* requires the Central Valley Water Board to prescribe requirements that will result in the best practicable treatment or control (BPTC) of the wastes in the discharge. BPTC is an evolving concept that takes into account changes in the technological feasibility of deploying new or improved treatment or control methodologies, new scientific insights regarding the effect of pollutants, and the economic realities that regulated industries face. Because this concept evolves over time, standard industry practices that are considered BPTC today may not be considered BPTC in the future. And though "practicality" limits the extent to which a discharger must implement expensive treatment or control measures, the Central Valley Water Board must ultimately ensure that discharges do not cause pollution or nuisance, thereby protecting those who rely on the quality of groundwater and surface waters. Neither the Water Code nor the *State Anti-Degradation Policy* defines the term "best practicable treatment or control." However, the State Water Board has stated that "one factor to be considered in determining BPTC would be the water quality achieved by other similarly situated dischargers, and the methods used to achieve that water quality" (See State Water Board Order WQ 2000-07, at pp. 10-11). Furthermore, in a "Questions and Answers" document for Resolution 68-16 (the Questions and Answers Document), BPTC is interpreted to include:

> "[A] comparison of the proposed method to existing proven technology; evaluation of performance data (through treatability studies); comparison of alternative methods of treatment or control, and consideration of methods currently used by the discharger or similarly situated dischargers."

Though the Central Valley Water Board is prohibited from specifying the design, location, type of construction, or particular manner in which a discharger may comply with a requirement, order, or decree (Wat. Code section 13360.), the Central Valley Water Board can still compare the treatment or control practices that a discharger has described in its ROWD to the treatment or control practices employed by similarly-situated dischargers in order to make a BPTC determination (State Water Board Order WQ 2000-7). Furthermore, "practicability" dictates that the Central Valley Water Board considers the costs associated with the treatment or control measures that are proposed in the ROWD.

Step 7: The *State Anti-Degradation Policy* also requires that the Central Valley Water Board consider whether the degradation authorized in a permit is "consistent with the maximum benefit to people of the state." For discharges subject to the federal Clean Water Act, it is only after "intergovernmental coordination and public participation" and a determination that "allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located" that the Central Valley Water Board can allow for degradation. (40 C.F.R. section 131.12.)

As described in the Question and Answers Document mentioned above, some of the factors that the Central Valley Water Board considers in determining whether

degradation is consistent with the maximum benefit to people of the State include: economic and social costs, tangible and intangible, of the proposed discharge, as well as the environmental aspects of the proposed discharge, including benefits to be achieved by enhanced pollution controls. USEPA guidance clarifies that the federal anti-degradation provision,

> "... is not a 'no growth' rule and was never designed or intended to be such. It is a policy that allows public decisions to be made on important environmental actions. Where the state intends to provide for development, it may decide under this section, after satisfying the requirements for intergovernmental coordination and public participation, that some lowering of water quality in "high quality waters" is necessary to accommodate important economic or social development" (EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters, Chapter 4).

APU 90-004 requires the Central Valley Water Board to consider both the costs to the discharger and the costs imposed upon the affected public in the NPDES context, and states that "cost savings to the discharger, standing alone, absent a demonstration of how these savings are necessary to accommodate 'important social and economic development' are not adequate justification for allowing degradation."

It is, however, important to keep the "maximum benefit to people of the state" requirement in context. Neither the *State Anti-Degradation Policy* nor the Water Code allows unreasonable affects to beneficial uses. Therefore, such unreasonable effects (such as the unmitigated pollution of a drinking water source) are not the focus of the Central Valley Water Board's inquiry, because they are legally prohibited. Instead, the *State Anti-Degradation Policy* requires the Central Valley Water Board to consider the costs that may be imposed on other dischargers as a result of the degradation that the Central Valley Water Board is allowing to occur. For example, if the Central Valley Water Board allows a discharger to operate a sub-standard facility that degrades a high-quality groundwater, dischargers situated downstream (for surface waters) or downgradient (for groundwater's) from that discharge would be discharging to a receiving water that lacks any capacity to assimilate additional waste loads. This may impose higher treatment costs on the downstream/downgradient discharger.

Ultimately, the Central Valley Water Board may allow degradation to occur following a demonstration that the degradation is consistent with the maximum benefit to the people of the state; the *State Anti-Degradation Policy* is not a no-growth or no-degradation policy. However, the Central Valley Water Board must justify why this degradation is beneficial not only to the discharger, but to others reliant on the water quality of the receiving water body.

Step 8: the Central Valley Water Board must ensure that discharges will not unreasonably affect present and anticipated beneficial use of such water, will not result in water quality less than that prescribed in relevant policies, and will not cause pollution or nuisance. The Water Code defines "pollution" to mean an alteration of the quality of the waters of the state by waste to a degree that unreasonably affects either the waters

for beneficial uses or the facilities that serve these beneficial uses, i.e., violation of water quality objectives. (Wat. Code, section 13050(1)). The term nuisance is defined as anything that is, (1) injurious to health, indecent or offensive to the senses, or an obstruction to the free use of property so as to interfere with the comfortable enjoyment of life or property; (2) affects an entire community or considerable number of persons; and (3) occurs during, or as a result of, the treatment or disposal of wastes. (Wat. Code, section 13050(m).). To constitute a nuisance, all three factors must be met.

The Central Valley Water Board ensures that this component of the *State Anti-Degradation Policy* is met by requiring a discharger to comply with water quality objectives designed to protect all designated beneficial uses, thereby protecting those who rely on the quality of groundwater and surface waters.

The State Anti-Degradation Policy as Applied to the Middle Basin Order
Steps 1-5 (Applied): There are no known historic shallow groundwater quality data available for the area of the proposed Mid Evaporation Basin (MEB) for 1968 or earlier. However, shallow groundwater quality was measured by the United States Geological Survey from wells situated approximately three miles to the north of the site in 1989, and electrical conductivity values are available from 1979 for shallow monitoring wells located approximately three miles south of the site (Table 3).

Historical shallow groundwater quality for the vicinity of the purposed facility (Table 3) has exceeded the primary MCL value for arsenic and secondary MCL values for conductivity (short term), TDS (short term), sulfate (short term), chloride (short term), aluminum, and manganese. While it is possible that shallow groundwater quality may have been somewhat better in 1968, it is improbable that it could have been usable as a source for drinking water during this period of time.

Table 3 - Historical Groundwater Quality

Analyte	Well at 23S/21E-8R sampled 28 June 1989	Well at 23S/22E-6R sampled 19 June 1989	Pre-Hacienda Basin Monitoring well 13-1A sampled 1979	Pre-Hacienda Basin Monitoring well 18-1A sampled 1979	Units[1]	California MCL	California Secondary MCL[2]	PHG[3]
Electrical Conductivity	11,400	10,500	14,500	14,600	umhos/cm		2,200	
Total Dissolved Solids	8,890	8,530			mg/L		1,500	
Chloride	1,400	3,100			mg/L		600	

Analyte	Well at 23S/21E-8R sampled 28 June 1989	Well at 23S/22E-6R sampled 19 June 1989	Pre-Hacienda Basin Monitoring well 13-1A sampled 1979	Pre-Hacienda Basin Monitoring well 18-1A sampled 1979	Units[1]	California MCL	California Secondary MCL[2]	PHG[3]
Nitrate + Nitrite as Nitrogen	<0.01[4]	0.58			mg/L	10		10
Sulfate	3,900	6,100			mg/L		600	
Bicarbonate	830	998			mg/L			
Aluminum	0.30	0.20			mg/L	1	0.2	0.6
Arsenic	0.014	0.024			mg/L	0.010		0.004
Barium	<0.1[4]	<0.1[4]			mg/L	1	2	2
Boron	6	2.5			mg/L			
Calcium	490	770			mg/L			
Chromium	<0.002[4]	<0.002[4]			mg/L	0.05		
Iron	3.8	3.4			mg/L			
Lead	NA[5]	NA[5]			mg/L	0.015[6]		0.0002
Magnesium	230	290			mg/L			
Manganese	7.2	9.6			mg/L			
Mercury (inorganic)	<0.001[4]	<0.001[4]			mg/L	0.002		1.2
Nickel	0.005	0.007			mg/L	0.1		0.012
Potassium	9.0	9.7			mg/L			
Selenium	<0.001[4]	<0.001[4]			mg/L	0.05		0.03
Silver	NA	NA			mg/L		0.1	
Sodium	2,200	1,600			mg/L			
Uranium (dissolved)	0.350	0.0074			ug/L[7]	20 pCi/L[c]	0.5	

1. Units - umhos/cm = micromhos per centimeter; mg/L = Milligrams per liter; ug/L = micrograms per liter; pCi/L = picocuries per liter.
2. The maximum contaminant level shown for EC, TDS, chloride, and sulfate are short term limits
3. PHG = Primary health goal. Action level only. Not a Maximum contaminant level.
4. < 0 01 = The less than symbol indicates the analyte was not detected above the laboratory reporting limit, which is the number shown to the right for the specific analyte.

5. NA = not analyzed.
6. Lead value is an action level, not a MCL
7. Federal MCL value for uranium is 30 ug/L; California MCL is 20 Picocuries per liter (pCi/L).

Current groundwater data (Tables 1 and 2) show that the water quality in all of the site wells and in the two tile drainage sumps exceeds the Primary MCL values for arsenic and uranium and Secondary MCLs for conductivity, TDS, and sulfate (the sole exception is for sulfate below the secondary MCL value in well 24-1B). Additionally, both tile drainage sumps contained water that exceeded the Primary MCL value for selenium and the sump at the northwest corner of Section 24 exceeded Primary MCL values for aluminum and lead. Based upon current and historic groundwater data, the quality of the shallow groundwater beneath the proposed facility is insufficient to support the Tulare Lake Basin Plan, Municipal and Domestic Supply (MUN) beneficial use. Therefore, this groundwater is not a high-quality water subject to the Anti-degradation Policy with respect to the MUN beneficial use.

Agricultural Supply (AGR) Beneficial Use

The Tulare Lake Basin Plan narrative description for the AGR beneficial use states, "uses of water for farming, horticulture, or ranching, including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing." Constituents of concern (COC's) with respect to the agricultural beneficial use include: 1) Stock watering - TDS, EC, sulfate, nitrate, aluminum, arsenic, boron, sodium, calcium, chloride, cadmium, selenium, uranium and zinc; 2) Irrigation Water - TDS, EC, sulfate, boron, chloride, sodium, calcium, and magnesium.

In an effort to evaluate numeric limits for AGR, Kennedy/Jenks Consultants, for the CV-SALTS program, reviewed a variety of published guidelines that have been developed for livestock drinking water requirements, primarily by universities or industry groups. An assortment of these studies was utilized by Kennedy/Jenks Consultants to prepare guidelines that identify upper and lower ranges of tolerable limits for sensitive livestock (Table 4 below).

Table 4 – Kennedy/Jenks Consultants Proposed Livestock Drinking Water Limits

Constituent[1]	Lower Value[2]	Upper Value	Sensitive Stock
TDS	<2,000 mg/L	5,000 mg/L	Poultry, especially turkeys
EC	<3,000 umhos/cm	<7,500 umhos/cm	Poultry, especially turkeys
Sodium	1,000 mg/L	2,000 mg/L	Poultry
Chloride	1,500 mg/L	3,000 mg/L	Poultry, Horses
Sulfate	1,000 mg/L	2,000 mg/L	Cattle
Boron	5.0 mg/L	7.0 mg/L	All
Nitrate + nitrite as N	100 mg/L	300 mg/L	Ruminants and Horses
Nitrate as N	10 mg/L	30 mg/L	Ruminants and Horses

1. TDS + Total dissolved solids. EC = electrical conductivity, Nitrate + nitrite as N = Nitrate + Nitrite as nitrogen, Nitrate as N = Nitrate as nitrogen.
2. Units – mg/L = milligram per liter, umhos.cm = micromhos per centimeter.

Historic groundwater quality data (Table 3), values from the Kennedy/Jenks review (Table 4), and data from additional published stock watering studies has been used by Central Valley Water Board staff to construct Table 5 below.

Table 5 provides an evaluation of the region's historic groundwater quality data, the upper concentrations for each COC, and the animal that is reported to be the most tolerant at these concentrations.

Table 5 - Historical Groundwater Quality

	Wells					Literature Values	Animal	
Analyte	Well at 23S/21E-8R sampled 28 June 1989	Well at 23S/22E-6R sampled 19 June 1989	Pre-Hacienda Basin Monitoring well 13-1A sampled 1979	Pre-Hacienda Basin Monitoring well 18-1A sampled 1979	Units[1]	Upper Value	Tolerant Animal Under Low Heat Stress Environment	Reference
Electrical Conductivity	11,400	10,500	14,500	14,600	umhos /cm	11,000 – 16,000	Non-lactating older horses, swine and sheep	1, 2, 3, 17
Total Dissolved Solids Dissolved Salts	8,890	8,530			mg/L	7,000 - 10,000	Non-lactating older horses, swine and sheep	1, 2, 3, 4, 5, 6, 7, 8, 9, 14, 17, 18, 19
Nitrate + Nitrite as Nitrogen	<0.01	0.58			mg/L	100	General Livestock	2, 3, 4, 8, 11, 14, 17, 19
Sulfate	3,900	6,100			mg/L	2,500 – 3,500	Non-lactating older horses, swine and sheep	6, 9, 13, 16
Aluminum	0.30	0.20			mg/L	5.0	General Livestock	1, 3, 4, 8, 10, 14, 17
Arsenic	0.014	0.024			mg/L	0.2	General Livestock	1, 2, 3, 5, 8, 10, 14, 17, 19
Boron	6	2.5			mg/L	5.0	General Livestock	1, 3, 4, 5, 10, 11, 14, 17
Cadmium	NA	NA			mg/L	0.05	General	1, 2, 3, 5,

	Wells					Literature Values	Animal	
Analyte	Well at 23S/21E-8R sampled 28 June 1989	Well at 23S/22E-6R sampled 19 June 1989	Pre-Hacienda Basin Monitoring well 13-1A sampled 1979	Pre-Hacienda Basin Monitoring well 18-1A sampled 1979	Units[1]	Upper Value	Tolerant Animal Under Low Heat Stress Environment	Reference
							Livestock	8, 14, 17, 19
Calcium	490	770			mg/L	1,000	General Livestock	4, 11
Selenium	<0.001	<0.001			mg/L	0.05	General Livestock	1, 2, 3, 4, 10, 14, 17,
Sodium	2,200	1,600			mg/L	1,000 – 4,000	General Livestock	15

1. Units – mg/L = milligram per liter, umhos/cm = micromhos per centimeter.

Comparison of the values presented in Table 5 with groundwater quality data for three of the four site monitoring wells (Middle Basin 24-1A, 24-1B, and 25-1A) shows that all three wells had concentrations below the Upper Values for all of the constituents listed. Additionally, wells Middle Basin 24-1B and 25-1A had concentration of sodium, chloride, sulfate, boron, nitrate + nitrite as N, and nitrate as N below the Lower Values for sensitive livestock.

Assessment of the site data (Tables 1 and 2) and historic groundwater quality data (Table 3) with the upper limits for COC's for tolerant livestock usage reveals that: monitoring well 24-1A meets the water quality requirements for livestock watering; monitoring wells 24-1B and 25-1A meet all requirements, except for arsenic (range of detections is slightly above the 0.2 mg/L value). Based upon this analysis, the groundwater at the Middle Basin is suitable for livestock watering and as such is subject to the Anti-degradation Policy with respect to the livestock watering AGR beneficial use.

In addition to livestock watering, the AGR beneficial use specifies the use of water furnished for irrigation purposes. Review of available literature for the production of crops using high salinity groundwater (Ayers, R.S., and Westcot, D.W., 1985, *Water Quality for Agriculture*: FAO Irrigation and Drainage Paper # 29 Rev 1, Food and Agricultural Organization of the United Nations. Available at: http://www.fao.org/docrep/003/t0234e/t0234E00.htm) shows that barley, cotton, sorghum and wheat (crops that are currently grown in the area) could be produced using groundwater from monitoring wells Middle Basin 24-1A, 24-1B, and 25-1A. Additionally, a variety of salt-tolerant crops may be grown using the historic groundwater

quality depicted in Table 6 and the water quality of the tail water sumps reported on Table 2.

A selection of these salt-tolerant crops is presented in Table 6 along with their associated reference studies.

Table 6 – Salt Tolerant Crops

Crop	Electrical Conductivity (umhos/cm)[1]	Total Dissolved Solids (mg/L)[2]	Boron (mg/L)[2]	Reference
Jose Tall Wheatgrass	15,000	9,600	20	2, 4, 5, 9
Alfalfa (Azgerm Salt II)	15,000	9,600	26.2	5, 8
Bermuda grass	12, 700	8,128	15	1, 3, 5, 7
Nypa forage *Distichlis spicata*	15,000 to 40,000	9,600 to 25,600	NA	6

1. Umhos/cm = micromhos per centimeter.
2. mg/L = milligram per liter.

Step 6 (Applied): Given that the *State Anti-Degradation Policy* applies for AGR, the Central Valley Water Board must ensure that the Middle Basin Order requires the Discharger to implement BPTC measures to minimize the amount of degradation that will occur.

Best Practicable Treatment or Control Measures for Pond Construction

This Order requires the implementation of BPTC in the construction and operation of the Middle Basin. Specifically, with respect to construction, the Discharger is required to submit final engineering drawings prepared and signed by a California Registered Civil Engineer, or Engineering Geologist for the proposed ponds, control structures, and piping design for Central Valley Water Board staff review and for Executive Officer approval prior to construction. The submittal must also include a seismic stability analysis of the proposed levee design and a construction quality assurance/quality control plan (QA/QC Plan). The QA/QC Plan will describe the process of additional field review to be conducted at locations within the proposed pond bottoms where test borings and/or excavation pits indicate a significant presence of shallow sandy soil layers. Location specific analysis of these areas will be used to determine whether it is feasible to disc, regrade, and then compact said soil layer to reduce seepage losses versus removing and replacing it.

Levee construction (both perimeter and internal) will be performed using acceptable silt/clay fill material (per the QA/QC Plan) that is excavated from within ponds and placed in compacted lifts to the required levee height. Similar to the pond bottoms

investigations, areas below the Middle Basin levees where the scarifying process identifies significant sandy intervals will be investigated for mitigation measures.

Drainage water collected by the subsurface tile drainage system will drain into drainage sumps that will be pumped back into the Middle Basin ponds.

Best Practicable Treatment or Control Measures for Pond Operations
The Middle Basin will be operated using two pump stations for delivery of drainage water to the ponds. Drain water would flow by gravity from the existing Main Pipeline into the pump sumps and the drainage water would then be pumped to the respective delivery points. Inlet #1 will be the primary or normal delivery point. Inlet #2 will provide operational flexibility to allow drainage water to continue to be diverted into the north half of the Middle Basin if for any reason there is a desire or need to dewater Ponds 1, 2, or 3 for operational purposes or necessary maintenance work. The use of Inlet #2 will only occur for short periods of time, as necessary, to accommodate maintenance operations. It will not be routinely used to fill the last three ponds.

Flow meters will be installed to measure the drainage water discharged into the Middle Basin at both inlets. Inlet pump flow rate will be controlled to insure the ponds are kept full (minimum depth above 2 feet up to approximately 5 feet with a required 2-foot freeboard). When drainage water is discharged at Inlet #1 it will begin filling Pond 1. Each pond will be approximately 310 acres in size. Two regulating structures will be installed in each pond to allow quicker dewatering and filling of the ponds. Each regulating structure will have an operational spill so once a pond is full water will begin spilling into the next pond. Each regulating structure will also have a control gate that can be opened to increase flows through the culvert between the ponds. This will provide the ability to quickly lower a pond water level if necessary. The gates to the ponds will normally be closed. The discharge at Inlet #1 will be delivered into Pond 1 and the flow will continue into this pond until the flow is allowed to spill at the regulating structures into the next pond.

During ongoing operations, drainage water will normally be discharged into Pond 1 and then allowed to gradually flow from pond to pond as the filling, flow through, and evaporation process occurs. A continuous review of pump operations and pond water level elevations (staff gauges will be set in each pond) will verify if acceptable water depths are being maintained. Water depths less than 2 feet can encourage certain avian species to wade and feed on the invertebrate organisms within the ponds. A minimum depth of 2 feet is required to minimize this possibility. The ponds will be able to fill to a depth of approximately 5 feet. This will provide operational flexibility to minimize shallow drainage water in the ponds. With the primary Inlet #1 pumps operating at a capacity of 70 cubic feet per second the spill from this flow into the next pond will fill a 2-foot depth of water in a 310 acre pond in approximately 2 days. With the ability to increase the water depth in each pond to nearly 5 feet, an upstream pond can be filled to a level significantly above the minimum 2-foot depth. When the canal gates at the control structures are opened the flow into the next pond can be increased

even further reducing the time to fill the pond to a 2-foot depth. This will minimize avian species foraging opportunities in shallow waters. If the drainage flows diminish and the pond cannot be kept above a depth of 2 feet then the pond will be pumped dry with portable pumps until increased drainage flows occur and additional storage is needed.

The design water surface elevation in Pond 1 will be the highest with a small drop in water surface elevation at each successive regulating structure to allow for gravity flow through sequential ponds in the system. The regulating structures and pipes installed through levees to the next pond are to be sized to minimize the drop in water surface elevation. The resulting design will allow for a continual flow from pond to pond with the ability to vary water levels if there is a need to increase storage during peak drainage flow periods.

Studies on wildlife reproduction show potentially significant potential environmental impacts linked to the discharge of subsurface agricultural drainage water to evaporation basins, particularly the cumulative effect of all discharges of this nature. In order to address this issue, the Wildlife Protocols developed with the United States Department of Fish and Wildlife, the California Department of Fish and Wildlife and the District have been incorporated into this Order.

Step 7 (Applied): Allowing the Discharger to degrade high quality waters is consistent with maximum benefit to people of the State as long as that degradation does not result in detrimental impacts to beneficial uses over the long term. California's farming industry is important to the economic well-being of the small communities that exist in the vicinity of the Tulare Lake Bottom. Farms generate jobs in a variety of sectors, from employees on the farm, providers of farm services, transportation of farm products, and many others. According to the Districts analysis, the addition of 18,000 acres of subsurface agricultural drainage will result in the retention of 180 farm labor jobs and provide $6.8 million in economic activity. In addition, the increased crop tonnages that will result from the removal of salt from the soil will further increase the number of agricultural jobs in the cultivation, harvesting, processing, and marketing sectors.

Step 8 (Applied): In the case of the Middle Basin Order, allowing the maximum extent of degradation allowed by law (i.e., degradation up to the water quality objectives that are protective of the designated beneficial uses) would result in water quality somewhere between the "best water quality that has existed since 1968" and a numeric limit that is protective of all beneficial uses, the Central Valley Water Board acknowledge that their primary task lies in preventing pollution and protecting sensitive uses.

Verifying that the State Anti-Degradation Policy is Satisfied

The Central Valley Water Board recognizes that monitoring of the evaporation ponds and their effect on surface water and groundwater is needed to verify that water quality is adequately protected and the intent of the *State Anti-Degradation Policy* is met. Accordingly, the Order, in conjunction with its Monitoring and Reporting Program (MRP), prohibits discharges from the evaporation basin to surface waters and requires

that groundwater monitoring must be conducted by the Discharger. Should surface discharges of drainage water occur, the Order requires discharge monitoring and chemical analysis to determine if an exceedance of a water quality objective has occurred. Additionally, the MRP requires the Discharger to monitor the existing subsurface tile drainage system and first-encountered groundwater adjacent to the basin. The purpose of requiring monitoring of the area directly below the ponds and the first-encountered groundwater adjacent to the basin is to determine whether the operation of the Middle Basin is protective of groundwater quality at the most vulnerable points. Groundwater monitoring is necessary to: determine background groundwater quality, determine existing groundwater conditions near the ponds, determine whether additional pond operational practices need to be implemented, and confirm that any additional practices implemented have the desired result on groundwater quality.

The deeper confined ground water below the proposed Middle Basin (beneath the "E" clay) is of good quality and can be beneficially used for municipal, agricultural, and industrial supply. It is anticipated that the operation of the subsurface tile drainage system in conjunction with the low permeability of the underling clayey soils, will result in little opportunity for vertical migration from the shallow unconfined or semi-confined groundwater into the deeper groundwater. In order to confirm this assumption, this Order requires the Discharger to install a series of deeper groundwater monitoring wells adjacent to the shallow first encountered monitoring system.

This Order requires the Discharger to report any noncompliance that endangers human health or the environment, or any noncompliance with the Prohibitions contained in the Order within 24 hours of becoming aware of its occurrence. This Order also requires the Discharger to submit annual monitoring reports that contain the analytical results of laboratory data, including all laboratory analyses (including Chain of Custody forms and laboratory QA/QC results) for surface and groundwater monitoring. Additionally, an annual assessment of groundwater monitoring is required. The assessment must include an evaluation of the groundwater monitoring program's adequacy to assess compliance with the Order, including whether the data provided are representative of conditions upgradient and downgradient of the Middle Basin.

<u>Waters that are Not High Quality: The "Best Efforts" Approach</u>
When the quality of a receiving water body exceeds or just meets the applicable water quality objective due to naturally-occurring conditions or due to prior Central Valley Water Board-authorized activities, it is not considered a high-quality water, and it is not subject to the requirements of the *State Anti-Degradation Policy*. However, where a groundwater constituent exceeds or just meets the applicable water quality objective, the Central Valley Water Board must set limitations no higher than the objectives set forth in the Basin Plan. This rule may be relaxed if the Central Valley Water Board can show that "a higher discharge limitation is appropriate due to system mixing or removal of the constituent through percolation through the ground to the aquifer" (State Water Board Order No. WQ 81-5). However, the Central Valley Water Board should set limitations that are more stringent than applicable water quality objectives if the more

stringent limitations can be met through the use of "best efforts." (State Water Board Order No. WQ 81-5)(*City of Lompoc*). The "best efforts" approach involves the establishment of requirements that require the implementation of reasonable control measures. Factors that are to be analyzed under the "best efforts" approach include the water quality achieved by other similarly situated dischargers, the good faith efforts of the discharger to limit the discharge of the constituent, and the measures necessary to achieve compliance (*City of Lompoc*, at p. 7.). The State Water Board has applied the "best efforts" factors in interpreting BPTC (see State Water Board Order Nos. WQ 79-14 and WQ 2000-07). Additionally, per the Basin Plan and the *Sources of Drinking Water Policy* (Resolution No. 88-63), where the Central Valley Water Board finds that one of the exceptions applies, it may remove the MUN designation for the particular water body through a formal Basin Plan amendment that includes a public hearing. The District via Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) is in the process of conducting a hydrologic evaluation for the purposes of delisting of the MUN and AGR beneficial uses for a portion of the general footprint of the Tulare Lakebed that includes the proposed Middle Basin location.

In summary, the Central Valley Water Board may establish requirements more stringent than applicable water quality objectives even outside the context of the *State Anti-Degradation Policy*. The "best efforts" approach must be taken where a water body is not "high quality" and the antidegradation policies are accordingly not triggered.

California Environmental Quality Act (CEQA)
On 20 December 2012 the District filed a draft Mitigated Negative Declaration (MND), Initial Study, and Environmental Checklist with the State Clearinghouse, Office of Planning & Research (SCH Number 2012121057) for the proposed construction and operation of the Mid-Evaporation Basin for management and disposal of sub-surface agricultural drain water. The review period for the environmental documents ended on 22 January 2013. Comments were received from the California Department of Conservation, CDF&W, Region 4, and the Native American Heritage Commission. Both the CDF&W (23 January 2013) and the Central Valley Water Board (9 May 2013) submitted late comments. CDF&W's comments were addressed in the final EIR that was received at the State Clearinghouse on 22 May 2013 and a Notice of Determination filed on the same day.

Central Valley Salinity Alternatives for Long-Term Sustainability
The CV-SALTS initiative has the goal of developing sustainable solutions to the increasing salt and nitrate concentrations that threaten achievement of water quality objectives in Central Valley surface waters and groundwater. The Central Valley Water Board intends to coordinate all such actions with the CV-SALTS initiative. The District and the Tulare Lake Basin Water Storage District are currently engaged in such an action with CV-SALTS (an evaluation of the MUN and AGR beneficial uses in the Tulare Lake Bottom area). This is the first step in the process of potentially recommending de-designation of these beneficial uses from a segment of the groundwater beneath a portion of the Tulare Lake Bed. The de-designation of a beneficial use is a multipart

process that involves a significant commitment of time and resources. Should such an effort prove successful, this Order can be amended in the future to implement any policies or requirements established by the Central Valley Water Board as a result of the CV-SALTS process.

REQUIREMENTS AND ENFORCEMENT OF THE ORDER

What are the wastes to be discharged to the Middle Basin, and what are their potential impacts to water quality?

For the purposes of this Order, agricultural drainage-water wastes includes, but is not limited to, EC, TDS, chloride, nitrate as NO_3, sulfate as SO_4, arsenic, boron, cadmium, calcium, copper, hardness as CaCO3, lead, magnesium, manganese (inorganic), potassium, selenium, sodium, uranium and pesticides (those pesticides listed in 22 CCR section 64431). This list of COC's includes those previously identified above for the AGR beneficial use, constituents specified as being of primary concern in the Final Report of the San Joaquin Valley Drainage Program (1990) and constituents on Tables 1 and 2 that exceeded one half of their respective MCL values. A variety of the COC's identified for monitoring are specified as drinking water contaminants in 22 CCR section 64431. These drinking water contaminants have been included given the existing MUN designation for the groundwater beneath the Tulare Lake Bed. Should the MUN designation be removed, the Orders MRP will be modified to reflect a reduced list of COC's.

Surface water can be degraded and polluted by both the type and high concentrations of pollutants contained in agricultural drainage-water. High salinity, trace element contaminants (i.e. arsenic, boron, lithium, molybdenum, and selenium), and atypical ratios of major ions (i.e. sulfate, magnesium, sodium, chloride, calcium) in the waste are toxic to aquatic life. In addition, nitrogen and phosphorus compounds in the waste can cause excessive algal growth in surface waters, resulting in lower oxygen levels and that in turn causes fish and other organisms to die. The presence of pathogens in the waste can create a public health threat through human contact with affected waters.

This Order includes prohibitions, specifications, and provisions for the construction and operation of the Middle Basin that are consistent with state regulations. Consistent with Title 27, this Order prohibits the direct or indirect discharge of waste from the Middle Basin to surface water. This Order also prohibits discharges that cause pollution or nuisance, or that causes or contributes to exceedances of any water quality objective in the Basin Plan or water quality criteria set forth in the California Toxics Rule and the National Toxics Rule.

How Will the Central Valley Water Board Regulate the Discharge of These Wastes?

Prohibitions: The Middle Basin Order includes a number of prohibitions to protect surface and groundwater quality, and to ensure that waste discharges not regulated by

this Order are prohibited unless otherwise regulated by another Order of the Central Valley Water Board.

Discharge Specifications: The Order includes a number of Discharge Specifications that require the Discharger to: operate and maintain effective interceptor systems to minimize lateral seepage from the basins; operate and maintain the subsurface tile drainage system to minimize vertical seepage; rapid filling of ponds to attain the minimum water depth (2 feet) or drain to zero (0) feet as quickly as possible; conduct avian species monitoring and hazing program coupled with the operation of compensation habitat as approved by the United States Department of Fish and Wildlife and California Department of Fish and Wildlife; and operated and maintain ponds to prevent inundation or washout due to floods with up to a 100-year return period.

Evaporation Pond Specifications: The Middle Basin Order requires that the basins be designed, constructed, and operated to maintain a minimum freeboard of 2 feet unless levees are certified in writing by a registered civil engineer or geotechnical engineer as structurally sound and capable of preventing overtopping at a specific lesser freeboard. Specifically, the level of waste in retention ponds shall be kept a minimum of two feet from the top of each aboveground embankment. Ponds shall not have small coves and irregularities around the perimeter of the water surface. Ponds shall have interior side slopes at 3:1 or steeper. Weeds shall be minimized in all ponds through control of water depth, harvesting, or other appropriate method, and dead algae, vegetation, and debris shall not be allowed to accumulate on the water surface.

Closure Provisions: This Order requires annual submittal of a Closure Plan and Financial Assurance Plan and includes a provision that the Discharger must maintain coverage under this Order or a subsequent revision to this Order until all drainage water is removed or evaporated and final grading and disposal of sediments containing elevated levels of minerals and trace elements have been completed. Solids removed from the basins shall be disposed of in a manner that is consistent with title 27 and approved by the Executive Officer.

These closure requirements ensure compliance with the provisions of the *State Anti-Degradation Policy*.

Receiving Water Limitations: This Order includes Groundwater Limitations that require the discharge of waste at the Middle Basin not cause the underlying groundwater to exceed water quality objectives, unreasonably affect beneficial uses, or cause a condition of pollution or nuisance.

How Will the Central Valley Water Board Evaluate the Effectiveness of Management Practices?

This Order includes a provision that requires compliance with the MRP, and future revisions thereto, as specified by the Central Valley Water Board or the Executive Officer. The MRP requires:

- daily inspections of the pond areas
- influent wastewater monitoring
- individual cell monitoring (wastewater and sediment)
- groundwater monitoring
- seepage monitoring including subsurface tile drain water and interceptor drain monitoring
- monitoring of surface water and discharges to surface water
- wildlife monitoring
- quarterly and annual reporting of monitoring data
- annual reporting of groundwater monitoring

Specifically, the Middle Basin Order requires the Discharger to monitor first encountered groundwater upgradient and downgradient of the waste retention ponds, and to monitor the deeper groundwater to ensure that vertical seepage will not adversely impact the semi-confined and/or confined ground water below the proposed Middle Basin. The purpose of the groundwater monitoring program is to determine that pond operations do not cause receiving waters to exceed applicable groundwater objectives and confirm compliance with the requirements of this order.

The Middle Basin Order contains significant requirements for evaporation basin operations that are designed to be protective of surface and groundwater quality while also being practicable and economically feasible. These include: collection of vertical and lateral pond seepage waters; implementation of testing and measurement of pond water, pond sediment, subsurface drainage water, and groundwater; and wildlife monitoring and hazing operations.

How Will This Order Be Enforced?

The State Water Board's Water Quality Enforcement Policy (Enforcement Policy) establishes a process for using progressive levels of enforcement, as necessary, to achieve compliance. It is the goal of the Central Valley Water Board to enforce this order in a fair, firm, and consistent manner. Violations of this order will be evaluated on a case-by-case basis with appropriate enforcement actions taken based on the severity of the infraction and may include issuance of administrative civil liabilities. Progressive enforcement is an escalating series of actions that allows for the efficient and effective use of enforcement resources to: 1) assist cooperative dischargers in achieving compliance; 2) compel compliance for repeat violations and recalcitrant violators; and 3) provide a disincentive for noncompliance. Progressive enforcement actions may begin with informal enforcement actions such as a verbal, written, or electronic communication between the Central Valley Water Board and the Discharger. The purpose of an

informal enforcement action is to quickly bring the violation to the discharger's attention and to give the discharger an opportunity to return to compliance as soon as possible. The highest level of informal enforcement is a Notice of Violation.

The Enforcement Policy recommends formal enforcement actions for the highest priority violations, chronic violations, and/or threatened violations. Violations of the Middle Basin Order that will be considered as high priority violations include, but are not limited to:

1. Any discharge of waste and/or storm water from the ponds to surface waters.
2. Failure to submit notification of a discharge to surface water in violation of the Order.
3. Falsifying information or intentionally withholding information required by applicable laws, regulations or an enforcement order.
4. Failure to pay annual fee, penalties, or liabilities.
5. Failure to monitor as required.
6. Failure to submit required reports on time.

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

STANDARD PROVISIONS AND REPORTING REQUIREMENTS FOR WASTE DISCHARGE REQUIREMENTS

1 March 1991

A. General Provisions:

1. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, or protect the Discharger from liabilities under federal, state, or local laws. This Order does not convey any property rights or exclusive privileges.

2. The provisions of this Order are severable. If any provision of this Order is held invalid, the remainder of this Order shall not be affected.

3. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to:

   a. Violation of any term or condition contained in this Order;

   b. Obtaining this Order by misrepresentation, or failure to disclose fully all relevant facts;

   c. A change in any condition that results in either a temporary or permanent need to reduce or eliminate the authorized discharge;

   d. A material change in the character, location, or volume of discharge.

4. Before making a material change in the character, location, or volume of discharge, the discharger shall file a new Report of Waste Discharge with the Regional Board. A material change includes, but is not limited to, the following:

   a. An increase in area or depth to be used for solid waste disposal beyond that specified in waste discharge requirements.

   b. A significant change in disposal method, location or volume, e.g., change from land disposal to land treatment.

   c. The addition of a major industrial, municipal or domestic waste discharge facility.

   d. The addition of a major industrial waste discharge to a discharge of essentially domestic sewage, or the addition of a new process or product by an industrial facility resulting in a change in the character of the waste.

have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing within **two weeks**. The written notification shall state the nature, time and cause of noncompliance, and shall include a timetable for corrective actions.

2. The discharger shall have a plan for preventing and controlling accidental discharges, and for minimizing the effect of such events.

   This plan shall:

   a. Identify the possible sources of accidental loss or leakage of wastes from each waste management, treatment, or disposal facility.

   b. Evaluate the effectiveness of present waste management/treatment units and operational procedures, and identify needed changes of contingency plans.

   c. Predict the effectiveness of the proposed changes in waste management/treatment facilities and procedures and provide an implementation schedule containing interim and final dates when changes will be implemented.

   The Board, after review of the plan, may establish conditions that it deems necessary to control leakages and minimize their effects.

3. All reports shall be signed by persons identified below:

   a. <u>For a corporation</u>: by a principal executive officer of at least the level of senior vice-president.

   b. <u>For a partnership or sole proprietorship</u>: by a general partner or the proprietor.

   c. <u>For a municipality, state, federal or other public agency</u>: by either a principal executive officer or ranking elected or appointed official.

   d. A duly authorized representative of a person designated in 3a, 3b or 3c of this requirement if;

      (1) the authorization is made in writing by a person described in 3a, 3b or 3c of this provision;

      (2) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a waste management unit, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and

      (3) the written authorization is submitted to the Board

complete the application for this Order. Records shall be maintained for a minimum of three years from the date of the sample, measurement, report, or application. This period may be extended during the course of any unresolved litigation regarding this discharge or when requested by the Regional Board Executive Officer.

Record of monitoring information shall include:

a. the date, exact place, and time of sampling or measurements,
b. the individual(s) who performed the sampling of the measurements,
c. the date(s) analyses were performed,
d. the individual(s) who performed the analyses,
e. the laboratory which performed the analysis,
f. the analytical techniques or methods used, and
g. the results of such analyses.

4. All monitoring instruments and devices used by the discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated at least yearly to ensure their continued accuracy.

5. The discharger shall maintain a written sampling program sufficient to assure compliance with the terms of this Order. Anyone performing sampling on behalf of the discharger shall be familiar with the sampling plan.

6. The discharger shall construct all monitoring wells to meet or exceed the standards stated in the State Department of Water Resources *Bulletin 74-81* and subsequent revisions, and shall comply with the reporting provisions for wells required by Water Code Sections 13750 through 13755.22

D. Standard Conditions for Facilities Subject to California Code of Regulations, Title 23, Division3, Chapter 15 (Chapter 15)

1. All classified waste management units shall be designed under the direct supervision of a California registered civil engineer or a California certified engineering geologist. Designs shall include a Construction Quality Assurance Plan, the purpose of which is to:

   a. demonstrate that the waste management unit has been constructed according to the specifications and plans as approved by the Board.

   b. provide quality control on the materials and construction practices used to construct the waste management unit and prevent the use of inferior products and/or materials which do not meet the approved design plans or specifications.

2. Prior to the discharge of waste to any classified waste management unit, a California registered civil engineer or a California certified engineering geologist must certify that the waste management unit meets the construction or prescriptive standards and performance goals in Chapter 15, unless an engineered alternative has been approved by the Board. In the case of an engineered alternative, the registered civil engineer or a certified engineering geologist must

a. an upset occurred and the cause(s) can be identified;

b. the permitted facility was being properly operated at the time of the upset;

c. the discharger submitted notice of the upset as required in paragraph B.1. above; and

d. the discharger complied with any remedial measures required by waste discharge requirements.

In any enforcement proceeding, the discharger seeking to establish the occurrence of an upset has the burden of proof.

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 Board by **31 January**.

5. Effluent samples shall be taken downstream of the last addition of wastes to the treatment or discharge works where a representative sample may be obtained prior to disposal. Samples shall be collected at such a point and in such a manner to ensure a representative sample of the discharge.

6. Definitions

   a. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with effluent limitations because of factors beyond the reasonable control of the Discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper action.

   b. The monthly average discharge is the total discharge by volume during a calendar month divided by the number of days in the month that the facility was discharging. This number is to be reported in gallons per day or million gallons per day.

      Where less than daily sampling is required by this Order, the monthly average shall be determined by the summation of all the measured discharges by the number of days during the month when the measurements were made.

   c. The monthly average concentration is the arithmetic mean of measurements made during the month.

   d. The "daily maximum" **discharge** is the total discharge by volume during any day.

additional limitations, or changes to existing requirements, may be necessary to prevent Pass Through, Interference, or noncompliance with sludge disposal requirements.

c. The cumulative number of industrial users that the discharger has notified regarding Baseline Monitoring Reports and the cumulative number of industrial user responses.

d. An updated list of the discharger's industrial users including their names and addresses, or a list of deletions and additions keyed to a previously submitted list. The discharger shall provide a brief explanation for each deletion. The list shall identify the inddustrial users subject to federal categorical standards by specifying which set(s) of standards are applicable. The list shall indicate which categorical industries, or specific pollutants from each industry, are subject to local limitations that are more stringent that the federal categorical standards. The discharger shall also list the noncategorical industrial users that are subject only to local discharge limitations. The discharger shall characterize the compliance status through the year of record of each industrial user by employing the following descriptions:

(1) Complied with baseline monitoring report requirements (where applicable);

(2) Consistently achieved compliance;

(3) Inconsistently achieved compliance;

(4) Significantly violated applicable pretreatment requirements as defined by 40 CFR 403.8(f)(2)(vii);

(5) Complied with schedule to achieve compliance (include the date final compliance is required);

(6) Did not achieve compliance and not on a compliance schedule;

(7) Compliance status unknown.

A report describing the compliance status of any industrial user characterized by the descriptions in items (d)(3) through (d)(7) above shall be **submitted quarterly from the annual report date** to EPA and the Board. The report shall identify the specific compliance status of each such industrial user. This quarterly reporting requirement shall commence upon issuance of this Order.

e. A summary of the inspection and sampling activities conducted by the discharger during the past year to gather information and data regarding the industrial users. The summary shall include but not be limited to, a tabulation of categories of dischargers that were inspected and sampled; how many and how often; and incidents of noncompliance detected.

Regional Administrator
U.S. Environmental Protection Agency W-5
75 Hawthorne Street
San Francisco, CA 94105

and

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Revised January 2004 to update addresses and phone numbers