

October 27, 2015

State Water Resources Control Board
Office of Chief Counsel
Adrianna M. Crowl
P.O. Box 100
Sacramento, CA 95812-0100

Petition to intervene in the Central Valley Regional Water Quality Control Board Adopted Order No. R5-2015-0093

Section (1)

Central California Environmental Justice Network (CCEJN) requests that the State Water Resources Control Board intervene in Order No. R5-2015-0093 adopted by the Central Valley RWQCB on July 30, 2015. The physical address of the petitioner, should be filed as:

Attn: Cesar Campos
Director
Central California Environmental Justice Network
4270 N. Blackstone Ave #212
Fresno, CA 93726
559-485-1416 ext 116
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Section (2)

CCEJN is requesting the review of Order No. R5-2015-0093 – Cease and Desist Order for Valley Water Management Company’s Race track Hill and FEE 34 facilities in Kern County.

Attachment I of this petition is a copy of the adopted version of the order, adopted on July 30, 2015. Attachment II of this letter provides a copy of the proposed CDO considered by the board during the hearing on that day, and proposed as a draft on May 15, 2015.

The adopted order is significantly different from the proposed order and lifts a requirement for Valley Water “to cease all discharge other than to established impoundments” by August 15, 2015.

Section (3)

There are several dates applicable as follows:

On May 15, 2015 the Central Valley RWQCB released a draft Cease and Desist order (R5-2015-XXXX) certified under Pamela A. Creedon, Executive Officer, in regards to Valley Water Management Company Race Track Hill and FEE 34 Facility in the Edison Oil Field of Kern County.

This proposed order was in official hearing as item 10 of the July 30, 2015 Central Valley RWQCB meeting. At this time the prosecution and the discharger both made extensive remarks about the Cease & Desist Order.

On July 30, 2015 during the hearing, and after the official hearing had been closed to public comment, significant amendments to the proposed Cease & Desist Order were considered by the Regional Board prompted by the “distribution” of a document detailing those amendments.

On July 30, 2015 the Regional Water Board voted to adopt the amended Cease & Desist Order (No. R5-2015-0093). It is important to note that both the discharger and the prosecution as well as Board members verbally expressed insufficient time to review the amendments, and the public was not given a chance to comment on the amendments.

Section (4)

Central California Environmental Justice Network is issuing a petition for review of this order for several actions conducted by the Central Valley Regional Water Board during the process to adopt this item.

These actions made for an improper decision:

1. The Central Valley Regional Water Quality Control Board adopted a measure and failed to provide the public sufficient time for reviewing, and commenting on that order. We express that 15 minutes to review amendments is insufficient, as was expressed by RWQCB members, the prosecution, and the discharger. {Cited on Section 7}
2. The Central Valley Regional Water Quality Control Board failed to provide the public an opportunity to voice concerns about the adopted order by only re-opening the hearing to testimony from the prosecution team and the discharger, after the amendments had been proposed to the Cease and Desist Order. {Cited on Section 7}
3. The Central Valley Regional Water Quality Control Board failed to properly discuss, note, and rectify the lack of compliance with the Basin Plan and Order 92-110 for Edison Oil Field Operations, and Resolution 58-349 from the Race Track Hill and FEE 34 Facilities. {Cited on Section 7}
4. The Central Valley Regional Water Quality Control Board expressed that the timelines in the order were amended “taking into account some of the timelines proposed by Valley Water.” This admission is problematic as it suggests that the discharger has been allowed the opportunity to request its own timeline for complying with the law. It is also problematic that the amendments were proposed from a bias of helping the discharger, as opposed to focusing on enforcing regulatory authority. {Cited on Section 7}
5. The Central Valley Regional Water Quality Control Board failed to move on the agenda item of voting on the proposed order as was established during the full discussion of the meeting.
6. The Central Valley Regional Water Quality Control Board voted for adopting the amended order because of claims that the timelines set forth in the proposed order would have negative economic impact on the corporations sending water to Valley Water—we hold that this consideration is out of the scope of the Board’s authority. More so, the Board failed to prove that this claim was in fact, true—given that the discharger did not present a congruent case that they could not handle the produced water even if they shut down these facilities. Furthermore, since the Board claimed to consider negative economic impacts, they did not consider the full extent of economic impacts of contamination to groundwater or the health of communities downstream.
7. In the adopted order the Central Valley Regional Water Quality Control Board allows the discharger to continue the operation of both facilities prior to fully characterizing the extent and nature of groundwater contamination and surface runoff, which is inconsistent with the

proposed order (5.15.15) that would have seized operations prior to characterization of those operations. This is problematic as the RWQCB adopted an order that has the potential to cause further contamination.

Section (5)

Central California Environmental Justice Network operates as a network of organizations that support environmental justice communities in the San Joaquin Valley. Our member organizations support community members in power building, network organizing, community-data gathering, etc to reverse the pattern of historical conditions and decisions that have disproportionately impacted the low-income minority communities in our region. We have member organizations across the eight counties of the San Joaquin Valley, including Kern County and the Tulare Lake Basin.

As an environmental justice organization, we have a responsibility to our constituencies to call out situations in which decisions made by regulatory bodies serve to further exploit the resources of our region. This decision by the Central Valley Regional Water Quality Control Board is a decision that by its very nature contradicts the principles of environmental justice that call for proper opportunities for public opinion and engaged decision-making. This decision also serves to continue decades of contamination suffered by communities in Kern County, as it compromises the quality of ground and surface water in order to protect the interest of a few corporations in an industry that continues to have a detrimental environmental impact in this region.

Given the continued emphasis on the scarcity of good quality water in this region, any action to further contaminate water is one that will have detrimental effects on disadvantaged communities. It is these communities that are already paying a high price for water that they are not even able to drink. It is these communities that suffer first if less agricultural products means less work hours. For these communities it is incredibly important to continue to protect good sources of water.

Section (6)

Through this petition we request the careful consideration of the grievances to water quality acquired by this decision of the Regional Water Quality Control Board.

1. We request that the adoption of Order R5-2015-0093 be nullified upon receipt of this letter and re-notified for public comment.
2. We request that the State Water Resources Control Board make a statement to classify the significance of changes made by the adopted CDO in comparison to the proposed CDO. We request that given this classification, the SWRCB provide guidelines for an appropriate public comment and response period that should be undertaken prior to the adoption of this order.
3. We request that the Regional Water Quality Control Board properly cite Valley Water with a Notice of Violation for failure to comply with the Basin Plan and Order 92-110 for Edison Oil Field Operations, and Resolution 58-349 from the Race Track Hill and FEE 34 Facilities that includes proper enforcement actions.
4. We request that operations at the Race Track Hill and FEE 34 facilities be stopped in consistency with the timelines proposed in the May 15, 2015 draft order.

Section (7)

The following citations are gathered to support claims made on section 4 of this document. They are numbered in correspondence to the number assigned on Section 4:

1. Central Valley Regional Water Quality Control Board. *7-30-15 Central Valley Region Water Quality Control Board Meeting (Afternoon Session)*. Published August 4, 2015. Retrieved from: https://www.youtube.com/watch?v=IkROJ_QG3gw; Reference 4:10:34, 4:26:17, 4:27:37.
2. Central Valley Regional Water Quality Control Board. *7-30-15 Central Valley Region Water Quality Control Board Meeting (Afternoon Session)*. Published August 4, 2015. Retrieved from: https://www.youtube.com/watch?v=IkROJ_QG3gw; Reference 4:25:46.
3. Creedon, Pamela C., California Regional Water Quality Control Board, *Order No. R5-2015-0093 for Valley Water Management Company Race Track Hill Facility and Fee 34 Facility, Edison Kern County*. July 30, 2015.
4. Central Valley Regional Water Quality Control Board. *7-30-15 Central Valley Region Water Quality Control Board Meeting (Afternoon Session)*. Published August 4, 2015. Retrieved from: https://www.youtube.com/watch?v=IkROJ_QG3gw; Reference 4:34:02.
5. N/A
6. Central Valley Regional Water Quality Control Board. *7-30-15 Central Valley Region Water Quality Control Board Meeting (Afternoon Session)*. Published August 4, 2015. Retrieved from: https://www.youtube.com/watch?v=IkROJ_QG3gw; Reference 4:05:54.
7. Creedon, Pamela C., California Regional Water Quality Control Board, *Order No. R5-2015-0093 for Valley Water Management Company Race Track Hill Facility and Fee 34 Facility, Edison Kern County*. July 30, 2015.

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Creedon, Pamela C., California Regional Water Quality Control Board, *Order No. R5-2015-XXXX for Valley Water Management Company Race Track Hill Facility and Fee 34 Facility, Edison Kern County*. May 15, 2015.

Section (8)

This petition has been sent to the State Water Board using appropriate channels in compliance with California Code of Regulations Title 23 § 2050. The petition has been sent on the date printed above.

Section (9)

The request for this petition was first expressed in a letter dated August 20, 2015 addressed to the State Water Resources Control Board. That letter was sent during the 30 day period to register actions following the adoption of Order No. R5-2015-0093 on July 30, 2015.

On October 9, 2015 the State Water Resources Control Board responded with a Notice of Incomplete Petition addressed to Cesar Campos.

This petition is filed in completion on October 27, 2015, within the 20 day period allowed since the date of the Notice of Incomplete Petition.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2015-XXXX

FOR
VALLEY WATER MANAGEMENT COMPANY
RACE TRACK HILL FACILITY AND
FEE 34 FACILITY, EDISON
KERN COUNTY

WATER CODE SECTION 13301 ORDER
TO COMPLY WITH RESOLUTION 58-349 AND
ORDERS 92-110 AND 92-11037

The California Regional Water Quality Control Board, Central Valley Region (hereafter referred to as "Central Valley Water Board" or "Board") finds that:

1. Valley Water Management Company (hereinafter referred to as Valley Water), owns and operates two oil well production wastewater disposal facilities under the names of "Fee 34 Facility" and "Race Track Hill Facility" in the Edison area of Kern County. Each facility has been issued an individual order for operation. However, since the two facilities are parts of a single wastewater processing and disposal operation, they are jointly addressed in this order as a single wastewater processing facility.

FEE 34 FACILITY

2. The Fee 34 Facility (also known as the C-Plant Facility) is on 3.4 acres (Assessor's Parcel Number 388-050-254) in the SW $\frac{1}{4}$ of the SW $\frac{1}{4}$ of Section 34, T29S, R29E, MDB&M. The Fee 34 Facility is approximately one mile northeast of the community of Edison in the Edison Oil Field (see Attachment A, which is attached hereto and made part of this Order). Discovered in 1928, the Edison Oil Field as of 2008 had a cumulative production of over 150 million barrels of oil, over 5.5 million barrels in reserve, 932 producing wells, and was ranked 38th among California's largest and most productive oil fields by total ultimate recovery.¹ In the year 2013, the Edison Oil Field produced 790,130 barrels of oil and 12,107,770 barrels of water.²
3. The Fee 34 Facility contains six surface impoundments. Wastewater is transported to the facility by pipeline from various small, independent oil company leases throughout the Edison Oil Field. Crude oil skimmed from the produced waters flows into two netted, unlined oil recovery impoundments until shipped offsite. The wastewater flows through three gunite-lined

¹ "2009 Report of the State Oil & Gas Supervisor," Department of Oil, Gas, and Geothermal Resources (DOGGR), California Department of Conservation, 2009, accessible at ftp://ftp.consrv.ca.gov/pub/oil/annual_reports/2009/PR06_Annual_2009.pdf at p. 65.

² "2013 Report of the State Oil & Gas Supervisor," Department of Oil, Gas, and Geothermal Resources (DOGGR), California Department of Conservation, 2013, accessible at ftp://ftp.consrv.ca.gov/pub/oil/annual_reports/2013/PR03_PreAnnual_2013.pdf at p. 9.

impoundments equipped with skimmers and is then pumped via pipeline to Valley Water's Race Track Hill Facility for disposal. There is one unlined contingency impoundment for temporary storage of excess wastewater in the instance of power failure or other emergency event. Dimensions of the impoundments range from approximately 30 feet (ft.) x 50 ft. to 120 ft. x 180 ft., and are approximately 10 ft. to 15 ft. deep. An aerial photograph of the Fee 34 Facility is attached hereto as Attachment B and made part of this Order.

4. The Fee 34 Facility is regulated by Central Valley Water Board Order Nos. 92-110 and 92-11037. Order 92-110 sets forth general WDRs for the discharge of oil field produced wastewaters from Edison Oil Field operations, including the Fee 34 Facility. Order 92-11037 is the Notice of Applicability of the general WDRs to the Fee 34 Facility, and includes a chemical analysis of the wastewater with the following characteristics: 7,900 micromhos per centimeter ($\mu\text{mhos/cm}$) electrical conductivity (EC), 4,450 milligrams/liter (mg/l) chloride, and 15.6 mg/l boron.
5. The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition* (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.
6. Surface drainage is toward the East Side Canal in the Arvin-Wheeler Ridge Hydrologic Area (557.30) of the Tulare Lake Basin. Surface waters in the Arvin-Wheeler Ridge Hydrologic Area are designated as Valley Floor Waters. The designated beneficial uses of Valley Floor Waters, as specified in the Basin Plan, are agricultural supply; industrial service and process supply; water contact and non-contact water recreation; warm fresh water habitat; wildlife habitat; preservation of rare, threatened, and endangered species; and groundwater recharge.
7. The Fee 34 Facility is in the Kern County Basin Hydrologic Unit, Detailed Analysis Unit (DAU) 258. The designated beneficial uses of the groundwater, as specified in the Basin Plan for DAU 258, are municipal and domestic water supply, agricultural supply, industrial service, and process supply.
8. Information obtained from the California Department of Water Resources identified 36 groundwater supply wells within about one-mile of the Fee 34 Facility. The groundwater is primarily used for agricultural supply. Driller's reports for 19 of the wells identify six domestic supply wells, twelve agricultural supply wells, and one industrial supply well.

RACE TRACK HILL FACILITY

9. The Race Track Hill Facility is located on 338.4 acres in the western half of Section 24, T29S, R29E, MDB&M. The Facility is about fifteen miles east of Bakersfield in Kern County on Assessor's Parcel Number 387-060-031(see Attachment C).
10. The Race Track Hill Facility contains 27 unlined surface impoundments and approximately 94 acres of land, a portion of which is used for surface sprinkler disposal. Wastewater discharge began 56 ½ years ago, in approximately December of 1958. Wastewater is transported to the Facility by pipeline from Valley Water's Fee 34 Facility, which is about four miles to the southwest in the Edison Oil Field. The wastewater is discharged to the impoundments for percolation and evaporation. Excess wastewater that does not percolate or evaporate is sprayed onto portions of the 94 acres for disposal.

11. The Race Track Hill Facility is in an area of rolling topography and a portion of the site may drain toward Cottonwood Creek, about one-half mile northeast of the Facility. Cottonwood Creek is tributary to the Kern River. The designated beneficial uses of the Kern River below the southern California Edison Kern River Powerhouse Number One, as specified in the Basin Plan, are municipal and domestic supply, agricultural supply, industrial service and process supply, hydropower generation, water contact and non-contact recreation, warm fresh water habitat, wildlife habitat, preservation of rare, threatened and endangered species, and groundwater recharge.
12. The Race Track Hill Facility is in the Kern County Basin Hydrologic Unit, DAU 257. The designated beneficial uses of the groundwater for DAU 257, as specified in the Basin Plan, are municipal and domestic water supply, agricultural supply, industrial service and process supply, and water contact recreation.
13. The Race Track Hill Facility is underlain by unconsolidated sediments of the Kern River-Chanac Series. The consolidated sediments of the Santa Margarita Formation underlie the Kern River-Chanac Series. The top of the Santa Margarita Formation and the overlying sediments dip to the southwest at an angle of approximately five degrees.
14. The Race Track Hill Facility's WDRs, Resolution No. 58-349, was adopted by the Central Valley Water Board on September 18, 1958, and set forth requirements for the discharge of oil field produced wastewater at the Facility.
15. The WDRs allow the discharge of oil field produced wastewater to the ground surface, into natural drainage channels, and into surface impoundments in Section 24, T298, R29E, MDB&M, with no waste constituent limitations. The WDRs also allow the discharge of oil field produced wastewater to the ground surface, into natural drainage channels, or into unlined surface impoundments other than those constructed in Section 24, provided the wastewater conforms to the following criteria:
 - a. Total dissolved solids shall not exceed 1,000 parts per million.
 - b. Chlorides shall not exceed 150 parts per million.
 - c. Boron shall not exceed 1.0 part per million.
16. The WDRs predate the Basin Plan and do not contain the limitations on the discharge of oil field produced wastewater to surface impoundments within Section 24 that are contained in the Basin Plan.
17. Although Resolution 58-349 found "no freshwater producing wells in this vicinity" in 1958, more recent information obtained from the California Department of Water Resources identified six groundwater supply wells within one-mile of the Facility. Groundwater from these wells may have been used for domestic water supply, agriculture supply, and industrial service supply. The current status of these wells is not clear and some may have been destroyed.

WASTE DISPOSAL OPERATIONS AND COMPLIANCE

18. Discharge of Waste to Land: This information is based upon the 27 November 2012 and 18 September 2013 Central Valley Water Board inspections of the Fee 34 Facility and Race Track Hill Facility, and based upon Valley Water’s wastewater analysis lab report dated 23 July 2013 for the Fee 34 Facility regarding concentrations of EC in $\mu\text{mhos/cm}$, chloride in mg/l , and boron in mg/l . The Basin Plan and Order 92-110 for Edison Oil Field Operators, and Resolution 58-349 set forth the following waste constituent limitations for the discharge of oil field wastewater:

	<u>Units:</u>	<u>Basin Plan & Order 92-110 Limitation Value:</u>	<u>Res. 58-349 Limitation Value:</u>
<u>Specific EC:</u>	$\mu\text{mhos/cm}$	1,000	None
<u>Total Dissolved Solids:</u>	mg/l (ppm)	NA	1,000 (outside Section 24)
<u>Chloride:</u>	mg/l	200	150 (outside Section 24)
<u>Boron:</u>	mg/l	1	1 (outside Section 24)

The Basin Plan allows discharges of oil field wastewater that exceed the above maximum salinity limits to unlined sumps, stream channels, or surface waters if the Discharger successfully demonstrates to the Central Valley Water Board in a public hearing that the proposed discharge will not substantially affect water quality nor cause a violation of water quality objectives.

The 23 July 2013 wastewater analytical results at Fee 34 Facility were measured at the following values and are compared to 1992 levels and the Basin Plan limits:

	<u>Units:</u>	<u>1992 Value</u>	<u>2013 Value:</u>	<u>Basin Plan Limits:</u>
<u>Specific EC:</u>	$\mu\text{mhos/cm}$	7,900	5,700	1,000
<u>Chloride:</u>	mg/l	4,450	1,800	200
<u>Boron:</u>	mg/l	15.6	14	1

19. The Fee 34 Facility and Race Track Hill Facility were also inspected on 27 March 2015. Violations of the WDRs for both facilities were noted during the inspections. At the Fee 34 Facility, wastewater with EC, chloride, and boron values greater than the Basin Plan limits was being discharged to the ponds in violation of Discharge Specification B.1 of the WDRs. Also, the ponds at the Fee 34 Facility had insufficient freeboard in violation of Discharge Specification B.6 of the WDRs and were not adequately netted or covered to preclude access by wildlife to wastewater with oil coatings in violation of Discharge Specification B.4 of the WDRs. The inspection report noted that the Race Track Hill Facility had insufficient freeboard on two ponds and insufficient netting on three ponds.
20. On 24 May 1996, Valley Waste Disposal Company, the predecessor of Valley Water, submitted the report *Drilling and Data Acquisition Report, Race Track Hill District, Edison Oil Field, Kern County, California*. The report was submitted pursuant to Discharge Specification B.2.c. of Order 92-110. The report and transmittal letter stated that the Fee 34 Facility "... does not pose a threat to ground water quality and that no further action should be required for continued operation of the site." The transmittal letter also requested a hearing if necessary to demonstrate that the facility does not pose a threat to groundwater quality. There is no record of a response nor an evaluation of the report in the site files, and a hearing before the Central Valley Water Board was not held. Current

Central Valley Water Board staff reviewed the report and transmittal letter and found it inadequate to demonstrate that there have been no impacts, or that there is no threat, to groundwater.

21. On 9 October 2013, the Central Valley Water Board issued a Notice of Violation (NOV) to Valley Water (see Attachment D, which is attached hereto and made part of this Order) for violations of the Discharge Specifications of Order 92-110 at the Fee 34 Facility. The NOV allegations included discharging wastewater in excess of the numerical limitations specified in Discharge Specification B.1 (see Finding No. 18), which is causing, or is threatening to cause a condition of pollution,³ contamination or nuisance⁴; and failure to maintain the minimum freeboard of two feet in two of the impoundments as specified in Discharge Specification B.6, which is causing, or is threatening to cause, a condition of pollution, contamination, or nuisance caused by overtopping the impoundments. Valley Water submitted a response to the NOV on 8 November 2013 addressing each allegation.
22. Section 13301 of the Water Code provides in relevant part that:

When a regional board finds that a discharge of waste is taking place, or threatening to take place, in violation of requirements of discharge prohibitions prescribed by the regional board or the state board, the board may issue an order to cease and desist and direct that those persons not complying with the requirements or discharge prohibitions (a) comply forthwith, (b) comply in accordance with a time schedule set by the board, or (c) in the event of a threatened violation, take appropriate remedial or preventive action. Cease and desist orders may be issued direct by a board, after notice and hearing.
23. The discharge of waste with high salinity and boron concentrations and other oil field wastewater constituents to the ground, surface water, and/or groundwater creates, or threatens to create, a condition of pollution in surface and groundwater, and may result in the degradation of water quality.
24. Land around the Fee 34 Facility is being used for agricultural production, primarily citrus and grapes. Land around the Race Track Hill Facility is also used for agricultural production including open stock grazing, a five-acre vineyard located approximately 3,000 feet southwest of the facility, and other crops grown in the area beginning about one mile south of the facility.
25. Many of the crops are irrigated with groundwater from local supply wells. Irrigation water with a chloride concentration above 350 mg/l can cause severe crop problems. Boron toxicity can impair

³ "Pollution" is defined by Water Code section 13050, subdivision (l)(1) as, an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects either of the following: (A) The waters for beneficial uses; (B) Facilities which serve these beneficial uses." Water Code §13050(l).

⁴ "Nuisance" means anything which meets all of the following requirements: (1) Is injurious to health, or is 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 at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes." Water Code §13050(m).

crops sensitive to boron at concentrations less than 1 mg/l in irrigation water.⁵

26. Underlying groundwater may be degraded if mixed with oil field wastewater. Elevated EC, chloride, and boron levels could impair groundwater for municipal and domestic supply and agricultural supply uses.
27. Due to the topographic relief at the Race Track Hill Facility and the relatively close proximity (one-half mile) to Cottonwood Creek, a major storm has the potential to flush a portion of the accumulated salts discharged to the spray field the past 50-60 years into Cottonwood Creek, which could then be transported to the Kern River 2.5 miles downstream. This has the potential to result in a temporary salt and boron loading of water in the Kern River, and to increase salt and boron loading to groundwaters at the terminus of Kern River flow where groundwater is recharged. Operation of the spray field would require a permit under the National Pollution Discharge Elimination System, but the disposal operation currently would not meet the requirements for discharge to a surface water.

HYDROGEOLOGICAL INVESTIGATION

28. On 1 July 2014, the Central Valley Water Board issued an Order pursuant to Section 13267 of the California Water Code to Valley Water requiring preparation and submission of work plans for hydrogeologic site characterizations for each facility and technical reports presenting their findings. The Discharger petitioned this Order to the State Water Resources Control Board.
29. Valley Water agreed to assess the impacts of wastewater discharges at the Racetrack and Fee 34 facilities. To date, the approach has been to conduct the work in phases with preparation of a work plan containing a specific scope of work, implementation of the work, followed by reporting. Based on the results of each phase, additional work is proposed.
30. As of 1 May 2015, two phases of field work have been completed, including:
 - Soil borings at both Facilities;
 - Soil sampling and analysis;
 - Shallow and deep monitoring well installations at both facilities;
 - Groundwater sampling and analysis; and
 - Leak-testing the lined ponds at the Fee 34 Facility.

⁵ Ayers, R. S., and D. W. Westcott. "FAO 1985. Water Quality for Agriculture." *Irrigation and Drainage Paper* 29.

31. As of 1 May 2015, the results of the Phase 1 field work and parts of the Phase 2 field work have been formally reported. The conclusions include:
- There are wastewater constituents in the soils at the Race Track Hill Facility;
 - Groundwater occurs at depths ranging from 48 to 80 feet below ground surface at the Race Track Hill Facility;
 - There is groundwater mounding beneath the Race Track Hill Facility;
 - Groundwater beneath the Racetrack Hill Facility flows to the southwest;
 - Groundwater beneath the Racetrack Hill Facility has been impacted by the wastewater disposed to the ponds. The EC of the groundwater and the concentrations of boron and chloride are similar to oil field wastewater at the Race Track Hill Facility; and
 - The seepage rates of the North Pond and the South Pond at the Fee 34 Facility are 4.4 millimeters per day and 1.8 millimeters per day, respectively. Those rates translate to approximately 500 gallons per day from the North Pond and approximately 200 gallons per day from the South Pond.
32. The investigations conducted by Valley Water have determined the discharge of wastewater in excess of Basin Plan limitations and water quality objectives has caused a condition of pollution to groundwater at the Racetrack Hill Facility. Additional assessment is needed to determine the nature and extent of the wastewater constituents in groundwater.
33. The apparent direction of groundwater flow beneath the Racetrack Hill Facility is towards residential water supply wells immediately to the southwest and towards Edison and Bakersfield, five to ten miles to the southwest.
34. Based on a review of the site conditions, wastewater quality and volumes, and the results of the field investigations, spraying wastewater onto the ground surface and into natural drainages exacerbates the pollution of the underlying groundwater and creates a potential for waste constituents to drain into Cottonwood Creek and the Kern River. This Order requires the Discharger to cease all discharge of wastewater other than to established impoundments within two weeks of adoption.

REGULATORY CONSIDERATIONS

35. It is anticipated that General Waste Discharge Requirements for the operation of oil field wastewater ponds would be proposed for consideration by the Central Valley Water Board in the spring or summer of 2016. The Fee 34 Facility and the Race Track Hill Facility will be required to comply with those General Waste Discharge Requirements, or the discharges shall cease and residual liquid wastes shall be removed and disposed of at an appropriately regulated discharge facility.

36. The deadlines set forth herein are reasonable given the need to investigate the potential threat to groundwater and surface water quality.
37. In accordance with Water Code section 13267(b) these findings provide Valley Water with a written explanation with regard to the need for remedial action and reports, and identify the evidence that supports the requirement to implement investigative activities, to implement cease and desist activities if needed, and to submit the reports. Valley Water owns and operates the Fee 34 Facility and Race Track Hill Facility which are subject to this Cease and Desist Order. The technical and monitoring reports required by this Order are necessary to determine compliance with this Cease and Desist Order. The actions and reports required by this Order are needed to provide information to provide information to the Central Valley Water Board regarding (a) the nature and extent of the discharge, (b) the nature and extent of pollution in waters of the State and/or U.S. created by the discharge, (c) the threat to public health posed by the discharge; and (d) appropriate cease and desist measures. Based on the nature and possible consequences of the discharges, including the contamination of surface water or groundwater, or impacts to groundwater recharge areas, the burden of the required tasks, including the costs, bears a reasonable relationship to the need for the tasks and reports, and the benefits to be obtained from the tasks and information.
38. Issuance of this Cease and Desist Order is being taken for the protection of the environment and as such is exempt from provisions of the California Environmental Quality Act (CEQA) (Public Resources Code section 21000 et seq.) in accordance with California Code of Regulations, title 14, sections 15061(b)(3), 15306, 15307, 15308, and 15321. This Cease and Desist Order generally requires Valley Water to submit plans for approval prior to implementation of cleanup activities at the Fee 34 Facility and Race Track Hill Facility. Mere submission of plans is exempt from CEQA as submission will not cause a direct or indirect physical change in the environment and/or is an activity that cannot possibly have a significant effect on the environment. CEQA review at this time would be premature and speculative, as there is simply not enough information concerning Valley Water's proposed remedial activities and possible associated environmental impacts.
39. If the Regional Board determines that implementation of any plan required by this Cease and Desist Order will have a significant effect on the environment, the Regional Board will conduct the necessary and appropriate environmental review prior to the Assistant Executive Officer's approval of the applicable plan. The Discharger will bear the costs, including the Regional Board's costs, of determining whether implementation of any plan required by this Cease and Desist Order will have a significant effect on the environment and, if so, in preparing, handling, and providing any documents necessary for environmental review. If necessary, the Discharger and a consultant acceptable to the Regional Board shall enter into a memorandum of understanding with the Regional Board regarding such costs prior to undertaking any environmental review.
- As a result of the events and activities described in this Order, the Central Valley Water Board finds that a discharge of waste in violation of the Basin Plan has polluted groundwater. This Order requires Valley Water to take appropriate remedial action and to comply in accordance with the time schedule set forth below.
40. This Cease and Desist Order is based upon: 1) Chapter 5, Enforcement and Implementation commencing with section 13300, of the Porter-Cologne Water Quality Control Act (Water Code Division 7, commencing with section 13000); 2) Water Code section 13267, Investigations; inspections, Chapter 4, Regional Water Quality Control; 3) all applicable provisions of the Basin Plan including beneficial uses, water quality

objectives, and implementation plans; 4) California State Water Resources Control Board (State Water Board) Resolution No. 68-16 (*Statement of Policy with Respect to Maintaining High Quality of Waters in California*); 5) State Water Board Resolution No. 92-49 (*Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code section 13304*); and 6) all other applicable legal authority.

41. Water Code section 13267 subdivision (b)(1) states, in relevant part:

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

42. On 30/31 July 2015, in Rancho Cordova, California, after due notice to the Discharger and all other affected persons, the Central Valley Water Board conducted a public hearing at which evidence was received to consider an Order under Water Code section 13301 to establish a time schedule to achieve compliance with the Basin Plan or cease discharge.

IT IS HEREBY ORDERED that, pursuant to Water Code sections 13301 and 13267, Valley Water Management Company shall implement the following measures necessary in order to comply with the *Water Quality Control Plan for the Tulare Lake Basin, Second Edition*, and this Order.

This Order requires the submission of technical reports. These technical reports shall contain the information and decisions required by the following paragraphs. If a report is submitted without the required information or decision, then the Discharger is in violation of this Order and subject to additional enforcement.

1. **By 15 August 2015**, Valley Water shall cease all discharge other than to established impoundments.
2. **By 15 August 2015**, Valley Water shall prepare and submit to the Central Valley Water Board a report containing the results of the entire Phase 2 Subsurface Investigation for the impacts or threatened impacts of wastewater discharges at the Fee 34 Facility and Race Track Hill Facility to the groundwater, soils, and surface water.
3. **By 31 August 2015**, Valley Water shall submit a report that contains the amount of wastewater discharged to the Facility for the period from 1 January 2010 through 31 December 2014. The report shall tabulate the volume on a monthly and annual basis, provide the average monthly discharge per year, and the average annual discharge for each year.

4. **By 30 September 2015**, Valley Water shall submit the Phase 3 Work Plan for the Race Track Hill Facility. The Work Plan shall be complete and approvable by the Assistant Executive Officer (or for his/her delegate's approval) and shall detail the following activities and shall include a time schedule detailing the sequence of the work plan activities and the time frame for completing each activity:
 - (a) Continue the hydrogeological site characterization to determine the nature and extent of the release of waste constituents consistent with the evaluation monitoring program requirements contained in Title 27;
 - (b) Prepare and submit a Water Quality Protection Standard Report proposing statistical data analysis methods to calculate concentration limits for each Constituent of Concern specified in Monitoring and Reporting Program R5-2015-XXXX.
 - (c) Identify and sample water supply wells located within one-mile of the Race Track Hill Facility and analyze the samples for waste constituents of concern;
 - (d) Analyze groundwater, surface water, and soil samples at a California certified laboratory in accordance with the SAP submitted as part of the Phase I Work Plan (see Finding No. 28) and approved by the Assistant Executive Officer (or his/her delegate);
 - (e) Following the characterization of the nature and extent of the release, a groundwater, surface water, and/or soil remediation program shall be submitted for Assistant Executive Officer (or his/her delegate) review and approval that is consistent with the corrective action program requirements contained in Title 27. This will entail the preparation of an engineering feasibility study followed by a proposed corrective action program;
 - (f) Implementation of BMPs to minimize further discharges of waste to groundwater, surface waters, or soils;
 - (g) Based on information acquired during the hydrogeological site characterization, submit a revised report of waste discharge, if appropriate, for revision of the waste discharge requirements consistent with current regulations and policies;

5. **By 31 October 2015**, Valley Water shall submit the Phase 3 Work Plan for the Fee 34 Facility. The Work Plan shall be complete and approvable by the Assistant Executive Officer (or for his/her delegate's approval) and shall detail the following activities and shall include a time schedule detailing the sequence of the work plan activities and the time frame for completing each activity:
 - (a) Conduct a hydrogeological site characterization to determine any wastewater impacts to the unsaturated zone and the groundwater underlying the Fee 34 Facility.
 - (b) Prepare and submit a Water Quality Protection Standard Report proposing statistical data analysis methods to calculate concentration limits for each Constituent of Concern specified in Monitoring and Reporting Program R5-2015-XXXX.
 - (c) Identify and sample water supply wells located within one-mile of the Fee 34 Facility and analyze the samples for waste constituents of concern;

- (d) Analyze groundwater, surface water, and soil samples at a California certified laboratory in accordance with the SAP submitted as part of the Phase I Work Plan (see Finding No. 28) and approved by the Assistant Executive Officer (or his/her delegate);
6. If the a release of waste constituents has impacted the unsaturated zone or the groundwater underlying the Fee 34 Facility, then Valley Water shall complete the following as part of a Phase 4 investigation:
- (a) Conduct a hydrogeological site characterization to determine the nature and extent of any release of waste constituents consistent with the evaluation monitoring program requirements contained in Title 27;
 - (b) Following the characterization of the nature and extent of the release, a groundwater, surface water, and/or soil remediation program shall be submitted for Assistant Executive Officer (or his/her delegate) review and approval that is consistent with the corrective action program requirements contained in Title 27. This will entail the preparation of an engineering feasibility study followed by a proposed corrective action program;
 - (c) Implement BMPs to minimize further discharges of waste to groundwater, surface waters, or soils;
 - (d) Based on information acquired during the hydrogeological site characterization, submit a revised report of waste discharge, if appropriate, for revision of the waste discharge requirements consistent with current regulations and policies.
7. Valley Water shall implement the Phase 3 Work Plans, the Fee 34 Facility Phase 4 Work Plan (if required), and any additional work required as approved by the Assistant Executive Officer (or his/her delegate) in accordance with the approved time schedule included in the Work Plan and the deadlines indicated in Monitoring and Reporting Program No. XXXXX.
8. Beginning **1 November 2015**, or a date approved by the Assistant Executive Officer (or his/her delegate), and quarterly thereafter until all Work Plan activities are complete, Valley Water shall submit technical reports that provide information to document the Work Plan activities completed to date and to ultimately document that all elements of the Work Plan have been completed. Corrective actions shall be proposed and included in these technical reports when Work Plan activities fail to satisfy any interim or final success criteria.
9. **By 31 December 2016**, discharges at both the Fee 34 Facility and Race Track Hill Facility shall be able to comply with one of the General Waste Discharge Requirements that are anticipated to be considered by the Central Valley Water Board in the spring or summer of 2016, or the discharges shall cease and the Discharge shall submit a Closure Plan and Time Schedule to remove the residual liquid waste and implement closure of the ponds.

10. If it is determined that discharges from the Fee 34 Facility or Race Track Hill Facility have impaired the beneficial use of water, Valley Water can be further required upon notification by the Assistant Executive Officer (or his/her delegate) to provide a replacement water supply or treat the water to allow continued use.

Other Requirements

11. **Electronic and Paper Media Reporting Requirements.** Valley Water shall submit both electronic and paper copies of all reports required under this Cease and Desist Order including work plans, technical reports, and monitoring reports. Larger documents shall be divided into separate files at logical places in the report to keep file sizes under 150 megabytes. Valley Water shall continue to provide a paper transmittal letter, a paper copy of all figures larger than 8.5 inches by 14 inches (legal size), and an electronic copy (on Compact Disc [CD] or other appropriate media) of all reports to the Central Valley Water Board. All paper correspondence and documents submitted to the Central Valley Water Board shall include the following identification numbers in the header or subject line: Fee 34 Facility Geotracker Site ID: T10000005197; and Race Track Hill Facility Geotracker Site ID: T10000005199. Valley Water shall comply with the following reporting requirements for all reports and plans (and amendments thereto) required by this Order:
 - (a) Reports and Plans Required by this Order. Valley Water shall submit one paper and one electronic, searchable Portable Document Format (PDF) copy of all technical reports, monitoring reports, progress reports, and plans required by this Order. The PDF copy of all the reports shall also be uploaded into the Geotracker database, as required by Reporting Requirement 2.(b)(iv) below.
 - (b) Electronic Data Submittals to the Central Valley Water Board in compliance with the Cease and Desist Order are required to be submitted electronically via the Internet into the Geotracker database (Fee 34 Facility Geotracker Site ID: T10000005197; and Race Track Hill Facility Geotracker Site ID: T10000005199). The electronic data shall be uploaded on or prior to the regulatory due dates set forth in the Cease and Desist Order or addenda thereto. To comply with these requirements, Valley Water shall upload to the Geotracker database the following minimum information:
 - (1) Laboratory Analytical Data: Analytical data (including geochemical data) for all waste, soil, and water samples shall be submitted in Electronic Deliverable Format (EDF), which facilitates the transfer of data from the laboratory to the end user. Waste, soil, and water include analytical results of samples collected from the following locations and devices: surface samples, equipment, monitoring wells, boreholes, gas and vapor wells or other collection devices, surface water, groundwater, piezometers, and stockpiles.
 - (2) Locational Data: All permanent monitoring locations (monitoring wells, sediment sampling locations, surface water sampling locations, etc.) shall be surveyed with latitude and longitude coordinates in a decimal degree format based on the North American Datum 1983 ellipsoid, and accurate to within one meter (3 feet) and elevation data accurate to 0.01 feet.

- (3) **Site Maps:** Site maps which display discharge locations, streets bordering the Facilities, and sampling locations for all waste, soil, and water samples. A site map is a stand-alone document that may be submitted in various electronic formats. Site maps must also be uploaded to show the maximum extent of any soil impact and water pollution. An update to the site maps may be uploaded at any time.
 - (4) **Electronic Report:** A complete copy (in character searchable PDF) of all work plans, work plan modifications, assessment, cleanup, and monitoring reports including the signed transmittal letters, professional certifications, and all data presented in the reports.
12. **Duty to Use Qualified Professionals.** As required by the California Business and Professions Code sections 6735, 7835, and 7835.1, all reports shall be prepared by, or under the supervision of, a California Registered Engineer or Professional Geologist and signed by the registered professional. Each technical report submitted by Valley Water shall contain the professional's signature and/or stamp of the seal.
 13. **Signatory Requirements.** All reports required under this Cease and Desist Order shall be signed and certified by Valley Water or by a duly authorized representative and submitted to the Central Valley Water Board. A person is a duly authorized representative only if: 1) The authorization is made in writing by Valley Water; and 2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity. (A duly authorized representative may be either a named individual or any individual occupying a named position.)
 14. With each report required by this Cease and Desist Order, Valley Water shall provide under penalty of perjury under the laws of California a "Certification" statement to the Central Valley Water Board. The "Certification" shall include the following signed statement:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. Pursuant to Water Code section 13350, any person who violates a cease and desist order may be liable administratively or civilly in an amount up to fifteen thousand dollars (\$15,000) for each day in which the cease and desist order is violated.

15. All monitoring and technical reports required under this Cease and Desist Order shall be submitted to:

California Regional Water Quality Control Board
Central Valley Region
1685 E Street, Suite 200
Fresno, CA 93706
Attn: Ron Holcomb
Geotracker Site ID No.: T10000005197 or T10000005199

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 or may issue a complaint for administrative civil liability.

Failure to comply with this Order, Order 92-110, Order 92-11037, or Resolution 58-349 may result in the assessment of Administrative Civil Liability of up to \$10,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268, 13350 and 13385. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050, et seq. 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 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 July 2015.

PAMELA C. CREEDON, Executive Officer

(Date)

REH: 15 May 2015

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2015-0093

FOR
VALLEY WATER MANAGEMENT COMPANY
RACE TRACK HILL FACILITY AND
FEE 34 FACILITY, EDISON
KERN COUNTY

WATER CODE SECTION 13301 ORDER
TO COMPLY WITH RESOLUTION 58-349 AND
ORDERS 92-110 AND 92-11037

The California Regional Water Quality Control Board, Central Valley Region (hereafter referred to as "Central Valley Water Board" or "Board") finds that:

1. Valley Water Management Company (hereinafter referred to as Valley Water), owns and operates two oil well production wastewater disposal facilities under the names of "Fee 34 Facility" and "Race Track Hill Facility" in the Edison area of Kern County. Each facility has been issued an individual order for operation. However, since the two facilities are parts of a single wastewater processing and disposal operation, they are jointly addressed in this order as a single wastewater processing facility.

FEE 34 FACILITY

2. The Fee 34 Facility (also known as the C-Plant Facility) is on 3.4 acres (Assessor's Parcel Number 388-050-254) in the SW ¼ of the SW ¼ of Section 34, T29S, R29E, MDB&M. The Fee 34 Facility is approximately one mile northeast of the community of Edison in the Edison Oil Field (see Attachment A, which is attached hereto and made part of this Order). Discovered in 1928, the Edison Oil Field as of 2008 had a cumulative production of over 150 million barrels of oil, over 5.5 million barrels in reserve, 932 producing wells, and was ranked 38th among California's largest and most productive oil fields by total ultimate recovery.¹ In the year 2013, the Edison Oil Field produced 790,130 barrels of oil and 12,107,770 barrels of water.²
3. The Fee 34 Facility contains six surface impoundments (Attachment B). Wastewater is transported to the facility by pipeline from various small, independent oil company leases throughout the Edison Oil Field. Crude oil skimmed from the produced waters flows into two netted, unlined oil recovery impoundments until shipped offsite. The wastewater flows through three gunite-lined

¹ "2009 Report of the State Oil & Gas Supervisor," Department of Oil, Gas, and Geothermal Resources (DOGGR), California Department of Conservation, 2009, accessible at ftp://ftp.consrv.ca.gov/pub/oil/annual_reports/2009/PR06_Annual_2009.pdf at p. 65.

² "2013 Report of the State Oil & Gas Supervisor," Department of Oil, Gas, and Geothermal Resources (DOGGR), California Department of Conservation, 2013, accessible at ftp://ftp.consrv.ca.gov/pub/oil/annual_reports/2013/PR03_PreAnnual_2013.pdf at p. 9.

impoundments equipped with skimmers and is then pumped via pipeline to Valley Water's Race Track Hill Facility for disposal. There is one unlined contingency impoundment for temporary storage of excess wastewater in the instance of power failure or other emergency event. Dimensions of the impoundments range from approximately 30 feet (ft.) x 50 ft. to 120 ft. x 180 ft., and are approximately 10 ft. to 15 ft. deep. An aerial photograph of the Fee 34 Facility is attached hereto as Attachment B and made part of this Order.

4. The Fee 34 Facility is regulated by Central Valley Water Board Order Nos. 92-110 and 92-11037. Order 92-110 sets forth general WDRs for the discharge of oil field produced wastewaters from Edison Oil Field operations, including the Fee 34 Facility. Order 92-11037 is the Notice of Applicability of the general WDRs to the Fee 34 Facility, and includes a chemical analysis of the wastewater with the following characteristics: 7,900 micromhos per centimeter ($\mu\text{mhos/cm}$) electrical conductivity (EC), 4,450 milligrams/liter (mg/l) chloride, and 15.6 mg/l boron.
5. The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition* (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.
6. Surface drainage is toward the East Side Canal in the Arvin-Wheeler Ridge Hydrologic Area (557.30) of the Tulare Lake Basin. Surface waters in the Arvin-Wheeler Ridge Hydrologic Area are designated as Valley Floor Waters. The designated beneficial uses of Valley Floor Waters, as specified in the Basin Plan, are agricultural supply; industrial service and process supply; water contact and non-contact water recreation; warm fresh water habitat; wildlife habitat; preservation of rare, threatened, and endangered species; and groundwater recharge.
7. The Fee 34 Facility is in the Kern County Basin Hydrologic Unit, Detailed Analysis Unit (DAU) 258. The designated beneficial uses of the groundwater, as specified in the Basin Plan for DAU 258, are municipal and domestic water supply, agricultural supply, industrial service, and process supply.
8. Information obtained from the California Department of Water Resources identified 36 groundwater supply wells within about one-mile of the Fee 34 Facility. The groundwater is primarily used for agricultural supply. Driller's reports for 19 of the wells identify six domestic supply wells, twelve agricultural supply wells, and one industrial supply well.

RACE TRACK HILL FACILITY

9. The Race Track Hill Facility is located on 338.4 acres in the western half of Section 24, T29S, R29E, MDB&M. The Facility is about fifteen miles east of Bakersfield in Kern County on Assessor's Parcel Number 387-060-031(see Attachment C).
10. The Race Track Hill Facility contains 27 unlined surface impoundments and approximately 94 acres of land, a portion of which is used for surface sprinkler disposal. Wastewater discharge began 56 ½ years ago, in approximately December of 1958. Wastewater is transported to the Facility by pipeline from Valley Water's Fee 34 Facility, which is about four miles to the southwest in the Edison Oil Field. The wastewater is discharged to the impoundments for percolation and evaporation. Excess wastewater that does not percolate or evaporate is sprayed onto portions of the 94 acres for disposal.

11. The Race Track Hill Facility is in an area of rolling topography and a portion of the site drains toward Cottonwood Creek, about one-half mile northeast of the Facility. Cottonwood Creek is tributary to the Kern River. The designated beneficial uses of the Kern River below the southern California Edison Kern River Powerhouse Number One, as specified in the Basin Plan, are municipal and domestic supply, agricultural supply, industrial service and process supply, hydropower generation, water contact and non-contact recreation, warm fresh water habitat, wildlife habitat, preservation of rare, threatened and endangered species, and groundwater recharge.
12. The Race Track Hill Facility is in the Kern County Basin Hydrologic Unit, DAU 257. The designated beneficial uses of the groundwater for DAU 257, as specified in the Basin Plan, are municipal and domestic water supply, agricultural supply, industrial service and process supply, and water contact recreation.
13. The Race Track Hill Facility is underlain by unconsolidated sediments of the Kern River-Chanac Series. The consolidated sediments of the Santa Margarita Formation underlie the Kern River-Chanac Series. The top of the Santa Margarita Formation and the overlying sediments dip to the southwest at an angle of approximately five degrees.
14. The Race Track Hill Facility's WDRs, Resolution No. 58-349, was adopted by the Central Valley Water Board on September 18, 1958, and set forth requirements for the discharge of oil field produced wastewater at the Facility.
15. The WDRs allow the discharge of oil field produced wastewater to the ground surface, into natural drainage channels, and into surface impoundments in Section 24, T298, R29E, MDB&M. The WDRs also allow the discharge of oil field produced wastewater to the ground surface, into natural drainage channels, or into unlined surface impoundments other than those constructed in Section 24, provided the wastewater conforms to the following criteria:
 - a. Total dissolved solids shall not exceed 1,000 parts per million.
 - b. Chlorides shall not exceed 150 parts per million.
 - c. Boron shall not exceed 1.0 part per million.
16. The WDRs predate the Basin Plan and do not contain the limitations on the discharge of oil field produced wastewater to surface impoundments within Section 24 that are contained in the Basin Plan.
17. Although Resolution 58-349 found "no freshwater producing wells in this vicinity" in 1958, more recent information obtained from the California Department of Water Resources identified six groundwater supply wells within one-mile of the Facility. Groundwater from these wells may have been used for domestic water supply, agriculture supply, and industrial service supply. The current status of these wells is not clear and some may have been destroyed.

WASTE DISPOSAL OPERATIONS AND COMPLIANCE

18. Discharge of Waste to Land: This information is based upon the 27 November 2012 and 18 September 2013 Central Valley Water Board inspections of the Fee 34 Facility and Race Track Hill Facility, and based upon Valley Water’s wastewater analysis lab report dated 23 July 2013 for the Fee 34 Facility regarding concentrations of EC in $\mu\text{mhos/cm}$, chloride in mg/l, and boron in mg/l. The Basin Plan and Order 92-110 for Edison Oil Field Operators, and Resolution 58-349 set forth the following waste constituent limitations for the discharge of oil field wastewater:

	<u>Units:</u>	<u>Basin Plan & Order 92-110 Limitation Value:</u>	<u>Res. 58-349 Limitation Value:</u>
<u>Specific EC:</u>	$\mu\text{mhos/cm}$	1,000	None
<u>Total Dissolved Solids:</u>	mg/l (ppm)	NA	1,000 (outside Section 24)
<u>Chloride:</u>	mg/l	200	150 (outside Section 24)
<u>Boron:</u>	mg/l	1	1 (outside Section 24)

The Basin Plan allows discharges of oil field wastewater that exceed the above maximum salinity limits to unlined sumps, stream channels, or surface waters if the Discharger successfully demonstrates to the Central Valley Water Board in a public hearing that the proposed discharge will not substantially affect water quality nor cause a violation of water quality objectives.

The 23 July 2013 wastewater analytical results at Fee 34 Facility were measured at the following values and are compared to 1992 levels and the Basin Plan limits:

	<u>Units:</u>	<u>1992 Value</u>	<u>2013 Value:</u>	<u>Basin Plan Limits:</u>
<u>Specific EC:</u>	$\mu\text{mhos/cm}$	7,900	5,700	1,000
<u>Chloride:</u>	mg/l	4,450	1,800	200
<u>Boron:</u>	mg/l	15.6	14	1

19. The Fee 34 Facility and Race Track Hill Facility were also inspected on 27 March 2015. Violations of the WDRs for both facilities were noted during the inspections. At the Fee 34 Facility, wastewater with EC, chloride, and boron values greater than the Basin Plan limits was being discharged to the ponds in violation of Discharge Specification B.1 of the WDRs. Also, the ponds at the Fee 34 Facility had insufficient freeboard in violation of Discharge Specification B.6 of the WDRs and were not adequately netted or covered to preclude access by wildlife to wastewater with oil coatings in violation of Discharge Specification B.4 of the WDRs. The inspection report noted that the Race Track Hill Facility had insufficient freeboard on two ponds and insufficient netting on three ponds.
20. On 24 May 1996, Valley Waste Disposal Company, the predecessor of Valley Water, submitted the report *Drilling and Data Acquisition Report, Race Track Hill District, Edison Oil Field, Kern County, California*. The report was submitted pursuant to Discharge Specification B.2.c. of Order 92-110. The report and transmittal letter stated that the Fee 34 Facility “... does not pose a threat to ground water quality and that no further action should be required for continued operation of the site.” The transmittal letter also requested a hearing if necessary to demonstrate that the facility does not pose a threat to groundwater quality. There is no record of a response nor an evaluation of the report in the site files, and a hearing before the Central Valley Water Board was not held. Current

Central Valley Water Board staff reviewed the report and transmittal letter and found it inadequate to demonstrate that there have been no impacts, or that there is no threat, to groundwater.

21. On 9 October 2013, the Central Valley Water Board issued a Notice of Violation (NOV) to Valley Water (see Attachment D, which is attached hereto and made part of this Order) for violations of the Discharge Specifications of Order 92-110 at the Fee 34 Facility. The NOV allegations included discharging wastewater in excess of the numerical limitations specified in Discharge Specification B.1 (see Finding No. 18), which is causing, or is threatening to cause a condition of pollution,³ contamination or nuisance⁴; and failure to maintain the minimum freeboard of two feet in two of the impoundments as specified in Discharge Specification B.6, which is causing, or is threatening to cause, a condition of pollution, contamination, or nuisance caused by overtopping the impoundments. Valley Water submitted a response to the NOV on 8 November 2013 addressing each allegation.
22. Section 13301 of the Water Code provides in relevant part that:

When a regional board finds that a discharge of waste is taking place, or threatening to take place, in violation of requirements of discharge prohibitions prescribed by the regional board or the state board, the board may issue an order to cease and desist and direct that those persons not complying with the requirements or discharge prohibitions (a) comply forthwith, (b) comply in accordance with a time schedule set by the board, or (c) in the event of a threatened violation, take appropriate remedial or preventive action. Cease and desist orders may be issued direct by a board, after notice and hearing.
23. The discharge of waste with high salinity and boron concentrations and other oil field wastewater constituents to the ground, surface water, and/or groundwater creates, or threatens to create, a condition of pollution in surface and groundwater, and may result in the degradation of water quality.
24. Land around the Fee 34 Facility is being used for agricultural production, primarily citrus and grapes. Land around the Race Track Hill Facility is also used for agricultural production including open stock grazing, a five-acre vineyard located approximately 3,000 feet southwest of the facility, and other crops grown in the area beginning about one mile south of the facility.
25. Many of the crops are irrigated with groundwater from local supply wells. Irrigation water with a chloride concentration above 350 mg/l can cause severe crop problems. Boron toxicity can impair

³ "Pollution" is defined by Water Code section 13050, subdivision (l)(1) as, an alteration of the quality of the waters of the state by waste to a degree which unreasonably affects either of the following: (A) The waters for beneficial uses; (B) Facilities which serve these beneficial uses." Water Code §13050(l).

⁴ "Nuisance" means anything which meets all of the following requirements: (1) Is injurious to health, or is 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 at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal. (3) Occurs during, or as a result of, the treatment or disposal of wastes." Water Code §13050(m).

crops sensitive to boron at concentrations less than 1 mg/l in irrigation water.⁵

26. Underlying groundwater may be degraded if mixed with oil field wastewater. Elevated EC, chloride, and boron levels could impair groundwater for municipal and domestic supply and agricultural supply uses.
27. Due to the topographic relief at the Race Track Hill Facility and the relatively close proximity (one-half mile) to Cottonwood Creek, a major storm has the potential to flush a portion of the accumulated salts discharged to the spray field the past 50-60 years into Cottonwood Creek, which could then be transported to the Kern River 2.5 miles downstream. This has the potential to result in a temporary salt and boron loading of water in the Kern River, and to increase salt and boron loading to groundwaters at the terminus of Kern River flow where groundwater is recharged. Operation of the spray field would require a permit under the National Pollution Discharge Elimination System, but the disposal operation currently would not meet the requirements for discharge to a surface water.

HYDROGEOLOGICAL INVESTIGATION

28. On 1 July 2014, the Central Valley Water Board issued an Order pursuant to Section 13267 of the California Water Code to Valley Water requiring preparation and submission of work plans for hydrogeologic site characterizations for each facility and technical reports presenting their findings. The Discharger petitioned this Order to the State Water Resources Control Board.
29. Valley Water agreed to assess the impacts of wastewater discharges at the Racetrack and Fee 34 facilities. To date, the approach has been to conduct the work in phases with preparation of a work plan containing a specific scope of work, implementation of the work, followed by reporting. Based on the results of each phase, additional work is proposed.
30. As of 1 May 2015, two phases of field work have been completed, including:
 - Soil borings at both Facilities;
 - Soil sampling and analysis;
 - Shallow and deep monitoring well installations at both facilities;
 - Groundwater sampling and analysis; and
 - Leak-testing the lined ponds at the Fee 34 Facility.

⁵ Ayers, R. S., and D. W. Westcott. "FAO 1985. Water Quality for Agriculture." *Irrigation and Drainage Paper* 29.

31. As of 1 May 2015, the results of the Phase 1 field work and parts of the Phase 2 field work have been formally reported. The conclusions include:
- There are wastewater constituents in the soils at the Race Track Hill Facility;
 - Groundwater occurs at depths ranging from 48 to 80 feet below ground surface at the Race Track Hill Facility;
 - There is groundwater mounding beneath the Race Track Hill Facility;
 - Groundwater beneath the Racetrack Hill Facility flows to the southwest;
 - Groundwater beneath the Racetrack Hill Facility has been impacted by the wastewater disposed to the ponds. The EC of the groundwater and the concentrations of boron and chloride are similar to oil field wastewater at the Race Track Hill Facility; and
 - The seepage rates of the North Pond and the South Pond at the Fee 34 Facility are 4.4 millimeters per day and 1.8 millimeters per day, respectively. Those rates translate to approximately 500 gallons per day from the North Pond and approximately 200 gallons per day from the South Pond.
32. The investigations conducted by Valley Water have determined the discharge of wastewater in excess of Basin Plan limitations and water quality objectives has caused a condition of pollution to groundwater at the Racetrack Hill Facility. Additional assessment is needed to determine the nature and extent of the wastewater constituents in groundwater.
33. The apparent direction of groundwater flow beneath the Racetrack Hill Facility is towards residential water supply wells immediately to the southwest and towards Edison and Bakersfield, five to ten miles to the southwest.
34. Based on a review of the site conditions, wastewater quality and volumes, and the results of the field investigations, spraying wastewater onto the ground surface and into natural drainages exacerbates the pollution of the underlying groundwater and creates a potential for waste constituents to drain into Cottonwood Creek and the Kern River.

REGULATORY CONSIDERATIONS

35. If the Fee 34 Facility has resulted in impacts to beneficial uses of the underlying groundwater, this Order requires the Discharger to submit a Report of Waste Discharge to obtain new WDRs for the operation of the Fee 34 Facility by 1 September 2016. This Order also requires that the Discharger submit a Report of Waste Discharge for the Race Track Hill Facility by 1 September 2016. It is anticipated that General Waste Discharge Requirements for the operation of oil field wastewater ponds would be proposed for consideration by the Central Valley Water Board in the spring or summer of 2016. If the discharges from the Fee 34 Facility or Race Track Hill Facility are eligible for coverage under the anticipated General Order, and if this General Order is in effect by 1 September 2016, the Discharger may choose coverage under the General Order rather than the submittal of individual reports of waste discharge for the two facilities.

36. The deadlines set forth herein are reasonable given the need to investigate the potential threat to groundwater and surface water quality.
37. In accordance with Water Code section 13267(b) these findings provide Valley Water with a written explanation with regard to the need for remedial action and reports, and identify the evidence that supports the requirement to implement investigative activities, to implement cease and desist activities if needed, and to submit the reports. Valley Water owns and operates the Fee 34 Facility and Race Track Hill Facility which are subject to this Cease and Desist Order. The technical and monitoring reports required by this Order are necessary to determine compliance with this Cease and Desist Order. The actions and reports required by this Order are needed to provide information to provide information to the Central Valley Water Board regarding (a) the nature and extent of the discharge, (b) the nature and extent of pollution in waters of the State and/or U.S. created by the discharge, (c) the threat to public health posed by the discharge; and (d) appropriate cease and desist measures. Based on the nature and possible consequences of the discharges, including the contamination of surface water or groundwater, or impacts to groundwater recharge areas, the burden of the required tasks, including the costs, bears a reasonable relationship to the need for the tasks and reports, and the benefits to be obtained from the tasks and information.
38. Issuance of this Cease and Desist Order is being taken for the protection of the environment and as such is exempt from provisions of the California Environmental Quality Act (CEQA) (Public Resources Code section 21000 et seq.) in accordance with California Code of Regulations, title 14, sections 15061(b)(3), 15306, 15307, 15308, and 15321. This Cease and Desist Order generally requires Valley Water to submit plans for approval prior to implementation of cleanup activities at the Fee 34 Facility and Race Track Hill Facility. Mere submission of plans is exempt from CEQA as submission will not cause a direct or indirect physical change in the environment and/or is an activity that cannot possibly have a significant effect on the environment. CEQA review at this time would be premature and speculative, as there is simply not enough information concerning Valley Water's proposed remedial activities and possible associated environmental impacts.
39. If the Regional Board determines that implementation of any plan required by this Cease and Desist Order will have a significant effect on the environment, the Regional Board will conduct the necessary and appropriate environmental review prior to the Assistant Executive Officer's approval of the applicable plan. The Discharger will bear the costs, including the Regional Board's costs, of determining whether implementation of any plan required by this Cease and Desist Order will have a significant effect on the environment and, if so, in preparing, handling, and providing any documents necessary for environmental review. If necessary, the Discharger and a consultant acceptable to the Regional Board shall enter into a memorandum of understanding with the Regional Board regarding such costs prior to undertaking any environmental review.

As a result of the events and activities described in this Order, the Central Valley Water Board finds that a discharge of waste in violation of the Basin Plan has polluted groundwater. This Order requires Valley Water to take appropriate remedial action and to comply in accordance with the time schedule set forth below.

40. This Cease and Desist Order is based upon: 1) Chapter 5, Enforcement and Implementation commencing with section 13300, of the Porter-Cologne Water Quality Control Act (Water Code Division 7, commencing with section 13000); 2) Water Code

section 13267, Investigations; inspections, Chapter 4, Regional Water Quality Control; 3) all applicable provisions of the Basin Plan including beneficial uses, water quality objectives, and implementation plans; 4) California State Water Resources Control Board (State Water Board) Resolution No. 68-16 (*Statement of Policy with Respect to Maintaining High Quality of Waters in California*); 5) State Water Board Resolution No. 92-49 (*Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code section 13304*); and 6) all other applicable legal authority.

41. Water Code section 13267 subdivision (b)(1) states, in relevant part:

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

42. On 30/31 July 2015, in Rancho Cordova, California, after due notice to the Discharger and all other affected persons, the Central Valley Water Board conducted a public hearing at which evidence was received to consider an Order under Water Code section 13301 to establish a time schedule to achieve compliance with the Basin Plan or cease discharge.

IT IS HEREBY ORDERED THAT, pursuant to Water Code sections 13301 and 13267, Valley Water Management Company shall implement the following measures necessary to comply with the requirements of the *Water Quality Control Plan for the Tulare Lake Basin* and Orders issued by the Board.

Fee 34 Facility

1. **By 1 October 2015**, Valley Water Management Company shall submit a ***Phase 3 Investigation Work Plan for the Fee 34 Facility***. This work plan shall describe a time schedule under which Valley Water Management Company will conduct the following activities, including the time frame for completing each activity:
 - a. Conduct a hydrogeological site characterization to determine nature and extent of the release of waste constituents to the unsaturated zone and the groundwater underlying the Fee 34 Facility;
 - b. Prepare and submit a Water Quality Protection Standard Report proposing statistical data analysis methods to calculate concentration limits for each Constituent of Concern specified in Monitoring and Reporting Program R5-2015-0093;
 - c. Identify and sample water supply wells located within one-mile of the Fee 34 Facility and analyze the samples for waste constituents of concern; and

- d. Analyze groundwater, surface water, and soil samples at a California certified laboratory in accordance with the SAP submitted as part of the Phase I Work Plan (see Finding No. 28) and approved by the Assistant Executive Officer (or his/her delegate).

Valley Water Management Company shall implement the *Phase 3 Investigation Work Plan for the Fee 34 Facility* immediately upon the Assistant Executive Officer's approval of the workplan. All timelines indicated in the workplan, as approved, are fully enforceable under this Order.

2. If the investigation conducted pursuant to the *Phase 3 Investigation Work Plan for the Fee 34 Facility* indicates that a release of waste constituents has impacted the unsaturated zone or the groundwater underlying the Fee 34 Facility such that the beneficial uses of the underlying groundwater or surface waters are threatened, then Valley Water Management Company shall submit a ***Phase 4 Remediation Work Plan for the Fee 34 Facility***. This work plan shall describe a time schedule under which Valley Water Management Company will conduct the following activities, including the time frame for completing each activity:
 - a. Conduct a hydrogeological site characterization to determine the nature and extent of any release of waste constituents consistent with the evaluation monitoring program requirements contained in California Code of Regulations, Title 27, section 20005 et seq. (Title 27);
 - b. Following the characterization of the nature and extent of the release, a groundwater, surface water, and/or soil remediation program consistent with the corrective action program requirements contained in Title 27 (this will entail the preparation of an engineering feasibility study followed by a proposed corrective action program); and
 - c. Based on the information acquired during the hydrogeological site characterization, submit a revised report of waste discharge that will ensure that discharges at the Fee 34 Facility will be in compliance with the *Water Quality Control Plan for the Tulare Lake Basin*.

Valley Water Management Company shall implement the *Phase 4 Remediation Work Plan for the Fee 34 Facility* immediately upon the Assistant Executive Officer's approval of the workplan. All timelines indicated in the workplan, as approved, are fully enforceable under this Order. In no event shall the report of waste discharge required under 2.c., above be submitted after

1 September 2016.

Race Track Hill Facility

3. **By 1 October 2015**, Valley Water Management Company shall submit a ***Phase 3 Investigation Work Plan for the Race Track Hill Facility***. This work plan shall describe a time schedule under which Valley Water Management Company will conduct the following activities, including the time frame for completing each activity:
 - a. Continue a hydrogeological site characterization to determine the nature and extent of the release of waste constituents consistent with the evaluation monitoring program requirements contained in Title 27;
 - b. Prepare and submit a Water Quality Protection Standard Report proposing statistical data analysis methods to calculate concentration limits for each Constituent of Concern specified in Monitoring and Reporting Program R5-2015-0093.
 - c. Identify and sample water supply wells located within one-mile of the Race Track Hill Facility and analyze the samples for waste constituents of concern;

- d. Provide an assessment of the potential water quality impacts to groundwater and surface water from operation of the sprayfields. This assessment shall look at the buildup of salts on the soil surface and in the soil column, shall evaluate the capacity of the soils beneath the sprayfield and the plants grown in the sprayfield to attenuate the salt, and shall evaluate the extent to which stormwater runoff from the sprayfields may mobilize salts and transport them to surface waters; and
- e. Analyze groundwater, surface water, and soil samples at a California certified laboratory in accordance with the SAP submitted as part of the Phase I Work Plan (see Finding No. 28) and approved by the Assistant Executive Officer (or his/her delegate).

Valley Water Management Company shall implement the *Phase 3 Investigation Work Plan for the Race Track Hill Facility* immediately upon the Assistant Executive Officer's approval of the workplan. All timelines indicated in the workplan, as approved, are fully enforceable under this Order.

4. **By 1 October 2015**, Valley Water Management Company shall submit a ***Race Track Hill Water Balance Report*** that contains a water balance for the Race Track Hill facility. The *Race Track Hill Water Balance Report* must provide calculations showing:
 - a. The storage capacity and surface areas of the surface impoundments and sprayfield, including the topography of the sprayfields;
 - b. The volume of water applied each month to the surface impoundments;
 - c. The calculated leakage to the subsurface per month from the surface impoundments;
 - d. The monthly evaporation loss from the surface impoundments;
 - e. The monthly rainfall falling at the facility;
 - f. The monthly volume of water applied to the sprayfields;
 - g. The monthly volume of water returned to the ponds from collection of stormwater runoff from the sprayfield areas; and
 - h. The monthly evapotranspiration from the sprayfields.

The *Race Track Hill Water Balance Report* should include actual or estimated monthly volumes of water discharged to the Rack Track Hill facility for the period from 1 January 2010 through 31 December 2014, the average annual discharge for each of these years, as well as the average monthly discharges for each month in a typical calendar year.

5. **By 1 April 2016**, Valley Water Management Company shall submit a ***Surface Water Quality Protection Report***. This report shall:
 - a. Describe the current runoff control features and BMPs for the sprayfields at the Rack Track Hill facility,
 - b. Explain how operation and maintenance of the sprayfields runoff control features and BMPs will ensure that there is no discharge of stormwater from the sprayfields to surface waters.
 - c. If current runoff control features and BMPs for the sprayfields at the Rack Track Hill facility shows that there is insufficient capacity to capture and store the stormwater runoff from the sprayfields, then the *Surface Water Quality Protection Report* shall describe a time schedule under which Valley Water Management Company will add runoff controls and/or BMPs to

ensure full capture of all stormwater runoff from the sprayfields and impoundments at the Race Track Hill facility by 1 October 2016.

By 1 October 2016, Valley Water Management Company shall fully implement all runoff control features and BMPs described or proposed in the in the *Surface Water Quality Protection Report*.

6. **By 1 September 2016**, Valley Water Management Company shall:

- a. Submit a complete **Report of Waste Discharge**⁶ based on the information acquired during the hydrogeological site characterization that will ensure that future discharges at the Race Track Hill Facility will be in compliance with the *Water Quality Control Plan for the Tulare Lake Basin*. The Report of Waste Discharge may propose a reasonable time schedule to come into compliance with applicable requirements of the *Water Quality Control Plan for the Tulare Lake Basin*. Delays in acquiring authorization from the Division of Oil, Gas & Geothermal Resources to conduct underground injection activities shall not be used as an excuse to delay this submittal.
- b. Submit a **Closure Plan and Closure Time Schedule** for the wind-down and closure of any portions of the Race Track Hill Facility that Valley Water Management Company determines are no longer to be used. The Closure Plan and Time Schedule shall specify the dates by which Valley Water Management Company will remove the residual liquid waste and close the ponds in accordance with applicable regulatory requirements.
- c. Submit a **Race Track Hill Remediation Workplan** based on the *Phase 3 Investigation Work Plan for the Race Track Hill Facility* that shall either
 - i. Describe a time schedule under which Valley Water Management Company will conduct groundwater, surface water, and/or soil remediation consistent with the corrective action program requirements of Title 27. This will entail the preparation of an engineering feasibility study followed by a proposed corrective action program; or
 - ii. Specify a suite of groundwater, surface water, and/or soil management practices that Valley Water Management Company will implement to minimize or prevent any additional water quality degradation that may occur due to current and historic waste management practices at the Race Track Hill Facility. Concurrently, Valley Water Management Company would propose studies and/or technical reports in support of an amendment that would incorporate site specific objectives, groundwater management zones, or other alternate compliance strategies for the Race Track Hill Facility into *Water Quality Control Plan for the Tulare Lake Basin* (such proposals would need to be coordinated with the CV-SALTS stakeholder initiative). However, if such proposals cannot ensure the protection of beneficial uses in the vicinity of the Race Track Hill Facility or are otherwise infeasible, the Central Valley Water Board or its delegee may reject the proposal and require Valley Water Management Company to comply with the remediation requirements of 6.c.i, above.

7. **On 1 January 2018**, Valley Water is prohibited from discharging to surface impoundments or land at the Race Track Hill facility unless those discharges are in full compliance with waste discharge requirements issued by the Central Valley Water Board. Waste discharge requirements issued by

⁶ If the discharges at the facility may be regulated under a General Order, Valley Water Management Company may elect to submit a Notice of Intent to obtain coverage under that General Order in lieu of submitting an individual Report of Waste Discharge.

the Central Valley Water Board may include an enforceable time schedule, should additional time be necessary to complete actions pursuant to section 6.c.ii, above.

Annual Reporting

Beginning **1 November 2015**, or a date approved by the Assistant Executive Officer (or his/her delegate), and quarterly thereafter until all activities described in this Order are complete, Valley Water Management Company shall submit technical reports that provide information to document the activities completed to date. Corrective actions shall be proposed and included in these technical reports when Work Plan activities fail to satisfy any interim or final success criteria

Other Requirements

8. **Electronic and Paper Media Reporting Requirements.** Valley Water shall submit both electronic and paper copies of all reports required under this Cease and Desist Order including work plans, technical reports, and monitoring reports. Larger documents shall be divided into separate files at logical places in the report to keep file sizes under 150 megabytes. Valley Water shall continue to provide a paper transmittal letter, a paper copy of all figures larger than 8.5 inches by 14 inches (legal size), and an electronic copy (on Compact Disc [CD] or other appropriate media) of all reports to the Central Valley Water Board. All paper correspondence and documents submitted to the Central Valley Water Board shall include the following identification numbers in the header or subject line: Fee 34 Facility Geotracker Site ID: T10000005197; and Race Track Hill Facility Geotracker Site ID: T10000005199. Valley Water shall comply with the following reporting requirements for all reports and plans (and amendments thereto) required by this Order:
- (a) Reports and Plans Required by this Order. Valley Water shall submit one paper and one electronic, searchable Portable Document Format (PDF) copy of all technical reports, monitoring reports, progress reports, and plans required by this Order. The PDF copy of all the reports shall also be uploaded into the Geotracker database, as required by Reporting Requirement 2.(b)(iv) below.
 - (b) Electronic Data Submittals to the Central Valley Water Board in compliance with the Cease and Desist Order are required to be submitted electronically via the Internet into the Geotracker database (Fee 34 Facility Geotracker Site ID: T10000005197; and Race Track Hill Facility Geotracker Site ID: T10000005199). The electronic data shall be uploaded on or prior to the regulatory due dates set forth in the Cease and Desist Order or addenda thereto. To comply with these requirements, Valley Water shall upload to the Geotracker database the following minimum information:
 - (1) Laboratory Analytical Data: Analytical data (including geochemical data) for all waste, soil, and water samples shall be submitted in Electronic Deliverable Format (EDF), which facilitates the transfer of data from the laboratory to the end user. Waste, soil, and water include analytical results of samples collected from the following locations and devices: surface samples, equipment, monitoring wells, boreholes, gas and vapor wells or other collection devices, surface water, groundwater, piezometers, and stockpiles.
 - (2) Locational Data: All permanent monitoring locations (monitoring wells, sediment sampling locations, surface water sampling locations, etc.) shall be surveyed with latitude and

longitude coordinates in a decimal degree format based on the North American Datum 1983 ellipsoid, and accurate to within one meter (3 feet) and elevation data accurate to 0.01 feet.

- (3) Site Maps: Site maps which display discharge locations, streets bordering the Facilities, and sampling locations for all waste, soil, and water samples. A site map is a stand-alone document that may be submitted in various electronic formats. Site maps must also be uploaded to show the maximum extent of any soil impact and water pollution. An update to the site maps may be uploaded at any time.
 - (4) Electronic Report: A complete copy (in character searchable PDF) of all work plans, work plan modifications, assessment, cleanup, and monitoring reports including the signed transmittal letters, professional certifications, and all data presented in the reports.
9. **Duty to Use Qualified Professionals.** As required by the California Business and Professions Code sections 6735, 7835, and 7835.1, all reports shall be prepared by, or under the supervision of, a California Registered Engineer or Professional Geologist and signed by the registered professional. Each technical report submitted by Valley Water shall contain the professional's signature and/or stamp of the seal.
10. **Signatory Requirements.** All reports required under this Cease and Desist Order shall be signed and certified by Valley Water or by a duly authorized representative and submitted to the Central Valley Water Board. A person is a duly authorized representative only if: 1) The authorization is made in writing by Valley Water; and 2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity. (A duly authorized representative may be either a named individual or any individual occupying a named position.)
11. With each report required by this Cease and Desist Order, Valley Water shall provide under penalty of perjury under the laws of California a "Certification" statement to the Central Valley Water Board. The "Certification" shall include the following signed statement:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. Pursuant to Water Code section 13350, any person who violates a cease and desist order may be liable administratively or civilly in an amount up to fifteen thousand dollars (\$15,000) for each day in which the cease and desist order is violated.

12. All monitoring and technical reports required under this Cease and Desist Order shall be submitted to:

California Regional Water Quality Control Board
Central Valley Region
1685 E Street, Suite 200
Fresno, CA 93706
Attn: Ron Holcomb
Geotracker Site ID No.: T10000005197 or T10000005199

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 or may issue a complaint for administrative civil liability.

Failure to comply with this Order, Order 92-110, Order 92-11037, or Resolution 58-349 may result in the assessment of Administrative Civil Liability of up to \$10,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268, 13350 and 13385. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050, et seq. 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 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 30 July 2015.

Original signed by:

PAMELA C. CREEDON, Executive Officer

30 July 2015

(Date)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM R5-2015-0093

FOR
VALLEY WATER MANAGEMENT COMPANY
RACE TRACK HILL FACILITY AND
FEE 34 FACILITY, EDISON
KERN COUNTY

Compliance with this Monitoring and Reporting Program is required pursuant to Water Code section 13267 as ordered by Cease and Desist Order R5-2015-0093 (the "CDO"). Failure to comply with this program constitutes noncompliance with the CDO and the Water Code, which can result in the imposition of civil liability. All sampling and analyses shall be by United States Environmental Protection Agency (USEPA) approved methods. The test methods chosen for detection of the constituents of concern shall be subject to review and concurrence by the California Regional Water Quality Control Board, Central Valley Region ("Central Valley Water Board").

A complete list of substances tested for and reported on by the testing laboratory shall be provided to the Central Valley Water Board. All chromatographic peaks must be reported. In addition, both the method detection limit and the practical quantification limit shall be reported. Detection limits shall equal or be more precise than USEPA methodologies. Water samples must be analyzed within allowable holding time limits as specified in 40 CFR Part 136. All quality assurance/quality control (QA/QC) samples must be run on the same dates when samples were actually analyzed. Proper chain of custody procedures must be followed and a copy of the completed chain of custody form shall be submitted with the report. All analyses must be performed by a California Department of Public Health certified laboratory.

The Discharger shall maintain all sampling and analytical results: date, exact place, and time of sampling; dates analyses were performed; analyst's name; analytical techniques used; and results of all analyses. Such records shall be retained for a minimum of three years. This period of retention shall be extended during the course of any unresolved litigation regarding this discharge, or when requested by the Central Valley Water Board.

GROUNDWATER MONITORING

The Discharger shall operate and maintain a groundwater monitoring system at the Fee 34 Facility and at the Race Track Hill Facility that complies with the requirements of the CDO and is consistent with the detection monitoring requirements of section 20420 of California Code of Regulations, title 27, section 20005 et seq. (Title 27). The monitoring system shall be certified by a California-licensed professional civil engineer or geologist as being consistent with the detection monitoring requirements of Title 27. The Discharger shall revise the groundwater monitoring system (after review and approval by Central Valley Water Board staff) as needed to characterize the groundwater and to delineate the nature and extent of any release of waste constituents due to the operation of each facility.

Groundwater samples shall be collected from groundwater monitoring wells and other sampling points established in accordance with the hydrogeological characterization required by the CDO. The samples shall be collected at the specified frequencies and analyzed for the parameters and constituents listed in Table I. The Discharger shall collect, preserve, and transport groundwater

samples in accordance with the Sample Collection and Analysis Plan approved by the Assistant Executive Officer.

The Discharger is required to submit a Water Quality Protection Standard (WQPS) Report that proposes statistical data analysis methods to calculate concentrations limits for each Monitoring Parameter and Constituent of Concern.

The report shall:

- a. Identify all distinct bodies of surface and groundwater that have been or could be affected by a release from a surface impoundment or land application activities. This list shall include any permanent or ephemeral zones of perched groundwater underlying the facility.
- b. Include a map showing all monitoring points (monitoring points within the degradation plume and monitoring points hydraulically downgradient and outside of the degradation plume) for the groundwater monitoring program for each groundwater zone that has been or could be affected by a release.
- c. Evaluate the perennial direction(s) of groundwater movement within each groundwater zone(s).
- d. Include a proposed statistical method for calculating concentration limits for Monitoring Parameters and Constituents of Concern that are detected in 10% or greater of the background data (naturally-occurring constituents) using a statistical procedure from Section 20415(e)(8)(A-D)] or Section 20415(e)(8)(E) of Title 27.
- e. Include a retesting procedure to confirm or deny measurably significant evidence of a release pursuant to Section 20415(e)(8)(E) and Section 20420(j)(1-3) of Title 27.

Any proposed changes to the WQPS, other than an annual update of the concentration limits, shall be submitted in a report for review and approval.

Quarterly monitoring for the parameters and constituents listed in Table I is necessary to collect sufficient data to establish a WQPS. After sufficient data have been collected and a WQPS established, the Discharger may request that the sampling frequency of Constituents of Concern be revised by providing technical justification.

INFLUENT MONITORING

Produced water samples shall be collected at a point in the system before discharge to the ponds. Time of collection of the sample shall be recorded. The collected produced water samples shall be analyzed for the parameters and constituents listed in Table I in accordance with the specified methods

and frequencies. The Discharger shall collect, preserve, and transport produced water samples in accordance with the approved Sample Collection and Analysis Plan.

FACILITY MONITORING

Permanent markers shall be in place in each pond with calibrations indicating the water level at design capacity and available operational freeboard. The freeboard shall be monitored on all ponds to the nearest tenth of a foot **monthly**.

Annually, prior to the anticipated rainy season, but **no later than 30 September**, the Discharger shall conduct an inspection of the facility. The inspection shall assess repair and maintenance needed for: drainage control systems; slope failure; groundwater monitoring wells, or any change in site conditions that could impair the integrity of the surface impoundments or precipitation and drainage control structures; and shall assess preparedness for winter conditions including, but not limited to, erosion and sedimentation control. The Discharger shall take photos of any problems areas before and after repairs. Any necessary construction, maintenance, or repairs shall be **completed by 31 October**. Annual facility inspection reporting shall be **submitted by 30 November**.

The Discharger shall inspect all precipitation, diversion, and drainage facilities for damage **within 7 days** following major storm events (e.g., a storm that causes continual runoff for at least one hour) capable of causing flooding, damage, or significant erosion. The Discharger shall take photos of any problems areas before and after repairs. Necessary repairs shall be completed **within 30 days** of the inspection. Notification and reporting requirements for major storm events shall be conducted as required in Reporting Requirements 2. of this MRP.

The Discharger shall monitor and record on-site rainfall data using an automated rainfall gauge. Data shall be used in establishing the severity of storm events and wet seasons for comparison with design parameters used for waste management unit design and conveyance and drainage design. Daily data and on-site observation shall be used for establishing the need for inspection and repairs after major storm events. Rainfall data shall be reported in the quarterly monitoring reports as required by this MRP.

REPORTING REQUIREMENTS

1. The Discharger shall report all monitoring data and information as specified herein. Reports that do not comply with the required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with this Monitoring and Reporting Program.
2. Quarterly groundwater monitoring and remediation system reports shall be submitted to the Central Valley Water Board according to the schedule below.

<u>Monitoring Period</u>	<u>Report Due</u>
January – March	April 30
April – June	July 31
July – September	October 31

October – December January 31

Each quarterly report shall include the following minimum information:

- (a) a description and discussion of the groundwater sampling event(s) and results, including trends in the concentrations of waste constituents and groundwater elevations in the wells. If there are any deficiencies during the sampling event or if impacts to groundwater extend beyond recent historical boundaries, the report shall include an explanation and/or evaluation and propose options for addressing or correcting the deficiencies;
 - (b) field logs that contain, at a minimum, water quality parameters measured before, during, and after purging, method of purging, depth of water, volume of water purged, etc.;
 - (c) groundwater contour maps for all groundwater zones, if applicable;
 - (d) waste constituent isoconcentration maps for all groundwater zones, if applicable;
 - (e) a table showing well construction details that shall include, at a minimum, well number, groundwater zone being monitored, measuring point elevation, depth to top and bottom of screen, water level elevation, and depth to water;
 - (f) cumulative data tables containing all historical water quality analytical results and depth to groundwater;
 - (g) a copy of all laboratory analytical data reports;
 - (i) results of any monitoring done more frequently than required at the locations specified in this Monitoring and Reporting Program or at other locations at the site shall be reported to the Central Valley Water Board;
 - (j) a summary of any spills/releases that occurred during the quarter and tasks undertaken in response to the spills/releases;
 - (k) an update and status on each of the outstanding tasks required by the CDO or Assistant Executive Officer;
 - (l) a map showing all wells on the facility;
3. In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized to demonstrate compliance with the requirements. All data shall be submitted in an electronic form acceptable to the Assistant Executive Officer.
 4. The Discharger shall submit an **annual report by 31 January** of each year for the preceding year. The report can be combined with the Discharger's fourth quarter report. The report shall contain:

- a. Both tabular and graphical summaries of all data obtained during the year;
 - b. An in-depth evaluation of groundwater conditions at the site including short and long-term trends of the constituents of concern in each area of the site;
 - c. An evaluation of the effectiveness of the groundwater monitoring network in delineating the lateral and vertical extent of impacts to groundwater in all affected areas of the site. This needs to include an identification of any data gaps and potential deficiencies in the monitoring system or reporting program. The report shall include recommendations to address any deficiencies in the monitoring and report program;
 - d. An evaluation of the effectiveness of each of the remediation systems. The evaluation shall include the effectiveness of the systems in remediating impacted groundwater and each of the source areas or suspected source areas. The report shall include recommendations for improving or expanding the systems, if necessary;
 - e. A summary of the performance of each remediation system including the amount and percentage of operating and downtime, and the amount of petroleum hydrocarbons removed; and
 - f. A summary of all spills/releases, if any, that occurred during the year, tasks undertaken in response to the spills, the results of the tasks undertaken.
5. For each required quarterly and annual report, one report shall be submitted containing all monitoring data collected at the site by the Discharger and include all information cited in the above sections. A hard copy of all required reports on/or responses shall be submitted by the due date unless otherwise arranged with Central Valley Water Board staff.
 6. The Discharger may request that the Assistant Executive Officer change the monitoring frequency or constituents of concern after the first year of monitoring. The request needs to include a demonstration that adequate data has been collected to determine background groundwater conditions and a justification for the change.
 6. The Discharger shall maintain a data base containing historical and current monitoring data in an electronic form acceptable to the Assistant Executive Officer. The data base shall be updated quarterly and provided to the Central Valley Water Board in electronic format.
 7. The Discharger shall submit electronic copies of all workplans, reports, analytical results, and groundwater elevation data over the Internet to the State Water Board Geographic Environmental Information Management System database (GeoTracker) at <http://geotracker.swrcb.ca.gov>. Electronic submittals shall comply with GeoTracker standards and procedures as specified on the State Water Board's web site. Uploads to Geotracker shall be completed on or prior to the due date. In addition, a hardcopy of each document shall be submitted to:

California Regional Water Quality Control Board
Central Valley Region
1685 E Street, Suite 200
Fresno, CA 93706
Attn: Ron Holcomb
Geotracker Site ID: **T10000005197 or T10000005199**

8. A transmittal letter explaining the essential points shall accompany each report. At a minimum, the transmittal letter shall identify any violations found since the last report was submitted, and if the violations were corrected. If no violations have occurred since the last submittal, this shall be stated in the transmittal letter. The transmittal letter shall also state that a discussion of any violations found since the last report was submitted, and a description of the actions taken or planned for correcting those violations, including any references to previously submitted time schedules, is contained in the accompanying report. The transmittal letter shall contain a statement identical to that required by the CDO by the discharger, or the discharger's authorized agent, under penalty of perjury, that to the best of the signer's knowledge the report is true, accurate, and complete.

The Discharger shall implement the above monitoring program on the effective date of this Program.

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

30 July 2015

(Date)

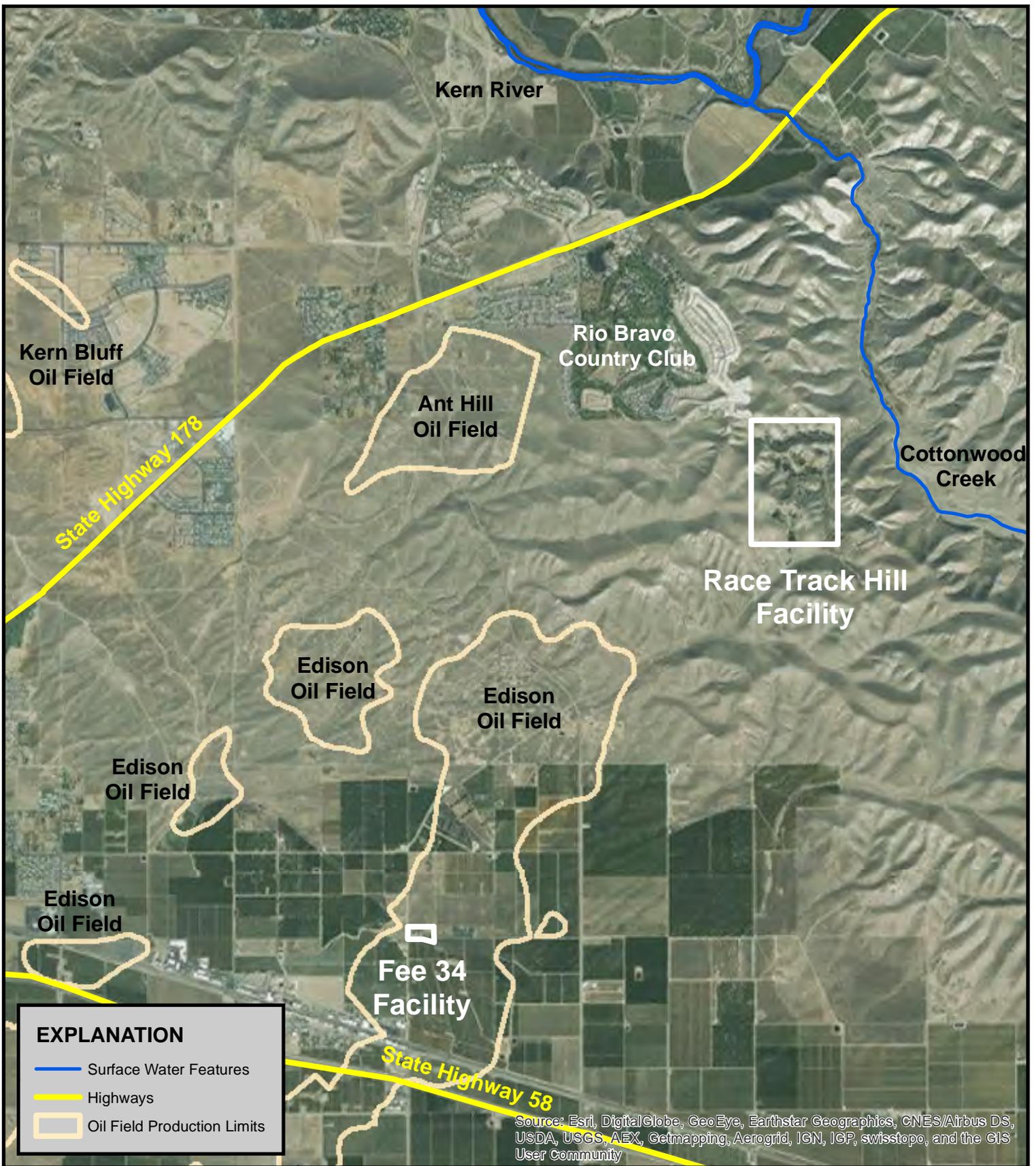
Table 1 - Groundwater and Influent Monitoring				
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>US EPA or other Method</u>	<u>Reporting Frequency</u>
<u>Groundwater Elevation</u>	feet & hundredths, MSL ¹	Quarterly		Quarterly
<u>Field Parameters</u>				
Temperature	°F ²	Quarterly		Quarterly
Electrical Conductivity	umhos/cm ³	Quarterly		Quarterly
pH	pH units	Quarterly		Quarterly
<u>Monitoring Parameters</u>				
Total Dissolved Solids (TDS)	mg/l ⁴	Quarterly	160.1	Quarterly
Electrical Conductivity	umhos/cm	Quarterly	120.1	Quarterly
Boron, dissolved	mg/l	Quarterly	6010B	Quarterly
<u>Standard Minerals</u>				
Alkalinity as CaCO ₃	mg/l	Quarterly	310.1	Quarterly
Bicarbonate Alkalinity as CaCO ₃	mg/l	Quarterly	310.1	Quarterly
Carbonate Alkalinity as CaCO ₃	mg/l	Quarterly	310.1	Quarterly
Hydroxide Alkalinity as CaCO ₃	mg/l	Quarterly	310.1	Quarterly
Sulfate , dissolved	mg/l	Quarterly	300.0	Quarterly
Nitrate-N, dissolved	mg/l	Quarterly	300.0	Quarterly
Calcium, dissolved	mg/l	Quarterly	6010B	Quarterly
Magnesium, dissolved	mg/l	Quarterly	6010B	Quarterly
Sodium, dissolved	mg/l	Quarterly	6010B	Quarterly
Potassium	mg/l	Quarterly	6010B	Quarterly
Chloride	mg/l	Quarterly	300.0	Quarterly
<u>PAHs</u> ⁵	ug/l ⁶	Quarterly	8270	Quarterly
<u>Total Petroleum Hydrocarbons (TPH)</u>	ug/l	Quarterly	418.1	Quarterly
<u>Aromatic Hydrocarbons</u>				
Benzene	ug/l	Quarterly	8260B	Quarterly
Ethyl Benzene	ug/l	Quarterly	8260B	Quarterly
Toluene	ug/l	Quarterly	8260B	Quarterly

Table 1 - Groundwater and Influent Monitoring				
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>US EPA or other Method</u>	<u>Reporting Frequency</u>
M,p-Xylenes	ug/l	Quarterly	8260B	Quarterly
o-Xylene	ug/l	Quarterly	8260B	Quarterly
<u>Stable Isotopes</u>				
Oxygen (¹⁸ O)		Quarterly	900.0	Quarterly
Hydrogen (² H, deuterium [D])	pCi/L ⁷	Quarterly	900.0	Quarterly
<u>Radionuclides</u>				
Radium-226	pCi/L	Quarterly	SM ⁸ 7500-Ra	Quarterly
Radium-228	pCi/L	Quarterly	SM 7500-Ra	Quarterly
Gross Alpha particle (excluding radon and uranium)	pCi/L	Quarterly	SM 7110	Quarterly
Uranium	pCi/L	Quarterly	200.8	Quarterly
<u>Constituents of Concern</u>				
Lithium	mg/l	Quarterly	200.7	Quarterly
Strontium	mg/l	Quarterly	200.7	Quarterly
Iron	mg/l	Quarterly	200.8	Quarterly
Manganese	mg/l	Quarterly	200.8	Quarterly
Antimony	mg/l	Quarterly	200.8	Quarterly
Arsenic	mg/l	Quarterly	200.8	Quarterly
Barium	mg/l	Quarterly	200.8	Quarterly
Beryllium	mg/l	Quarterly	200.8	Quarterly
Cadmium	mg/l	Quarterly	200.8	Quarterly
Chromium (total)	mg/l	Quarterly	200.8	Quarterly
Chromium (hexavalent)	mg/l	Quarterly	7196A	Quarterly
Cobalt	mg/l	Quarterly	200.8	Quarterly
Copper	mg/l	Quarterly	200.8	Quarterly
Lead	mg/l	Quarterly	200.8	Quarterly
Mercury	mg/l	Quarterly	7470A	Quarterly

MONITORING AND REPORTING PROGRAM NO. R5-2015-0093
 VALLEY WATER MANAGEMENT COMPANY
 RACE TRACK HILL FACILITY
 FEE 34 FACILITY
 KERN COUNTY

Table 1 - Groundwater and Influent Monitoring				
<u>Parameters</u>	<u>Units</u>	<u>Monitoring Frequency</u>	<u>US EPA or other Method</u>	<u>Reporting Frequency</u>
Molybdenum	mg/l	Quarterly	200.8	Quarterly
Nickel	mg/l	Quarterly	200.8	Quarterly
Selenium	mg/l	Quarterly	200.8	Quarterly
Silver	mg/l	Quarterly	200.8	Quarterly
Thallium	mg/l	Quarterly	200.8	Quarterly
Vanadium	mg/l	Quarterly	200.8	Quarterly
Zinc	mg/l	Quarterly	200.8	Quarterly

- ¹ Mean Sea Level
- ² Fahrenheit
- ³ Micromhos per centimeter
- ⁴ Milligrams per liter
- ⁵ Polycyclic aromatic hydrocarbons
- ⁶ Micrograms per liter
- ⁷ Picocuries per liter
- ⁸ Standard Methods



T28S, R27E, MDB&M



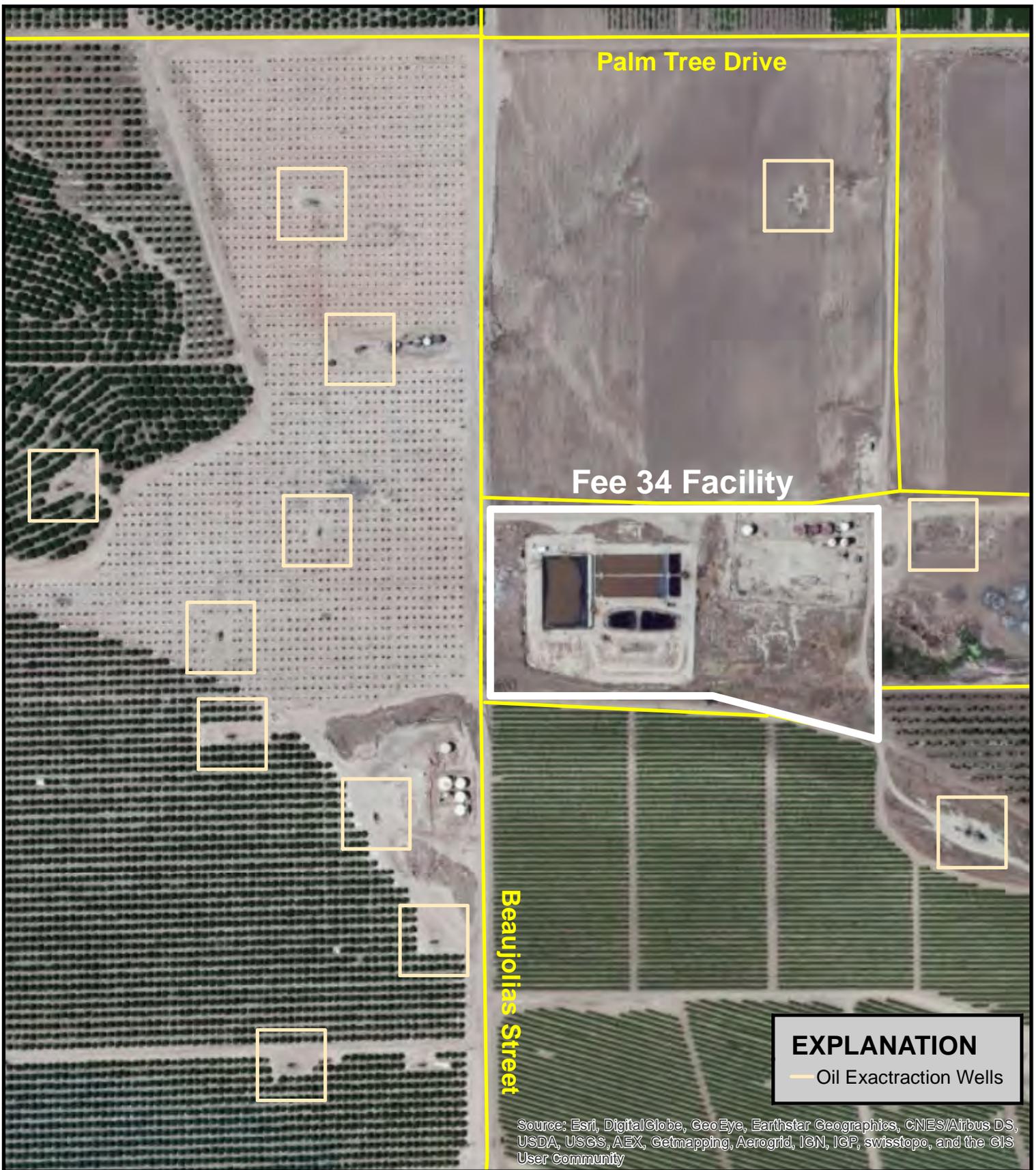
0 2,050 4,100 8,200
Feet

VICINITY MAP

CEASE AND DESIST
ORDER NO. R5-2015-0093
FOR

VALLEY WATER MANAGEMENT COMPANY
RACE TRACK HILL AND FEE 34 FACILITY, EDISON OIL FIELD
KERN COUNTY

ATTACHMENT A



Palm Tree Drive

Fee 34 Facility



Beaujolias Street

EXPLANATION
 — Oil Exactraction Wells

Source: Esri, DigitalGlobe, Geo Eye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

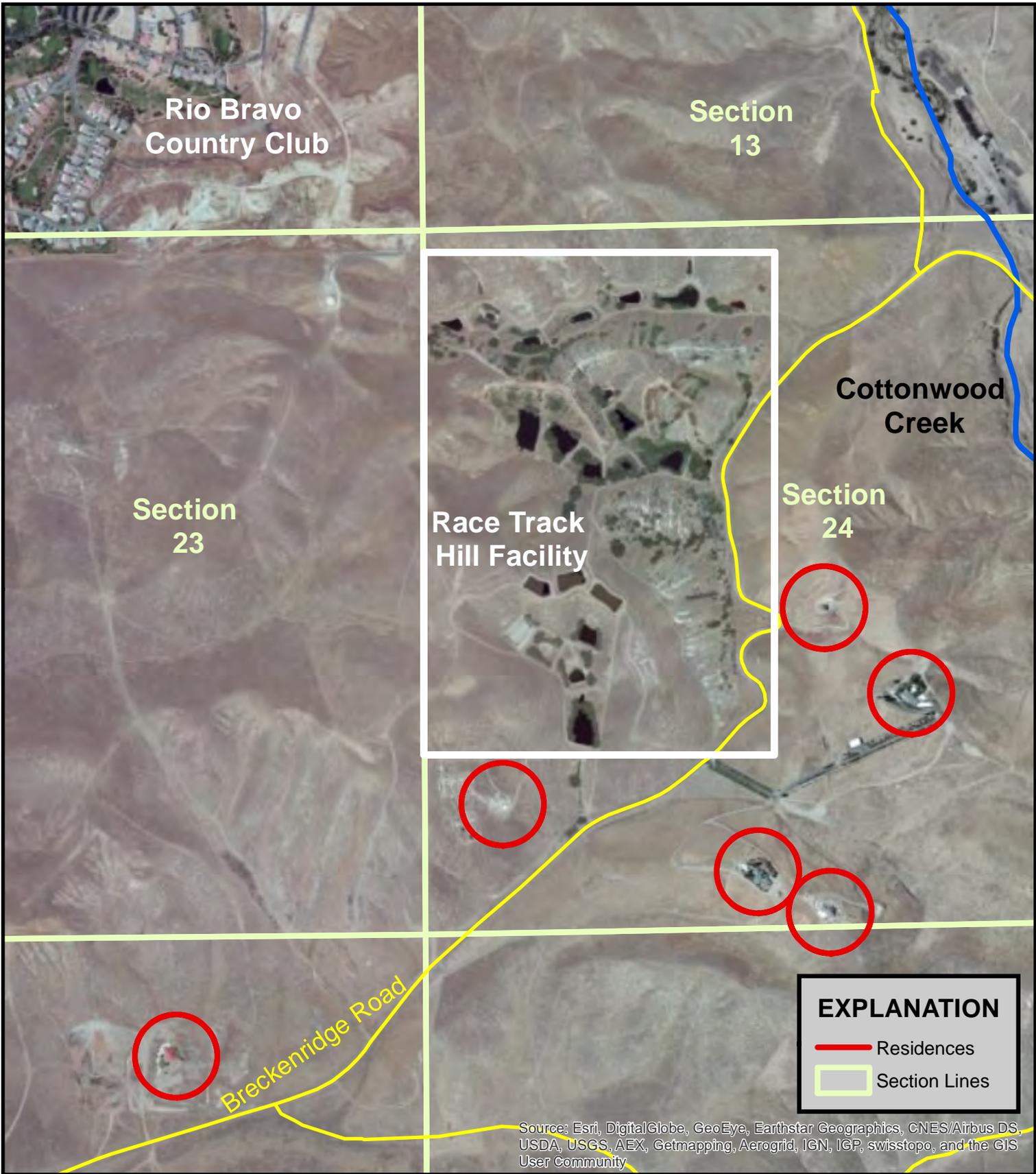
Section 34, T29S, R29E, MDB&M



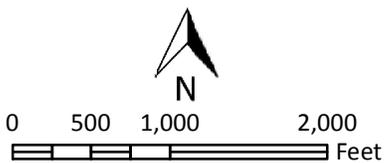
0 137.5 275 550
 Feet

FEE 34 FACILITY SITE MAP
 CEASE AND DESIST
 ORDER NO. R5-2015-0093
 FOR
 VALLEY WATER MANAGEMENT COMPANY
 FEE 34 FACILITY, EDISON OIL FIELD
 KERN COUNTY

ATTACHMENT B



Section 24, T29S, R29E, MDB&M



RACE TRACK HILL FACILITY SITE MAP
 CEASE AND DESIST
 ORDER NO. R5-2015-0093
 FOR
 VALLEY WATER MANAGEMENT COMPANY
 RACE TRACK HILL FACILITY, EDISON OIL FIELD
 KERN COUNTY

ATTACHMENT C

Attachment D

Central Valley Regional Water Quality Control Board

9 October 2013

NOTICE OF VIOLATION

Larry Bright
Valley Water Management Company
7500 Meany Avenue
Bakersfield, CA 93308

CERTIFIED MAIL
7012 2920 0000 1430 3329

**INSPECTION REPORT – VALLEY WATER MANAGEMENT COMPANY, C-PLANT FACILITY,
EDISON OIL FIELD, KERN COUNTY**

Central Valley Regional Water Quality Control Board staff (Staff) inspected the wastewater disposal facility at the C-Plant Facility on 18 September 2013. Disposal operations at the facility are regulated by Waste Discharge Requirements Order 92-11037 (WDRs). Staff's comments and observations are presented in the enclosed inspection report.

Staff observed that oil field produced wastewater was being discharged into seven surface impoundments (sumps) at the facility. Two sumps (referred to as wastewater sumps; see Figure 1) appeared to have insufficient freeboard (approximately 1 foot of freeboard) and are in violation of the WDRs. Waste Discharge Specification B.6 of the WDRs states that a minimum of two feet of freeboard needs to be maintained in the sumps. The final sump in the series has recently been covered with netting to preclude wildlife.

Waste Discharge Specification B.1 of the WDRs states that wastewater discharged to sumps cannot exceed the following limits: electrical conductivity (EC), 1,000 micromhos per centimeter ($\mu\text{mhos/cm}$); chloride, 200 milligrams per liter (mg/L); and boron, 1.0 mg/L. Analytical results provided in Valley Water Management Company's 2013 annual monitoring report indicate that the wastewater contains an EC of 5,700 $\mu\text{mhos/cm}$, a chloride concentration of 1,800 mg/L, and a boron concentration of 14 mg/L, which exceed the salinity limits prescribed in the WDRs. Discharge of high salinity wastewater to sumps at the facility is a violation of the WDRs and poses a threat to groundwater.

Failure to comply with Waste Discharge Requirements Order 92-11037 can subject you to administrative civil liability (monetary penalties) at a rate of up to \$10 for each gallon discharged to the surface impoundments which exceeds the waste constituent limitations contained in Discharge Specification 1, of Order 92-11037. It is important that you promptly comply with the discharge limitations stipulated in Order 92-11037 to minimize your potential liability pursuant to California Water Code section 13350(e).

If you have any questions, please contact Ryan West at (559) 445-6188 or by email at Ryan.West@waterboards.ca.gov



DANE S. JOHNSON
Senior Engineering Geologist
PG No. 4239

Enclosure: Inspection Report

cc: Vincent Agusiegbe, CDOG&GR, Bakersfield

VALLEY WATER MANAGEMENT COMPANY	EDISON, C-PLANT FACILITY
DISCHARGER NAME	FACILITY NAME
7500 MEANY AVENUE	SW ¼ OF SECTION 34, T29S, R29E, MDB&M
STREET ADDRESS	STREET ADDRESS
BAKERSFIELD, CA 93308	KERN COUNTY
CITY, STATE, ZIP CODE	CITY, STATE, ZIP CODE
LARRY BRIGHT	RUSSELL EMERSON
DISCHARGER CONTACT PERSON	FACILITY CONTACT PERSON
(661) 410-7500	(661) 978-0982
lbright@vwwater.com	remerson@vwwater.com
TELEPHONE NO.	TELEPHONE NO.
	E-MAIL ADDRESS

GENERAL INSPECTION INFORMATION

Inspection Type: B Type Compliance Inspection Lead Inspector: R. West

9/18/2013 to 09/18/2013 9:30 am Clear, Sunny

INSPECTION DATE(S) INSPECTION TIME GENERAL WEATHER CONDITIONS

INSPECTION ATTENDEE(S)			
Scott Moore	Central Valley Water Board	(559) 445-5170	smoore@waterboards.ca.gov
NAME	COMPANY/AGENCY	TELEPHONE NO.	E-MAIL ADDRESS
Russell Emerson	Valley Water Management Co.	(661) 978-0982	remerson@vwwater.com
NAME	COMPANY/AGENCY	TELEPHONE NO.	E-MAIL ADDRESS
Mike Toland	CDOGGR	(661) 334-3662	michael.toland@conservation.ca.gov
NAME	COMPANY/AGENCY	TELEPHONE NO.	E-MAIL ADDRESS

INSPECTION SUMMARY (for CIWQS entry – 500 character maximum)

The C-Plant Facility was inspected to determine compliance with Waste Discharge Requirements Order 92-11037 (WDRs). Oil field produced wastewater is discharged into seven surface impoundments (sumps) at the facility. The quality of wastewater discharged to sumps exceeds salinity limits prescribed in Discharge Specification B. 1 of the WDRs. Discharge of high salinity wastewater to sumps at the facility is a violation of the WDRs and poses a threat to groundwater.

INSPECTION VIOLATIONS SUMMARY (if applicable)

Identify VIOLATIONS noted during inspection in table below. For each violation documented entered into CIWQS, identify Violation ID and Violation Type, describe violation, and identify section of the WDRs or Water Code violated.

Label	Violation ID	Violation Type	Violation Description	Section of the WDRs Violated
V1	955513	Effluent Violation	Disposal of high salinity wastewater to sumps.	Discharge Specification B.1
V2	955555	Order Conditions	Insufficient freeboard	Discharge Specification B.6
V3	393320	NOV	Notice of Violation letter describing facility violations	
V4				
V5				
V6				

OTHER VIOLATIONS (if applicable)

SMR violations?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Evaluated	Notes:
File Review violations?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Evaluated	Notes:

Lead Inspector ID: 139472 Signature: Ryan K. West Date: 10/8/13

Inspection Tracking Information Reviewed by: (1) [Signature] (2) _____ (3) (RKW) 139472
CIWQS Coordinator

Filename: VWMC, C-Plant Facility, Edison Oil Field, Kern County, Order No. 92-11037 CIWQS Entry Date: 09/26/2013 CIWQS Inspection ID: 13869583

FACILITY INFORMATION

Oil field production wastewater disposal facility.

Active

FACILITY DESCRIPTION (e.g., total area in acres, number of waste management units, etc.)

STATUS (active, inactive, closed)

Oil field production wastewater.

Sub-15 Surface Impoundments

WASTE TYPES

FACILITY CLASSIFICATION

Twenty-seven unlined surface impoundments and sprinkler irrigation system.

DISPOSAL DESCRIPTION (e.g., composting, landfill, surface impoundment, etc.)

BACKGROUND

The C-Plant Facility (Figure 1) contains seven sumps that are used for oil separation and storage of oil field production wastewater. The C-Plant Facility accepts approximately 4.5 million barrels (189 million gallons) of oil field production wastewater per year from several small oil producers in the Edison Oil Field whose wastewater does not meet Basin Plan salinity limits for discharges to unlined sumps. The wastewater contains an electrical conductivity (EC) of 5,700 micromhos per centimeter ($\mu\text{mhos/cm}$), a chloride concentration of 1,800 milligrams per liter (mg/L), and a boron concentration of 14 mg/L. Wastewater from the C-plant Facility is piped to Valley Water Management Company's Race Track Hill Facility for disposal to unlined sumps.

INSPECTION GIS DATA

GIS Equipment used:

	MANUFACTURER	MODEL	SERIAL NO.	DATUM
Description of Measured Point	Latitude	Longitude	Datum	Comments
Centroid of Facility	35.355071	-118.859904	NAD 83	

INSPECTION OBSERVATIONS AND FINDINGS

Describe observations and findings and identify those that document and reference each violation listed in the Inspection Violations Summary table by identifying the cited violation number within parentheses following the observation/finding (e.g., Exposed waste on top deck (V1)).

The facility was inspected to observe current wastewater disposal operations and evaluate compliance with the WDRs. Photographs were taken to document conditions observed (see page 4).

Staff observed that oil field produced wastewater was being discharged into seven sumps at the facility. Land in the immediate vicinity of the facility is used for farming. It appeared that grapes are being farmed immediately south of the facility (see Figure 1).

Wastewater enters the facility by means of inlet pipes (Photograph 1). The inlet pipes discharge wastewater into two oil separation sumps that are covered with netting (Photograph 2). The oil separation sumps are gunite-lined and contained wastewater coated with crude oil. From the oil separation sumps, the wastewater enters two gunite-lined sumps (hereafter referred to as "wastewater sumps") that are each approximately 125 feet in length and 45 feet wide (Photographs 3 and 4). The two wastewater sumps are equipped with built-in skimmers, that when lowered by an operator, skim crude oil off the wastewater. I did not observe any crude oil in the wastewater sumps (Photograph 4). Both of the wastewater sumps appeared to have insufficient freeboard (approximately 1 foot of freeboard). There are two unlined sumps (hereafter referred to as "oil sumps") that are used for storage of crude oil that is skimmed from wastewater. The two oil sumps were at maximum capacity and contained wastewater coated with a thin veneer of crude oil (Photograph 5). The last sump in the series is gunite-lined and is referred to as the shipping sump. Netting was recently constructed over the shipping sump to prevent wildlife from contacting crude oil (Photograph 6). The shipping sump contained wastewater coated with some crude oil near the northeast corner of the sump.

The storm water basin located at the southern portion of the facility was dry.

SAMPLING INFORMATION AND OBSERVATIONS

Were samples collected during the inspection? Yes No
 Did discharger collect split samples? Yes No

Are sample results included in report? Yes No

SAMPLE COLLECTION INFORMATION AND OBSERVATIONS

SAMPLE ID	SAMPLE DESCRIPTION/OBSERVATIONS	SAMPLE TIME (hours)	PHOTO NO.
SAMPLE ID	SAMPLE DESCRIPTION/OBSERVATIONS	SAMPLE TIME (hours)	PHOTO NO.
SAMPLE ID	SAMPLE DESCRIPTION/OBSERVATIONS	SAMPLE TIME (hours)	PHOTO NO.
SAMPLE ID	SAMPLE DESCRIPTION/OBSERVATIONS	SAMPLE TIME (hours)	PHOTO NO.

DISCUSSION OF SAMPLING RESULTS

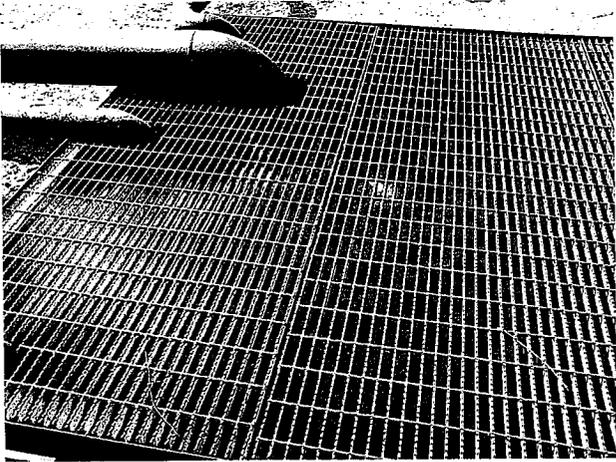
Discuss sampling results (e.g., discuss whether sampling results show compliance with WDRs).

CONCLUSIONS

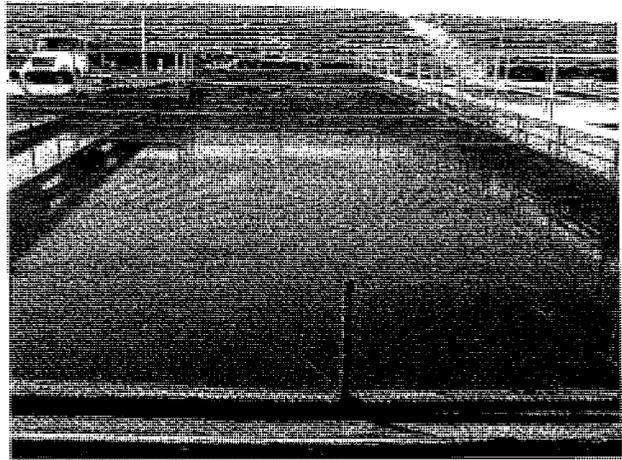
Summarize the conclusions of the inspection(s) below.

1. The shipping sump has recently been covered with netting to preclude wildlife. This resolves the Notice of Violation dated 28 June 2012 issued to Valley Water Management Company.
 2. The two wastewater sumps appeared to have insufficient freeboard (approximately 1 foot) and are in violation of the WDRs. Waste Discharge Specification B.6 of the WDRs states that a minimum of two feet of freeboard needs to be maintained in the sumps.
 3. Waste Discharge Specification B.1 of the WDRs states that wastewater discharged to sumps cannot exceed the following limits: EC, 1,000 μ mhos/cm; chloride, 200 mg/L; and boron, 1.0 mg/L. Analytical results provided in Valley Water Management Company's 2013 annual monitoring report indicate that the wastewater contains an EC of 5,700 μ mhos/cm, a chloride concentration of 1,800 mg/L, and a boron concentration of 14 mg/L, which exceed the salinity limits prescribed in the WDRs.
 4. Discharge of high salinity wastewater to sumps at the facility is a violation of the WDRs and poses a threat to groundwater. The disposal of wastewater to sumps at the facility needs to cease.
 5. The WDRs are outdated and need to be updated for conformance with current Central Valley Water Board policies, and State regulations and policies.

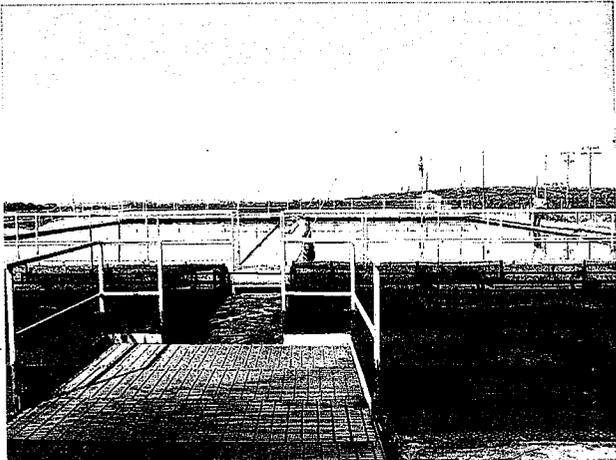
PHOTOGRAPHS



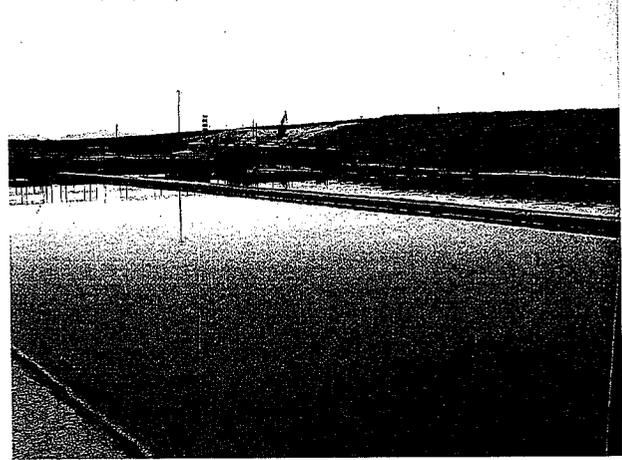
Photograph 1. – View of incoming wastewater pipes that discharge into the separation sumps.



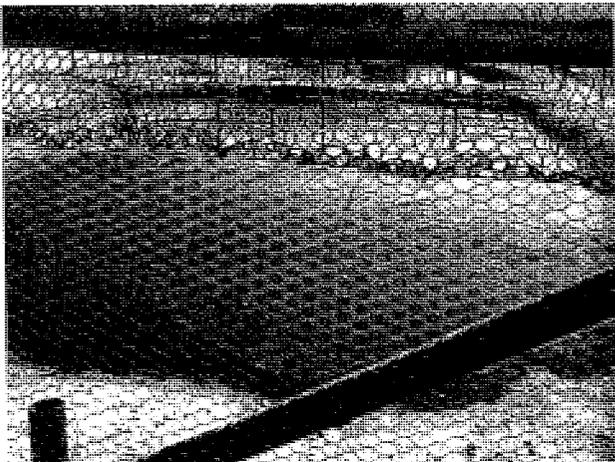
Photograph 2. – View of oil separation sumps.



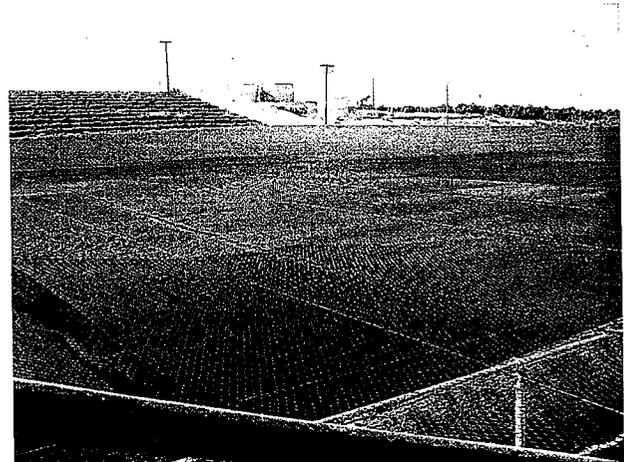
Photograph 3. – View of a separation sump and wastewater sumps looking west.



Photograph 4. – View of the wastewater sumps looking southeast.



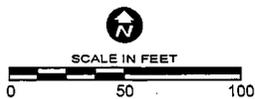
Photograph 5. – View of the two unlined oil sumps.



Photograph 6. – View of the shipping sump.



Map Source:
ESRI's ArcGIS Online Premium Services
Section 34, T29S, R29E, MDB&M



SITE MAP
ORDER NO. 92-11037
VALLEY WATER MANAGEMENT COMPANY
EDISON FEE 34 (RACETRACK HILL, C-PLANT) FACILITY
KERN COUNTY

FIGURE 1

Central Valley Regional Water Quality Control Board

9 October 2013

NOTICE OF VIOLATION

Larry Bright
Valley Water Management Company
7500 Meany Avenue
Bakersfield, CA 93308

CERTIFIED MAIL
7012 2920 0000 1430 3350

INSPECTION REPORT – VALLEY WATER MANAGEMENT COMPANY, RACE TRACK HILL FACILITY, EDISON, KERN COUNTY

Central Valley Regional Water Quality Control Board staff (Staff) inspected the wastewater disposal facility at the Race Track Hill Facility on 18 September 2013. Disposal operations at the facility are regulated by Waste Discharge Requirements Resolution 58-349 (WDRs). Staff's comments and observations are presented in the enclosed inspection report.

Twenty-seven surface impoundments (sumps) were observed on the lease that are used for percolation and evaporation of oil field produced wastewater. The "Entry Sump" has recently been covered with netting to preclude wildlife. The sumps and netting appeared to be in satisfactory condition. Freeboard appeared to be adequate in all of the sumps.

A sprinkler irrigation system is used to irrigate a variety of salt tolerant vegetation to facilitate evapotranspiration of the wastewater. Approximately 94 acres of land on the facility are being irrigated. Sprinklers were operating at the time of the inspection. Waste Discharge Requirements Resolution 58-349 states that wastewater discharged or overflowing onto the surface of the ground needs to conform to the following limits: total dissolved solids cannot exceed 1,000 parts per million (ppm), chlorides cannot exceed 150 ppm, and boron cannot exceed 1.0 ppm.

The wastewater being discharged comes directly from Valley Water Management Company's C-Plant. Analyses of the wastewater at the C-Plant documented the following waste constituent concentrations: electrical conductivity, 5,700 micromhos per centimeter; chloride, 1,800 milligrams per liter (mg/L); and boron, 14 mg/L. The wastewater being sprayed to the ground exceeds the limits permitted by the WDRs. The discharge of wastewater through the sprinkler irrigation system to land is a violation of the WDRs.

Failure to comply with Waste Discharge Requirements Resolution 58-349 can subject you to administrative civil liability (monetary penalties) at a rate up to \$10 for each gallon discharged through the sprinkler system which exceeds the waste constituent limitations contained in Resolved 3.a., b. and c. It is important that you promptly comply with the discharge limitations stipulated in Resolution 58-349 to minimize your potential liability pursuant to California Water Code section 13350(e).

If you have any questions, please contact Ryan West at (559) 445-6188 or by email at Ryan.West@waterboards.ca.gov



DANE S. JOHNSON
Senior Engineering Geologist
PG No. 4239

Enclosure: Inspection Report

cc: Vincent Agusiegbe, CDOG&GR, Bakersfield

<u>VALLEY WATER MANAGEMENT COMPANY</u> DISCHARGER NAME	<u>EDISON, RACE TRACK HILL FACILITY</u> FACILITY NAME
<u>7500 MEANY AVENUE</u> STREET ADDRESS	<u>W 1/2 OF SECTION 24, T29S, R29E, MDB&M</u> STREET ADDRESS
<u>BAKERSFIELD, CA 93308</u> CITY, STATE, ZIP CODE	<u>KERN COUNTY</u> CITY, STATE, ZIP CODE
<u>LARRY BRIGHT</u> DISCHARGER CONTACT PERSON	<u>RUSSELL EMERSON</u> FACILITY CONTACT PERSON
<u>(661) 410-7500</u> TELEPHONE NO.	<u>lbright@vwwater.com</u> E-MAIL ADDRESS
<u>(661) 978-0982</u> TELEPHONE NO.	<u>remerson@vwwater.com</u> E-MAIL ADDRESS

GENERAL INSPECTION INFORMATION

Inspection Type: B Type Compliance Inspection Lead Inspector: R. West

9/18/2013 to 09/18/2013 10:45 am Clear, Sunny

INSPECTION DATE(S) INSPECTION TIME GENERAL WEATHER CONDITIONS

INSPECTION ATTENDEE(S)			
<u>Scott Moore</u> NAME	<u>Central Valley Water Board</u> COMPANY/AGENCY	<u>(559) 445-5170</u> TELEPHONE NO.	<u>smoore@waterboards.ca.gov</u> E-MAIL ADDRESS
<u>Russell Emerson</u> NAME	<u>Valley Water Management Co.</u> COMPANY/AGENCY	<u>(661) 978-0982</u> TELEPHONE NO.	<u>remerson@vwwater.com</u> E-MAIL ADDRESS
<u>Mike Toland</u> NAME	<u>CDOGGR</u> COMPANY/AGENCY	<u>(661) 334-3662</u> TELEPHONE NO.	<u>michael.toland@conservation.ca.gov</u> E-MAIL ADDRESS

INSPECTION SUMMARY (for CIWQS entry – 500 character maximum)

The Race Track Hill Facility was inspected to determine compliance with Waste Discharge Requirements Resolution 58-349 (WDRs). There are twenty-seven unlined surface impoundments (sumps) on the facility that are used for percolation and evaporation of oil field production wastewater. A sprinkler irrigation system is used to irrigate a variety of salt tolerant vegetation to facilitate evapotranspiration of the wastewater. Wastewater discharged through the irrigation system exceeds the salinity limits stipulated in the WDRs for discharges onto the surface of the ground.

INSPECTION VIOLATIONS SUMMARY (if applicable)

Identify VIOLATIONS noted during inspection in table below. For each violation documented entered into CIWQS, identify Violation ID and Violation Type, describe violation, and identify section of the WDRs or Water Code violated.

Label	Violation ID	Violation Type	Violation Description	Section of the WDRs Violated
V1	955354	Effluent Violation	Irrigation of wastewater w/ elevated EC, chloride, & boron to ground surface	discharge specification no. 3 (a,b,c)
V2	393289	NOV	Notice of Violation	
V3				
V4				
V5				
V6				

OTHER VIOLATIONS (if applicable)

SMR violations?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Evaluated	Notes:
File Review violations?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Evaluated	Notes:

Lead Inspector ID: 139472 Signature: Ryan K. West Date: 10/8/13

Inspection Tracking Information Reviewed by: (1) [Signature] (2) _____ (3) (RKW) 139472
CIWQS Coordinator

Filename: WVMC, Race Track Hill Facility, Edison, Kern County, Resolution 58-349 CIWQS Entry Date: 09/24/2013 CIWQS Inspection ID: 13834522

FACILITY INFORMATION

Oil field production wastewater disposal facility.
FACILITY DESCRIPTION (e.g., total area in acres, number of waste management units, etc.)

Active

STATUS (active, inactive, closed)

Oil field production wastewater.
WASTE TYPES

Sub-15 Surface Impoundments
FACILITY CLASSIFICATION

Twenty-seven unlined surface impoundments and sprinkler irrigation system.
DISPOSAL DESCRIPTION (e.g., composting, landfill, surface impoundment, etc.)

BACKGROUND

The Race Track Hill Facility (Figure 1) contains 27 unlined sumps and an irrigation sprinkler system that are used for disposal of wastewater. The wastewater, collected at Valley Water Management Company's C-Plant Facility in the Edison Oil Field, is delivered to the facility by pipeline for disposal. The C-Plant Facility accepts approximately 4.5 million barrels (189 million gallons) of oil field production wastewater per year from several small oil producers in the Edison Oil Field whose wastewater does not meet Basin Plan salinity limits for discharges to unlined sumps. The wastewater contains an electrical conductivity of 5,700 micromhos per centimeter, a chloride concentration of 1,800 milligrams per liter (mg/L), and a boron concentration of 14 mg/L.

INSPECTION GIS DATA

GIS Equipment used:

<small>MANUFACTURER</small>	<small>MODEL</small>	<small>SERIAL NO.</small>	<small>DATUM</small>	
Description of Measured Point	Latitude	Longitude	Datum	Comments
Centroid of Facility	35.392863	-118.821173	NAD 83	

INSPECTION OBSERVATIONS AND FINDINGS

Describe observations and findings and identify those that document and reference each violation listed in the Inspection Violations Summary table by identifying the cited violation number within parentheses following the observation/finding (e.g., Exposed waste on top deck (V1)).

The facility was inspected to observe current wastewater disposal operations and evaluate compliance with the WDRs. Photographs were taken to document observations (see page 4).

There are twenty-seven unlined sumps on the facility that are used for percolation and evaporation of oil field production wastewater. Wastewater is gravity fed from one sump to the next in a downhill series. Netting was recently constructed over the "Entry Sump" to prevent wildlife from contacting crude oil in the sump (Photograph 1). A vacuum truck operator was on-site cleaning crude oil out of the north-east corner of Sump 2 (Photograph 2). Mr. Emerson (Valley Water Management Company) stated that vacuum trucks are used on a frequent basis as part of regular facility maintenance. Crude oil was not observed in the remainder of the sumps (Photographs 3 and 5). A few of the sumps did not contain wastewater (Photograph 6).

A sprinkler irrigation system is used to irrigate a variety of salt tolerant vegetation to facilitate evapotranspiration of the wastewater. Approximately 94 acres of land on the facility are irrigated (see Figure 1). Sprinklers were operating at the time of the inspection (Photograph 4).

SAMPLING INFORMATION AND OBSERVATIONS

Were samples collected during the inspection? Yes No Are sample results included in report? Yes No
 Did discharger collect split samples? Yes No

SAMPLE COLLECTION INFORMATION AND OBSERVATIONS

SAMPLE ID	SAMPLE DESCRIPTION/OBSERVATIONS	SAMPLE TIME (hours)	PHOTO NO.

DISCUSSION OF SAMPLING RESULTS

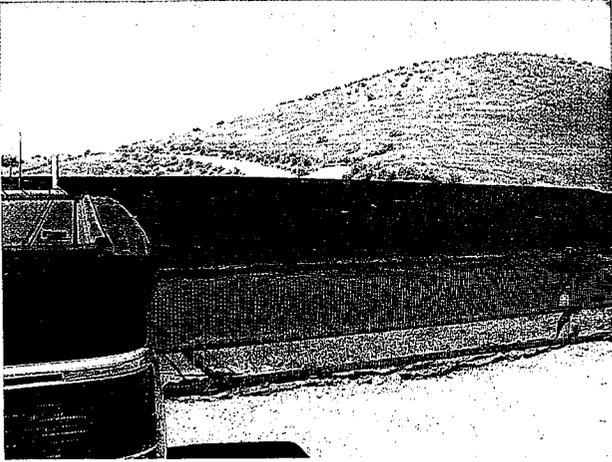
Discuss sampling results (e.g., discuss whether sampling results show compliance with WDRs).

CONCLUSIONS

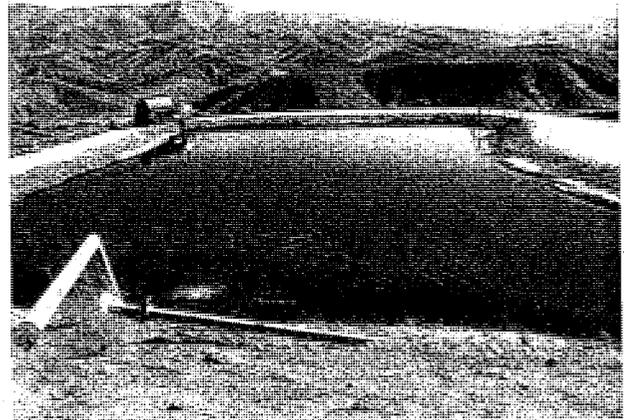
Summarize the conclusions of the inspection(s) below.

1. The "Entry Sump" has recently been covered with netting to preclude wildlife. This resolves the Notice of Violation dated 10 July 2012 issued to Valley Water Management Company.
2. A sprinkler irrigation system is used to irrigate a variety of salt tolerant vegetation to facilitate evapotranspiration of the wastewater. Approximately 94 acres of land on the facility are irrigated. Sprinklers were operating at the time of the inspection. Waste Discharge Requirements Resolution 58-349 states that wastewater discharged or overflowing onto the surface of the ground, or into natural drainage channels or into unlined sumps other than those constructed in Section 24, T29S, R29E, MDB&M shall conform to the following criteria: total dissolved solids cannot exceed 1,000 parts per million (ppm), chlorides cannot exceed 150 ppm, and boron cannot exceed 1.0 ppm. Facility wastewater exceeds these criteria.
3. The disposal of wastewater through the sprinkler irrigation system is in violation of the WDRs and needs to cease.
4. The WDRs are outdated and need to be updated for conformance with current Central Valley Water Board policies, and State regulations and policies.

PHOTOGRAPHS



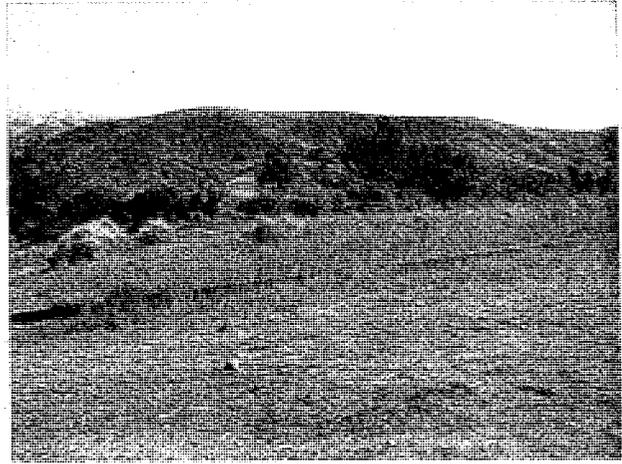
Photograph 1. – View of netting recently constructed over the "Entry Sump."



Photograph 2. – View of vacuum truck removing a small amount of crude oil in NE corner of Sump 2.



Photograph 3. – View of a few sumps on the northern portion of the facility.



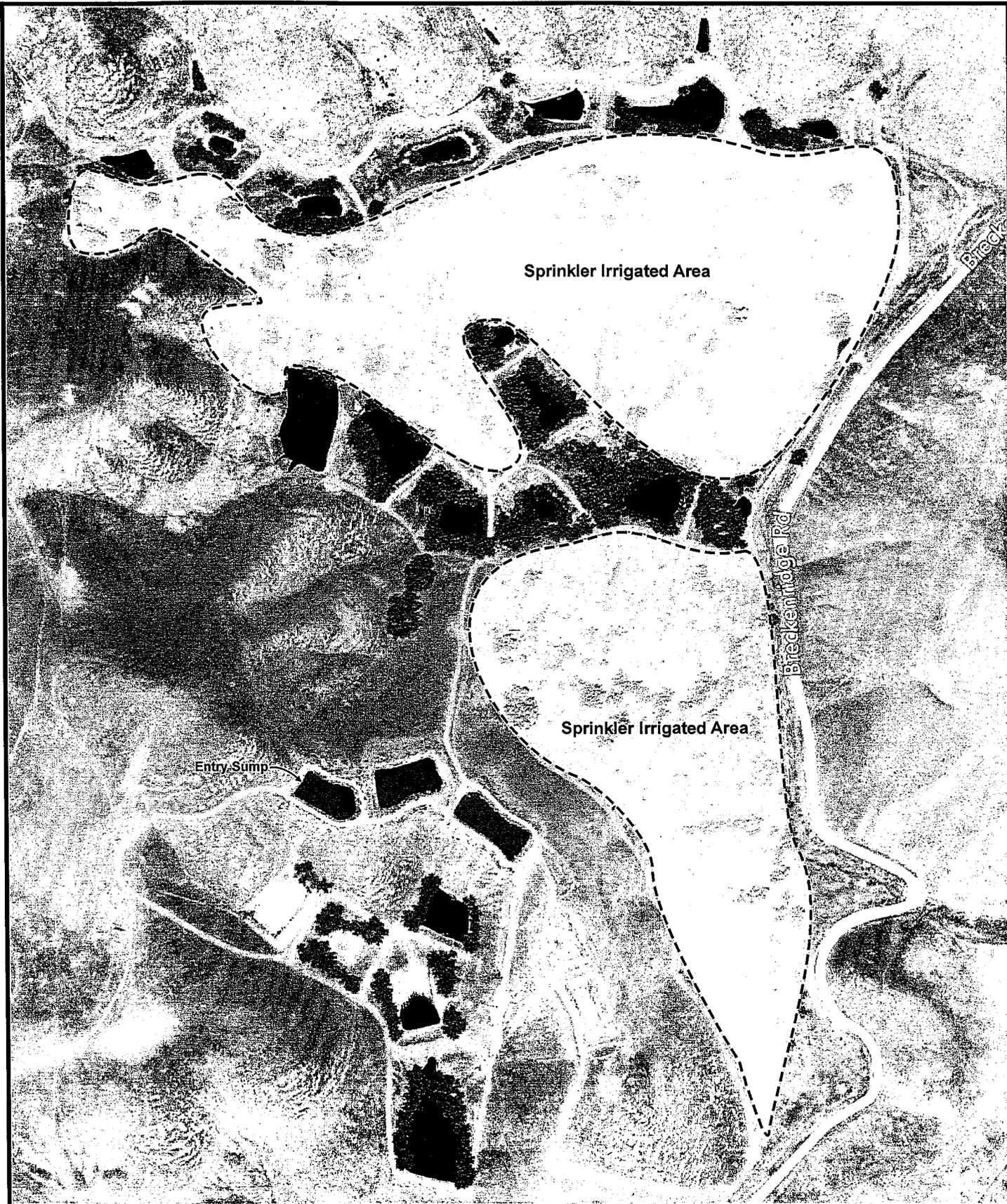
Photograph 4. – View of a sprinklers irrigating an area on the northern portion of the facility.



Photograph 5. – View of the elevated berm on Sump 26.



Photograph 6. – View of the last sump in the series (Sump 27). Breckenridge road in the background.



Map Source:
ESRI's ArcGIS Online Premium Services
Section 24, T29S, R29E, MDB&M



SITE MAP
RESOLUTION 58-349
VALLEY WATER MANAGEMENT COMPANY
EDISON (RACETRACK HILL - SEC24) FACILITY
KERN COUNTY

FIGURE 1