CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2019-0077

WASTE DISCHARGE REQUIREMENTS
FOR

SAN LUIS & DELTA-MENDOTA WATER AUTHORITY
AND
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

SURFACE WATER DISCHARGES FROM THE
GRASSLAND BYPASS PROJECT

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December 2019

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FRESNO AND MERCED COUNTIES

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

Findings

SCOPE AND COVERAGE OF THIS ORDER

1. The San Luis and Delta-Mendota Water Authority (Authority) submitted a Report of Waste Discharge dated 30 December 2008 for Phase III of the Grassland Bypass Project. This project, which started operations on 23 September 1996, transported subsurface agricultural drainage and stormwater runoff via the Grassland Bypass Channel to a portion of the San Luis Drain (Drain) that discharges to Mud Slough (north), a tributary of the San Joaquin River. The Drain is owned by the United States Department of the Interior, Bureau of Reclamation (Bureau), and is operated by the Authority. Hereafter, the Authority and Bureau will be jointly referred to as the Dischargers.
2. This Order only addresses the portions of the Grassland Bypass Project that involve the collection, transport, and discharge of agricultural subsurface drainage flows and stormwater to surface waters. Discharges to groundwater are addressed in Order R5-2015-0095, Waste Discharge Requirements General Order for Growers in the Grassland Drainage Area.
3. On 6 September 2019, the United States Court of Appeals for the Ninth Circuit issued a ruling that reversed and remanded for the district court to reconsider the claims related to the necessity to obtain a National Pollutant Discharge Elimination System (NPDES) permit for the Grassland Bypass Project[1]. The Court held that under 33 U.S.C. section 1342(1)(1), discharges must be entirely from return flows related to crop production to qualify for the exemption from NPDES permit requirements. This Order is not a NPDES permit, nor does this Order permit any discharges from activities other than those related to crop production. If, after final deposition of the case, it is determined that additional permitting is needed for discharges from the Grassland Drainage Area, the

[1] Pacific Coast Federation of Fishermen's Associations v. Donald R. Glaser (9th Cir. 6 September 2019), 2019 WL 4230097, ___ F.3d ___.

Central Valley Water Board will begin the appropriate permitting process.

4. On 22 October 2019, a presentation (*Standing too Close to the Elephant: Addressing Scales in Restoration and Fisheries Conservation)* was made at the 14th Biennial State of the San Francisco Estuary Conference. This presentation included information about spinal deformities observed in juvenile splittail from a single cohort collected in February-March 2011 with evidence attributing the deformities, at least in part, to the presence of selenium in the San Joaquin River. The Central Valley Water Board will continue to pursue additional information about the occurrence of these deformities in coordination with the researchers who completed the study as well as other experts. If it is determined that additional action is needed to address this issue, this permit may be reopened.

5. This Order, as revised, covers elements of Phase IV of the Grassland Bypass Project. The Authority previously submitted Reports of Waste Discharge dated 25 August 1997, 9 February 2001, and 30 December 2008 for Phases I, II, and III of the Grassland Bypass Project. Phase I was regulated by the board's waste discharge requirements Order No. 98-171 adopted on 24 July 1998. Phase II was regulated by waste discharge requirement Order No. 5-01-234 adopted on 7 September 2001. Phase III was regulated by the previous version of this Order, adopted on 31 July 2015.

6. During the first three phases of the Grassland Bypass Project the Dischargers have implemented projects, including source control and operation of the San Joaquin River Improvement Water Quality Project (SJRIP), that have eliminated agriculture related discharges to the San Joaquin River during the majority of the year. However, the discharge of storm related flows that flow down slope cannot be prevented. Phase IV of the Grassland Bypass Project is designed to manage storm related flows and minimize water quality and other environmental impacts associated with these storm events.

7. The Grassland Bypass Project currently serves approximately 97,400 acres of farmland and is designed to minimize discharges from the Grassland Drainage Area and route subsurface agricultural drainage and stormwater flows containing selenium and other constituents around wetland supply channels in the Grassland Watershed. This drainage previously flowed through a variety of channels to wetland habitat before discharging to the San Joaquin River.

8. The Grassland Bypass Channel is a four-mile long earthen ditch that links the combined discharges from the Grassland Drainage Area (Figure 1) to the Drain. The Drain is an 85-mile long, trapezoidal concrete canal that starts near Five Points in Fresno County and generally runs northwest to its terminus at the northern end of the former Kesterson Reservoir near Gustine in Merced County.

   Only the lower 28 miles of the Drain, starting at the point where it intersects the Grassland Bypass Channel approximately one-half mile west of Russell Avenue, are being used as part of the Grassland Bypass Project. The Drain has been blocked above this point and the Authority is operating the system to keep other drainage from entering the portion of the Drain being used by the Grassland Bypass Project.

9. Phases I, II, and III of the Grassland Bypass Project primarily dealt with transporting and discharging subsurface agricultural drainage flows generally characterized as containing salts, boron, selenium, and other constituents. The Project also managed stormwater runoff that entered the drainage system. Tailwater returns are not allowed in the Drain. By the end of Phase III, the drainage discharges are expected to be fully managed without discharge from the Grassland Drainage Area, but stormwater cannot be fully

managed without discharge to the Drain.

10. Phase IV of the Grassland Bypass Project will continue to implement the strategy of previous phases, including:
    a) Implementing management actions to prevent the discharge of subsurface agricultural drainage from the Grassland Drainage Area by continuing a suite of individual farmer, drainage district, and regional management activities;
    b) Separating storm-induced drainage discharged from the Grassland Drainage Area from wetland water supply conveyance channels; and
    c) Facilitating the drainage management that maintains the viability of agriculture in the Grassland Drainage Area while maintaining water quality improvement achievements of the previous phases in the San Joaquin River.
11. Phase IV of the Grassland Bypass Project will also add 800 acres to the Grassland Drainage Area for management and coverage under this Order. From the total acreage in the expanded coverage area, approximately 1,500 acres will be repurposed for use by the San Joaquin River Water Quality Improvement Project.
12. The Central Valley Water Board has adopted a *Water Quality Control Plan, Fifth Edition, for the Sacramento River and San Joaquin River Basins* (Basin Plan), which designates beneficial uses, establishes water quality objectives and contains implementation plans and policies for waters of the Sacramento and San Joaquin Basins. The requirements in the Order implement the Basin Plan.
13. The beneficial uses of Mud Slough (north), as identified in the Basin Plan, are: limited irrigation supply, stock watering, water contact recreation and noncontact water recreation, sports fishing, shellfish harvesting, warm water aquatic habitat, warm water spawning and wildlife habitat.
14. The Basin Plan contains the timetable for meeting performance goals and water quality objectives for selenium in Mud Slough (north) and the San Joaquin River. A prohibition of discharge and waste discharge requirements will be used to control agricultural subsurface drainage discharges containing selenium unless water quality objectives for selenium are being met. Table 1 below lists the performance goal and water quality objective for selenium with the time schedule for compliance.

Table 1. Selenium Water Quality Objective, Performance Goal, and Compliance Time Schedule as specified in the Basin Plan

Time Schedule for Compliance	Water Body	Performance Goal (monthly mean)	Water Quality Objective (4-day average)
31 December 2015 through 31 December 2019	Mud Slough (north) and the San Joaquin River from the Mud Slough Confluence to the Merced River	15 µg/L	Not Applicable
After 31 December 2019		Not Applicable	5 µg/L

15. The performance goal for selenium of 15 micrograms per liter (μg/L) (monthly mean) has been consistently met since the established compliance date of 31 December 2015. Since 2015, the 5 μg/L (4-day average) water quality objective has been met nearly 90% of the time.

16. The first cap on selenium loading from the Grassland Watershed to the San Joaquin River was set before the initiation of the Grassland Bypass Project as a prohibition of discharge in the Basin Plan: "The discharge of selenium from agricultural subsurface drainage systems in the Grassland Watershed to the San Joaquin River is prohibited in amounts exceeding 8,000 lbs/year for all water year types beginning 10 January 1997." During the first three phases of the Grassland Bypass Project, the San Luis Drain carried all of the subsurface agricultural drainage discharged from the Grassland Drainage Area, except for three storm events when the capacity of the San Luis Drain was exceeded.

17. The Central Valley Water Board has identified the San Joaquin River as a water quality limited segment with respect to selenium. Section 303(d) of the Federal Clean Water Act requires the development of a Total Maximum Daily Load (TMDL) where existing discharge limits are not stringent enough to meet water quality standards. The August 2001 Staff Report titled *Selenium Total Maximum Daily Load for the Lower San Joaquin River* contains a TMDL designed to meet the Clean Water Act requirements and set more stringent load limits for selenium compared to the 8,000-pound annual limit. The TMDL establishes monthly load limits (TMML values) that represent the total load that the San Joaquin River can assimilate without exceeding the applicable water quality objective at a specified frequency.

    The U.S. Environmental Protection Agency (US EPA) allows violations of standards at a frequency no greater than once every three years. The TMML is apportioned among background sources of selenium (wetlands, the Merced River, and the San Joaquin River upstream of Salt Slough), a margin of safety (established as 10% of the TMML), and a load allocation (discharges from the Grassland Drainage Area), and is designed to meet the 5 µg/L selenium objective in the San Joaquin River at Crows Landing. The TMML has been met in every year since it was established reflecting a continual reduction in the selenium loading through the Grassland Bypass Project (see Figure 6 in Attachment A to this Order).

    The applicable monthly load allocation is based on the water year classification established using the best available estimate of the 60-20-20 San Joaquin Valley water year hydrologic classification[2] at the 75% exceedance level using data from the Department of Water Resources Bulletin 120 series. The previous year's classification will apply until an estimate is made of the current water year.

    The Agreements for Use of the San Luis Drain (Use Agreements) between the Bureau and Authority associated with Phases I, II, and III of the Grassland Bypass Project contained calculated selenium load limits for the Grassland Bypass Project. These load limits were initially designed to meet the Total Maximum Monthly Load (TMML) limits. Once TMML load limits were met, the Use Agreements required further reductions in order to eliminate irrigation induced subsurface agricultural discharges to the San

[2] As defined in Footnote 17 for Table 3 in the State Water Resources Control Board's Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, May 1995.

Joaquin River. The load limit reductions below TMML levels started in 2015 as agreed to by the Dischargers under the terms of the 2009 Use Agreement, which extended the project through 31 December 2019. The reductions between historical load limits and the TMML load limits resulted in a gradual reduction in loading. All discharges from the area to the San Joaquin River are now managed by the Dischargers in a way that has eliminated discharges except for those related to storm events.

18. The Long-Term Storm Water Management Plan includes selenium load targets for discharges to Mud Slough (north) and the San Joaquin River. Table 2 shows the TMML annual load allocations (sums of the monthly load allocations) for selenium from the Grassland Drainage Area currently required and the proposed selenium load targets. The targets represent an approximately 75% reduction in selenium loading from the TMML annual load allocations. A multi-year performance target requiring that the selenium load over a 3-year period at Site B be less than the sum of the 3 annual targets, based on water year type, would be used to determine if the load targets are being met. If the performance target is exceeded, the Dischargers will propose additional management practices to reduce the selenium loading to meet the performance goal. The selenium water quality objective will continue to be used to determine compliance with the Basin Plan.

Table 2. Selenium Annual Load Allocations for the Grassland Drainage Area[3]
(pounds of selenium)

Selenium Load	Critical (Discharge Limit)	Dry/Below Normal (Discharge Limit)	Above Normal (Discharge Limit)	Wet (Discharge Limit)
Annual Load Allocation	1075	2496	4162	4480
Annual Load Target	300	600	900	1200
Percent Reduction	72%	76%	78%	73%

19. Sediment deposited in the Drain may contain trace elements at concentrations that are higher than those found in average California soils and, if flushed from the Drain, would pose a threat to receiving waters. The discharge limits apply to selenium from the sediment as well as selenium in drainage water from the Grassland Drainage Area.

20. The Basin Plan also contains numerical objectives for boron and molybdenum that apply to the San Joaquin River from the mouth of the Merced River to Vernalis and to Mud Slough (north) as shown in Table 3.

[3] The TMML annual load allocations in Table 2 are based on the sum of the monthly load allocation based on the water year calculation needed to meet the selenium water quality objectives at the San Joaquin River at Crows Landing.

Table 3. Boron and Molybdenum Water Quality Objectives

Constituent	Time Periods	Monthly Means	Max Concentration	Applicable Water Bodies
Boron (mg/L)	15 March through 15 September	0.8	2.0	San Joaquin River, mouth of the Merced River to Vernalis
	16 September through 14 March	1.0	2.6	
	Critical Year	1.3	Not Applicable	
	15 March through 15 September	2.0	Not Applicable	Mud Slough (north), San Joaquin River from Sack Dam to the mouth of Merced River
	Year Round	Not Applicable	5.8	
Molybdenum (µg/L)	Year Round	19	50	Mud Slough (north), San Joaquin River from Sack Dam to the mouth of Merced River
	Year Round	10	15	San Joaquin River, mouth of the Merced River to Vernalis

21. Subsurface agricultural drainage from the Grassland Drainage Area is high in boron and molybdenum and discharges from the Drain have resulted in violations of these objectives. This drainage has historically flowed to Mud Slough (north) via other channels and the steps taken to meet the load limits for selenium discharges also resulted in reductions in boron and molybdenum discharges.

22. The Basin Plan contains objectives for toxicity and other water quality parameters that apply to this discharge.

23. The primary focus of the Grassland Bypass Project has been on the control of selenium, but discharges may be causing or have the potential to cause or contribute to the violations of water quality objectives for other constituents in Mud Slough (north) and the San Joaquin River. Since the Grassland Bypass Project involves consolidation and rerouting of drainage rather than a new discharge, this Order requires the development and implementation of a new Drainage Management Plan that will address constituent loads.

24. The Basin Plan's selenium control program states that all those discharging or contributing to the generation of agricultural subsurface drainage will be required to submit for approval a Long-Term Drainage Management Plan (LTDMP) designed to meet final water quality objectives. Order No. 98-171 required the Dischargers to prepare a LTDMP and to update it annually. This Order requires the Dischargers to prepare a new Drainage Management Plan to reflect the revised management strategy that will be implemented to address discharges occurring after 31 December 2019 that include selenium, boron, molybdenum, and salt, and to provide updates in the Annual Monitoring Report.

REASON FOR THE CENTRAL VALLEY WATER BOARD ISSUING THIS ORDER

25. The Central Valley Water Board's authority to regulate waste discharges that could affect the quality of the waters of the state, which includes both surface water and groundwater, is found in the Porter-Cologne Water Quality Control Act (California Water Code Division 7).

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

> [T]he 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.

27. The technical reports required by this Order are necessary to evaluate Dischargers' compliance with the terms and conditions of this Order and to ensure protection of waters of the state. Consistent with Water Code section 13267, this Order requires the implementation of a monitoring and reporting program (MRP) that is intended to determine the effects of waste discharges on water quality, to verify the adequacy and effectiveness of the Order's conditions, and to evaluate the Dischargers' compliance with the terms and conditions of the Order. The Dischargers must comply with MRP Order R5-2019-0077 which is part of this Order, and future revisions thereto made by the Executive Officer or Board.

28. In May 2004, the State Water Board adopted the *Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program* (NPS Policy). The purpose of the NPS Policy is to improve the state's ability to effectively manage NPS pollution and conform to the requirements of the Federal Clean Water Act and the Federal Coastal Zone Act Reauthorization Amendments of 1990. The NPS Policy requires, among other key elements, an NPS control implementation program's ultimate purpose to be explicitly stated. It also requires implementation programs, to at a minimum, address NPS pollution in a manner that achieves and maintains water quality objectives and beneficial uses, including any applicable antidegradation requirements.

29. This Order constitutes an NPS Implementation Program for the discharges regulated by the Order. Attachment A, Information Sheet, describes the five key elements required by the NPS Policy and provides justification that the requirements of this Order meet the requirements of the NPS Policy. This Order is consistent with the NPS Policy.

30. The United States Environmental Protection Agency adopted the National Toxics Rule (NTR) on 5 February 1993 and the California Toxics Rule (CTR) on 18 May 2000, which was modified on 13 February 2001. The NTR and CTR contain water quality criteria which, when combined with beneficial use designations in the Basin Plans, constitute enforceable water quality standards for priority toxic pollutants in California surface waters.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

31. An Environmental Impact Statement and Environmental Impact Report (2009 EIS/EIR) (State Clearinghouse No. 2007121110) dated August 2009, was prepared for the Grassland Bypass Project for the period 1 October 2010 through 31 December 2019[4]. The U.S. Bureau of Reclamation is the lead agency and issued a Record of Decision.[5] The lead agency pursuant to CEQA (Pub. Resources Code § 21100 et seq.) was the San Luis & Delta-Mendota Water Authority. A Notice of Determination (NOD) was filed on 12 October 2009.[6]

32. In October 2019, an Addendum to the 2009 EIR was adopted by the San Luis & Delta-Mendota Water Authority. The modifications to the 2009 EIR include continued use of the San Luis Drain at its current capacity (150 cubic feet per second [cfs]) for stormwater related flows from irrigated lands combined with the use of existing and new short-term storage basins to reduce storm-induced discharges to Mud Slough (north). The Project modifications include measures to address the capacity limitations of the Grassland Bypass Channel and San Luis Drain, storm event frequency and magnitude, and available stormwater management tools to minimize discharges. It also considers some enhancements to existing facilities including acquiring additional land and/or securing ownership of leased land for purposes of drain water reuse on salt tolerant crops under the San Joaquin River Water Quality Improvement Project, new pump/conveyance systems, additional regulating reservoirs, and a remote shut-off system for operation of tile sumps.

33. Selenium levels in Mud Slough (north) have reduced gradually each year since the implementation of the Grassland Bypass Project. Implementation of the Long-Term Storm Water Management Plan is expected to continue this trend, resulting in substantially reduced discharges into Mud Slough (north).

34. The environmental analysis for the Grassland Bypass Project finds that water quality and biota in the last six miles of Mud Slough (north) may be adversely impacted by the project. However, the Grassland Bypass Project has demonstrated significant water and habitat quality improvements in wetland water supply channels and the San Joaquin River, and further modifications are implemented specifically to offset the impacts of the Grassland Bypass Project to Mud Slough (north). Water quality-related mitigation measures identified in the EIS/EIR documents are listed below.

    a) The proposed project is limited in duration. A biological, water quality, and sediment monitoring program will be implemented during the life of the project to evaluate the impact of the project. If unacceptable problems or impacts are identified, appropriate actions will be developed. Attachment A to this Order

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[4] Entrix, 2009. Final Grassland Bypass Project Environmental Impact Statement/Environmental Impact Report. Prepared for the Bureau of Reclamation, Sacramento and Fresno, CA, and the San Luis Delta-Mendota Water Authority. August 2009.

[5] ROD-07-141 dated18 December 2009. The ROD implements the GBP plus the terms and conditions specified in the 9 December 2009 Biological Opinion (available from Bureau upon request).

[6] NOD filed for the Grassland Bypass Project, 2010-2019, State Clearinghouse Number 2007121110.

summarizes the mitigation measures and demonstrates how this Order complies with CEQA.

b) Drainage from the Grassland Drainage Area has been removed from 6.6 miles of the San Joaquin River [between Salt Slough and Mud Slough (north) confluence] and 93 miles of wetland water supply channels as defined in Appendix 40 of the Basin Plan.

c) The amount of drainage water discharged to the San Joaquin River system will be reduced to meet Basin Plan water quality objectives. A plan will be submitted by the drainage entities to the Central Valley Water Board, which outlines drainage reduction efforts and the use of the Drain as a drain water conveyance facility as part of the overall program to effectively manage and monitor agricultural drainage discharges. These plans will be submitted on an annual basis.

d) Drainage will be maintained within the Drain north of Check 19, MP 105.72. Any stormwater and groundwater that has seeped into the San Luis Drain south of Check 19 will be discharged downstream as necessary to prevent overtopping.

e) The discharge from the Drain to Mud Slough (north) will be operated so as to minimize hydraulic turbulence and erosion within Mud Slough (north). If necessary, bank stabilization shall be undertaken and an energy dissipation structure operated and maintained.

f) The Drain will be operated such that sediments in the Drain are not mobilized. A flow rate not to exceed 150 cfs has been determined to be the appropriate velocity to achieve this goal. Sediments in the drain will be monitored and will be removed before they exceed hazardous waste levels.

g) The San Joaquin River Water Quality Improvement Project, created by the Grassland Area Farmers, sets aside more than 6,000 acres to plant salt tolerant crops for drainage reuse, with plans to expand the project to more than 7,000 acres. In 2018, approximately 29,000 acre-feet of drain water produced in the Grassland Drainage Area were used to irrigate salt-tolerant crops.

h) Since 2003, the Grassland Area Farmers have worked with the Bureau to implement the Westside Regional Drainage Plan. The plan involves the implementation of source control through seepage reduction and irrigation improvements, drainage reuse, and recirculation.

In addition to these mitigation measures, the Addendum to the 2009 EIS/EIR discusses changes to the Grassland Bypass Project including the addition of a remote shut-off system for tile sumps, use of new and existing short-term storage basins and pump stations, and reuse area expansion. These additional activities will help ensure that applicable water quality objectives are met. The Central Valley Water Board as the responsible agency pursuant to CEQA (Public Resources Code, section 21069) and in making its determinations and findings, must presume that the Addendum to the 2009 EIR/EIS comports with the requirements of CEQA and is valid. (Public Resources Code, section 21167.3.) The Central Valley Water Board has considered the above CEQA documents in preparing this Order. Attachment A of this Order summarizes the mitigation measures and demonstrates how this Order complies with CEQA.

The addended CEQA documents assess project activities that will be implemented through 31 December 2045. In the event the Grassland Bypass Project is extended, the

Board may reissue this Order or prescribe new Waste Discharge Requirements only upon a showing that all significant environmental impacts associated with the continued operation of the GBP have been analyzed pursuant to any applicable provisions of CEQA and only after the Dischargers demonstrate to the satisfaction of the Board that the continued operation of the GBP is in compliance with the Endangered Species Act[7].

STATE WATER RESOURCES CONTROL BOARD RESOLUTION 68-16

35. State Water Resources Control Board (State Water Board) Resolution 68-16 *Statement of Policy with Respect to Maintaining High Quality of Waters in California* (Resolution 68-16 or "antidegradation policy") requires that a regional water quality control board maintain high quality waters of the state unless the board determines that any authorized degradation is consistent with maximum benefit to the people of the state, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in a regional water quality control board's policies (e.g., quality that exceeds applicable water quality objectives). The board must also assure that any authorized degradation of existing high quality waters is subject to waste discharge requirements which will result in the best practicable treatment or control (BPTC) of the discharge necessary to assure that pollution, or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the state will be maintained.

    Attachment A to this Order summarizes applicable antidegradation requirements and provides detailed rationale demonstrating how this Order is consistent with Resolution 68-16. As indicated in the summary, this Order authorizes degradation of high quality surface waters, not to exceed water quality performance goals and objectives stated in the Basin Plan, threaten beneficial uses, or cause a condition of pollution or nuisance. The Order will also result in the implementation of best efforts to non-high quality waters and assure that any change in water quality will be consistent with maximum benefit to the people of the state.

WATER CODE SECTION 13241

36. Water Code section 13263 requires that the Central Valley Water Board consider the following factors, found in section 13241, when considering adoption of waste discharge requirements.

    a) Past, present, and probable future beneficial uses of water.

    b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto.

    c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area.

    d) Economic considerations.

    e) The need for developing housing within the region.

    f) The need to develop and use recycled water.

    These factors have been considered in the development of this Order. Attachment A, Information Sheet, provides further discussion on the consideration of section 13241

[7] The board will determine the Dischargers' compliance by consulting with the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife.

factors.

RELATIONSHIP TO OTHER ONGOING WATER QUALITY EFFORTS

37. Other water quality efforts conducted pursuant to state and federal law directly or indirectly serve to reduce waste discharges from irrigated lands to waters of the state. Those efforts will continue, and will be supported by implementation of this Order.

38. On 31 May 2018, the Central Valley Water Board adopted amendments to the Basin Plan to implement the Salt and Nitrate Management Plan that was developed through the collaborative, stakeholder process known as the Central Valley Salinity Alternatives for Long-term Sustainability initiative (CV-SALTS). The amendments include, in part, implementation provisions for the discharges of salt and nitrate, collectively referred to as the Salt and Nitrate Control Program. The amendments have been revised and adopted by the State Water Board and must be approved by the Office of Administrative Law prior to becoming effective. The Dischargers must comply with applicable provisions of the Salt and Nitrate Control Program upon such provisions becoming effective. Dischargers who do not comply with the requirements of the Salt and Nitrate Control Program will be subject to a prohibition of discharge and associated enforcement actions as stated in the amendments.

39. Total Maximum Daily Loads (TMDLs) are established for surface waters that have been placed on the State Water Board's 303(d) list of Water Quality Limited Segments for failure to meet applicable water quality standards. A TMDL, which may be adopted by the Central Valley Water Board as Basin Plan amendments, is the sum of allowable loads of a single pollutant from all contributing point sources and nonpoint sources. This Order implements all TMDLs containing requirements that pertain to irrigated agriculture in the Grassland Drainage Area.

40. Resolution R5-2017-0057 Amendment to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Pyrethroid Pesticide Discharges (Pyrethroid Control Program) requires monitoring by agricultural dischargers for the water column concentrations of pyrethroid pesticides and total and dissolved organic carbon, and water column and sediment toxicity testing in surface receiving waters.

41. The General Order for Existing Milk Cow Dairies (R5-2013-0122) and NPDES Dairy General Permit CAG015001 (Dairy General Orders) regulates discharges of waste to surface waters and groundwater from existing milk cow dairies in the Central Valley. Discharges from irrigated agricultural parcels are regulated by the Dairy General Orders if the owner or operator of the parcel applies dairy waste from its dairy operation.

42. Water quality monitoring is conducted in water bodies surrounding the Grassland Bypass Project by the Westside San Joaquin River Watershed Coalition of the Irrigated Lands Regulatory Program and the San Joaquin River Restoration Program. This monitoring was considered when designing the updated monitoring and reporting program and data developed through these efforts will be used to help evaluate the impacts of the GBP. The San Joaquin River below the Merced River and Salt Slough has been de-listed for selenium on the 303(d) list.

43. Waste Discharge Requirements General Order for Growers in the Grassland Drainage Area (Order R5-2015-0095, as amended) regulates discharges to groundwater from farming in the Grassland Drainage Area, including the San Joaquin River Water Quality Improvement Project, and requires implementation and reporting of management practices and reporting of nitrogen application.

ENFORCEMENT FOR NONCOMPLIANCE WITH THIS ORDER

44. Water Code section 13350 provides that any person who violates waste discharge requirements may be: 1) subject to administrative civil liability imposed by the Central Valley Water Board or State Water Board in an amount of up to $5,000 per day of violation, or $10 per gallon if the discharge involves a discharge of pollutants; or 2) be subject to civil liability imposed by a court in an amount of up to $15,000 per day of violation, or $20 per gallon. The actual calculation and determination of administrative civil penalties must be set forth in a manner that is consistent with the State Water Board's Water Quality Enforcement Policy (Enforcement Policy).

45. The Enforcement Policy endorses progressive enforcement action for violations of waste discharge requirements when appropriate, but recommends formal enforcement as a first response to more significant violations. Progressive enforcement is an escalating series of actions that allows for the efficient and effective use of enforcement resources to: 1) assist cooperative dischargers in achieving compliance; 2) compel compliance for repeat violations and recalcitrant violators; and 3) provide a disincentive for noncompliance. Progressive enforcement actions may begin with informal enforcement actions such as a verbal, written, or electronic communication between the Central Valley Water Board and a discharger. The purpose of an informal enforcement action is to quickly bring the violation to the discharger's attention and to give the discharger an opportunity to return to compliance as soon as possible. The highest level of informal enforcement is a Notice of Violation.

GENERAL FINDINGS

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

47. This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. sections 1531 to 1544). If a "take" will result from any action authorized under this Order, the Dischargers shall obtain authorization for an incidental take prior to construction or operation of the project. The Dischargers shall be responsible for meeting all requirements of the applicable Endangered Species Act.

48. This Order does not supersede the Central Valley Water Board's Basin Plans and policies, including prohibitions (e.g., pesticides) and implementation plans (e.g., Total Maximum Daily Loads), or the State Water Board's plans and policies.

49. As stated in Water Code section 13263(g), the discharge of waste into waters of the state is a privilege, not a right, and regulatory coverage under this Order does not create a vested right to continue the discharge of waste. Failure to prevent conditions that create or threaten to create pollution or nuisance will be sufficient reason to modify, revoke, or enforce this Order, as well as prohibit further discharge.

50. This Order requires the Dischargers to provide the Central Valley Water Board with contact information of the person(s) authorized to provide access to property for inspections. This requirement provides a procedure to enable Board staff to contact representatives so that it may more efficiently monitor compliance with the provisions of this Order.

51. Any instance of noncompliance with this Order constitutes a violation of the Water Code and its implementing regulations. Such noncompliance is grounds for enforcement

action, and/or termination of coverage for waste discharges under this Order, subjecting the discharger to enforcement under the Water Code for further discharges of waste to surface water.

52. All discharges from the Grasslands Bypass Project are expected to comply with the lawful requirements of municipalities, counties, drainage districts, and other local agencies regarding discharges to storm drain systems or to other courses under their jurisdiction.

53. The fact that it would have been necessary to halt or reduce the discharge in order to maintain compliance with this Order shall not be a defense for violations of the Order by the Dischargers.

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

55. Water Code section 13260(d)(1)(A) requires persons subject to waste discharge requirements to pay an annual fee established by the State Water Board.

56. The Findings of this Order, supplemental information and details in the attached Information Sheet (Attachment A), and the administrative record of the Central Valley Water Board relevant to the Grassland Bypass Project were considered in establishing these waste discharge requirements.

57. The Central Valley Water Board has notified interested agencies and persons of its intent to adopt this Order for discharges of waste from the Grassland Bypass Project, and has provided them with an opportunity for a public hearing and an opportunity to submit comments.

58. The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to this Order.

IT IS HEREBY ORDERED that Order No. 5-01-234 is rescinded and that pursuant to Water Code sections 13260, 13263, and 13267 and in order to meet the provisions contained in Division 7 of the Water Code and regulations and policies adopted there under; the San Luis and Delta-Mendota Water Authority and the U.S. Bureau of Reclamation, their agents, successors, and assigns shall comply with the following:

I. Prohibitions

1. The discharge of hazardous wastes, as that term is defined in California Code of Regulations, title 22, section 66261.1 et seq. is prohibited.
2. The discharge of agricultural subsurface drainage water to Salt Slough and the wetland water supply channels identified in Appendix 40 of the Basin Plan is prohibited unless the provisions of the Storm Event Plan are being implemented, or the water quality objectives for selenium are being met.
3. The discharge of agricultural subsurface drainage water to Mud Slough (north) is prohibited after 31 December 2019 unless water quality objectives for selenium are being met.
4. The discharge of agricultural subsurface drainage is immediately prohibited upon determination by the Board that timely and adequate mitigation has not been provided.

II. Limits that apply to the Grassland Bypass Project

A. Discharge Limits (Drain Terminus)

1. The rate of discharge at the terminus of the San Luis Drain shall not exceed 150 cfs.
2. The discharge of selenium from the San Luis Drain shall not exceed the annual TMML loads in Table 2.

B. Discharge Specifications

1. The discharge shall not cause a pollution or nuisance as defined by Water Code section 13050.
2. The San Luis Drain will be operated to prevent the mobilization of drain sediments. A maximum flow rate of 150 cfs will be used to prevent scouring and mobilization of drain sediments.
3. The San Luis Drain will be operated to minimize erosion in Mud Slough (north). An energy dissipating structure will be operated and maintained at the discharge point to Mud Sough (north) to dissipate the energy caused by the hydraulic drop. Erosion within the stream, including stream bottom and sides will be prevented and bank stabilization will be undertaken, if necessary.
4. Sediment in the San Luis Drain shall not exceed hazardous waste levels for any constituent.

C. Receiving Water Limitations

1. The discharge from the San Luis Drain shall not cause or contribute to the following in Mud Slough (north) or the San Joaquin River.
   a) In surface water, an exceedance of applicable water quality objectives or a trend of degradation that may threaten applicable beneficial uses, or cause or contribute to a condition of pollution or nuisance.
   b) Oils, greases, waxes, or other materials to form a visible film or coating on the water surface or objects in the water.
   c) Oils, greases, waxes, floating material (liquids, solids, foams, and scums), or suspended materials to create a nuisance or adversely affect beneficial uses.
   d) Aesthetically undesirable discoloration.
   e) Fungi, slimes, or other objectionable growths.
   f) Deposition of material that causes nuisance or adversely affects beneficial uses.
   g) Toxic pollutants to be present in the water column, sediments or biota in concentrations that adversely affect beneficial uses; that produce detrimental physiological response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.
   h) Chemical constituents, including pesticides, to be present in concentrations that cause nuisance or adversely affect beneficial uses.
2. If the discharge of wastes does not meet the receiving water limitations in II.C.1 (directly above), the Dischargers are in compliance with this Order relative to section II.C.1. for a specific waste parameter provided:

a) The Dischargers are preparing, or have submitted a Surface Water Quality Management Plan for that waste parameter in accordance with Section V.G. of this Order, and such plan is pending action by the Executive Officer or board; or

b) The Executive Officer or board has approved the applicable Surface Water Quality Management Plan for that waste parameter, and

   i. The Dischargers are implementing or have a documented schedule to implement improved management practices consistent with the approved plan to achieve compliance with II.C.1. and

   ii. The Dischargers are in compliance with the approved management plan's Time Schedules for Compliance.

III. Provisions

A. General Specifications

1. The Dischargers subject to this Order shall implement water quality management practices as necessary, to protect water quality and to achieve compliance with applicable water quality objectives.
2. The provisions of this Order are severable. If any provision of the Order is held invalid, the remainder of the Order shall not be affected.

B. Requirements

1. The Dischargers shall comply with all applicable provisions of the California Water Code, the Water Quality Control Plan for the Sacramento and San Joaquin River Basins, and applicable State Water Board plans and policies.
2. The Dischargers shall comply with the attached Monitoring and Reporting Program (MRP) R5-2019-0077, and any future revisions thereto made by the board or Executive Officer.
3. The Dischargers shall follow the 1997 Grassland Bypass Project Storm Event Plan and any amendments thereto approved by the Executive Officer.
4. The Dischargers shall continue to implement the selenium load reduction strategy developed and implemented in the prior phases of the project.
5. The requirements prescribed in this Order do not authorize the commission of any act causing injury to the property of another, or protect the Dischargers from liabilities under other federal, state, county, or local laws. This Order does not convey any property rights or exclusive privileges.
6. This Order shall not create a vested right, and all such discharges of waste shall be considered a privilege, as provided for in Water Code section 13263.
7. The Dischargers understand that the Central Valley Water Board or its authorized representatives, may, at reasonable hours, inspect the facilities and lands of persons subject to this Order to ascertain whether the purposes of the Porter-Cologne Act are being met and whether the Dischargers are complying with the conditions of this Order. To the extent required by Water Code section 13267(c) or other applicable law, the inspection shall be made with the consent of the Dischargers or authorized representative, or if consent is withheld, with a duly issued warrant pursuant to the procedure set forth in Title 13 Code of Civil Procedure Part 3 (commencing with section 1822.50). In the event of an emergency affecting the public health and

safety, an inspection may be performed without the consent or the issuance of a warrant.

8. The Dischargers shall properly operate and maintain in good working order any facility, unit, system, or monitoring device installed to achieve compliance with the Order.
9. The Dischargers shall maintain a copy of this Order at the primary place of business so as to be available at all times to operations personnel. The Dischargers shall be familiar with the content of this Order.
10. Central Valley Water Board staff will hold an annual meeting during the same time each year with the Dischargers, responsible agencies, and other interested parties, to review and discuss the results of the surface water monitoring and management strategy implemented by the Dischargers. If the monitoring results raise any concerns, board staff will hold a follow-up meeting with the interested parties to discuss the effectiveness of the management strategy and mitigation measures and any proposed changes. Should constituent concentrations increase, or water quality objectives be exceeded, board staff will work with the Dischargers to determine if a revised approach is needed to reduce constituent discharges.

IV. Permit Reopening, Revision, Transfer, Revocation, Termination, and Reissuance

1. This Order may be reopened to address any changes in state statutes, regulations, plans, or policies that would affect the water quality requirements for the discharges, including, but not limited to, the Basin Plan.
2. This Order may be reopened, or the Executive Officer may revise Attachment B to this Order (Monitoring and Reporting Program), to address scientific evidence that supports the need for revisions to, additional, or new requirements for the Dischargers to ensure that water quality standards are being met. New requirements may include, but are not limited to, additional monitoring requirements if the biological monitoring required under the Biological Opinion is not completed or found to be inadequate to protect beneficial uses.
3. The filing of a request for modification, revocation and re-issuance, or termination of the Order, or notification of planned changes or anticipated noncompliance, does not stay any condition of the Order.
4. The Dischargers, shall provide to the Executive Officer any information which the Executive Officer may request to determine whether cause exists for modifying, revoking and re-issuing, or terminating the Order, or to determine compliance with the requirements of this Order.
5. The Central Valley Water Board will review this Order periodically and may revise this Order when necessary. No later than 31 December 2021, and every five years thereafter, Central Valley Water Board staff will present to the board an update on the Grassland Bypass Project, project compliance with Order requirements, and any additional information needed to determine whether the Order should be revised.
6. In the event of any change in control or ownership of the Grassland Bypass Project, the Dischargers must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Central Valley Water Board.

7. To assume operation as Dischargers under this Order, the succeeding owners or operators must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Central Valley Water Board, and a statement. The statement shall comply with the signatory paragraph in section VI.3 of this Order and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the Water Code. The Executive Officer will submit transfer requests to the Central Valley Water Board so that the Board may consider transferring the ownership of this Order at one of its regularly scheduled meetings.
8. This Order does not authorize discharges to the San Luis Drain beyond 2045. Discharges to the San Luis Drain beyond 31 December 2045 shall only be authorized upon a showing that any significant environmental impacts associated with the continued operation of the GBP have been analyzed pursuant to any applicable provisions of CEQA and only after the Dischargers demonstrate to the satisfaction of the Board that the continued operation of the GBP is in compliance with the Endangered Species Act[8].

V. Required Reports and Notices

Reports and notices shall be submitted in accordance with section VI, Reporting Provisions, as well as MRP Order R5-2019-0077. The Dischargers must prepare and maintain the following reports as instructed below and shall submit or make available such reports to the Central Valley Water Board as identified below.

A. Semi-annual Submittals of Surface Water Monitoring Results

The Dischargers shall submit the previous six months surface water monitoring results in accordance with the requirements in section III of the MRP.

B. Annual Monitoring Report

The Dischargers shall submit the Annual Monitoring Report to the Central Valley Water Board in accordance with the requirements in section III of the MRP.

C. Drainage Management Plan

The Dischargers shall submit the Drainage Management Plan to the Central Valley Water Board in accordance with the requirements in section III of the MRP. The current Long Term Drainage Management Plan, initially required under Order No. 98-171, identifies critical milestones for the Grassland Bypass Project through 1 October 2010. Development of the Long Term Drainage Management Plan was followed by Resolution No. R5-2010-0046 Amending the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Selenium in the Lower San Joaquin River Basin, which extended the timeline for compliance with the selenium water quality objective in Mud Slough (north) and the San Joaquin River from the Mud Slough Confluence to the Merced River until 31 December 2019. The Long Term Drainage Management Plan, and updates made to it, shall continue to apply until the new

[8] The board will determine the Dischargers' compliance by consulting with the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife.

Drainage Management Plan is approved by the Executive Officer.

D. Technical Reports

Where monitoring required by this Order is not effective in allowing the board to determine the effects of discharge on state waters or the effectiveness of water quality management practices being implemented, the Executive Officer may require technical reports be provided to determine the effects of operations or implemented management practices on surface water.

E. Total Maximum Daily Load (TMDL) Requirements

Approved TMDLs in the Basin Plan that apply to surface water bodies downstream of the San Luis Drain discharge and have allocations for irrigated agriculture shall be implemented in accordance with the applicable Basin Plan provisions. Where applicable, SQMPs shall be developed or the Drainage Management Plan shall be updated to address TMDL requirements.

TMDL requirements include, but are not limited to, Basin Plan provisions for the Control Program for Salt and Boron Discharges into the Lower San Joaquin River. To meet the requirements of the Control Program for Salt and Boron Discharges into the Lower San Joaquin River, the Discharger must, by the applicable compliance date 1) participate in a Central Valley Water Board approved real-time management program[9]; or 2) submit a surface water quality management plan that includes the required elements identified in the Monitoring and Reporting Program, Appendix MRP-1 and is designed to meet the Base Salt Load Allocations identified in Table 4-8 *Summary of Allocations and Credits*[10] within the applicable compliance schedule for compliance in Table 4-7.[11]

F. Exceedance Report

The Dischargers shall provide exceedance reports if limits identified in section II are not met. Exceedance reports shall be submitted in accordance with the requirements described in section III.C of the MRP.

G. Surface Water Quality Management Plan

A Surface Water Quality Management Plan (SQMP) shall be developed by the Dischargers where: (1) an applicable water quality objective or applicable water quality trigger limit is exceeded (considering applicable averaging periods[12]) twice in a three year period for the same constituent at a monitoring location (trigger limits are described in section IV of the MRP) and discharge from the Grassland Bypass Project may cause

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9 Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, page 4-63.

10 Ibid., page 4-67.

11 Ibid., page 4-66.

12 Exceedances of water quality objectives or water quality triggers will be determined based on available data and application of the appropriate averaging period. The averaging period is typically defined in the Basin Plan, as part of the water quality standard established by the USEPA, or as part of the criteria being used to interpret narrative objectives. If averaging periods are not defined in the Basin Plan, USEPA standard, or criteria, or approved water quality trigger, the Central Valley Water Board will use the best available information to determine an appropriate averaging period.

or contribute to the exceedances; (2) the Basin Plan requires development of a surface water quality management plan for a constituent or constituents discharged by irrigated agriculture, or (3) the Executive Officer determines that the Grassland Bypass Project may be causing or contributing to a trend of degradation of surface water that may threaten applicable Basin Plan beneficial uses. A SQMP is not required if the constituent of concern is addressed by the Drainage Management Plan, unless the Executive Officer determines that additional requirements applicable under a SQMP are necessary to achieve compliance with the applicable water quality objective or trigger limit.

A SQMP submitted by the Dischargers shall conform to the requirements provided in MRP, Appendix MRP-1.

The Dischargers shall ensure continued implementation of SQMPs until approved as completed by the Executive Officer pursuant to the provisions contained in the attached MRP, Appendix MRP-1, section III. The Dischargers shall submit a progress report in compliance with the provisions contained in the attached MRP, Appendix MRP-1, section I.F.

VI. Reporting Provisions

1. The Dischargers must submit required reports and notices in accordance with the requirements in this Order and attached Monitoring and Reporting Program Order R5-2019-0077, unless otherwise requested by the Executive Officer.
2. All reports shall be accompanied by a cover letter containing the certification specified in section VI.3. below. The cover letter shall be signed by a person duly authorized under California law to bind the party submitting the report.
3. Each person signing a report required by this Order or other information requested by the Central Valley Water Board shall make the following certification:

   > "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 knowingly submitting false information, including the possibility of fine and imprisonment for violations."

4. All reports prepared and submitted to the Executive Officer in accordance with the terms of this Order will be made available for public inspection at the offices of the Central Valley Water Board, except for reports, or portions of such reports, subject to an exemption from public disclosure in accordance with California law and regulations, including the Public Records Act, Water Code section 13267(b)(2), and the California Food and Agriculture Code. If the Dischargers assert that all or a portion of a report is subject to an exemption from public disclosure, it must clearly indicate on the cover of the report that it asserts that all or a portion of the report is exempt from public disclosure. The complete report must be submitted with those portions that are asserted to be exempt in redacted form, along with separately-bound unredacted pages (to be maintained separately by staff). The Dischargers shall identify the basis for the exemption. If the Executive Officer cannot identify a reasonable basis for treating the

information as exempt from disclosure, the Executive Officer will notify the Dischargers that the information will be placed in the public file unless the Central Valley Water Board receives, within 10 calendar days, a satisfactory explanation supporting the claimed exemption. Data on waste discharges, water quality, meteorology, geology, and hydrogeology shall not be considered confidential.

5. To the extent feasible, all reports submitted by the Dischargers shall be submitted electronically to irrlands@waterboards.ca.gov. and to the Central Valley Water Board-assigned staff liaison. Upon notification by the Central Valley Water Board, all reports shall be submitted directly into an online reporting system, to the extent feasible.

VII. Record-keeping Requirements

The Dischargers shall maintain any reports or records required by this Order for five years. The maintained reports or records, including electronic information, shall be made available to the Central Valley Water Board upon written request of the Executive Officer. This includes all monitoring information, calibration and maintenance records of sampling equipment, copies of reports required by this Order, and records of all data used to complete the reports. Records shall be maintained for a minimum of five years from the date of sample, measurement, report, or application. This five-year period shall be extended during the course of any unresolved litigation regarding the discharge or when requested in writing by the Executive Officer.

VIII. Annual Fees

1. Water Code section 13260(d)(1)(A) requires persons subject to waste discharge requirements to pay an annual fee established by the State Water Resources Control Board (State Water Board).
2. The Dischargers shall pay an annual fee to the State Water Board in compliance with the Waste Discharge Requirement fee schedule set forth at California Code of Regulations, title 23, section 2200 that is applicable to Agricultural and Irrigated Lands.

This Order becomes effective on 5 December 2019 and remains in effect unless rescinded or revised by the Central Valley Water Board.

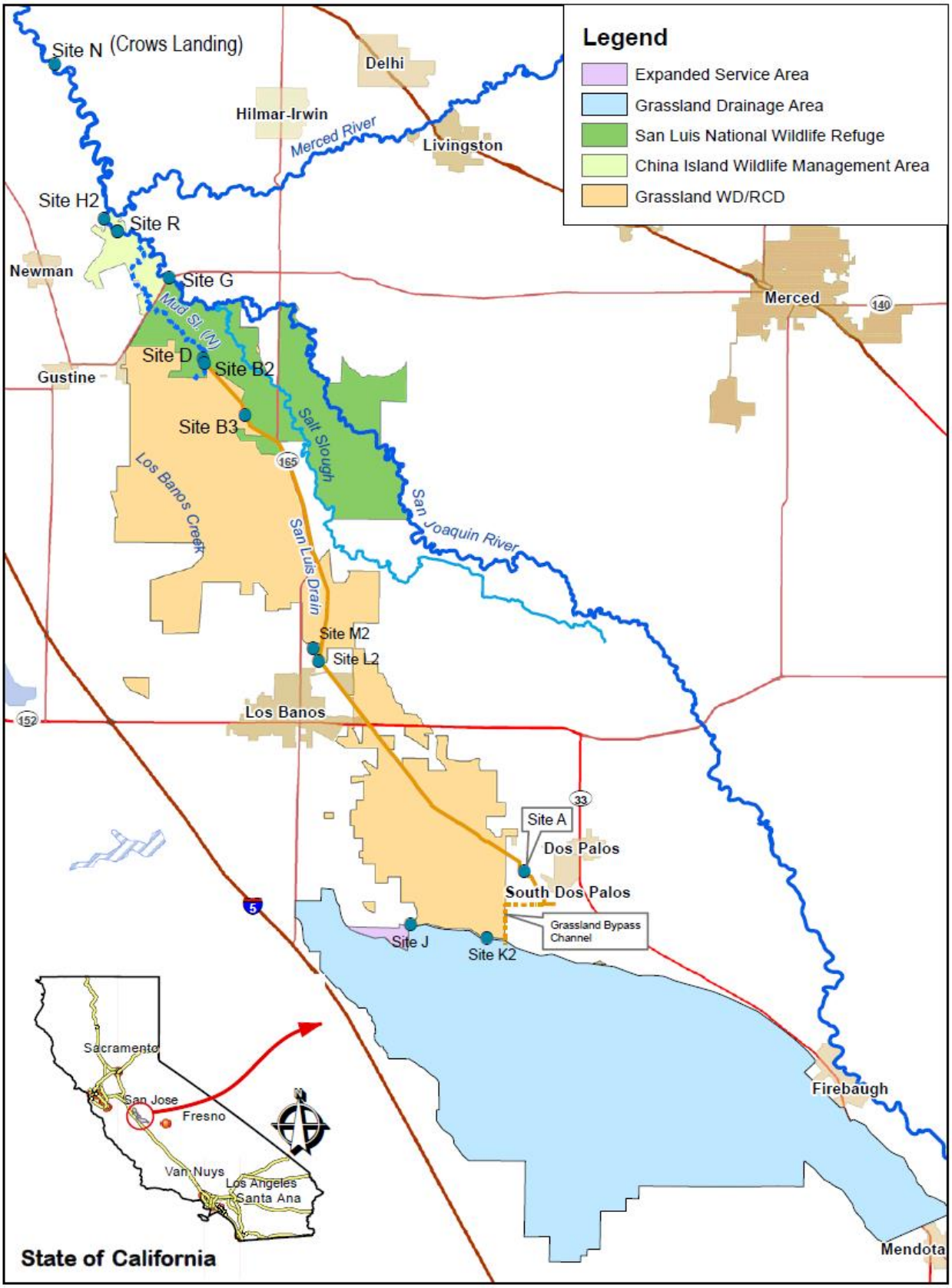
Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00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

I, PATRICK PULUPA, Executive Officer, do hereby certify the foregoing is a full and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region on 5 December 2019.

PATRICK PULUPA, Executive Officer

Figure 1:

Map of Grassland Drainage Area (comprising lands served by the Grassland Bypass Project) and Grassland Bypass Project monitoring locations. Figure provided by Summers Engineering on behalf of the Dischargers.



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ATTACHMENT A
INFORMATION SHEET

TO ORDER R5-2019-0077
WASTE DISCHARGE REQUIREMENTS
FOR

SAN LUIS & DELTA-MENDOTA WATER AUTHORITY
AND
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

Table of Contents

I. Overview

Two separate orders address discharges from the Grassland Drainage Area: one for surface water discharge to tributaries of the San Joaquin River - Waste Discharge Requirements for Surface Water Discharges from the Grassland Bypass Project, Order R5-2019-0077 (referred to as the "GBP Order"), and one for discharges to groundwater - Waste Discharge Requirements General Order for Growers in the Grassland Drainage Area, Order R5-2015-0095 (referred to as the "GDA Order"). The two orders complement each other.

This attachment is intended to provide information regarding the GBP Order. A brief discussion of the integration of the GBP Order and the GDA Order to meet required state policy is also provided. Table 1 summarizes the rationale for and key differences between the two orders.

Table 1. Key aspects of the GBP Order and GDA Order

Key Aspects	Grassland Bypass Project (GBP) Order	Grassland Drainage Area (GDA) Order
Order	Waste Discharge Requirements with discharge and receiving water limits set in the Basin Plan	General Order, Irrigated Lands Regulatory Program, with receiving water limitations based on beneficial use(s) of groundwater in the GDA
Discharge Location	To surface water (to Mud Slough via San Luis Drain)	To groundwater (area discharge to 97,400 acres in GDA)
Discharger	U.S. Bureau of Reclamation / San Luis & Delta-Mendota Water Authority	Growers in the GDA (commercial irrigated lands)
Water Quality Assessment	Water quality monitored at the point of discharge to surface water, and at receiving water compliance points	Groundwater quality trend monitoring and Management Practices Evaluation Program

The Grassland Bypass Project (GBP) has been under waste discharge requirements (WDRs) for surface water since 1998. The GBP WDRs regulate the discharge to surface water from the GDA for the duration of the GBP. In the event the GBP is extended, the GBP WDRs may also be extended if the Dischargers are able to demonstrate compliance with both the California Environmental Quality Act and the Endangered Species Act. Selenium is the main concern in the surface water discharge due to reproduction impacts on waterfowl and aquatic organisms. Selenium is a naturally occurring element in the soil and not a material added for crop production. All GBP WDRs were issued to the United States Department of the Interior Bureau of Reclamation (Bureau), owner of the San Luis Drain, and the San Luis & Delta-Mendota Water Authority (Water Authority) that represents member districts within the GDA. The GBP Order replaces Waste Discharge Requirements No. 5-01-234 (2001 Order) and is consistent with the current requirements in the *Water Quality Control Plan, Fifth Edition, for the Sacramento and San Joaquin River* (Basin Plan).

The Central Valley Regional Water Quality Control Board's (Central Valley Water Board or "board") Irrigated Lands Regulatory Program (ILRP) was initiated in 2003 as a conditional waiver of WDRs program to regulate discharges from irrigated commercial agricultural land to Central Valley surface waters. Since surface water discharges were already regulated under the GBP WDRs, the growers in the GDA were not regulated by the ILRP conditional waiver. In 2012, the Central Valley Water Board started issuing WDRs for discharges to surface water and groundwater for irrigated commercial agricultural land. Discharges to

groundwater may include water soluble residue from agricultural operations, such as nitrate or pesticides.

The GDA Order regulates discharge to groundwater by growers in the GDA under the ILRP and is similar to other ILRP general orders in structure and organization for groundwater monitoring and reporting requirements.

A. Goals and Objectives of the Irrigated Lands Regulatory Program

The goals and objectives of Central Valley Water Board regulation of irrigated commercial agricultural land are described below. Although the GBP pre-dates the ILRP, these goals and objectives still apply to agriculture within the Grassland Drainage Area. These are the goals as described in the PEIR for the ILRP.[1]

> "Understanding that irrigated agriculture in the Central Valley provides valuable food and fiber products to communities worldwide, the overall goals of the ILRP are to (1) restore and/or maintain the highest reasonable quality of state waters considering all the demands being placed on the water; (2) minimize waste discharge from irrigated agricultural lands that could degrade the quality of state waters; (3) maintain the economic viability of agriculture in California's Central Valley; and (4) ensure that irrigated agricultural discharges do not impair access by Central Valley communities and residents to safe and reliable drinking water. In accordance with these goals, the objectives of the ILRP are to:
>
> - Restore and/or maintain appropriate beneficial uses established in Central Valley Water Board water quality control plans by ensuring that all state waters meet applicable water quality objectives.
> - Encourage implementation of management practices that improve water quality in keeping with the first objective, without jeopardizing the economic viability for all sizes of irrigated agricultural operations in the Central Valley or placing an undue burden on rural communities to provide safe drinking water.
> - Provide incentives for agricultural operations to minimize waste discharge to state waters from their operations.
> - Coordinate with other Central Valley Water Board programs, such as the Grasslands Bypass Project WDRs for agricultural lands total maximum daily load development, CV-SALTS, and WDRs for dairies.
> - Promote coordination with other regulatory and non-regulatory programs associated with agricultural operations (e.g., California Department of Pesticide Regulation (DPR), the State Water Resources Control Board Division of Drinking Water Programs, the California Air Resources Board [ARB], the California Department of Food and Agriculture, Resource Conservation Districts [RCDs], the University of California Extension, the Natural Resources Conservation Service [NRCS], the USDA National Organic Program, CACs, State Water Board Groundwater Ambient Monitoring and Assessment Program, the U.S. Geological Survey, and local groundwater programs [SB 1938, Assembly Bill

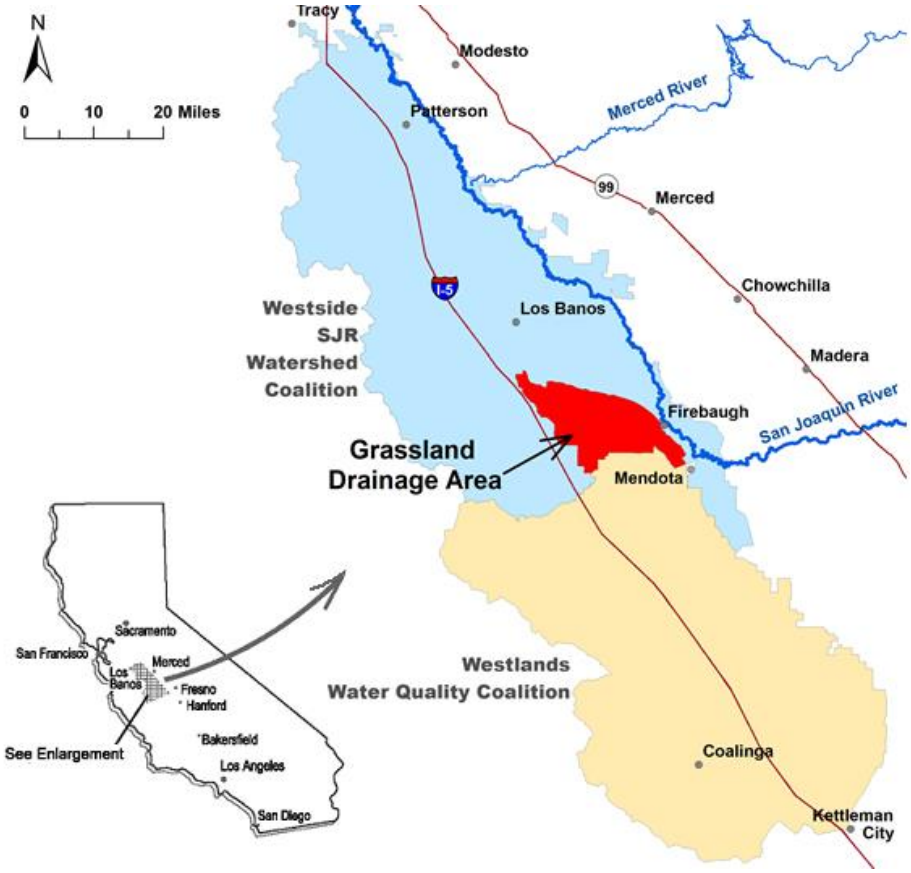
[1] PEIR, page 2-6

[AB] 3030, and Integrated Regional Water Management Plans]) to minimize duplicative regulatory oversight while ensuring program effectiveness."

II. Generalized Description of the Grassland Watershed and Grassland Drainage Area

The Grassland watershed is a valley floor sub-basin of the San Joaquin River (SJR) Basin, covering an area of approximately 370,000 acres. Major land uses in the Grassland watershed include agriculture and managed wetlands. The GDA encompasses about 97,400 acres within the Grassland watershed, roughly between Los Banos to the north and Mendota to the south (Figures 1 and 2). Permanent crops (nuts, grapes, and tree crops) make up about 12,000 acres (12%) of the total acreage in the GDA. Other crops grown in the GDA may vary from year to year due to economic factors, water availability, contractual requirements, and weather. Top crops based on acreage in 2013 were tomatoes, wheat, cotton, and alfalfa (Table 2). The approximate acreage in Table 2 also includes crops grown in the San Joaquin River Water Quality Improvement Project (SJRIP) which occupies about 6,000 acres within the GDA with a proposed expansion of approximately 1,500 acres included in the Long-Term Storm Water Plan for the GBP[2].

Figure 1: Location of the Grassland Drainage Area



(Note: figure provided by Summers Engineering, Inc.)

[2] Summers Engineering, Inc. 2019. Grassland Bypass Project Long-Term Storm Water Management Plan 2020-2045. Addendum to Final Environmental Impact Statement and Environmental Impact Report for the Grassland Bypass Project, 2010-2019. SCH No. 2007121110. Draft. August 2019. Prepared for San Luis & Delta-Mendota Water Authority.

The Grassland watershed overlies the Delta-Mendota groundwater subbasin which consists of the Tulare Formation, terrace deposits, alluvium, and flood-basin deposits. The GDA primarily overlies the Tulare Formation. The primary aquifer system occurs in unconsolidated alluvial and continental deposits of the Tulare Formation. The Tulare Formation is composed of beds, lenses, and tongues of clay, sand and gravel that have been alternately deposited in oxidizing and reducing environments. The Corcoran clay of this formation underlies the basin at depths ranging from 100 to 500 feet and acts as a confining bed.

Groundwater in the Delta-Mendota subbasin occurs in three water-bearing zones:

- the lower zone contains confined fresh water in the lower section of the Tulare Formation, beneath the Corcoran Clay layer;
- the upper zone contains confined, semi-confined, and unconfined water in the upper section of the Tulare Formation and younger deposits; and
- a shallow zone which contains unconfined water within approximately 25 feet of the ground surface.

Shallow, saline groundwater occurs within about 10 feet of the ground surface over a large portion of the subbasin. There are also localized areas of high iron, fluoride, nitrate, and boron in the subbasin.

The primary sources of groundwater recharge in the subbasin are from the percolation of applied irrigation water and from canals and water storage facilities. Some recharge occurs due to seepage losses along the San Joaquin River and infiltration of runoff from the Coast Ranges into tributary streams.

Table 2: Primary crops grown and approximate acreage in Grassland Drainage Area

Land Use	Approximate Acreage
Fallow/Barren	19,000
Tomatoes	17,000
Wheat	16,000
Cotton	12,000
Alfalfa	10,000
Almonds	6,000
Barley	3,000
Grapes	3,000
Pasture	3,000
Miscellaneous Crops	3,000
Pistachios	2,000
Rice	2,000
Pomegranates	1,000
TOTAL	**97,000**

(Note: Acreage estimates are from Summers Engineering based on the 2013 data in the USDA National Agricultural Statistics Service CropScape located online. <nassgeodata.gmu.edu/CropScape/>

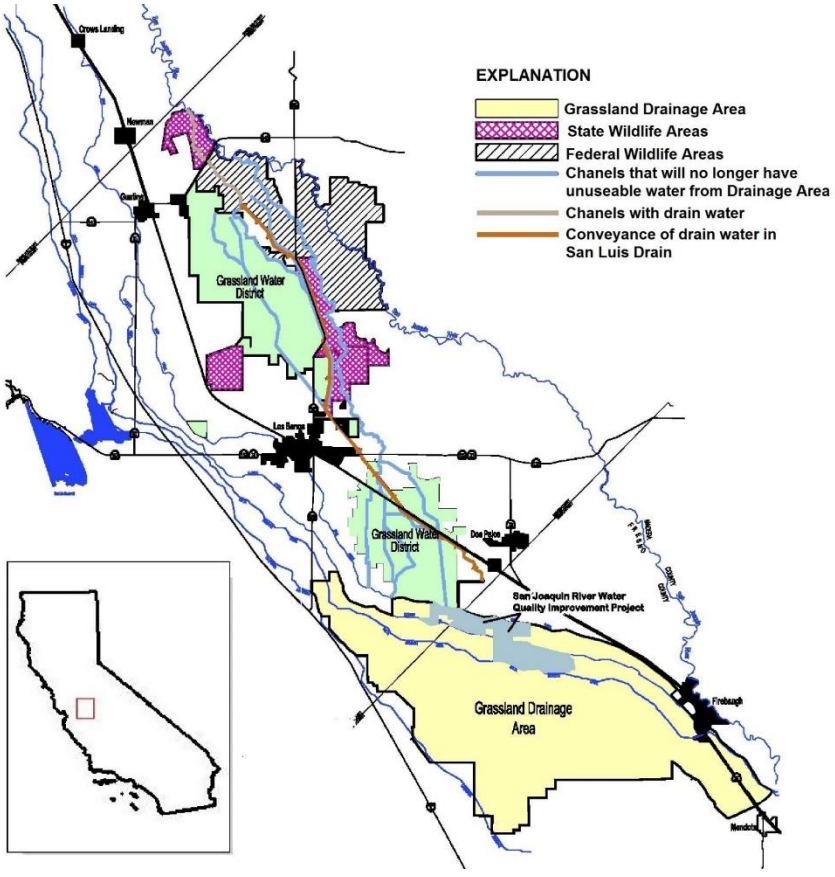
Note: Fallow/Barren land use includes 9,500 acres of non-irrigated land, some of which are dry-land farmed.)

Soils on the west side of the SJR Basin are of marine origin and are fine-textured, saline, and high in selenium and salts. The source of selenium in the GDA are sediments eroded through

natural processes from the coastal range foothills that are mobilized through irrigation. Irrigation is necessary for nearly all crops grown commercially in the watershed. Approximately 9,500 acres in the GDA are not irrigated. Of the remaining 87,000 acres, 33,100 acres (~38%) utilize subsurface drainage systems to remove saline groundwater from the root zone of the irrigated crops and discharge that drainage to the Grassland Bypass Channel. About 53,900 acres of irrigated agricultural land are not tile drained.

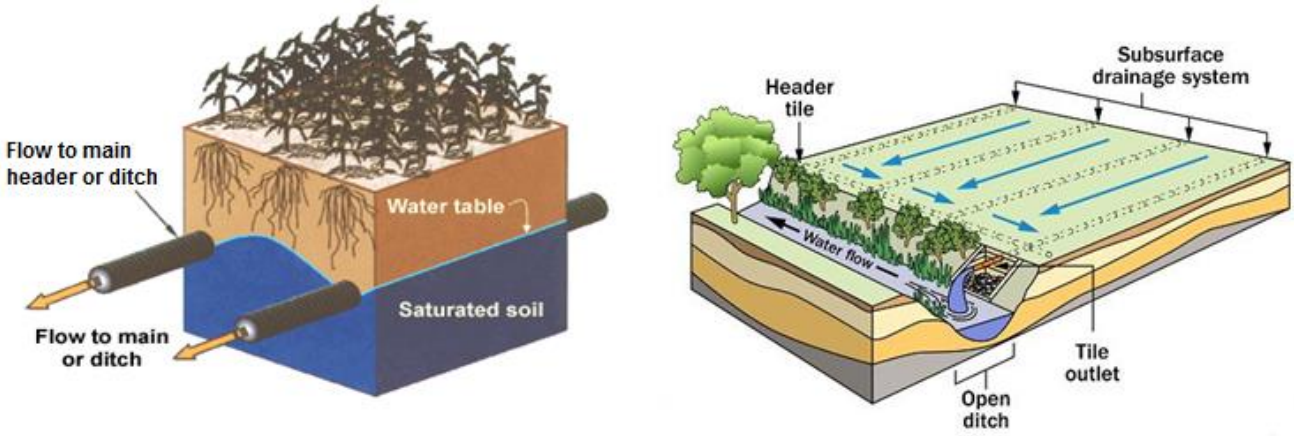
Irrigation without adequate drainage causes the shallow or perched water table to rise, leading to waterlogging and evapoconcentration of salts and trace elements in the crop root zone. Adding more irrigation water to dissolve and leach these salts into the shallow groundwater is necessary to maintain the salt balance in the root zone. Subsurface or tile drainage systems (Figure 3) are utilized to remove percolated irrigation water and the shallow groundwater from the field. The subsurface drainage from this area typically contains high concentrations of selenium and salts, and the GDA is the primary source of selenium to Mud Slough and the San Joaquin River. While selenium is the primary concern, the drainage also contains boron, molybdenum, and high levels of salts that can impact receiving waters.

Figure 2: Map of Grassland Watershed with Bypass Project



(Note: figure modified from Final EIS/EIR for Grassland Bypass Project, 2010-2019, August 2009)

Figure 3: Surface (title) drainage systems



The tile drains are horizontal “pipes”, collecting the irrigation water and shallow groundwater to gravity-fed header tile drains that empty into open ditches or sumps that are pumped into a ditch. Tile drains are placed deep enough below the soil surface (about 7 to 8 feet in the GDA) to keep groundwater out of the crop root zone.

A. Water Flow Before and After Grassland Bypass Project Implementation

The GBP was initiated as a means to control selenium in the Grassland Drainage Area, and is based upon an agreement between the Bureau and the Water Authority to use a segment of the San Luis Drain to convey agricultural subsurface drainage water from the GDA to Mud Slough (north), a tributary of the San Joaquin River.

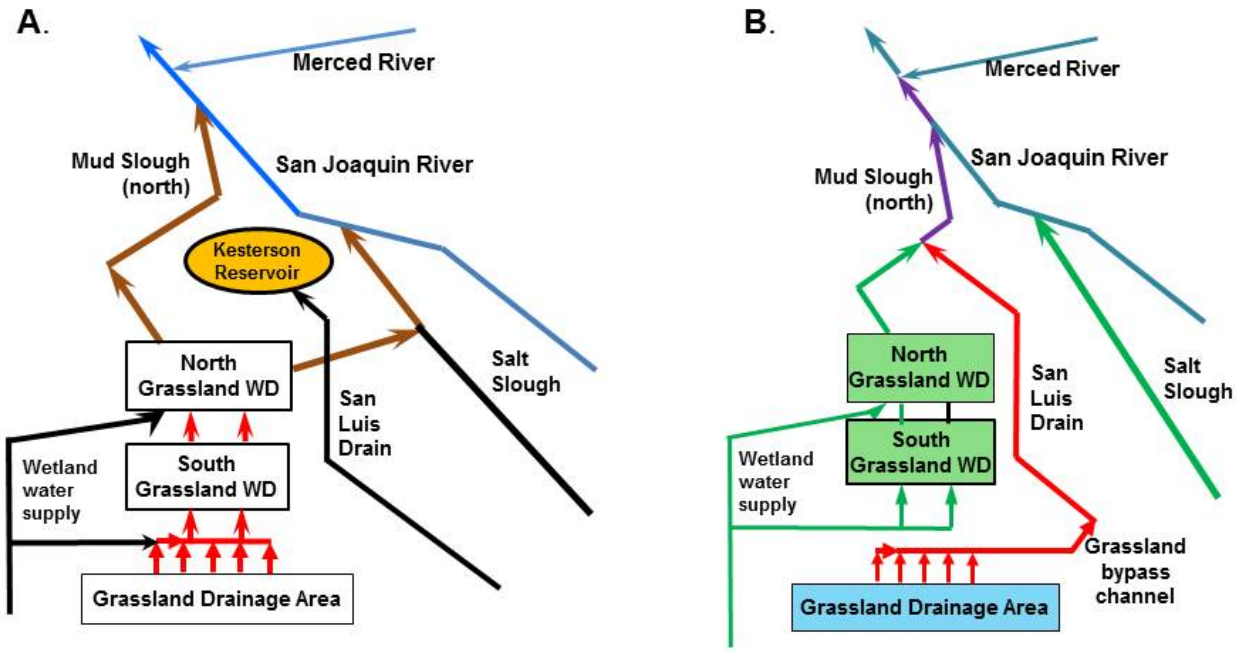
Historically, subsurface drainage from the GDA first travelled north to the southern section of the Grassland Water District along with the wetland water supply (Figure 4A shows a schematic of water flow in the Grassland area before the GBP). The drainage then moved to the northern section of the Grassland Water District. Depending on how water was routed, the subsurface discharge ended in Salt Slough or Mud Slough (north). Both Salt Slough and Mud Slough enter the San Joaquin River before the confluence of the Merced River.

In the 1980’s as part of the Central Valley Water Project, the Bureau allowed the Westlands Water District located south of the GDA, to discharge subsurface drainage water into the San Luis Drain. Instead of being completed to the Delta as originally envisioned, the Drain terminated at Kesterson Reservoir, which was operated as a waterfowl refuge. The drainage water was high in selenium, and selenium bioaccumulated in waterfowl causing deformities and mortality. This raised concerns that selenium levels from subsurface drainage in the GDA could also impact waterfowl in the wetlands. In 1986 Westlands Water District ceased discharge into the San Luis Drain.

With the GBP implementation, subsurface agricultural drainage from approximately 33,100 acres in the GDA is routed to the San Luis Drain through the Grassland Bypass Channel. From there, it travels 28 miles to the Drain’s terminus and discharges to Mud Slough (north), a point about six miles upstream of the San Joaquin River confluence (Figure 4B shows a schematic of the drainage flows with the GBP). The GBP effectively allows drainage water from the GDA to “bypass” approximately 93 miles of wetland supply channels, thereby, avoiding the discharge of high levels of selenium to managed wetlands, where waterfowl could be impacted.

During most of the year, the discharge primarily consists of subsurface agricultural drainage that is high in salts, selenium, boron, and other constituents that naturally occur in the soil. However, implemented practices have greatly reduced the volume of water discharged since the first WDRs were adopted in 1998. The GBP is also required to handle local stormwater runoff. The San Luis Drain has been blocked above the Grassland Bypass Channel at Russell Avenue to prevent the introduction of other flows.

Figure 4: Water flow before (A) and after (B) Grassland Bypass Project Implementation



During major storm events, general surface runoff and stormwater flows may exceed the 150 cubic feet per second (cfs) capacity of the Grassland Bypass Channel. During these major events, all commingled surface runoff, stormwater flows and any subsurface agricultural drainage may be diverted temporarily to the Grassland Water District channels, ditches and sloughs that carried drainage water and stormwater runoff to the San Joaquin River prior to the GBP implementation. The procedures and monitoring required for such an event are outlined in section II.B of the MRP Order. The expansion of mitigation measures (i.e., remote sump shutoff and short-term storage basins) included in the Long-Term Storm Water Plan for the GBP[3] will provide additional opportunities for the Dischargers to segregate stormwater flows from subsurface agricultural drainage, as well as retain an increased volume stormwater that may otherwise be diverted.

III. Organization and Responsibilities

The GBP Order regulates the discharge of agricultural subsurface drainage and stormwater from the Grassland Drainage Area, to tributaries of the San Joaquin River. The waste discharge requirements are issued to the Bureau and the Water Authority. Discharge limits apply to the discharge at the terminus of the San Luis Drain, as well as receiving water limitations in Mud Slough (north) and the San Joaquin River.

[3] ibid.

A. Grassland Bypass Project Order

The Water Authority, a joint powers agency organized pursuant to the California Government Code section 6500 *et seq*.[4], represents its member districts that participate in the GBP. Seven contiguous member districts[5] of the Water Authority are located within the GDA. These districts supply or transport irrigation water and/or manage subsurface drainage within the GDA. The Water Authority and these districts have signed the Grassland Basin Drainage Management Activity Agreement (Activity Agreement) that allows the districts to implement the actions and monitoring necessary for compliance for the past and proposed GBP Order. The member districts have formed the Grassland Basin Drainage Steering Committee (Steering Committee) to operate the GBP and the member districts work with their growers to control the release of selenium and other constituents from the GDA.

For the GBP, a number of participating organizations, besides the Bureau, Water Authority and Central Valley Water Board, are involved in committees for GBP data collection, monitoring, and reporting including: U.S. Environmental Protection Agency (USEPA), U.S. Fish and Wildlife Service, U.S. Geological Survey, National Marine Fisheries Service, and California Department of Fish and Wildlife.

1. Use Agreement for the San Luis Drain

The GBP was implemented through an "Agreement for Use of the San Luis Drain" between the Bureau and the Water Authority. The Bureau, the owner of the San Luis Drain, allows the Water Authority, the operator, the use of the San Luis Drain to separate unusable agricultural drainage water discharged from the GDA from wetland water supply conveyance channels, and to facilitate drainage management that maintains the viability of agriculture in the GDA and promotes continuous improvement in water quality in the San Joaquin River. The Use Agreement set the conditions for use of the San Luis Drain to transport subsurface drainage.

There have been three use agreements between the Bureau and the Water Authority since 1996:

- 1996 Use Agreement[6] (1 October 1996 to 30 September 2001, Water Years[7] 1997 to 2001). A Finding of No Significant Impact was adopted by the Bureau for the original project.

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[4] A joint powers authority is an entity whereby two or more public authorities (e.g., local governments, or utility or transport districts), may jointly exercise any power common to all of them. The joint power authority has separate operating boards of directors that can be given any of the powers inherent in all of the participating agencies.

[5] The districts are the Charleston Drainage District, Pacheco Water District, Panoche Drainage District, Broadview Water District, Firebaugh Canal Water District, Widren Water District, and the Camp 13 Drainage District. Broadview Water District and Widren Water District remain within the GDA boundaries but no longer participate in or discharge to the GBP.

[6] Agreement No. 6-07-20-21319.

[7] A water year is defined as a 12 month time period from 1 October of one year to 30 September of the next. The water year is designated by the calendar year in which it ends (the year within which 9 of the 12 months fall).

- 2001 Use Agreement[8] (1 October 2001 to 31 December 2009) following the completion of a Final Environmental Impact Statement/Environmental Impact Report (EIS/EIR)[9].
- 2009 Use Agreement[10] (1 January 2010 through 31 December 2019). The Water Authority and Bureau prepared an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) [11] that was finalized in August 2009, when the Water Authority certified the document and Bureau adopted its Record of Decision[12] to continue the GBP. The third Use Agreement expires on 31 December 2019.

The last two Use Agreements included salt and selenium load limits, as well as financial incentives so that if load limits are not met, then "fees" are paid by the GDA growers to a fund dedicated for projects approved by the Oversight Committee[13]. Fees are calculated by the Bureau of Reclamation for the attributable discharge for each year and month. The annual selenium load values are designed to meet the total maximum daily load (TMDL) for the San Joaquin River in all water year types by water year 2011 and achieve compliance with the water quality objective of 5 micrograms per liter (μg/L) by 31 December 2019.[14] Figure 5 shows the annual selenium loads required by the water year type (critical, below normal, above normal and wet). The graph shows a decrease in the annual selenium loads for each water year type until 2019 when the 2009 Use Agreement expires, and by when the selenium loading must comply with the water quality objectives in Mud Slough.

A new Use Agreement is currently in development which will formalize the coordination effort between the Bureau and the Water Authority for continued use of the San Luis Drain after the 2009 Use Agreement expires. The 15 μg/L (monthly mean) performance goal and selenium TMDL will continue to apply until 31 December 2019. After 31 December 2019, the water quality objective of 5 μg/L (4-day average) and selenium TMDL will be used to measure compliance with the Basin Plan.

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8 Agreement No. 01-WC-20-2075

9 URS, 2001. *Grassland Bypass Project Environmental Impact Statement and Environmental Impact Report*. Final May 25, 2001. Prepared for U.S. Bureau of Reclamation, Sacramento and Fresno, CA. and San Luis & Delta-Mendota Water Authority, Los Banos, CA.

10 Agreement No. 10-WC-20-3975, finalized 17 December 2009.

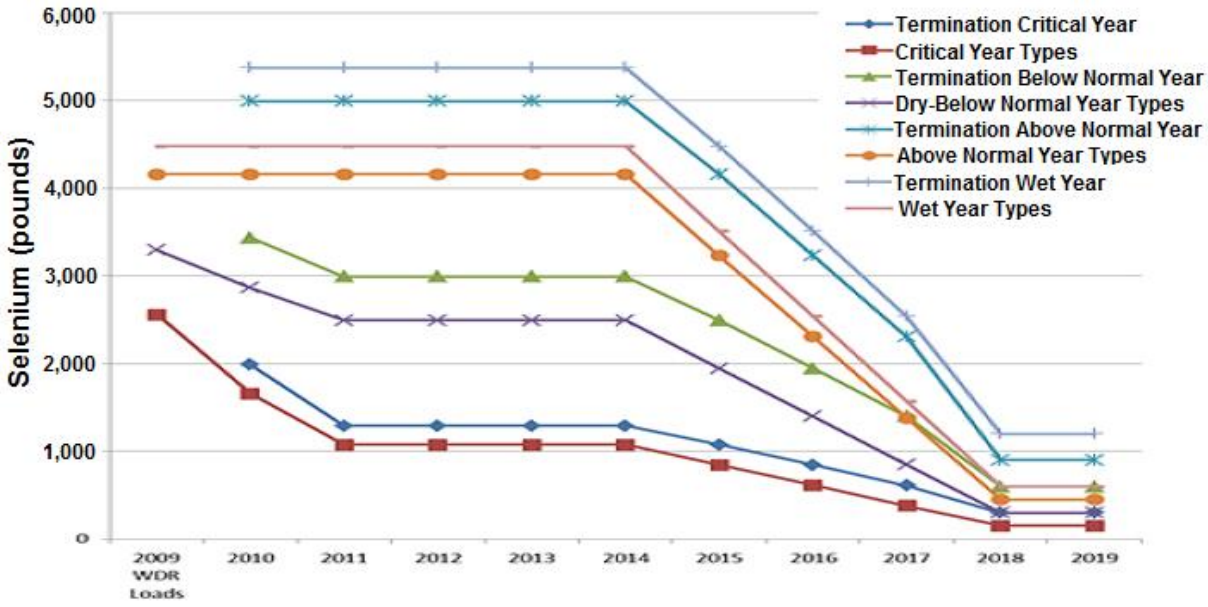
11 Entrix, 2009. *Grassland Bypass Project, 2010-2019, Environmental Impact Statement and Environmental Impact Report.* Final August 2009. Concord, CA. Prepared for: U.S. Bureau of Reclamation, South Central California Office and Mid-Pacific Region; and San Luis & Delta-Mendota Water Authority, Los Banos, CA.

12 Bureau of Reclamation, 18 December 2009, Record of Decision Grassland Bypass Project, 2010-2919.

13 The Oversight Committee is made up of representatives from the Bureau, USFWS, CDFW, USEPA, and the Central Valley Water Board.

14 Selenium water quality objectives and load limits have been met for the San Joaquin River below the confluence with the Merced River. The selenium water quality objectives in Mud Slough (north) have not been consistently met except in recent years.

Figure 5: Use Agreement Annual Selenium Loads and Termination Loads by Water Year Type



2. Water Board Involvement

In 1988, the Central Valley Water Board adopted an amendment to the Basin Plan, establishing a selenium control program. Some improvements in water quality in the San Joaquin River resulted, but selenium levels in the wetland water channels did not improve.

In 1992, the U.S. Environmental Protection Agency promulgated 5 µg/L as the water quality standard for selenium in the San Joaquin River and its tributaries. In November 1995, the Central Valley Water Board received a letter from the Water Authority, U.S. EPA and U.S. Fish and Wildlife Service (commonly referred to as the Consensus Letter) recommending adoption of a Basin Plan amendment that would develop a long-term strategy to achieve compliance with the selenium water quality objectives for the San Joaquin River and its tributaries, and that the Central Valley Water Board issue waste discharge requirements to implement the strategy. The Consensus Letter also contained recommendations for specific numerical monthly and annual discharge limits which would provide for measurable reduction in selenium load.

In 1996 the Central Valley Water Board amended the Basin Plan to address selenium in the San Joaquin River, Salt Slough, Mud Slough, and wetland supply channels in the Grassland watershed. The amendment indicated that WDRs would be used to regulate discharges to surface water and included time schedules, performance goals and water quality objectives. The control actions were designed to achieve the following in the order of priority:

1. Separate subsurface agricultural drainage containing high levels of selenium from sensitive wildlife areas.[15]

[15] Water quality objectives for Salt Slough and wetland water supply channels listed in Appendix 40 are a 2 µg/L monthly mean.

2. Obtain compliance with selenium water quality objectives in the San Joaquin River downstream of the Merced River confluence.[16]
3. Obtain compliance with the selenium objectives in Mud Slough downstream of the San Luis Drain outfall and in the San Joaquin River from its confluence with Mud Slough to the confluence with the Merced River.[17]

The first goal was achieved through the implementation of the GBP and is reinforced by a prohibition of discharge in the GBP WDRs for the project. The second goal has been achieved through selenium load reduction measures implemented by the GDA growers – Salt Slough and the stretch of the San Joaquin River downstream of the Merced are no longer listed as impaired by selenium. The third goal has not yet been achieved, although compliance with the selenium objectives in Mud Slough and in the River are met in some months. The GBP Order and the Basin Plan require that the third goal be met by 31 December 2019.

In 1998, the Central Valley Water Board issued WDR 98-171 for the GBP to the Water Authority[18] and the Bureau (Dischargers). The Monitoring and Reporting Program (MRP) 98-171 required that the Dischargers monitor and report as described in *Compliance Monitoring Program for Use and Operations of the Grassland Bypass Project*[19]. MRP 98-171 also included monitoring for molybdenum at specific locations[20], monitoring during storm events[21], and set discharge limits for selenium monthly and annual loads as stated in the Consensus Letter for the 1998 Order. The 1998 Order also required the annual reporting of the Long-term Drainage Management Plan (LTDMP) that would address activities related to management of subsurface drainage from 1 October 2001 to the time the discharges are in compliance with the Basin Plan.

During the five-year period the 1996 Use Agreement was in effect, the Use Agreement required a 15 percent reduction of selenium from the average historical load to the San Joaquin River by the 5th year; however, in the subsequent Use Agreements additional reductions in the selenium load were required to continue improvements to the San Joaquin River water quality and meet selenium requirements in the 1998 Basin Plan.

WDR 5-01-234 was issued in 2001.[22] MRP 5-01-234 attached to the 2001 GBP

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16 Basin Plan water quality objectives for selenium are 12 µg/L (maximum concentration) and 5 µg/L (4-day average) in the San Joaquin River from the mouth of the Merced River to Vernalis.

17 Basin Plan water quality objectives for selenium in Mud Slough (north) and the San Joaquin River from Sack Dam to the Merced River have a 5 µg/L 4-day average.

18 The San Luis & Delta-Mendota Water Authority is a joint powers agency organized pursuant to the California Government Code Section 6500 *et seq*.

19 Dated September 1996 and required as part of Use Agreement No. 6-07-20-21319.

20 Molybdenum was added for Sites B, C and D on a monthly basis.

21 Selenium samples collected and flow to be measured for all discharge sites (J, K, L2 and M2,) as well as Sites F and D.

22 WDR 5-01-234 was 7 September 2001.

Order specified monitoring for general parameters[23], selenium, boron, molybdenum, nitrate and aquatic toxicity testing at specific sites with a set schedule and frequency. Stormwater monitoring was required during storm events when the GBP may not be able to accommodate all surface runoff, stormwater flows, and agricultural drainage water. The stormwater monitoring was required to determine the effect of GDA discharge diversion to Grassland and wetlands channels. The GBP Order also included continued reporting of the LTDMP on an annual basis.

Selenium loads limits[24] were established for discharge to the San Joaquin River and waste discharge requirements were used to control discharges of subsurface agricultural drainage from the GDA. The compliance timetable gave the Dischargers deadlines to meet the selenium objective in the San Joaquin River and various channels, including Salt Slough and Mud Slough (north).[25] There was also a prohibition of discharge effective 1 October 2010 for subsurface agricultural drainage discharges unless selenium water quality objectives were being met.

In 2004, a Basin Plan amendment for the control of salt and boron in the San Joaquin River was adopted by the board. The amendment includes allocations of salt loads for the Grassland watershed.

In 2010, the Basin Plan was amended to extend the compliance dates for the selenium objective in Mud Slough (north) and the San Joaquin River upstream of the Merced River from 2010 to 2019. With that amendment, the board recognized that, despite the best efforts of the GDA growers and districts in significantly reducing selenium loads, there was just not enough dilution to meet objectives in the receiving waters and additional time was needed to implement solutions.

Since the 2001 GBP Order, the ILRP was initiated in the Central Valley to monitor and evaluate the effect irrigated agriculture has on surface water quality; requirements for groundwater were added to ILRP Orders starting with 2012. Waste discharges to groundwater in the Grassland Drainage Area are covered by the GDA Order.

IV. Surface Water Monitoring History of GBP

Initial selenium compliance monitoring for the GBP started in 1995 and was performed by the

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[23] General parameters included flow, pH, electrical conductivity and temperature.

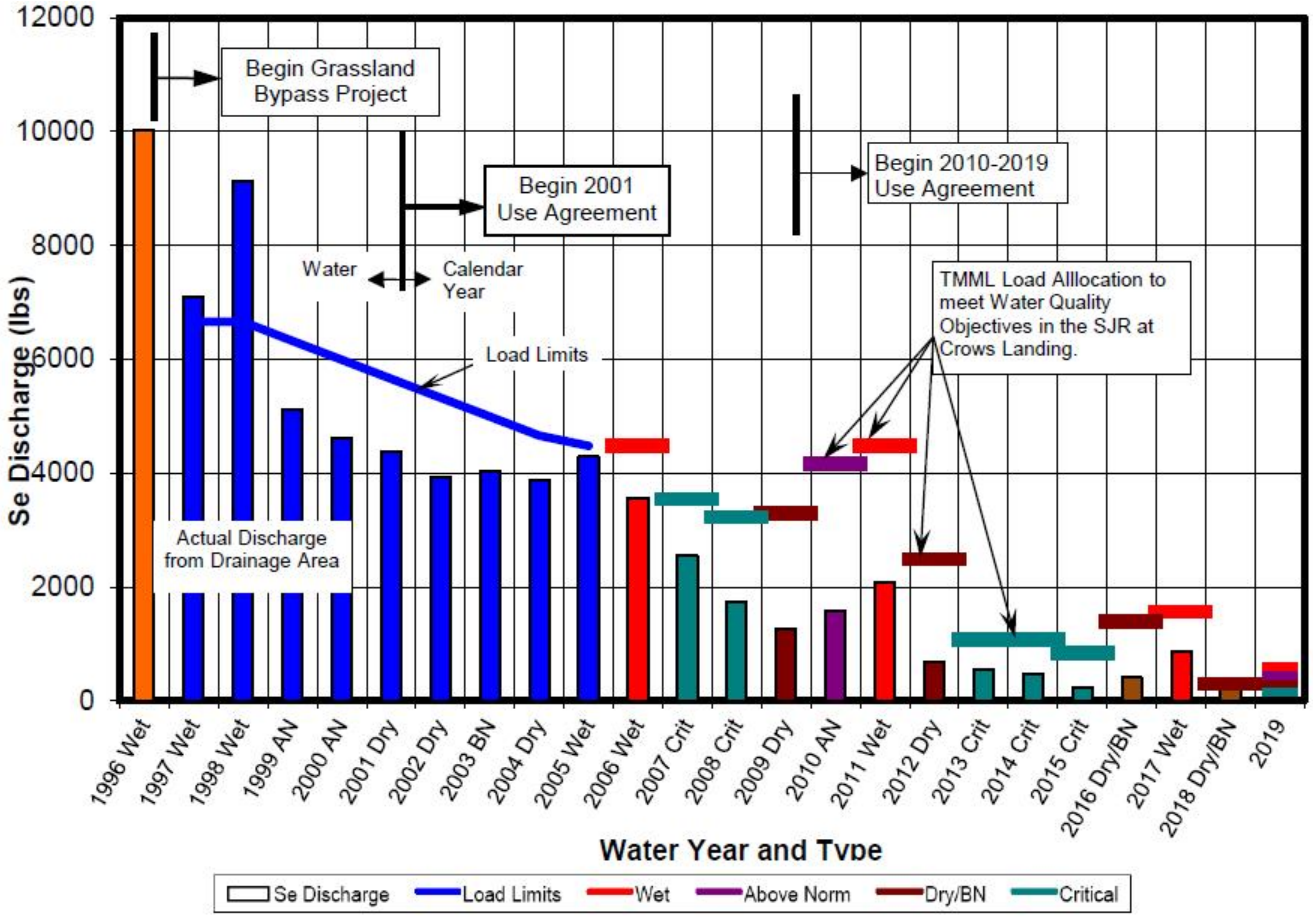
[24] Load limits for selenium were based on water year classification established using the best available estimate of the 60-20-20 San Joaquin Valley water year hydrologic classification (as defined in Footnote 17 for Table 3 in the State Water Resources Control Board's *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary*, May 1995) at the 75% exceedance level using data from the Department of Water Resources Bulletin 120 series. The previous year's classification will apply until an estimate is made of the current water year.

[25] Salt Slough and the wetland channels had a deadline of 10 January 1997 to meet 2 µg/L selenium, monthly mean; Mud Slough (north) and the San Joaquin River from Sack Dam to the Merced River had a 1 October 2010 deadline to meet 5 µg/L (4-day average); and the San Joaquin River below the Merced River (above normal and wet water years) a deadline of 1 October 2005 at 5 µg/L (4-day average), with critical, dry and below normal water years a deadline of 1 October 2010 at 5 µg/L (4-day average).

Central Valley Water Board until 2011, when the Bureau assumed these duties. Monthly, quarterly, and annual reports are posted for all GBP monitoring on the San Francisco Estuary Institute (SFEI) website <www.sfei.org/gbp/reports>.

Previous GBP monitoring sites targeted selenium concentrations to determine compliance with selenium load limits set within the Use Agreements and the corresponding WDRs. Monthly load limits for selenium were also calculated based on the category of water year, historical monitoring data, the TMDL allocations, and required water quality objectives. Figure 6 shows the selenium discharged from the GDA on an annual basis, with the limits set by the water year type.

Figure 6: Grassland Drainage Area – Selenium Discharge and Targets



(Figure taken from the 2018 Annual Monitoring Report[26].)

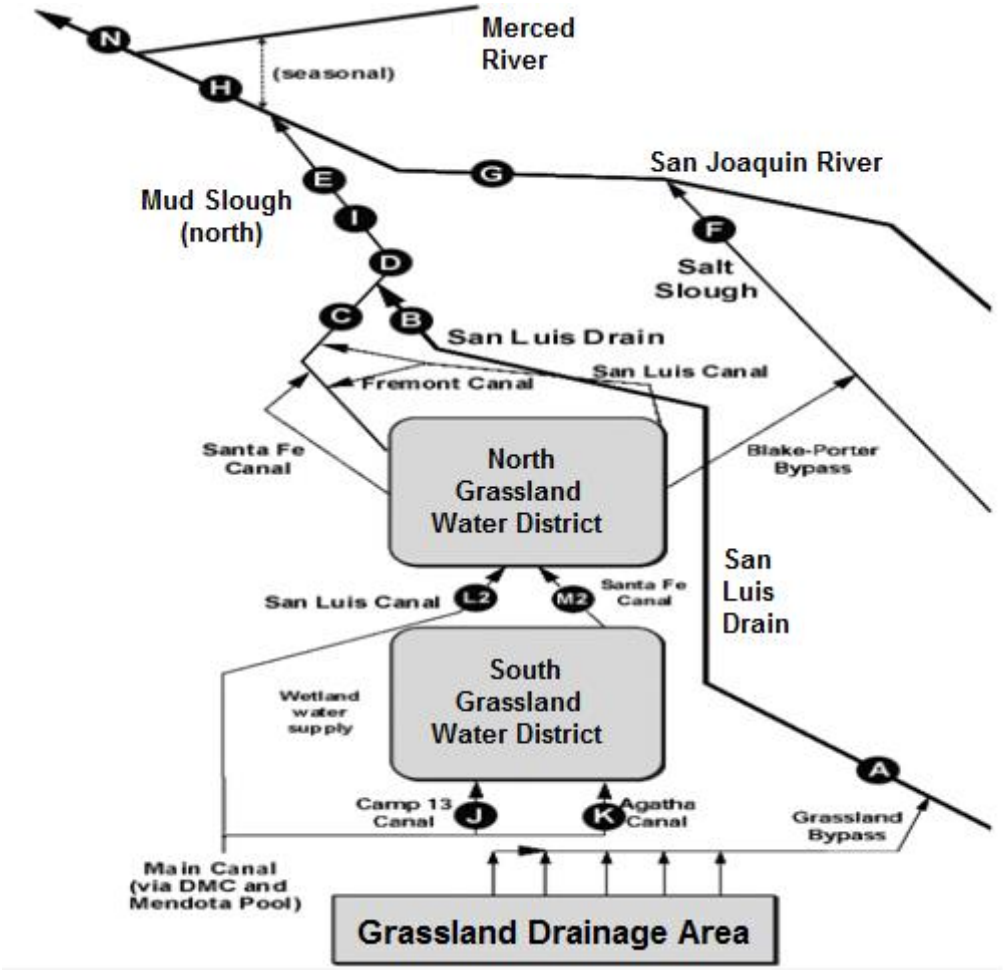
Historically, monitoring occurred at four areas with at least one monitoring location: 1) the San Luis Drain; 2) Mud Slough (north); 3) the wetlands channels; and 4) the San Joaquin River. The monitoring program has included sampling upstream and downstream sites (shown in Tables 3.1-3.3) to determine selenium loading from the GBP and possible other contributors to the total selenium load. Selenium monitoring has historically occurred at Mud Slough (north) upstream of the San Luis Drain discharge (Station C, now monitored under

[26] Summers Engineering, Inc. Grassland Bypass Project Surface Water Monitoring, Order R5-2015-0094, Annual Monitoring Report 2018. 30 April 2019. Amended 31 August 2019.

Order R5-2014-0002[27]) to determine wetlands contribution; Mud Slough (north) downstream of the San Luis Drain (Station D) to determine total discharge from the GBP and wetlands to Station D; and the GBP contribution to the selenium load by sampling in the San Luis Drain before discharge to Mud Slough (Station B). San Joaquin River monitoring has occurred downstream of the Mud Slough discharge (Stations H and N) to determine the GBP's and wetland contribution to the river before and after confluence with the Merced River. Figure 7 is a schematic showing the location of these sites.

Additional monitoring sites under the Use Agreement included areas within the San Luis Drain (Station A), Salt Slough and other wetlands water supply channels (Stations F, J, K, L2, M2), and the San Joaquin River at Fremont Ford (Station G). Salt Slough monitoring was reduced since the Basin Plan selenium water quality objective[28] was achieved and the channel has been delisted for selenium.

Figure 7: Schematic of Past GBP Monitoring Sites



[27] Central Valley Water Board. 2014. Order R5-2014-0002 Waste Discharge Requirements General Order for Growers within the Western San Joaquin River Watershed that are Members of a Third-party Group. Adopted 9 January 2014 (as revised).

[28] Water quality objective was 2 µg/L selenium (monthly mean) in Salt Slough and wetland water supply channels.

Table 3.1: Historic Monitoring Sites of the GBP – San Luis Drain

CEDEN Code	Station	Location	Latitude	Longitude
541MER562	A	Check 17	36.96658 N	-120.67063 W
541SLDGCR	B3	Gun Club Road	37.23159 N	-120.87599 W
541MER535	B2	San Luis Drain @ Terminus	37.25944 N	-120.90389 W

Table 3.2: Historic Monitoring Sites of the GBP – Mud Slough (north)

CEDEN Code	Station	Location	Latitude	Longitude
541MER536	C	Upstream of San Luis Drain Terminus	37.25417 N	-120.9069 W
541MER542	D	Downstream of San Luis Drain	37.26389 N	-120.90611 W
MSBWSI2	I2	Backwater below San Luis Drain	37 27241 N	-120.90975 W

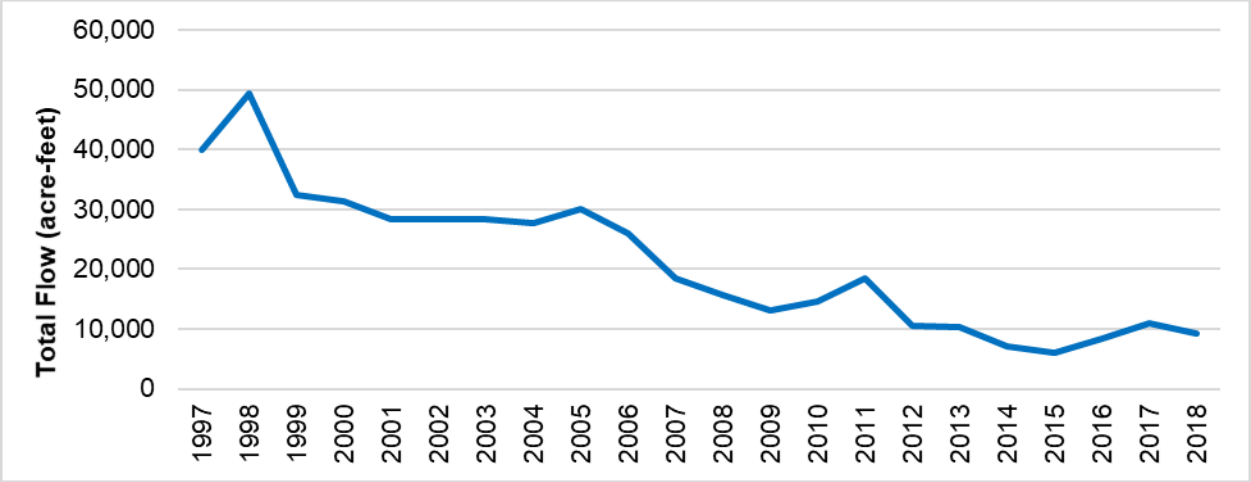
Table 3.3: Historic Monitoring Sites of the GBP – Wetlands channels
(Note: Station J, K2, L2 and M2 are storm only)

CEDEN Code	Station	Location	Latitude	Longitude
541MER531	F	Salt Slough @ Lander Ave	37 24861 N	-120.85111 W
	F2	Salt Slough in San Luis National Wildlife Refuge	37 21765 N	-120.83147 W
541MER505	J	Camp 13 Drain, headworks	36.94083 N	-120.75611 W
541MER506	K2	Agatha Canal, headworks	36.93667 N	-120.70194 W
541MER563	L2	San Luis Canal upstream of Splits	37.09167 N	-120.82306 W
541MER545	M2	Santa Fe Canal @ Weir Rd	37.09889 N	-120.82667 W
541MER538	G	Fremont Ford (upstream of Mud Slough confluence)	37.30944 N	-120.92917 W
541STC512	H2	Above Merced River (Hills Ferry)	37.34250 N	-120.97222 W
535STC504	N	Crows Landing	37.43149 N	-121.01341 W

A. Surface Water Monitoring Results

Past monitoring results are summarized in this section for the following parameters that are of concern: selenium, boron, molybdenum, and salts (as indicated by electrical conductivity measurements). Since GBP implementation, the discharge from the GDA has decreased significantly, and was 77% lower in 2018 compared to total flow in 1997 (Figure 8). The decrease in flow is likely due to the combined result of water delivery infrastructure improvements, irrigation system modernization, and reuse activities for subsurface drainage.

Figure 8: Discharge from the Grassland Drainage Area, Years 1997 to 2018



1. **Selenium**

   The selenium load has decreased approximately 80%[29] since the start of the program. In addition to the decrease in discharge volume from the GDA, the selenium concentration at Mud Slough (north) downstream of the Drain (Station D) decreased from 1997 to 2018 (Figure 9). Monitoring results for selenium in the San Joaquin River at the Basin Plan compliance point (Crows Landing, Site N) from 2004 to 2018 also show the selenium concentration decrease (Figure 10).

   Elevated selenium concentration in wetlands has been a major issue addressed by the GBP. Selenium concentrations within the wetland channels have decreased significantly with rerouting of the subsurface drainage. Salt Slough and wetland water supply channels listed in Appendix 40 of the Basin Plan have a 2 µg/L (monthly mean) selenium objective. Selenium concentrations in Salt Slough have been below the 2 µg/L objective since 1998, and Salt Slough has been removed from the 303(d) list for selenium (Figure 11). In wetland supply channels to the south and north Grassland Water District, selenium exceeds the water objective generally during the rainy season when other sources, such as storm runoff from upstream sources, are introduced into the channels (Figure 12). Although drainage from the GDA is directed to the San Joaquin River Water Quality Improvement Project for reuse during the irrigation season, drainage occurring during the storm season and from other drains in the area outside of the GDA can cause selenium concentrations to exceed water quality objectives. With dry or critical years, selenium may be introduced to wetland channels from groundwater used to supplement irrigation supply from areas outside the GDA.

[29] Percentage calculated based on average of selenium annual loads from 2008 to 2012 and the load in 1997. Values for 1997, 2008 to 2011 from Table 3c of Grassland Bypass Project Annual Report 2010-2011. 2012 selenium load value from letter dated 26 December 2013 from Joseph C. McGahan to Pamela C. Creedon, *Waste Discharge Requirement Order No. t-01-234, Update of Long Term Drainage Management Plan.*

Figure 9: Selenium Concentration in Mud Slough below San Luis Drain 1997 to 2018

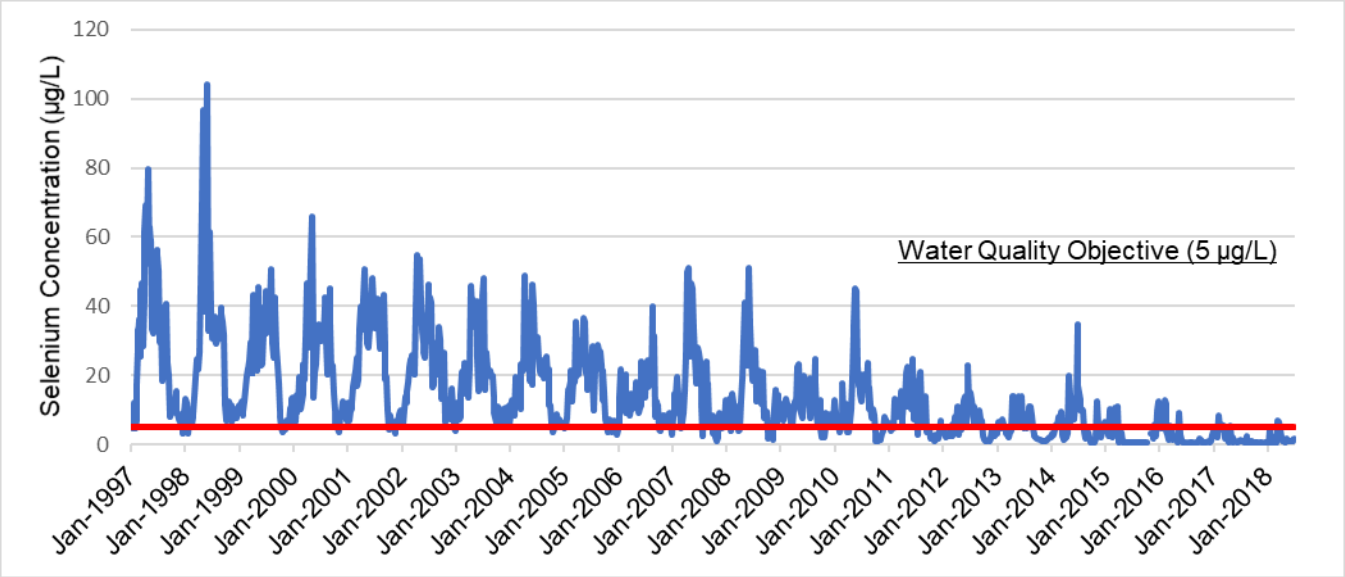


Figure 10: Selenium Concentration in San Joaquin River at Crows Landing 2004 to 2018

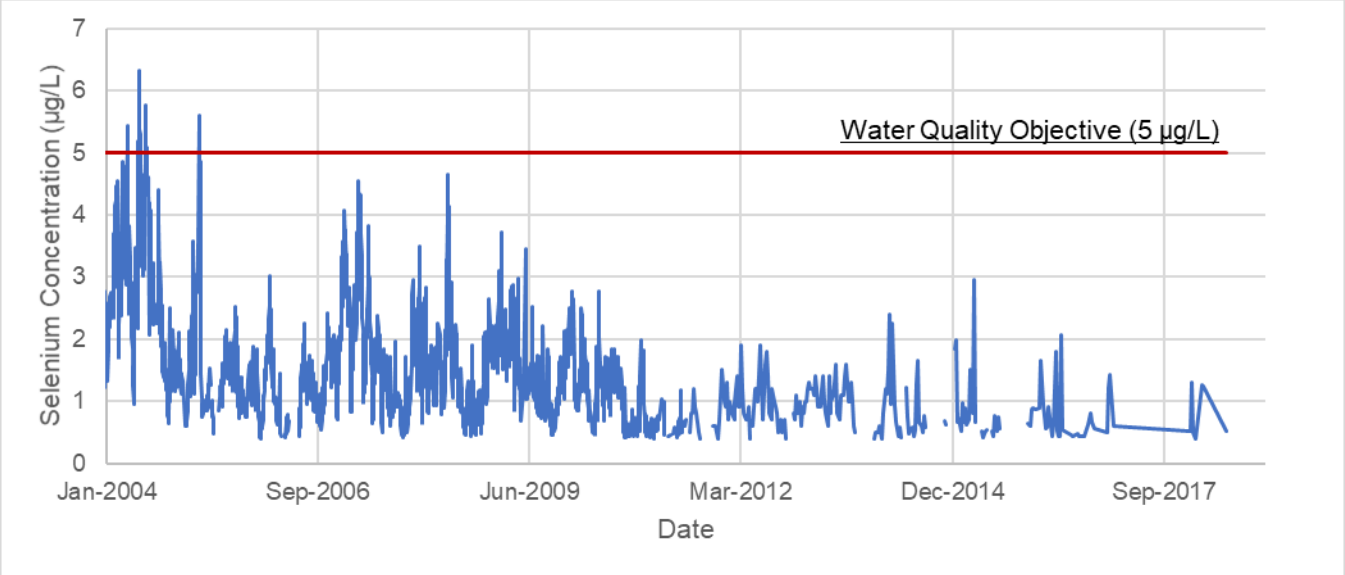


Figure 11: Selenium Concentrations in Salt Slough (Station F)

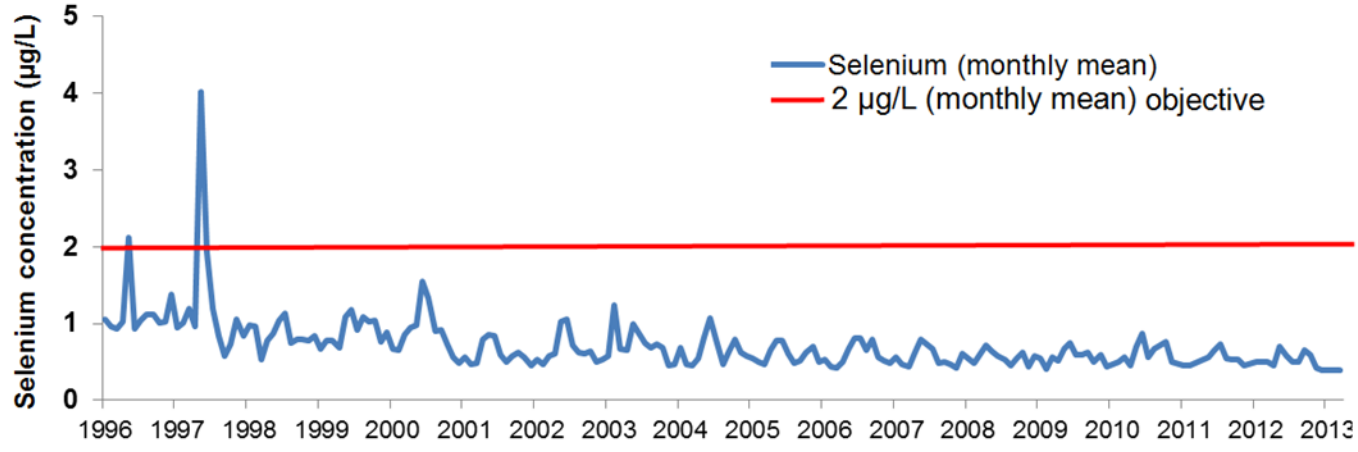
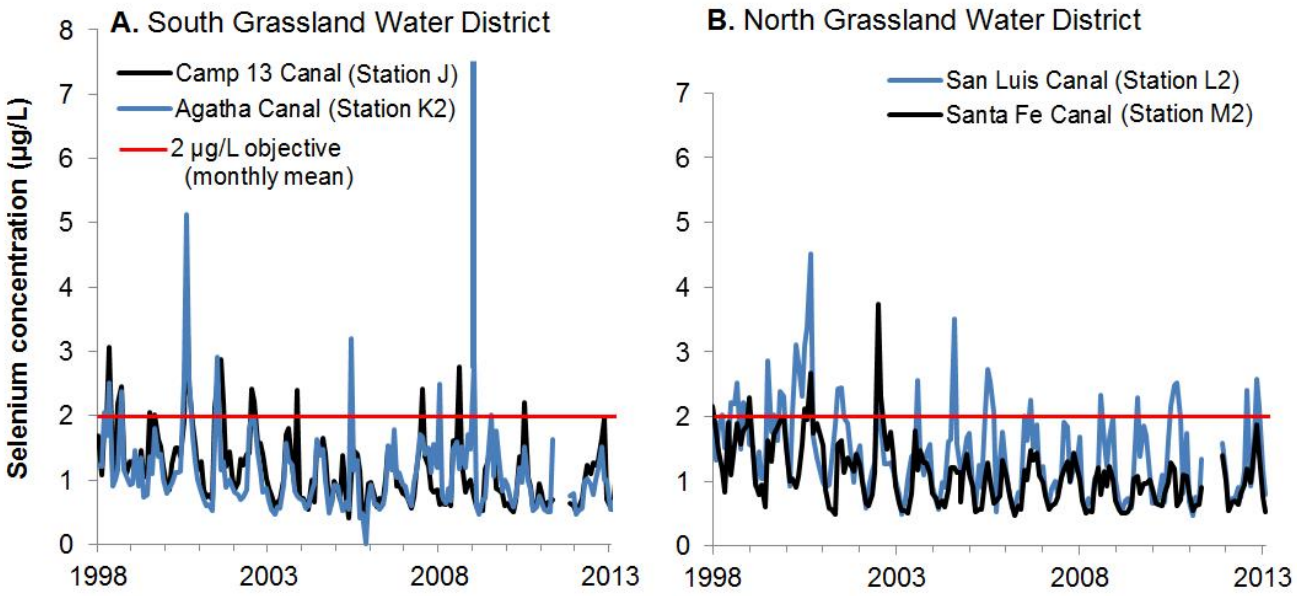


Figure 12: Selenium Concentrations in Wetland Supply Channels



2. Boron and Molybdenum

The boron concentration in the San Joaquin River after the confluence with the Merced River (Station N) generally meets the water quality objective (Figure 13), and it is anticipated further implementation of the GBP including the San Joaquin River Water Quality Improvement Project will further reduce the boron concentrations from the GBP. Molybdenum concentrations observed in Mud Slough (Station D) are generally below the 50 µg/L maximum concentration (Figure 14).

Past monitoring has shown boron and salt loads have decreased as selenium loads have decreased. It is expected that this correlation will continue.

Figure 13: Boron Concentration in San Joaquin River (Station N)

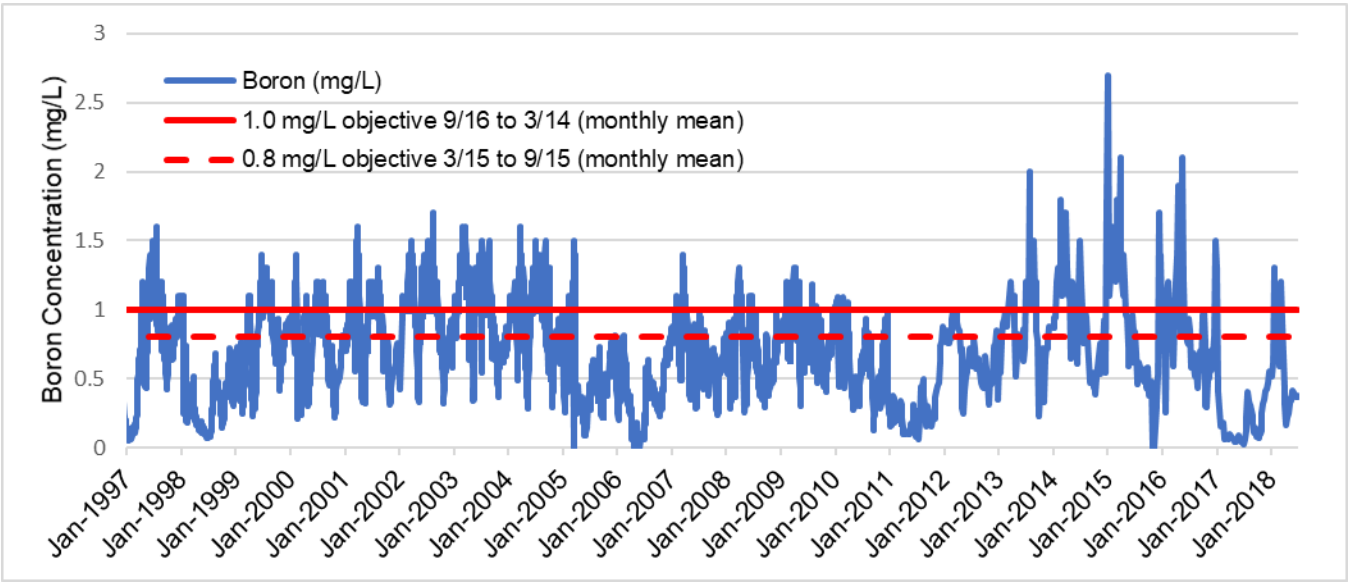
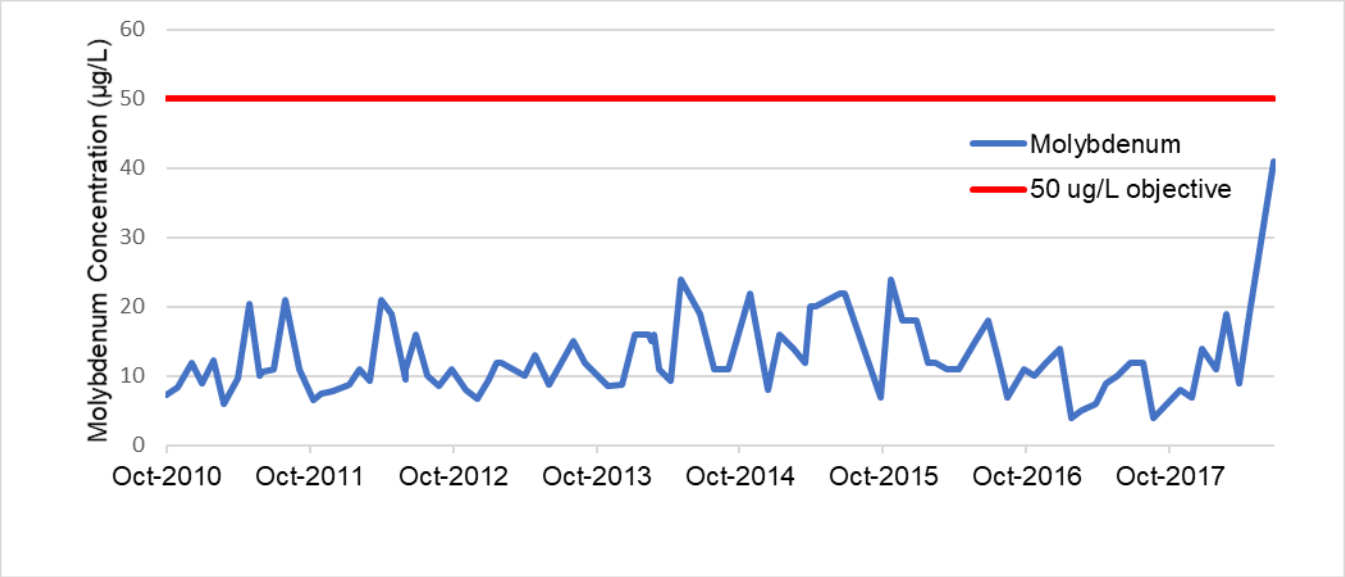


Figure 14: Molybdenum Concentration at Mud Slough below San Luis Drain (Station D)



3. Salinity

The lower San Joaquin River is 303(d) listed for salts. Discharge limits for salts are not in the waste discharge requirements for the GBP. The Basin Plan provisions for the Control Program for Salt and Boron Discharges into the Lower San Joaquin River[30] requires that by July 2018 in a Critical Year Type and July 2014 in all other Year Types the Dischargers must: 1) participate in a Central Valley Water Board approved real-time management program; or 2) submit a management plan that includes the elements identified in the Monitoring and Reporting Program, Appendix MRP-1 that is designed to meet the Base Salt Load Allocations identified in Table 4-8, *Summary of Allocations and Credits*,[31] within the applicable schedule for compliance in Table 4-7.[32] A real-time management program is being used to measure and report flow and electrical conductivity. The GBP participants are part of the board-approved real-time management program[33].

Monthly and annual salt loads are part of the second and third Use Agreements and are calculated using electrical conductivity and flow and are based on water year category. Annual salt loads have been below the salt load limits based on the methodology in the 2001 Use Agreement. Water year salt loads from the outlet of the San Luis Drain (Site B) have decreased by 83% since 1997 (Figure 15). Conductivity at Mud Slough (north) downstream of the Drain (Station D) remained generally stable from 1997 to 2018 with increased concentrations measured from mid-2013 through mid-2015 (Figure 16). Conductivity at in the San Joaquin River at Crows Landing (Station N) also remained generally stable from 1997 to 2019 with

[30] Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, page 4-61

[31] *Ibid*., page IV-4-67

[32] *Ibid*., page 4-66

[33] Resolution R5-2014-0151: Real Time Management Program for meeting salinity water quality objectives in the Lower San Joaquin River at Vernalis.

increased concentrations measured from mid-2013 into 2016 (Figure 17). 2013, 2014, and 2015 were classified as critical water year types and 2016 was classified as a dry/below normal water year type.

Figure 15: Water Year Salt Loads from the Grassland Drainage Area

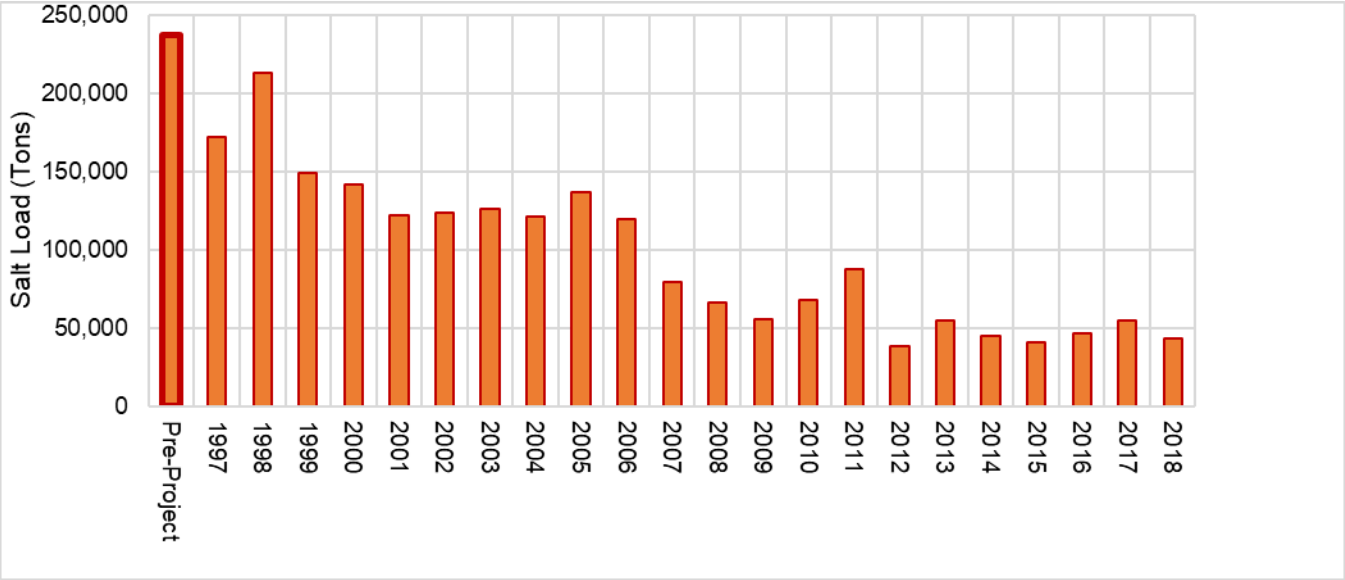


Figure modified from the Dischargers presentation to the board on 7 August 2019.

Figure 16: Conductivity in Mud Slough below San Luis Drain 1997 to 2018

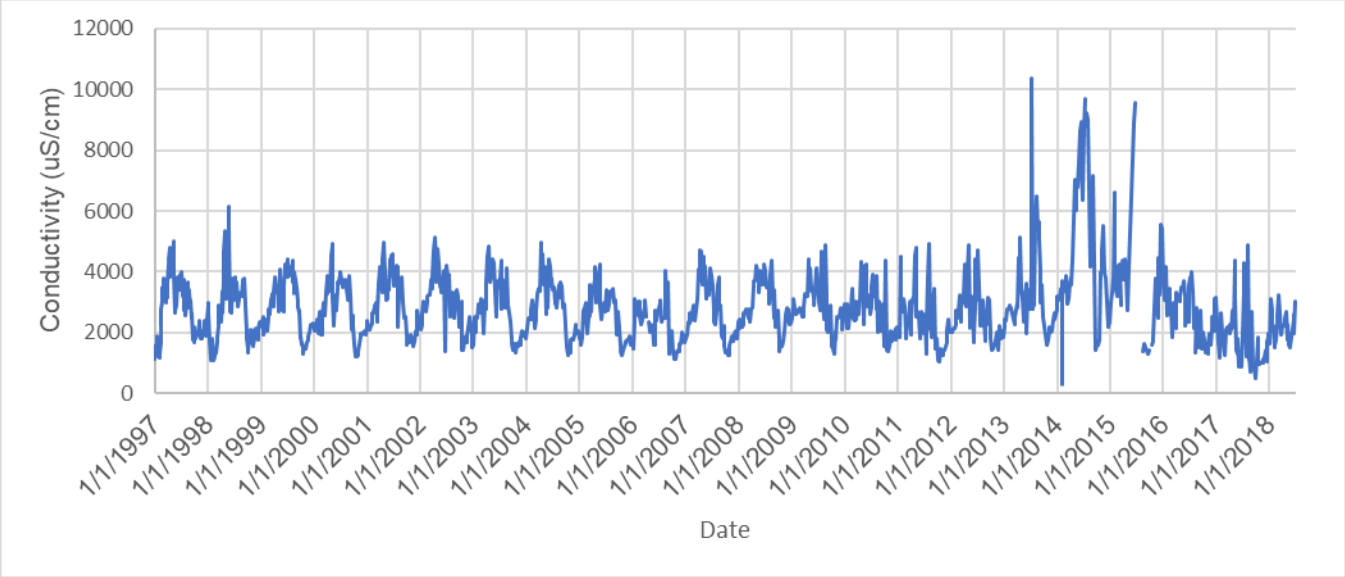
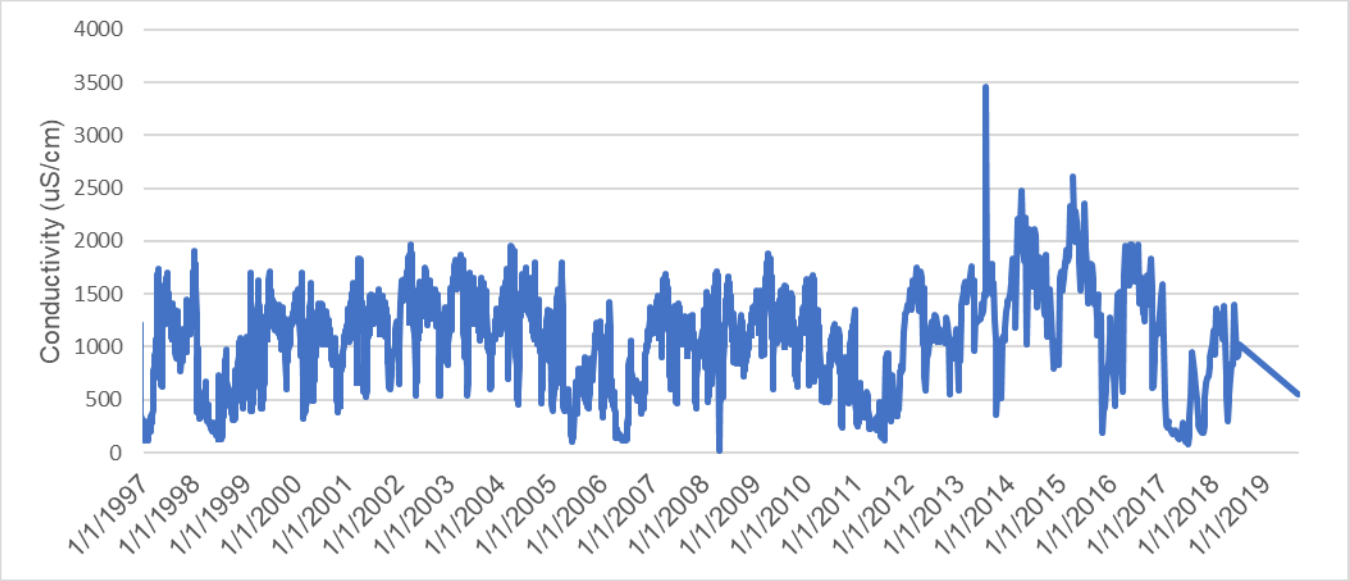


Figure 17: Conductivity in San Joaquin River at Crows Landing 1997 to 2019



4. Nutrients

Five nutrient parameters were analyzed for the previous MRP Order: nitrate as nitrogen (N), ammonia as N, Total Kjeldahl Nitrogen (TKN), total phosphate, and orthophosphate. Of these five parameters at Station D, nitrate as N was above the water quality objective (10 mg/L) five times for the period from 2004 to 2013. Monitoring since 2008 has had only one exceedance of the 10 mg/L water quality objective for nitrate as N. For Station D from 2000 to 2013, total ammonia as N was <1 mg/L.

V. Actions and Implemented Management Practices

The ultimate goal of the Grassland Bypass Project is to eliminate all agricultural subsurface drainage to the San Joaquin River, a zero discharge to the River. To accomplish this goal, the GDA Member Districts and GDA growers have implemented management practices and actions to lower the selenium load discharged to the San Joaquin River, including improved irrigation application, tiered water pricing, tailwater controls, and reuse and treatment involving recycling, and the use of subsurface drainage water on salt tolerant crops and to wet roadways for dust control. This section lists some of the management practices and actions that have been implemented or are planned for implementation:

A. Conservation Efforts

Conservation efforts were initiated by GDA growers and by the water district to reduce the volume of subsurface drainage to the GBP. These efforts include the following:

(1) Improved irrigation management

Growers have implemented management practices that limit pre-irrigation use and over-watering. Installation of drip or micro-irrigation, combined with improved water management, lowers water use and increases irrigation efficiency. Shorter water runs are encouraged. Improved irrigation efficiency results in less water going past the crop root zone and, thereby, raising the water table, which generates the subsurface drainage.

The member districts of the GDA have programs that encourage growers to improve their irrigation practices. Several of the districts have provided low interest loans to growers for improved irrigation equipment.

(2) Retrofitting of drainage tile systems
Growers were encouraged to retrofit the controls on tile-drain systems. Sensors on the sump pumps for drainage tile systems were raised so they were activated only when groundwater approached an approximate minimum depth to groundwater target. Drains that discharged directly to open ditches were modified with a weir control structure to store more drainage water beneath each field prior to discharge to the district drainage system. Under the Long-Term Storm Water Plan for the GBP[34] a remote shutoff system for the tile drain sumps will be installed to increase the Dischargers ability to segregate stormwater flows from subsurface agricultural drainage during storm events.

(3) Initiation of tiered water pricing
The member districts of the GDA have implemented a tiered water price structure that encourages the conservation of water and efficient use of any delivered irrigation water. Higher prices per acre-foot of water delivered are charged if growers go above a certain amount.

(4) Installation of tailwater controls
Growers in some parts of the GDA are required to separate tailwater from subsurface drainage. Discharge of tailwater is prohibited from the GDA to the Grassland Bypass Channel. A number of GDA growers have installed tailwater return systems or use irrigation methods that do not generate surface runoff.

(5) Reduced drainage seepage
Infrastructure improvements, such as lining canals and installing piping, have reduced drain seepage through the transport system. Reducing drainage seepage to groundwater helps keep groundwater levels lower, and, thereby, reduces the amount of subsurface drainage water produced.

B. Reuse and recycling

The GDA growers and water districts have implemented the following efforts to reduce the subsurface drainage entering waters of the state.

1. Recirculation of subsurface drainage by participating districts
The participating water and irrigation districts in the GDA have constructed facilities to recirculate drain water back into their irrigation distribution system. Recycling drainage water reduces the amount of water that would otherwise need to be imported or pumped and reduces the net amount of subsurface drainage that needs to be discharged out of the area.

2. Prohibition of tailwater discharge into the Grassland Bypass Channel
To encourage conservation and recycling, water districts do not allow the discharge

[34] Summers Engineering, Inc. 2019. Grassland Bypass Project Long-Term Storm Water Management Plan 2020-2045. Addendum to Final Environmental Impact Statement and Environmental Impact Report for the Grassland Bypass Project, 2010-2019. SCH No. 2007121110. Draft. August 2019. Prepared for San Luis & Delta-Mendota Water Authority.

of tailwaters into the Grassland Bypass Channel and the San Luis Drain. Tailwater is recirculated within the GDA for reuse.

3. Use of subsurface drain waters on roads
   Subsurface drainage has been reused to wet roads for dust control.

C. Dry-land Farming and Fallowing of Land

Approximately 9,500 acres in the GDA are not irrigated, including lands served by the Broadview Water District. These lands are no longer irrigated, which eliminates deep percolation from irrigation from these areas. Every year additional lands may be temporarily fallowed.

D. San Joaquin River Water Quality Improvement Project

The San Joaquin River Water Quality Improvement Project (SJRIP) is located within the GDA covering approximately 6,000 acres. The land was bought for the purpose of subsurface drainage disposal. In addition, the SJRIP includes a series of projects to aid the GDA growers with lowering the selenium loading from the GBP. Subsurface drainage from the GDA is channeled to the SJRIP area. Projects in progress or being proposed include the following:

- Reuse of subsurface drainage water: Started in 2001, this project included the construction of distribution facilities and the planting of salt tolerant crops on agricultural land. The planted acreage has increased from the original 1,821 acres to more than 5,200 acres, which have been irrigated with drainage water or blended water (subsurface drainage and “fresh” irrigation water). In 2013, approximately 26,000 acre-feet of drain water was reused to irrigate pistachio trees and salt-tolerant grasses.
- Future phases of the SJRIP area involve the development of additional acreage, installation of more subsurface drainage systems, and implementation of treatment and salt disposal components. The Long-Term Storm Water Plan for the GBP[35] includes a proposed expansion of 1,500 acres.
- The SJRIP project also involves an extensive biological contaminant monitoring program, one component of which is for bird eggs. This biological monitoring started in 2002 and has examined the levels of selenium in a small sample of bird eggs each year. In line with this project, the Member Districts and GDA growers have tried to discourage birds from inhabiting or nesting in the SJRIP. The program involves hazing birds during the nesting season, diligent water management, and modification of drains to discourage avian use.

Subsurface drainage not reused within the SJRIP is diverted to the GBP. The WDRs for the GDA address releases from the SJRIP to groundwater.

E. Demonstration Treatment Projects

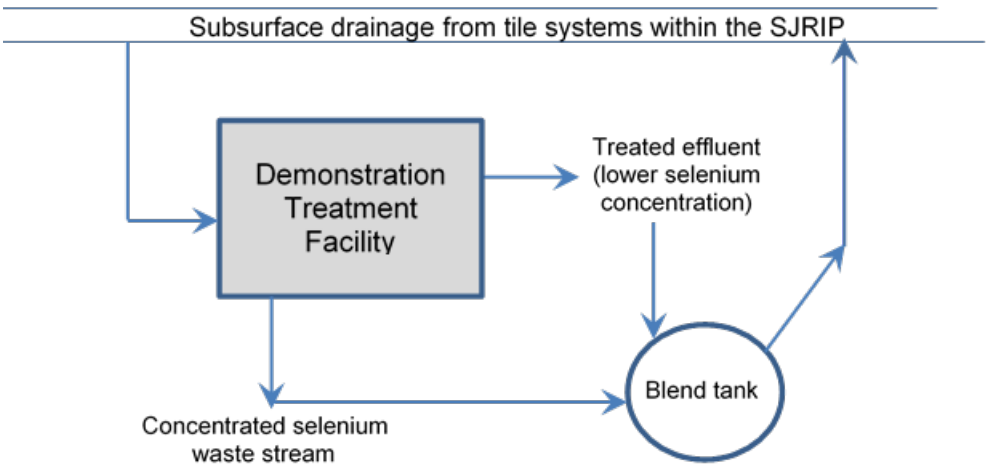
The Bureau’s Demonstration Treatment Facility and other pilot treatment projects are located on a portion of the SJRIP reuse area and will test various treatment projects to reduce selenium and salinity loads from the GDA farmers. Projects being considered are:

[35] ibid.

- Water FX Solar Distillation Demonstration Project: use of a parabolic solar collector to heat and distill the subsurface drain water, then condensing the evaporate which should be “clean” water. A concentrated brine solution is produced as the other byproduct. Phase I of the pilot project has been completed. The contractor proposes to expand the project to increase capacity and install thermal storage to allow operation through the night.
- UCLA Smart Membrane Pilot Test: project is testing an optical membrane monitoring device on a reverse osmosis pilot treatment system.
- HDR Deep Well Injection Study: The project reviewed existing information on deep aquifer formations to estimate the potential for deep well injection of subsurface drainage as a management tool.
- USBR RO Demonstration Treatment Facility: The Bureau has constructed a demonstration-scale reverse osmosis treatment facility with a selenium removal component.

The Demonstration Treatment Facility is operated by the Bureau with cooperation from the Panoche Drainage District to intercept drainage from the existing subsurface agricultural drain systems in the SJRIP area, run the drainage water through various treatment processes to evaluate the efficacy for salt and selenium removal, blend the output from each of the treatment systems, and then recycle the blended mixture back into the SJRIP drainage system (see schematic shown as Figure 18). The selenium loading will not change with operation of the Demonstration Treatment Facility since both the treated effluent and the higher selenium byproduct will be blended prior to being discharged back into the SJRIP subsurface drainage system.

Figure 18: Schematic of Demonstration Treatment Facility



The different treatment options will be evaluated and assessed for efficiency and effectiveness in removing selenium and salts from the subsurface drainage waters. The ultimate goal of the GDA growers is a “zero discharge” of subsurface agricultural drainage from the GDA by the end of 2019.

F. Removal of sediment from the San Luis Drain

Selenium is listed as a hazardous waste at high concentrations under the USEPA 40 CFR 261.24. Sediments in the Drain contain selenium. These sediments, if transported along the Drain, would transport the selenium that may then migrate back into the water

column. If selenium migration from the sediment to water column occurs, this selenium would be included in the total annual load discharged by the GDA growers. If sediment acts as a sink (or repository) for the selenium, then the selenium concentration may reach the value where it may be considered "hazardous" waste.

The 2009 Use Agreement limits the maximum rate of flow in the Drain to be 150 cfs in order to avoid re-suspending sediment that may contain selenium and the draft Use Agreement proposed continuation of this limitation, which is a discharge limit required by the GPB Order. If monitoring results indicate the Drain behaves like a sink, the total selenium load in the sediment can be calculated and the information used to determine if the concentrations are close to hazardous waste values. Sediments would be removed before composite concentrations reach those values.

The Bureau and the Water Authority have been monitoring the accumulation and selenium content of sediment in the San Luis Drain (Drain). Data[36] in the 2012-2013 GBP Annual Report indicated that 214,000 tons of sediment had accumulated in the Drain during the GBP, and the selenium concentration in sediment in 2012 ranged from 3 to 28 mg/kg dry weight (converted to wet weight concentration, the 28 mg/kg is approximately 10 mg/kg at moisture content 63%)[37], well below the hazardous waste criterion of 100 mg/kg wet weight[38]. Approximately 180,000 cubic yards of sediment have been removed from the San Luis Drain, as of August 2018, and used to fill in drains in the SJRIP. The remaining sediment is planned for removal by the end of 2020[39].

VI. Required Surface Water Monitoring

The monitoring program (sites and parameters analyzed) in the GBP MRP Order are designed to evaluate compliance with the requirements of the GBP WDR, which include objectives and limitations in the Basin Plan. Monitoring will be performed by the Bureau and the Water Authority as specified in WDR Order R5-2019-0077. Tables 1 and 2 of the MRP Order show details on the location of monitoring stations and monitoring sites, parameters and frequency for sampling required by the WDR.

A. Surface Water Monitoring

Monitoring sites under the GBP Order are shown in Figure 1 of the Order. A summary of the required monitoring to assess compliance with the discharge limitations and the receiving water limitations is shown in Tables 4.1-4.3. A rationale and summary of differences from the monitoring programs under previous WDRs follow in the section

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[36] San Francisco Estuary Institute, Grassland Bypass Project Annual Report 2012 – 2013. Draft Chapters 9 and 10 posted online <www.sfei.org/gbp/reports>

[37] San Francisco Estuary Institute, 2012 Grassland Bypass Project Annual Report (Final Draft). Accessed on 2 April 2015 <www.sfei.org/sites/default/files/2012%20GBP%20Annual%20Report%20Final.pdf>

[38] Total Threshold Limit Concentration defined for selenium in California Code of Regulations. Title 22. Division 4.5. Chapter 11. Article 3. §66261.24 (a)(2)(A), Table (II).

[39] Summers Engineering, Inc. 2019. Grassland Bypass Project Long-Term Storm Water Management Plan 2020-2045. Addendum to Final Environmental Impact Statement and Environmental Impact Report for the Grassland Bypass Project, 2010-2019. SCH No. 200712110. Draft. August 2019. Prepared for San Luis & Delta-Mendota Water Authority.

below. In general, the monitoring design for the GBP has evolved as water quality issues have been identified and resolved over time.[40]

Flow is measured in the San Luis Drain at Check 17 and at its terminus, in Mud Slough, and in the San Joaquin River as a basic parameter in the measurement of contaminant loads in the Grassland Basin. Additionally, flow in the San Luis Drain must be managed to prevent sediment erosion. Stations B3 and D will be monitored for compliance with discharge and receiving water limits, respectively. Stations N and R will be monitored for compliance with the Basin Plan receiving water limits in the San Joaquin River before and after the confluence with the Merced River. The constituents and sample frequency are selected to determine compliance with numeric objectives in the Basin Plan for Mud Slough (north), and at various points in the San Joaquin River.

Diversion points into the wetland channels are monitored daily for flow and water quality during storm events, when any GDA subsurface drainage is routed from the Grassland Bypass Channel to the southern Grassland Water District wetland channels. Drains outside of the GDA that may supply wetland channels are within areas covered by other ILRP Orders that surround the GDA.

[40] Data Collection and Reporting Team (DCRT). Grassland Bypass Project 2013 Revised Monitoring Program dated 26 March 2013.

Table 4.1: Variable frequency monitoring sites and parameters for the GBP Order

Monitoring Site	Flow (Daily)	Pesticides (TBD)	Toxicity (Semi-annually – *D. magna, P. promelas, H. azteca*)	Sediment (Annually)
Station N San Joaquin below Merced River	X			
Station H2 San Joaquin above Merced River	X			
Station R China Island (San Joaquin after mud Slough)		X		
Station G Fremont Ford (San Joaquin above mud Slough)	X			
Station D Mud Slough (north) after San Luis Drain (***receiving waters***)	X	X	X	X*
Station B2 San Luis terminus	X			
Station B3 San Luis Drain (**discharge**)		X		X
Station A San Luis Drain at Check 17	X			
J, K2, L2, M2 Wetland channels (***storm monitoring daily***)	X			

* *Note for Sediment:* sediment monitoring at Station D is performed biannually.

Table 4.2: Weekly monitoring sites and parameters for the GBP Order

Monitoring Site	pH	EC*	temp	TOC	Se*	B
Station N San Joaquin below Merced River	X	X	X		X	X
Station H2 San Joaquin above Merced River		X**				
Station R China Island (San Joaquin after mud Slough)	X	X	X		X	X
Station G Fremont Ford (San Joaquin above mud Slough)	X	X	X		X	
Station D Mud Slough (north) after San Luis Drain (***receiving waters***)	X	X	X	X	X	X
Station B2 San Luis terminus		X**				
Station B3 San Luis Drain (**discharge**)	X	X	X		X	X
Station A San Luis Drain at Check 17	X	X	X		X	X
J, K2, L2, M2 Wetland channels (***storm monitoring daily***)	X	X	X		X	X

* *Note for EC and Se:* electrical conductivity and selenium include additional daily monitoring described in the MRP.

** *Note for Station B2 and H2:* electrical conductivity only collected daily.

Table 4.3: Monthly monitoring sites and parameters for the GBP Order

Monitoring Site	Mo	Nitrate	Ammonia
Station N San Joaquin below Merced River	X		
Station H2 San Joaquin above Merced River			
Station R China Island (San Joaquin after mud Slough)	X		
Station D Mud Slough (north) after San Luis Drain (***receiving waters***)	X	X	X
Station B2 San Luis terminus			
Station B3 San Luis Drain (**discharge**)	X	X	X
J, K2, L2, M2 Wetland channels (***storm monitoring daily***)			

Monitoring sites from the previous MRP Order were changed due to safety concerns, operational changes, and monitoring costs. Differences between the previous MRP Order and the GBP Order include:

- Station C was eliminated as a monitoring site for the GBP, but is monitored under Order R5-2014-0002[41]. Station C is located in Mud Slough before the San Luis Drain outfall and no subsurface drainage is discharged to the site from the GBP unless a major storm event occurs. In that case, monitoring is initiated at stations J, K2, L2 and M2 where subsurface drainage enters the wetland supply channels.
- Station G was restored as a monitoring site. Station G is located in the San Joaquin River upstream of the Mud Slough confluence and is used for source assessment. This site should have minimal selenium loading since it is located upstream of the discharge at Mud Slough.Station B3 replaces Station B2 in the San Luis Drain. Station B3 is located approximately 2 miles upstream of Station B2 on the San Luis Drain and is the location where water quality samples are collected. There are no drainage inputs between Stations B2 and B3.

[41] Central Valley Water Board. 2014. Order R5-2014-0002 Waste Discharge Requirements General Order for Growers within the Western San Joaquin River Watershed that are Members of a Third-party Group. Adopted 9 January 2014 (as revised).

- Station R at the China Island Unit in the San Joaquin River before the Merced confluence is added as a monitoring site. This site will monitor compliance with water quality objectives for the San Joaquin River before the Merced River, replacing H2 (Hills Ferry). This site is closer to the discharge from Mud Slough (north) into the San Joaquin River than Hills Ferry.
- Station A in the San Luis Drain at Check 17 is located at the top of the San Luis Drain just after the discharge point from the Grassland Bypass Project. Monitoring at Station A is used for source assessment.
- Stormwater monitoring will be required at Stations J, K2, L2 and M2. These four sites will monitor the selenium concentration entering wetland channels since they are the diversion points for subsurface drainage into those channels. The previous MRP Order required monitoring at Stations D [Mud Slough (north) after the San Luis Drain terminus] and F (Salt Slough). Two wetland channel locations, sites L3 and M3, on the San Luis Canal and Santa Fe Canal are monitored regularly under Order R5-2014-0002 (as revised)[42].

Differences in monitored parameters between the previous MRP Order and the GBP Order include:

- Elimination of Total Kjeldahl Nitrogen (TKN), total phosphate, and ortho phosphate from monitoring parameters. Monitoring at Station D (Mud Slough after the San Luis Drain confluence) showed concentrations to be <3.5 mg/L for TKN and <2 mg/L for both total phosphorus and ortho phosphate. These levels are not a water quality problem. As a comparison, Westside SJR Watershed Coalition (located north of the GDA) reported TKN and total phosphorus concentrations ranging from 0.088 to 150 mg/L, and 0.048 to 4.7 mg/L, respectively.
- Nutrients (nitrate as N and ammonia as N) will be monitored monthly at Stations B3 (San Luis Drain before terminus) and D. The previous MRP required monitoring at Station N (San Joaquin River at Crows Landing).
- In the San Luis Drain, a 24-hour composite for boron is no longer required. A weekly grab sample will be required instead to determine compliance with the water quality objective in Table 5.1.
- Total organic carbon (weekly) and sediment toxicity testing (biannual) will be required at Station D.
- Pesticides will be monitored at Stations B3, D and R on a schedule and frequency to be determined per the Pesticides Evaluation Protocol[43].
- Annual sediment testing is now required at Station B3, with the analyses to be determined.
- Electrical conductivity monitoring is now required daily at Stations A, B2, D, G, H2, and N and weekly at Stations A, B3, D, G, R, and N.

[42] Central Valley Water Board. 2014. Order R5-2014-0002 Waste Discharge Requirements General Order for Growers within the Western San Joaquin River Watershed that are Members of a Third-party Group. Adopted 9 January 2014 (as revised).

[43] Central Valley Water Board. 2016. Issuance of the Pesticides Evaluation Protocol and List of Pesticides. Issued on 29 November 2016.

- Selenium monitoring is now required daily at Stations A, B3, D, and N, and weekly at Stations A, B3, D, G, R, and N.
- Flow monitoring and field measurements are now required at Stations A, G, and N.

B. Stormwater Monitoring

Storm and flood event monitoring will be required when flows are expected to exceed the capacity of the San Luis Drain as a result of major rainfall events, and discharges must be made from the GDA to Grasslands wetlands. Actions to be taken are specified in the MRP and Storm Event Plan.[44]

VII. Technical Reports

The surface water quality monitoring under the GBP Order is regional in nature, since the GBP addresses drainage discharges at a regional level and responsibility for those discharges is assumed by entities with responsibility and authority in the GDA. A benefit of regional monitoring is the ability to determine whether water bodies accepting discharges from the GDA are meeting discharge and receiving water limitations. Regional monitoring allows the Central Valley Water Board to determine, at the regional level, whether implemented operations and actions are protective of water quality. There are limitations to regional monitoring when trying to determine possible sources of water quality problems.

Therefore, through Surface Water Quality Management Plans, the Dischargers must evaluate the effectiveness of its operations in meeting discharge and receiving water limitations. Through the evaluations and studies conducted by the Dischargers, and the board's compliance and enforcement activities, the board will be able to determine whether the Dischargers are complying with the GBP Order.

The GBP Order requires the Dischargers to provide technical reports. These reports may include special studies at the direction of the Executive Officer. The Executive Officer may require special studies where the required monitoring is ineffective in determining potential sources of water quality problems. Special studies help ensure that the potential information gaps may be filled through targeted technical reports.

VIII. Reports and Plans

The GBP Order is structured such that the Executive Officer is to make determinations regarding the adequacy of reports and information provided by the Dischargers and allows the Executive Officer to approve such reports. It is the right of any interested person to request the Central Valley Water Board to review any of the aforementioned Executive Officer decisions.

IX. Water Quality Objectives

A. Surface Water

The Basin Plan specifies water quality objectives for selenium, boron, and molybdenum at various locations (Tables 5.1-5.3). The 2009 Use Agreement contains monthly salinity load values dependent on the month and water year category. These values are based on the salt load allocations in Table 4-8 of the Basin Plan's Salt and Boron

[44] Grassland Area Farmers and San Luis & Delta-Mendota Water Authority. "A Storm Event Plan for Operating the Grassland Bypass Project". August 25, 1997.

Control Program. To comply with the Salt and Boron Control Program, the Bureau has implemented a real-time management program[45] as described in Table 4-8.

Table 5.1: Boron Numerical Objectives

Objectives	Maximum	Location
0.8 mg/L (15 March-15 September) 1.0 mg/L (16 September - 14 March) 1.3 mg/L (Critical Year)	2.0 mg/L 2.6 mg/L	San Joaquin River, mouth of the Merced River to Vernalis
2.0 mg/L (15 March-15 September)	5.8 mg/L	Mud Slough (north), San Joaquin River from Sack Dam to the mouth of Merced River

Table 5.2: Selenium Numerical Objectives

4-day Average	Maximum	Location
5 µg/L	20 µg/L	Mud Slough (north) and the San Joaquin River from the Mud Slough confluence to the Merced River
5 µg/L	12 µg/L	San Joaquin River, mouth of the Merced River to Vernalis

Table 5.3: Molybdenum Numerical Objectives

Monthly Average	Maximum	Location
19 µg/L	50 µg/L	Salt Slough, Mud Slough (north) and San Joaquin River from Sack Dam to mouth of Merced River
10 µg/L	15 µg/L	San Joaquin River, mouth of Merced River to Vernalis

The Basin Plan amendments allow discharges from the GBP area to continue to exceed selenium objectives at Mud Slough (north) and the San Joaquin River between the Mud Slough discharge and the confluence with the Merced River through 2019. Load limits for selenium set forth in the GBP Order and the required monitoring will determine if progress is being made to reach compliance with water quality objectives.

The compliance time schedule has been established for selenium in Mud Slough (north) and the San Joaquin River from the Mud Slough confluence to the Merced River. A performance goal specified in the Basin Plan for achieving 15 µg/L monthly mean is by 31 December 2015. The water quality objective (5 µg/L as 4-day average) must be met by 31 December 2019. In addition, the GBP Order requires compliance with the

[45] In 2014, the Central Valley Water Board adopted a Resolution R5-2014-0151 approving a Real Time Management Program for meeting salinity water quality objectives in the Lower San Joaquin River at Vernalis.

selenium load reduction strategy in the 2009 Use Agreement, which includes the annual and monthly selenium load values and, the application of the Drainage Incentive Fees in accordance with the Performance Incentive System. Annual load targets for selenium are also included in the GBP Order as triggers for additional management practices. A new Use Agreement is currently being drafted to allow use of the Drain beyond 2019.

The Salt and Boron Control Program prescribes salt load allocations to geographic areas within the Lower San Joaquin River Basin and to imported salt from the Delta Mendota Canal, and establishes salt load limits to meet compliance at Vernalis. The salinity water quality objectives for the San Joaquin River at Vernalis, measured as electric conductivity (EC), are 700 µS/cm and 1000 µS/cm during irrigation and non-irrigation seasons, respectively. The salinity objective at Vernalis has been met since 1994, in part through releases of fresh water the Bureau from New Melones Reservoir into the Stanislaus River upstream of the Vernalis compliance point, as well as through decreased discharges from the GBP and the Irrigated Lands Regulatory Program.

The Salt and Boron Control Program schedule of compliance is phased with areas contributing the most salt required to comply first. The earliest compliance dates apply to nonpoint source dischargers on the west side of the basin, which includes the GDA. During normal through dry water years the compliance was required by 28 July 2014, and for critically dry water years by 28 July 2018. The 2014 and 2015 water years are critically dry.

The Salt and Boron Control Program provides the opportunity for dischargers and the Bureau of Reclamation to participate in a Central Valley Water Board-approved real time management program (RTMP). Participation and attainment of water quality objectives at Vernalis constitutes compliance. Under the RTMP, water monitoring and management actions are coordinated in conjunction with real-time forecasts of river water quality to time salt discharges during optimum assimilative capacity. The goal of the RTMP is to continue to meet irrigation and non-irrigation season salinity water quality objectives at Vernalis. In addition, the goal is to manage salt loads so discharges occur when there is assimilative capacity in the river rather than be constrained by mandated monthly load allocations in WDRs. Managing the use of assimilative capacity is also anticipated to reduce reliance on fresh water releases from New Melones Reservoir to meet the salinity objectives at Vernalis and to provide a mechanism to maximize salt exports from the San Joaquin River Basin.

As long as salt and boron water quality objectives at Vernalis are met, those participating in the RTMP are considered in compliance with the Salt and Boron Control Program. During development and implementation of the RTMP, the Bureau will continue to meet salinity objectives at Vernalis as specified in the operation requirements in State Water Board Water Rights Decision D-1641.[46]

B. Implementation of Water Quality Objectives

The Basin Plan includes numeric and narrative water quality objectives. The narrative

[46] Revised Water Right Decision 1641: Decision Implementing Flow Objectives for the Bay-Delta Estuary, Approving a Petition to Change Points of Diversion of the Central Valley Project and the State Water Project in the Southern Delta, and Approving a Petition to Change Places of Use and Purposes of Use of the Central Valley Project, Revised in accordance with Order WR 2000-02, 15 March 2000.

toxicity objective states: “All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.” The Basin Plan states that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. The narrative chemical constituent objective states that waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At a minimum, “…water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs)” in Title 22 of the California Code of Regulations (CCR). The Basin Plan further states that, to protect all beneficial uses, the Regional Water Board may apply limits more stringent than MCLs. The narrative tastes and odors objective states: “Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.”

The Sacramento-San Joaquin Basin Plan at page 4-28, contains an implementation policy, “Application of Water Quality Objectives,” that specifies that the Central Valley Water Board “will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives.” With respect to narrative objectives, the Regional Water Board must establish limitations using one or more of three specified sources, including: (1) USEPA’s published water quality criteria, (2) a proposed state criterion (i.e., water quality objective) or an explicit state policy interpreting its narrative water quality criteria (i.e., the Regional Water Board’s “Policy for Application of Water Quality Objectives”), or (3) an indicator parameter. For purposes of the GBP Order, all three sources will be used as part of the process described below.

Implementation of numeric and narrative water quality objectives under the GBP Order involves an iterative process. The GBP Order’s MRP establishes management plan trigger limits that are equivalent to the applicable Basin Plan numeric water quality objectives. For constituents that are not assigned Basin Plan numeric water quality objectives, Central Valley Water Board staff will develop trigger limits in consultation with the Department of Pesticide Regulation (for pesticides) and other agencies as appropriate. Central Valley Water Board staff will provide interested parties, including the Dischargers, with an opportunity to review and comment on the trigger limits. The Executive Officer will then provide the trigger limits to the Dischargers. Those trigger limits will be considered the numeric interpretation of the applicable narrative objectives. In locations where trigger limits are exceeded, water quality management plans must be developed that will form the basis for reporting which steps have been taken to achieve compliance with numeric and narrative water quality objectives.

X. Non-Point Source (NPS) Program

The GBP Order regulates waste discharges from irrigated agricultural lands to state waters at a specific location with limits set within the Basin Plan. As such, even though the source of the discharge is an NPS, the discharge to state waters is covered by a WDR with discharge and receiving water limits and a time schedule for compliance specified in the Basin Plan.

The GBP Order includes elements to implement the provisions of the State Water Board’s *Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control*

Program (NPS Policy) in combination with the GDA Order, which regulates discharges from irrigated agricultural lands to state waters as an NPS program. Under the NPS Policy, the Regional Water Board must find that the program will promote attainment of water quality objectives. The non-point-source program also must meet the requirements of five key structural elements. These elements include (1) the purpose of the program must be stated and the program must address NPS pollution in a manner that achieves and maintains water quality objectives and beneficial uses, including any applicable antidegradation requirements; (2) describe the practices to be implemented and processes to be used to select and verify proper implementation of practices; (3) where it is necessary to allow time to achieve water quality requirements, include a specific time schedule, and corresponding quantifiable milestones designed to measure progress toward reaching specified requirements; (4) feedback mechanisms to determine whether the program is achieving its purpose; and (5) the consequences of failure to achieve the stated purpose.

The GBP Order addresses each of the five key elements, as described below.

1. The purpose of the GBP Order is to address the water quality impacts of surface water discharges from the area served by the GBP. The principal goal of the GBP is summarized as providing for the achievement of the water objectives set by the board and the Basin Plan related to subsurface drainage discharges from the GDA while maintaining viable agricultural production in the area. The requirements of the GBP Order include requirements to meet discharge and receiving water limitations, applicable water quality objectives as stated in the Basin Plan and the requirements of State Water Board Resolution 68-16 (antidegradation requirements). Further discussion of the GBP Order's implementation of antidegradation requirements is given below under the section titled "State Water Board Resolution 68-16."
2. The board is prevented by Water Code section 13360 from prescribing specific management practices to be implemented. However, it may set forth performance standards and require dischargers to report on what practices they have or will implement to meet those standards.

   The GBP Order requires that the Dischargers develop a new Drainage Management Plan, as described in section III.D of Attachment B to the GBP Order, and provide annual updates on the actions that have or will be implemented to achieve compliance with discharge and receiving water limitations. The update will include the description of various control or management practices utilized to control the discharge of selenium and other constituents of concern and the milestones achieved set in the Basin Plan or previous annual reports under the Drainage Management Plan. Updates to the Drainage Management Plan may be submitted as part of the Annual Monitoring Report.
3. The GBP Order requires the development and implementation of a management plan to meet water quality objectives stated in the Basin Plan. A time schedule for compliance with the Basin Plan objectives is part of this Order. In addition, the GBP Order requires the development of SQMPs when water quality objectives are not met. For constituents that do not have a specific time schedule in the Basin Plan, SQMPs must include time schedules for implementing the plans and meeting the receiving water limitations (section II of the Order) as soon as practicable, but within a maximum of 10 years. The time schedules for the SQMPs must be consistent with the requirements for time schedules set forth in the GBP Order. The time schedules must include quantifiable milestones that will be reviewed by the Executive Officer and the

public prior to approval. The time schedule requirements in the GBP Order are consistent with Key Element 3.

4. The GBP Order requires feedback on whether program goals are being achieved. The GBP Order requires surface water quality monitoring. The feedback will allow iterative implementation of practices to ensure that program goals are achieved. This feedback mechanisms required by the GBP Order are consistent with Key Element 4.
5. The GBP Order establishes the following consequences where requirements are not met:
   a) The Dischargers will be required, in an iterative process, to conduct additional monitoring and/or implement actions/measures when discharge or receiving water limitations or water quality objectives are not being met.
   b) Appropriate Central Valley Water Board enforcement action where the iterative process is unsuccessful, program requirements are not met, or time schedules are not met.

The GBP Order describes consequences for failure to meet requirements and is consistent with Key Element 5.

XI. California Environmental Quality Act (CEQA)

The GBP Order is covered by the Environmental Impact Statement and Environmental Impact Report for the Grassland Bypass Project (EIS/EIR)[47] and addendum[48]. The lead agency for the EIS is the U.S. Bureau of Reclamation. The lead agency pursuant to CEQA (Pub. Resources Code § 21100 et seq.) is the San Luis & Delta-Mendota Water Authority. A Notice of Determination (NOD) was filed on 12 October 2009.[49] A Record of Decision (ROD-07-141) was issued in December 2009. No legal challenges were made to either decision.

The GBP Order relies on the environmental impact analysis contained in the EIS/EIR and addendum to satisfy the requirements of CEQA. The EIS/EIR and addendum identify the following mitigation measures that apply to surface water discharges regulated by the GBP Order:

- Update and implement a water quality monitoring program.
  Results of the monitoring program for the GBP will be reviewed semi-annually. If unacceptable problems or impacts are identified, appropriate mitigative actions will be identified to address the problems.

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[47] Entrix, 2009. *Grassland Bypass Project, 2010-2019, Environmental Impact Statement and Environmental Impact Report.* Final August 2009. Concord, CA. Prepared for: U.S. Bureau of Reclamation, South Central California Office and Mid-Pacific Region; and San Luis & Delta-Mendota Water Authority, Los Banos, CA

[48] Summers Engineering, Inc. 2019. Grassland Bypass Project Long-Term Storm Water Management Plan 2020-2045. Addendum to Final Environmental Impact Statement and Environmental Impact Report for the Grassland Bypass Project, 2010-2019. SCH No. 2007121110. Draft. August 2019. Prepared for San Luis & Delta-Mendota Water Authority.

[49] NOD filed for the Grassland Bypass Project, 2010-2019, State Clearinghouse Number 2007121110.

Appropriate mitigative actions may include, but not necessarily be limited to, interruption of specific identified contaminant pathways through hazing or habitat manipulation; increased management, enhancement, and recovery activities directed at impacted species in channels cleaned up as a result of the GBP, and/or establishment and attainment of more stringent contaminant load reductions. The costs of mitigation, as well as any required cleanup, will be borne by the draining parties. Monitoring to ensure the mitigative actions are effective will be required or continued to evaluate effectiveness.

- Implement the Storm Event Plan developed in 2007 when trigger event occurs. When major storm events occur, the Grassland Bypass Channel may not be able to handle the combined commingled discharge of surface runoff, stormwater flows and agricultural drainage, and flow may be diverted to Grassland Water District channels. Increased water velocities in the Drain have the potential to scour and damage the structural integrity of the Drain, as well as release the accumulated sediment in the channel. The Storm Event Plan details a process for notifying regulatory and system users, the trigger velocity when gates to the Grassland Water District supply channel may be opened and then closed, and a requirement for daily monitoring to determine quantity and quality of the bypassed flows.

The GBP WDRs require implementation and reporting of these mitigation measures. These measures are in addition to mitigation measures found in the Use Agreement, the EIS/EIR, and the Biological Opinion from the U.S. Fish and Wildlife Service.[50] The additional mitigation measures in the other documents include a provision of water to enhance wildlife management areas and development of mitigation funds from monthly fees applicable to each pound of selenium discharged commencing in 2015, as well as mitigation achieved through environmental commitments regarding operations, spill prevention, downstream users notification, regional archaeology, protection of China Island, Mud Slough, sediment and ongoing load reduction assurance measures. The status of mitigation measures will be reported in the Annual Monitoring Report as required by the MRP.

The Dischargers have complied with the habitat mitigation requirements in the affected reaches of Mud Slough (north) and the San Joaquin River by paying for the delivery of water to California Department of Fish and Wildlife for the creation of 95 acres of wetland (China Island), and by funding the habitat enhancement and water deliveries to U.S. Fish and Wildlife Service for 32 acres of created wetlands (Schwab Unit).

XII. Statement of Policy With Respect to Maintaining High Quality Waters in California (State Water Board Resolution 68-16)

This section of the Information Sheet first provides background on State Water Board Resolution 68-16 *Statement of Policy with Respect to Maintaining High Quality of Waters in California* (Resolution 68-16). Following the background discussion, the Information Sheet describes how the various provisions in the WDR and MRP collectively implement Resolution 68-16. In summary, the requirements of Resolution 68-16 are met through a combination of upfront project-level planning and implementation at the regional (GBP Order) or farm level (GDA Order), representative monitoring and assessments to determine whether trends in degradation are occurring, and regional planning and on-farm implementation when degradation trends are identified.

[50] Memorandum, “Endangered Species Consultation on the Proposed Continuation of the Grassland Bypass Project, 2010-2019”, dated 18 December 2009.

For the GBP Order, regional trend monitoring of surface water together with periodic assessments of available surface water information is required to determine compliance with water quality objectives and determine whether any trends in water quality improvement or degradation are occurring. If trends of degradation are identified that could result in impacts to beneficial uses, a surface quality management plan must be prepared by the Dischargers. The plan must include the identification of steps that will be implemented to address the trend in degradation and an evaluation of the effectiveness of those practices in addressing the degradation. Failure to implement improved practices will result in further direct regulation by the board, including, but not limited to, taking enforcement action.

A. Background

Basin Plan water quality objectives are developed to ensure that beneficial uses are protected. The quality of some state surface waters is higher than established Basin Plan water quality objectives. For example, nutrient levels in good, or "high quality" waters may be very low, or not detectable, while existing water quality standards for nutrients may be much higher. In such waters, some degradation of water quality may occur without compromising protection of beneficial uses. State Water Board Resolution 68-16 *Statement of Policy with Respect to Maintaining High Quality of Waters in California* (Resolution 68-16) was adopted in October of 1968 to address high quality waters in the state. Title 40 of the Code of Federal Regulations, Section 131.12 -- Antidegradation Policy (40 C.F.R. § 131.12) was developed in 1975 to ensure water quality necessary to protect existing uses in waters of the United States. Resolution 68-16 applies to discharges to all high quality waters of the state (Wat. Code, § 13050[e]); 40 C.F.R. § 131.12 applies only to surface waters.

The requirement to implement the Antidegradation Policy is contained in Resolution 68-16 (provision 2 presented below) and in the Basin Plan. The Basin Plan states that the Central Valley Water Board actions must conform to State Water Board plans and policies and among these policies is Resolution 68-16, which requires that:

1. *"Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies."*
2. *"Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained."*

For discharges to surface waters only, the Federal Antidegradation Policy (40 C.F.R. § 131.12) requires:

1. *"Existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.*
2. *Where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be*

maintained and protected unless the State finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the State's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the State shall assure water quality adequate to protect existing uses fully. Further, the State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.

3. *When high quality waters constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.*
4. *In those cases where potential water quality impairment associated with a thermal discharge is involved, the antidegradation policy and implementing method shall be consistent with section 316 of the Act."*

The State Water Board has interpreted Resolution 68-16 to incorporate the Federal Antidegradation Policy in situations where the policy is applicable (SWRCB Order WQ 86-17). The application of the Federal Antidegradation Policy to nonpoint source discharges (including discharges from irrigated agriculture) is limited.[51]

Administrative Procedures Update (APU) 90-004, Antidegradation Policy Implementation for NPDES Permitting, provides guidance for the Regional Water Boards in implementing Resolution 68-16 and 40 CFR 131.12, as these provisions apply to National Pollutant Discharge Elimination System (NPDES) permitting. APU 90-004 is not applied by this Order, which addresses nonpoint discharges from agriculture.

On 6 September 2019, the United States Court of Appeals for the Ninth Circuit issued a ruling that reversed and remanded for the district court to reconsider the claims related to the necessity to obtain a National Pollutant Discharge Elimination System (NPDES) permit for the Grassland Bypass Project[52]. The Court held that under 33 U.S.C. section

[51] 40 CFR 131.12(a)(2) requires that the "State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and *all cost-effective and reasonable best management practices for nonpoint source control.*" The EPA Handbook, Chapter 4, clarifies this as follows: "Section 131.12(a)(2) does not mandate that States establish controls on nonpoint sources. The Act leaves it to the States to determine what, if any, controls on nonpoint sources are needed to provide attainment of State water quality standards (See CWA Section 319). States may adopt enforceable requirements, or voluntary programs to address nonpoint source pollution. Section 40 CFR 131.12(a)(2) does not require that States adopt or implement best management practices for nonpoint sources prior to allowing point source degradation of a high quality water. However, States that have adopted nonpoint source controls must assure that such controls are properly implemented before authorization is granted to allow point source degradation of water quality." Accordingly, in the context of nonpoint discharges, the BPTC standard established by state law controls.

[52] Pacific Coast Federation of Fishermen's Associations v. Donald R. Glaser (9th Cir. 6 September 2019), 2019 WL 4230097, ___ F.3d ___.

1342(1)(1), discharges must be entirely from return flows related to crop production to qualify for the exemption from NPDES permit requirements. This Order is not a NPDES permit, nor does this Order permit any discharges from activities other than those related to crop production. If, after final deposition of the case, it is determined that additional permitting is needed for discharges from the Grassland Drainage Area, the Central Valley Water Board will begin the appropriate permitting process.

A number of key terms are relevant to application of Resolution 68-16 to the GBP Order. These terms are described below.

High Quality Waters: Resolution 68-16 applies whenever "existing quality of water is better than quality established in policies as of the date such policies become effective,"[53] and 40 C.F.R. § 131.12 refers to "quality of waters [that] exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation." Such waters are "high quality waters" under the state and federal antidegradation policies. In other words, high quality waters are waters with a background quality of better quality than that necessary to protect beneficial uses.[54] The Water Code directs the State Water Board and the Regional Water Boards to establish water quality objectives for the reasonable protection of beneficial uses. Therefore, where water bodies contain levels of water quality constituents or characteristics that are better than the established water quality objectives, such waters are considered high quality waters.

Both state and federal guidance indicate that the definition of high quality waters is established by constituent or parameter [State Water Board Order WQ 91-10, USEPA Water Quality Handbook, Chapter 4 Antidegradation (40 C.F.R. § 131.12) ("EPA Handbook")]. Waters can be of high quality for some constituents or beneficial uses but not for others. With respect to degraded groundwater, a portion of the aquifer may be degraded with waste while another portion of the same aquifer may not be degraded with waste. The portion not degraded is high quality water within the meaning of Resolution 68-16 (see State Water Board Order WQ 91-10).

In order to determine whether a water body is high quality water with regard to a given constituent, the background quality of the water body unaffected by the discharge must be compared to the water quality objectives. If the quality of a water body has declined since the adoption of the relevant policies and that subsequent lowering was not a result of regulatory action consistent with the state antidegradation policy, a baseline representing the historically higher water quality may be an appropriate representation of background.[55] However, if the decline in water quality was permitted consistent with state and federal antidegradation policies, the most recent water quality resulting from permitted action constitutes the relevant baseline for determination of whether the water body is high quality (see, e.g., SWRCB Order WQ 2009-0007, page 12). Additionally, if

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[53] Such policies would include policies such as State Water Board Resolution 88-63, Sources of Drinking Water Policy, establishing beneficial uses, and water quality control plans.

[54] USEPA Water Quality Handbook, Chapter 4 Antidegradation (40 CFR 131.12) , defines "high quality waters" as "those whose quality exceeds that necessary to protect the section 101(a)(2) goals of the Act [Clean Water Act], regardless of use designation."

[55] The state antidegradation policy was adopted in 1968; therefore water quality as far back as 1968 may be relevant to an antidegradation analysis. For purposes of application of the federal antidegradation policy only, the relevant year would be 1975.

water quality conditions have improved historically, the current higher water quality would again be the point of comparison for determining the status of the water body as high quality water.

Best Practicable Treatment or Control: Resolution 68-16 requires that, where degradation of high quality waters is permitted, best practicable treatment or control (BPTC) limits the amount of degradation that may occur. Neither the Water Code nor Resolution 68-16 defines the term "best practicable treatment or control."

Despite the lack of a BPTC definition, certain State Water Board water quality orders and other documents provide direction on the interpretation of BPTC. The State Water Board has stated: "one factor to be considered in determining BPTC would be the water quality achieved by other similarly situated dischargers, and the methods used to achieve that water quality" (see Order WQ 2000-07, pages 10-11). In a "Questions and Answers" document for Resolution 68-16 (the Questions and Answers Document), BPTC is interpreted to additionally include a comparison of the proposed method to existing proven technology, evaluation of performance data (through treatability studies), comparison of alternative methods of treatment or control, and consideration of methods currently used by the discharger or similarly situated dischargers.[56] The costs of the treatment or control should also be considered. Many of the above considerations are made under the "best efforts" approach described later in this section. In fact, the State Water Board has not distinguished between the level of treatment and control required under BPTC and what can be achieved through "best efforts."

The Regional Water Board may not "specify the design, location, type of construction or particular manner in which compliance may be had with [a] requirement, order, or decree" (Water Code 13360). However, the Regional Water Board still must require the discharger to demonstrate that the proposed manner of compliance constitutes BPTC (SWRCB Order WQ 2000-07). The requirement of BPTC is discussed in greater detail below.

Maximum Benefit to People of the State: Resolution 68-16 requires that where degradation of water quality is permitted, such degradation must be consistent with the "maximum benefit to people of the state." Only after "intergovernmental coordination and public participation" and a determination that "allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located" does 40 C.F.R. §131.12 allow for degradation.

As described in the Question and Answers Document, factors considered in determining whether degradation of water quality is consistent with maximum benefit to people of the State include economic and social costs, tangible and intangible, of the proposed discharge, as well as the environmental aspects of the proposed discharge, including benefits to be achieved by enhanced pollution controls. With reference to economic costs, both costs to the dischargers and the affected public are considered. Closely related to the BPTC requirement, consideration must be given to alternative treatment and control methods and whether lower water quality can be abated or avoided through reasonable means, and the implementation of feasible alternative treatment or control methods should be considered.

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[56] See *Questions and Answers, State Water Resources Control Board, Resolution 68-16* (February 16, 1995).

USEPA guidance clarifies that the federal antidegradation provision “is not a ‘no growth’ rule and was never designed or intended to be such. It is a policy that allows public decisions to be made on important environmental actions. Where the state intends to provide for development, it may decide under this section, after satisfying the requirements for intergovernmental coordination and public participation, that some lowering of water quality in "high quality waters" is necessary to accommodate important economic or social development” (EPA Handbook for Developing Watershed Plans to Restore and Protect Our Waters, Chapter 4). Similarly, under Resolution 68-16, degradation is permitted where maximum benefit to the people of the state is demonstrated.

Water Quality Objectives and Beneficial Uses: As described above, Resolution 68-16 and 40 C.F.R. § 131.12 are both site-specific evaluations that are not easily employed to address large areas or broad implementation for classes of discharges. However, as a floor, any degradation permitted under the antidegradation policies must not cause an exceedance of water quality objectives or a pollution or nuisance. Furthermore, the NPS Policy establishes a floor for all water bodies in that implementation programs must address NPS pollution in a manner that achieves and maintains water quality objectives and beneficial uses.

Waters that are Not High Quality: The “Best Efforts” Approach: Where a water body is not high quality and the antidegradation policies are accordingly not triggered, the Central Valley Water Board should, under State Water Board precedent, set limitations more stringent than the objectives set forth in the Basin Plan. The State Water Board has directed that, “where the constituent in a groundwater basin is already at or exceeding the water quality objective, the Regional Water Board should set limitations more stringent than the Basin Plan objectives if it can be shown that those limitations can be met using ‘best efforts.’” SWRCB Order WQ 81-5; *see also* SWRCB Orders Nos. WQ 79-14, WQ 82- 5, WQ 2000-07. Finally, the NPS Policy establishes standards for management practices.

The “best efforts” approach involves the Regional Water Board establishing limitations expected to be achieved using reasonable control measures. Factors which should be analyzed under the “best efforts” approach include the effluent quality achieved by other similarly situated dischargers, the good faith efforts of the discharger to limit the discharge of the constituent, and the measures necessary to achieve compliance (SWRCB Order WQ 81-5, page 7). The State Water Board has applied the “best efforts” factors in interpreting BPTC. (See SWRCB Order Nos. WQ 79-14, and WQ 2000-07).

In summary, the board may set discharge limitations more stringent than water quality objectives even outside the context of the antidegradation policies. The “best efforts” approach must be taken where a water body is not “high quality” and the antidegradation policies are accordingly not triggered.

B. Application of Resolution 68-16 Requirements to the GBP Order

The determination of a high quality water within the meaning of the antidegradation policies is water body and constituent-specific. Some water bodies receiving discharge from the GBP are already impaired for some constituents. Those same receiving water bodies meet objectives for particular constituents and would be considered “high quality waters” with respect to those constituents.

The temporary degradation of Mud Slough (north) and the San Joaquin River between

Mud Slough (north) and the Merced River is allowed through policies established in the Basin Plan. This temporary degradation is allowed because: 1) the continuation of the GBP discharges diverts drainage away from Salt Slough and the wetland water supply channels listed in Appendix 40, as afforded by the regional drainage management project, and has long-term environmental benefits to the wildlife utilizing this portion of the Pacific Flyway and the Grasslands Ecological Area; 2) the farm-based economy of the area would be adversely affected by the discontinuation of the GBP; and 3) it provides time for the development of regional drainage management capability to meet water quality objectives.

Any application of the antidegradation requirements must account for the fact that at least some of the waters into which the subsurface agricultural wastes discharge are high quality waters for some constituents. Further, the GBP Order provisions should also account for the fact that even where a water body is not high quality (such that discharge into that water body is not subject to the antidegradation policy), the board should, under State Water Board precedent, impose limitations more stringent than the objectives set forth in the Basin Plan, if those limits can be met by “best efforts.”

The WDR and MRP for the Grassland Bypass Project are intended to allow a means for the Dischargers to work with GDA growers to implement measures to meet the discharge and receiving limitations, and eventually the water quality objectives for the San Joaquin River. Continuation of the Project will allow water quality to improve by the implementation of “best effort” measures by the GDA growers.

C. Consistency with BPTC and the “Best Efforts” Approach

Due to the numerous commodities being grown, the different water management systems in place and the regional nature of the problem, identification of a specific technology or treatment device as BPTC or “best efforts” has not been accomplished. The Central Valley Water Board recognizes that there is often site-specific, crop-specific, and regional variability that affects the selection of appropriate management practices, as well as design constraints and pollution-control effectiveness of various practices. In addition, the board recognizes that the gains made in previous years in the area served by the GBP are a result of a combination of individual grower improvements, improvements made at the district level, and regional efforts.

Growers need the flexibility to choose management practices that best achieve a management measure’s performance expectations given their own unique circumstances. Management practices developed for agriculture are to be used as an overall system of measures to address nonpoint-source pollution sources on any given site. In most cases, not all of the practices will be needed to address the nonpoint sources at a specific site. Operations may have more than one constituent of concern to address and may need to employ two or more of the practices to address the multiple sources. Where more than one source exists, the application of the practices should be coordinated to produce an overall system that adequately addresses all sources for the site in a cost-effective manner.

There is no specific set of technologies, practices, or treatment devices that can be said to achieve BPTC/best efforts universally in the watershed.

The GBP needs the flexibility to explore, implement and evaluate control and treatment measures that best achieve performance expectations. These control and treatment measures will operate on a regional basis to lower the discharge loads of selenium,

salts, and boron. More than one means of control or treatment has been and will likely continue to be required for these constituents in order to meet the water quality objectives for Mud Slough (north) and the San Joaquin River above the Merced River.

There is no specific set of technologies or treatment devices that can be said to achieve BPTC/best efforts universally in the watershed considering the crop variety and factors (e.g., water allocation) affecting individual farms in the GDA. The Basin Plan in page 4-60 states:

"(1) In developing control actions for selenium, the Regional Board will utilize a priority system which focuses on a combination of sensitivity of the beneficial use to selenium and the environmental benefit expected from the action.

(2) Control actions which result in selenium load reductions are most effective in meeting water quality objectives.

(3) With the uncertainty in the effectiveness of each control action, the regulatory program will be conducted as a series of short-term actions that are designed to meet long-term water quality objectives.

(4) Best management practices such as water conservation measures, are applicable to the control of agricultural subsurface drainage."

The efforts of the GDA growers to 1) limit the discharge from the GDA; 2) the projects initiated under the SJRIP; and 3) the reuse of subsurface drainage are considered "best efforts" by the Central Valley Water Board. These efforts have lowered the selenium loading from the GBP to the San Joaquin River so that a section of the San Joaquin River has been delisted for selenium under 303(d).

BPTC is not defined in Resolution 68-16. However, the State Water Board describes in its 1995 Questions and Answers, Resolution 68-16: "To evaluate the best practicable treatment or control method, the discharger should compare the proposed method to existing proven technology; evaluate performance data, e.g., through treatability studies; compare alternative methods of treatment or control; and/or consider the method currently used by the discharger or similarly situated dischargers." Available state and federal guidance on management practices may serve as a measure of the types of water quality management goals for irrigated agriculture recommended throughout the state and country (e.g., water quality management goals for similarly situated dischargers). This will provide a measure of whether implementation of the above performance standards will lead to implementation of BPTC/best efforts.

- As part of California's Nonpoint Source Pollution Control Program, the State Water Board, California Coastal Commission, and other state agencies have identified seven management measures to address agricultural nonpoint sources of pollution that affect state waters (*California's Management Measures for Polluted Runoff*, referred to below as "Agriculture Management Measures").[57] The agricultural management measures include practices and plans installed under various NPS programs in California, including systems of practices commonly used and recommended by the USDA as components of resource management systems, water quality management plans, and agricultural waste management systems.

[57] California's Management Measures for Polluted Runoff <www.waterboards.ca.gov/water_issues/programs/nps/docs/cammpr/info.pdf>

- USEPA's National Management Measures to Control Nonpoint Source Pollution from Agriculture (EPA 841-B-03-004, July 2003),[58] "*is a technical guidance and reference document for use by State, local, and tribal managers in the implementation of nonpoint source pollution management programs. It contains information on the best available, economically achievable means of reducing pollution of surface and ground water from agriculture."*

Both of the above guidance documents describe a series of management measures. The agricultural management measures described in the state and USEPA reference documents generally include: 1) erosion and sediment control, 2) facility wastewater and runoff from confined animal facilities, 3) nutrient management, 4) pesticide management, 5) grazing management, 6) irrigation water management, and 7) education and outreach. A comparison of the recommendations with the management practices implemented by the GBP, and the GBP Order's requirements are provided below.

Management measure 1, erosion and sediment control. The GBP Order places limits on the maximum flow rate in the San Luis Drain to prevent scouring and the mobilization of drain sediments. The 2009 Use Agreement states that "[t]o avoid re-suspending sediment in the Drain, the maximum rate of flow in the Drain shall be 150 cfs" and that "[u]nder normal operations, flows will be slow enough to not cause sediment movement." This flow rate is included in the GBP Order as a discharge limit. In addition, GDA growers are not allowed to discharge tailwaters into water district canals that discharge to the Grassland Bypass Channel.

Management measure 2 is not applicable to the GBP Order, as the Order does not address waste discharges from confined animal facilities.

Management measure 3, nutrient management. As described in the State's Agricultural Management Measures document, *"this measure addresses the development and implementation of comprehensive nutrient management plans for areas where nutrient runoff is a problem affecting coastal waters and/or water bodies listed as impaired by nutrients."* Nutrient management practices implemented to meet performance standards are consistent with this measure.

Where nutrients are causing exceedances of water quality objectives in surface waters, the GBP Order would require development of a detailed SQMP which would address sources of nutrients and require implementation of practices to manage nutrients.

Management measure 4, pesticide management. As described in the State's Agricultural Management Measures document, this measure *"is intended to reduce contamination of surface water and groundwater from pesticides."* Farm management performance standards established in the GDA Order address this measure along with surface water quality monitoring conducted for pesticides based on the Pesticide Evaluation Protocol issued by the Central Valley Water Board Executive Officer on 29 November 2016 that considers factors including pesticide use rates and environmental fate.

Management measure 5, grazing management is not applicable, as the Grassland

[58] National Management Measures to Control Nonpoint Source Pollution from Agriculture <water.epa.gov/polwaste/nps/agriculture/agmm_index.cfm>

Drainage Area contains minimal acreage used for grazing.

Management measure 6, irrigation water management. As described in the state Agricultural Management Measures document, this measure "*promotes effective irrigation while reducing pollutant delivery to surface and ground waters.*"

For the GBP Order, the GDA growers are not allowed to discharge tailwater into the Grassland Bypass Channel. Control and treatment technologies are being explored to minimize the release of selenium and salts to the discharge point. Reuse of the subsurface drainage is also being utilized to meet discharge limitations and eventually the water quality objective.

Management measure 7, education and outreach. The GBP Order requires that the Dischargers meet specific performance standards and deadlines. The Dischargers have used education and outreach to the GDA growers in the past to inform growers of projects in the SJRIP and monitoring results for salinity and selenium. It is anticipated that this approach will be used, as necessary, in the future.

Implementation of practices to achieve the GBP Order's water quality requirements described above are consistent with the state and federal guidance for management measures. Because these measures are recommended for similarly situated dischargers (e.g., agriculture), compliance with the requirements of the Order will lead to implementation of BPTC/best efforts by the growers.

1. Additional Planning and Implementation Measures (SQMPs)

   The Order requires development of water quality management plans for surface water where degradation trends are observed that threaten to impair a beneficial use or where beneficial uses are impaired (i.e., water quality objectives are not being met). SQMPs include requirements to investigate sources; develop strategies to implement practices to ensure waste discharges are meeting discharge and receiving water limitations; and develop/implement a monitoring strategy to provide feedback on the effectiveness of the management plan. In addition, the SQMPs must include actions to "Identify, validate, and implement management practices to reduce loading of COC's [constituents of concern]" to the subsurface agricultural discharge, thereby improving water quality" (see Appendix MRP-1). Under these plans, additional management practices will be implemented in an iterative manner, to ensure that the management practices represent BPTC/best efforts and that degradation does not threaten beneficial uses. The SQMPs need to meet the performance standards set forth in the GBP Order. The SQMPs are also reviewed periodically to determine whether adequate progress is being made to address the degradation trend or impairment. If adequate progress is not being made, then the Executive Officer can require monitoring studies, on-site verification of implementation of practices, or the board may revoke the coverage under the GBP Order.

   It is also important to note that in some cases, other agencies may establish performance standards that are equivalent to BPTC and may be relied upon as part of a SQMP. For example, the Bureau may remove, at its discretion, sediment and organic materials deposited in the Drain at any time during the term of the 2009 Use Agreement.

   The State Water Board indicates in its Questions and Answers, Resolution 68-16: "To evaluate the best practicable treatment or control method, the discharger

should…evaluate performance data, e.g., through treatability studies...” Water quality management plans, referred to as SQMPs above, institute an iterative process whereby the effectiveness of any set of measures/practices in achieving receiving water limitations will be periodically reevaluated as necessary and/or as more recent and detailed water quality data become available. For the GBP Order, the Dischargers are required to submit a Drainage Management Plan and provide annual updates to it that detail the specific control or treatment methods implemented for subsurface drainage to comply with water quality objectives contained in the Basin Plan for discharges from the GBP. Resolution 68-16 does not require Dischargers or the GDA growers to use technology that is better than necessary to prevent degradation (as evaluated on a constituent by constituent basis). As such, the board presumes that the performance standards required by the GBP Order are sufficiently achieving BPTC where water quality conditions and management practice implementation are already preventing degradation.

D. Summary

The GBP Order Dischargers are required to implement measures to meet the above goals and periodically review the effectiveness of implemented measures and make improvements where necessary. Also, the GBP Order requires water quality monitoring and assessments aimed to identify trends, evaluate effectiveness of management practices, and detect exceedances of water quality objectives. The process of periodic review of SQMPs, review of monitoring data, and development of and updates to the Drainage Management Plan provides mechanisms for the board to better ensure that the Dischargers are meeting the requirements of the GBP Order.

The GBP Order is designed to achieve site-specific antidegradation and antidegradation-related requirements through implementation of BPTC/best efforts as appropriate and monitoring, evaluation, and reporting to confirm the effectiveness of the BPTC/best efforts measures in achieving their goals. The GBP Order relies on implementation of control and treatment technologies that constitute BPTC/best efforts, based to the extent possible on existing data, and requires the water quality monitoring to ensure that the selected measures in fact constitute BPTC where degradation of high quality waters is or may be occurring, and best efforts where waters are already degraded. For the GBP Order, the Basin Plan sets performance goals to meet water quality objectives while these measures are being implemented.

The GBP Order allows degradation of existing high-quality waters while best efforts measures/practices are being implemented. The degradation is consistent with maximum benefit to the people of the state for the following reasons:

- At a minimum, the GBP Order requires that the discharge and receiving waters achieve and maintain compliance with the discharge limitations in the Basin Plan and protect existing beneficial uses;
- The requirements implementing the GBP Order will result in use of BPTC where irrigated agricultural waste discharges may cause degradation of high quality waters; where waters are already degraded, the requirements will result in the pollution controls that reflect the “best efforts” approach. Because BPTC will be implemented, any lowering of water quality will be accompanied by implementation of the most appropriate treatment or control technology; and

- The GBP Order includes performance standards that will work to prevent further degradation of surface water quality.

The requirements of the GBP Order and the limited degradation that would be allowed are consistent with State Water Board Resolution 68-16. The requirements of the Order will result in the implementation of BPTC necessary to assure the highest water quality consistent with the maximum benefit to the people of the state. The water limitations in sections II of the GBP Order; the compliance schedules in section II and the Basin Plan for the GBP Order; and the Monitoring and Reporting Program's requirements to track compliance for the Order are designed to ensure that further degradation of water quality will not occur and that limited degradation will not unreasonably affect beneficial uses, or cause a condition of pollution or nuisance. Finally, the iterative process of reviewing data and instituting additional management measures/practices where necessary will ensure that the highest water quality consistent with the maximum benefit to the people of the state will be maintained.

XIII. Water Code Section 13141 (GBP Order)

The EIR/EIS for the 2009 Use Agreement examined the socioeconomic impacts to the region under three scenarios: 1) No Action Alternative; 2) Proposed Action; and 3) Alternate Action. The No Action Alternative assumed termination of the GBP. The Proposed Action would implement the 2009 Use Agreement conditions for the GBP. The Alternative Action examined a continuation of the GBP, but at the level set in the 2001 Use Agreement.

The key farm-level variable used for measurement of impact significance was farm profit. Farm profit summarizes the effects of an alternative on the long-run viability of farming in the area and was measured relative to estimated 2007 existing conditions. All three alternatives examined the projected effects from 2010 to 2019. Each alternative had negative annual impacts when compared to the 2007 existing conditions. The most extreme impact was the No Action Alternative which soil and water salinity would increase, crop yields and revenues would decline, acreages would shift among crops, but total cropped acreage would remain very similar between 2010 and 2019. The economic impact between the Proposed Alternative and the Alternative Action were insignificant.

The Alternative Action would not lower selenium levels below those set in the 2001 Use Agreement. The Proposed Action would lower these levels in accordance with the 2009 Use Agreement, which would lower selenium loading significantly below the TMML and eventually achieve the water quality objectives in Mud Slough (north) and the San Joaquin River above the Merced River.

XIV. Water Code Section 13263

Water Code section 13263 requires that the Central Valley Water Board consider the following factors, found in section 13241, when considering adoption of waste discharge requirements.

a) *Past, present, and probable future beneficial uses of water*
The Basin Plan identifies applicable beneficial uses of surface water and groundwater within the Sacramento and San Joaquin River Basins.

In the Grassland Watershed, identified beneficial uses for Salt Slough, Mud Slough

(north) and wetland water supply channels include irrigation,[59] stock watering, contact recreation, other noncontact recreation, warm freshwater habitat, warm spawning, wildlife habitat, commercial use, and shellfish. The GBP Order protects the beneficial uses identified in the Basin Plan. Applicable past, present, and probable future beneficial uses of the Grassland Watershed waters were considered by the Central Valley Water Board as part of the Basin Planning process and are reflected in the Basin Plan itself.

For the GBP Order, Mud Slough (north), the San Joaquin River and the wetland supply channels, the water bodies subject to discharges from the area served by the GBP, are all listed in the Basin Plan along with their designated beneficial uses.

b) *Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto*
Environmental characteristics of the Grassland watershed were considered in the development of the GBP Order. This information is contained in the August 2009 Environmental Impact Statement and Environmental Impact Report for the Grassland Bypass Project, 2010-2019, and addendum.

c) *Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area*
The GBP Order provides a process to review these factors during implementation of surface water quality management plans (SQMPs).

The GBP Order requires that agricultural subsurface discharges to surface water do not cause or contribute to an exceedance of applicable discharge limitations set in the Basin Plan or water quality objectives. SQMPs are required in areas where discharge limitations or water quality objectives are not being met and are not being addressed by existing SQMPs. Under these plans, sources of waste must be estimated along with background water quality to determine what options exist for reducing waste discharge to ensure that the GBP is in compliance with water limitations and objectives. The SQMPs must be designed to ensure that agricultural subsurface discharges do not cause or contribute to an exceedance of water limitations or a water quality objectives set in the Basin Plan, and meet other applicable requirements of the GBP Order, including, but limited to, section II.

d) *Economic considerations*
For the GBP Order, the EIR/EIS for the GBP from 2010 to 2019 anticipated economic effects to be farm income linked to farm investment and consumption. Regional economic activity would be affected due to the linkages between production agriculture and a myriad of other sectors of the economy. The GBP Order allows for the continuation of farm activities and the use of the Drain. Costs for the GBP Order into Phase III of the Project are borne by the farmers in the Grassland Drainage Area. Implementation of the GBP Order is expected to increase farm profits from crop production compared to the No Action alternative (no use agreement for the Drain) until 2015 when an anticipated treatment facility is operational and annual costs will decrease farm profits. The decrease in profits is estimated to fall slight below profits

[59] Basin Plan footnote for Mud Slough (north) and wetland water supply channels states "[e]levated natural salt and boron concentrations may limit this use to irrigation of salt and boron tolerant crops. Intermittent low flow conditions may also limit this use."

from the No Action alternative for the period from 2015 to 2019. The GBP Order will not unreasonably affect the GDA growers or region adversely.

e) *The need for developing housing within the region*
The GBP Order establishes waste discharge requirements for subsurface agricultural discharges and stormwater runoff from the area served by the Grassland Bypass Project, where the land use is primarily irrigated agriculture. The GBP Order will not affect the development of housing within the region.

f) *The need to develop and use recycled water*
The GBP Order does not establish any requirements for the use or purveyance of recycled wastewater. The SJRIP treatment facility will treat subsurface drainage and plans to recycle the treated lower selenium/salt effluent back into the fields where the drainage originated. No waste discharge requirements will be required for this pilot facility since the discharge will be recycled into essentially a closed loop system (see Figure 18). Once the closed loop system is terminated and recycled water from the treatment facility is recycled, waste discharge requirements will be required.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ATTACHMENT B TO ORDER R5-2019-0077
MONITORING AND REPORTING PROGRAM

WASTE DISCHARGE REQUIREMENTS
FOR

SAN LUIS & DELTA-MENDOTA WATER AUTHORITY
AND
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

SURFACE WATER DISCHARGES FROM THE
GRASSLAND BYPASS PROJECT

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FRESNO AND MERCED COUNTIES

I. Introduction

This Monitoring and Reporting Program (MRP) is issued pursuant to California Water Code (Water Code) section 13267 which authorizes the California Regional Water Quality Control Board, Central Valley Region (hereafter Central Valley Water Board or "board"), to require preparation and submittal of technical and monitoring reports. This MRP includes requirements for San Luis & Delta-Mendota Water Authority and United States Department of the Interior Bureau of Reclamation (hereafter "Dischargers") operating under Order R5-2019-0077 (hereafter referred to as the "Order"). The requirements of this MRP are necessary to determine whether state waters receiving discharges are meeting discharge and receiving water limitations. Additional discussion and rationale for this MRP's requirements are provided in Attachment A of the Order.

This MRP Order addresses the discharge of subsurface agricultural drainage from the Grassland Drainage Area (GDA) by member districts within the San Luis & Delta-Mendota Authority that use a portion of the San Luis Drain (SLD), owned by the Bureau of Reclamation, to Mud Slough (north), a point six miles upstream of the San Joaquin River confluence. This is known as the Grassland Bypass Project which has removed subsurface agricultural drainage from wetlands water supply channels in the Grasslands watershed.

The MRP Order establishes specific surface water monitoring, reporting, and electronic data deliverable requirements for the Dischargers that are required to determine compliance with the limitations set in the Order.

II. General Provisions

To the extent feasible, all technical reports required by this MRP must be submitted electronically in a format specified by the Central Valley Water Board that is reasonably available to the Dischargers.

A. Surface Water Monitoring

Surface water monitoring shall be conducted at the sites listed in Table 1. Locations of these monitoring stations are shown in Figure 1 of the Order.

Table 2 lists the discharge and receiving water monitoring parameters and frequency for stations in the San Luis Drain, Mud Slough (north), and the San Joaquin River. Monitoring at each station will consider the safety of the sampling crew. If the sampling crew is unable to sample a location due to safety concerns, photos and/or field sheets shall be provided to document the reason no samples were taken.

Table 3 lists the requirements for sediment tests, including sediment toxicity, for this MRP. The Dischargers shall submit a sediment monitoring plan consistent with the requirements in section III.E that will include constituents to be analyzed and a monitoring schedule. Sediment tests, at a minimum, shall include total selenium.

Table 1: Monitoring Stations

Feature	CEDEN Code	Station	Location	Latitude	Longitude
San Luis Drain	541MER562	A	Check 17	36.96658 N	-120.67063 W
	Not Applicable	B2*	Terminus at Mud Slough	37.26100 N	-120.90520 W
	541SLDGCR	B3	Gun Club Road	37.23159 N	-120.87599 W
Mud Slough (north)**	541MER542	D	Downstream of San Luis Drain	37.26374 N	-120.90627 W
Wetlands channels	541MER505	J***	Camp 13 Drain, headworks	36.94117 N	-120.75685 W
	541AGCHWK	K2***	Agatha Canal, headworks	36.93399 N	-120.70258 W
	541MER563	L2***	San Luis Canal upstream of splits	37.09167 N	-120.82306 W
	541MER545	M2***	Santa Fe Canal @ Weir Rd	37.09889 N	-120.82667 W
San Joaquin River	541SLRACI	R	China Island Unit	37.33622 N	-120.96763 W
	541MER538	G	Fremont Ford	37.30944 N	-120.92917 W
	Not Applicable	H2*	Above Merced River (Hills Ferry)	337.34737 N	-120.97500 W
	535STC504	N	Crows Landing	37.43149 N	-121.01341 W

* *Note for Station B2 and H2:* Flow and electrical conductivity measurement only.

** Note for Mud Slough (north): Mud Slough (north) upstream of the San Luis Drain is monitored regularly under Order R5-2014-0002 (as revised)[1].

*** *Note for Station J, K2, L2 and M2:* Samples will be collected when water is passing site during a storm event. Two wetland channel locations, sites L3 and M3, on the San Luis Canal and Santa Fe Canal are monitored regularly under Order R5-2014-0002 (as revised)[2].

[1] Central Valley Water Board. 2014. Order R5-2014-0002 Waste Discharge Requirements General Order for Growers within the Western San Joaquin River Watershed that are Members of a Third-party Group. Adopted 9 January 2014 (as revised).

Table 2: Discharge and Receiving Water Monitoring Stations, Parameters and Frequency[3]

Parameter (unit)	Type of Sample	Station	Frequency
Flow (cfs)	Daily average	A, B2*, D, G, H2*, N	Daily
Field measurements[4]			
pH (pH units)	Grab	A, B3, D, G, R, N	Weekly
Electrical conductivity (µmhos/cm)	Grab	A, B3, D, G, R, N	Weekly
Electrical conductivity (µmhos/cm)	Daily average	A, B2*, D, G, H2*, N	Daily
Temperature (ºC)	Grab	A, B3, D, G, R, N	Weekly
General physical			
Total organic carbon (mg/L)	Grab	D	Weekly
Selenium (total) (µg/L)	Grab	A, B3, D, G, R, N	Weekly
Selenium (total) (µg/L)	Composite	A, B3, D, N	Daily
Boron (mg/L)	Grab	B3, D, R, N	Weekly
Molybdenum (µg/L)	Grab	B3, D, R, N	Monthly
Nutrients			
Nitrate as N (mg/L)	Grab	B3, D	Monthly
Ammonia as N (mg/L)	Grab	B3, D	Monthly
Pesticides			
Per Pesticides Evaluation Protocol[5]	Grab	B3, D, R	Monthly when Site A is flowing.
Chronic Aquatic Toxicity			
Selenastrum capricornutum (growth)	Grab	D	Monthly
Acute Aquatic Toxicity			
Daphnia magna (survival)	Grab	D	Monthly
Pimephales promelas (survival)	Grab	D	Monthly

* *Note for Station B2 and H2:* Flow and electrical conductivity measurement only.

Daily selenium samples collected at San Luis Drain at Check 17 (Site A), San Luis Drain at Gun Club Road (Site B3), Mud Slough (north) (Site D), and the San Joaquin River

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[2] ibid.

[3] Additional monitoring requirements apply to agricultural dischargers under Resolution R5-2017-0057 Pyrethroid Control Program, which requires monitoring for the water column concentrations of pyrethroid pesticides and total and dissolved organic carbon, and water column and sediment toxicity testing in surface receiving waters.

[4] Field measurements shall be noted on the Field Sheet, as well as any physical and/or visual observations regarding the water body, the environment, or surrounding area.

[5] Central Valley Water Board. 2016. Issuance of the Pesticides Evaluation Protocol and List of Pesticides. Issued on 29 November 2016.

(Site N) will be composite samples collected by on-site, multi-bottle auto-samplers and composited during a 24-hour period before changing bottles. San Luis & Delta-Mendota Water Authority staff will visit the auto-samplers weekly to collect bottles and to inspect the auto-samplers. Daily samples will be used to calculate the 4-day average selenium concentration. If equipment failure prevents the collection of three (3) or more consecutive daily samples, the weekly grab sample will be used as a substitute for the calculation of the 4-day average selenium concentration.

Table 3: Sediment Monitoring Stations, Parameters and Frequency[6]

Sediment Toxicity	Type of Sample	Station	Frequency
Hyalella Azteca (survival) Total organic carbon (mg/L) Grain size	Grab	D	Biannual
Sediment[7] To be determined	Grab	B3	Annual

B. Stormwater Monitoring

Storm and flood event monitoring will be required when flows are expected to exceed the capacity of the San Luis Drain as a result of rainfall events. Actions to be taken are specified in the Stormwater Plan[8], which is distinct from the Long-term Stormwater Management Plan. At a minimum, the following components of the Stormwater Plan shall be done when heavy rains or storm events are predicted for the region and the Regional Drainage Coordinator, identified in the Environmental Impact Statement and Environmental Impact Report for the Grassland Bypass Project (EIS/EIR)[9], determines that the Grassland Bypass will be unable to accommodate all of the surface runoff, stormwater flows and agricultural drainage water from the event, and thereby allowing commingled water to enter Grassland wetland supply channels:

1. Notification

The following individuals are to be informed of the possible diversion to Grassland wetland supply channels:

- the main contact at the Central Valley Water Board in Sacramento;
- the Manager of the Grassland Water District;

[6] Additional monitoring requirements apply to agricultural dischargers under Resolution R5-2017-0057 Pyrethroid Control Program, which requires monitoring for the water column concentrations of pyrethroid pesticides and total and dissolved organic carbon, and water column and sediment toxicity testing in surface receiving waters.

[7] Provision II.B.4 of the WDR prohibits hazardous waste levels for any constituent.

[8] Grassland Area Farmers and San Luis & Delta-Mendota Water Authority. “A Storm Event Plan for Operating the Grassland Bypass Project”. August 25, 1997.

[9] Entrix, 2009. *Grassland Bypass Project, 2010-2019, Environmental Impact Statement and Environmental Impact Report.* Final August 2009. Concord, CA. Prepared for: U.S. Bureau of Reclamation, South Central California Office and Mid-Pacific Region; and San Luis & Delta-Mendota Water Authority, Los Banos, CA

- the Manager of the Central California Irrigation District;
- the Manager of the San Luis Canal Company;
- personnel at the State and Federal Wildlife Areas that use the water supply channels in the region;
- managers of the irrigation and drainage districts participating in the Grassland Drainage Area;
- the Manager of the San Joaquin River Exchange Contractors Water Authority; and
- the Area Manager, South-Central California Area Office, Bureau of Reclamation.

2. Criteria and Associated Actions

Criteria	Action
Anticipated flow through Station A >100 cfs and threat of precipitation	– Notification process initiated – Gates to Camp13 Ditch and/or Agatha Canal opened by Grassland Water District – Proportional amounts of flow diverted estimated by operators of the Grassland Bypass in consultation with Grassland Water District personnel – Stormwater monitoring program initiated
Flow through Station A falls below 100 cfs and no threat of precipitation	– Flow of water to Grassland Water District terminated – Stormwater monitoring program continued for 1 week

Station A is the point where the Grassland Bypass Channel discharges into the San Luis Drain. The Regional Drainage Coordinator measures the flows at Station A and will determine if the storm event notifications and monitoring need to be initiated.

Monitoring shall occur immediately prior to diversion of stormwater into the Grassland wetland supply channels at Stations J (Camp-13 Ditch) and K2 (Agatha Canal), and at the channels entering the North Grassland Water District at Stations L2 and M2. Table 4 lists the parameters that are to be monitored during a stormwater event; monitoring shall occur daily during the water diversion and for one week after the diversion ceases.

Table 4: Stormwater Monitoring Parameters and Frequency

Parameter (unit)	Type of Sample	Sampling Frequency
Flow	Daily average	Daily
pH	Grab	Daily
Electrical conductivity	Grab	Daily
Temperature	Grab	Daily
Selenium	Grab	Daily
Boron	Grab	Daily

C. Pesticides

The pesticides to be monitored will be identified according to the process provided in the Pesticides Evaluation Protocol (PEP), issued by the Executive Officer on 29

November 2016. The pesticides to be monitored will be updated annually and submitted for Executive Officer approval. Pesticide samples will be collected monthly at Sites B3, D, and R during periods when there is discharge from the Grassland Drainage Area into Site A. The time lag between the start of the discharge at Site A and the resulting discharge at Site B3 is 24 to 48 hours and pesticide sampling may be delayed up 72 hours, but no more, from the initiation of flow at Site A, depending on hydrologic conditions.[10]

D. Toxicity Testing

The purpose of toxicity testing is to: 1) evaluate compliance with the Basin Plan narrative toxicity water quality objective; 2) identify the causes of toxicity when and where it is observed (e.g. metals, pesticides, ammonia, etc.); and 3) evaluate any additive toxicity or synergistic effects due to the presence of multiple constituents.

1. Aquatic Toxicity

Aquatic toxicity testing shall include *Daphnia magna*, *Pimephales promelas*, and *Selenastrum capricornutum* in the water column. Testing for *Daphnia magna* and *Pimephales promelas* shall follow the USEPA acute toxicity testing methods, Method 2012.0 and 2000.0, respectively.[11] Testing for *Selenastrum capricornutum* shall follow the USEPA short-term chronic toxicity testing method, Method 1003.0.[12] Toxicity test endpoints are survival for *Daphnia magna* and *Pimephales promelas*, and growth for *Selenastrum capricornutum*.

Water column toxicity analyses shall be conducted on 100% (undiluted) sample for the initial screening. A sufficient sample volume must be collected to allow for renewal during the toxicity test and for any additional testing as specified below.

If within the first 96 hours of the initial toxicity screening, the mortality reaches 100%, a multiple dilution test shall be initiated. The dilution series must be initiated within 24 hours of the sample reaching 100% mortality and must include a minimum of five (5) sample dilutions in order to quantify the magnitude of the toxic response. For the fathead minnow test, the laboratory must take the steps to procure test species within one working day, and the multiple dilution tests must be initiated the day fish are available.

Daphnia magna and *Pimephales promelas* Media Renewal

Daily sample water renewals shall occur during all acute toxicity tests to minimize the effects of rapid pesticide losses from test waters. Test solution renewal must be 100% sample water as defined in the freshwater toxicity testing manual.

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[10] Pesticides to be monitored may include environmentally stable degradates of the registered active ingredient. The evaluation factors applied to degradates will be the same as those applied to the registered active ingredient and will include consideration of the commercial availability of analytical methods to detect the degradate.

[11] USEPA. 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. Office of Water, Washington, D.C. USEPA-821-R-02-012.

[12] USEPA. 2002. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition. Office of Water, Washington, D.C. USEPA-821-R-02-013.

Selenastrum capricornutum Pre-Test Treatment

Algae toxicity testing shall not be preceded with treatment of the chelating agent EDTA. The purpose of omitting this agent is to ensure that metals used to control algae in the field are not removed from sample aliquots prior to analysis or during the initial screening.

2. Sediment Toxicity

Sediment toxicity analyses shall be conducted according to EPA Method 600/R-99/064. Sampling and analysis for sediment toxicity testing utilizing *Hyalella azteca* shall be conducted at the sites specified in Table 3, if appropriate sediment (i.e. silt, clay) is present at the site. If appropriate sediment is not present at the designated water quality monitoring site, an alternative site with appropriate sediment shall be designated for all sediment collection and toxicity testing events. Sediment samples shall be collected and analyzed for toxicity twice per year, with one sample collected between 15 August and 15 October, and one sample collected between 1 March and 30 April, during each year of monitoring. The *Hyalella azteca* sediment toxicity test endpoint is survival. The Executive Officer may request different sediment sample collection timing and frequency under a Surface Water Quality Management Plan.

All sediment samples must be analyzed for total organic carbon (TOC) and grain size. Analysis for TOC is necessary to evaluate the expected magnitude of toxicity to the test species. Note that sediment collected for grain size analysis shall not be frozen. If the sample is not toxic to the test species, the additional sample volume can be discarded.

E. Surface Water Data Management

All surface water field and laboratory data (including sediment) must be submitted electronically to the Central Valley Water Board in the required templates. The Dischargers shall ensure that the most current version of the templates is being utilized. Required formatting and business rules for field, chemistry and toxicity data are detailed within the respective template instruction manuals (see below). These manuals are maintained in collaboration with the Central Valley Regional Data Center (CV RDC) to ensure comparability with the California Environmental Data Exchange Network (CEDEN). In addition to the use of required templates for field, chemistry, and toxicity data, the Dischargers shall maintain an electronic version of its approved Quality Assurance Project Plan (eQAPP). Detailed electronic water quality data submittal requirements are provided in section II.E of this MRP Order. Note that electronic copies (e.g. PDF) of all original field sheets, field measurement instrumentation calibration logs, chain of custody forms and laboratory reports must be included in the electronic data submittal

Once data have been submitted to the Central Valley Water Board, it will undergo a series of reviews for adherence to the required formatting and business rules. The data will also be reviewed for the required quality control elements as detailed within the Dischargers' eQAPP. The Dischargers will be notified of any changes made to the dataset to successfully load the data. If significant changes are found to be needed, the dataset will be returned to the Dischargers for revision. Once any needed review and/or correction of the data sets are complete, data will be uploaded by the Central Valley Water Board into a CV RDC CEDEN comparable database. The dataset will then undergo a final set of reviews to ensure completeness and then be transferred to

CEDEN for public access.

A narrative describing each required template is provided below. Links to the required templates, instruction manuals and optional tools are available on the ILRP Electronic Water Quality Monitoring Data Submission Resources webpage

<www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/electronic_data_submission/>.

Field Data Template (Required)

The Dischargers shall input all site visit information and field measurement results into the field data template, which is an Excel workbook. Site visit information (Location and Habitat) must be recorded for any site visit conducted to comply with the requirements in this Order, including events when a site is dry. The field data template contains three required worksheets (Locations, FieldResults, HabitatResults) and four optional worksheets (Stations, FundingCode, GroupCode and Personnel). An instruction manual for the template is available on the ILRP Electronic Data Submission webpage.

Chemistry Data Template (Required)

The Dischargers shall input all chemistry analysis and associated quality control information into the chemistry data template, which is an Excel workbook. The chemistry data template contains two required worksheets: Results and LabBatch. An instruction manual for the template is available on the ILRP Electronic Data Submission webpage.

Toxicity Data Template (Required)

The Dischargers shall input all toxicity analysis and associated quality control information, with the exception of reference toxicity analyses, into the toxicity data template, which is an Excel workbook. The toxicity data template contains three required worksheets: Results, Summary, and ToxBatch. An instruction manual for the template is available on the ILRP Electronic Data Submission webpage.

Electronic Quality Assurance Program Plan (eQAPP) (Required)

The eQAPP is an Excel workbook containing a worksheet of the quality control requirements for each analyte and method as detailed in the most current version of the Dischargers' approved QAPP. The eQAPP workbook will also include additional worksheets containing references for applicable codes, CEDEN retrieval information, and other project specific information. The Dischargers shall be responsible for updating the Quality Control worksheet to the most current approved QAPP. Each analyte, method, extraction, units, recovery limits, QA sample requirement, etc. is included in this document using the appropriate codes required for the CEDEN comparable database. This information should be used to conduct a quality control review before submission. Data that does not meet the project quality assurance acceptance requirements must be flagged accordingly and include applicable comments.

The Central Valley Water Board and CV RDC have also developed several optional tools to assist the Dischargers. Links to these tools, unless otherwise noted, are available on the ILRP Electronic Data Submission webpage.

Field Sheet Template (Optional)

An example of a CEDEN comparable field sheet can be found on the ILRP webpage. This field sheet was designed to match the entry user interface within the CEDEN

comparable database to allow for easier data entry of all sample collection information.

CV RDC Field Entry Shell Database (Optional)

The CV RDC Field Entry Shell Database is a copy of the CV RDC database infrastructure that provides a user interface for site visit and field measurements data entry only. The shell database may be used by those who prefer to enter field data through a user interface rather than directly into the required Excel template. The database provides an export function that can populate the required CV RDC field data template with the data entered. The populated template is then required to be submitted to the Central Valley Water Board. The shell database may not be used for entry of chemistry or toxicity data. A custom field entry shell database may be obtained by contacting the CV RDC <mlj-llc.com/contact.html>.

Format Quick Guide (Optional Tool)

The Format Quick Guide is a guidance document developed to aid the Dischargers with data entry and can be used as a reference tool for commonly used codes necessary for populating the required data entry templates. The Central Valley Water Board will provide this document, and updates to it, upon request.

EDD Checklist with example Pivots (Optional Tool)

The electronic data deliverable (EDD) checklist provides for a structured method for reviewing data deliverables from data entry staff or laboratories before loading. Example pivot tables are provided to assist with the review of the data. Documentation on how to use the checklist and associated pivot tables is available on the ILRP Electronic Data Submission webpage.

Online Data Checker (Optional Tool)

An online data checker was developed to automate the checking of the datasets against many of the format requirements and business rules associated with CEDEN comparable data. The data checker can be accessed through the ILRP Electronic Data Submission webpage. Please note that data submission will not be accepted through this tool; however, the checker can still be used to check data for formatting and business rule compliance.

III. Reporting Requirements

Reports and notices shall be submitted in accordance with section VI of the Order, Reporting Provisions.

A. Semi-annual Submittals of Surface Water Monitoring Results

Every six months, the Dischargers shall submit the previous six months surface water monitoring results in an electronic format. The schedule for these submittals is listed in Table 5 below.

Table 5: Semi-annual Surface Water Monitoring Data Report Schedule

Due Date	Type	Reporting Period
31 October	Semi-annual Monitoring Data Report	1 January through 30 June of calendar year
30 April	Semi-annual Monitoring Data Report	1 July through 31 December of previous calendar year

Exceptions to due dates for submittal of electronic data may be granted by the Executive Officer if good cause is shown. The Semi-annual Surface Water Monitoring Data Report shall include the following for the required reporting period:

1. An Excel workbook containing an export of all data records uploaded and/or entered into the CEDEN comparable database (surface water data). The workbook shall contain, at a minimum, those items detailed in the most recent version of the Dischargers' approved QAPP.
2. The most current version of the Dischargers' eQAPP.
3. Electronic copies of all field sheets.
4. Electronic copies of photos obtained from all surface water monitoring stations, clearly labeled with the CEDEN comparable station code and date.
5. Electronic copies of all applicable laboratory analytical reports on a CD.
6. For toxicity reports, all laboratory raw data must be included in the analytical report (including data for failed tests), as well as copies of all original bench sheets showing the results of individual replicates, such that all calculations and statistics can be reconstructed. The toxicity analyses data submittals must include individual sample results, negative control summary results, and replicate results. The minimum in-test water quality measurements reported must include the minimum and maximum measured values for specific conductivity, pH, ammonia, temperature, and dissolved oxygen.
7. For chemistry data, analytical reports must include, at a minimum, the following:
    a. A lab narrative describing QC failures,
    b. Analytical problems and anomalous occurrences,
    c. Chain of custody (COCs) and sample receipt documentation,
    d. All sample results for contract and subcontract laboratories with units, RLs and MDLs,
    e. Sample preparation, extraction and analysis dates, and
    f. Results for all QC samples including all field and laboratory blanks, lab control spikes, matrix spikes, field and laboratory duplicates, and surrogate recoveries.

Laboratory raw data such as chromatograms, spectra, summaries of initial and continuing calibrations, sample injection or sequence logs, prep sheets, etc., are not required for submittal, but must be retained by the laboratory in accordance with the requirements of section VII of the Order, Record-keeping Requirements.

If any data are missing from the semi-annual report, the submittal must include a description of what data are missing and when they will be submitted to the Central Valley Water Board. If data are loaded into the CEDEN comparable database, this shall also be noted with the submittal.

B. Annual Monitoring Report

The Annual Monitoring Report shall be submitted by 30 April of each year. The report shall cover the monitoring periods for the previous calendar year (1 January through 31 December). The report shall include the following components:

1. Signed transmittal letter;

2. Title page;
3. Table of contents;
4. Executive summary;
5. Monitoring objectives and design;
6. Sampling site descriptions and rainfall records for the time period covered under the Monitoring Report;
7. Location map(s) of sampling sites;
8. Results of all analyses arranged in tabular form so that the required information is readily discernible;
9. Discussion of data relative to water quality objectives, limitations and water quality management plan milestones, where applicable;
10. Sampling and analytical methods used;
11. Summary of Quality Assurance Evaluation results (as identified in the most recent version of the approved QAPP for Precision, Accuracy and Completeness);
12. Specification of the method(s) used to obtain estimated flow at each surface water monitoring site during each monitoring event;
13. Summary of exceedances of water quality objectives/trigger limits occurring during the reporting period.
14. Any storm event monitoring performed during the reporting period.
15. Actions taken to address water quality exceedances that have occurred, including but not limited to, revised or additional management practices implemented;
16. Evaluation of monitoring data to identify spatial and temporal trends and patterns;
17. Status of implemented measures to meet water quality objectives and/or limits;
18. Status of mitigation measures specified in the EIS/EIR[13] and addendum[14].
19. Conclusions and recommendations.

Additional requirements and clarifications necessary for the above report components are described below.

Report Component (1) —Signed Transmittal Letter
A transmittal letter shall accompany each report. The transmittal letter shall be submitted and signed in accordance with the requirements of section VI of the Order, Reporting Provisions.

[13] Entrix, 2009. *Grassland Bypass Project, 2010-2019, Environmental Impact Statement and Environmental Impact Report.* Final August 2009. Concord, CA. Prepared for: U.S. Bureau of Reclamation, South Central California Office and Mid-Pacific Region; and San Luis & Delta-Mendota Water Authority, Los Banos, CA.

[14] Summers Engineering, Inc. Grassland Bypass Project Long-Term Storm Water Management Plan 2020-2045. Addendum to Final Environmental Impact Statement and Environmental Impact Report for the Grassland Bypass Project, 2010-2019. SCH No. 2007121110. Draft. August 2019. Prepared for San Luis & Delta-Mendota Water Authority.

Report Component (7) — Location Maps
Location map(s) showing the sampling stations within the project area must be updated (based on available sources of information) and included in the Annual Monitoring Report. An accompanying GIS shapefile or geodatabase of monitoring site information must include the CEDEN comparable site code and name and Global Positioning System (GPS) coordinates. The map(s) must contain a level of detail that ensures they are informative and useful. GPS coordinates must be provided as latitude and longitude in the decimal degree coordinate system (at a minimum of five decimal places). The datum must be either WGS 1984 or NAD83, and clearly identified on the map. The source and date of all data layers must be identified on the map(s). All data layers/shapefiles/geodatabases included in the map shall be submitted with the Annual Monitoring Report.

Report Component (8) – Tabulated Results
In reporting monitoring data, the Dischargers shall arrange the data in tabular form so that the required information is readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with the data collection requirements of the MRP. The results of any monitoring done more frequently than required at the locations specified in this MRP Order shall be reported to the Board in the Annual Monitoring Report.

Report Component (9) — Data Discussion to Illustrate Compliance
The report shall include a discussion of the compliance with the data collection requirements of the MRP. If a required component was not met, an explanation for the missing data must be included. Results must also be compared to water quality objectives and trigger limits. Discussion shall include visual observations noted on the field sheets regarding the sampling station (e.g., film noted on surface of water, debris in the channel).

Report Component (11) — Quality Assurance Evaluation (Precision, Accuracy and Completeness)
A summary of precision and accuracy results (both laboratory and field) is required in the report. The required data quality objectives are identified in the most recent version of the approved QAPP; acceptance criteria for all measurements of precision and accuracy must be identified. The Dischargers must review all QA/QC results to verify that protocols were followed and identify any results that did not meet acceptance criteria. A summary table or narrative description of all QA/QC results that did not meet objectives must be included. Additionally, the report must include a discussion of how the failed QA/QC results affect the validity of the reported data. The corrective actions to be implemented are described in the QAPP Guidelines.

In addition to precision and accuracy, the Dischargers must also calculate and report completeness. Completeness includes the percentage of all quality control results that meet acceptance criteria, as well as a determination of project completeness. The Dischargers may ask the laboratory to provide assistance with evaluation of their QA/QC data, provided that the Dischargers prepare the summary table or narrative description of the results for the Annual Monitoring Report.

Report Component (13) — Summary of Exceedances
A summary of the exceedances of water quality objectives or triggers that have occurred during the monitoring period is required in the Annual Monitoring Report.

Report Component (14) – Storm Event Monitoring

The Dischargers shall report if any stormwater from the GDA is discharged into the wetlands water supply channels and the monitoring performed for the event.

Report Component (16) — Evaluation of Monitoring Data

The Dischargers must evaluate the monitoring data in the Annual Monitoring Report in order to identify potential trends and patterns in surface quality that may be associated with waste discharge from irrigated lands. As part of this evaluation, the Dischargers must analyze all readily available monitoring data, including monitoring data collected by the Westside San Joaquin River Watershed Coalition under Order R5-2014-0002 (as revised)[15] (e.g., Mud Slough [north] upstream of the San Luis Drain, site C, and two wetland channel locations, sites L3 and M3, on the San Luis Canal and Santa Fe Canal) that meet program quality assurance requirements to determine deficiencies in monitoring for discharges from the Grassland Bypass Project and whether additional sampling locations are needed. If deficiencies are identified, the Dischargers must propose a schedule for additional monitoring or source studies. Where this monitoring is being conducted by other projects, the sites, constituents, sampling schedule, and data location may be reported rather than duplicating the effort. Upon notification from the Executive Officer, the Dischargers must monitor any parameter in a watershed that lacks sufficient monitoring data (i.e., a data gap should be filled to assess irrigated agriculture's effects on water quality).

The Dischargers should incorporate pesticide use information, as needed, to assist in its data evaluation. Wherever possible, the Dischargers should utilize tables or graphs that illustrate and summarize the data evaluation.

Report Component (17) – Status of Implemented Measures

As part of the Annual Monitoring Report, the Dischargers shall report on the implemented measures (control or treatment) specified in the EIS/EIR[16] and addendum[17], and update the activities and measures implemented for the year to meet water quality objectives and/or limits. The update shall include an evaluation of the effectiveness of the control or treatment measures implemented. Any milestones set in the Drainage Management Plan (which can be incorporated in this component of the Annual Monitoring Report) shall be identified and the status reported.

Report Component (18) – Status of Mitigation Measures

The Dischargers shall report on the status of the mitigation measures that are specified

[15] Central Valley Water Board. 2014. Order R5-2014-0002 Waste Discharge Requirements General Order for Growers within the Western San Joaquin River Watershed that are Members of a Third-party Group. Adopted 9 January 2014 (as revised).

[16] Entrix, 2009. *Grassland Bypass Project, 2010-2019, Environmental Impact Statement and Environmental Impact Report.* Final August 2009. Concord, CA. Prepared for: U.S. Bureau of Reclamation, South Central California Office and Mid-Pacific Region; and San Luis & Delta-Mendota Water Authority, Los Banos, CA

[17] Summers Engineering, Inc. 2019. Grassland Bypass Project Long-Term Storm Water Management Plan 2020-2045. Addendum to Final Environmental Impact Statement and Environmental Impact Report for the Grassland Bypass Project, 2010-2019. SCH No. 2007121110. Draft. August 2019. Prepared for San Luis & Delta-Mendota Water Authority.

in the EIS/EIR[18] and addendum[19]. Electronic copies of photos obtained to document the implementation of mitigation measures (e.g., short-term storage basins) shall also be provided.

C. Surface Water Exceedance Reports

The Dischargers shall provide surface water exceedance reports if monitoring results show exceedances of adopted numeric water quality objectives or trigger limits, which are based on interpretations of narrative water quality objectives or other limitations established in this Order. For each surface water quality objective exceeded at a receiving water monitoring location, the Dischargers shall submit an Exceedance Report to the Central Valley Water Board. The estimated flow at the monitoring location must be submitted in addition to the exceedance report but do not need to be submitted more than once. The Dischargers shall evaluate all of its monitoring data and determine exceedances no later than five (5) business days after receiving the laboratory analytical reports for an event. Upon determining an exceedance, the Dischargers shall send the Exceedance Report by email to the designated Central Valley Water Board staff contact by the next business day. The Exceedance Report shall describe the exceedance, the follow-up monitoring, and analysis or other actions the Dischargers may take to address the exceedance. Upon request, the Dischargers shall also notify the agricultural commissioner of the county in which the exceedance occurred and/or the director of the Department of Pesticide Regulation.

D. Drainage Management Plan

By 6 December 2020, the Dischargers shall submit a Drainage Management Plan (DMP). The Long Term Drainage Management Plan previously developed, including the previous annual updates made to it, shall continue to apply until the DMP is approved by the Executive Officer. The DMP shall address how the Dischargers propose to meet water quality objectives and specify control or treatment measures to manage constituent loads (e.g., boron, molybdenum, salt, and selenium). The plan shall contain the following information:

1. The specific control or treatment methods that will be implemented to comply with the water quality control program for subsurface drainage discharges from the Grassland Watershed as contained in the Basin Plan. The DMP shall present the on-farm and district level activities the Dischargers will implement to achieve water quality objectives. Provide a time schedule for implementation.
2. An indication of the relative importance of the various control or treatment measures, describe and list them in the order of significance with respect to the extent to which each is expected to reduce selenium discharges.
3. Operation and maintenance procedures for specific control or treatment methods (e.g., remote shut-off system for tile sumps, routing of stormwater to short-term storage basins).

[18] Entrix, 2009.

[19] Summers Engineering, Inc. 2019.

4. Define and/or quantify the criteria (e.g., storm events) that will result in the initiation of specific control or treatment methods and/or the discharge of stormwater from the Grassland Bypass Project.
5. Identification of critical milestones the control program must address.
6. For each milestone, identify the goal of the Grassland Area Farmers and the critical steps that must be taken to continue operations in compliance with the Basin Plan and other limitations. For each critical step, indicate the proposed start and completion dates.
7. Address the long-term approach for dealing with stormwater. What efforts will be made to reduce the threat of flooding, monitor the impacts on the project, or minimize the "uncontrollable" aspects of these events.
8. In the event the program does not meet water quality objectives as specified in the Basin Plan, identify what options are available to achieve immediate, major reductions in discharges as may be required during dry years.
9. Discuss the projected impacts of the selenium control or treatment measures on the discharges of boron, molybdenum, and salt.
10. Identify any additional technically and economically feasible control measures that could be implemented to reduce the discharge of boron, molybdenum, or salt. For each control measure so identified, provide a time schedule for implementation.
11. Provide information on the costs of the control or treatment measures evaluated for use in the control program.

Several components of the proposed management strategy are predicated on the occurrence of a significant storm event. Due to the variety of conditions that may result from precipitation, the operation and maintenance procedures associated with the management approach implemented by the Drainage Management Plan should include discrete criteria for storm events that would result in discharge from the Grassland Bypass Project.

In addition, the Dischargers must include their decision of the technical and economic feasibility of drainage treatment in the DMP, which was initially required for inclusion in the 1 January 2013 update to the Long Term Drainage Management Plan by Order No. 5-01-234. The DMP must include a plan demonstrating how compliance with the prohibition and selenium water quality objective will be achieved, whether or not drainage treatment is determined to be feasible.

Prior to Executive Officer approval of the DMP, the Central Valley Water Board will make the draft DMP available for a review and comment period. Stakeholder comments will be considered by Central Valley Water Board staff. Based on information provided by the Dischargers and after consideration of comments provided by other interested stakeholders, the Central Valley Water Board's Executive Officer will either: (1) approve the DMP; (2) conditionally approve the DMP or (3) disapprove the DMP. Review of the DMP and the associated action by the Executive Officer will be based on findings as to whether the plan meets program requirements and goals and contains all of the information required for the DMP.

By 30 April of each year, the Dischargers shall prepare and submit to the Central Valley

Water Board updates to the DMP. Annual updates may be submitted as an attachment to the Annual Monitoring Report. Annual updates to the DMP shall contain the following information:

- Updates on specific control or treatment methods for selenium and/or other constituents (e.g., salts) that have or will be implemented to meet water quality objectives and goals for discharges from the Grassland Drainage Area. The DMP shall include on-farm and district level activities and the time schedule/update for implementation.
- Identify critical milestones the control program will address.
- If discharges to the San Luis Drain are proposed after 31 December 2045, begin providing updates on the status of any environmental review for compliance with CEQA, including the project description and methods for complying with the Basin Plan, starting in April 2043.
- Any plans to deal with stormwater from outside the GDA to reduce the threat of flooding.

E. Sediment Monitoring Plan

By 30 April 2020, and every five years thereafter, the Dischargers shall submit an updated sediment monitoring plan for Executive Officer approval. The sediment monitoring plan may be submitted as part of the Annual Monitoring Report. The plan shall include the constituents to be analyzed in the annual sampling event and the schedule for sampling. At a minimum, sediment analysis shall include total selenium. The results of monitoring conducted under the Sediment Monitoring Plan shall be reported in the Annual Monitoring Report. The Dischargers previously submitted a sediment monitoring plan in 2016 that was approved by the Executive Officer on 15 April 2016 for the monitoring period from 30 July 2015 through 31 December 2019.

F. Pesticide Monitoring Plan

A Pesticide Monitoring Plan shall be submitted for the Executive Officer's approval annually according to the process identified in the Pesticides Evaluation Protocol[20]. The plan shall include the pesticides to be analyzed, the sampling location, and the frequency and schedule for monitoring. The plan shall include an assessment of available monitoring and application data, and justification for the pesticide to be monitored.

IV. Water Quality Triggers for Development of Management Plans

This Order requires that the Dischargers comply with all adopted water quality objectives and established federal water quality criteria applicable to their discharges. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* (Basin Plan) contains numeric and narrative water quality objectives applicable to surface water and groundwater within the Order's watershed area. USEPA's 1993 National Toxics Rule (NTR) and 2000 California Toxics Rule (CTR) contain water quality criteria which, when combined with Basin Plan beneficial use designations constitute numeric water quality standards. Tables 6.1-6.7 of this MRP lists Basin Plan numeric water quality objectives

[20] Central Valley Water Board. 2016. Issuance of the Pesticides Evaluation Protocol and List of Pesticides. Issued on 29 November 2016.

and NTR/CTR criteria for constituents of concern that may be discharged.

Tables 6.1-6.7 do not include water quality criteria that may be used to interpret narrative water quality objectives, which shall be considered trigger limits. Trigger limits will be developed by the Central Valley Water Board staff through a process involving coordination with the Department of Pesticide Regulation (for pesticides) and stakeholder input. The trigger limits will be designed to implement narrative Basin Plan objectives and to protect applicable beneficial uses. The Executive Officer will make a final determination as to the appropriate trigger limits.

V. Modifications to MRP

The Dischargers may submit written requests for the removal or addition of monitoring sites or parameters, or to modify the monitoring schedule and frequency, for approval by the Executive Officer. The Dischargers shall continue monitoring pursuant to this Order until the Executive Officer has approved any proposed changes.

Monitoring requirements for surface waters will be periodically reassessed to determine if changes should be made to better represent discharges to state waters. The monitoring schedule will also be reassessed so that constituents are monitored during application and/or release timeframes when constituents of concern are most likely to affect water quality. The Dischargers shall not implement any changes to this MRP unless the Central Valley Water Board or the Executive Officer issues a revised MRP.

VI. Quality Assurance Project Plan

Monitoring data collected to meet the requirements of the Order must be collected and analyzed in a manner that assures the quality of the data. The Dischargers must follow sampling and analytical procedures as specified in the Quality Assurance Project Plan (QAPP).

The Dischargers must develop and/or maintain a QAPP that includes watershed and site-specific information, project organization and responsibilities, and the quality assurance components in the QAPP Guidelines. Chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the recognized state agency for water quality analyses. Alternate methods[21] may be used for chemical analyses if the laboratory has submitted the required validation package[22] as specified by USEPA for approval by the Executive Officer.

Attachment 1 to the MRP Order lists the analytical methods and required reporting limit (RL) for each method. Analytical methods shall conform to the QAPP requirements approved by the State Water Resources Control Board Quality Assurance Officer. QA/QC requirements for duplicate and spike recovery ranges, and acceptable replicate percent difference (RPD) for each parameter should be outlined in the QAPP.

The Central Valley Water Board may conduct an audit of the Dischargers' contracted laboratories at any time in order to evaluate compliance with the most current version of the QAPP Guidelines. Quality control requirements are applicable to all of the

[21] "Alternate methods" is defined as laboratory methods not EPA-approved for the constituent analyzed.

[22] USEPA, 1999. Protocol for EPA Approval of Alternate Test Procedures for Organic and Inorganic Analytes in Wastewater and Drinking Water. Office of Water, Washington, D.C. EPA 821-B-98-002

constituents listed in the QAPP Guidelines, as well as any additional constituents that are analyzed or measured, as described in the appropriate method. Acceptable methods for laboratory and field procedures as well as quantification limits are described in the QAPP Guidelines.

This MRP Order becomes effective 5 December 2019 and remains in effect unless rescinded or revised by the Central Valley Water Board or the Executive Officer.

I, PATRICK PULUPA, Executive Officer, do hereby certify the foregoing is a full and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region on 5 December 2019.

Ordered by: _____
PATRICK PULUPA, Executive Officer

Table 6.1: Basin Plan Numeric Water Quality Objectives for Boron in the San Joaquin River Watershed

Note: Where more than one objective is applicable, the most stringent shall be applied.

Constituent / Chemical Abstracts Service Registry Number (CAS)	Basin Plan Water Quality Objective	Source of Numeric Threshold	Numeric Threshold (maximum unless noted otherwise	Units	Inland Surface Water Beneficial Use(s):
Boron, total 7440-42-8	Chemical Constituents	Basin Plan. San Joaquin River, mouth of Merced River to Vernalis (15 Mar – 15 Sep)	2,000	µg/L	Agricultural water uses, including irrigation supply & stock watering
			800 (monthly mean)	µg/L	
		Basin Plan. San Joaquin River, mouth of Merced River to Vernalis (16 Sep – 14 Mar)	2,600	µg/L	
			1,000 (monthly mean)	µg/L	
		Basin Plan. San Joaquin River, mouth of Merced River to Vernalis (critical year; see Basin Plan for definition)	1,300 (monthly mean)	µg/L	
		Basin Plan. San Joaquin River from Sack Dam to mouth of Merced River	5,800	µg/L	
			2,000 (monthly mean)	µg/L	

Table 6.1, Acronyms & Abbreviation Notes:

µg/L microgram per liter

Table 6.2: Basin Plan Numeric Water Quality Objectives for Molybdenum in the San Joaquin River Watershed

Note: Where more than one objective is applicable, the most stringent shall be applied.

Constituent / Chemical Abstracts Service Registry Number (CAS)	Basin Plan Water Quality Objective	Source of Numeric Threshold	Numeric Threshold (maximum unless noted otherwise	Units	Inland Surface Water Beneficial Use(s):
Molybdenum, total 7439-98-7	Chemical Constituents	Basin Plan. San Joaquin River, mouth of Merced River to Vernalis	15	µg/L	Agricultural water uses, including irrigation supply & stock watering
			10 (monthly mean)	µg/L	
		Basin Plan. San Joaquin River, Sack Dam to mouth of Merced River, Mud Slough (north)	50	µg/L	
			19 (monthly mean)	µg/L	

Table 6.2, Acronyms & Abbreviation Notes:

µg/L microgram per liter

Table 6.3: Basin Plan Numeric Water Quality Objectives for Selenium in the San Joaquin River Watershed

Note: Where more than one objective is applicable, the most stringent shall be applied.

Constituent / Chemical Abstracts Service Registry Number (CAS)	Basin Plan Water Quality Objective	Source of Numeric Threshold	Numeric Threshold (maximum unless noted otherwise	Units	Inland Surface Water Beneficial Use(s):
Selenium, total 7782-49-2	Chemical Constituents	Basin Plan. San Joaquin River, mouth of Merced River to Vernalis	12	µg/L	Not Applicable
			5 (4-day average)	µg/L	

Selenium, total 7782-49-2	Chemical Constituents	Basin Plan. Mud Slough (north), San Joaquin River from the Mud Slough confluence to the Merced River (performance goal by 31 December 2015)	15 (monthly mean)	µg/L	Not Applicable
		Basin Plan. Mud Slough (north), San Joaquin River from the Mud Slough confluence to the Merced River (performance goal by 31 December 2019)	5 (4-day average)	µg/L	
		Basin Plan. Mud Slough (north), San Joaquin River from the Mud Slough confluence to the Merced River	20	µg/L	
			5 (4-day average)	µg/L	
		California Primary MCL	50	µg/L	MUN-MCL
	Toxicity	National Toxics Rule (USEPA)	5 (4-day average)	µg/L	Aquatic Life & Consumption

Table 6.3, Acronyms & Abbreviation Notes:

MCL	Maximum Contaminant Level
µg/L	microgram per liter
MUN-MCL	Municipal or domestic supply with default selection of drinking water MCL when available
Aquatic Life & Consumption	Aquatic life and consumption of aquatic resources

Table 6.4: Basin Plan Numeric Water Quality Objectives for Pesticides in the San Joaquin River Watershed

Note: Where more than one objective is applicable, the most stringent shall be applied.

Constituent / Chemical Abstracts Service Registry Number (CAS)	Basin Plan Water Quality Objective	Source of Numeric Threshold	Numeric Threshold (maximum unless noted otherwise	Units	Inland Surface Water Beneficial Use(s):
Chlorpyrifos 2921-88-2	Pesticides	Basin Plan. San Joaquin River from Mendota Dam to Vernalis	0.025 (1-hour average)	µg/L	Aquatic Life & Consumption
			0.015 (4-day average)	µg/L	
Diazinon 50-29-3			0.16 (1-hour average)	µg/L	
			0.10 (4-day average)	µg/L	
Simazine 122-34-9	Chemical Constituents	California Primary MCL	4	µg/L	MUN-MCL; MUN-Toxicity

Table 6.4, Acronyms & Abbreviation Notes:

MCL	Maximum Contaminant Level
µg/L	microgram per liter
Aquatic Life & Consumption	Aquatic life and consumption of aquatic resources
MUN-MCL	Municipal or domestic supply with default selection of drinking water MCL when available
MUN-Toxicity	Municipal or domestic supply with consideration of human toxicity thresholds that are more stringent than drinking water MCL

Table 6.5: Basin Plan Numeric Water Quality Objectives for Nitrate in the San Joaquin River Watershed

Note: Where more than one objective is applicable, the most stringent shall be applied.

Constituent / Chemical Abstracts Service Registry Number (CAS)	Basin Plan Water Quality Objective	Source of Numeric Threshold	Numeric Threshold (maximum unless noted otherwise	Units	Inland Surface Water Beneficial Use(s):
Nitrate (as nitrogen) 14797-55-8	Chemical Constituents	California Primary MCL	10	mg/L	MUN-MCL; MUN-Toxicity

Table 6.5, Acronyms & Abbreviation Notes:

MCL	Maximum Contaminant Level
mg/L	milligram per liter
MUN-MCL	Municipal or domestic supply with default selection of drinking water MCL when available
MUN-Toxicity	Municipal or domestic supply with consideration of human toxicity thresholds that are more stringent than drinking water MCL

Table 6.6: Basin Plan Numeric Water Quality Objectives for General Physical Parameters in the San Joaquin River Watershed

Note: Where more than one objective is applicable, the most stringent shall be applied.

Constituent / Chemical Abstracts Service Registry Number (CAS)	Basin Plan Water Quality Objective	Source of Numeric Threshold	Numeric Threshold (maximum unless noted otherwise	Units	Inland Surface Water Beneficial Use(s):
Conductivity at 25 degrees Celsius (electrical conductivity)	Salinity	Basin Plan. San Joaquin River, Friant Dam to Mendota Pool	150	µmhos/cm	Not Applicable
	Salinity	California Secondary MCL	900-1600	µmhos/cm	MUN-MCL; MUN-Toxicity
Dissolved Oxygen, minimum 7782-44-7	Dissolved Oxygen	Basin Plan. Merced River, from Cressy to New Exchequer Dam, all year	8.0	mg/L	Aquatic Life & Consumption

Dissolved Oxygen, minimum 7782-44-7	Dissolved Oxygen	Basin Plan. Tuolumne River, Waterford to La Grange (15 Oct – 15 Jun)	8.0	mg/L	Aquatic Life & Consumption
		Basin Plan. Waters designated WARM	5.0	mg/L	
		Basin Plan. Waters designated COLD and/or SPWN	7.0	mg/L	
pH, minimum	pH	Basin Plan	6.5	units	MUN-MCL; MUN-Toxicity
pH, maximum			8.5	units	
Temperature	Temperature		Variable (see table footnote A)		Not Applicable
Total Dissolved Solids (TDS)	Chemical Constituents	California Secondary MCL, recommended level	500 – 1,000	mg/L	MUN-MCL; MUN-Toxicity
Turbidity	Turbidity	Basin Plan. Where natural turbidity is less than 1 NTU	2	NTU	Not Applicable
		Where natural turbidity is between 1 and 5 NTUs, increases shall not exceed 1 NTU.	Variable; 2 - 6	NTU	
		Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20%.	Variable; 6 – 70	NTU	
	Not Applicable	Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTU.	Variable; 60 – 110	NTU	
		Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10%.	variable	NTU	

Table 6.6, Footnotes:

A) The natural receiving water temperature shall not be altered unless it can be demonstrated to the satisfaction of the Water Board that such alteration does not adversely affect beneficial uses. However, at no time shall the temperature of WARM and COLD waters be increased more than 5 degrees Fahrenheit above natural receiving water temperature.

Table 6.6, Acronyms & Abbreviation Notes:

MCL	Maximum Contaminant Level
SPWN	Spawning, Reproduction, and/or Early Development – uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.
NTU	Nephelometric Turbidity Units
µmhos/cm	micromhos per centimeter
mg/L	milligram per liter
MUN-MCL	Municipal or domestic supply with default selection of drinking water MCL when available
MUN-Toxicity	Municipal or domestic supply with consideration of human toxicity thresholds that are more stringent than drinking water MCL
Aquatic Life & Consumption	Aquatic life and consumption of aquatic resources

Table 6.7: Basin Plan Numeric Water Quality Objectives for Metals in the San Joaquin River Watershed

Note: Where more than one objective is applicable, the most stringent shall be applied.

Constituent / Chemical Abstracts Service Registry Number (CAS)	Basin Plan Water Quality Objective	Source of Numeric Threshold	Numeric Threshold (maximum unless noted otherwise	Units	Inland Surface Water Beneficial Use(s):
Copper, total 7440-50-8	Chemical Constituents	California Secondary MCL	1,000	µg/L	MUN-MCL; MUN-Toxicity
Lead, total 7439-92-1			15	µg/L	
Zinc, total 7440-66-6			5,000	µg/L	
Copper, dissolved 7440-50-8	Toxicity	California Toxics Rule (USEPA)	Variable (hardness dependent; generally, increases with hardness)	µg/L	Aquatic Life & Consumption
Lead, dissolved 7439-92-1					
Zinc, dissolved 7440-66-6					

Table 6.7, Acronyms & Abbreviation Notes:

MCL	Maximum Contaminant Level
µg/L	microgram per liter
Aquatic Life & Consumption	Aquatic life and consumption of aquatic resources
MUN-MCL	Municipal or domestic supply with default selection of drinking water MCL when available
MUN-Toxicity	Municipal or domestic supply with consideration of human toxicity thresholds that are more stringent than drinking water MCL

Attachment 1: Analytical Methods and Reporting Limits for Water

Parameter	Method	Reporting Limit	Units
Electrical conductivity	EPA 9050A or EPA 120.1	100	µmhos/cm
Total dissolved solids	EPA 160.1 or SM2540C	10	mg/L
Total organic carbon	EPA 415.3	0.5	mg/L
Nitrate as N	EPA 300, EPA 300.1, EPA 351.3, EPA 353.2 or SM4500	0.05	mg/L
Ammonia as N (total)	EPA 350 or SM4500-NH3	0.1	mg/L
Boron	EPA 200.7 or EPA 200.8	10	µg/L
Molybdenum	EPA 200.7, EPA 200.8, EPA 6010, EPA 6020, or EPA 3015A	1	µg/L
Selenium (total)	PA 200.7, EPA 200.8, and EPA 6010B	2.0	µg/L
Selenastrum capricornutum	EPA-1003.0	Not Applicable	Cell/mL and % Growth
Pimephales promelas	EPA 2000.0	Not Applicable	% Survival and Reproduction
Daphnia magna	EPA 2021.0	Not Applicable	% Survival

Attachment 2: Analytical Methods and Reporting Limits for Sediment

Parameter	Method	Reporting Limit	Units
Hyalella azteca	EPA 100.1	Not Applicable	% Survival
Total organic carbon	EPA 415.1, EPA 9060,	200	mg/kg
Grain size	ASTM D-422, EPA 1995, and USACE 1918	1	% sand, $ silt, % clay, % gravel

Method Note for Attachment 1 & 2: The list shows approved USEPA methods, but modified or alternate methods (e.g., USGS lab method) may be used as long as the EPA requirements for the use of modified[23] or alternate test procedures[24] are met.

[23] Letter from Richard Reding, USEPA, dated 20 November 2007 titled “Flexibility to Modify CWA Methods” provides guidance on allowed modifications to EPA methods.

[24] Protocol for EPA Approval of Alternate Test Procedures for Organic and Inorganic Analytes in Wastewater and Drinking Water. March 1999: EPA 821-B-96-002. This document lists the requirements for method validation.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

APPENDIX MRP-1 TO ORDER R5-2019-0077
MANAGEMENT PLAN REQUIREMENTS FOR SURFACE WATER

WASTE DISCHARGE REQUIREMENTS
FOR

SAN LUIS & DELTA-MENDOTA WATER AUTHORITY
AND
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

SURFACE WATER DISCHARGES FROM THE
GRASSLAND BYPASS PROJECT

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MRP-1: MANAGEMENT PLAN REQUIREMENTS FOR SURFACE WATER

I. Management Plan Development and Required Components

This appendix describes requirements for the development of surface water quality management plans (SQMPs) under Waste Discharge Requirements for the Grassland Bypass Project for the San Luis & Delta-Mendota Authority and the U.S. Bureau of Reclamation (Dischargers) in Order R5-2019-0077 (hereafter "Order"). When a SQMP has been triggered, the Dischargers shall ascertain the potential source(s) of the water quality exceedance(s) and determine appropriate actions that may be implemented to mitigate the exceedance.

The Discharger shall submit the SQMP to the Central Valley Water Board within a sixty (60) day period that begins the first business day after the Discharger's receipt of the field or laboratory results that report the triggering exceedance. The Central Valley Water Board will post the proposed SQMP for public review and comment as stated in section II.a below.

The SQMP shall contain the required elements presented and discussed in the following sections. The Dischargers may develop one management plan to cover all areas where plans have been triggered rather than developing separate management plans for each management area where plans have been triggered. The Dischargers will maintain the overarching plan as new information is collected, potentially triggering additional management areas and completion of other management plans.

If multiple constituents of concern (COCs) are to be included in a single management plan, a discussion of the prioritization process and proposed schedule shall be included in the plan.

If a number of management plans are triggered, the Dischargers shall submit a prioritization list to the Central Valley Water Board Executive Officer. This list may prioritize the order of management plan development based on, for example, 1) the potential to harm public health; 2) the beneficial use affected; and/or 3) the likelihood of meeting water quality objectives by implementing specific activities. The Executive Officer may approve or require changes be made to the management plan priority list. The Dischargers shall implement the prioritization schedule approved by the Executive Officer.

A. Introduction and Background

The introduction portion of the management plan shall include a discussion of the COCs that are the subject of the plan and the water quality objective(s) or trigger(s) requiring preparation of the SQMP. The introduction shall also include an identification (both narrative and in map form) of the boundaries (geographic and surface water basin[s] or portion of a basin) to be covered by the SQMP including how the boundaries were delineated.

B. Physical Setting and Information

The SQMP needs to provide a discussion of the physical conditions that affect surface water in the management plan area and the associated existing data. At a minimum, the discussion needs to include the following:

a) Land use maps which identify the crops being grown in the watershed. Map(s) must be in electronic format using standard geographic information system software (ArcGIS shapefiles).

b) Identification of the potential sources of the COCs for which the management plan is being developed. If the potential sources are not known, a study may be designed and implemented to determine the source(s). Requirements for source identification studies are given in section I.G below. In the alternative, instead of conducting a source identification study, the Dischargers may develop a management plan for the COCs that meets the management plan requirements as specified in this appendix.

c) A summary, discussion, and compilation of available surface water quality data (as applicable) for the parameters addressed by the management plan. Available data from existing water quality programs may be used, including but not limited to: Surface Water Ambient Monitoring Program (SWAMP), United States Geological Survey (USGS), California Department of Public Health (DPH), California Department of Pesticide Regulation (DPR), California Department of Water Resources (DWR), and local surface water management programs.

C. Management Plan Strategy

This section provides a discussion of the strategy to be used in the implementation of the SQMP and should at a minimum, include the following elements:

1. A description of the approach to be utilized by the SQMP (e.g., multiple COCs addressed in a scheduled priority fashion, multiple areas covered by the plan with a single area chosen for initial study, or all areas addressed simultaneously [area wide]).
2. The plan must include actions to meet the following goals and objectives:
   a) Compliance with the Order's receiving water limitations (section III of the Order).
   b) Educate growers about the sources of the water quality exceedances in order to promote prevention, protection, and remediation efforts that can maintain and improve water quality.
   c) Identify and implement activities to reduce loading of COCs, thereby improving water quality.
3. Identify the duties and responsibilities of the individuals or groups implementing the SQMP. This section should include:
   a) Identification of key individuals involved in major aspects of the project (e.g., project lead, data manager, sample collection lead, lead for stakeholder involvement, quality assurance manager).
   b) Discussion of each individual's responsibilities.
   c) An organizational chart with identified lines of authority.
4. Strategies to implement the management plan tasks. This element must:
   a) Identify the entities or agencies that will be contacted to obtain data and assistance.
   b) Identify activities that may be used to control sources of COCs from subsurface agricultural drainage that are 1) technically feasible; 2) economically feasible; 3) proven to be effective at protecting water quality, and 4) will comply with sections II.A, B and C of the Order. The task shall include an estimate of

implemented activity effectiveness or any known limitations on the effectiveness of the activity.

c) Identify outreach that will be used to disseminate information to the Grassland Area Farmers. This discussion shall include: the strategy for informing growers of the water quality problems that need to be addressed, and a description of how the effectiveness of the outreach efforts will be evaluated. The Dischargers may conduct outreach efforts or work with the assistance of the County Agricultural Commissioners, U.C. Cooperative Extension, Natural Resources Conservation Service, Resource Conservation District, California Department of Food and Agriculture, or other appropriate groups or agencies.

d) Include a specific schedule and milestones for the implementation of activities and tasks outlined in the SQMP. The schedule must include the following items: time estimated to identify activities necessary to meet the Order's surface receiving water limitations (section II of the Order) and a timetable for implementation of identified activities (e.g., at least 75% of growers identified in management plan area have attended meetings in first year of outreach implementation).

e) Establish measurable performance goals that are aligned with the elements of the management plan strategy. Performance goals include specific targets that identify the expected progress towards meeting a desired outcome.

D. Monitoring Design

The monitoring system must be designed to measure effectiveness at achieving the goals and objectives of the SQMP and capable of determining whether activities implemented in response to the management plan are effective and can comply with the terms of the Order.

Field studies may be used to approximate the contribution of the Dischargers to the COC. Where the Dischargers determine that field studies are appropriate or the Executive Officer requires a technical report under CWC 13267 for a field study, the Dischargers must identify a reasonable number and variety of field study sites that are representative of the crop type being evaluated.

The strategy to be used in the development and implementation of the monitoring methods for surface water should address the general requirements and, at a minimum, include the following elements:

a) The location(s) of the monitoring site and schedule (including frequencies) for monitoring should be chosen to be representative of the COC discharge.

b) Surface water monitoring data must be submitted electronically per the requirements given in section II.E of the MRP.

E. Data Evaluation

Methods to be used to evaluate the data generated by the SQMP monitoring and to evaluate the effectiveness of the implemented activities must be described. The discussion should include at a minimum, the following:

1. Methods to be utilized to perform data analysis (graphical, statistics, modeling, index computation, or some combination thereof).

2. Identify the information necessary to quantify program effectiveness going forward, including the tracking of implemented activities to meet water quality objectives or limitations. The approach for determining the effectiveness must be described. Acceptable approaches include field studies of implemented activities at representative sites and modeling or assessment to associate the degree of implementation to changes in water quality. The process for tracking implementation must also be described. The process must include a description of how the information will be collected, the type of information being collected, how the information will be verified, and how the information will be reported.

F. Records and Reporting

By 30 April of each year, the Dischargers must prepare a Management Plan Progress Report that summarizes the progress in implementing management plans. The Management Plan Progress Report must summarize the progress for the calendar year. The Management Plan Progress Report shall include the following components:

1. Title page
2. Table of contents
3. Executive Summary
4. Location map(s) and a brief summary of management plans covered by the report
5. Updated table that tallies all exceedances for the management plans
6. A list of new management plans triggered since the previous report
7. Status update on preparation of new management plans
8. A summary and assessment of management plan monitoring data collected during the reporting period
9. A summary of management plan grower outreach conducted
10. Results from evaluation of implemented activity effectiveness
11. An evaluation of progress in meeting performance goals and schedules
12. Any recommendations for changes to the management plan

G. Source Identification Study Requirements

Should the Dischargers conduct a Source Identification Study to comply with this Order, the Dischargers must first receive approval from the Executive Officer. Once approved, the Discharger may proceed with its study.

The minimum components for a source identification study are:

1. An evaluation of the potential sources.
2. Continued monitoring at the management plan site/area and increased monitoring if appropriate.
3. An assessment of the potential pathways through which the constituents of concern can occur.
4. A schedule for conducting the study.

Specific field studies (including edge-of field studies) may be required to approximate the contribution of the Dischargers to the water quality exceedance. At a minimum, the

Dischargers must evaluate the feasibility of field studies as part of their source identification study proposal. Where field studies are deemed appropriate, the Dischargers should identify a reasonable number and variety of field study sites that are representative of the particular activity being evaluated. If field studies are not proposed, the Dischargers must demonstrate how the alternative source identification method will produce data or information that will enable the determination of contributions from the Dischargers to the water quality problem.

If an approved study shows that the Dischargers are not a source, then the Dischargers can request the Executive Officer to approve completion of the associated management plan. Where the Dischargers are identified as a source, a full management plan shall be prepared and implemented.

II. Approval and Review of the Management Plan

The following discussion describes the review and approval process for draft management plans submitted to the Executive Officer for approval. Any proposed changes to the management plan must be approved by the Executive Officer prior to implementation.

a) Water quality management plan approval – Prior to Executive Officer approval of any management plan, the Central Valley Water Board will post the draft management plan on its website for a review and comment period. Stakeholder comments will be considered by Central Valley Water Board staff. Based on information provided by the Dischargers and after consideration of comments provided by other interested stakeholders, the Central Valley Water Board's Executive Officer will either: (1) approve the management plan; (2) conditionally approve the management plan or (3) disapprove the management plan. Review of the management plan and the associated action by the Executive Officer will be based on findings as to whether the plan meets program requirements and goals and contains all of the information required for a management plan.

b) Periodic review of water quality management plans – At least once every five years, the Central Valley Water Board intends to review available data to determine whether the approved management plan is resulting in water quality improvements. Central Valley Water Board staff will meet with the Dischargers and other interested parties to evaluate the sufficiency of management plans. Based on input from all parties, the Executive Officer will determine whether and how the management plan should be updated based on new information and progress in achieving compliance with the Order's receiving water limitations, as applicable (see section III of the Order). The Executive Officer also may require revision of the management plan based on available information indicating that the Dischargers are not in compliance with surface receiving water limitations (as applicable) of the Order. The Executive Officer may also require revision to the management plan if available information indicates that degradation of surface water calls for the inclusion of additional areas, COCs, or additional activities in the management plan. During this review, the Executive Officer will make one of the findings described below:

1. Adequate progress – The Executive Officer will make a determination of adequate progress in implementing the plan if water quality improvement milestones and compliance time schedules have been met or the receiving water limitations of the Order are met.

2. Inadequate progress – The Executive Officer will make a determination of inadequate progress in implementing the plan if the Order's receiving water limitations are not being met; and water quality improvement milestones and compliance time schedules in the approved management plan have not been met.

The actions taken by the Executive Officer upon a determination of inadequate progress include, but are not limited to one or more of the following for the area in which inadequate progress has been made:

- Field monitoring studies – The Dischargers may be required to develop and implement a field monitoring study plan to characterize the discharge of the COCs and evaluate the pollutant reduction efficacy of implemented activities to reduce the COCs. Based on the study and evaluation, the Executive Officer may require the management plan to be revised to include additional activities to achieve compliance with the Order's receiving water limitations.
- Independent, on-site verification of implemented activities and evaluation of their adequacy.

III. Management Plan Completion

The SQMP can be completed in one of two ways: 1) if an approved source study shows that the activities of the Dischargers are not causing or contributing to the water quality problem; or 2) if the implemented activities have resolved the water quality problem.

The goal of the SQMP is to identify the source(s) of COCs, track the implementation of effective activities, and ultimately ensure that waste discharges from the GBP are meeting the receiving water limitations of the Order. If an approved source study shows that the Dischargers' activities are not a source, then the Dischargers can request the Executive Officer to approve completion of the associated management plan.

A request for approval of completion of a SQMP will require credible evidence that the water quality problem has been resolved. The Executive Officer will evaluate each request on a case-by-case basis. The following key components must be addressed in the request:

a) Demonstration through evaluation of monitoring data that the water quality problem is no longer occurring (i.e., 3 or more years with no exceedances during the times of the year when previous exceedances occurred) or demonstrated compliance with the Order's receiving water limitations.

b) Documentation of Dischargers education and outreach to applicable Growers in the Grassland Drainage Area where water quality impairment occurred.

A SQMP may be completed for all or some of the constituents that prompted preparation of the management plan. When Executive Officer approval is given for completion of a SQMP for one or more constituents, each constituent shall revert to regular, ongoing monitoring requirements (as described in the MRP).

Requests for a SQMP completion must summarize and discuss all information and data being used to justify completion. The Dischargers shall not discontinue any of the associated management plan requirements prior to Executive Officer approval of its completion request.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ATTACHMENT C TO ORDER R5-2019-0077
DEFINITIONS, ACRONYMS & ABBREVIATIONS

WASTE DISCHARGE REQUIREMENTS
FOR

SAN LUIS & DELTA-MENDOTA WATER AUTHORITY
AND
UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

SURFACE WATER DISCHARGES FROM THE
GRASSLAND BYPASS PROJECT

The following definitions, acronyms and abbreviations apply to this Order as related to surface water discharges from subsurface drainages associated with irrigated agriculture. All other terms shall have the same definitions as prescribed by the Porter-Cologne Water Quality Control Act (California Water Code Division 7), unless specified otherwise.

Definitions

1. Antidegradation Policy – State Water Board Resolution 68-16, "Statement of Policy with Respect to Maintaining High Quality Waters in California," requires existing high quality water to be maintained until it has been demonstrated that any change will be consistent with maximum benefit to the people of the state, will not unreasonably affect present and anticipated beneficial use of water, and will not result in water quality less than that prescribed in Resolution 68-16. The Central Valley Water Board must establish standards in its orders for discharges to high quality waters that result in the implementation of best practicable treatment or control of the discharge necessary to avoid pollution or nuisance and to maintain the highest water quality consistent with maximum benefit to the people of the state. Resolution 68-16 has been approved by the USEPA to be consistent with the federal anti-degradation policy.

2. Basin Plan – The Basin Plan is the Central Valley Regional Water Quality Control Plan for the Sacramento River and San Joaquin River Basins. The Basin Plan describes how the quality of the surface and groundwater in the Central Valley Region should be managed to ensure reasonable protection of beneficial uses. The Basin Plan includes beneficial uses, water quality objectives, and a program of implementation.

3. Degradation – Any measurable adverse change in water quality.

4. Exceedance – For the purposes of this Order, an exceedance is a reading using a field instrument or detection by a California state-certified analytical laboratory where the detected result indicates an impact to the beneficial use of the receiving water when compared to a water quality objective for the parameter or constituent. Exceedances will be determined based on available data and application of the appropriate averaging period. The appropriate averaging period may be defined in the Basin Plan, as part of

the water quality criteria established by the USEPA, or as part of the water quality criteria being used to interpret a narrative water quality objective. If averaging periods are not defined as part of the water quality objective or the water quality criteria being used, then the Central Valley Water Board may use its best professional judgment to determine an appropriate period.

5. Impaired water body – A surface water body that is not attaining water quality standards and is identified on the State Water Board's Clean Water Act section 303(d) list.

6. Management practices to protect water quality – A practice or combination of practices that is the most effective and practicable (including technological, economic, and institutional considerations) means of controlling nonpoint pollutant sources at levels protective of water quality.

7. Monitoring – Monitoring undertaken in connection with assessing water quality conditions, and factors that may affect water quality conditions. Monitoring includes, but is not limited to, water quality monitoring undertaken in connection with agricultural activities, monitoring to identify short and long-term trends in water quality, nutrient monitoring, active inspections of operations, and management practice implementation and effectiveness monitoring. The purposes of monitoring include, but are not limited to, verifying the adequacy and effectiveness of the Order's requirements, and evaluating compliance with the requirements of the Order.

8. Nonpoint source waste discharge– The Sacramento and San Joaquin River Basin Plan states that "A nonpoint source discharge usually refers to waste emanating from diffused locations." Nonpoint source pollution generally results from land runoff, precipitation, atmospheric deposition, drainage, seepage or hydrologic modification. The term "nonpoint source" is defined to mean any source of water pollution that does not meet the legal definition of "point source" in section 502(14) of the Clean Water Act. The Clean Water Act (CWA) defines a point source as a discernible, confined, and discrete conveyance, such as a pipe, ditch, or channel. Irrigated agricultural return flows and agricultural storm water runoff are excluded from the CWA's definition of point source. Nonpoint pollution sources generally are sources of water pollution that do not meet the definition of a point source as defined by the CWA.

9. Nuisance – "Nuisance" is defined at section 13050 of the Water Code as "…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.) Occur during, or as a result of, the treatment or disposal of wastes."

10. Nutrient – Any element taken in by an organism which is essential to its growth and which is used by the organism in elaboration of its food and tissue.

11. Pollution – Defined in section 13050(l)(1) of the Porter-Cologne Water Quality Control Act 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."

12. Requirements of applicable water quality control plans – Water quality objectives, prohibitions, total maximum daily load implementation plans, or other requirements contained in water quality control plans adopted by the Central Valley Water Board and approved according to applicable law.

13. Subsurface drainage – Water generated by installing and operating drainage systems to lower the water table below irrigated lands. Subsurface drainage systems, deep open drainage ditches, or drainage wells can generate this drainage.

14. Tailwater – The runoff of irrigation water from an irrigated field.

15. Total Maximum Daily Load (TMDL) -- From the Code of Federal Regulations (CFR), 40 CFR 130.2(i), a TMDL is: "The sum of the individual WLAs [waste load allocations] for point sources and LAs [load allocations] for nonpoint sources and natural background. … TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure. …".

16. Total Maximum Monthly Load (TMML) – Similar to TMDL, but with waste allocations based on a monthly basis rather than daily.

17. Toxicity – Refers to the toxic effect to aquatic organisms from waste contained in a water sample.

18. Waste – Includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal as defined in California Water Code section 13050(d). Wastes that conform to this definition include, but are not limited to, earthen materials (such as soil, silt, sand, clay, rock), inorganic materials (such as metals, salts, boron, selenium, potassium, nitrogen, phosphorus), organic materials such as pesticides, and biological materials, such as pathogenic organisms. Such wastes may directly impact beneficial uses (e.g., toxicity of metals to aquatic life) or may impact water temperature, pH, and dissolved oxygen.

19. Water Year -- A water year is defined as a 12 month time period from 1 October of one year to 30 September of the next. The water year is designated by the calendar year in which it ends (the year within which 9 of the 12 months fall).

20. Waters of the State – Is defined in Water Code section 13050 as "any surface water or groundwater, including saline waters, within the boundaries of the State."

21. Water Quality Criteria – Levels of water quality required under section 303(c) of the Clean Water Act that are expected to render a body of water suitable for its designated uses. Criteria are based on specific levels of pollutants that would make the water harmful if used for drinking, swimming, farming, fish production, or industrial processes. The California Toxics Rule adopted by USEPA in April 2000 sets numeric water quality criteria for non-ocean surface waters of California for a number of toxic pollutants.

22. Water Quality Objectives – Defined in Water Code section 13050 as "limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specified area." Water quality objectives may be either numerical or narrative and serve as water quality criteria for purposes of section 303 of the Clean Water Act.

23. Water quality problem – Exceedance of an applicable water quality objective or a trend of degradation that may threaten applicable Basin Plan beneficial uses.

24. Water Quality Standards – Provision of state or federal law that consist of the designated beneficial uses of a waterbody, the numeric and narrative water quality criteria that are necessary to protect the uses of that particular waterbody, and an antidegradation statement. Water quality standards include water quality objectives in the Central Valley Water Board's two Basin Plans, water quality criteria in the California Toxics Rule and National Toxics Rule adopted by USEPA, and/or water quality objectives in other applicable State Water Board plans and policies. Under section 303 of the Clean Water Act, each state is required to adopt water quality standards.

25. Stormwater Plan – Plan to deal with stormwater that exceeds the capacity of the San Luis Drain.

26. Long-term Storm Water Management Plan – Plan to continue to use the San Luis Drain for discharge of storm related flows.

Acronyms and Abbreviations

Authority	The San Luis & Delta-Mendota Water Authority
Basin Plan	Water Quality Control Plan for the Sacramento and San Joaquin River Basins (4th Ed.)
Bureau	U.S. Bureau of Reclamation
BPTC	best practicable treatment or control
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEDEN	California Environmental Data Exchange Network
Central Valley Water Board	California Regional Water Quality Control Board, Central Valley Region
CEQA	California Environmental Quality Act

CFR	Code of Federal Register
COC	constituent of concern
CTR	California Toxics Rule
CV RDC	Central Valley Regional Data Center
CV-SALTS	Central Valley Salinity Alternatives for Long-Term Sustainability
CWC	California Water Code
DCRT	Data Collection and Reporting Team
DMP	Drainage Management Plan
DO	dissolved oxygen
DPH	California Department of Public Health
DPR	California Department of Pesticide Regulation
DWR	California Department of Water Resources
EDD	electronic data deliverable
EIS/EIR	environmental impact statement/environmental impact report
ESA	federal Endangered Species Act
GBD	Grassland Basin Drainage
GBP	Grassland Bypass Project
GDA	Grassland Drainage Area
GIS	Geographic Information System
GPS	Global Positioning System
GWD	Grassland Water District
ILRP	Irrigated Lands Regulatory Program
MAA	management agency agreement
MDL	method detection limit
MRP	monitoring and reporting program
MRPP	monitoring and reporting program plan
NAD83	North American Datum 1983
NAVD88	North American Vertical Datum 1988
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOD	Notice of Determination
NPDES	National Pollutant Discharge Elimination System
NPS	nonpoint source

NPS Policy	State Water Board's Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program
NTR	National Toxics Rule
PUR	pesticide use report, CA DPR
QAPP	quality assurance project plan
QA/QC	quality assurance and quality control
RL	reporting limit
ROD	record of decision
ROWD	report of waste discharge
SFEI	San Francisco Estuary Institute
SLD	San Luis Drain
SIP	Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of CA (State Implementation Plan)
SJRIP	San Joaquin River Improvement Project
SQMP	surface water quality management plan
State Water Board	State Water Resources Control Board (SWRCB)
SWAMP	surface water ambient monitoring program
TDS	total dissolved solids
TMDL	total maximum daily load
TMML	total maximum monthly load
TPRT	Technical and Policy Review Team
UA	Use Agreement
USBR	U.S. Bureau of Reclamation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U. S. Geological Survey
WDRs	waste discharge requirements