Attachment A to Resolution No. 2006- XXXX
Amendment to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins – Central Valley Region Resolution No. 2005-0138
A Program for Control of Diazinon and Chlorpyrifos Runoff into the Lower San Joaquin River.

Changes to Chapter I Introduction
Under the Chapter I heading: "Basin Description beginning on page I-1.00, make the following changes:

This Basin Plan covers the entire area included in the Sacramento and San Joaquin River drainage basins (see maps in pocket* and Figure II-1). The basins are bound by the crests of the Sierra Nevada on the east and the Coast Range and Klamath Mountains on the west. They extend some 400 miles from the California - Oregon border southward to the headwaters of the San Joaquin River.

*NOTE: The planning boundary between the San Joaquin River Basin and the Tulare Lake Basin follows ~~the northern boundary of Little Panoche Creek basin~~ the southern watershed boundaries of the Little Panoche Creek, Moreno Gulch, and Capita Canyon to boundary of the Westlands Water District. From here, the boundary follows the northern edge of the Westlands Water District until its intersection with the Firebaugh Canal Company's Main Lift Canal. The basin boundary then follows the Main Lift Canal to the Mendota Pool and continues eastward along the channel of the San Joaquin River to Millerton Lake in the Sierra Nevada foothills, and then follows along the southern boundary of the San Joaquin River drainage basin.

The Sacramento River and San Joaquin River Basins cover about one fourth of the total area of the State and over 30% of the State's irrigable land. The Sacramento and San Joaquin Rivers furnish roughly 51% of the State's water supply. Surface water from the two drainage basins meet and form the Delta, which ultimately drains to San Francisco Bay. Two major water projects, the Federal Central Valley Project and the State Water Project, deliver water from the Delta to Southern California, the San Joaquin Valley, Tulare Lake Basin, the San Francisco Bay area, as well as within the Delta boundaries.

The Delta is a maze of river channels and diked islands covering roughly 1,150 square miles, including 78 square miles of water area. The legal boundary of the Delta is described in

Section 12220 of the Water Code (also see Figure III-1 of this Basin Plan).

Ground water is defined as subsurface water that occurs beneath the ground surface in fully saturated zones within soils and other geologic formations. Where ground water occurs in a saturated geologic unit that contains sufficient permeability and thickness to yield significant quantities of water to wells or springs, it can be defined as an aquifer (USGS, Water Supply Paper 1988, 1972). A ground water basin is defined as a hydrogeologic unit containing one large aquifer or several connected and interrelated aquifers (Todd, *Groundwater Hydrology*, 1980).
Major ground water basins underlie both valley floors, and there are scattered smaller basins in the foothill areas and mountain valleys. In many parts of the Region, usable ground waters occur outside of these currently identified basins. There are water-bearing geologic units within ground water basins in the Region that do not meet the definition of an aquifer. Therefore, for basin planning and regulatory purposes, the term "ground water" includes all subsurface waters that occur in fully saturated zones and fractures within soils and other geologic formations, whether or not these waters meet the definition of an aquifer or occur within identified ground water basins.

Sacramento River Basin

The Sacramento River Basin covers 27,210 square miles and includes the entire area drained by the Sacramento River. For planning purposes, this includes all watersheds tributary to the Sacramento River that are north of the Cosumnes River watershed. It also includes the closed basin of Goose Lake and drainage sub-basins of Cache and Putah Creeks.

The principal streams are the Sacramento River and its larger tributaries: the Pit, Feather, Yuba, Bear, and American Rivers to the east; and Cottonwood, Stony, Cache, and Putah Creeks to the west. Major reservoirs and lakes include

Shasta, Oroville, Folsom, Clear Lake, and Lake Berryessa.

DWR Bulletin 118-80 identifies 63 ground water basins in the Sacramento watershed area. The Sacramento Valley floor is divided into 2 ground water basins. Other basins are in the foothills or mountain valleys. There are areas other than those identified in the DWR Bulletin with ground waters that have beneficial uses.

San Joaquin River Basin

The San Joaquin River Basin covers 15,880 square miles and includes the entire area drained by the San Joaquin River. It includes all watersheds tributary to the San Joaquin River and the Delta south of the Sacramento River and south of the American River watershed. The southern planning boundary is described in the first paragraph of the previous page.

The principal streams in the basin are the San Joaquin River and its larger tributaries: the Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno Rivers. Major reservoirs and lakes include Padre, New Hogan, Millerton, McClure, Don Pedro, and New Melones.

DWR Bulletin 118-80 identifies 39 ground water basins in the San Joaquin watershed area. The San Joaquin Valley floor is divided into 15 separate ground water basins, largely based on political considerations. Other basins are in the foothills or mountain valleys. There are areas other than those identified in the DWR Bulletin with ground waters that have beneficial uses.

Grassland Watershed

The Grassland watershed is a valley floor sub-basin of the San Joaquin River Basin. The portion of the watershed for which agricultural subsurface drainage policies and regulations apply covers an area of approximately 370,000 acres, and is bounded on the north by the alluvial fan of Orestimba Creek and by the Tulare Lake Basin to the south. The San Joaquin River forms the eastern boundary and Interstate Highway 5 forms the approximate western boundary. The San Joaquin River forms a wide flood plain in the region of the Grassland watershed.

The hydrology of the watershed has been irreversibly altered due to water projects, and is presently governed by land uses. These uses are primarily managed wetlands and agriculture. The wetlands form important waterfowl habitat for migratory waterfowl using the Pacific Flyway. The alluvial fans of the western and southern portions of the watershed contain salts and selenium, which can be mobilized through irrigation practices, and can impact beneficial uses of surface waters and wetlands if not properly regulated.

Lower San Joaquin River Watershed and Subareas

Technical descriptions of the Lower San Joaquin River (LSJR) and its component subareas are contained in Appendix 41. General descriptions follow: The LSJR watershed encompasses approximately 4,580 square miles in Merced County and portions of Fresno, Madera, San Joaquin, and Stanislaus counties. For planning purposes, the LSJR watershed is defined as the area draining to the San Joaquin River downstream of the Mendota Dam and upstream of the Airport Way Bridge near Vernalis, excluding the areas upstream of dams on the major Eastside reservoirs: New Don Pedro, New Melones, Lake McClure, and similar Eastside reservoirs in the LSJR system. The LSJR watershed excludes all lands within Calaveras, Tuolumne, San Benito, and Mariposa Counties. The LSJR watershed has been subdivided into seven major sub areas. In some cases major subareas have been further subdivided into minor subareas to facilitate more effective and focused water quality planning (Table I-1).

Table I-1 Lower San Joaquin River Subareas

Major Subareas		Minor Subareas	
1	LSJR upstream of Salt Slough	1a	Bear Creek
		1b	Fresno-Chowchilla
2	Grassland	-- --	

3	East Valley Floor	3a	Northeast Bank
		3b	North Stanislaus
		3c	Stevinson
		3d	Turlock Area
4	Northwest Side	4a	Greater Orestimba
		4b	Westside Creeks
		4c	Vernalis North
5	Merced River	-	-- --
6	Tuolumne River	-	-- --
7	Stanislaus River	-	-- --

1. Lower San Joaquin River upstream of Salt Slough

This subarea drains approximately 1,480 square miles on the east side of the LSJR upstream of the Salt Slough confluence. The subarea includes the portions of the Bear Creek, Chowchilla River and Fresno River watersheds that are contained within Merced and Madera Counties. The northern boundary of the subarea generally abuts the Merced River Watershed. The western and southern boundaries follow the San Joaquin River from the Lander Avenue Bridge to Friant, except for the lands within the Columbia Canal Company, which are excluded. Columbia Canal Company lands are included in the Grassland Subarea. This subarea is composed of the following drainage areas:

1a. Bear Creek (effective drainage area)

This minor subarea is a 620 square mile subset of lands within the LSJR upstream of Salt Slough Subarea. The Bear Creek Minor Subarea is predominantly comprised of the portion of the Bear Creek Watershed that is contained within Merced County.

1b. Fresno-Chowchilla

The Fresno-Chowchilla Minor Subarea is comprised of approximately 860 square miles of land within the southern portion of the LSJR upstream of Salt Slough Subarea. This minor subarea is located in southeastern Merced County and western Madera County and contains the land area that drains into the LSJR between Sack Dam and the Bear Creek confluence, including the drainages of the Fresno and Chowchilla Rivers.

2. Grassland

The Grassland Subarea drains approximately 1,370 square miles on the west side of the LSJR in portions of Merced, Stanislaus, and Fresno Counties. This subarea includes the Mud Slough, Salt Slough, and Los Banos Creek watersheds. The eastern boundary of this subarea is generally formed by the LSJR between the Merced River confluence and the Mendota Dam. The Grassland Subarea extends across the LSJR, into the east side of the San Joaquin Valley, to include the lands within the Columbia Canal Company. The western boundary of the subarea generally follows the crest of the Coast Range with the exception of lands within San Benito County, which are excluded.

3. East Valley Floor

This subarea includes approximately 413 square miles of land on the east side of the LSJR that drains directly to the LSJR between the Airport Way Bridge near Vernalis and the Salt Slough confluence. The subarea is largely comprised of the land between the major east-side drainages of the Tuolumne, Stanislaus, and Merced Rivers. This subarea lies within central Stanislaus County and north-central Merced County. Numerous drainage canals, including the Harding Drain and natural drainages, drain this subarea. The subarea is comprised of the following minor subareas:

3a. Northeast Bank

This minor subarea of the East Valley Floor contains all of the land draining the east side of the San Joaquin River between the Maze Boulevard Bridge and the Crows Landing Road Bridge, except for the Tuolumne River subarea. The Northeast Bank covers approximately 123 square miles in central Stanislaus County.

3b. North Stanislaus

The North Stanislaus minor subarea is a subset of lands within the East Valley Floor Subarea. This minor subarea drains approximately 68 square miles of land

between the Stanislaus and Tuolumne River watersheds that flows into the San Joaquin River between the Airport Way Bridge near Vernalis and the Maze Boulevard Bridge.

3c. Stevinson
This minor subarea of the East Valley Floor contains all of the land draining to the LSJR between the Merced River confluence and the Lander Avenue (Highway 165) Bridge. The Stevinson Minor Subarea occupies approximately 44 square miles in north-central Merced County.

3d. Turlock Area
This minor subarea of the East Valley Floor contains all of the land draining to the LSJR between the Crows Landing Road Bridge and the Merced River confluence. The Turlock Area Minor Subarea occupies approximately 178 square miles in south-central Stanislaus County and northern Merced County.

4. Northwest Side
This 574 square mile area generally includes the lands on the West side of the LSJR between the Airport Way Bridge near Vernalis and the Newman Waste way confluence. This subarea includes the entire drainage area of Orestimba, Del Puerto, and Hospital/Ingram Creeks. The subarea is primarily located in Western Stanislaus County except for a small area that extends into Merced County near the town of Newman and the Central California Irrigation District Main Canal.

4a. Greater Orestimba
The Greater Orestimba Minor Subarea is a 285 square mile subset of the Northwest Side Subarea located in southwest Stanislaus County and a small portion of western Merced County. It contains the entire Orestimba Creek watershed and the remaining area that drains into the LSJR from the west between the Crows Landing Road Bridge and the confluence of the Merced River, including Little Salad and Crow Creeks.

4b. Westside Creeks
This Minor Subarea is comprised of 277 square miles of the Northwest Side Subarea in western Stanislaus County. It consists of the areas that drain into the west side of the San Joaquin River between Maze Boulevard and Crows Landing Road, including the drainages of Del Puerto, Hospital, and Ingram Creeks.

4c. Vernalis North
The Vernalis North Minor Subarea is a 12 square mile subset of land within the most northern
portion of the Northwest Side Subarea. It contains the land draining to the San Joaquin River from the west between the Maze Boulevard Bridge and the Airport Way Bridge near Vernalis.

5. Merced River
This 294 square mile subarea is comprised of the Merced River watershed downstream of the Merced-Mariposa county line and upstream of the River Road Bridge. The Merced River subarea includes a 13-square-mile "island" of land (located between the East Valley Floor and the Tuolumne River Subareas) that is hydrologically connected to the Merced River by the Highline Canal.

6. Tuolumne River
This 294 square mile subarea is comprised of the Tuolumne River watershed downstream of the Stanislaus-Tuolumne county line, including the drainage of Turlock Lake, and upstream of the Shiloh Road Bridge.

7. Stanislaus River
This 157 square mile subarea is comprised of the Stanislaus River watershed downstream of the Stanislaus-Calaveras county line and upstream of Caswell State Park.

Pesticides

- No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.

- Discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses.

- Total identifiable persistent chlorinated hydrocarbon pesticides shall not be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency or the Executive Officer.

- Pesticide concentrations shall not exceed those allowable by applicable antidegradation policies (see State Water Resources Control Board Resolution No. 68-16 and 40 C.F.R. Section 131.12.).

- Pesticide concentrations shall not exceed the lowest levels technically and economically achievable.

- Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of pesticides in excess of the Maximum Contaminant Levels set forth in California Code of Regulations, Title 22, Division 4, Chapter 15.

- Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of thiobencarb in excess of 1.0 µg/l.

Pesticide concentrations shall not exceed the levels identified in Table III-2A. Where more than one objective may be applicable, the most stringent objective applies.

For the purposes of this objective, the term pesticide shall include: (1) any substance, or mixture of substances which is intended to be used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, which may infest or be detrimental to vegetation, man, animals, or households, or be present in any agricultural or nonagricultural environment whatsoever, or (2) any spray adjuvant, or (3) any breakdown products of these materials that threaten beneficial uses. Note that discharges of "inert" ingredients included in pesticide formulations must comply with all applicable water quality objectives.

TABLE III-2A
SPECIFIC PESTICIDE OBJECTIVES

PESTICIDE	MAXIMUM CONCENTRATION AND AVERAGING PERIOD	APPLICABLE WATER BODIES
Chlorpyrifos	0.025 µ g/L；1-hour average (acute) 0.015 µ g/L；4-day average (chronic) Not to be exceeded more than once in a three year period.	San Joaquin River from Mendota Dam to Vernalis (Reaches include Mendota Dam to Sack Dam (70), Sack Dam to Mouth of Merced River (71), Mouth of Merced River to Vernalis (83))

PESTICIDE	MAXIMUM CONCENTRATION AND AVERAGING PERIOD	APPLICABLE WATER BODIES
Diazinon	0.16 µ g/L；1-hour average (acute) 0.10 µ g/L；4-day average (chronic) Not to be exceeded more than once in a three year period.	San Joaquin River from Mendota Dam to Vernalis (Reaches include Mendota Dam to Sack Dam (70), Sack Dam to Mouth of Merced River (71), Mouth of Merced River to Vernalis (83))

review and control authority. The Board will work with water agencies and others whose activities may influence pesticide levels to minimize concentrations in surface waters.

Since the discharge of pesticides into surface waters will be allowed under certain conditions, the Board will take steps to ensure that this control program is conducted in compliance with the federal and state antidegradation policies. This will primarily be done as pesticide discharges are evaluated on a case-by-case basis.

Insert to Chapter IV Implementation after 7. Diazinon Discharges into the Sacramento and Feather Rivers

8. Control of Diazinon and Chlorpyrifos Runoff into the San Joaquin River

Beginning December 1, 2010, the direct or indirect discharge of diazinon or chlorpyrifos into the San Joaquin River is prohibited during the dormant season (1 December through 1 March) if any exceedance of the chlorpyrifos or diazinon water quality objectives, or diazinon and chlorpyrifos loading capacity occurred during the previous dormant season.

Beginning March 2, 2011, the direct or indirect discharge of diazinon or chlorpyrifos into the San Joaquin River is prohibited during the irrigation season (2 March through 30 November) if any exceedance of the chlorpyrifos or diazinon water quality objectives, or diazinon and chlorpyrifos loading capacity occurred during the previous irrigation season.

These prohibitions apply only to i) dischargers who discharge the pollutant causing or contributing to the exceedance of the water quality objective or loading capacity; and ii) dischargers located in those subareas not meeting their load allocations.

These prohibitions do not apply if the discharge of diazinon or chlorpyrifos is subject to a waiver of waste discharge requirements implementing the diazinon and chlorpyrifos water quality objectives and load allocations for diazinon and chlorpyrifos for the San Joaquin River, or governed by individual or general waste discharge requirements.

Insert to Chapter IV Implementation page 36.01

Diazinon and Chlorpyrifos Runoff in the San Joaquin River Basin

1. The pesticide runoff control program shall:
   a. Ensure compliance with water quality objectives applicable to diazinon and chlorpyrifos in the San Joaquin River through the implementation of management practices.
   b. Ensure that measures that are implemented to reduce discharges of diazinon and chlorpyrifos do not lead to an increase in the discharge of other pesticides to levels that cause or contribute to violations of applicable water quality objectives and Regional Water Board policies; and
   c. Ensure that discharges of pesticides to surface waters are controlled so that pesticide concentrations are at the lowest levels that are technically and economically achievable.

2. Dischargers must consider whether a proposed alternative to diazinon or chlorpyrifos has the potential to degrade ground or surface water. If the alternative has the potential to degrade groundwater, alternative pest control methods must be considered. If the alternative has the potential to degrade surface water, control measures must be implemented to ensure that applicable water quality objectives and Regional Board policies are not violated, including State Water Resources Control Board Resolution 68-16.

3. Compliance with applicable water quality objectives, load allocations, and waste load allocations for diazinon and chlorpyrifos in the San Joaquin River is required by December 1, 2010.

   The water quality objectives and allocations will be implemented through one or a combination of the following: the adoption of one or more waivers of waste discharge requirements, and general or individual waste discharge requirements. To the extent not already in place, the Regional Water Board expects to adopt or revise the appropriate waiver(s) or waste discharge requirements by December 31, 2007.

4. The Regional Board intends to review the diazinon and chlorpyrifos allocations and the implementation provisions in the Basin Plan at least once every five years, beginning no later than December 31, 2009.

5. Regional Board staff will meet at least annually with staff from the Department of Pesticide Regulation and representatives from the California Agricultural Commissioners and Sealers Association to review pesticide use and instream pesticide concentrations during the dormant spray and irrigation application seasons, and to consider the effectiveness of management measures in meeting water quality objectives and load allocations.

6. The Waste Load Allocations (WLA) for all NPDES-permitted dischargers, Load Allocations (LA) for nonpoint source discharges, and the Loading Capacity of the San Joaquin River from the Mendota Dam to Vernalis shall not exceed the sum (S) of one (1) as defined below.

$$TU = \frac{C_D}{WQO_D} + \frac{C_C}{WQO_C} \leq 1.0$$

where

C_D = diazinon concentration in µg/L of point source discharge for the WLA; nonpoint source discharge for the LA; or San Joaquin River for the LC.

C_C = chlorpyrifos concentration in µg/L of point source discharge for the WLA; nonpoint source discharge for the LA; or San Joaquin River for the LC.

WQO_D = acute or chronic diazinon water quality objective in µg/L.

WQO_C = acute or chronic chlorpyrifos water quality objective in µg/L.

Available samples collected within the applicable averaging period for the water quality objective will be used to determine compliance with the allocations and loading capacity. For purposes of calculating the sum (S) above, analytical results that are reported as "non-detectable" concentrations are considered to be zero.

At a minimum, Loading Capacity shall be calculated for each of the following six water

quality compliance points in the San Joaquin River:

- San Joaquin River at the Airport Way Bridge near Vernalis (United States Geological Survey (USGS) Identification Number 11303500)
- San Joaquin River at the Maze Boulevard (Highway 132) Bridge (USGS Identification Number 11290500)
- San Joaquin River at Las Palmas Avenue near Patterson (USGS Identification Number 11274570)
- San Joaquin River at Hills Ferry Road
- San Joaquin River at Highway 165 near Stevinson (USGS Identification Number 11260815)
- San Joaquin River at Sack Dam

6. The load allocations for non-point source discharges into the San Joaquin River are assigned to the following subareas:

   a. The combined Stanislaus River; North Stanislaus; and Vernalis North subareas.
   b. The combined Tuolumne River; Northeast Bank; and Westside Creek subareas.
   c. The combined Turlock; Merced; and Greater Orestimba subareas.
   d. The combined Stevinson and Grassland subareas.
   e. The combined Bear Creek and Fresno-Chowchilla subareas.

7. The established waste load and load allocations for diazinon and chlorpyrifos, and the water quality objectives for chlorpyrifos and diazinon in the San Joaquin River represent a maximum allowable level. The Regional Water Board shall require any additional reductions in diazinon and chlorpyrifos levels necessary to account for additional additive or synergistic toxicity effects or to protect beneficial uses in tributary waters.

8. Pursuant to CWC Section 13267, the Executive Officer will require dischargers to submit a management plan that describes the actions that the discharger will take to reduce diazinon and chlorpyrifos discharges and meet the applicable allocations by the required compliance date.

   The management plan may include actions required by State and federal pesticide regulations. The Executive Officer will require the discharger to document the relationship between the actions to be taken and the expected reductions in diazinon and chlorpyrifos discharges. The Executive Officer will allow individual dischargers or a discharger group or coalition to submit management plans.

   The management plan must comply with the provisions of any applicable waiver of waste discharge requirements or waste discharge requirements.

   The Executive Officer may require revisions to the management plan if compliance with applicable allocations is not attained or the management plan is not reasonably likely to attain compliance.

9. If the loading capacity in the San Joaquin River is not being met by the compliance date, dischargers in subareas where load allocations are not being met will be required to revise their management plans and implement an improved complement of management measures to meet the loading capacity.

10. Any waiver of waste discharge requirements or waste discharge requirements that govern the control of pesticide runoff that is discharged directly or indirectly into the San Joaquin River must be consistent with the policies and actions described in paragraphs 1 – 9.

11. In determining compliance with the waste load allocations, the Regional Water Board will consider any data or information submitted by the discharger regarding diazinon and chlorpyrifos inputs from sources outside of the jurisdiction of the permitted discharger, including any diazinon and chlorpyrifos present in precipitation, and other available relevant information; and any applicable provisions in the discharger's NPDES permit requiring the discharger to reduce the discharge of pollutants to the maximum extent possible.

Add to "Estimated Costs of Agricultural Water Quality Control Programs and potential Sources of Financing" section-

The total estimated costs for management practices to meet the diazinon and chlorpyrifos objectives for the San Joaquin River range from -$56,000 to $2.5 million for the dormant season, and from $3.9 million to $5.3 million for the irrigation season. The estimated costs for discharger compliance monitoring, planning and evaluation range from $600,000 to $3.1 million. The estimated total annual costs range from $4.4 million to $10.9 million (2004 dollars).

Potential funding sources include:

1. Those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program and the Pesticide Control Program.

Add to Chapter 5 Surveillance and Monitoring

The Regional Water Board requires a focused monitoring effort of pesticide runoff from orchards and fields in the San Joaquin Valley.

The monitoring and reporting program for any waste discharge requirements or waiver of waste discharge requirements that addresses pesticide runoff from orchards and fields in the San Joaquin valley must be designed to collect the information necessary to:

1.determine compliance with established water quality objectives and the loading capacity applicable to diazinon and chlorpyrifos in the San Joaquin River;
2. determine compliance with established load allocations for diazinon and chlorpyrifos;
3. determine the degree of implementation of management practices to reduce off-site movement of diazinon and chlorpyrifos;
4. determine the effectiveness of management practices and strategies to reduce off-site migration of diazinon and chlorpyrifos;
5. determine whether alternatives to diazinon and chlorpyrifos are causing surface water quality impacts;
6. determine whether the discharge causes or contributes to a toxicity impairment due to additive or synergistic effects of multiple pollutants; and
7. demonstrate that management practices are achieving the lowest pesticide levels technically and economically achievable.

Dischargers are responsible for providing the necessary information. The information may come from the dischargers' monitoring efforts; monitoring programs conducted by State or federal agencies or collaborative watershed efforts; or from special studies that evaluate the effectiveness of management practices.

Add to Appendices

Add a new Appendix 41 titled "San Joaquin Area Subarea Descriptions". The proposed language is in Appendix A of this report.

Subarea Boundaries: The area of interest is divided into seven subareas, each with a unique hydrologic drainage. Three of the subareas have been further delineated into minor subareas for purpose of facilitating the determination of load from various parts of the subarea watershed and the lower San Joaquin River watershed as a whole. The subarea boundaries were derived, in part, on previous watershed delineations performed by Charlie Kratzer with the USGS (USGS, 1998) and modified by Regional Board staff with digital 1:24,000 USGS topographic quadrangles by digitizing new or additional boundaries using a GIS.

A. East Valley Floor:

This is the drainage area that primarily drains to the San Joaquin River from the east and is located between each of the three major river drainages on the east side. It contains three inter-basin areas, the northern most of the three areas is the region between the Stanislaus and Tuolumne River drainages, the middle region is between the Tuolumne and Merced River drainages, and the southern region is between the Merced River and Bear Creek drainage basins. This area is made up of all land east of the San Joaquin River that is not included in any of the previously mentioned watersheds, south of the Stanislaus River, west of Tuolumne and Mariposa counties, and north of the Bear Creek drainage area.

The East Valley Floor drains approximately 413 square miles (264,000 acres) and is located primarily in the central part of Stanislaus County with small portions in north-central Merced County and south-central San Joaquin County. It includes the cities of Hughson, Keyes, Turlock, and Denair, as well as the southern part of Salida, northern Modesto, southern Ceres, and northern Hilmar. The East Valley Floor also encompasses most of Turlock Irrigation District, western Modesto Irrigation District, and a small portion of southern Oakdale Irrigation District. The boundary of this area is defined as follows:

BEGINNING at the junction of the Stanislaus River and the San Joaquin River lying in Section 19, Township 3 South, Range 7 East, Mount Diablo Meridian; thence along the following courses:

1. Meander the centerline of the Stanislaus River northeasterly upstream to its intersection with boundary of Calwater RBUASPW area 6535100000 (Manteca Hydrologic Area) near Caswell Memorial State Park;

2. North on the said boundary of Calwater RBUASPW area 6535100000 (Manteca Hydrologic Area) near Caswell Memorial State Park to its intersection with the centerline of a road located slightly more than one half mile north of the river;

3. East on centerline of said road to its junction with the centerline of the north levee of the Stanislaus River;

4. Southwesterly on centerline of said Stanislaus River levee to its intersection with the centerline of the park road connecting to the campsites, were said road extended to intersect the levee;

5. Easterly on said road to the point of intersection with a line perpendicular from the bank of the Stanislaus River directly opposite of Campsite number 24;

6. North-Northeasterly on said perpendicular line to its intersection with the centerline of the Stanislaus River;

7. East to the intersection with the crest of the ridge parallel to the opposite side of the river bend from the Caswell Memorial State Park;

8. Southeast on said ridge to its intersection with the centerline of the south bank levee of the Stanislaus River;

9. Meander centerline of said levee northeasterly to its intersection with the centerline of Modesto Irrigation District Lateral Number 6;

10. Meander centerline of said Lateral No. 6 easterly to its junction with the centerline of Modesto Main Canal;

11. Meander centerline of said Main Canal southeasterly to its junction with the centerline of Thompson Lateral;

12. Meander centerline of said Thompson Lateral northerly to its junction with the centerline of Stowell Lateral;

13. Meander centerline of said Stowell Lateral northeasterly to its junction with the centerline of Claribel Lateral;

14. Meander centerline of said Claribel Lateral southerly to its junction with the centerline of Dry Creek;

15. Meander centerline of Dry Creek westerly to its intersection with the centerline of Modesto Main Canal;

16. Meander centerline of said Main Canal northwesterly to its junction with Modesto Irrigation District Lateral Number 3;

17. Meander centerline of said Lateral No. 3 westerly to its junction with Modesto Irrigation District Lateral Number 4;

18. Meander centerline of said Lateral No. 4 southwest to its intersection with the boundary of the McHenry Avenue Stormdrain Basin, as defined by the City of Modesto, in Modesto;

19. Meander the boundary of the said McHenry Avenue Stormdrain Basin to its intersection with the boundary of the Ninth Street Stormdrain Basin, as defined by the City of Modesto, in Modesto;

20. Meander boundary of the said Ninth Street Stormdrain Basin to its intersection with the centerline of Franklin Street;

21. South on the centerline of Franklin Street to the intersection with the centerline of Locust Street;

22. West on the centerline of Locust Street to its intersection with the centerline of Modesto Irrigation District Lateral Number 5, were it extended west to intersect the centerline of said Lateral No. 5;

23. Meander centerline of said Lateral No. 5 southwesterly to its intersection with the centerline of Hart Road;

24. South on the centerline of said road to its junction with the centerline of Paradise Road;

25. West on the centerline of Paradise Road to its junction with the centerline of Shiloh Road;

26. Southerly 1.5 miles on the centerline of said Shiloh Road to the location where it bends to the due west;

27. Meander the drainage boundary of the Tuolumne River southeasterly to its intersection with the centerline of Turlock Irrigation District Lower Lateral Number 2;

28. Meander centerline of said Lateral No. 2 westerly to its junction with the centerline of Turlock Irrigation District Lateral Number 1;

29. Meander centerline of said Lateral No. 1 to its junction with the centerline of Ceres Main Canal;

30. Meander centerline of said Ceres Main Canal easterly to its junction with the centerline of Turlock Main Canal;

31. Meander centerline of said Turlock Main Canal easterly to its junction with the centerline of Highline Canal;

32. Meander centerline of said Highline Canal southerly to its intersection with the drainage boundary of Sand Creek approximately 2000 feet upstream of the intersection with Keyes Road in Stanislaus County;

33. Meander drainage boundary of Sand Creek such that it is included in the East Valley Floor back to its intersection with the centerline of Highline Canal approximately one half mile southeast of the intersection of Hickman Road and Monte Vista Avenue in Stanislaus County;

34. Meander centerline of said Highline Canal southwest to its intersection with the drainage divide between Turlock Irrigation District Cross Ditch Number 1 and Turlock Irrigation District Cross Ditch Number 2 approximately 0.33 miles southwest of the intersection of Santa Fe Drive with the Merced County line;

35. Meander said drainage divide southwesterly to its intersection with the centerline of Turlock Irrigation District Lateral Number 6 at the junction of the centerlines of Turlock Main Canal, Turlock Irrigation District Lateral Number 5 (Harding Drain), and said Lateral No. 6;

36. Meander centerline of said Lateral No. 6 southwesterly to its junction with the centerline of Turlock Irrigation District Lateral Number 7;

37. Meander centerline of said Lateral No. 7 southwesterly to its junction with the centerline of Stevinson Lower Lateral;

38. Meander centerline of said Stevinson Lower Lateral southwesterly to its intersection with the centerline of an unnamed aqueduct approximately one quarter of one mile west of the intersection of Tegner Road and Taylor Avenue in Merced County;

39. Westerly on the centerline of said aqueduct to its junction with the centerline of the Merced River at its apparent point of discharge;

40. Meander centerline of the Merced River to its junction with the centerline of an unnamed canal pumped from the river less than one fifth of a mile downstream of the discharge point of the unnamed aqueduct;

41. Northwest on centerline of said unnamed canal to its intersection with the centerline of an unnamed unpaved road parallel to the Merced River, which begins nearly at the pump on the river;

42. Meander the centerline of said road westerly to its junction with the centerline of Kelley Road;

43. South on the centerline of Kelley Road to its intersection with the centerline of River Road;

44. Southeast on centerline of said River Road to its intersection with the centerline of the East Side Canal;

45. Meander centerline of said East Side Canal northeasterly to its intersection with a line due east coincident with the ninety degree bend in River Road in Section 4, Township 7 South, Range 14 East, Mount Diablo Meridian;

46. East on said line to its intersection with the centerline of River Road in Merced County;

47. Northeasterly on centerline of said River Road to its intersection with the West Side Boulevard, were said road extended to intersect River Road;

48. East on centerline of said West Side Boulevard to its junction with the centerline of Weir Road in Merced County;

49. Northeast to the junction of the centerlines of Magnolia Avenue and Howard Avenue in Merced County;

50. East on centerline of said Magnolia Avenue to its intersection with the southern drainage boundary of the Garibaldi Lateral;

51. Meander said southern boundary of Garibaldi Lateral to its intersection with the centerline of Hammatt Lateral at its junction with the centerline of Arena Canal near Livingston;

52. South on said drainage boundary of Bear Creek to its intersection with the centerline of the East Side Irrigation Canal, also known as the East Side Bypass Project, near said canal's junction with Howard Lateral;

53. Southwesterly on the drainage boundary of the San Joaquin River upstream of its intersection with Lander Avenue (Highway 165) to its intersection with the centerline of the San Joaquin River at its intersection with the centerline of Lander Avenue (Highway 165);

54. Meander centerline of said San Joaquin River northwesterly to its junction with the centerline of the Stanislaus River and the point of beginning of this description.

1. North Stanislaus:

Located in the northern portion of Stanislaus County, south of the Stanislaus River, this minor subarea of the East Valley Floor contains much of northern Modesto and southern Salida. It drains 68 square miles (43,400 acres) of land between the Stanislaus and Tuolumne River watersheds that flows into the San Joaquin River from the east, upstream of Airport Road and downstream of Maze Boulevard, including much of northern Modesto Irrigation District and a small portion of southern Oakdale Irrigation District. The boundary of this area is defined as follows:

BEGINNING at the junction of the Stanislaus River and the San Joaquin River lying in Section 19, Township 3 South, Range 7 East, Mount Diablo Meridian; thence along the following courses:

1. Meander the centerline of the Stanislaus River northeasterly upstream to its intersection with boundary of Calwater RBUASPW area 6535100000 (Manteca Hydrologic Area) near Caswell Memorial State Park;

2. North on the said boundary of Calwater RBUASPW area 6535100000 (Manteca Hydrologic Area) near Caswell Memorial State Park to its intersection with the centerline of a road located slightly more than one half mile north of the river;

3. East on centerline of said road to its junction with the centerline of the north levee of the Stanislaus River;

4. Southwesterly on centerline of said Stanislaus River levee to its intersection with the centerline of the park road connecting to the campsites, were said road extended to intersect the levee;

5. Easterly on said road to the point of intersection with a line perpendicular from the bank of the Stanislaus River directly opposite of Campsite number 24;

6. North-Northeasterly on said perpendicular line to its intersection with the centerline of the Stanislaus River;

7. East to the intersection with the crest of the ridge parallel to the opposite side of the river bend from the Caswell Memorial State Park;

8. Southeast on said ridge to its intersection with the centerline of the south bank levee of the Stanislaus River;

9. Meander centerline of said levee northeasterly to its intersection with the centerline of Modesto Irrigation District Lateral Number 6;

10. Meander centerline of said Main Canal southeasterly to its junction with the centerline of Thompson Lateral;

11. Meander centerline of said Thompson Lateral northerly to its junction with the centerline of Stowell Lateral;

12. Meander centerline of said Stowell Lateral northeasterly to its junction with the centerline of Claribel Lateral;

13. Meander centerline of said Claribel Lateral southerly to its junction with the centerline of Dry Creek;

14. Meander centerline of Dry Creek westerly to its intersection with the centerline of Modesto Main Canal;

15. Meander centerline of said Main Canal northwesterly to its junction with Modesto Irrigation District Lateral Number 3;

16. Meander centerline of said Lateral No. 3 westerly to its junction with Modesto Irrigation District Lateral Number 4;

17. Meander centerline of said Lateral No. 4 southwest to its intersection with the boundary of the McHenry Avenue Stormdrain Basin, as defined by the City of Modesto, in Modesto;

18. Meander the boundary of the said McHenry Avenue Stormdrain Basin northwesterly to its intersection with the boundary of the Ninth Street Stormdrain Basin, as defined by the City of Modesto, in Modesto;

19. West and south on the boundary of the said Ninth Street Stormdrain Basin to its intersection with the centerline Highway 99;

20. Northwest on centerline of said Highway 99 to its intersection with the centerline of Woodland Avenue/Coldwell Avenue;

21. West on centerline on said centerline of Woodland Avenue to its intersection with the western boundary intersection of Sections 21 and 28, Township 3 South, Range 8 East, Mount Diablo Meridian;

22. North on boundary of Section 21, Township 3 South, Range 8 East, Mount Diablo Meridian to its intersection with the centerline of Modesto Irrigation District Lateral Number 3;

23. West on centerline of said Lateral No. 3 to its junction with the centerline of an unnamed lateral approximately one half mile downstream of the intersection with the section boundary;

24. Meander centerline of said unnamed canal southwesterly to its junction with the centerline of the north levee of Modesto Irrigation District Lateral Number 4 if it were extended to cross said unnamed canal;

25. Meander centerline of said levee of Lateral No. 4 westerly to its junction with the centerline of the eastern levee of Finnegan Cut on San Joaquin River;

26. Meander centerline of said levee of Finnegan Cut on the San Joaquin River to its intersection with the centerline of Maze Boulevard in Stanislaus County;

27. Westerly on centerline of said Maze Boulevard to its intersection with the centerline of the San Joaquin River;

28. Meander centerline of said San Joaquin River northerly to its intersection with the centerline of the Stanislaus River and the point of beginning of this description.

2. Northeast Bank:

This minor subarea of the East Valley Floor contains all of the land draining into the east side San Joaquin River upstream of Maze Boulevard and downstream of Las Palmas Avenue Road and covers 123 square miles (78,800 acres). It is located in central Stanislaus County and includes the cities of Houghson, Keyes, southern Ceres, parts of western Modesto and much of northern Turlock Irrigation District and southwest Modesto Irrigation District. The boundary of this area is defined as follows:

BEGINNING at the centerline of the San Joaquin River at the Maze Boulevard Bridge lying in Section 29, Township 3 South, Range 7 East, Mount Diablo Meridian; thence along the following courses:

1. Easterly on centerline of said Maze Boulevard to its intersection with the centerline of the east bank levee of the San Joaquin River;

2. Meander centerline of said levee of the San Joaquin River southeasterly to its intersection with the north bank levee of Modesto Irrigation District Lateral Number 4;

3. Meander centerline of said levee of Lateral No. 4 easterly to its intersection with the centerline of an unnamed lateral connecting Lateral No. 3 and Lateral No. 4, were it extended east to said centerline;

4. Meander centerline of said unnamed lateral to its junction with the centerline of Modesto Irrigation District Lateral Number 3;

5. East on centerline of said Lateral No. 3 to its intersection with the western boundary of Section 21, Township 3 South, Range 8 East, Mount Diablo Meridian;

6. South on boundary of said Section 21 to its intersection with the centerline of Woodland Avenue;

7. East on the centerline of said Woodland Avenue to its intersection with the centerline of Highway 99;

8. Southeast on the centerline of said Highway 99 to its intersection with the centerline of Franklin Street;

9. South on the centerline of Franklin Street to the intersection with the centerline of the centerline of Locust Street;

10. West on the centerline of Locust Street to its intersection with the centerline of Modesto Irrigation District Lateral Number 5, were it extended west to intersect said Lateral No. 5;

11. Meander centerline of said Lateral No. 5 southwesterly to its intersection with the centerline of Hart Road;

12. South on the centerline of said road to its junction with the centerline of Paradise Road;

13. West on the centerline of Paradise Road to its junction with the centerline of Shiloh Road;

14. South 1.5 miles on the centerline of said Shiloh Road to the location where it bends to the due west;

15. Meander the drainage boundary of the Tuolumne River southeasterly to its intersection with the centerline of Turlock Irrigation District Lower Lateral Number 2;

16. Meander centerline of said Lateral No. 2 westerly to its junction with the centerline of Turlock Irrigation District Lateral Number 1;

17. Meander centerline of said Lateral No. 1 to its junction with the centerline of Ceres Main Canal;

18. Meander centerline of said Ceres Main Canal easterly to its junction with the centerline of Turlock Main Canal;

19. Meander centerline of said Turlock Main Canal southerly to its junction with the centerline of Turlock Irrigation District Upper Lateral Number 3;

20. Meander centerline of said Lateral No. 3 westerly to its junction with the centerline of Turlock Irrigation District Lower Lateral Number 3;

21. West on centerline of said Lateral No. 3 to its intersection with the centerline of an unnamed lateral located approximately 3000 feet downstream of the Lateral No. 3 intersection with the centerline of Carpenter Road in Stanislaus County;

22. South on centerline of said unnamed lateral to its intersection with the centerline of Monte Vista Avenue in Stanislaus County;

23. Southwesterly on the drainage boundary separating the San Joaquin River from the unnamed drain and associated natural channel to its junction with the centerline of the east bank levee of the San Joaquin River;

24. Northwesterly on centerline of said levee of the San Joaquin River to its intersection with the drainage of the San Joaquin River upstream of West Main Street approximately 700 feet southeast of the intersection of the centerline of the east bank levee of the San Joaquin River and the centerline of West Main Street;

25. Northwesterly on drainage boundary of the San Joaquin River upstream of Las Palmas Avenue in Stanislaus County to its intersection with the centerline of the San Joaquin River at its intersection with the centerline of Las Palmas Avenue;

26. Northwesterly on the centerline of said San Joaquin River to its intersection with the centerline of Maze Boulevard and the point of beginning of this description.

3. Stevinson:

This minor subarea of the East Valley Floor contains all of the land flowing to the San Joaquin River from the east upstream of its confluence with the Merced River and downstream of the Lander Avenue (Highway 165) crossing and covers 44 square miles (28,200 acres). It is located in north-central Merced County and includes a small portion of western Merced Irrigation District. The boundary of this area is defined as follows:

BEGINNING at the centerline of the San Joaquin River at its junction with the centerline of the Merced River lying in Section 03, Township 07 South, Range 09 East, Mount Diablo Meridian; thence along the following courses:

1. East on centerline of Hills Ferry Road to its intersection with the centerline of River Road in Merced County;

2. Southeast on centerline of said River Road to its intersection with the centerline of the East Side Canal;

3. Meander centerline of said East Side Canal northeasterly to its intersection with a line due east coincident with the ninety degree bend in River Road in Section 4, Township 7 South, Range 14 East, Mount Diablo Meridian;

4. East on said line to its intersection with the centerline of River Road in Merced County;

5. Northeasterly on centerline of said River Road to its intersection with the West Side Boulevard, were said road extended to intersect River Road;

6. East on centerline of said West Side Boulevard to its junction with the centerline of Weir Road in Merced County;

7. Northeast to the junction of the centerlines of Magnolia Avenue and Howard Avenue in Merced County;

8. East on centerline of said Magnolia Avenue to its intersection with the southern drainage boundary of the Garibaldi Lateral;

9. Meander said southern boundary of Garibaldi Lateral to its intersection with the centerline of Hammatt Lateral at its junction with the centerline of Arena Canal near Livingston;

10. South on said drainage boundary of Bear Creek to its intersection with the centerline of the East Side Irrigation Canal, also known as the East Side Bypass Project, near said canal's junction with Howard Lateral;

11. Southwesterly on the drainage boundary of the San Joaquin River upstream of its intersection with Lander Avenue (Highway 165) to its intersection with the centerline of the San Joaquin River at its intersection with the centerline of Lander Avenue (Highway 165);

12. Northwesterly on centerline of said San Joaquin River to its junction with the centerline of the Merced River and the point of beginning of this description.

4. Turlock Area:

This minor subarea of the East Valley Floor contains all of the land draining into the San Joaquin River from the east upstream of Las Palmas Avenue/West Main Street and downstream of the confluence of the San Joaquin River and Merced River and covers 178 square miles (114,000 acres). including the Harding Drain (T.I.D. Lateral Number 5). It is located in south-central Stanislaus County and northern Merced County and contains much of Hilmar and the cities of Turlock and Denair, as well as most of central and southern Turlock Irrigation District (T.I.D.) including the Harding Drain (T.I.D. Lateral Number 5). The boundary of this area is defined as follows:

BEGINNING at the centerline of the San Joaquin River at the intersection with the centerline of the Las Palmas Avenue Bridge lying in Section 15, Township 05 South, Range 08 East, Mount Diablo Meridian; thence along the following courses:

1. Southeasterly on the drainage boundary of the San Joaquin River upstream of West Main Street in Stanislaus County to its intersection with the centerline of the east bank levee of the San Joaquin River approximately 700 feet southeast of the intersection of the centerline of said levee and the centerline of West Main Street;

2. Southeasterly on centerline of said levee of the San Joaquin River to its intersection with the drainage boundary approximately 3500 feet south of the intersection of the centerline of Jennings Road and the centerline of West Main Street in Stanislaus County separating the San Joaquin River from an unnamed lateral and associated natural channel downstream of its intersection with the centerline with Monte Vista Avenue in Stanislaus County;

3. Northwesterly on said drainage boundary to its intersection with the centerline of Monte Vista Avenue at its intersection with the centerline of the unnamed lateral;

4. North on centerline of said unnamed lateral to its junction with the centerline of Turlock Irrigation District Lower Lateral Number 3 approximately 3000 feet downstream of said Lateral No. 3 intersection with the centerline of Carpenter Road in Stanislaus County;

5. Meander centerline of said Lateral No.3 east to its junction with the centerline of Turlock Irrigation District Upper Lateral Number 3;

6. Meander centerline of said Lateral No. 3 east to its junction with the centerline of Turlock Main Canal;

7. Meander centerline of said Turlock Main Canal north to its junction with the centerline of Highline Canal;

8. Meander centerline of said Highline Canal southerly to its intersection with the drainage boundary of Sand Creek approximately 2000 feet upstream of the intersection with Keyes Road in Stanislaus County;

9. Meander drainage boundary of Sand Creek such that it is included in the East Valley Floor back to its intersection with the centerline of Highline Canal approximately one half mile southeast of the intersection of Hickman Road and Monte Vista Avenue in Stanislaus County;

10. Meander centerline of said Highline Canal southwest to its intersection with the drainage divide between Turlock Irrigation District Cross Ditch Number 1 and Turlock Irrigation District Cross Ditch Number 2 approximately 0.33 miles southwest of the intersection of Santa Fe Drive with the Merced County line;

11. Meander said drainage divide southwesterly to its intersection with the centerline of Turlock Irrigation District Lateral Number 6 at the junction of the centerlines of Turlock Main Canal, Turlock Irrigation District Lateral Number 5 (Harding Drain), and said Lateral No. 6;

12. Meander centerline of said Lateral No. 6 southwesterly to its junction with the centerline of Turlock Irrigation District Lateral Number 7;

13. Meander centerline of said Lateral No. 7 southwesterly to its junction with the centerline of Stevinson Lower Lateral;

14. Meander centerline of said Stevinson Lower Lateral southwesterly to its intersection with the centerline of an unnamed aqueduct approximately one quarter of one mile west of the intersection of Tegner Road and Taylor Avenue in Merced County;

15. Westerly on the centerline of said aqueduct to its junction with the centerline of the Merced River at its apparent point of discharge;

16. Meander centerline of the Merced River to its junction with the centerline of an unnamed canal pumped from the river less than one fifth of a mile downstream of the discharge point of the unnamed aqueduct;

17. Northwest on centerline of said unnamed canal to its intersection with the centerline of an unnamed unpaved road parallel to the Merced River, which begins nearly at the pump on the river;

18. Meander the centerline of said road westerly to its junction with the centerline of Kelley Road;

19. South on the centerline of Kelley Road to its intersection with the centerline of Hills Ferry/River Road;

20. West on centerline of said Hills Ferry Road to its intersection with the centerline of the San Joaquin River;

21. Meander centerline of said San Joaquin River northwesterly to its intersection with the centerline of West Main Street and the point of beginning of this description.

B. Grasslands: The Grasslands is the southwest region of the TMDL project area. It encompasses the drainage areas of Mud Slough, Salt Slough, Los Banos Creek, water districts

receiving water from the Mendota Pool, and all other water bodies draining to the San Joaquin River upstream of its confluence with the Newman Wasteway from the west side and downstream of Sack Dam, including the drainage of Columbia Canal Company which is known to contribute to the San Joaquin River upstream of Sack Dam and the Grassland Drainage Project Area. The area occupies 1,370 square miles (878,000 acres) including nearly all of Merced County west of the San Joaquin River as well as small portion of southern Stanislaus County and northwestern Fresno County. It includes the cites of Los Banos, Gustine, Dos Palos, South Dos Palos, and Firebaugh as well as numerous water and irrigation districts including the Grasslands Water District, San Luis Canal Company, San Luis Water District, and most of Central California Irrigation District. The boundary of this area is defined as follows:

BEGINNING at the junction of the Newman Wasteway and the San Joaquin River lying in Section 10, Township 7 South, Range 9 East, Mount Diablo Meridian; thence along the following courses:

1. Meander the centerline of the San Joaquin River southeasterly upstream to its junction with the jurisdictional boundary of Columbia Canal Company;

2. West and south on the jurisdictional boundary of Columbia Canal Company to its intersection with the San Joaquin River;

3. Meander said centerline of the San Joaquin River easterly to its intersection with the center point of the Mendota Pool;

4. Meander the centerline of the Fresno Slough channel southerly to its intersection with the centerline of the Firebaugh Canal Water District Main Lift;

5. West southwest on the centerline of said Main Lift to its intersection with the centerline of the Firebaugh Canal Water District Third Lift Canal;

6. Northwesterly and westerly on the boundary of Westlands Water District, as defined by said district, to its intersection with the southern drainage boundary of Capita Canyon;

7. Meander on said drainage boundary of Capita Canyon southwesterly to its intersection with the southern drainage boundary of Moreno Gulch;

8. Meander on said drainage boundary of Moreno Gulch westerly to its intersection with southern drainage boundary of Little Panoche Creek;

9. Meander on said drainage boundary of Little Panoche Creek northwesterly to its intersection with the county line between Fresno and San Benito counties where the county line crosses the southern boundary of Section 31, Township 14 South, Range 11 East, Mount Diablo Meridian;

10. Northwesterly on the San Benito County line to its intersection with the crest of the Coast Range;

11. Meander on the crest of the Coast Range north-northwesterly to its intersection with the peak of Mustang Peak, where the drainage divide between Orestimba Creek and Garzas Creek diverges from crest of the Coast Range;

12. Meander on said drainage boundary of Garzas Creek westerly to point where the drainage of Garzas Creek and Bennett Valley diverge;

13. Meander said southern boundary of Bennett Valley and associated watersheds to its intersection with the centerline of Eastin Road in Merced County;

14. North on centerline of said Eastin Road to its intersection with the centerline of the first and southern-most of the associated creeks of Bennett Valley, just south of its junction with Moorehead Road;

15. Meander centerline of said creek northeasterly to its intersection with the centerline of Central California Irrigation District's Main Canal;

16. Meander centerline of said Main Canal northwesterly to its intersection with the centerline of the Newman Wasteway;

17. East on centerline of said Newman Wasteway to its junction with the centerline of the San Joaquin River and the point of beginning of this description.

C. Merced River: This basin includes drainage to the Merced River, Stevinson Lower Lateral, Highline Canal, Dry Creek, and Livingston Canal. It is located in northern Merced County and portions of southern Stanislaus and occupies 294 square miles (188,000 acres). It includes the cities of Delhi, Snelling, southern Hilmar, and northern Atwater as well as Ballico-Cortez Water District, southern Turlock Irrigation District, northern Merced Irrigation District, and nearly all of Eastside Water District. The boundary of this area is defined as follows:

BEGINNING at the intersection of the centerline of the Merced River and the centerline of River Road lying in Section 3, Township 7 South, Range 9 East, Mount Diablo Meridian; thence along the following courses:

1. West on centerline of said River Road to its intersection with the centerline of Kelley Road;

2. North on centerline of said Kelley Road to its intersection with the centerline of an unnamed, unpaved road approximately 4000 feet north of the intersection of Kelley Road and River Road;

3. Meander centerline of said unnamed road to its intersection with the centerline of an unnamed lateral pumped from the Merced River;

4. Southeast on the centerline of said unnamed lateral to its intersection with the centerline of the Merced River;

5. Meander centerline of the Merced River to the discharge point of an unnamed aqueduct located less than one fifth of a mile upstream of the pump on said unnamed lateral;

6. Easterly on centerline of said aqueduct to its intersection with the centerline of Stevinson Lower Lateral;

7. Meander centerline of said Stevinson Lower Lateral northwesterly to its junction with the centerline of Turlock Irrigation District Lateral Number 7;

8. Meander centerline of said Lateral No. 7 northeasterly to its junction with the centerline of Turlock Irrigation District Lateral Number 6;

9. Meander centerline of said Lateral No. 6 northeasterly to its intersection with the drainage divide between Turlock Irrigation District Cross Ditch Number 1 and Turlock Irrigation District Cross Ditch Number 2 at the junction of the centerlines of Turlock Main Canal, Turlock Irrigation District Lateral Number 5 (Harding Drain), and said Lateral No. 6;

10. Meander said drainage northeasterly to its intersection with the centerline of Highline Canal approximately 0.33 miles southwest of the intersection of Santa Fe Drive with the Merced County line;

11. Meander centerline of said Highline Canal north to its junction with the centerline of Turlock Main Canal;

12. Meander drainage boundary of unnamed creeks draining easterly toward Highline Canal and to the Merced River via said canal southeasterly to its intersection with the drainage boundary of Sand Creek;

13. Meander said drainage boundary of Sand Creek southwesterly to its intersection with the centerline of Highline Canal approximately 2000 feet upstream of the intersection with Keyes Road;

14. Meander centerline of said Highline Canal southerly to its intersection with the southern drainage boundary of Sand Creek, approximately one half mile southeast of the intersection of Hickman Road and Monte Vista Avenue in Stanislaus County;

15. Meander said drainage boundary of Sand Creek easterly to its junction with the unnamed interior drainage basin west of Turlock Lake;

16. Meander said interior drainage basin northeasterly to its junction with the southern drainage boundary of Turlock Lake;

17. Meander said drainage boundary of Turlock Lake northeasterly to its junction with the southern drainage boundary of Peaslee Creek;

18. Meander said drainage boundary of Peaslee Creek northeasterly to its junction with the southern drainage boundary of Evans Creek;

19. Meander said drainage boundary of Evans Creek northeasterly to its junction with the southern drainage boundary of Vizard Creek;

20. Meander said drainage boundary of Vizard Creek easterly to its intersection with the Stanislaus County line, near the four-corner intersection of Stanislaus, Tuolumne, Merced, and Mariposa counties;

21. Southeast on said Stanislaus County line to its intersection with the Merced County line;

22. Southeasterly on the Merced County line to its intersection with the drainage boundary between Merced River and Burns Creek;

23. Meander said drainage boundary of Burns Creek southwesterly to its junction with the drainage boundary of Black Rascal Creek;

24. Meander said drainage boundary of Black Rascal Creek northwesterly to its junction with the drainage boundary of Stoney Creek;

25. Meander said drainage boundary of Stoney Creek northerly to its intersection with the centerline of the Merced River;

26. Meander centerline of said Merced River westerly to its junction with the centerline of the Merced Irrigation District Main Canal;

27. Meander centerline of said Main Canal southwesterly, excluding any creeks or canals flowing into it, to its intersection with the southern drainage boundary of Edendale Creek;

28. Meander said drainage boundary of Edendale Creek southwesterly to its junction with the drainage boundary of Canal Creek;

29. Meander said drainage boundary of Canal Creek southerly to its intersection with the centerline of Bellevue Road near Castle Airport in Merced County;

30. West on centerline of said Bellevue road to its intersection with the centerline of Canal Creek, were it extended to intersect said creek;

31. Southerly on the centerline of said Canal Creek to the point of divergence between Canal Creek and Livingston Canal;

32. Meander centerline of said Livingston Canal westerly to its junction with a small, unnamed creek south of Castle Gardens, approximately 1000 feet downstream of Buhach Road in Merced County;

33. Meander centerline of said unnamed creek southerly to its intersection with northern boundary of Section 7, Township 7 South, Range 13 East, Mount Diablo Meridian;

34. West on said section boundary to its intersection with the centerline of Sierra Madre Drive in the City of Atwater in Merced County, were it extended to intersect said section;

35. North on centerline of said Sierra Madre Drive to its junction with the centerline of Juniper Avenue in the City of Atwater in Merced County;

36. West on centerline of said Juniper Avenue to its junction with the centerline of Shaffer Road in the City of Atwater in Merced County;

37. North on centerline of said Shaffer Road to its junction with the centerline of Bellevue Road in the City of Atwater in Merced County;

38. West on centerline of said Bellevue Road to its intersection with the southeast corner of the subdivision boundary near the intersection with Bellevue Road and 5th Street in the City of Atwater in Merced County;

39. North on boundary of said subdivision to its intersection with the centerline Fruitland Avenue in the City of Atwater in Merced County, near its intersection with Chardonnay Way;

40. West on centerline of said Fruitland Avenue to its intersection with the western boundary of the subdivision lying south of said avenue;

41. South on the boundary of said subdivision to its intersection with the centerline of Bellevue Road in the City of Atwater in Merced County, near its intersection with 7th Street;

42. West on centerline of said Bellevue Road to its junction with the centerline of Winton Way in the City of Atwater in Merced County;

43. North on centerline of said Winton Way to its junction with the centerline of Fruitland Avenue in the City of Atwater in Merced County;

44. Meander centerline of said Fruitland Avenue northwesterly to its junction with the centerline of Vine Avenue in Merced County;

45. North on centerline of said Vine Avenue to its intersection with the centerline of the Livingston Canal;

46. Meander centerline of said Livingston Canal northwesterly to its junction with the centerline of Arena Canal;

47. Meander centerline of said Arena Canal southeasterly to the point of divergence between Arena Canal and the Wakefield Lateral on the west side of the intersection between Arena Canal and Cressy Way in Merced County;

48. Meander drainage divide between said Arena Canal and Wakefield Lateral westerly to its intersection with the centerline of the Hammatt Lateral;

49. Meander southern drainage boundary of Garibaldi Lateral southwesterly to its intersection with the centerline of Magnolia Avenue in Merced County;

50. West on centerline of said Magnolia Avenue to its junction with the centerline of Howard Avenue in Merced County;

51. Southwest to the junction of the centerlines of West Side Boulevard and Weir Avenues;

52. West on centerline of said West Side Boulevard to its intersection with the centerline of River Road, were it extended to intersect said road;

53. Southwesterly on centerline of said River Road to point that said road makes a ninety degree bend to the south in Section 4, Township 7 South, Range 14 East, Mount Diablo Meridian;

54. Due West to the intersection with the centerline of the East Side Canal;

55. Meander centerline of said East Side Canal southwesterly to its intersection with the centerline of River Road in Merced County;

56. West on centerline of said River Road to its intersection with the centerline of the Merced River and the point of beginning of this description.

Northwest Side: This area represents the west side of the San Joaquin Valley that drains to the San Joaquin River downstream of the Newman Wasteway and upstream of the Vernalis sampling site at Airport Road. The subarea occupies 574 square miles (368,000 acres) and includes the entire drainage area of Orestimba, Del Puerto, Ingram and Hospital Creeks. It occupies much of western Stanislaus County and includes small portions of western Merced County and southern San Joaquin County and includes the cities of Vernalis, Grayson, Westley, Patterson, Crow's Landing, and Newman as well as the northern part of Central California Irrigation District, Patterson Water District, and most of Del Puerto Water District. The Northwest Side has been further delineated into three minor subareas to allow for a more refined look at the areas contributing drainage to the San Joaquin River along specified reaches. Each of these minor subareas are defined below. The boundary of this area is defined as follows:

BEGINNING at the intersection of the centerline of the San Joaquin River and the centerline of the Airport Way Bridge lying in Section 13, Township 3 South, Range 6 East, Mount Diablo Meridian; thence along the following courses:

1. Southeasterly on centerline of said San Joaquin River to its junction with the centerline of the Newman Wasteway;

2. Southwesterly on centerline of said Newman Wasteway to its intersection with the centerline of Central California Irrigation District's Main Canal;

3. Southeasterly on centerline of said Main Canal to its junction with the centerline of the discharge point of an unnamed creek approximately 2200 feet downstream of the Newman Wasteway;

4. Southwesterly on centerline of said unnamed creek to its intersection with Eastin Road in Stanislaus County;

5. South on centerline of said Eastin Road to its intersection with the southern drainage boundary of the unnamed creek approximately 500 feet south of said road's junction with Pete Miller Road in Stanislaus County;

6. Meander said southern drainage boundary of unnamed creek southwesterly to its junction with the drainage boundary of Garzas Creek;

7. Meander said drainage boundary of Garzas Creek to its intersection with Mustang Peak, at which point the drainage boundary and Garzas Creek becomes the crest of the Coast Range;

8. Meander said crest of the Coast Range northwesterly to its intersection with the drainage boundary of Hospital Creek;

9. Meander said drainage boundary of Hospital Creek northerly to its intersection with the drainage boundary of Lone Tree Creek;

10. Meander drainage boundary of Lone Tree Creek northeasterly, excluding Lone Tree Creek, to its intersection with the centerline of Bird Road in San Joaquin County;

11. North on centerline of said Bird Road to its intersection with the centerline of Lone Tree Creek;

12. Northerly on the centerline of Lone Tree Creek to its intersection with the centerline of Vernalis Road in San Joaquin County;

13. East on centerline of said Vernalis Road to its intersection with a known underground gas pipeline approximately 2700 feet east of Koster Avenue;

14. Northeast on said gas pipeline to its intersection with the centerline of Durham Ferry Road in San Joaquin County;

15. Northeast on said centerline of Durham Ferry Road to its intersection with the centerline of the San Joaquin River at the Airport Way Bridge and the point of beginning of this description.

1. Greater Orestimba:
Greater Orestimba comprises the 285 square miles (182,000 acres) of the Northwest Side subarea in southwest Stanislaus County and the small portion of western Merced County. It contains the drainage flowing into the San Joaquin River from the west between Las Palmas Avenue and the confluence of the San Joaquin River and the Newman Wasteway, and is predominantly the drainage of Orestimba Creek as well as the minor creeks of Crows and Little Salado. It includes the cities of Crow's Landing and Newman and much of southern Del Puerto and Patterson Water Districts and northern Central California Irrigation District. The boundary of this area is defined as follows:

BEGINNING at the centerline of the San Joaquin River at the intersection with the centerline of the Las Palmas Avenue Bridge lying in Section 15, Township 05 South, Range 08 East, Mount Diablo Meridian; thence along the following courses:

1. Southeasterly on centerline of said San Joaquin River to its junction with the centerline of the Newman Wasteway;

2. Southwesterly on centerline of said Newman Wasteway to its intersection with the centerline of Central California Irrigation District's Main Canal;

3. Southeasterly on centerline of said Main Canal to its junction with the centerline of the discharge point of an unnamed creek approximately 2200 feet downstream of the Newman Wasteway;

4. Southwesterly on centerline of said unnamed creek to its intersection with Eastin Road in Merced County;

5. South on centerline of said Eastin Road to its intersection with the southern drainage boundary of the unnamed creek approximately 500 feet south of said road's junction with Pete Miller Road in Merced County;

6. Meander said southern drainage boundary of unnamed creek southwesterly to its junction with the drainage boundary of Garzas Creek;

7. Meander said drainage boundary of Garzas Creek to its intersection with Mustang Peak, the point at which said drainage of Garzas Creek intersects the crest of the Coast Range;

8. Meander said crest of the Coast Range northwesterly to its intersection with the northern drainage boundary of Orestimba Creek;

9. Meander said drainage boundary of Orestimba Creek easterly to its intersection with the drainage boundary of Little Salado Creek near Oaks Flat Ranch;

10. Meander said drainage boundary of Little Salado Creek northeasterly to its intersection with the centerline of Elfers Road at its intersection with the centerline of Del Puerto Avenue in Stanislaus County near Patterson;

11. East on centerline of said Elfers Road to its intersection with the centerline of Highway 33;

12. Northwest on centerline of said Highway 33 to its intersection with the centerline of Patterson Main Canal;

13. Northeast on centerline of said Patterson Main Canal to its intersection with the centerline of Las Palmas Avenue in Stanislaus County;

14. Northeast on centerline of said Las Palmas Avenue to its intersection with the centerline of the San Joaquin River and the point of beginning of this description.

2. Vernalis North:

Vernalis North comprises the 13 square miles (8,110 acres) of the Northwest Side subarea located in the northern extent of the TMDL project area, just to the north of the small town of Vernalis predominantly in San Joaquin County. It contains the drainages flowing to the San Joaquin River from the west between Maze Boulevard and Airport Road. The boundary of this area is defined as follows:

BEGINNING at the intersection of the centerline of the San Joaquin River and the centerline of the Airport Way Bridge lying in Section 13, Township 3 South, Range 6 East, Mount Diablo Meridian; thence along the following courses:

1. Southeasterly on centerline of said San Joaquin River to its intersection with the centerline of an unnamed, unpaved road approximately 250 feet south of Maze Boulevard in Stanislaus County, north of the El Solyo Lift, were said unnamed, unpaved road extended to intersect the centerline of the San Joaquin River;

2. Southwest on centerline of said unnamed, unpaved road to its junction with the centerline of McCracken Road in Stanislaus County near Vernalis;

3. South on centerline of said McCracken Road to its junction with the centerline of Blewett Road in San Joaquin County;

4. West on centerline of said Blewett Road to its intersection with the centerline of Lone Tree Creek;

5. Northerly on the centerline of Lone Tree Creek to its intersection with the centerline of Vernalis Road in San Joaquin County;

6. East on centerline of said Vernalis Road to its intersection with a known underground gas pipeline approximately 2700 feet east of Koster Avenue;

7. Northeast on said gas pipeline to its intersection with the centerline of Durham Ferry Road in San Joaquin County;

8. Northeast on said centerline of Durham Ferry Road to its intersection with the centerline of the San Joaquin River at the Airport Way Bridge and the point of beginning of this description.

3. Westside Creeks

Westside Creeks is comprised of the 277 square miles (177,000 acres) of the Northwest Side subarea located in western Stanislaus County. It contains the drainages of the major creeks that drain into the west side of the San Joaquin River between Maze Boulevard and Las Palmas Avenue, including the drainages of Del Puerto, Hospital, and Ingram Creeks. It also includes the cities of Patterson, Westley, and Grayson and West Stanislaus Water District, northern Patterson and Del Puerto Water Districts. The boundary of this area is defined as follows:

BEGINNING at the centerline of the San Joaquin River at the Maze Boulevard Bridge lying in Section 29, Township 3 South, Range 7 East, Mount Diablo Meridian; thence along the following courses:

1. Meander centerline of said San Joaquin River southeasterly to its intersection with the centerline of Las Palmas Avenue in Stanislaus County near Patterson;

2. Southwesterly on centerline of said Las Palmas Avenue to its intersection with the centerline of the Patterson Main Canal;

3. Southwesterly on centerline of said Patterson Main Canal to its intersection with the centerline of Highway 33 in Stanislaus County near Patterson;

4. Southeast on centerline of said Highway 33 to its intersection with the centerline of Elfers Road;

5. West on centerline of said Elfers Road to its intersection with the centerline of Del Puerto Avenue;

6. Meander the drainage boundary of Little Salado Creek southwesterly to its intersection with drainage boundary of Orestimba Creek;

7. Meander said drainage boundary of Orestimba Creek southwesterly to its intersection with intersects the hydrologic divide of the San Joaquin River basin in the Coast Range, heretofore referred to as the crest of the Coast Range;

8. Meander said crest of the Coast Range northwesterly to its intersection with the northern drainage boundary of Hospital Creek;

9. Meander said drainage boundary of Hospital Creek northerly to its intersection with the drainage boundary of Lone Tree Creek;

10. Meander drainage boundary of Lone Tree Creek northwesterly to its intersection with the centerline of Blewett Road in San Joaquin County;

11. East on centerline of said Blewett Road to its junction with the centerline of McCracken Road in Stanislaus County near Vernalis;

12. North on McCracken Road to its junction with an unnamed, unpaved road approximately 1000 feet north of said Blewett Road;

13. Norteasterly on said unnamed, unpaved road to its intersection with the centerline of the San Joaquin River, were it extended to intersect said river;

14. Northerly on said San Joaquin River to its intersection with the centerline of Maze Boulevard in Stanislaus County and the point of beginning of this description;

E. <u>San Joaquin River upstream of Salt Slough:</u> This subarea comprises the area that drains to the San Joaquin River upstream of the Lander Avenue (Highway 165) sampling site from the east side of the San Joaquin River, including the drainages of Bear Creek, Chowchilla River, and the Fresno River. It occupies 1,480 square miles (945,000 acres) of eastern Merced and western Madera counties. It contains Madera Irrigation District, Chowchilla Irrigation District, and most of Merced Irrigation District, as well as the cities of Livingston, Merced, Planada, Le Grand, Chowchilla, Madera, and southern Atwater.

The San Joaquin River upstream of Salt Slough has been further delineated into two minor subareas to allow for a more refined look at the areas contributing drainage to the San Joaquin River along specified reaches. Each of these minor subareas are defined below. The boundary of this area is defined as follows:

BEGINNING at the centerline of the San Joaquin River at its intersection with the centerline of Lander Avenue (Highway 165) in Merced County lying in Section 27, Township 07 South, Range 10 East, Mount Diablo Meridian; thence along the following courses:

1. Northeasterly on the drainage boundary of the San Joaquin River upstream of its intersection with Lander Avenue (Highway 165) to its intersection with the centerline of the East Side Irrigation Canal near said canal's junction with Howard Lateral;

2. Meander the drainage boundary of Bear Creek northeasterly to its intersection with centerline of Arena Canal at its junction with Hammatt Lateral near Livingston;

3. Meander to drainage divide between Arena Canal and Wakefield Lateral easterly to its intersection with the centerline of Arena Canal at the point of divergence between said canal and lateral near the intersection of Arena Canal and Cressy Way in Merced County;

4. Meander centerline of Arena Canal northwesterly to its junction with the centerline of Livingston Canal;

5. Meander centerline of Livingston Canal southeasterly to its intersection with the centerline of Vine Avenue in Merced County near Atwater;

6. South on centerline of said Vine Avenue to its junction with the centerline of Fruitland Avenue in the City of Atwater in Merced County;

7. Meander centerline of Fruitland Avenue southeasterly to its intersection with the centerline of Winton Way in the City of Atwater in Merced County;

8. South on centerline of said Winton Way to its junction with the centerline of Bellevue Road in the City of Atwater in Merced County;

9. East on centerline of said Bellevue Road to its intersection with the southwest corner of a subdivision near said road's intersection with 7th Street in the City of Atwater in Merced County;

10. North on the boundary of said subdivision to its intersection with the centerline of Fruitland Avenue in the City of Atwater in Merced County;

11. East on centerline of said Fruitland Avenue to its intersection with the eastern boundary of the subdivision lying south of said avenue, near the intersection with Chardonnay Way;

12. South on boundary of said subdivision to its intersection with the centerline of Bellevue Road in the City of Atwater in Merced County, near said road's intersection with 5th Street;

13. East on centerline of said Bellevue Road to its junction with the centerline of Shaffer Road in the City of Atwater in Merced County;

14. South on the centerline of said Shaffer Road to its junction with the centerline of Juniper Avenue in the City of Atwater in Merced County;

15. East on the centerline of said Juniper Avenue to its junction with the centerline of Sierra Madre Drive in the City of Atwater in Merced County;

16. South on the centerline of said Sierra Madre Drive to its intersection with the northern boundary of Section 7, Township 7 South, Range 13 East, Mount Diablo Maridian;

17. East on said section boundary to its intersection with the centerline of an unnamed creek about 750 feet before said section boundary intersects Buhach Road;

18. Meander centerline of said unnamed creek northerly to its junction with the centerline of the Livingston Canal;

19. Meander centerline of said Livingston Canal easterly to the point of divergence between Canal Creek and said canal;

20. Northerly on centerline of said Canal Creek to its intersection with the centerline of Bellevue Road in Merced County near Castle Airport;

21. East on centerline of said Bellevue Road to its intersection with the drainage boundary of Canal Creek near the intersection of Franklin Road and Bellevue Road in Merced County near Castle Airport;

22. Meander said drainage boundary of Canal Creek northerly to its junction with the drainage boundary of Edendale Creek;

23. Meander said drainage boundary of Edendale Creek northeasterly to its intersection with the centerline of Merced Irrigation District's Main Canal;

24. Meander centerline of said Main Canal northeasterly to its junction with the centerline of the Merced River, including any creeks and canals flowing into it along that length;

25. Meander centerline of said Merced River easterly to its intersection with the drainage boundary of Stoney Creek;

26. Meander said drainage boundary of Stoney Creek southerly to its junction with the drainage boundary of Black Rascal Creek;

27. Meander said drainage boundary of Black Rascal Creek southeasterly to its junction with the drainage boundary of Burns Creek;

28. Meander said drainage boundary of Burns Creek northeasterly to its intersection with the Merced County line;

29. Southeasterly on said Merced County line to its junction with Madera County line and Calwater 654530000 (Berenda Creek Hydrologic Area);

30. Southeasterly on the boundary of Calwater 654530000 (Berenda Creek Hydrologic Area) to its intersection with the centerline of the San Joaquin River at Friant Dam;

31. Southwesterly on centerline of said San Joaquin River to its intersection with the jurisdictional boundary of Columbia Canal Company;

32. Northwesterly on said boundary of Columbia Canal Company to its intersection with the centerline of the San Joaquin River;

33. Northwesterly on said San Joaquin River to its intersection with the centerline of Lander Avenue (Highway 165) and the point of beginning of this description.

1. Bear Creek:

Located in eastern Merced County and comprising the northern half of the LSJR upstream of Salt Slough subarea, the Bear Creek minor subarea contains the cities of Merced, Planada, Livingston, Le Grand, and the southern half of Atwater and drains 620 square miles (397,000 acres) of land that flows the San Joaquin River upstream of Lander Avenue (Highway 165) and downstream of the West Washington Avenue, including the drainages of Bear Creek and Mariposa Slough. This minor subarea is often considered to be the effective drainage area of the LSJR upstream of Salt Slough subarea as it is the only one of the two minor subareas to have significant, year-round contributions. The boundary of this area is defined as follows:

BEGINNING at the centerline of the San Joaquin River at its intersection with the centerline of Lander Avenue (Highway 165) in Merced County lying in Section 27, Township 07 South, Range 10 East, Mount Diablo Meridian; thence along the following courses:

1. Northeasterly on the drainage boundary of the San Joaquin River upstream of its intersection with Lander Avenue (Highway 165) to its intersection with the centerline of the East Side Irrigation Canal near said canal's junction with Howard Lateral;

2. Meander the drainage boundary of Bear Creek northeasterly to its intersection with centerline of Arena Canal at its junction with Hammatt Lateral near Livingston;

3. Meander to drainage divide between Arena Canal and Wakefield Lateral easterly to its intersection with the centerline of Arena Canal at the point of divergence between said canal and lateral near the intersection of Arena Canal and Cressy Way in Merced County;

4. Meander centerline of Arena Canal northwesterly to its junction with the centerline of Livingston Canal;

5. Meander centerline of Livingston Canal southeasterly to its intersection with the centerline of Vine Avenue in Merced County near Atwater;

6. South on centerline of said Vine Avenue to its junction with the centerline of Fruitland Avenue in the City of Atwater in Merced County;

7. Meander centerline of Fruitland Avenue southeasterly to its intersection with the centerline of Winton Way in the City of Atwater in Merced County;

8. South on centerline of said Winton Way to its junction with the centerline of Bellevue Road in the City of Atwater in Merced County;

9. East on centerline of said Bellevue Road to its intersection with the southwest corner of a subdivision near said road's intersection with 7th Street in the City of Atwater in Merced County;

10. North on the boundary of said subdivision to its intersection with the centerline of Fruitland Avenue in the City of Atwater in Merced County;

11. East on centerline of said Fruitland Avenue to its intersection with the eastern boundary of the subdivision lying south of said avenue, near the intersection with Chardonnay Way;

12. South on boundary of said subdivision to its intersection with the centerline of Bellevue Road in the City of Atwater in Merced County, near said road's intersection with 5th Street;

13. East on centerline of said Bellevue Road to its junction with the centerline of Shaffer Road in the City of Atwater in Merced County;

14. South on the centerline of said Shaffer Road to its junction with the centerline of Juniper Avenue in the City of Atwater in Merced County;

15. East on the centerline of said Juniper Avenue to its junction with the centerline of Sierra Madre Drive in the City of Atwater in Merced County;

16. South on the centerline of said Sierra Madre Drive to its intersection with the northern boundary of Section 7, Township 7 South, Range 13 East, Mount Diablo Maridian;

17. East on said section boundary to its intersection with the centerline of an unnamed creek about 750 feet before said section boundary intersects Buhach Road;

18. Meander centerline of said unnamed creek northerly to its junction with the centerline of the Livingston Canal;

19. Meander centerline of said Livingston Canal easterly to the point of divergence between Canal Creek and said canal;

20. Northerly on centerline of said Canal Creek to its intersection with the centerline of Bellevue Road in Merced County near Castle Airport;

21. East on centerline of said Bellevue Road to its intersection with the drainage boundary of Canal Creek near the intersection of Franklin Road and Bellevue Road in Merced County near Castle Airport;

22. Meander said drainage boundary of Canal Creek northerly to its junction with the drainage boundary of Edendale Creek;

23. Meander said drainage boundary of Edendale Creek northeasterly to its intersection with the centerline of Merced Irrigation District's Main Canal;

24. Meander centerline of said Main Canal northeasterly to its junction with the centerline of the Merced River, including any creeks and canals flowing into it along that length;

25. Meander centerline of said Merced River easterly to its intersection with the drainage boundary of Stoney Creek;

26. Meander said drainage boundary of Stoney Creek southerly to its junction with the drainage boundary of Black Rascal Creek;

27. Meander said drainage boundary of Black Rascal Creek southeasterly to its junction with the drainage boundary of Burns Creek;

28. Meander said drainage boundary of Burns Creek northeasterly to its intersection with the Merced County line;

29. Meander said Merced County line southeasterly to its intersection with the northern drainage boundary of the Chowchilla River;

30. Westerly on said drainage boundary of Chowchilla River to its intersection with the centerline of Marguerite Road;

31. West on centerline of said Marguerite Road to its intersection with the jurisdictional boundary of Chowchilla Water District, as defined by said water district, were said road extended to intersect Chowchilla Water District jurisdictional boundary;

32. Meander said Chowchilla Water District jurisdictional boundary to its intersection with the jurisdictional boundary of El Nido Irrigation District (now operated by Merced Irrigation District) as it existed at the time it changed hands;

33. Meander said jurisdictional boundary of El Nido Irrigation District to its intersection with the centerline of Vineyard Road in Merced County near El Nido;

34. South on centerline of said Vineyard Road to its intersection with the centerline of West Washington Road, were both roads extended such that they would make an intersection;

35. West on centerline of said West Washington Road to its intersection with the centerline of the San Joaquin River at the bridge where Indiana Road intersects from the opposite direction;

36. Northwesterly on centerline of said San Joaquin River to its intersection with the centerline of Lander Avenue (Highway 165) and the point of beginning of this description.

2. Fresno-Chowchilla:

Fresno-Chowchilla is a minor subarea that comprises southern 856 square miles (548,000 acres) of the LSJR upstream of Salt Slough subarea and is located in southeast Merced County and western Madera County. It contains the drainage flowing into the San Joaquin River downstream of Sack Dam and upstream of West Washington Avenue, including the drainages of the Fresno and Chowchilla Rivers. It contains the cities of Madera and Chowchilla, Chowchilla Water District, and Madera Irrigation District. The boundary of this area is defined as follows:

BEGINNING at the centerline of the San Joaquin River at its intersection the centerline of West Washington Road in Merced County lying in Section 31, Township 9 South, Range 13 East, Mount Diablo Meridian; thence along the following courses:

1. West on centerline of said West Washington Road to its intersection with the jurisdictional boundary of El Nido Irrigation District (now operated by Merced Irrigation District) as it existed at the time it changed hands;

2. Meander said jurisdictional boundary of El Nido Irrigation District to its intersection with the jurisdictional boundary of Chowchilla Water District, as defined by said water district;

3. Meander said jurisdictional boundary of Chowchilla Water District to its intersection with the centerline of Harvey Petit Road in Merced County near Le Grande;

4. East on centerline of said Harvey Petit Road to its intersection with the northern drainage boundary of the Chowchilla River, were said road extended to intersect the drainage boundary of the Chowchilla River;

5. Meander said drainage boundary of the Chowchilla River northeasterly to its intersection with the Merced County line;

6. Meander Merced County line southeasterly to its intersection with the Madera County line;

7. Southeasterly on the boundary of Calwater 654530000 (Berenda Creek Hydrologic Area) to its intersection with the centerline of the San Joaquin River at Friant Dam;

8. Southwesterly on centerline of said San Joaquin River to its intersection with the jurisdictional boundary of Columbia Canal Company;

9. Northwesterly on said boundary of Columbia Canal Company to its intersection with the centerline of the San Joaquin River;

10. Northwesterly on said San Joaquin River to its intersection with the land boundary south of the confluence with Mariposa Slough in Merced County that denotes the beginning of agricultural production south of said confluence with Mariposa Slough, were the land boundary extended to said centerline of the San Joaquin River, and the point of beginning of this description.

F. <u>Stanislaus River:</u> This subarea contains all of the land draining into the Stanislaus River upstream of Caswell State Park and downstream of the Stanislaus County line and covers 150 square miles (97,400 acres). It is located in the northern portion of Stanislaus County and contains the cities of Oakdale, Ripon, Riverbank, and much of Salida, as well as most of Oakdale Irrigation District, and small portions of South San Joaquin Water District and Modesto Irrigation District. The boundary is defined as follows:

BEGINNING at the centerline of the parking slip of Campsite number 24 in Caswell Memorial State Park lying in Section 02, Township 03 South, Range 07 East, Mount Diablo Meridian, at its intersection with the centerline of the Stanislaus River, were the centerline of

said parking slip extended to intersect the Stanislaus River; thence along the following courses:

1. Southwesterly on centerline of said parking slip to its intersection with the centerline of the main road connecting the campsites with the park entrance, were the centerline of said parking slip extended to said main road;

2. Westerly on centerline of said main park road to its intersection with the centerline of the north levee of the Stanislaus River, were the centerline of said main park road extended to intersect the centerline of the levee;

3. Meander centerline of said Stanislaus River levee northeasterly to its intersection with the centerline of Mohler Road at the point where said road bends west to become Moncure Road in San Joaquin County near Ripon, were the centerline of Mohler Road extended to intersect the centerline of said levee;

4. North on centerline of said Mohler Road to its intersection with the centerline of an unnamed canal underground a short distance south of the location at which Mohler Road bends to the east toward Ripon;

5. Meander centerline of said unnamed canal northerly to its junction with an unnamed canal approximately one quarter mile south of the intersection of Highland Avenue and Kamps Way in the City of Ripon in San Joaquin County;

6. Meander centerline of said unnamed canal northeasterly to its junction with the centerline of South San Joaquin Main District Canal;

7. Meander centerline of said Main District Canal northeasterly to its intersection with the centerline of Campbell Lateral;

8. Meander centerline of said Campbell Lateral southeasterly to its junction with the centerline of Tulloch Lateral;

9. Meander centerline of said Tulloch Lateral easterly to its intersection with the drainage boundary of Lone Tree Creek, approximately 3500 feet upstream of said lateral's intersection with Valley Home Road in Stanislaus County near Oakdale;

10. Meander said drainage boundary of Lone Tree Creek northeasterly to its intersection with the centerline of Twentysix Mile Road in Stanislaus County near Oakdale, approximately one half mile north of said road's intersection with Tulloch Lateral;

11. North on said Twentysix Mile Road to its intersection with the centerline of Young Lateral;

12. Easterly on centerline of said Young Lateral to its junction with the centerline of the Cometa Lateral;

13. Southerly on centerline of said Cometa Lateral to its intersection with the drainage boundary of an unnamed watershed north of this location approximately one quarter mile downstream of said lateral's intersection with Frankenheimer Road in Stanislaus County near the Woodward Reservoir;

14. Meander said drainage boundary of unnamed watershed northerly to its junction with the northern drainage boundary of the Cometa Lateral;

15. Meander said drainage boundary of Cometa Lateral northwesterly to its intersection with the centerline of Cometa Lateral approximately 1000 feet upstream of said lateral's intersection with Dodd Road in Stanislaus County near the Woodward Reservoir;

16. Northerly on centerline of said Cometa Lateral to its intersection with the South San Joaquin Water District's Main District Canal;

17. Meander centerline of said Main District Canal northeasterly to its junction with Woodward Reservoir;

18. Meander natural drainage boundary between Woodward Reservoir and Littlejohn's Creek easterly to its intersection with the centerline of Oakdale Irrigation District's North Main Canal, excluding Simmons Creek at the intersection of said North Main Canal and South San Joaquin Water District's Main District Canal;

19. Meander centerline of said North Main Canal easterly to its intersection with Little John's Dam;

20. Meander drainage boundary of Little John's Creek and its tributaries northeasterly to its intersection with the Stanislaus County line;

21. Southeast on said Stanislaus County line to its intersection with the southern drainage boundary of Wildcat Creek;

22. Meander said drainage boundary of Wildcat Creek southwesterly to its junction with the drainage boundary of Cashman Creek;

23. Meander said drainage boundary of Cashman Creek upstream of Cashman Dam southwesterly to its intersection with the centerline of Oakdale South Main Canal;

24. Meander centerline of said Oakdale South Main Canal southwesterly to its intersection with Sierra Railroad near Arnold Hill, approximately 1.25 miles northwest of said railroad's intersection with Fogarty Road in Stanislaus County;

25. Meander drainage boundary east of said Main Canal southeasterly to its intersection with the drainage boundary of Kearney Lateral;

26. Meander said drainage boundary of Kearney Lateral to its intersection with the centerline of Oakdale South Main Canal;

27. Meander centerline of said Oakdale South Main Canal westerly to its junction with the centerline of Claribel Lateral;

28. South on centerline of said Claribel Lateral to its junction with the centerline of Albers Lateral;

29. Meander centerline of said Albers Lateral southwesterly to its junction with the centerline of Stowell Lateral;

30. Meander centerline of said Stowell Lateral southwesterly to its junction with the centerline of Thompson Lateral;

31. Meander centerline of said Thompson Lateral southerly to its junction with the centerline of Modesto Irrigation District's Main Canal;

32. Meander centerline of said Modesto Main Canal northwesterly to its junction with the centerline of Modesto Irrigation District Lateral Number 6;

33. Meander centerline of said Lateral No. 6 westerly to its intersection with the centerline of the south bank levee of the Stanislaus River;

34. Meander said south bank levee westerly to its intersection with the crest of the ridge bordering the Stanislaus River on the peninsula opposite Caswell Memorial State Park;

35. Northwest on said crest to its intersection with a line due east from the intersection of the extension of the centerline of the slip of Campsite number 24 with the centerline of the Stanislaus River;

36. West on said line to its intersection with the centerline of the Stanislaus River and the point of beginning of this description.

G. Tuolumne River: Located in central eastern Stanislaus County, this subarea contains much of central Modesto and the town of Waterford and drains 294 square miles (188,000 acres) of land that flows directly into the Tuolumne River upstream of the Shiloh Road crossing and downstream of the Stanislaus County line, including the drainages of Dry Creek, Modesto Reservoir, Turlock Lake, and eastern Modesto Irrigation District. The boundary of this area is defined as follows:

BEGINNING at the intersection of the centerline of the Tuolumne River and the centerline of Shiloh Road in Stanislaus County lying in Section 7, Township 04 South, Range 08 East, Mount Diablo Meridian; thence along the following courses:

1. North on centerline of said Shiloh Road to its intersection with the centerline of Paradise Road in Stanislaus County near Grayson;

2. East on centerline of said Paradise Road to its intersection with the centerline of Hart Road in Stanislaus County near Modesto;

3. North on centerline of said Hart Road to its intersection with the centerline of Modesto Irrigation District Lateral Number 5;

4. Meander centerline of said Lateral No. 5 northeasterly to its intersection with the centerline of Locust Avenue in Stanislaus County, were it extended west to intersect the centerline of said Lateral No. 5;

5. East on centerline of said Locust Avenue to its intersection with the centerline of Franklin Street;

6. North on centerline of said Franklin Street to its intersection with the boundary of the Ninth Street Stormdrain Basin, as defined by the City of Modesto in Modesto;

7. Meander boundary of said Ninth Street Stormdrain Basin to its intersection with the boundary of the McHenry Avenue Stormdrain Basin, as defined by the City of Modesto, in Modesto;

8. Meander boundary of said McHenry Avenue Stormdrain Basin to its intersection with the centerline of Modesto Irrigation District Lateral Number 4;

9. Meander centerline of said Lateral No. 4 northeast to its junction with the centerline of Modesto Irrigation District Lateral Number 3;

10. Meander centerline of said Lateral No. 3 to its junction with the centerline of Modesto Irrigation District Main Canal;

11. Meander centerline of said Main Canal southeasterly to its intersection with the centerline of Dry Creek;

12. Meander centerline of Dry Creek easterly to its junction with the centerline of Claribel Latereal;

13. Meander centerline of said Claribel Lateral northerly to its junction with the centerline of Oakdale South Main Canal;

14. Meander centerline of said Oakdale South Main Canal easterly to its intersection with the centerline of Kearney Lateral;

15. Meander drainage boundary of Kearney Lateral southeasterly to the point of divergence of the Kearny Lateral drainage boundary and the Oakdale South Main Canal;

16. Meander said drainage boundary of Oakdale South Main Canal downstream of its intersection with Sierra Railroad northeasterly to its intersection with the centerline of Oakdale South Main Canal at its intersection with the centerline of Sierra Railroad approximately one and one quarter mile northwest of said railroad's intersection with Fogarty Road in Stanislaus County near Oakdale;

17. Meander said Main Canal northeasterly to its intersection with Cashman Dam;

18. Meander drainage boundary of Cashman Creek upstream of Cashman Dam southeasterly to its intersection with the drainage boundary of Wildcat Creek;

19. Meander said drainage boundary of Wildcat Creek northeasterly to its intersection with the Stanislaus County line;

20. Southeast on said Stanislaus County line to its intersection with the drainage boundary of Vizard Creek;

21. Meander said drainage boundary of Vizard Creek southwesterly to its intersection with the drainage boundary of Goodwin Creek;

22. Meander said drainage boundary of Goodwin Creek southwesterly to its intersection with the drainage boundary of Evans Creek;

23. Meander said drainage boundary of Evans Creek southwesterly to its intersection with the drainage boundary of Peaslee Creek;

24. Meander said drainage boundary of Peaslee Creek southwesterly to its intersection with the drainage boundary of Turlock Lake;

25. Meander said drainage of Turlock Lake southwesterly to its intersection with the drainage boundary of an unnamed interior drainage area west of the Turlock Lake drainage basin;

26. Meander said unnamed drainage boundary southwesterly to its intersection with the drainage boundary of Sand Creek;

27. Meander said drainage boundary of Sand Creek northwesterly to its intersection with the drainage boundary of unnamed creeks draining easterly toward Highline Canal and to the Merced River via said canal;

28. Meander said drainage boundary of unnamed creeks to its intersection with the centerline of Turlock Irrigation District Main Canal;

29. Meander centerline of said Turlock Main Canal westerly to its junction with the centerline of Ceres Main Canal;

30. Meander centerline of said Ceres Main Canal westerly to its junction with the centerline of Turlock Irrigation District Lateral Number 1;

31. Meander centerline of said Lateral No. 1 southwesterly to its junction with the centerline of Turlock Irrigation District Lower Lateral Number 2;

32. Meander centerline of said Lateral No. 2 to the point at which said lateral bends from northwest to southwest approximately three quarters of one mile upstream of its intersection with Grayson Road;

33. Meander said drainage boundary of the Tuolumne River to its intersection with the centerline of Shiloh Road in Stanislaus County at the location where Shiloh Road makes a ninety degree turn to the west 1.5 miles south of its intersection with Paradise Road;

34. North on centerline of said Shiloh Road to its intersection with the centerline of the Tuolumne River and the point of beginning of this description.

Minor Subareas

Bear Creek

Located in eastern Merced County and comprising the northern half of the LSJR upstream of Salt Slough subarea, the Bear Creek minor subarea contains the cities of Atwater, Merced, Planada, and the southern half of Livingston and drains 520 square miles (335,000 acres) of land that flows directly into Bear Creek downstream of the Merced County line and the San Joaquin River upstream of Lander Avenue (Highway 165) and downstream of the Bear Creek confluence.

Fresno-Chowchilla

Fresno-Chowchilla is a minor subarea that comprises southern 950 square miles (609,000 acres) of the LSJR upstream of Salt Slough subarea and is located in southeast Merced County and western Madera County. It contains the drainage flowing into the San Joaquin River downstream of Sack Dam and upstream of the confluence with Bear Creek, including the drainages of the Fresno and Chowchilla Rivers. It contains the cities of Madera and Chowchilla, Chowchilla Water District, and Madera Irrigation District.

Grassland

The Grasslands is the southwest region of the TMDL project area 1,360 square miles (871,000 acres). It encompasses region flowing to the San Joaquin River between the confluence of the San Joaquin River and Merced River and the Lander Avenue (Highway 165) crossing and between the Mendota Pool and Sack Dam. It includes the drainage areas of Mud Slough, Salt Slough, Los Banos Creek, the water districts receiving supply water from the Mendota Pool, and a small region of direct drainage upstream of the Merced River confluence with the San Joaquin and downstream of the Mud Slough confluence and includes the cities of Gustine, Los Banos, Dos Palos, and Firebaugh.

Greater Orestimba

Greater Orestimba comprises the 300 square miles (189,000 acres) of the Northwest Side subarea in southwest Stanislaus County and the small portion of western Merced County. It contains the drainage flowing into the San Joaquin River from the west between Las Palmas Avenue and the confluence of the San Joaquin River and the Merced River, and is predominantly the drainage of Orestimba Creek and contains the city of Newman.

Merced River

Located in northern Merced and southern Stanislaus counties, the Merced River subarea contains towns of Delhi and Winton and portions of the city of Livingston and drains 290 square miles (188,000 acres) of

land that flows directly into the Merced River upstream the River Road crossing and downstream of the Merced County line, including the drainages to the Merced River of Stevinson Lower Lateral, Highline Canal, Dry Creek, and Livingston Canal. In southern Stanislaus County is an "island" of land that is drained by Highline Canal to the Merced River, but is discontinuous with the subarea because of the exclusion of the Sand Creek watershed that flows beneath Highline Canal and therefore included as part of the East Valley Floor, Turlock Area minor subarea.

North Stanislaus
Located in the northern portion of Stanislaus County, south of the Stanislaus River, this minor subarea of the East Valley Floor contains much of northern Modesto and drains 68 square miles (43,400 acres) of land between the Stanislaus and Tuolumne River watersheds that flows into the San Joaquin River upstream of Airport Road and downstream of Maze Boulevard.

Northeast Bank
This minor subarea of the East Valley Floor contains all of the land draining into the east side San Joaquin River upstream of Maze Boulevard and downstream of Las Palmas Avenue and covers 120 square miles (78,600 acres). It is located in central Stanislaus County and includes the cities of Houghson, Keyes, Ceres, parts of western Modesto and much of northern Turlock Irrigation District and southwest Modesto Irrigation District.

Stanislaus River
This subarea contains all of the land draining into the Stanislaus River upstream of Caswell State Park and downstream of the Stanislaus County line and covers 150 square miles (97,400 acres). It is located in the northern portion of Stanislaus County and contains the cities of Oakdale, Ripon, Riverbank, and much of Salida, as well as most of Oakdale Irrigation District, and small portions of South San Joaquin Water District and Modesto Irrigation District.

Stevinson
This minor subarea of the East Valley Floor contains all of the land flowing to the San Joaquin River upstream of its confluence with the Merced River and downstream of the Lander Avenue (Highway 165) crossing and covers 44 square miles (28,000 acres). It is located in north-central Merced County.

Tuolumne River
Located in central eastern Stanislaus County, this subarea contains much of central Modesto and the town of Waterford and drains 294 square miles (188,000 acres) of land that flows directly into the Tuolumne River upstream of the Shiloh Road crossing and downstream of the Stanislaus County line, including the drainages of Dry Creek, Modesto Reservoir, Turlock Lake, and eastern Modesto Irrigation District.

Turlock Area
This minor subarea of the East Valley Floor contains all of the land draining into the San Joaquin River upstream of Las Palmas Avenue and downstream of the confluence of the San Joaquin River and Merced River and covers 180 square miles (114,000 acres), including the Harding Drain (T.I.D. Lateral Number 5). It is located in south-central Stanislaus County and northern Merced County and contains much of Hillmar and the cities of Turlock and Denair, as well as most of central and southern Turlock Irrigation District (T.I.D.).

Vernalis North
Vernalis North comprises the 9 square miles (5,770 acres) of the Northwest Side subarea located in the northern extent of the TMDL project area, just to the north of the small town of Vernalis predominantly in San Joaquin County. It contains the drainages flowing to the San Joaquin River from the west between Maze Boulevard and Airport Road.

Westside Creeks
Westside Creeks is comprised of the 300 square miles (191,000 acres) of the Northwest Side subarea located in western Stanislaus County. It contains the drainages of the major creeks that drain into the west

side of the San Joaquin River between Maze Boulevard and Las Palmas Avenue, including the drainages of Del Puerto, Hospital, and Ingram Creeks, as well as the city of Patterson.