

## WESTSIDE RESOURCE CONSERVATION DISTRICT 2010-2015 RESOURCE MANAGEMENT PLAN

### INTRODUCTION

The Westside Resource Conservation District (WRCD) was organized for the protection, conservation and management of soil, water, air and related natural resources in the interest of prosperity and general welfare of the people within WRCD boundaries in western Fresno and Kings Counties.

As of 1992, the primary purpose of Resource Conservation Districts (California Public Resources Code; 9001(a) et seq.) is: “to secure the adoption of conservation practices including, but not limited to; farm, range, open space, urban development, wildlife, recreation, watershed, water quality and woodland; to save the basic resources, soils water and air of the state from unreasonable and economically preventable waste and destruction.”

Under Resources Code 9001(b)(1) the District has legal authority to “cooperate with the United States, this State, counties, cities, public districts, other resource conservation districts, persons, associations and corporations”. Additionally, under (b), (2) with the consent of the owner, the RCD may construct on private or publicly owned land, “necessary works for the prevention and control of soil erosion and erosion stabilization”.

The California Legislature determined that the “construction and maintenance on privately or publicly-owned land of works for resource conservation is in the public interest and for the general public benefit”, and the expenditure of state, county, city, district or other public funds that are, or may become available for planning, designing or implementing the above (such resource conservation works) constitutes an expenditure for the general public benefit (Section 9002).

The RCD’s are empowered under both federal and state legislation. Agencies at all levels of government have responsibilities to provide expertise and to otherwise assist and cooperate with the RCD on natural resource projects. This is strengthened by (an) additional inter-agency “Memorandum(a) of Understanding”. The RCD provides local input and leadership and fosters interagency cooperation and coordination on natural resource projects on both public and private lands.

### MISSION

The mission of the WRCD is to obtain technical and financial assistance for landowners in the District to develop projects for the proper management of natural resources within the District (see map in Appendix). The District will encourage and assist the landowners to voluntarily plan and install “best management practices”. Best management practices will be applied to erosion, sedimentation, flooding, water conservation, air emissions,

rangeland, salt accumulation in soil and water, carbon management and energy creation or use. The practices developed will also be weighed to produce results in an economical and environmentally sound manner.

To accomplish this mission, the WRCD will maintain the necessary working relationships with Federal, State and County agencies and departments, non-profit organizations, educational institutions, and with private and public landowners to save the basic resources of soil, water, air and natural resources within the District.

## HISTORY AND ORGANIZATION

The Westside Resource Conservation District was established on February 12, 1984, as a legally constituted unit of State Government under Division 9 of the Public Resources Code. The WRCD was created to develop and expand ongoing programs of natural resource management. The WRCD is an autonomous, self-governing body that is not a branch or agency of any state or federal department. It is truly a “grass roots” organization dedicated to serving both the private and public interest.

The Board of Directors (currently nine members) is either appointed by the Fresno County Board of Supervisors or elected by private landowners and other conservation-minded citizens within the District. The Directors serve a four-year term and the terms are staggered. All Board members serve without pay. There are Associate Director positions available in the District and Associates generally are the first candidates reviewed for appointment to vacancies that occur in between election cycles. Associate Directors can discuss issues and motions and serve on committees, but do not count toward quorums and may not vote.

## PHYSICAL SETTING OF THE WESTSIDE RESOURCE CONSERVATION DISTRICT

The Westside RCD encompasses 1.05 million acres covering approximately one-fourth of the area of the 4 million acres in Fresno County. Approximately 52,000 acres are located in western Kings County. A location map of the WRCD is located at the USDA-NRCS Fresno field office and is posted on the California Association of Resource Conservation Districts web site at [www.carcd.org](http://www.carcd.org). The WRCD is approximately 60% irrigated cropland and 40% rangeland. The WRCD can be divided into two sections. Approximately 600,000 acres in the San Joaquin Valley is in western Fresno and Kings Counties. The remaining 450,000 acres are located in the Diablo Range of the coastal mountains in western Fresno County. The crest of this portion of the coastal mountains is the western boundary of the RCD with several peaks well over 4,000 feet (ASL). As you move in an easterly direction towards the irrigated cropland areas, the elevation drops to 185 feet near the northeastern boundary (near Mendota Pool, the junction of the San Joaquin River and the flood channel outlet of the Kings River) in the topographic trough of the San Joaquin Valley.

## CLIMATE

The climate of the WRCD area varies due to the differences in elevation. Summer temperatures in the Valley portion are characterized by hot, dry summers averaging 100 or more days above 90° F and cool wet winters with the normal low at 45° F. The highest temperature reported in the vicinity is 115° F and the lowest in the 20's. The Diablo Range area has reported somewhat lower highs, and slightly lower lows. For three months in the fall and winter the Valley portion of the district is often blanketed with a high density fog (tule fog) as the result of a meteorological temperature inversion that traps cool seasonal moisture in the near-ground level below a warmer thermal layer in the higher atmosphere (approximately 2000 feet ASL).

The precipitation pattern found within the RCD is significantly influenced by topography. Rainfall ranges from 3 to 25 inches east to west. Moist air from the Pacific Ocean passes over the coastal mountains then moves down slope as it comes into the Valley. Rainfall in the higher elevations averages between 15 and 20 inches annually. The coastal range intercepts substantial portions of the moisture, leaving the Valley portion of the District in a rain "shadow" with average precipitation between 6 and 8 inches at the mean Valley floor elevation. Most of the precipitation occurs as rain in the fall and winter months between November and March. Snow occasionally occurs in the mountainous area but does not accumulate to any substantial amount.

Vegetation ranges from annual grassland and irrigated crops to coniferous forest in the coastal mountains. There are five vegetation belts within the RCD. Going from the east to west, they include the irrigated cropland, annual grasslands, oak woodland, chaparral, and coniferous forest at the highest elevations.

## RESOURCE INVENTORIES

### *SOILS*

The soils within the WRCD are one of its most valuable natural resources. Several of the alluvial fan soil-types are world-class agricultural production areas when put under irrigation. A recent Western Fresno County soil survey has been completed and published. The survey covers 1.4 million acres in Fresno County and has 149 soil-mapping units. The units include alfisols, aridosols, inceptisols, mollisols and vertisols. There are natural soil problem areas including soils laden with asbestos fibers (serpentine parent material), boron, selenium, sodium (causing sodicity with attendant soil deflocculation) and high salinity. Significant areas of the District have been impacted by soil subsidence. Two types of subsidence have occurred including; (1) permanent and semi-permanent compression of deeper geologic materials from the excessive extraction of water from coarser water-bearing formations, as well as; (2) the dissolution of very soluble salts in near surface soils by water application which results in a phenomenon known as "hydro-compaction".

The District also has areas of erosion/sedimentation, landslides, slumps and slips and shrink/swell (sodium-dominated clays that expand and contract with changes in water content) soils. Soil quality also has to be maintained so as to support all related uses from intense agricultural production, to rangeland productivity and the natural environment. The most critical soil quality issue is the maintenance of an adequate carbon reservoir. Plant residues and carbon sequestration significantly impact nutrient management, water holding capacity and erodability; carbon is literally the “glue” that holds the soil system together. The soil quality in the District ranges from poor to excellent with respect to carbon content. Additional efforts should be made throughout the District to improve soil quality, especially the carbon:nitrogen ratio.

### *WATER*

Water is another critical resource in the RCD. A lack of water has become a serious threat to the economic viability of the area. In contrast, an overabundance of water occasionally also occurs in the District in the form of flash floods from the upper watershed areas and in localized flooding on the Valley floor. The general flood-prone areas have been identified on Flood Hazard maps that can be viewed at the USDA Service Center in Fresno. Numerous studies and activities have been completed to better manage floods in the District. The floods are not only destructive, but the water quality of the flood water poses a threat to human health (asbestos fibers) and the environment (selenium toxicity in avian species).

Water availability has changed for the District and the landowners/operators in the area. A significant reduction in imported surface water supplies has led to land use changes including the fallowing of approximately 100,000 acres of previously permanently irrigated land. The new land uses of the 100,000 acres include: intermittently irrigated land (if and when relatively inexpensive surface water becomes available), winter cereal crops or improved grazing land. Some areas are returning to native vegetation, both intentionally and naturally. Groundwater pumping has been curtailed in the retired area because of the pumping depth and the cost of pumping the water. The groundwater is in overdraft in most of the Valley floor area. Many of the wells are managed by the Westlands Water District to protect the future of this resource and keep it available for very dry years when little or no supplemental surface water would be available under the contract Westlands has with the United States Bureau of Reclamation.

### *RANGELAND WATERSHEDS*

The 450,000 acres of watersheds in the District supports a viable rangeland livestock industry. The watershed area of the District is also important to the irrigated cropland portion of the District. As mentioned previously, the watersheds are prone to disruptive and destructive floods that cause both erosion and sedimentation of irrigated areas causing economic damages to the crops and lands. The upper watersheds also contain important wildlife and recreation areas. Substantial areas at the top of the watersheds are owned and managed by the United States Bureau of Land Management for private grazing and public recreation, as well as environmentally sensitive habitats that are

exclusionary except for all but a few activities (hiking, day visits). Other unique features of the watersheds include the presence of abandoned and reclaimed mining areas including mercury and asbestos mines. (Several are federal USEPA Superfund sites.) The rangeland and watershed area of the District adjacent to and in the Pleasant Valley area (City of Coalinga) also supports an ongoing, but waning, petroleum extraction industry.

### *AIR*

Since the District lands are in a Federal and State non-attainment air basin for PM 10 (particulates smaller than 10 microns) and ozone, emissions have become more regulated within the District. State law (SB 700) regulates agricultural air pollution sources. Road dust, burning of pruning waste, emissions from animal confinement facilities and internal combustion engine emissions are now all regulated under a permit system that is designed to limit dust, hydrocarbons and volatile organic compounds. Each agricultural unit and animal confinement operation in excess of certain size must file an air quality management plan with the regional APCD. Burning of crop residues and pruning residuals have been for all practical purposes completely halted (the one exception being major weed pests such as Russian thistle) and vendors have brought in crop residue chipping and grinding equipment to meet the needs of the regulations and the farm operators. The NRCS has been assisting grower/operators in the preparation of the required management plans and the permitting issues. They also have added some of the costs of the treatment and management techniques to the list of fundable practices under the federal USDA EQIP program. A significant investment has been made in retiring farm equipment that have older, less efficient diesel engines that emit excessive particulate matter and oxides of nitrogen. The District will continue to support operators in obtaining both the technical and financial resources needed to meet the new regulations.

### *RIPARIAN AREAS*

There are numerous areas within the District that have sensitive riparian areas. These areas are of concern because they have been impacted by non-native, aggressive, invasive plant species, including but not limited to: tamarisk (salt cedar), arundo donax (giant reed or false bamboo), tocolote (coyote bush) and star thistle. Riparian areas that are not managed properly also contribute significantly to the erosion, sedimentation and water quality problems that adversely impact downstream land and water resources.

### CONSERVATION EDUCATION

The District has a long-range goal of increasing public awareness of natural resources and their conservation and protection through its web site, email blasts, partnerships with related conservation organizations, workshops for partners and landowners, hands-on conservation training and education for youth (Coalinga High School plant propagation greenhouse and California Range Camp scholarships to name two), and finally, field visits of implementation projects by, cooperators, partners, dignitaries and policy-makers.

## MAPPING OF CRITICAL ISSUES

The Westside RCD is organized for the protection and conservation of natural resources in the District boundaries. The USDA-NRCS is a critical partner in meeting the mission of the organization that provides support efforts such as review and mapping of resource management problems. The NRCS Fresno field office and the California Department of Conservation, Land Protection Division both continue to maintain the maps outlining critical issues which include the following:

1. Land Use – including important farmlands (CA DOC)
2. Rural Subdivisions
3. Erosion and Erodible Areas
4. Heavy Brush Areas
5. Irrigation Water Management Problem Areas
6. Irrigation Water Quality
7. Flood Prone and Sedimentation Areas
8. Soils with Water Intake Problems (saline and sodic)

## AREAS OF CONCERN WITHIN THE WRCD

The District has identified seven major areas of concern within its boundaries that should be addressed if the natural resource base for sustained use is to be maintained. The following problem areas have been given a priority (no preference or ranking among the priorities):

1. Soil resource concerns.
2. Water resource concerns.
3. Rangeland and watershed conditions.
4. Invasive plant species.
5. Air quality conditions and concerns.
6. Energy availability and alternatives.
7. Aquatic and terrestrial habitat

## CAUSES FOR CONCERN

### 1. SOIL RESOURCES

#### a. EROSION and SEDIMENTATION

Rain induced erosion – During flood events, the streams in the upper watersheds and upper alluvial fans (collectively the Westside stream group including; the Arroyo Pasajero complex, the Salt, Martinez and Cantua Creek area, and the Panoche-Silver Creek system) have considerable erosion and sedimentation. Large

amounts of water erode the upper watersheds and deposit large amounts of sediment onto the alluvial fans. When there are especially large flow events, many problems are created. These problems range from the down-cutting of gullies to large deposits of sediment on irrigated cropland, road infrastructure, water districts infrastructure, rural cities, power transmission line footings, gas and oil pipelines and in the California Aqueduct. This erosion and sediment deposition can and does create financial losses for the landowners and degrades the water quality in the California Aqueduct and the Mendota Pool on the San Joaquin River. The Arroyo Pasajero, Cantua Creek, and Salt Creek have main channels that extend out into the irrigated area and are deeply entrenched. As these creeks reach the California Aqueduct, the water backs up and slows down causing the silt in the water to drop out and cause sediment accumulation. Arroyo Pasajero sediment contains asbestos fibers; Salt, Martinez, and Cantua Creeks may contain boron and selenium. As these deposits increase in volume, the water storage areas decrease. Then during subsequent heavy runoff events, the water, with its sediment load, by necessity has to be discharged into the California Aqueduct, thereby creating a substantial water quality problem for downstream users.

The Arroyo-Pasajero complex (Warthan, Los Gatos, Jacalitos and Zapato Chino Creeks) is especially troublesome. The area has a significant watershed area with a high discharge rate at infrequent intervals. The discharge has the potential capacity to cause the California Aqueduct to fail at a frequency of approximately once in 50 years. The California Aqueduct provides a significant portion of the water supply for all of Southern California, approximately 22 million people, as well as irrigation water for a substantial area of arable land in Kings and Kern Counties in the San Joaquin Valley. Significant efforts have been expended to develop a silt containment structure and storage reservoir adjacent to the Aqueduct for most events in the watershed. However, the capacity is not sufficient beyond the 50 year event. The threat to the Aqueduct from the Arroyo Pasajero is exceeded in significance only by catastrophic levee failure in the Sacramento-San Joaquin Delta.

The Panoche-Silver Creek complex also flows down slope to the alluvial fan in the northern boundaries of the WRCD. This system joins to create the main Panoche Creek approximately seven miles west of the Interstate 5 highway. There is severe down-cutting in the channel and severe erosion throughout the approximate twelve-mile stretch from the I-5 bridge to Belmont Avenue, an east-west

road maintained by Fresno County that stretches from near I-5 to the community of Mendota. In heavy flood events of the Panoche system, the flow literally moves down Belmont Avenue into the City of Mendota. Nearby overland flow of irrigated lands often contributes to the load. The heaviest events often bifurcate near the City with some directed northerly into and damaging the water distribution facilities of Firebaugh Canal Water District as well as continuing on through the City of Mendota towards the Mendota Pool and hence the San Joaquin River. The Belmont Avenue flow cuts the City off from the High School and seriously disrupts commerce. The flood flows are laden with boron and selenium and cause major problems for managing local irrigated lands by impacting the subsurface drainage water with selenium. The drainage water must be removed to prevent water-logging and salt management problems for economic crop production, and the selenium-containing water must be re-cycled or blended to meet downstream discharge standards. Eventually the discharge will be prohibited, and the selenium will have to be managed completely within the watershed area itself.

Bank, rill, sheet, gully and stream bank erosion are occurring throughout the upper watershed areas of the RCD. Much of this problem is naturally occurring. Some is geologically inherent and not economically feasible to control. The other problems that are related to human activities are being more actively managed by programs sponsored by the RCD. Specifically, the RCD has sought and obtained grants to characterize the condition of all the watersheds of the Westside stream group and developed management and implementation plans for several. The primary tool designed for management of the working range lands is the “ranch plan”. Numerous ranch plans have been developed and implemented and the results are very encouraging. Significant improvements in reducing soil loss have occurred and riparian corridors have been environmentally restored to historic natural conditions along with an increase in quality and availability of water resources. Soil erosion and sedimentation concerns can be reduced by expanding the “ranch plan” process.

2. Irrigation induced erosion – Such erosion has become less of a concern in the RCD as many operators have installed tailwater return systems and laser-leveled their fields. Water scarcity and conservation, including many precision water application systems (micro-spray and drip) have driven much of the changes that have reduced this type of erosion. Where needed, the RCD will continue to support leveling and tailwater system construction and rehabilitation to manage this concern. Crop residues assist in

reducing irrigation induced erosion and a more active effort of carbon management as discussed below under soil quality will provide additional control of this problem

## b. SOIL QUALITY

Soil quality in the RCD is generally fairly good especially those of the alluvial fans created by the Coast Range; however several conditions of note need ongoing attention. They include saline-sodic soils, soils with higher than recommended levels of some trace elements and the carbon condition of both crop and range land soils.

Saline-sodic soils present a challenge because they need ample water, soil amendments and, in some cases, artificial subsurface drainage systems to maintain productivity. As a result of these needs, especially the water requirements, many of these soil areas are being fallowed from intensive production in the RCD area. The largest overlying water district, Westlands Water District, has aggressively sought out willing sellers of these land areas and has become the landowner of record for large portions of the heavy clays associated with saline-sodic soils. Their water supplies have been drastically reduced and the lack of availability caused Westlands to remove and re-assign the water allocation to more productive areas. The RCD programs for natural resource sustainability and protection needs to change and assist Westlands with management schemes that meet their needs on their lands. The landowners in the balance of the saline-sodic areas with ongoing crop production will be addressed with the District's Integrated On-Farm Drainage Management process. (See water concerns and actions.)

Soil areas in the upper watersheds and lower fans and basin soils also have high natural levels of minerals and trace elements. The concerns include asbestos, boron, selenium, mercury, chromium, lead, nickel, molybdenum and silver.

Asbestos occurs in the Arroyo Pasajero watershed, especially the Los Gatos Creek sub-watershed. The asbestos fibers are associated with natural geologic formations of serpentine, a metamorphic rock in the Coast Range. Natural weathering releases the asbestos into the streams which makes its way to the Valley floor, and as previously noted, can impact the California Aqueduct and local communities through water or air contamination. Several asbestos areas in the upper watersheds were actively mined in the past. These abandoned mines are now federal Superfund sites that are

being systematically assessed and closed to prevent those sources from further contaminating the watersheds. The balance of the natural areas are not controlled except where soil management practices such as in “ranch plans” can assist in avoiding the asbestos-laden sediment leaving those properties.

Many productive agricultural soils in the RCD have high concentrations of boron. Similar to asbestos, the source is geologic, serpentine rock. The soils are managed by leaching with water, although boron is more difficult to remove than general salts. Boron can be toxic to crops and poses an ongoing problem if not adequately managed.

Several of the other trace elements, including: selenium, mercury, chromium, lead, nickel, molybdenum and silver, are in the upper watershed in the geologic materials. Some were mined and the legacy of those mines, much like the asbestos areas, is ongoing contamination of the watersheds. A mercury mine, New Idria, is on Federal land and is also a Superfund site. High flows in the watershed can move all these contaminants into the lower watershed and impact water quality. Selenium is a problem when it reaches Valley agricultural areas. It becomes soluble in subsurface drainage water; and when drainage water needs to be discharged and/or disposed of it is toxic and mutagenic in avian species such as ducks, coots, grebes and stilts. Geologic selenium in the upper watershed is so concentrated in some areas that it completely inhibits vegetation growth, as the soil pH is as low as 3.5 in these areas. Lead, chromium, silver and molybdenum are also potential environmental contaminants in all areas.

Carbon management is also a concern in both the upper watersheds and agricultural areas. Carbon in the form of “residual dry matter” is critical for managing erosion in working range lands. In highly productive agricultural soils, carbon is necessary for good soil structure, water-holding capacity, nutrient management, trace element and/or ion exchange capacity. Carbon management needs to be more pro-actively supported by the RCD. The District has partnered with experts and associates to encourage conservation tillage (“no-till” or “limited-tillage”) of crop residues to improve carbon accumulation in the surface of the high production areas. Such residue management techniques minimize compaction, energy consumption (tractor trips) and improve carbon sequestration as well (slower decomposition and hence “gasification” [methane or CO<sub>2</sub>] of the carbon).

## 2. WATER RESOURCES

### a. WATER CONSERVATION

Water availability has become a critical issue for success of the District operators. Conservation measures and land fallowing have helped stabilize the condition at this time but increases in permanent crops continue to threaten the stability by “hardening” annual demands. The District will continue to assist landowners with addressing these concerns in the ways it is constructed to do so, such as by supporting federal USDA financing assistance (EQIP) and NRCS design of precision application systems and other water-saving and management techniques.

### b. INTEGRATED ON-FARM DRAINAGE MANAGEMENT (IFDM)

Throughout the San Joaquin Valley and the arid west, there are areas with chronic problems of salt accumulation and water-logging of irrigated lands. In addition, some areas with drainage problems are further complicated by toxic concentrations of minor elements such as boron and selenium. The problem derives from slow percolation and/or soil layers of differing permeability where less permeable deeper soil layers trap applied water and accumulate the water to the extent it rises to the root zone of plants, drowning them, or alternately, salts from the accumulated water precipitate (capillary attraction or wicking-up in some cases) in the same root zone area and inhibit plant growth unless the plants are very salt tolerant. Substantial areas of the RCD are impacted by these conditions. Land fallowing has reduced the problem for many such areas, but operators who continue to farm in similar conditions have sought alternate methods of subsurface drainage water management. In an effort to address this problem, the IFDM process was developed by experts from and through the RCD. Since 1985 the RCD has cooperated in the development of this management technique by sponsoring demonstration sites. IFDM has two objectives; (1) utilize subsurface drainage water as a resource to produce marketable crops and products, and; (2) manage salt and selenium from the drainage water directly on farms. The process involves capturing accumulated percolated drainage water in subsurface collection systems (perforated pipes), managing the depth to water by controlled and/or selective pumping of the drain water, sequentially using the drain water to grow crops of varying levels of salt tolerance and finally, developing dry salt from concentrated brine. The management of these waters is critical and still a significant concern, because

actively taking them under one's control subjects one to complicated regulatory strategies and/or permitting requirements. The District itself has been named in various permits and regulatory activities. Therefore it has a critical need to continue to educate, innovate and adapt in the use of IFDM techniques to minimize regulatory structure and constraints. To transfer this technology, several area-wide hurdles continue to need attention such as assessing the environmental impacts of this management system cumulatively. The District is committed to the techniques and has had considerable support from State and federal partners to conduct this effort, especially the California Department of Water Resources.

Recent improvements in water application technology has further reduced the footprint of the drainage problem to the extent it has become difficult to implement some of the drainage treatment strategies, therefore the drainage management program is entering a new era. The newest projects are designed to treat not only drainage water when and if it is available or an issue, but to use technology to explore the use of deeper groundwater zones between the drainage zone and the historical groundwater extraction zones below a significant geologic feature known as the Corcoran Clay (member of the Tulare formation). The zone of groundwater potentially used is between 50 and 500 feet below ground surface.

#### c. A NEED FOR A NEW MORE SUSTAINABLE WATER SUPPLY

A significant water resource concern that has developed since the last plan is the variability and potential additional permanent loss of substantial amounts of surface water supplies heretofore imported into the area from northern California. The result of this loss is the fallowing of additional lands beyond the previously aforementioned land retired due to salt and drainage issues. As also mentioned above, improved water application techniques have substantially reduced demand for drainage management activities that IFDM was designed to assist with. It now appears that some of the reuse and treatment technologies developed from IFDM will be valuable to augment the area water supply by utilizing zones of groundwater under the District that were previously thought to be unusable.

### 3. RANGELAND AND WATERSHED CONCERNS

#### a. ORGANIZATIONAL ADVANCES AND CONCERNS

The rangeland and watershed areas were previously organized into sub-regional zones to address local concerns with locally-lead groups of landowners. The framework used to conduct these efforts were; “Coordinated Resource Management Planning” groups, or “CRMPs”. The CRMPs were supported by technical staff and consultants to develop assessment, management and in some cases, implementation plans for the significant resource management issues. The main resource issues have been boiled down to erosion, riparian corridor improvement, terrestrial and aquatic habitat and invasive plant species management. The financial support has come from a variety of State “bond” measures that offered grants to address problems that had State-wide significance. Because the Westside stream group has such statewide significance, such as protection of the California Aqueduct, Interstate 5, and the San Joaquin River, several Westside RCD watershed CRMPs had financing for various activities. Those grant funds have been expended, and further funds for implementation may or may not be forthcoming. Therefore, a mechanism needs to be found to continue to implement best management practices, such as “ranch plans” to advance the RCD goals and to keep the area groups engaged and action-oriented. Substantial improvements in the watersheds, especially riparian corridors, need to be completed and replicated in all areas. However, a significant impediment to ongoing, full-scale implementation of the rangeland best management practices has occurred before the completion of the last grants. Several responsible agencies requested area-wide environmental analysis of the cumulative impacts of the improvement activities. The RCD must complete such work before additional “ranch plans” are implemented. All the range and montane watersheds have been assessed and a “management plan” completed, except for Salt-Martinez, which has only been assessed. The next steps include completing the Salt-Martinez Management Plan and developing “implementation plans” for many of the watersheds similar to the measures adopted in the Arroyo Pasajero and Panoche-Silver Creek watersheds. Implementation must include the area-wide California Environmental Quality Act (CEQA) analysis. One possible organizational tool potentially available is additional State bond money that will finance a “District-wide” watershed coordinator.

## b. BRUSH AND WEED PESTS

Brush continues to threaten the watersheds and ranges. Weed pests have moved to the forefront and will be addressed as a new category of concern and action, “invasive species”.

## 4. INVASIVE SPECIES

### a. RIPARIAN CORRIDORS

Particularly onerous invasive plants need to be removed from riparian corridors to complete their transformation to fully functioning systems of erosion control, water resource sustainability and water quality management. Of particular interest are tamarisk (salt cedar) and arundo donax (giant reed or false bamboo). Both are phreatophytes (water-loving/consuming), and salt cedar has the insidious effect of salting the ground under its canopy.

### b. RANGELAND WEED PESTS

Star thistle, tocolote, juniper and various other range pests are significantly impacting the utility and productivity of the rangeland watersheds. The RCD needs aggressive programs to remove these threats to rangeland productivity and sensitive native habitats. The District has signed a “memorandum of understanding” with the Bureau of Land Management and other agencies to participate in the “weed management area” programs.

### c. CROPLAND WEED PESTS

Areas that have been fallowed will need to be carefully monitored for weed pests so they do not adversely impact the vitality and productivity of nearby cropped areas. Some research may be necessary to study the relative merits of fallowing versus restoration to native habitat. Native habitat may not be completely attainable since non-native species have a proclivity to out-compete the natives: however, recent experience in native propagation on test plots has identified certain native species that can at least co-exist with non-natives and attain a climax mix that is practical and sustainable.

## 5. AIR QUALITY CONCERNS

### a. AIR IMPACTS ON PRODUCTIVITY

It is still unclear whether industrial and urban air pollution control programs have successfully mitigated crop or plant productivity losses, if any have been adequately measured. This should remain as a concern.

#### b. AGRICULTURAL CONTROLS

The new control program for agricultural PM10, volatile organic compounds and residue burning will need to be monitored and supported with financial and technical evaluation to make sure the benefits outweigh the costs.

### 6. ENERGY CONCERNS

#### a. WATER APPLICATION, DELIVERY AND ENERGY AVAILABILITY AND COST

Energy for the production of food and fiber and for environmental management is becoming more scarce and costly. Diesel use is being discouraged to improve air quality, but electricity is rapidly escalating in cost. The RCD proposes that energy strategies that support the economy must be thoroughly investigated including energy efficient pumping systems (20% of California energy is used to move water), energy efficiency, and energy recovery systems. In addition the RCD should and will explore and support “green energy” opportunities for its producers and citizens, including solar photovoltaic and wind energy systems. Solar energy opportunities appear the most promising because of the solar radiation rate assigned to the southern San Joaquin Valley and the availability of wide expanses of fallowed land. In addition, the farms and ranches that pump water locally could all benefit from on-site solar PV systems, because the western San Joaquin Valley is in an energy deficient area of the California grid.

#### b. ENERGY PRODUCING PLANT MATERIALS

The RCD concerns about energy can also be ameliorated by continuing to develop energy producing plant materials, whether it is ethanol-capable cropping patterns or residues or oil and biodiesel producing plant materials. (Canola has been tested, and sugar beets may become an energy crop.) The District energy concerns should also address processing and utilization of energy producing crops, Technology and infrastructure should be supported and advanced by the District that would bring operators as close to energy self-sufficiency as reasonably possible.

## 7. HABITAT AND ECOSYSTEM CONCERNS

### a. HABITAT CONCERNS

Watershed and rangeland management includes riparian corridor improvements. For riparian corridors to return to fully functioning systems, they require connectivity. Several watershed and habitat management partners are interested in improving connectivity and function along the riparian corridors in the RCD, which are currently somewhat disconnected. The implementation strategy involves identifying the corridors and securing the easements and access to such corridors to improve the function. The functioning corridors improve not only terrestrial and aquatic habitat but provide land buffers for agricultural operations where sometime urban encroachment could potentially adversely impact agricultural practices

## ACTION ITEMS TO MEET CONCERNS

### 1. SOIL CONCERN ACTIONS

- a. Erosion – continue and add, where appropriate, monitoring and reporting mechanisms that show how watershed improvements demonstrably reduce water energy and transport of sediment and contaminants. Continue to support erosion control and water conservation practices necessary to protect resources and sustain farming and ranching. Finish erosion control design and implement watershed management plans to reduce transport energy and impacts to roads, canals and farmlands on the alluvial fans of the watersheds. In particular, work with the “integrated watershed planning process” to develop the optimum set of tools to minimize erosion.
- b. Soil quality – continue IFDM and strategies to keep susceptible soils free from salt impacts and trace elements, especially any alterations that could render the matrix permanently impaired (e.g. boron accumulation that could not be economically leached). Develop a carbon sequestration program potentially including a carbon “bank”.

### 2. WATER CONCERN ACTIONS

- a. Integrated On-Farm Drainage Management – Conduct Valley-wide CEQA work (environmental conditions summary) for all IFDM

proposals for individuals or regional IFDM systems. Participate in Valley-wide salinity management strategies that include the ultimate removal and transport of stored salts to the most appropriate economical and environmentally sound location. Continue to support the introduction and development of economic salt-tolerant plant species as well as water and salt removal species. Continue the research and development on the partitioning and beneficial uses of stored, dry salts.

- b. Groundwater treatment - continue to test technology-based systems to utilize salinized groundwater sources to replace intermittent or permanently lost surface water supplies.
- c. Work with the Westside Integrated Regional Watershed Management Plan to develop localized methods of capturing and storing local and regional flood flows for direct beneficial use or for storage in groundwater basins in or near the District. Flood flows from the Arroyo Pasajero, Panoche-Silver Creek and Fresno Slough/North Fork Kings should be managed for not only protection of property but water supply benefits as long as the quality is adequate and the storage does not pose a threat to other resources. Areas have been identified for ground water recharge and any stored flood flows can be used for either direct application for agricultural supply or groundwater recharge and hence agricultural, industrial or municipal uses.

### 3. RANGELAND AND WATERSHED ACTIONS

- a. ORGANIZATIONAL ADVANCES AND CONCERNS – complete area-wide CEQA document to allow implementation of rangeland and invasive species best management practices. Compile and post all watershed assessments, management and implementation plans on a web site. Prioritize watershed problems, rangeland implementation plans and invasive species plans to optimize watershed improvements and use of available funds. Seek additional funds from agencies and cooperators who most directly benefit from range improvements that manage soil and contaminant transport. Coordinate a “Westside Stream Group” program under the Westside IRWM with representatives from each past CRMP organization for assistance in priority development and implementation. Establish ongoing O&M agreements that land managers can easily implement. Apply-for and fund a single watershed coordinator from a proposed competitive grant that can service all the District service area.
- b. BRUSH AND WEED PESTS – see invasive plant species actions.

### 4. INVASIVE SPECIES ACTIONS

- a. RIPARIAN CORRIDORS – focus on invasive species as a common core to re-connect with associate agencies such as BLM, B of R, UC

- Extension, NRCS, CA Fish and Game, and U.S. Fish and Wildlife Service to assist with landowner participation and meeting priorities.
- b. RANGELAND PESTS – coordinate with responsible agencies to address priority plants pests and eradication goals.

## 5. AIR QUALITY ACTIONS

- a. AGRICULTURAL PERMITS – continue to seek financing and technical assistance for appropriate, cost-effective control programs. Link residue management with carbon sequestration program and energy needs.

## 6. ENERGY MANAGEMENT ACTIONS

- a. ENERGY NEEDS – seek technical and financial assistance in locating and developing solar and wind energy sources for local energy needs.
- b. PLANT MATERIALS FOR ENERGY SOURCES – seek additional technical support and research on the viability of energy crops including alcohol and oil (biodiesel) producing materials. Include carbon residue management in the strategies.

## 7. HABITAT AND ECOSYSTEM ACTIONS

- a. Work with conservation partners to develop the concept of connectivity and preferred riparian restoration areas in the higher and lower elevations of the Westside RCD. A southern San Joaquin Valley partner, the Tulare Basin Wildlife Partners has mapped such areas for the lower RCD. The map is enclosed in the Appendix and made a part of this report. Additional partners within the RCD include the Department of Fish and Game which already operates in two of the corridors, Arroyo Pasajero and Fresno Slough, and Turk Station, a private wildlife habitat area also in the Arroyo Pasajero system. The upper systems are part of the ranch planning efforts as well as partnering with the US Bureau of Land Management. Another habitat opportunity that could work in conjunction with water supply management is intermittent waterfowl basins in the area of basin soils at the lowest end of the RCD. The concept involves diversion of flood flows of high quality water into basins that could be used for waterfowl in wet months until the water is needed for direct use or groundwater recharge. One area of the District has prohibited such activity to prevent conflict with a security purpose and that restriction needs to be honored and reflected in District implementation efforts. No water-ponding is recommended near the Lemoore Naval Air Station so as to create a hazard or nuisance for military jet aircraft. All wetland facilities should be closer to the State Fish and Game refuge near Mendota. This recommendation also comports well with the

notion of connectivity of habitat areas. Wildlife habitat near Fresno Slough is preferable to any near the South Fork Kings River.

## 8. OTHER ACTIONS TO SUPPORT THE MISSION

- a. Support farming and ranching in other relevant resource regulatory programs on an as needed basis (water, wastes, endangered species, migratory fowl, etc.)
- b. Seek more research on the impacts of fallowed and restored land on neighboring farmed areas.
- c. Participate in more integrated regional planning for land use and water management, especially land use changes that improve agricultural viability with value-added activities and preservation of water and other resources for the area (de-salination, re-cycling, and use of fallow land for wildlife mitigation habitat or energy production).
- d. Continue to seek more permanent, reliable financial resources to support the goals and actions of the organization.
- e. Work through Westside RCD Finance and Contracts, Personnel and Planning, Projects, and other committees as needed to adapt and re-invigorate goals, programs, and processes needed to complete the mission.

## SUMMARY

The area of the Westside RCD is in transition from a major focus on irrigated agriculture to sustainable irrigated agriculture, sustainable ranch and watershed practices and environmental restoration. Key new programs in the next long-range planning effort covered by this document needing support and implementation include: local water supply expansion, watershed management, invasive species management, energy management, air quality management and carbon sequestration. The traditional programs of water and soil resource management need to be continued at a steady pace that assures sustainability of the District operators as well as the rural economies dependent on and complementary to the Westside RCD programs.