SECTION 3
GROUNDWATER BASIN CHARACTERISTICS
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

SECTION 3
GROUNDWATER BASIN CHARACTERISTICS
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

GENERAL

The Deer Creek and Tule River Authority (Authority) is located within the Tule River Sub-basin of the San Joaquin Valley Groundwater Basin (Basin No. 5-22.13). The Tule River Sub-basin is bounded by the following groundwater sub-basins; Kaweah River (north), Tulare Lake (west) and Kern County (south). The groundwater basin includes three major surface drainages: Tule River, Deer Creek and White River.

Typical annual rainfall in the basin is approximately 11 inches. The western portion of the Basin is typically more arid. The eastern edge of the Basin along the mountains experiences higher rainfall amounts.

The region encompassed by the Authority's Groundwater Management Plan (Plan) is shown on Figure 2-1 in Section 2. Table 3-1 summarizes the communities located in the basin and their respective populations.

TABLE 3-1
COMMUNITY POPULATIONS
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

COMMUNITY	POPULATION (1)
Pixley	2,589
Poplar/Cotton Center	1,496
Porterville (2)	46,346
Terra Bella	3,466
Tipton	1,790
Woodville	1,678

NOTE: (1) Population based upon Census 2000 Census Designated Place (CDP).
(2) Includes East Porterville CDP (population, 6,730).

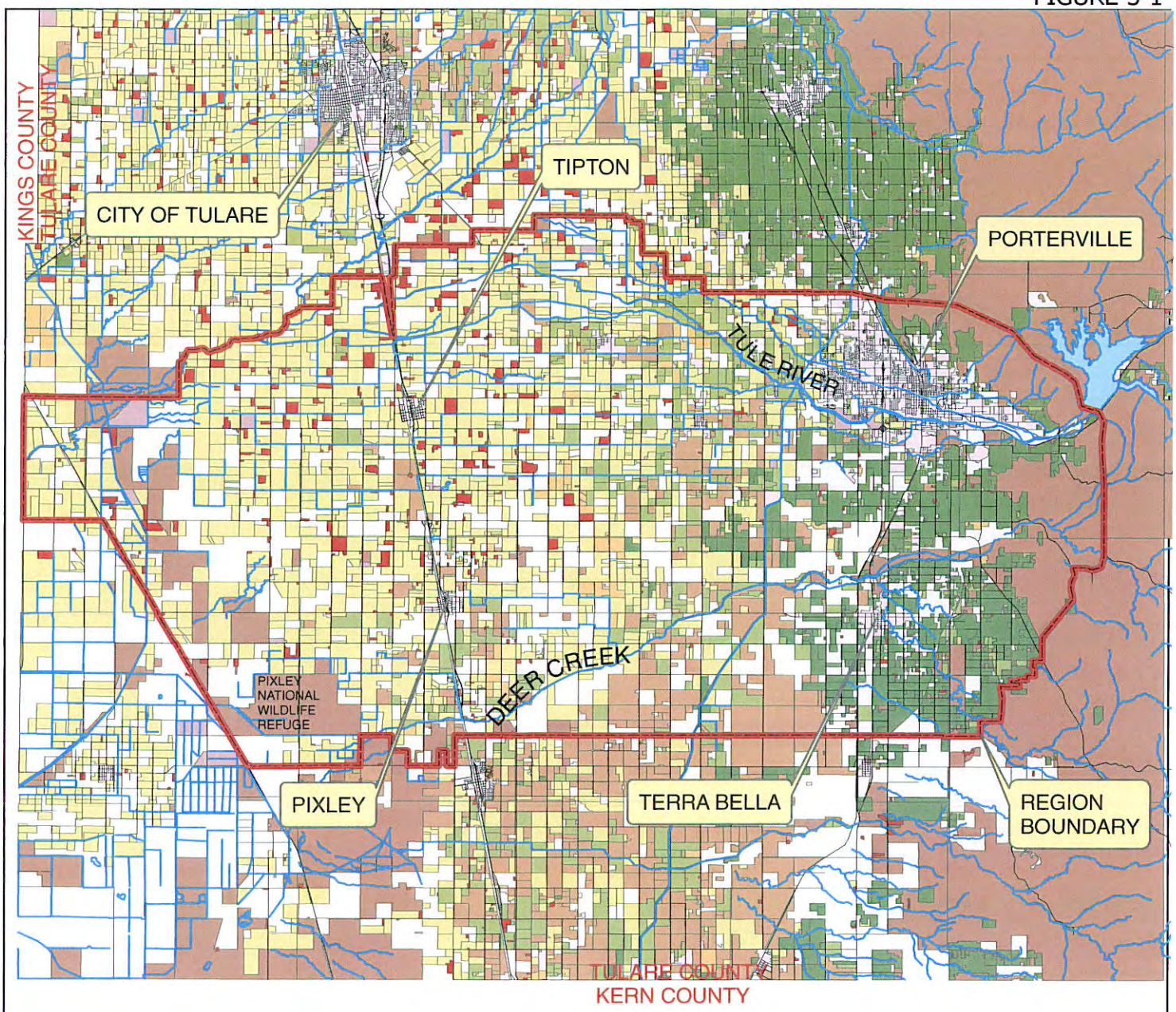
The Basin is rural in nature, dominated by agricultural land use as shown in Figure 3-1.

PHYSICAL CHARACTERISTICS

The physical characteristics of the groundwater basin influence the content of the Plan. In particular, the manner in which groundwater is replenished is directly affected by surface and subsurface characteristics, such as the permeability of the overlying and subsurface soils. The permeability of the soils within the groundwater basin is shown on Figure 3-2. In general, the soils having higher permeability rates are located adjacent to the main surface water drainages.

The Authority members overlie areas of both unconfined and confined aquifers. There are limited areas of perched water and shallow groundwater tables. These conditions result from subsurface geologic conditions. A general depiction of the aquifer and subsurface geologic conditions is presented on Figure 3-3. Figure 3-4 shows the groundwater elevations for spring, 2004, as compiled and prepared by the Department of Water Resources.

FIGURE 3-1



SOURCE: TULARE COUNTY GRAPHICAL INFORMATION SYSTEM, 1999

LEGEND

GEOGRAPHICAL INFORMATION

- Boundary - Groundwater Management Plan
- Streams
- Streets
- Lake Success

LAND USE

- Citrus
- Decdiduous Fruit and Nuts
- Field Crops
- Semi Agricultural: Livestock, Dairies, Etc.
- Truck, Nursery and Berry Crops
- Vineyards
- Native Vegetation
- Water Surfaces
- Urban

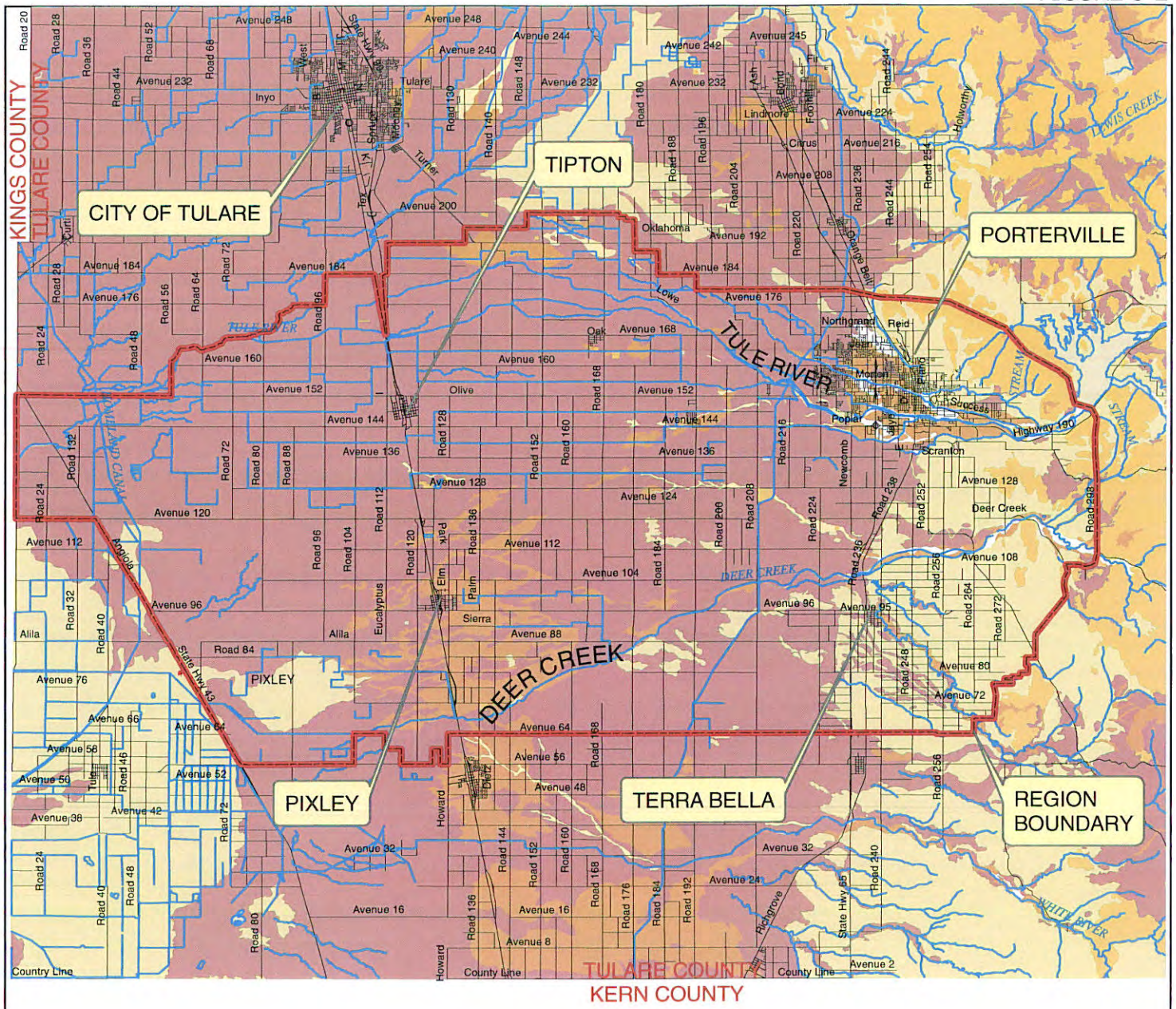
N W E S

10 5 0 10 Miles

LAND USE
GROUND WATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

KELLER/WEGLEY

FIGURE 3-2



SOURCE: TULARE COUNTY GRAPHICAL INFORMATION SYSTEM, 1999

LEGEND

GEOGRAPHICAL INFORMATION

- Boundary - Groundwater Management Plan
- Streams
- Streets
- Lake Success

PERMEABILITY

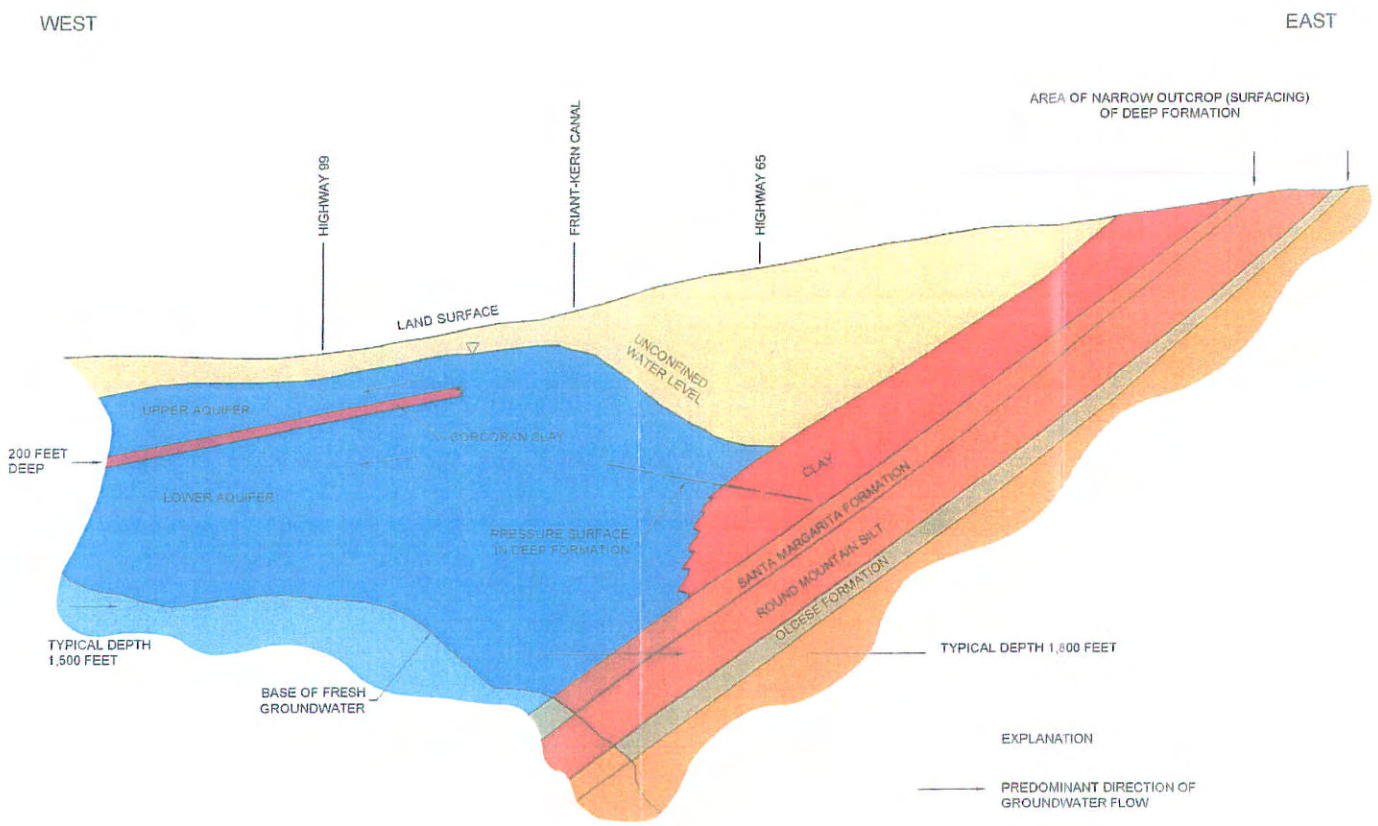
- Moderate
- Rapid
- Rock
- Slow
- Under Water

N W E S

10 5 0 10 Miles

SOIL PERMEABILITY
GROUND WATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

KELLER/WEGLEY

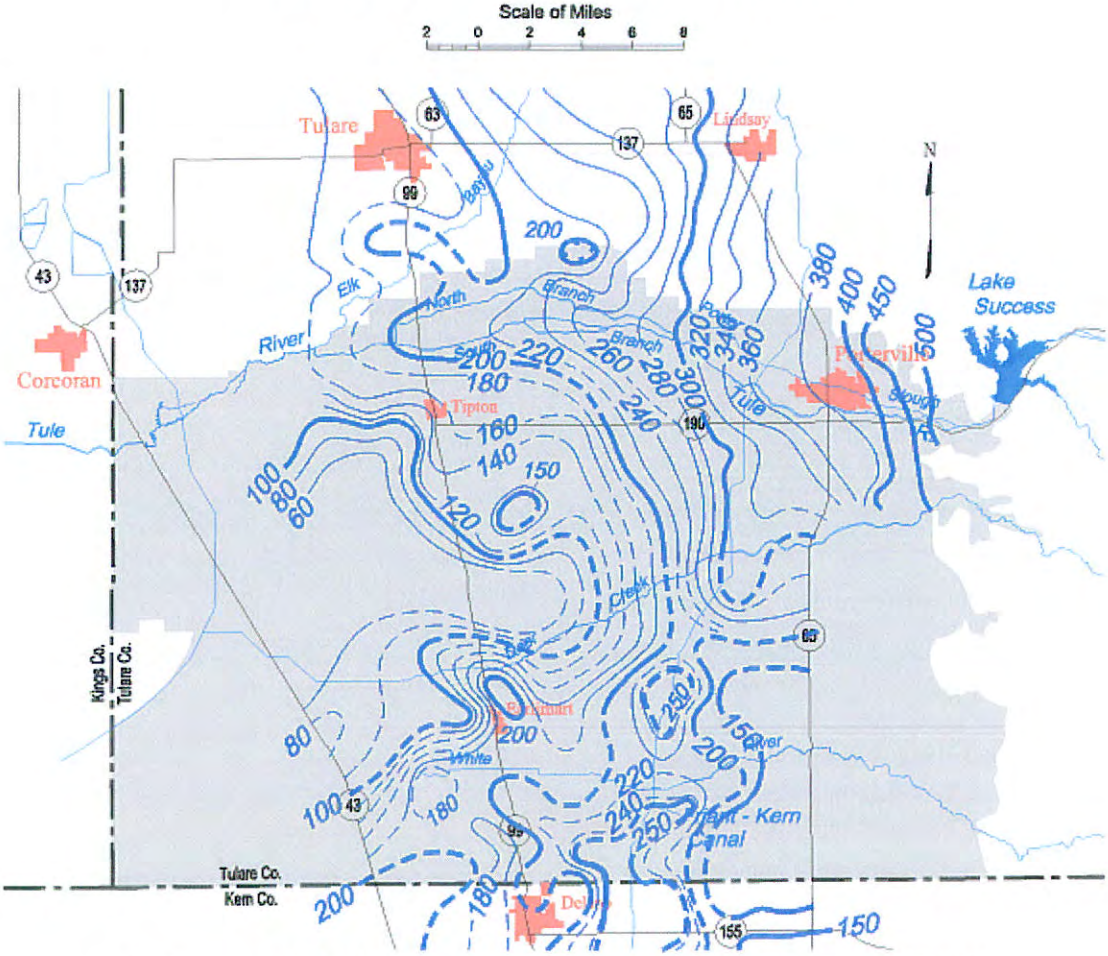


SOURCE: FIGURE 9, ANALYSIS OF GROUNDWATER RESOURCES
PROVOST AND PRITCHARD 2001.

SURFACE CONDITIONS
GROUND WATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

Tule Groundwater Basin

Spring 2004, Lines of Equal Elevation of Water in Wells, Unconfined Aquifer



Contours are dashed where inferred. Contour interval is 10, 20 and 50 feet.

SOURCE: DEPARTMENT OF WATER RESOURCES

GROUNDWATER ELEVATIONS
GROUND WATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

SECTION 4
BASIN MANAGEMENT OBJECTIVES
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

SECTION 4
BASIN MANAGEMENT OBJECTIVES
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

GENERAL

The Deer Creek and Tule River Authority (Authority) has developed five (5) basin management objectives to guide the implementation of the Groundwater Management Plan (Plan). By accomplishing these objectives, the Authority believes that a more reliable groundwater supply for long-term beneficial uses within the Plan area will be realized. The Authority's basin management objectives within the Plan area are:

1. To promote and realize groundwater resource protection;
2. To facilitate groundwater resource sustainability;
3. To develop groundwater resource understanding;
4. To develop groundwater basin understanding; and
5. To promote and facilitate information dissemination regarding the groundwater resource.

Each basin management objective is described below.

GROUNDWATER RESOURCE PROTECTION

Groundwater needs to have water quality that will sustain its beneficial uses to remain a viable water resource within the groundwater basin. This objective focuses the Authority's management strategies to maintain the good water quality of the Plan Area's groundwater. The Authority will utilize the following strategies to achieve this objective:

1. Wellhead/Recharge Area Protection;
2. Migration of Contaminated Water Controls;
3. Well Abandonment and Destruction Policies; and
4. Well Construction Policies.

Protection of the groundwater beneath the Plan Participants ensures that the maximum amount of groundwater remains available. Achieving this basin management objective minimizes the potential to lose groundwater volumes to contamination.

GROUNDWATER RESOURCE SUSTAINABILITY

Groundwater is the primary water supply in the Plan Area for both domestic and agricultural purposes. This objective emphasizes the maintenance and/or increase of the available groundwater supply. The following management strategies will be used toward achieving this objective:

1. Overdraft Mitigation;
2. Groundwater Recharge Policies;
3. Groundwater Extraction Management;
4. Conjunctive use Policies; and
5. Operation of Facilities.

This basin management objective of the Plan will identify and quantify the surface and groundwater supplies available to the Authority members and define the interaction between these supplies. Groundwater storage is affected by groundwater pumping and groundwater recharge as water users attempt to meet their water use demands. The net result of the

interactions between the available water supplies and the demands for water is a change in groundwater storage. This basin management objective is intended to provide the Authority with the information and tools required to maintain and improve the total water supply through coordinated management of groundwater.

GROUNDWATER RESOURCE UNDERSTANDING

The purpose of this basin management objective is to further develop knowledge regarding the Plan Area's groundwater. With detailed information regarding the groundwater resource, improved characterization will lead to future groundwater management decisions. The primary Plan element that will achieve this objective is groundwater monitoring.

Groundwater levels monitored at least annually will indicate the status (availability) of the resource. Groundwater levels also reveal the effectiveness of other strategies, such as groundwater recharge efforts. Monitoring data developed over time will serve as the foundation of conclusions regarding groundwater reliability and management strategy effectiveness.

GROUNDWATER BASIN UNDERSTANDING

This basin management objective garners basin information to facilitate evaluations regarding basin features and potential groundwater resource impacts.

Changes to the groundwater basin's topographic, geologic and hydrologic conditions may adversely affect the groundwater. Land use development can impact both the quantity and quality of groundwater. The availability of surface water reduces overall demand on the groundwater.

This objective will be achieved through the following management strategies:

1. Land Subsidence Monitoring;
2. Land Use Planning; and
3. Surface Water Management.

Through these strategies, the Authority will remain familiar with the Plan Area's topographic, geologic and hydrologic conditions that may affect the groundwater resource. The Authority will have the capability to react to proposed projects and changing conditions and potentially avoid adverse groundwater impacts.

INFORMATION DISSEMINATION

Groundwater resource and basin information and knowledge will result from the active implementation of this Plan. The Authority will serve as the primary conduit of information regarding the Plan and subsequent results.

This Basin management objective will result from the following plan elements:

1. Groundwater Basin and Resource Information Management;
2. Groundwater Basin and Resource Reports; and
3. Local Agency and Stakeholder Involvement.

The Plan and its management strategies will result in the compilation of various data and information regarding the groundwater basin and its resources. The Authority will compile, manage and disseminate this information to facilitate improved coordination and use of the Plan Area's hydrologic resources. The Plan will also result in various opportunities for the Basin's stakeholders to respond to basin management efforts.

SECTION 5
MANAGEMENT STRATEGIES
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

SECTION 5
MANAGEMENT STRATEGIES
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

GENERAL

California Water Code Sections 10753.7 and 10753.8 set forth required and recommended elements that establish strategies for groundwater management. Each strategy and the Deer Creek and Tule River Authority's (Authority) planned activities conducted in support of the strategy are described in this section. Some activities have been in use since the adoption of the previous 1994 Groundwater Management Plan (Plan). Planned activities describe proposed Authority efforts that will be utilized during the implementation of this Plan.

SALINE WATER INTRUSION CONTROL

The Tule River Groundwater Basin is a subbasin of the Tulare Lake Hydrologic Region. The western edge of the Plan Area is situated about 90 miles from the Pacific Ocean. The Authority does not consider saline water intrusion controls a management strategy that warrants consideration.

Plan Activities

None - The Authority reserves the right to decide whether or not it will be involved with this strategy in the future as authorized by Water Code Section 10753.8.

WELLHEAD AND RECHARGE AREA PROTECTION

The management strategy consists of the identification, establishment and management of wellhead and recharge protection areas. Areas where groundwater pumping and recharge occur warrant dedicated attention by the Authority. Wells represent a direct conduit to groundwater. Recharge area (basins) are typically constructed in areas exhibiting high soil permeability characteristics.

The Authority will monitor and participate in land use development activities within the Plan Area. The Authority will also consider structural measures such as fencing or land acquisition to protect wellhead or recharge areas.

Plan Activities

1. Land use and development monitoring;
2. Participation in pertinent land use/zoning planning procedures; and
3. Incorporation of security measures such as fencing, as necessary.

MIGRATION OF CONTAMINATED GROUNDWATER CONTROLS

This management strategy incorporates regulations and controls for contaminated groundwater. The Authority has not identified specific plumes of contaminated groundwater. Source specific plumes of contaminated groundwater, such as those from leaking underground storage tanks, fall under the jurisdiction of various state and federal agencies. The Authority is not in a position at this time to pursue regulations regarding unattributed groundwater contamination.

The Authority will develop and implement protocols to obtain and compile information regarding contaminated groundwater. Monitoring of groundwater quality will also be conducted.

Plan Activities

1. Monitoring of regulatory activities and records regarding contaminated groundwater within Plan Area; and
2. Complete an inventory and evaluate available groundwater quality data.

WELL ABANDONMENT/DESTRUCTION POLICIES

Improper well abandonment may allow contamination of the groundwater. Well abandonment must be conducted in conformance with standards adopted by the County of Tulare. The Authority will monitor these activities by reviewing abandonment records compiled by the County. Appropriate information on proper abandonment of wells within the Plan area will be made available through the Authority.

In lieu of well abandonment, the Authority will pursue the conversion of a production well to a monitoring well if such suitable opportunities arise and funding is available.

Plan Activities

1. Establish and maintain a protocol with Tulare County regarding review of well abandonment records;
2. Develop record keeping system/database of abandoned wells;
3. Establish public education activity to inform stakeholders of well standards and policies; and
4. Develop and implement program to convert abandoned production wells to monitoring wells.

WELL CONSTRUCTION POLICIES

The increase in groundwater extraction resulting from the construction of additional wells affects the long-term water balance of the region. Well construction may allow contamination of the groundwater if not done properly. Well construction must be conducted in conformance with standards adopted by the County of Tulare. The Authority will monitor these activities by reviewing well construction records compiled by the County. Appropriate information on proper construction of wells within the Plan area will be made available through the Authority.

Opportunities for additional groundwater monitoring wells may arise through the abandonment of existing production wells. The Authority will consider such a conversion to eliminate the construction of additional wells.

Plan Activities

1. Establish and maintain a protocol with Tulare County regarding review of well construction records;
2. Develop a record keeping system/database of constructed wells;
3. Establish public education activity to inform stakeholders of well construction standards and policies; and
4. Develop guidelines for monitoring well conversion.

OVERDRAFT MITIGATION

The groundwater basin is experiencing groundwater overdraft as evidenced by lower groundwater levels within the Plan Area.

This management strategy is best achieved through the implementation of several companion management strategies. Overdraft mitigation is accomplished through the integration of the following strategies:

1. Groundwater Recharge/Management;
2. Groundwater Extraction Policies;
3. Conjunctive Use Policies; and
4. Surface Water Management.

These strategies will be implemented to attempt to achieve a hydrologic balance within the Plan area, thereby reducing overdraft of the groundwater resource.

GROUNDWATER RECHARGE MANAGEMENT

The replenishment of the underlying groundwater occurs naturally and through deliberate, controlled means. The Authority's groundwater replenishment is achieved by controlled means principally through direct recharge to the underground and through the delivery of surface water, when available, to lands otherwise relying on the groundwater resource.

Direct recharge is achieved through the placement of surface water in channels or basins located on permeable soils for the express purpose of percolation to the underground. Within the area of the Authority, the members use natural channels, unlined ditches and canals and percolation basins for this purpose. It is the intention of the Authority members to expand the current network of recharge facilities. The monitoring of groundwater conditions under this Plan will enable the Authority to identify areas of need in this regard.

Delivery of surface water for irrigation purposes reduces the need for water users to draw on groundwater thereby conserving the water available in the aquifer for later use. The use of surface water in this manner is known as in-lieu recharge and is practiced by all Authority members. An additional benefit is derived when irrigation water applied beyond crop water needs percolates to the underground.

Plan Activities

1. Maintain and/or expand relationships involving networks of groundwater recharge facilities;
2. Maintain and/or expand surface water deliveries within the Plan area.; and
3. Pursue additional surface water supplies for specific purposes of groundwater recharge.

GROUNDWATER EXTRACTION POLICIES

Effective groundwater replenishment and maintenance of groundwater levels involves the management of water supplies available to the basin and extractions from the basin. Groundwater extractions within the management area are primarily by private wells. Management of groundwater extractions can best be achieved through economic incentives, rather than through the regulation of extractions. This current practice will continue to be implemented through the pricing of surface water at rates which encourage water users to use surface water in-lieu of pumping groundwater.

Plan Activities

1. Secure surface water quantities and establish subsequent pricing that encourages maximum surface water use;
2. Develop and implement an educational program focused on:
    a) Timing of use of groundwater;
    b) Timing of use of surface water; and
3. Evaluate grower incentive based banking program.

CONJUNCTIVE USE POLICIES

Groundwater management in California is rooted in the conjunctive use of surface and groundwater resources. Use of the water supplies from the two sources is integrated to accomplish the optimum utilization of each source.

In years of shortage, that previously stored water is pumped to supplement available surface water. Authority members will be encouraged to maximize the utilization of available facilities and resources for conjunctive use through cooperative management.

Conjunctive use opportunities motivated the Authority members to enter into long-term contracts with the United States beginning in the 1950's for the importation of supplemental surface water supply from the Friant Unit of the CVP.

Water transfers and exchanges are an integral part of the existing conjunctive use programs. Under the Plan, the Authority members will seek to preserve and enhance conjunctive use activities through coordinated use of available supplies made possible by water transfers and exchanges and through expansion of recharge facilities. Enhancement of conjunctive use activities could include the development of water banking arrangements with other agencies by utilizing available groundwater storage capacity for the temporary storage of water.

This management strategy will result from the integration of the following plan elements:

1. Groundwater Recharge Policies;
2. Groundwater Extraction Policies; and
3. Surface Water Management.

SURFACE WATER MANAGEMENT

Surface Water Quantity

The Authority members import surface water supplies from the Central Valley Project through the Friant Division and the Cross Valley Canal exchange program under long-term contracts with the United States and receive local surface supplies from the Tule River and Deer Creek. Also, the Authority members make short-term and year-to-year arrangements to secure additional Central Valley Project (CVP) water and other supplies. The Authority members have in place and operate an extensive system of conveyance, distribution and recharge facilities throughout their service area to make use of available surface supplies. Table 5-1 summarizes the water supply contract amounts of each member District of the Authority.

Under this Plan, the Authority will seek to preserve the existing water rights and contracts and will pursue opportunities to supplement these supplies through importation of additional water supplies for Authority members. Supplemental supplies may be obtained through purchase of additional CVP water from other entities, "Section 215 water" from the United States and through other programs as may be available. Efficient water use and distribution within the management area will be encouraged through the use of transfers and exchanges among Authority members.

Importation of affordable water supplies, in quantities sufficient to achieve a long-term water balance within the service area of the Authority members, is a prerequisite for successful implementation of the recharge groundwater management strategy. All opportunities to supplement the regular supplies of the Authority members through long-term water exchange and banking agreements, hereinafter referred to as Projects, will be evaluated for compatibility with the goals of this Plan pursuant to an adopted evaluation process.

TABLE 5-1
WATER SUPPLY
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

District	Acres	CVP Supply (AF)	Avg CVP Supply (AF)	Conveyance System	Other Notes
Lower Tule River ID	104,000	61,200 Class 1 238,000 Class 2 31,102 CVC	156,240	300 mi. Canals 25 mi. Rivers 5 mi. Piped	Local supply from Tule River 70,000 AF/y average
Pixley ID	70,000	31,102 CVC		46 mi. Canals 14 mi. River	Access to Deer Creek - minor supply
Porterville ID	17,000	16,000 Class 1 30,000 Class 2	27,320	13 mi. Unlined Canals 7 mi. Piped 12 mi. Rivers/Slough	Local supply from Tule River 10,600 AF/y average
Saucelito Irrigation District	19,500	21,200 Class 1 32,800 Class 2	33,300	100% Piped	
Stone Corral ID (1)	6,500	10,000 Class 1	9,200	100% Piped	GW storage is limited-Aquifer thickness ‹1600'
Terra Bella ID	13,300	29,000 Class 1	26,680	100% Piped	GW storage is limited-Aquifer thickness ‹1600'

Notes: (1) Not in groundwater basin.

This evaluation process will consist of the following steps:

1. Submittal of written proposal and technical report;
2. Authority Advisory Committee and consultant evaluation;
3. Proponent and Authority Coordination; and
4. Authority Advisory Committee recommendation and Board of Directors action.

For any proposed Project, the Proponent will initiate the process through the transmittal of a written proposal describing the Project, including the anticipated benefits. A technical report will be prepared by the Proponent and evaluated by the Authority. The report must describe:

1. Quantities and sources of water;
2. Structures and other physical features of the proposed Project;
3. Water accounting measures and/or methods;
4. Funding;
5. Schedule, including CEQA compliance;
6. Anticipated benefits; and
7. Proponent's evaluation of compliance with Plan's management objectives.

The Authority Advisory Committee will evaluate the Technical Report prior to any Board determination regarding the proposed Project.

The Authority Advisory Committee will utilize outside consultants, as necessary, for further evaluations. The proposal and technical report will be reviewed for consistency with the Plan's basin management objectives and utilization of adopted management strategies.

The resulting evaluation will be returned to the Project Proponent. The Authority Advisory Committee will coordinate with the Proponent to develop the final proposed Project.

Upon finalization of the proposed Project, the Authority Board of Directors will act to determine the compatibility of the proposed Project with the goals of this Plan. Similarly, water exchange and banking agreements among Authority members will be used where they may enable the Authority members to distribute water to areas identified under this Plan as suffering from groundwater depletion and as being suitable for groundwater storage.

Surface Water Quality

The surface waters of the Plan area are varied. Imported surface water originates in the San Joaquin River watershed (Friant-Kern Canal). Local surface water can be found in the Tule River and Deer Creek. These imported and local surface waters are subject to monitoring programs by various agencies. Current surface water monitoring programs are summarized in Table 5-2. Under this management strategy, the Authority will review results of existing monitoring programs. Additional surface water quality monitoring will be developed if deemed necessary.

Plan Activities

1. Maintain or increase quantities of imported surface water;
2. Preserve existing surface water rights;
3. Promote efficient water use through the use of water exchanges and transfers;
4. Investigate potential for water banking opportunities within the Plan area;
5. Develop additional water storage capacity within the Plan area; and
6. Monitor existing surface water quality testing efforts by other agencies.

TABLE 5-2
SURFACE WATER QUALITY MONITORING
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

SURFACE WATER	MONITORING AGENCY	FREQUENCY
Friant-Kern Canal	Reclamation District 770	Annually
	Terra Bella Irrigation District	Varies - monthly to annually
Tule River	Reclamation District 770	Annually
	Tule River Association	Seasonal

OPERATION OF FACILITIES

This management strategy consists of the construction and operation of facilities that address groundwater recharge, storage extraction, conservation contamination clean-up and water recycling. Current efforts primarily address groundwater recharge through percolation basins and unlined irrigation distribution channels. In general, the current projects are implemented individually by member Districts.

Additional groundwater facilities will be needed to sustain the resource as demands placed on the groundwater resource increase. The Authority will evaluate potential projects that will address this need. The current scope of this strategy will be expanded as necessary. Opportunities to incorporate recycling and reclamation and water conservation may be possible through coordination with domestic utility providers.

Plan Activities

1. Maintain policy that encourages the use of unlined channels (where possible);
2. Maintain policy which facilitates maintenance of recharge basins;
3. Develop and implement protocol to identify operations projects; and
4. Upgrade and expand surface water conveyance facilities.

GROUNDWATER MONITORING

Groundwater monitoring will be used by the Authority to assess the quantity and quality of the groundwater resource. The details of this management strategy are described in Section 6.

Each member District of the Authority currently participates in biannual monitoring of groundwater levels. Additional groundwater level information is available from domestic water providers.

In general, regular groundwater quality assessments are conducted by domestic water providers within the region. The Authority will develop a protocol to compile groundwater quality data. Additional groundwater quality monitoring efforts will be developed as needed.

LAND SUBSIDENCE MONITORING

The Authority does not have any substantial information regarding land subsidence within the Plan area. This management strategy consists of developing and implementing monitoring protocols to determine the pressure of land subsidence. The Authority's efforts will establish a starting point for future evaluations.

Plan Activities

1. Identify and establish an elevation control network throughout the Plan area; and
2. Conduct periodic survey of control network to determine presence, if any, of land subsidence.

LAND USE PLANNING

This management strategy consists of reviewing land use plans and coordination with local planning agencies. Under this strategy, the Authority will review projects and basin activities that affect land use and the potential for groundwater resource impacts.

Plan Activities

1. Develop and maintain protocols to participate in local land use planning efforts; and
2. Continue participation in California Environmental Quality Act as a responsible agency.

GROUNDWATER BASIN AND RESOURCE INFORMATION MANAGEMENT

Many strategies to be utilized by the Authority will produce groundwater resource and basin data or information. This information will need to be completed and inventoried.

The purpose of this management strategy is to ensure that data and information gathered during the implementation of the Plan is readily available for evaluation purposes. Many Plan efforts could be implemented by Authority member Districts or other Plan Participants. Centralizing this data and information will be critical to groundwater management.

Under this management strategy, the Authority will also conduct assessments and evaluations of the implementation data. These efforts will serve as the basis of development for the Authority's annual reports and other Plan documents.

In addition, a conjunctive use model for the Tule groundwater basin area was developed for the Department of Water Resources in 2002. The model is a productive tool that is available to the Authority. This tool provides an additional method to evaluate Plan data and conduct groundwater resource assessments.

Plan Activities

1. Establish data management authority and responsibilities;
2. Develop and implement data collection and inventory protocols and standards; and
3. Conduct periodic refinement and use of predictive groundwater model.

GROUNDWATER BASIN AND RESOURCE REPORTS

This management element consists of the preparation of reports and other documents used by the Authority to disseminate information and findings regarding its efforts under the Plan. Reports will be used to document Plan activities and subsequent effectiveness. These reports will also be used to present new and/or additional knowledge regarding the Basin characteristics and resources.

Detailed information regarding the Authority's reporting efforts can be found in Section 7, Implementation.

Plan Activities

1. Prepare Annual Groundwater Management Plan Report; and
2. Prepare technical memoranda as necessary to disseminate information regarding Plan activities.

LOCAL AGENCY AND STAKEHOLDER INVOLVEMENT

This management strategy consists of efforts to engage individuals and agencies within the Plan area in Plan participation. Three primary elements will form the foundation of this management strategy: Plan participation, Advisory Committee and Public Review. The first element is Plan Participation. There exists many agencies within the Plan area that will realize benefits from the Authority's coordinated Plan efforts to manage the groundwater resource. The Authority will pursue opportunities to engage such agencies as Plan Participants. Additional Plan Participants increase the extent of coordinated groundwater resource management and the amount of resources available to implement the Plan.

The second element of this strategy is the development and utilization of a Plan Advisory Committee (Committee) to address the implementation of the Plan. The Authority will establish the criteria regarding Committee formation and participation. To be effective, the Committee must include individuals and agencies that represent the various resource interests of the Plan area. The Authority will endeavor to enlist sufficient representation for the Committee. Additional committees may be created as necessary to facilitate implementation of the Plan.

The third element of this strategy consists of public participation and review. The meetings of the Authority are open to the public. Public notification will be completed to encourage public participation. During Plan reporting efforts, the public will be afforded opportunity to review and publicly comment on the Plan and its implementation. The Plan will be considered public record and available for inspection.

Plan Activities

1. Pursue Plan participation by local agencies within Plan Area;
2. Maintain advisory committee of Plan Participants and Plan stakeholders; and
3. Establish and maintain public notification and participation procedures regarding Plan activities.

SECTION 6
MONITORING
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

SECTION 6
MONITORING
GROUNDWATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

GENERAL

Optimal use of the groundwater resource is dependent on the acquisition of good basic data respecting both geology and hydrology. The purpose of this element of the Deer Creek and Tule River Authority (Authority) Groundwater Management Plan (Plan) is to monitor conditions within the groundwater basin to identify changing conditions which may require attention. Monitoring includes gathering and analyzing basic data generated from Plan management activities to characterize the basin to provide the information necessary for future management decisions. Existing and proposed management activities in this regard may be enhanced to provide a more complete picture of the condition of the groundwater resource. The Plan's primary monitoring effort will be directed at the groundwater resource. Additional monitoring efforts will result from activities proposed by management strategies.

GROUNDWATER MONITORING

Groundwater monitoring will consist of two components which are groundwater levels and groundwater quality.

Groundwater Levels

Data regarding groundwater levels is used to evaluate groundwater movement and storage conditions. Groundwater contour maps showing lines of equal elevation of the water surface indicate the direction of groundwater movement and can be used to develop estimates of

groundwater flow entering or leaving the management area. Maps of depth to groundwater can provide insight into the distribution of pumping lifts and resulting energy costs for extraction. Maps showing changes in groundwater levels, when used in conjunction with data on specific yield, can also be used to estimate changes in groundwater storage.

The Authority members routinely measure groundwater levels in approximately 200 wells. (The location of these wells is presented in Figure 6-1.) Measurements are made in both spring (February) and fall (October). The present monitoring networks will be maintained or enhanced to assure the availability of sufficient data for the preparation of groundwater contour maps. Measurement of groundwater levels will continue to be performed in both spring and fall in order to show seasonal variations.

Groundwater Quality

Monitoring of groundwater quality provides the information required for determinations of the suitability of groundwater for various uses. Comprehensive groundwater quality data for the Plan area does not exist. The Authority will develop protocols to obtain groundwater quality data from domestic water providers and other sources and consolidate it for management purposes.

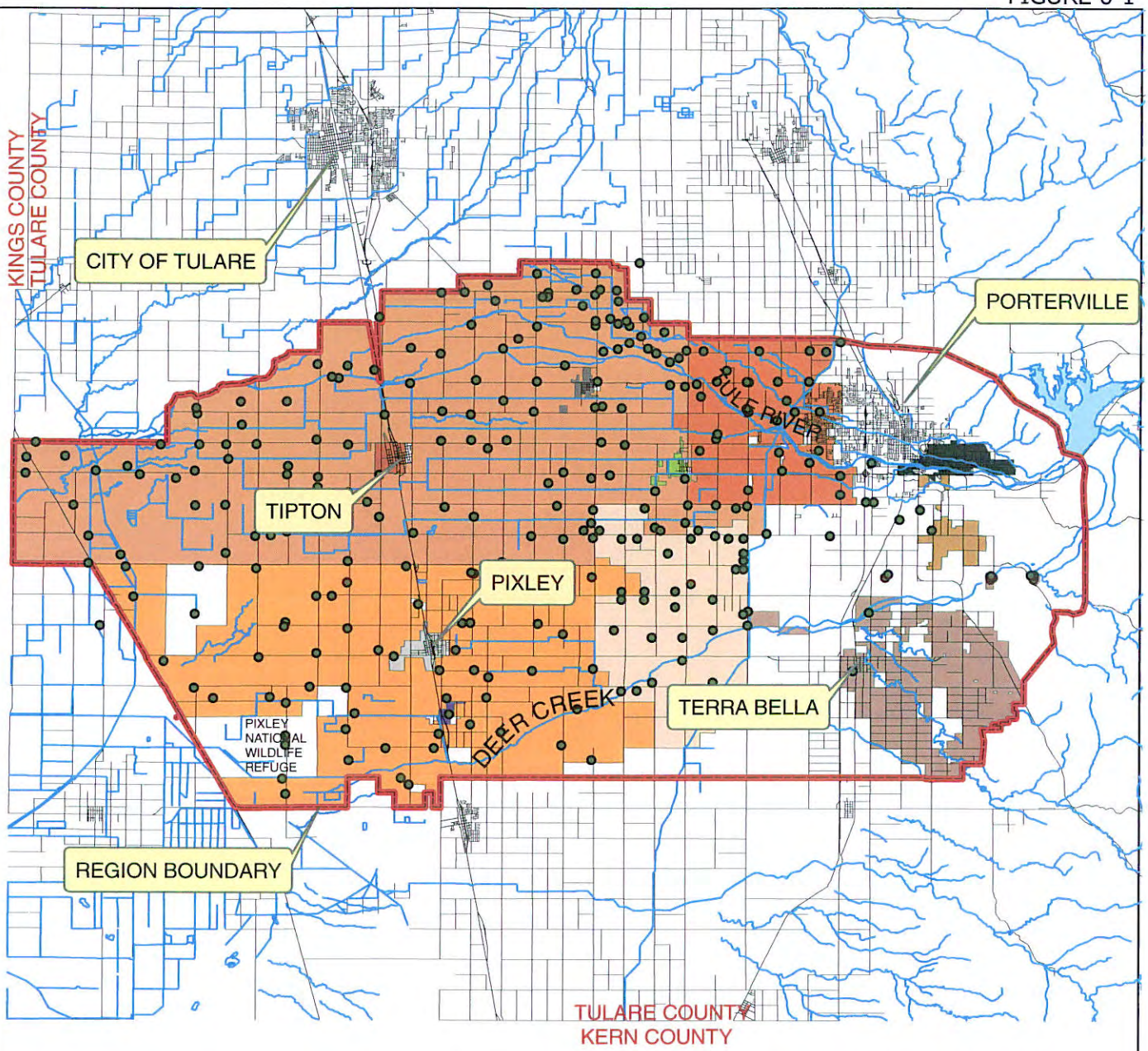
The sampling of the Authority's wells will be expanded, if necessary, to provide sufficient data to allow identification of water quality problem areas. Supplemental sampling may also be performed to better define localized areas of impaired water quality. Testing will typically include standard agricultural type analysis, but may also include additional testing, such as Title 22 parameters, as required.

ADDITIONAL MONITORING

Data related to the hydrologic inventory will be collected annually for quantification and analysis. Components of the inventory include precipitation, runoff, imported supplies, amounts of groundwater replenished and quantities of groundwater extracted. Additional monitoring efforts will result from the following Plan management strategies:

1. Groundwater Recharge Management;
2. Groundwater Extraction Policies;
3. Surface Water Management;
4. Land Use Planning;
5. Well Abandonment/Destruction Policies; and
6. Well Construction Policies.

FIGURE 6-1



SOURCE: TULARE COUNTY GRAPHICAL INFORMATION SYSTEM, 1999

LEGEND

GEOGRAPHICAL INFORMATION
- Boundary - Intergrated Regional Management Plan
- Streams
- Streets
- Lake Success

PUBLIC UTILITY DISTRICTS
- Pixley Public Utility District
- Porter Vista Public Utility District
- Woodville Public Utility District

COMMUNITY SERVICES DISTRICTS
- Poplar Community Services District
- Teviston Community Services District
- Tipton Community Services District

IRRIGATION DISTRICTS
- Lower Tule River Irrigation District
- Pixley Irrigation District
- Porterville Irrigation District
- Saucelito Irrigation District
- Terra Bella Irrigation District
- Vandalia Irrigation District
- Monitoring Well

N W E S

10 5 0 10 Miles

GROUND WATER MONITORING WELL LOCATIONS
GROUND WATER MANAGEMENT PLAN
DEER CREEK AND TULE RIVER AUTHORITY

KELLER/WEGLEY