APPENDIX A: EXCERPTS FROM TULARE COUNTY CEDS

County Infrastructure Projects

1) **Goshen Redevelopment Project Area – North Goshen Industrial Area Sewer and Water Extensions** - The project will extend sewer service to vacant industrial properties in the north and northeast of the community (North Goshen Industrial Area) and require installation of a new pump station. The project will also upgrade the existing water distribution system, extend the water lines 1,700 feet to the north, construct a water storage facility, and a new domestic well. Currently the sewer lines are 600 feet short of reaching the periphery of the subject area and the water distribution system is undersized and incapable of providing required fire flows. The project may be undertaken in 2004/05 in cooperation with Goshen CSD and California Water Service Co., as new industrial prospects will require extension of sewer and water services. Currently applying for funding with which to construct the project.

Status: The project is in the study phase.

2) **Goshen Redevelopment Project Area - Betty Drive Interchange Improvements** - Caltrans has improved the travel lanes and added a sidewalk to the Betty Drive Bridge as a temporary measure to improve pedestrian and traffic safety within the vicinity of the bridge. In conjunction with this project, in 2004, Caltrans will construct a pedestrian overcrossing bridge along the Ave. 308 alignment, approximately 1,000 feet south of the Betty Drive interchange, to link students on the east side of State Road 99 with the elementary school on its west side. Caltrans replaced the existing bridge travel surface with wider travel lanes (12 feet each way) and a new handicap compliant sidewalk (7.5 feet) on the south side. Caltrans will also prepare a Preliminary Study Report (PSR) to analyze the replacement configuration for the interchange to be included in its 20-year plan. It will be two to three years before this study is completed.

Status: The project underway (Pedestrian Bridge Design – construction in 2004). Interchange project in the design phase (Preliminary Study Report). Interchange bridge modifications completed.

3) **Goshen Redevelopment Project Area - Betty Drive/Ave. 312 Realignment Project Phase 1 & 2** – The Tulare County Redevelopment Agency (TCRA) received Economic Development Administration (EDA) funding for the proposed realignment of Betty Drive east of State Road 99 to connect with Avenue 312 and its widening to County Road 80. This project has been classified as a Regionally Significant Transportation project as Ave. 312 improvements will provide alternative truck transport access to the northern portion of the Visalia Industrial Park and to the northern portions of the Goshen Redevelopment Area designated for industrial development. Phase I of the project is currently in construction and additional funding for Phase 2 is secured from

the State Transportation Improvement Program. Phase 1 funding from the State Infrastructure and Economic Development Bank has closed. The project is a joint effort of the TCRA, Tulare County , and the City of Visalia. Phase 2 will widen the facility to four lanes.

Status: The project is underway. Phase 1 is in construction. Phase 2 is in the design phase.

4) **Goshen Redevelopment Project Area – West Betty Drive/Ave. 308 Realignment Project** – This project will provide the link for alternative truck transport access to the northern portion of the Visalia Industrial Park and the North Goshen Industrial Area to traffic from the west originating in Kings County. The project will realign a western extension of Betty Drive to Ave. 308 and a potential new interchange on State Road 198 and County Road 64. The project is currently in preliminary study for alignment options and funding opportunities.

Status: The project is in the design phase.

5) **Goshen Redevelopment Project Area - State Road 99 Landscaping** - This is a long-term project to landscape and beautify the "99" corridor from State Road 198 to the Betty Drive interchange. The Redevelopment Agency (Agency) will participate in a joint project with Caltrans, the City of Visalia (City), and the Goshen Community Services District (District). Caltrans will provide right-of-way access to install the landscaping, the Agency and City will provide the landscaping materials, and the District will provide its reclaimed treated wastewater from the City for irrigation waters. Upon completion of the project, Caltrans will maintain the improvements.

Status: The project in the study phase. Project on hold as other capital improvement projects have priority.

6) **Goshen Redevelopment Project Area - Storm Water Drainage & Recreation Project** – Limited portions of the project will be completed under the Betty Drive – Avenue 312 Realignment and Improvement Project with drainage improvements serving the northern sectors of the areas east of State Road 99 and creation of a seven acre detention basin will be created with a passive recreational park with recreational facilities west of Camp Drive.

Status: The project is in the study phase, but on hold until other projects with higher community priority are completed.

7) **Richgrove Redevelopment Project Area - Storm Water Drainage, Air Quality and Recreation Facilities -** The revised Storm Water Master Plan has been completed and final plans and specifications are nearly 100 percent complete. Purchase of the South Tulare County Memorial District property for the combined ponding basin/recreational facility has been initiated now that the elections have been held in compliance with

Proposition 218. The Joint Development Authority (TCRA/Richgrove School District/Richgrove Community Services District) has received a grant for sidewalk, curb, gutter, and road improvements from Caltrans via the Tulare County Association of Governments under the Congestion Management and Air Quality program. Approval to submit final applications to the United States Department of Agriculture has been obtained.

Status: The project is in the study phase. A revised master drainage plan for Richgrove has been completed and the project has applications submitted for funding. As partial funding for the project, a grant has been received from Caltrans under its Congestion Management and Air Quality Grant Program. The final design is pending Proposition 218 election.

8) **Richgrove Redevelopment Project Area - Richgrove Drive Underground Utility District Study –** A preliminary study showed that complete undergrounding of power lines along Richgrove Drive may be impractical. The power lines are high voltage transmission lines and their replacement or relocation may be more cost effective. Further study will be conducted when the project resumes.

Status: The project is in the study phase. The project was put on hold by Southern California Edison Co. pending resolution to California energy crisis.

9) **Poplar-Cotton Center Redevelopment Area - Storm Water Drainage Air Quality and Recreation Project** - Community Storm Water Master Plan completed; preliminary engineering design extended to begin mid-September 2003. The project is ready to proceed to the preparation of final plans and specifications phase. The Storm Water project, which includes a combined ponding basin/recreational facility, will be initiated after required elections, planned for March 2005, are held in compliance with Proposition 218. The Joint Development Authority (TCRA and the Poplar Community Services District) has received a grant for sidewalk, curb, gutter, and road improvements from the Tulare County Association of Governments under the Congestion Management and Air Quality program and is pursuing funding from the United States Department of Agriculture (USDA) and the State Parks and Recreation Department. The USDA has approved the pre-applications submitted in March 2003 and final applications are due in 2005.

Status: The project is in the study phase.

10) **Poplar-Cotton Center Redevelopment Project Area - Enhance street lighting, landscape to beautify the communities and transportation improvements** - Transit service is now in place, and rider-ship continues to grow. Funds secured for installation of new streetlights with emphasis on streets (where there are security and safety issues during the winter fog season) have been placed in a trust fund and are awaiting participation by Southern California Edison (SCE) Co. SCE has put its participation in all projects on hold pending resolution of the energy crisis.

Status: Project is in the study phase. The transit system is in place, and the street lighting project is on hold.

11) **Poplar-Cotton Center Redevelopment Area - Chamber of Commerce and Community Center Project -** Funding has been obtained from State Community Development Block Grant (CDBG) program and transfer of property ownership from Tulare County to the Tulare County Redevelopment Agency (TACR) is complete. Community volunteers have performed 90 percent of the reconstruction work to date. Property is temporarily transferred to the TCRA until construction is completed and then will transfer to the Poplar Chamber of Commerce. Construction began in September 2001 and will be complete in June 2003.

Status: The project is underway and under construction.

12) **Poplar-Cotton Center Redevelopment Project Area - Piping of Poplar Ditch -** Project on hold pending availability of funding and completion of community projects with higher priority. A portion of the Poplar Ditch will be piped and covered under the Caltrans Improvements to State Highway 190.

Status: The project is in the study phase.

13) **Poplar-Cotton Center Redevelopment Project Area - New Fire Station -** On hold pending donation of land and securing sources of funding to build a new regional fire station.

Status: The project is under consideration**.**

14) **Cutler-Orosi Redevelopment Project Area - Sidewalk and Community Improvements Projects No. 5 & 6 -** Waiting for Caltrans permits and final design. The next phase of the project (No. 5) is due to begin in late fall 2003 and entails completion of restructuring intersection curbs and handicap ramp installation by Caltrans. This will be followed by installation of all missing sidewalk segments (approx. ¾ mile) between Sand Creek and Ave. 416. Project No. 6 will start in the spring of 2004 and complete the last north/south link of sidewalk from the northern developed area of Orosi to the new Junior High School campus. In all, the projects No. 1 through 6 will have constructed over three miles of pedestrian sidewalk providing an all weather surface with access to businesses and educational facilities.

Status: The project is underway.

15) **Cutler-Orosi Redevelopment Project Area - Business Microenterprise (Incubator) Project** – This project funded by a State of California Economic Development Block Grant with main office located in Cutler-Orosi and satellite offices now established in Porterville and the unincorporated communities of Pixley and Goshen. The project is a

joint venture with Tulare County, Community Services and Employment Training (CSET) and the Cal. State University Fresno Small Business Development Center. The purpose of the center is to provide development of new businesses within low-income communities by providing entrepreneurs with computer, accounting and business management training and financial assistance. The Agency is seeking funding to continue the project beyond the October 2003 completion date.

Status: The project is underway. Initial project to be completed by October 2003.

16) **Cutler-Orosi Redevelopment Project Area - Underground Utility District No. 2 –** Project on hold pending resolution of the California energy crisis.

Status: The project is in the study phase.

17) **Pixley Redevelopment Project Area - Increase Capacity for Pixley Wastewater Treatment Facility -** The project will require engineering design and construction to enlarge the existing treatment facility to 1.5 million gallons per day of capacity and the capability to treat industrial wastes. Minor improvements have been made to the facility to comply with the corrections order from the Regional Water Quality Control Board.

Status: The project is in the study phase.

18) **Pixley Redevelopment Project Area – Industrial Wastewater Treatment Facility Study –** Under consideration for funding of a study to construct a new industrial wastewater facility as an alternative to additional capacity and plant modifications at the existing community wastewater facility. The existing facility serves residential development and is not currently designed or capable of handling industrial wastes.

Status: The project is in the study phase.

19) **Pixley Redevelopment Project Area - Master Storm Water Drainage Plan and Improvements -** Develop a master plan to integrate the individual (subdivision) storm water drainage systems and develop drainage facilities in areas that currently lack them. This project is currently placed on hold until funding sources are identified and other priority projects have been completed. The completed first phase of the project is in the downtown commercial district. This portion of the project constructed 800 lineal feet of new curb/gutter and sidewalk adjacent to Pixley Place (a proposed community park site).

Status: The project is in the study phase.

20) **Pixley Redevelopment Project Area - Fire Station Expansion** – Enlarge the current fire station building to accommodate the larger modern water tender units or build a separate building. This project is currently on hold until funding sources are identified and other priority projects have been completed.

Status: The project is in the study phase.

21) **Pixley Redevelopment Project Area - Industrial Park Access & Development Study** - The proposed study will focus on truck transport access solutions to the designated industrial development area within the community, improvements to the frontage road along State Road 99, and analysis of the types of industrial development which could occur with the review of infrastructure capacity needs assessment.

Status: The project is in the study phase.

22) **Pixley Redevelopment Project Area - Community Improvements** - Enhance street lighting, improve alleys, landscape and install welcome signs to enhance the appearance of the community and facilitate traffic circulation. The entry sign project is on hold pending availability of funding from a private foundation. The street lighting project is on hold pending completion of similar model projects in other communities.

Status: The project is in the study phase.

23) **Pixley Redevelopment Project Area - Industrial Park -** Development of the Pixley Industrial Park including upgrades, the extension of sewer and water systems, improvement and construction of new roads (industrial design standards) and improvement of freeway access with restructured interchange.

Status: The project is in the study phase.

24) **Pixley Redevelopment Project Area - Pixley Place Landscaping Project (Formerly Pixley Beautification) –** ***Phase 1-*** Sidewalk project with improvements in existing County rights-of-way including installation of curb, gutter and sidewalk. The paved shoulder parking areas along the east and north sides of the new park area have been completed. Rough grading of the park strip and the ponding basin for storm water drainage have also been completed. The project was funded with a Bank of America grant and USDA Community Facilities grant and is a joint project of the TCRA and Pixley Public Utility District. Construction completed. ***Phase 2 -*** Park improvements that include landscaping, streetlights, walk paths, irrigation, restoration of the artesian well monument and cleanup of the underground storage tanks on the parcel south of the park area for future expansion. This is a joint project of the TCRA, Pixley Public Utility District and Pixley Elementary School District and is pending funding availability.

Status: Phase 1 has been completed. Phase 2 is in the study phase with construction estimated to be completed by June 2005.

25) **Earlimart Redevelopment Project Area - Downtown Business District & Highway Commercial Study -** The study will focus on attraction of freeway commerce especially the tourist trade to entice traffic to stop in the community. The increasing volume of vehicular traffic is passing Earlimart by and the study will address the kinds of development needed

to attract this mobile trade. A secondary phase of the study will include the preparation of a Downtown Development Specific Plan to address growth and revitalization issues.

Status: The project is in the study phase.

26) Earlimart Redevelopment Project Area - Storm Water Drainage, Air Quality and Recreation Project - The project is a joint endeavor between the Earlimart Public Utilities District, Earlimart Elementary School District and TCRA. The school district has agreed to provide five acres for a mid-community detention basin, which will incorporate a small children playground for dry season use. The Public Utility District has agreed to operate and maintain the completed project. The project is now in the design phase and will require a community-wide election for an assessment district, in compliance with Proposition 218 before going to construction. The Tulare County Association of Governments has provided funding under the Congestion Management and Air Quality Program. USDA has approved the preliminary funding application for grant and loans.

Status: The project is in the study phase.

27) Ivanhoe Redevelopment Project Area - Community Improvement Program – Significant projects on hold pending the availability of funding. Enhanced improvements include street lighting and adding curb, gutters, bike paths and walkways for improved community access and circulation. The recent closing of the Save More Market, together with the prior closing of the hardware store and the relocation of Bradford Steel Construction out of town makes self-funding or match-funding from redevelopment revenues unlikely. Other sources of funding using pooled funds from multiple agencies will be sought.

Status: The project is in the study phase.

28) Ivanhoe Redevelopment Project Area - Storm Water Drainage – The construction of improvements to designed and implement the Storm Water Drainage Master Plan project include the installation of curbs, gutters, and sidewalks.

Status: The project is in the study phase.

29) Ivanhoe Redevelopment Project Area - Entrance Sign & Landscaping Project - The project includes the installation of an entrance sign at the south entrance to the community, development of a landscaped area near Depot Drive and Avenue 328 that will feature a pedestrian or bicycle path on surplus railroad property and a neighborhood park on an irregular shaped lot owned by a local produce packing company. These aesthetic improvements will make the community a more desirable place in which to live. The project is on hold pending the availability of funding.

Status: The project is in the study phase.

30) Ivanhoe Redevelopment Project Area - Storm Water Drainage Master Plan – The project is on hold pending the availability of funding and buildup of reserve funds. The updated

existing 40-year-old master plan will incorporate existing and new residential/commercial development into a community system.

Status: The project is in the study phase.

31) **Traver Redevelopment Project Area - Community Center Project** – The project is determined to be a lower priority for use of Redevelopment Agency funding than expansion of sewer/water infrastructure. The community is seeking other sources of funding for a community center.

Status: The project is in the study phase.

32) **Traver Redevelopment Project Area - Industrial Water and Wastewater Capacity Study** - In order to accommodate a planned residential subdivision and to encourage highway commercial growth, expansion of the service area of the water and sewer systems is required. In addition, capacity expansion is required at the wastewater treatment facility and new domestic water sources, storage, and filtering must be added to meet the community needs for water supply and sewage disposal. A study of the existing sewer and water systems began July 2003 to determine future requirements.

Status: The project is in the study phase.

33) **Goshen - Pedestrian Overcrossing Bridge** – The project sponsored by Caltrans. Funding was provided by Caltrans and the Tulare County Association of Governments. The project will provide direct pedestrian access from residential areas on the east side of State Road 99 (SR99) to the Goshen Elementary School and recreation facilities on the west side of SR99. Construction began in the Summer of 2003 and the project was completed in November 2003.

Status: The project is in the study phase.

34) **Strathmore Storm Water Flood Diversion Project** – The project is under consideration. It would study potential sites that could be acquired for diversion of storm water runoff, determine capacities and the potential for use as a natural habitat and endangered species preserve. A list of funding sources is under review for preparation.

Status: The project is in the study phase.

35) **Alpaugh-Allensworth Fire Station –** The project is under consideration. A proposed study will establish a new fire station facility to replace the existing substandard buildings in Alpaugh. The study would determine if the facility should remain in Alpaugh or would provide better service if located between Alpaugh and Allensworth.

Status: The project is in the study phase.

36) **Terra Bella Sewer System Expansion Project** – The project is under consideration. It is in a study phase to determine scope, cost, and potential ownership issues for serving existing

and planned new Self Help Enterprise residential developments. The proposed project would also serve highway commercial and would include the construction of new sewer mains, lift station(s) and modifications to the sewage plant head works.

Status: The project is in the study phase.

37) County Route 137 Expansion Project – The project is under consideration. This project will widen County Route 137 between Tipton on State Road 99 and the industrial areas of Porterville by providing a much shorter and more direct access route designed to truck traffic standards.

Status: The project is in the study phase.

38) County Road 80 Expansion Project – the project is in the design and environmental compliance phases. The project will widen the existing regional route from two lanes to four lanes, including replacing bridges and conduits, to accommodate the high volume of traffic, which uses the route to access industrial and agricultural areas in the north Tulare County area.

Status: The project is in the study phase.

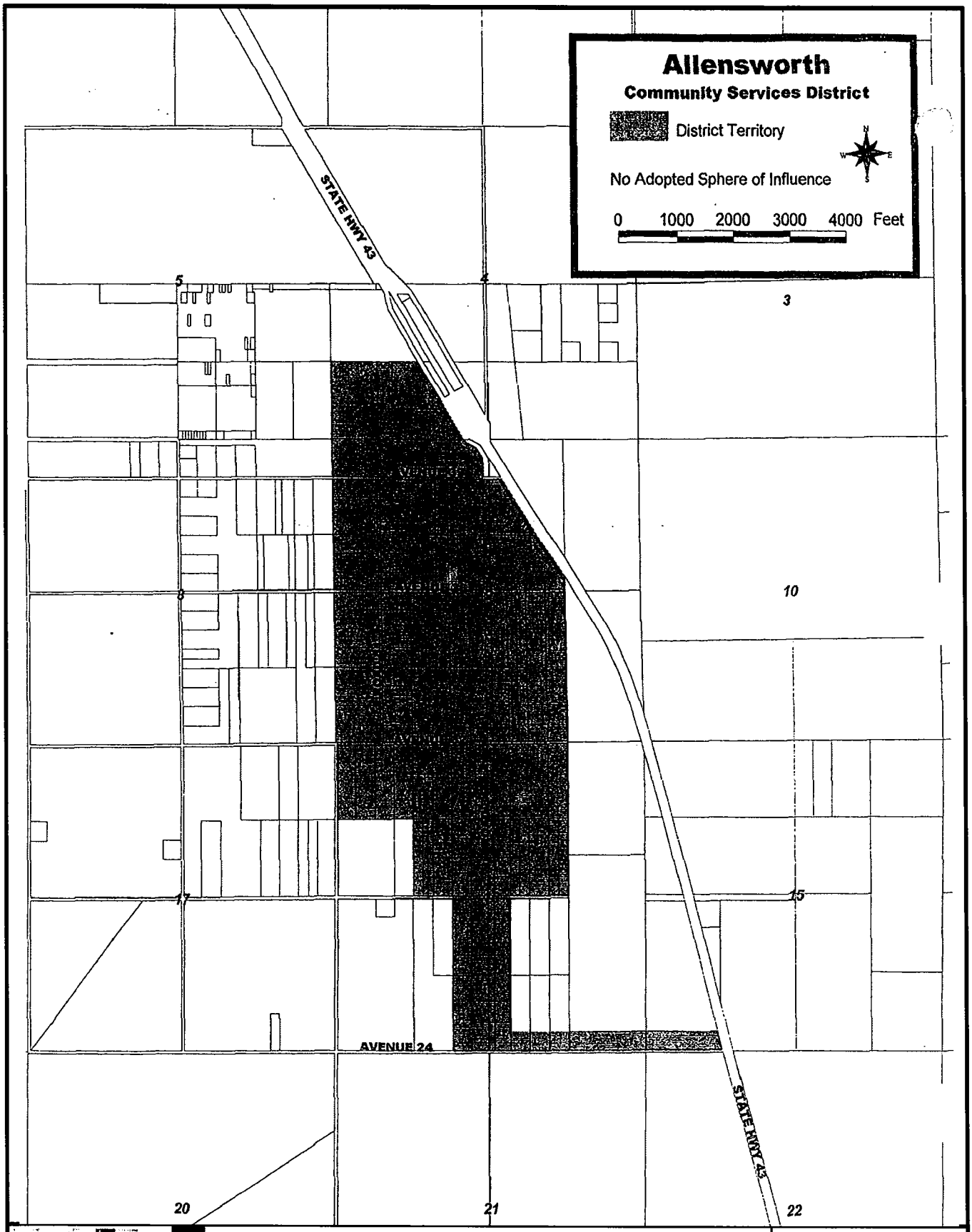


EXHIBIT 1-0
Allenworth CSD
Territory

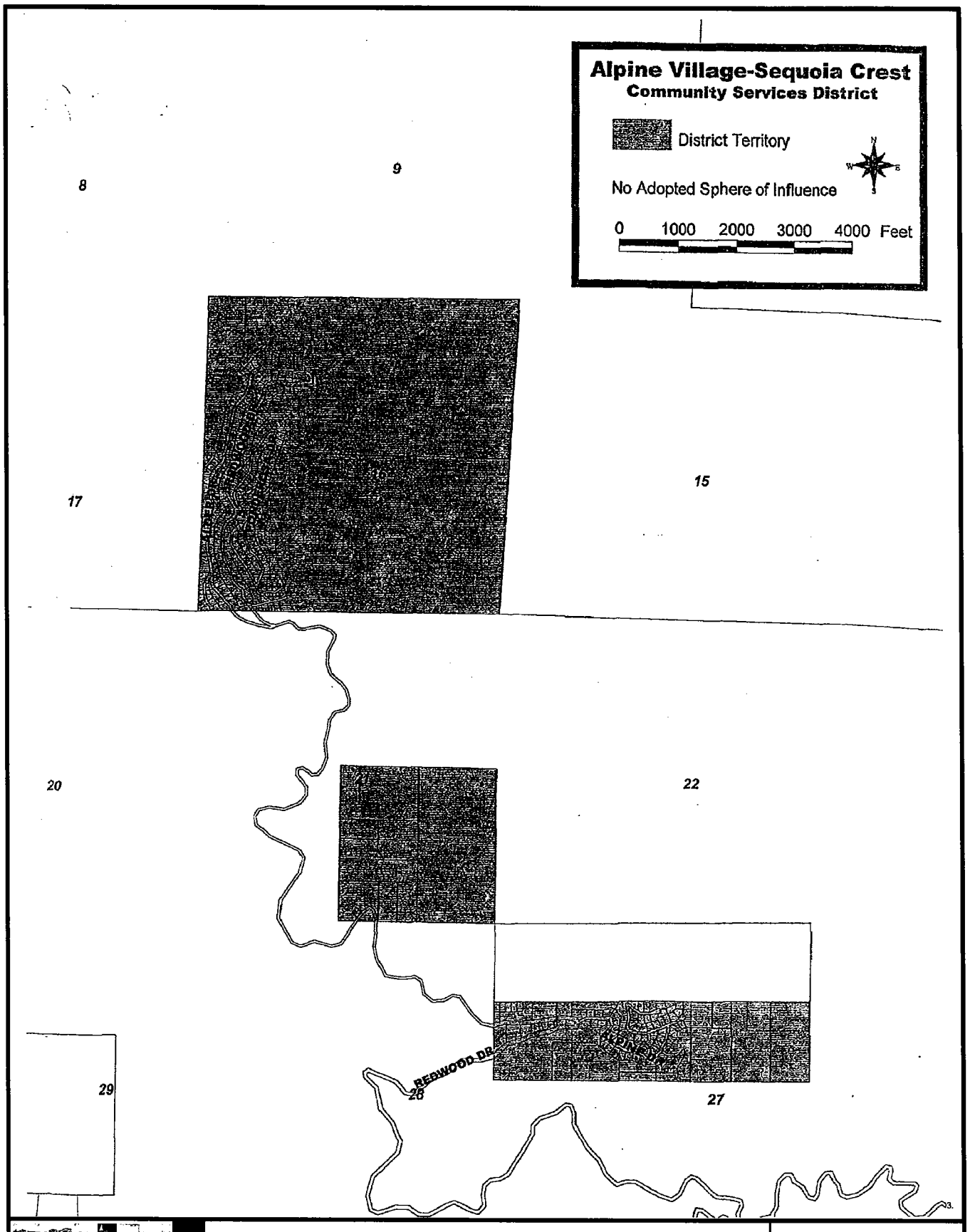


EXHIBIT 1-1
Alpine Village-Sequoia Crest CSD Territory

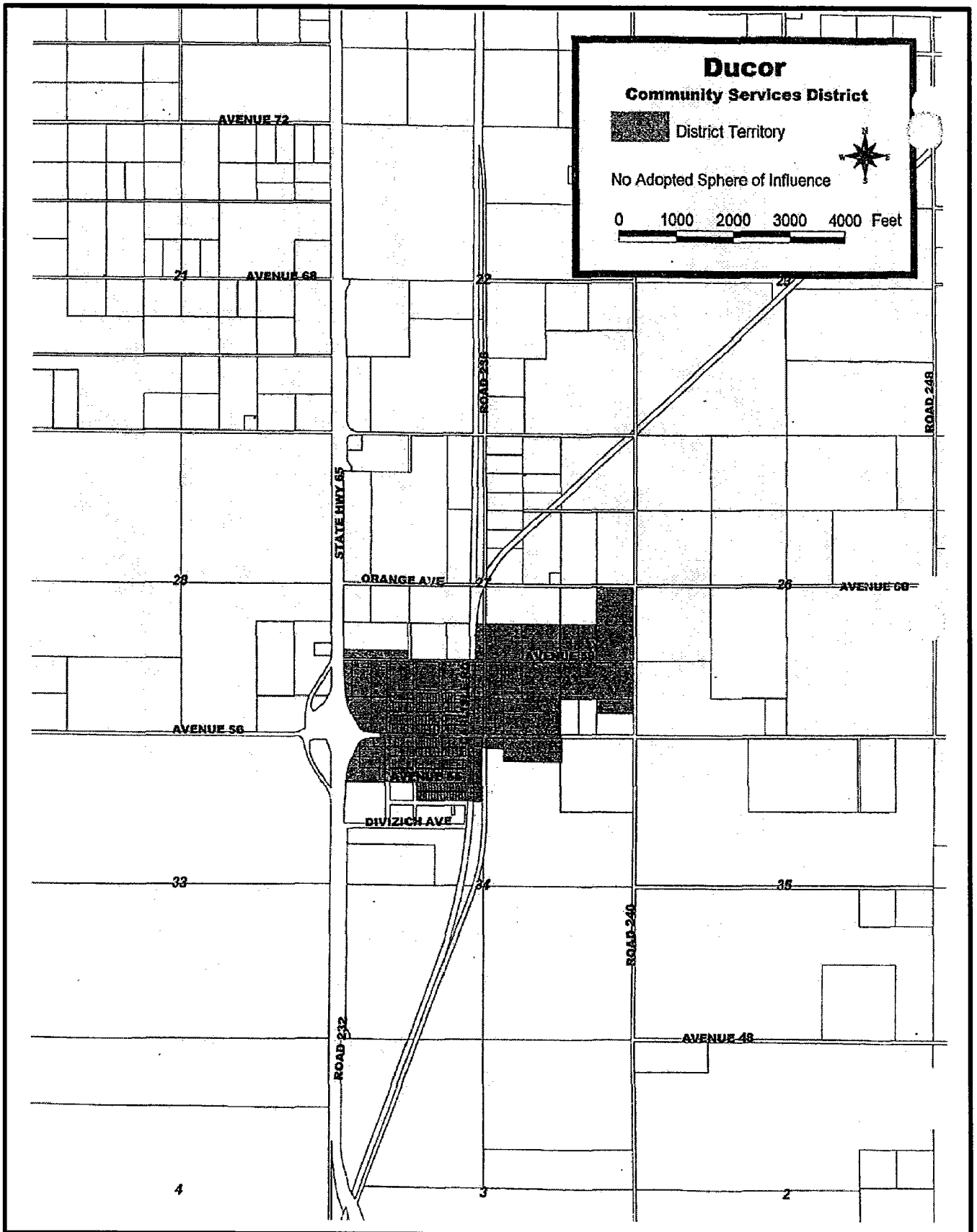


EXHIBIT 1-2
Ducor CSD Territory

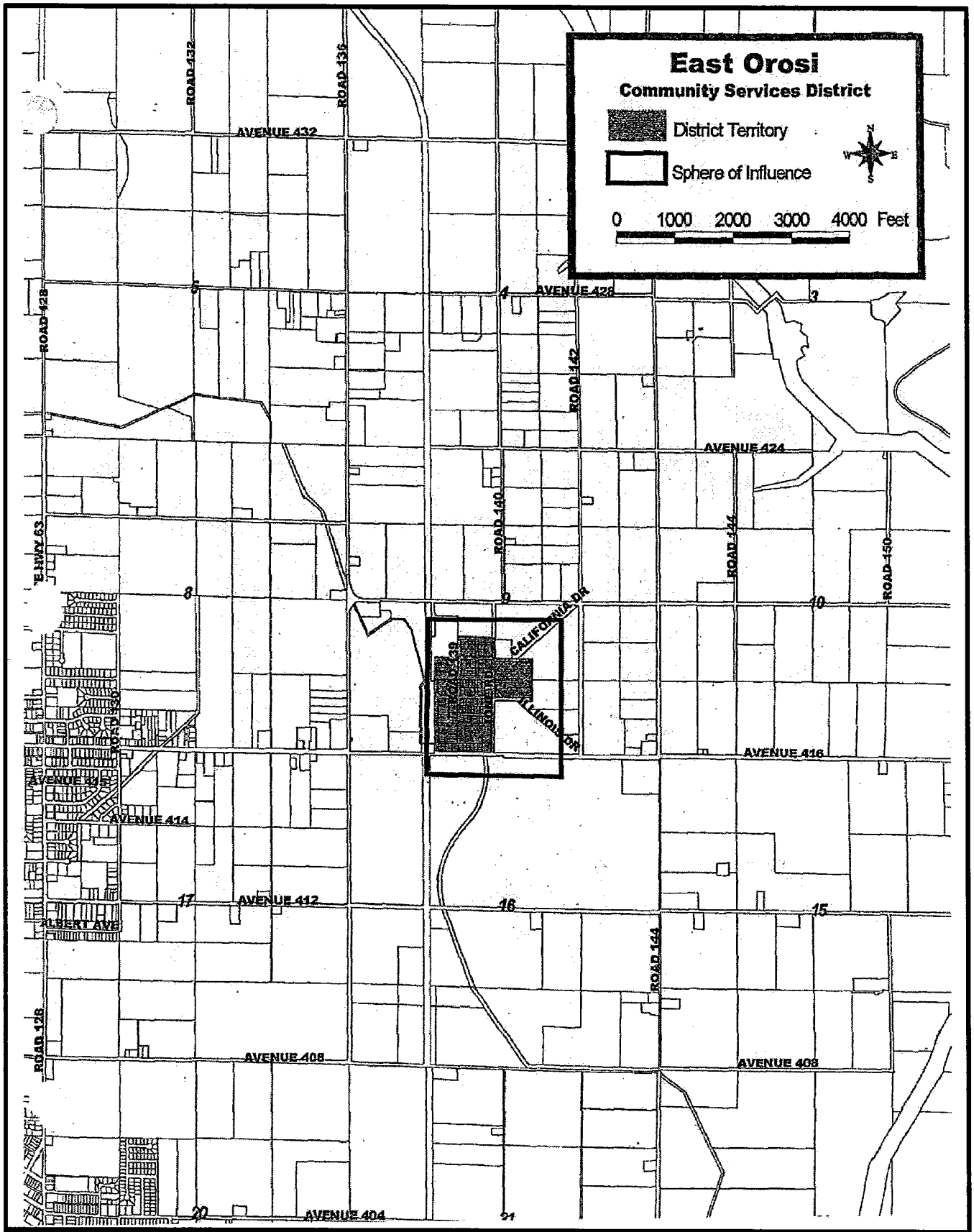


EXHIBIT 1-3
East Orosi CSD
Territory and Sphere of Influence

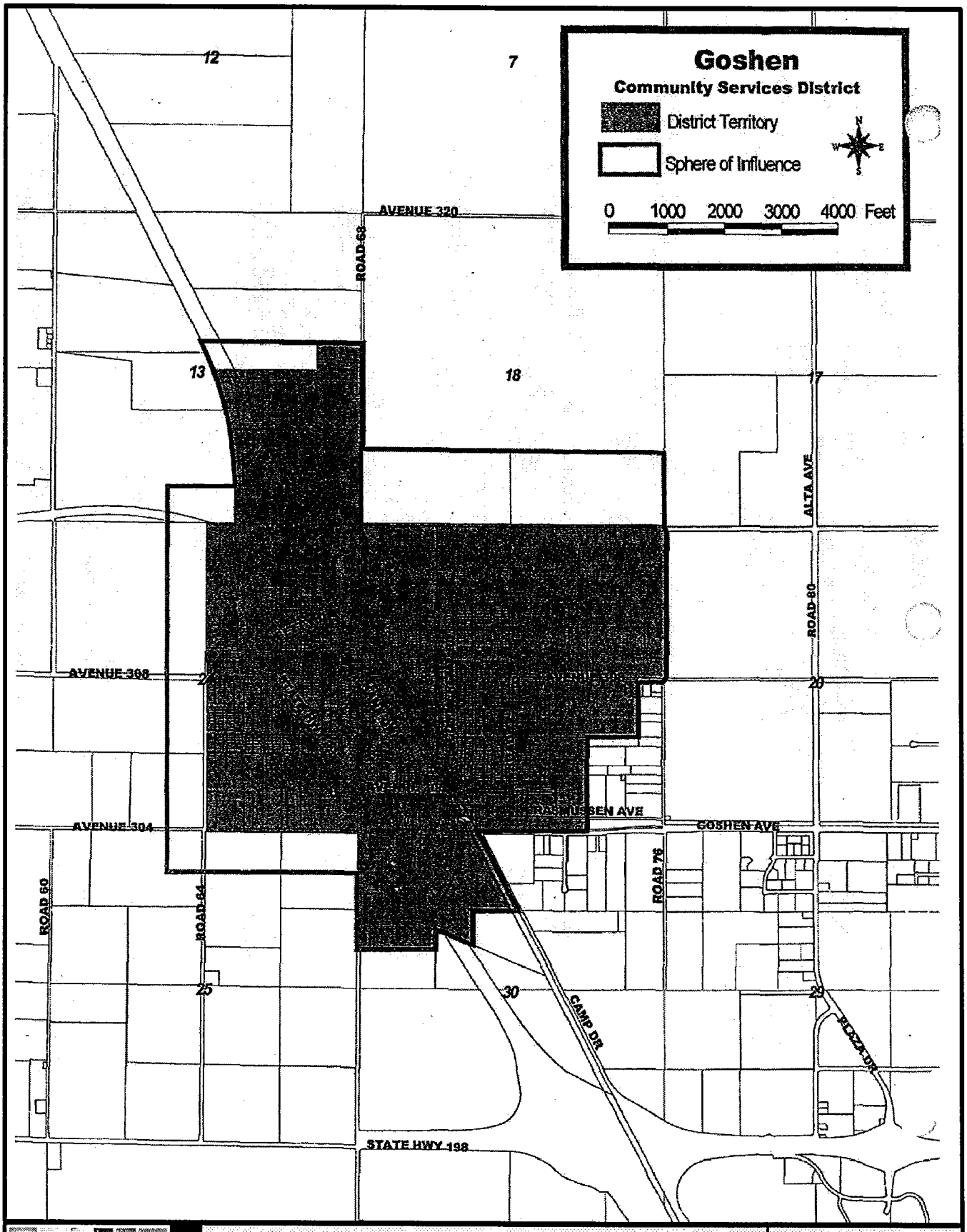


EXHIBIT 1-4
Goshen CSD Territory and Sphere of Influence

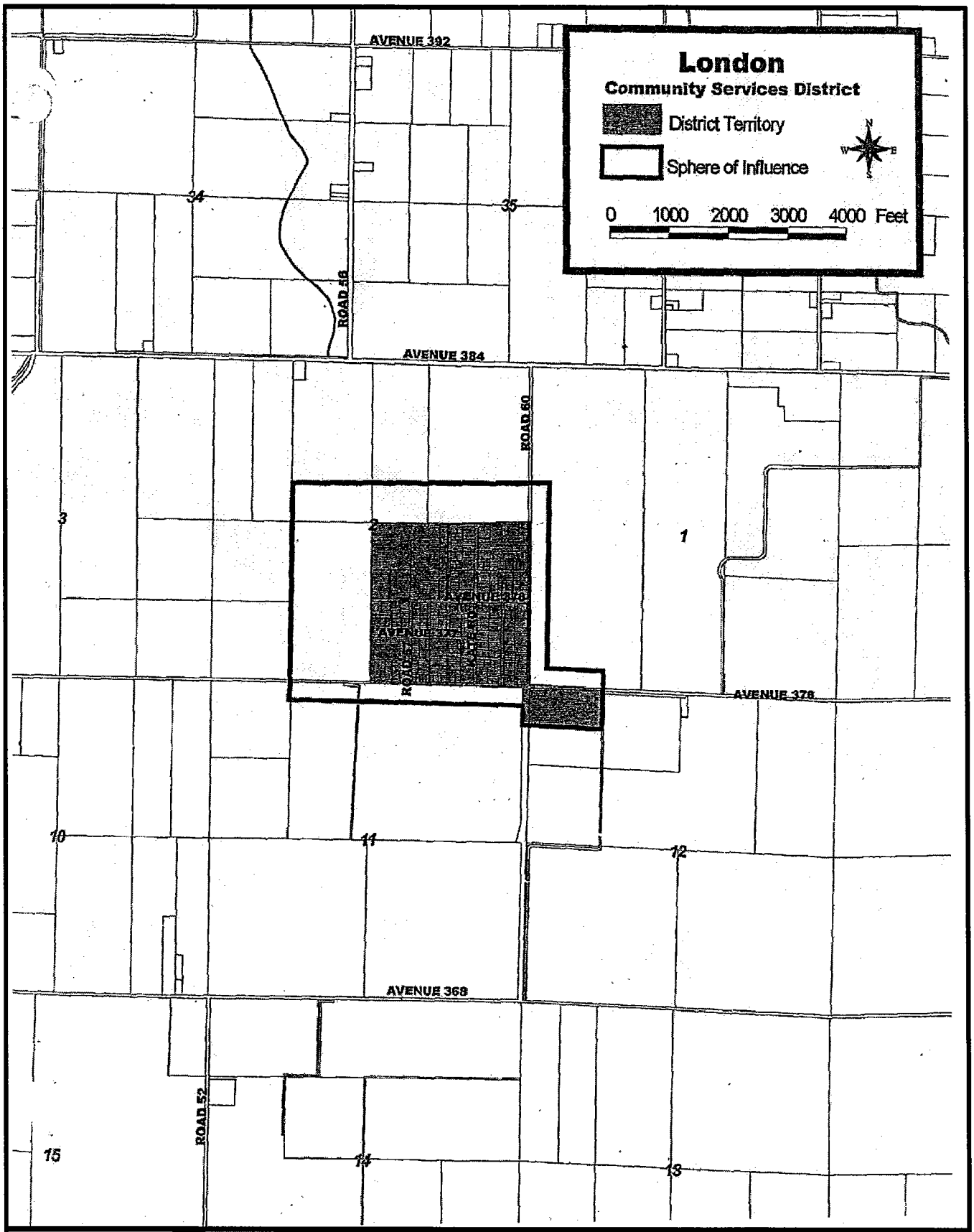


EXHIBIT 1-5
London CSD Territory
and Sphere of
Influence

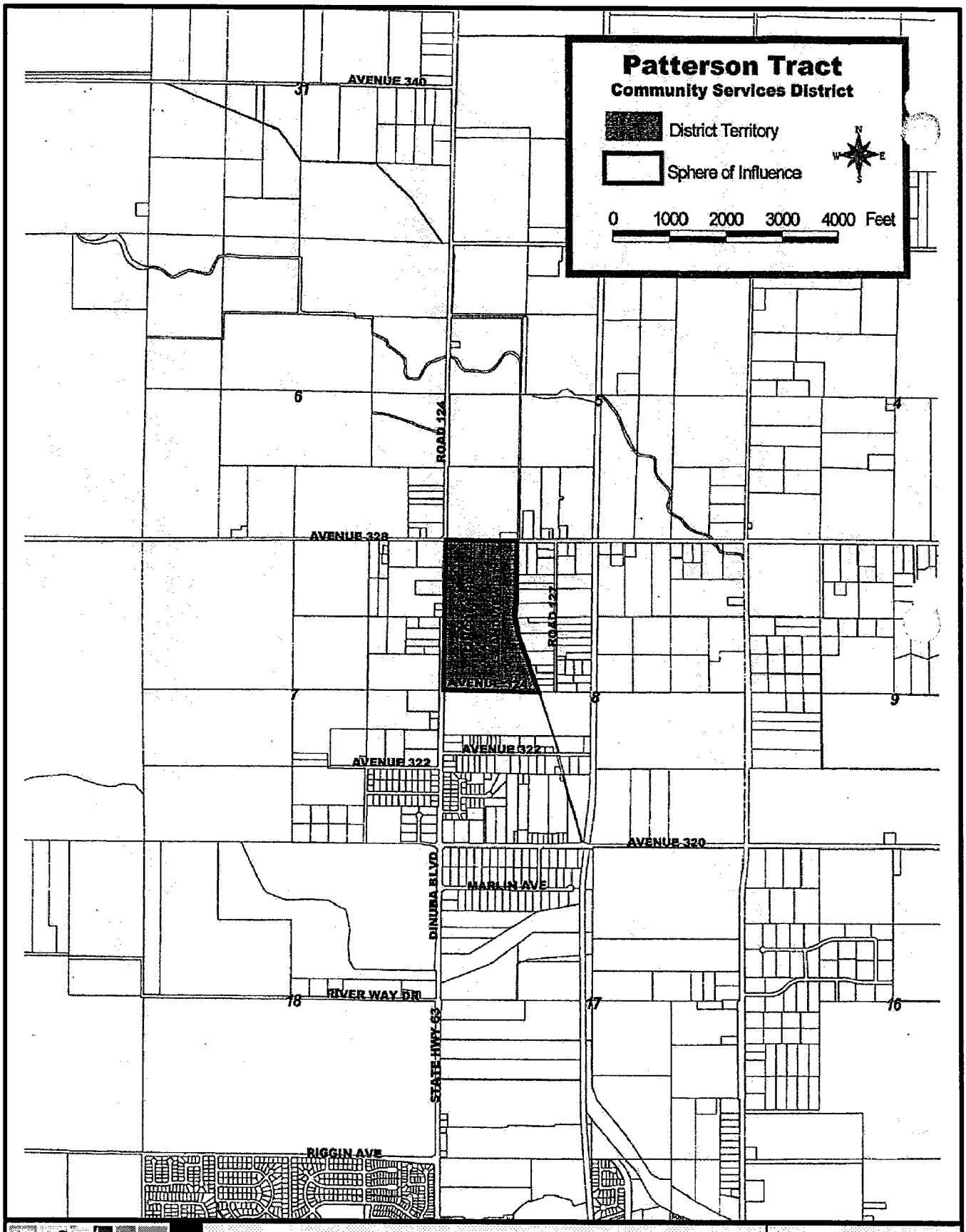


EXHIBIT 1-6
Patterson Tract CSD
Territory and Sphere of Influence

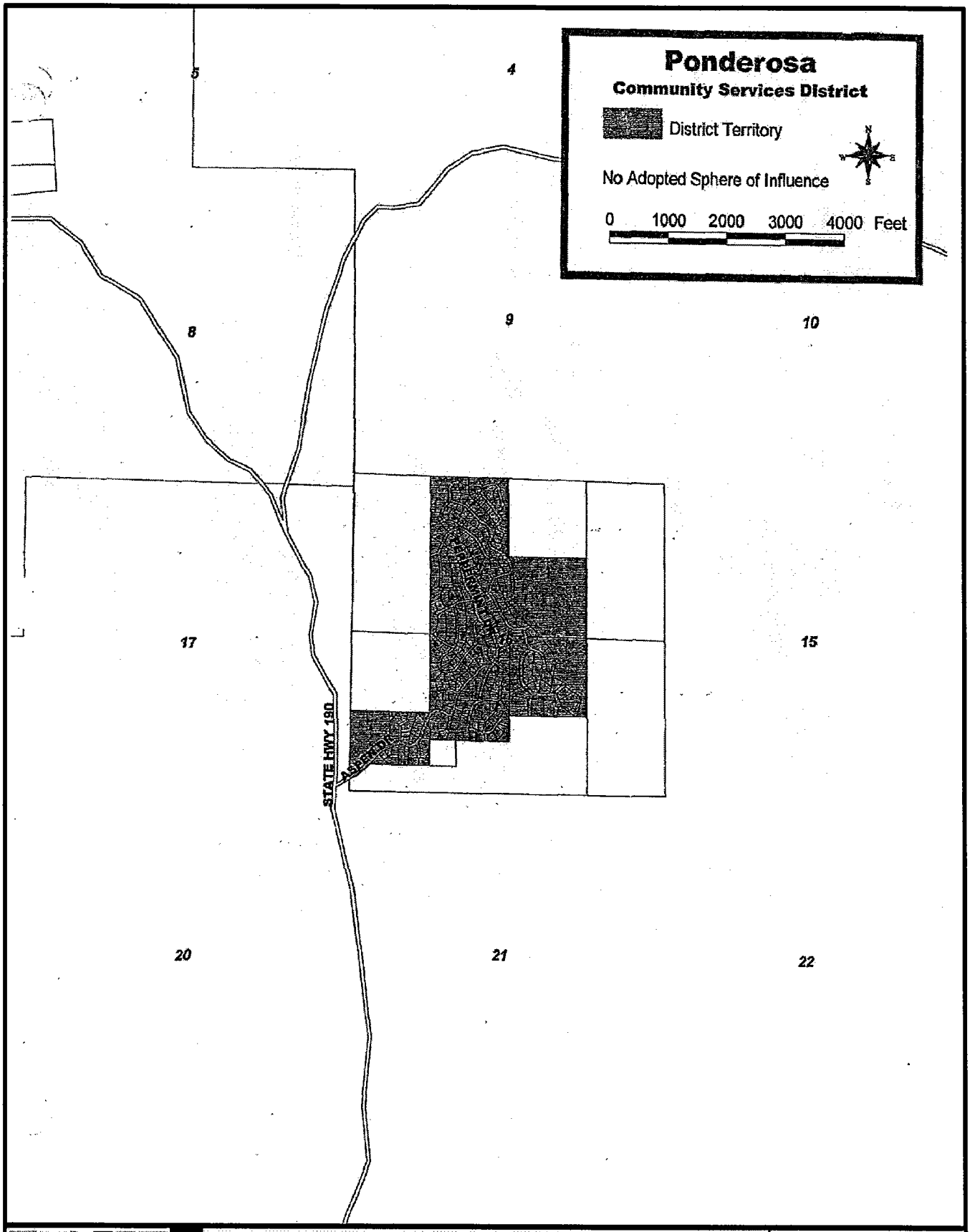


EXHIBIT 1-7
Ponderosa CSD
Territory

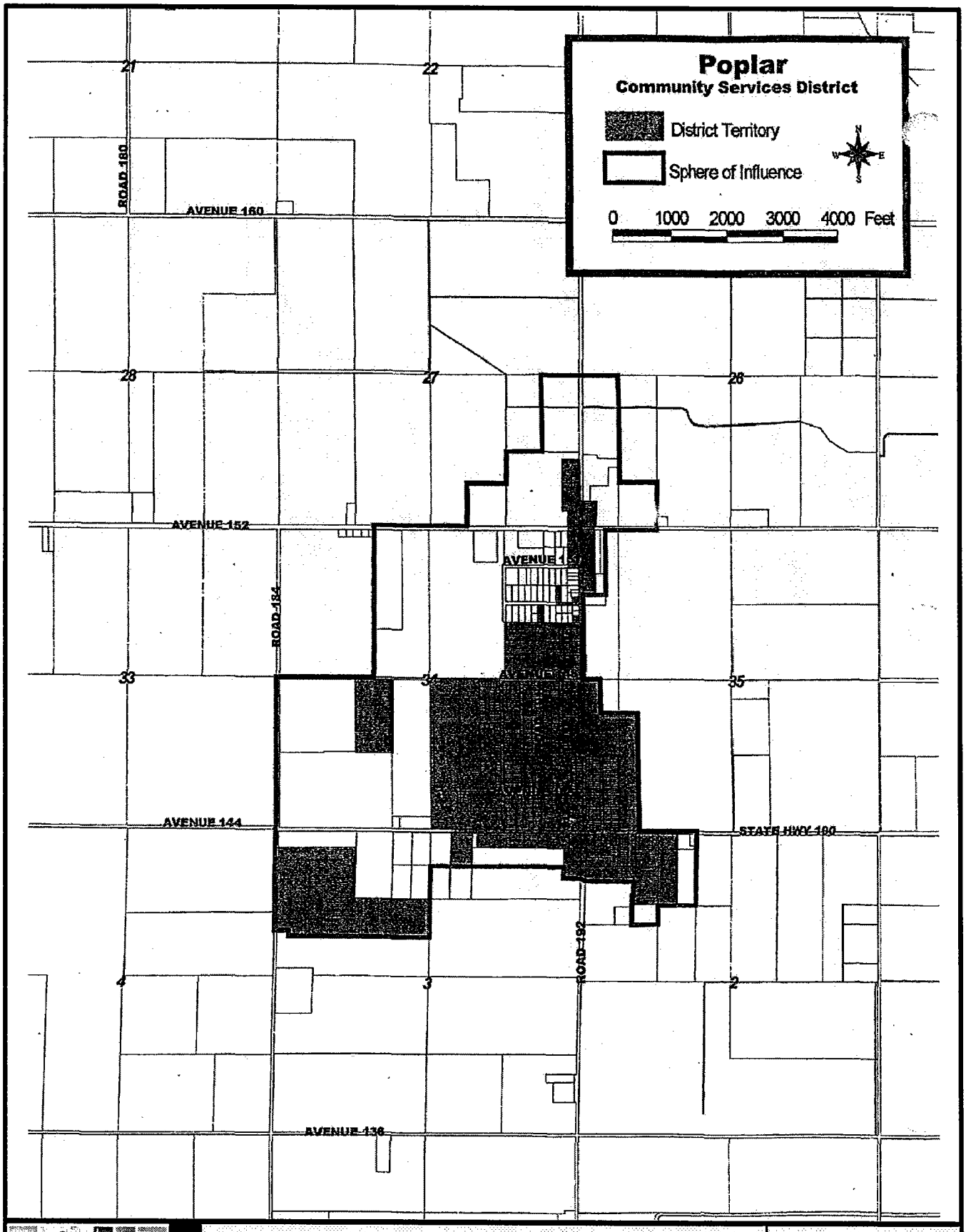


EXHIBIT 1-8
Poplar CSD Territory
and Sphere of
Influence

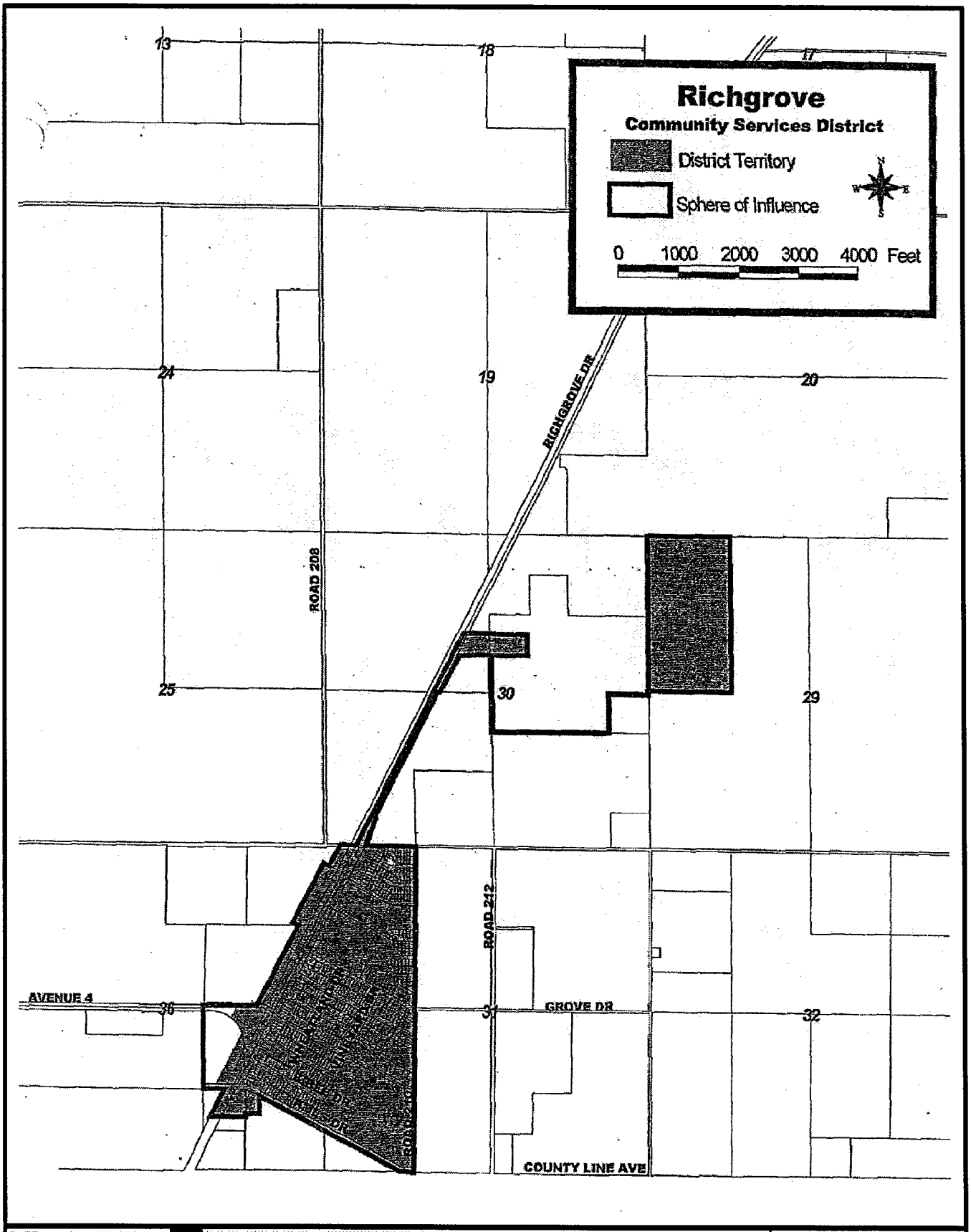


EXHIBIT 1-9
Richgrove CSD
Territory and Sphere
of Influence

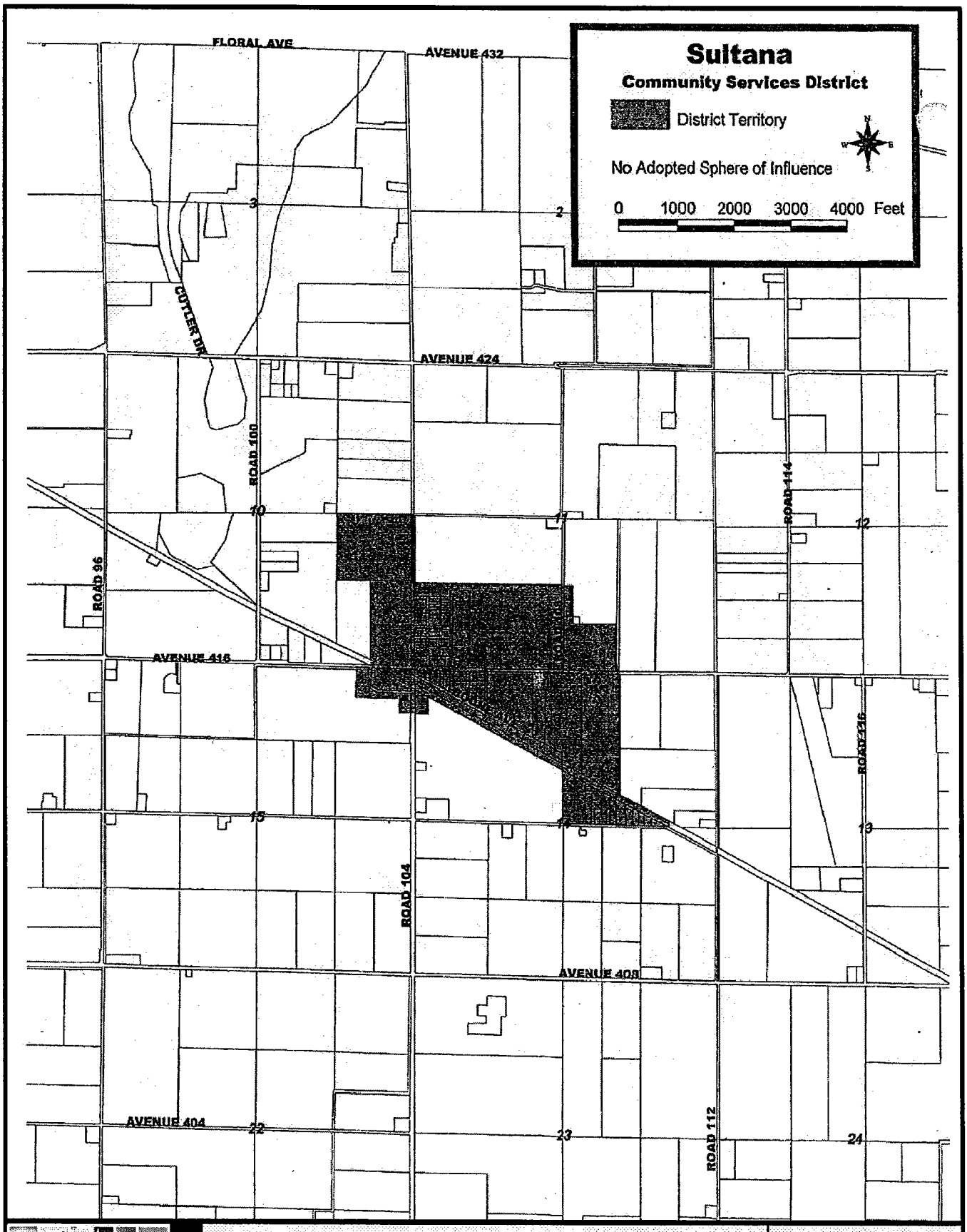


EXHIBIT 1-10
Sultana CSD Territory

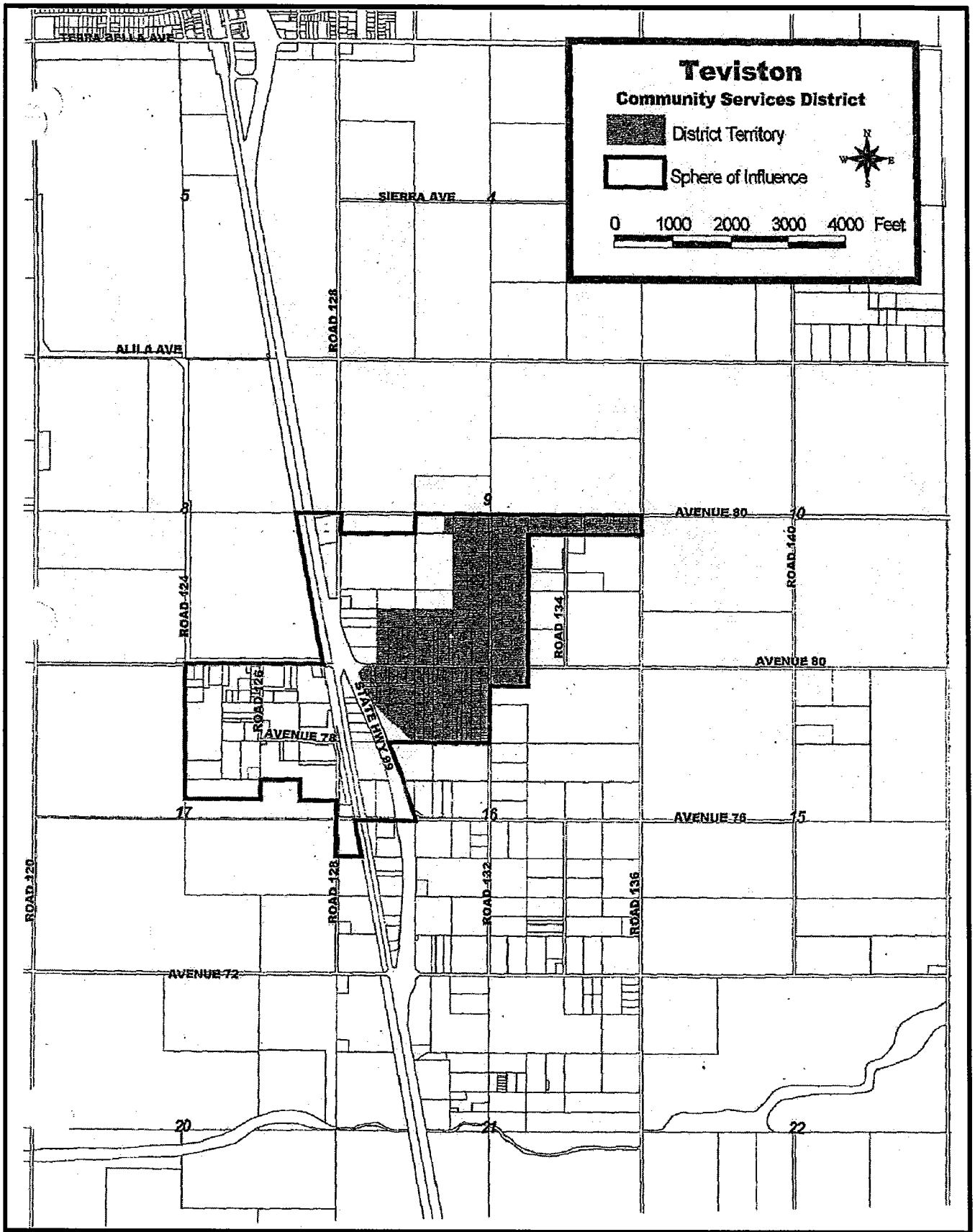
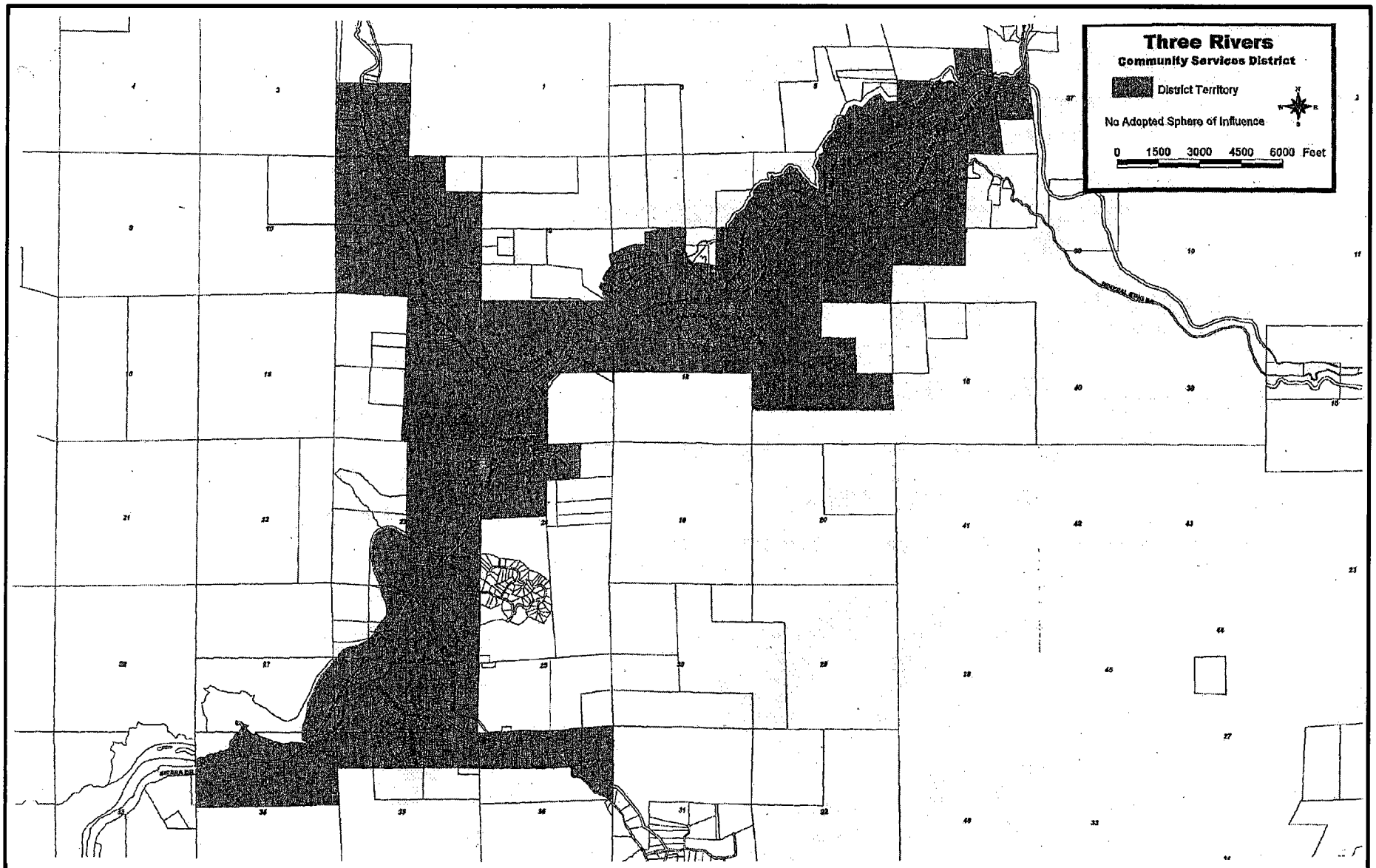


EXHIBIT 1-11
Sultana CSD Territory and Sphere of Influence



Tulare County General Plan Update

EXHIBIT 1-12
Three Rivers CSD
Territory

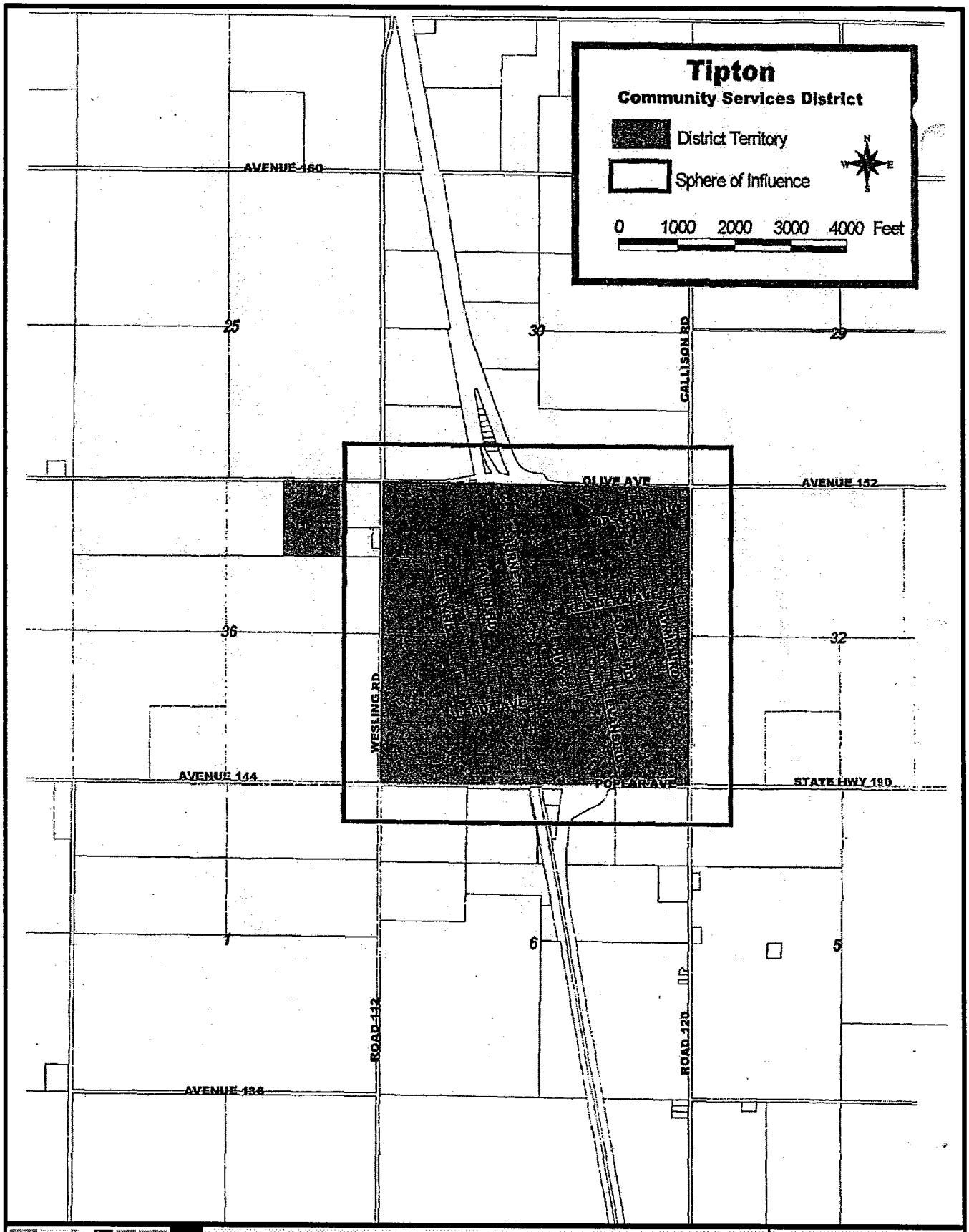


EXHIBIT 1-13
Tipton CSD Territory and Sphere of Influence

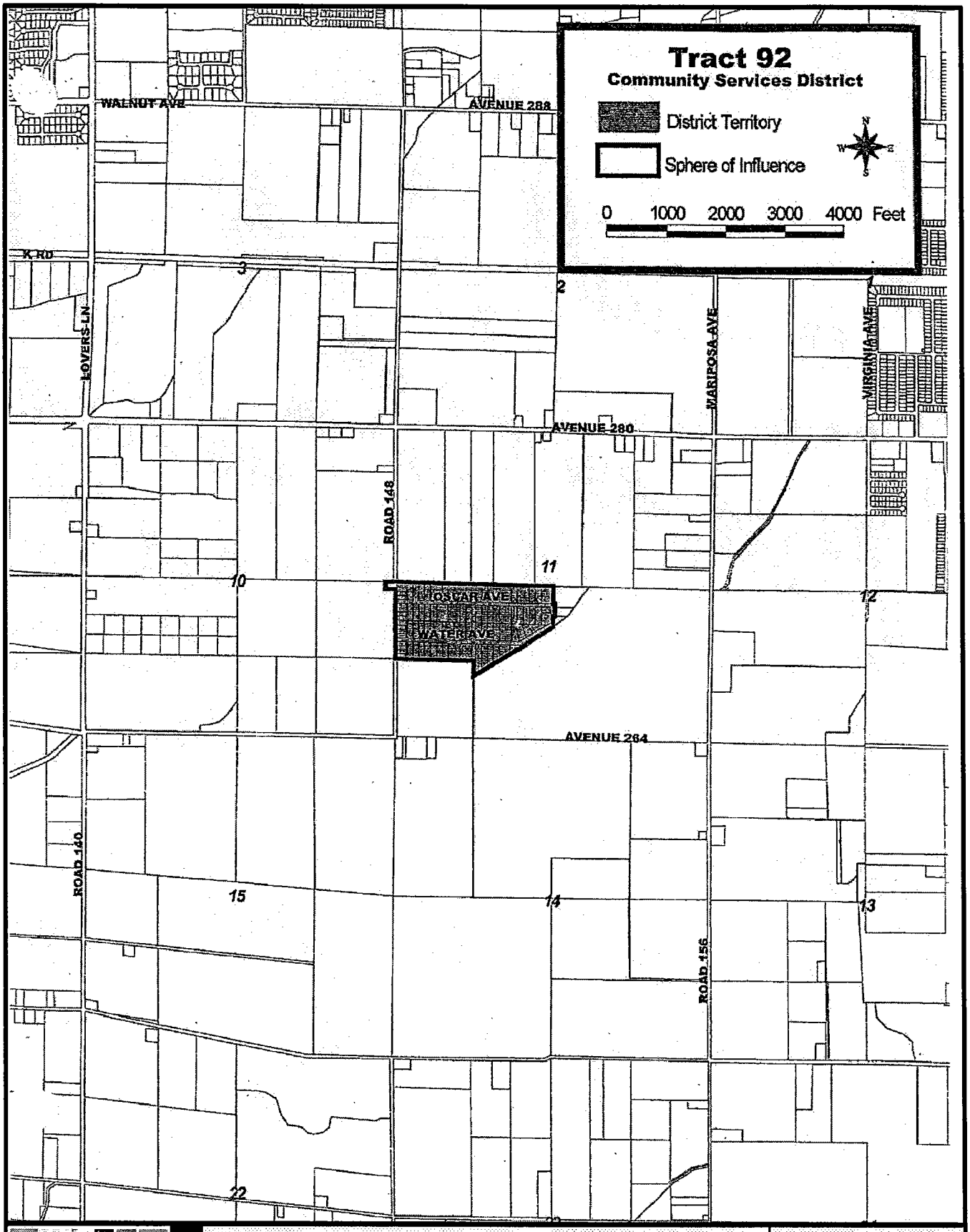


EXHIBIT 1-14
Tract 92 CSD Territory and Sphere of Influence

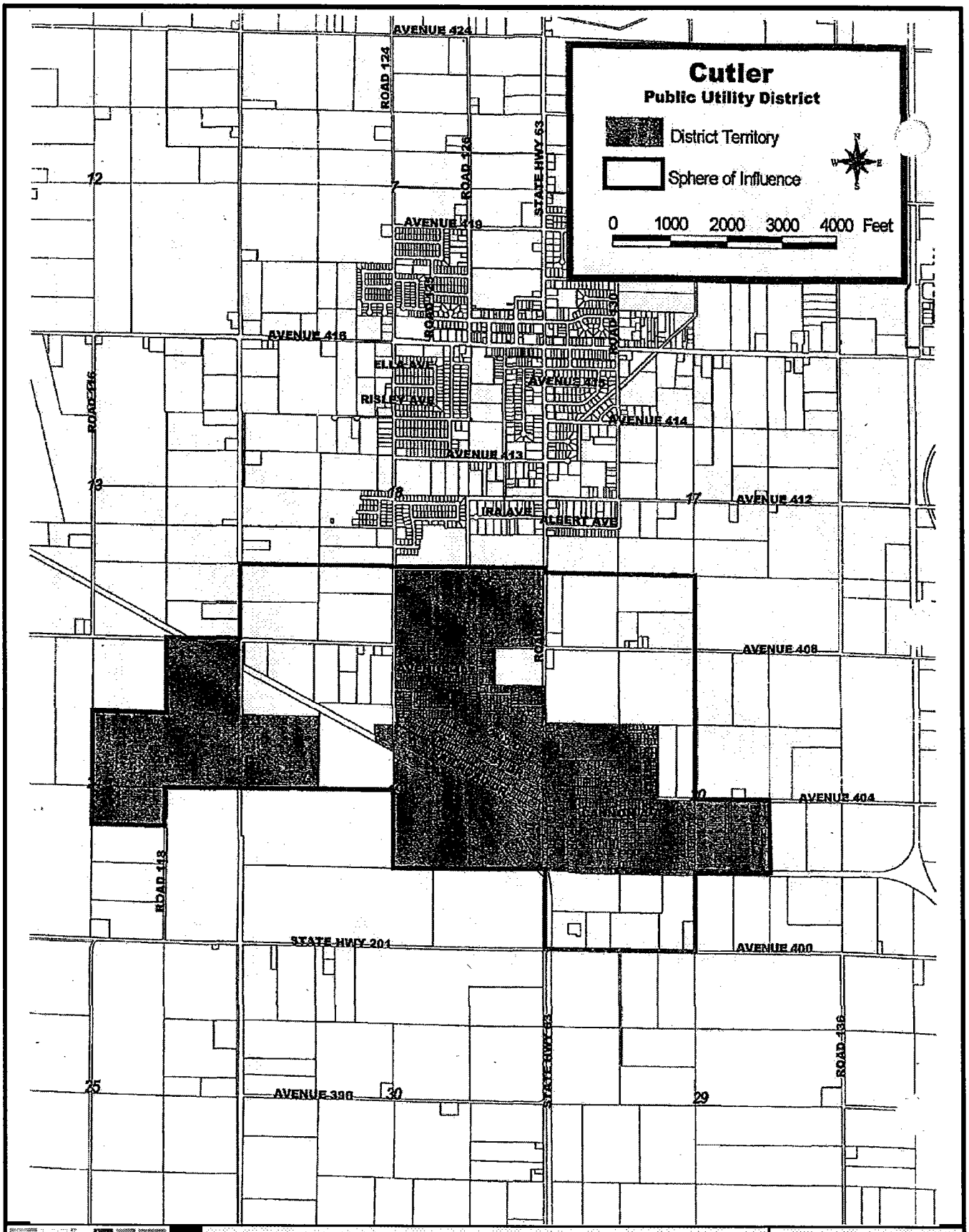
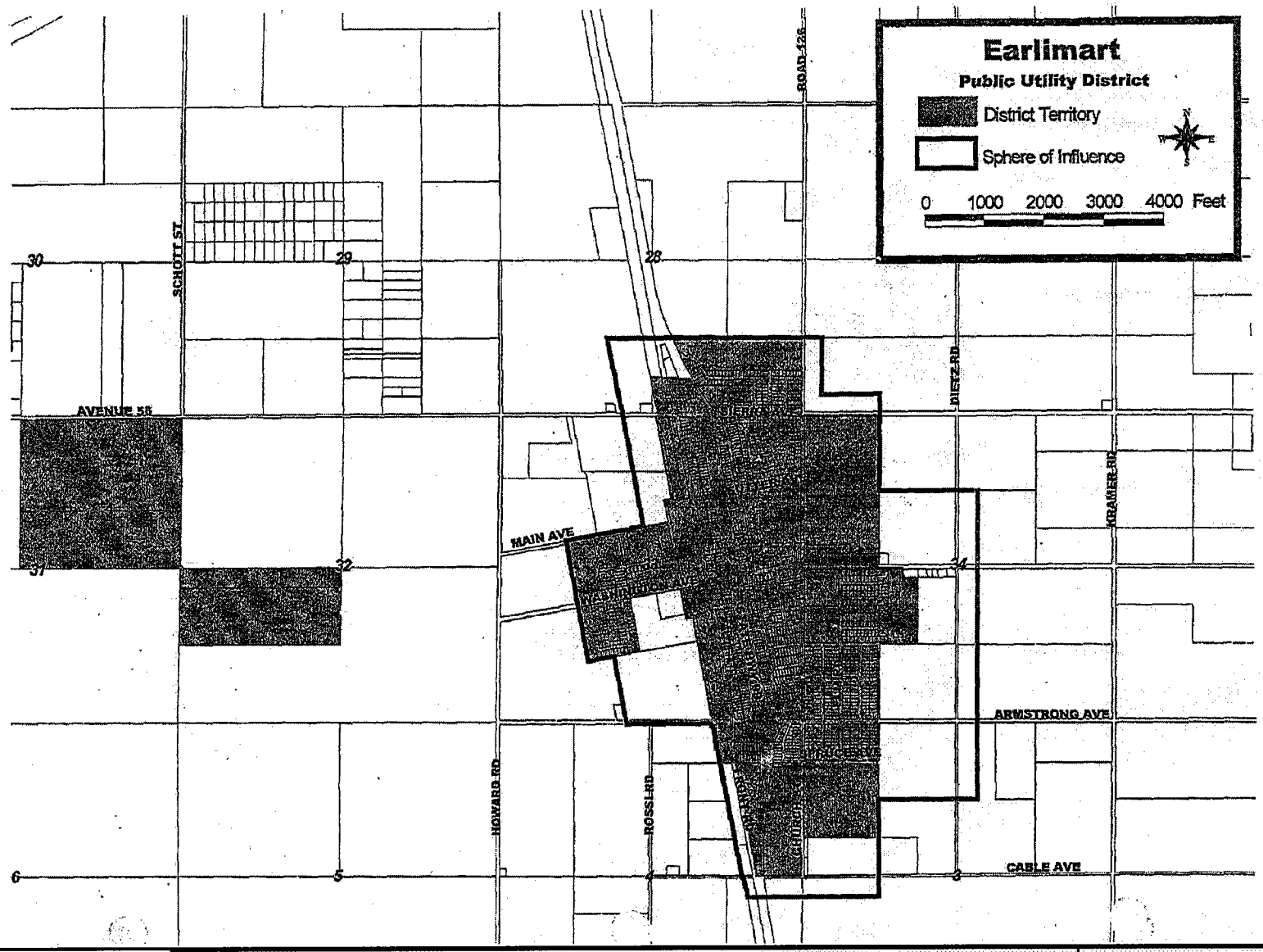


EXHIBIT 1-15
Cutler PUD Territory
and Sphere of Influence



Tulare County General Plan Update

EXHIBIT 1-16
Earlimart PUD Territory and Sphere of Influence

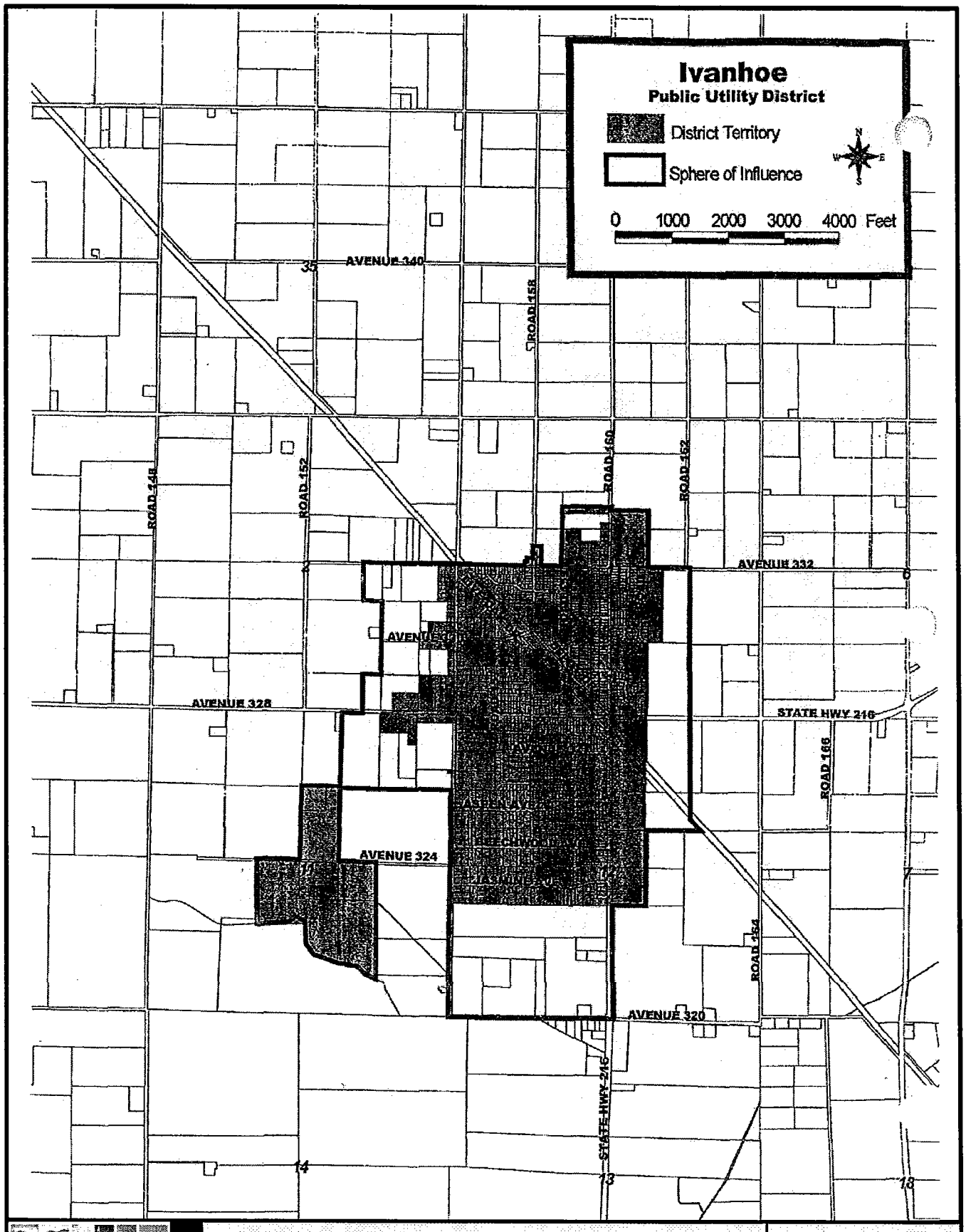


EXHIBIT 1-17
Ivanhoe PUD Territory and Sphere of Influence

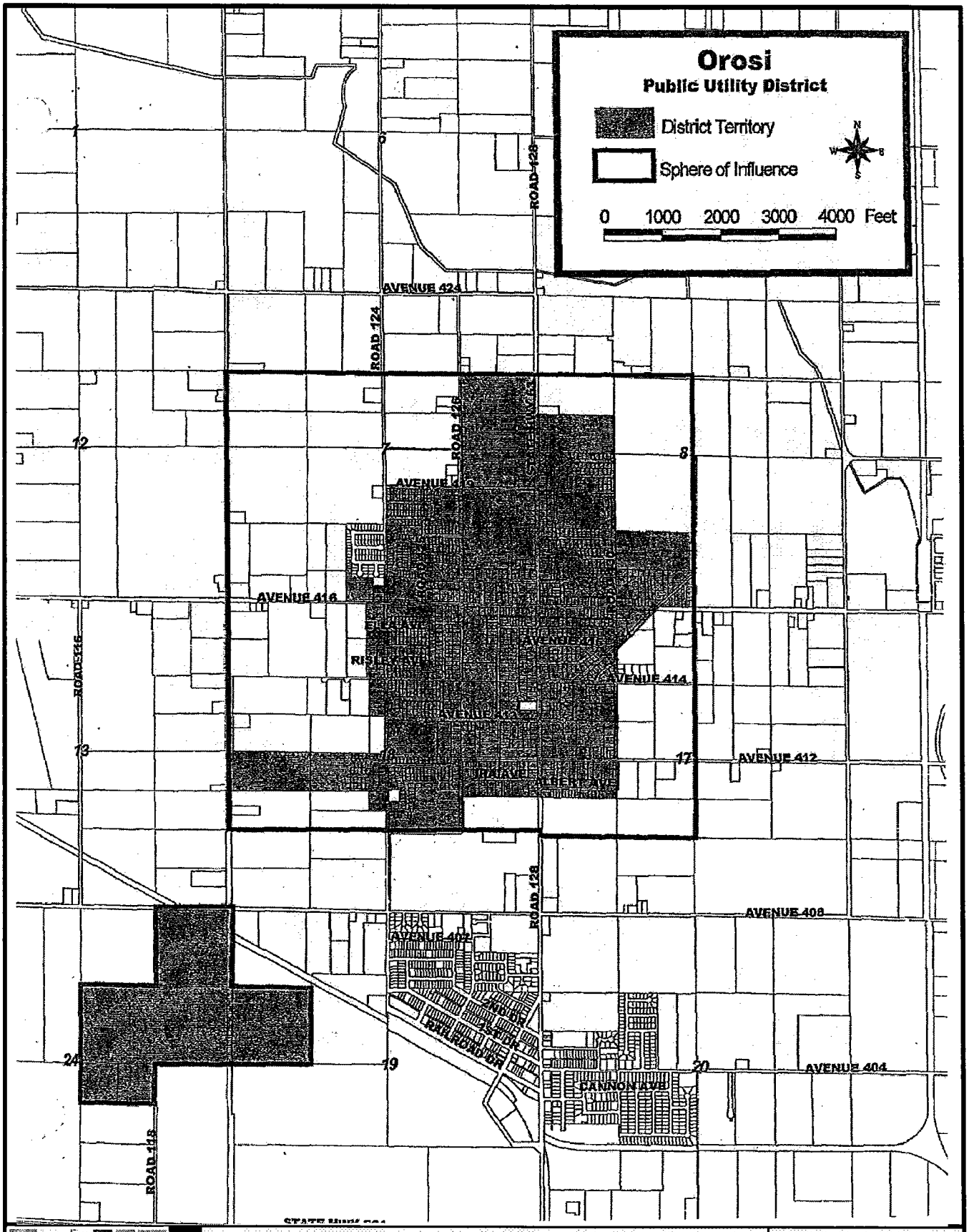


EXHIBIT 1-18
Orosi PUD Territory and Sphere of Influence

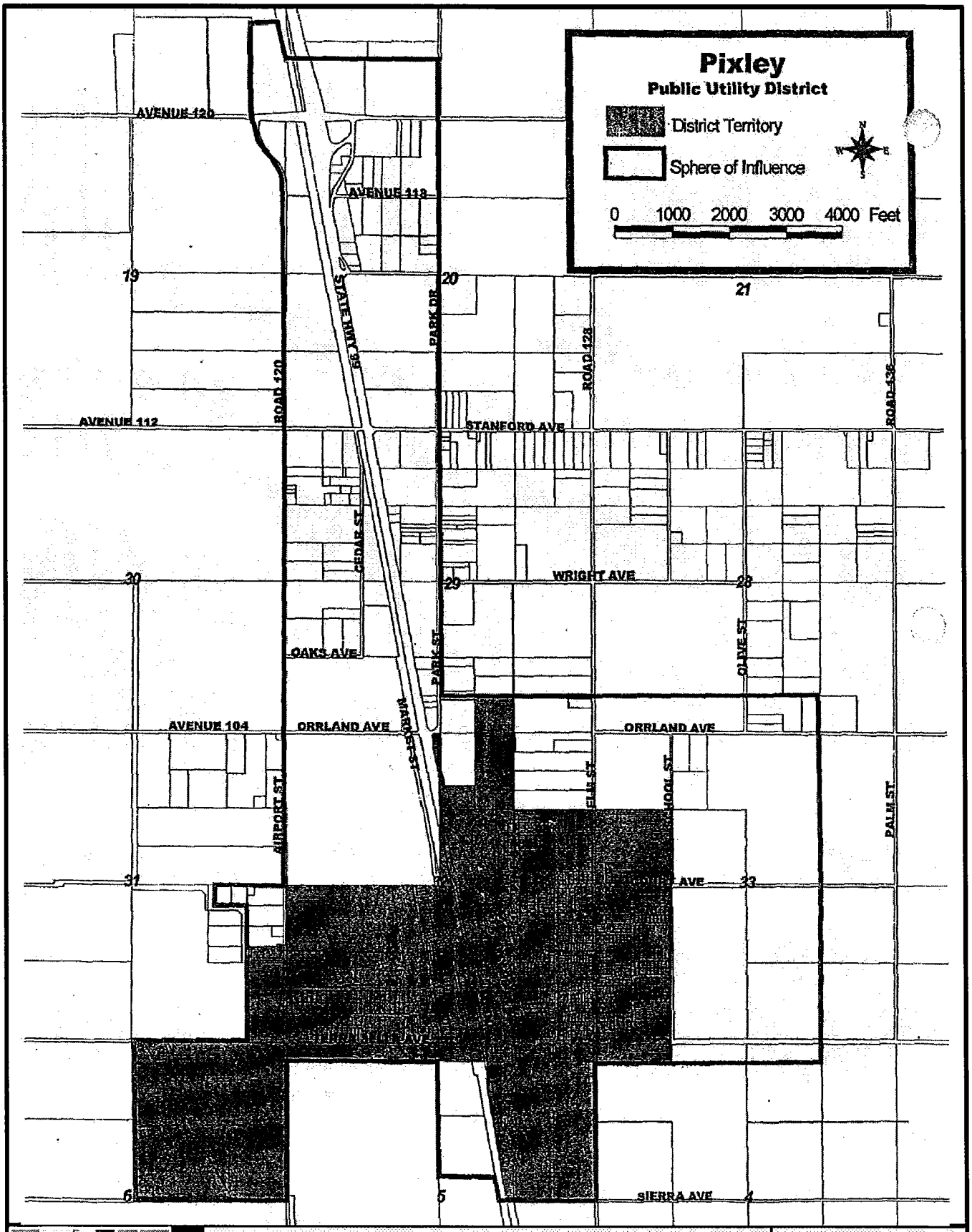
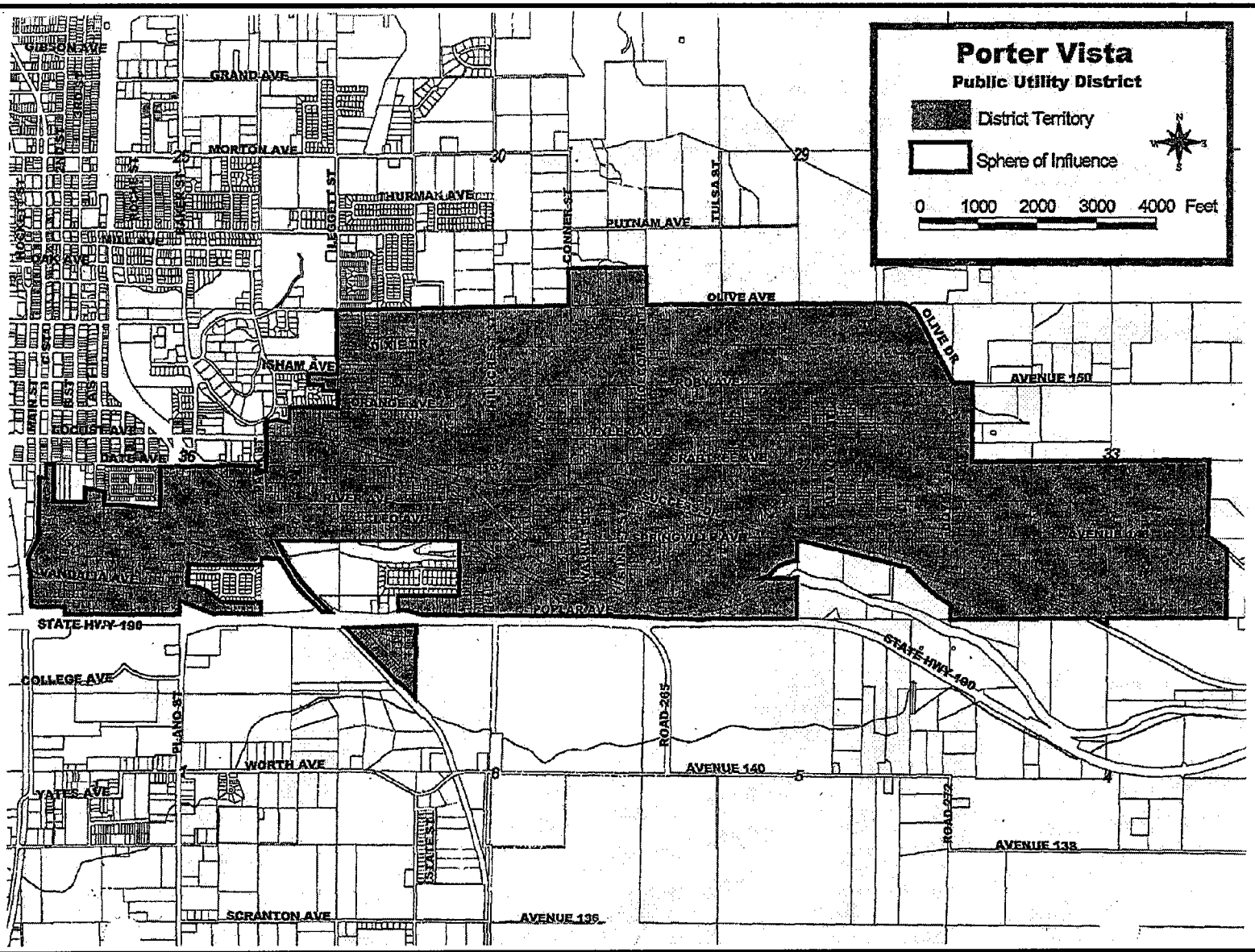


EXHIBIT 1-19
Pixley PUD Territory and Sphere of Influence



Tulare County General Plan Update

EXHIBIT 1-20
Porter Vista PUD
Territory and Sphere of Influence

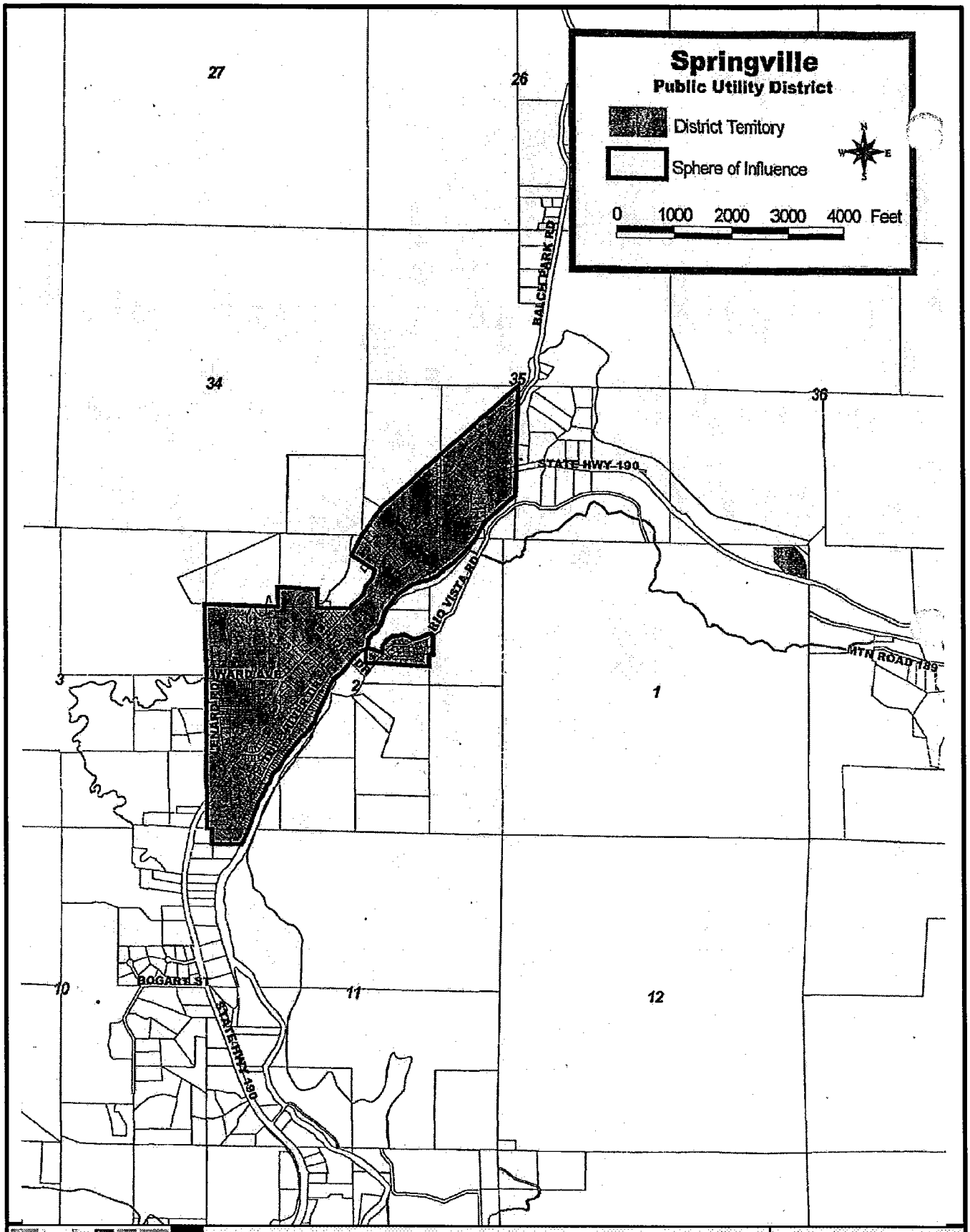


EXHIBIT 1-21
Springville PUD
Territory and Sphere
of Influence

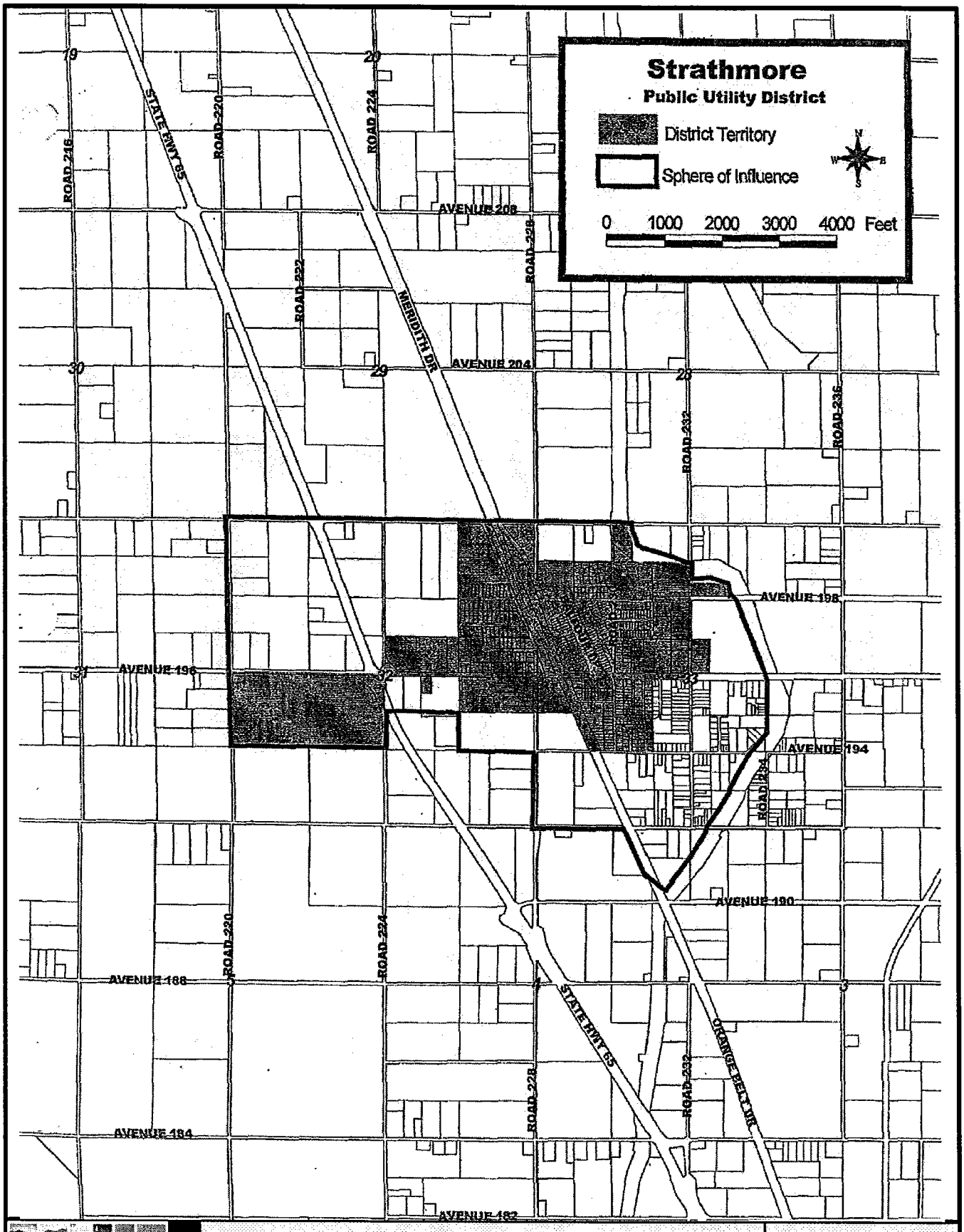


EXHIBIT 1-22
Strathmore PUD
Territory and Sphere
of Influence

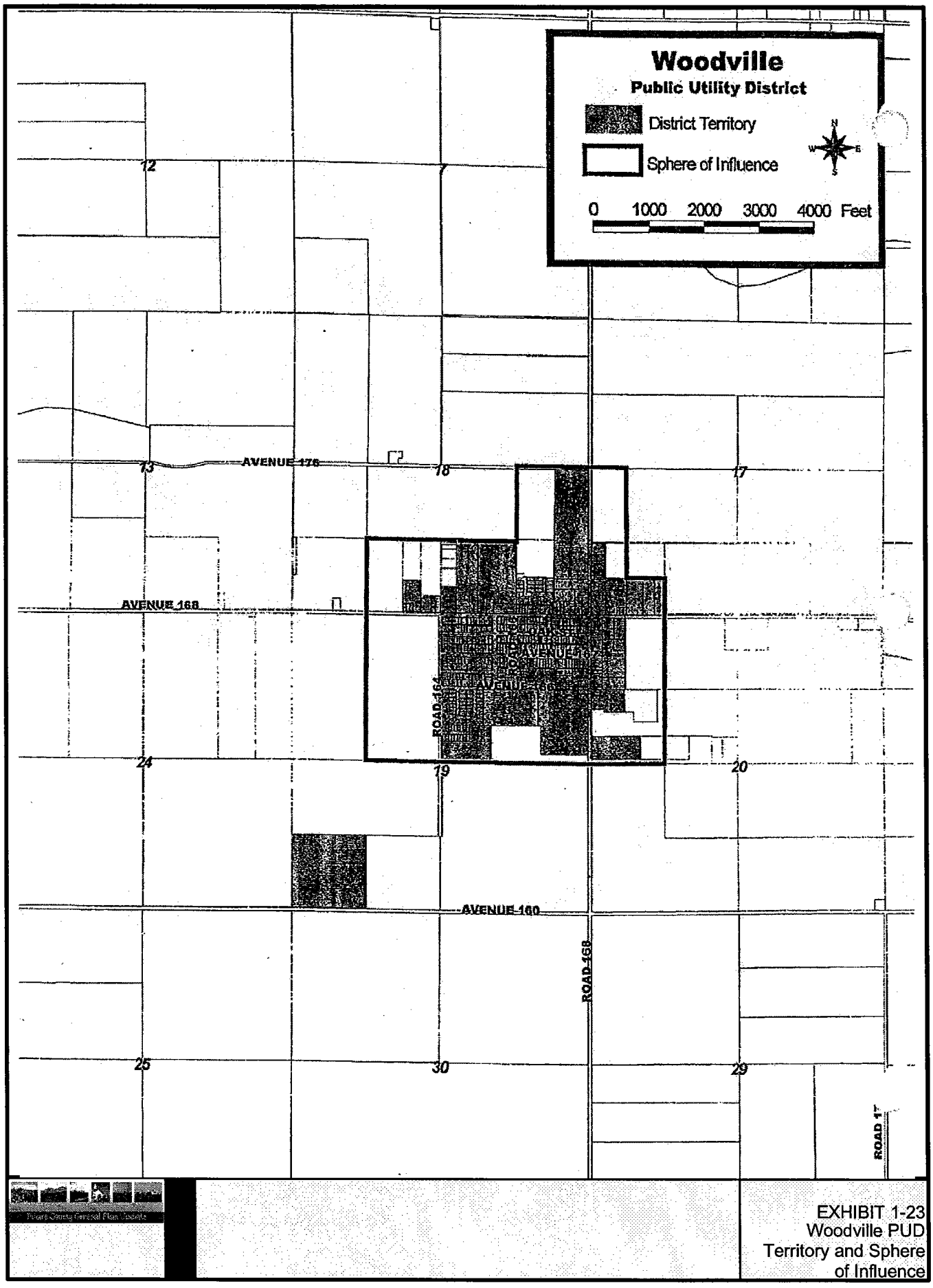
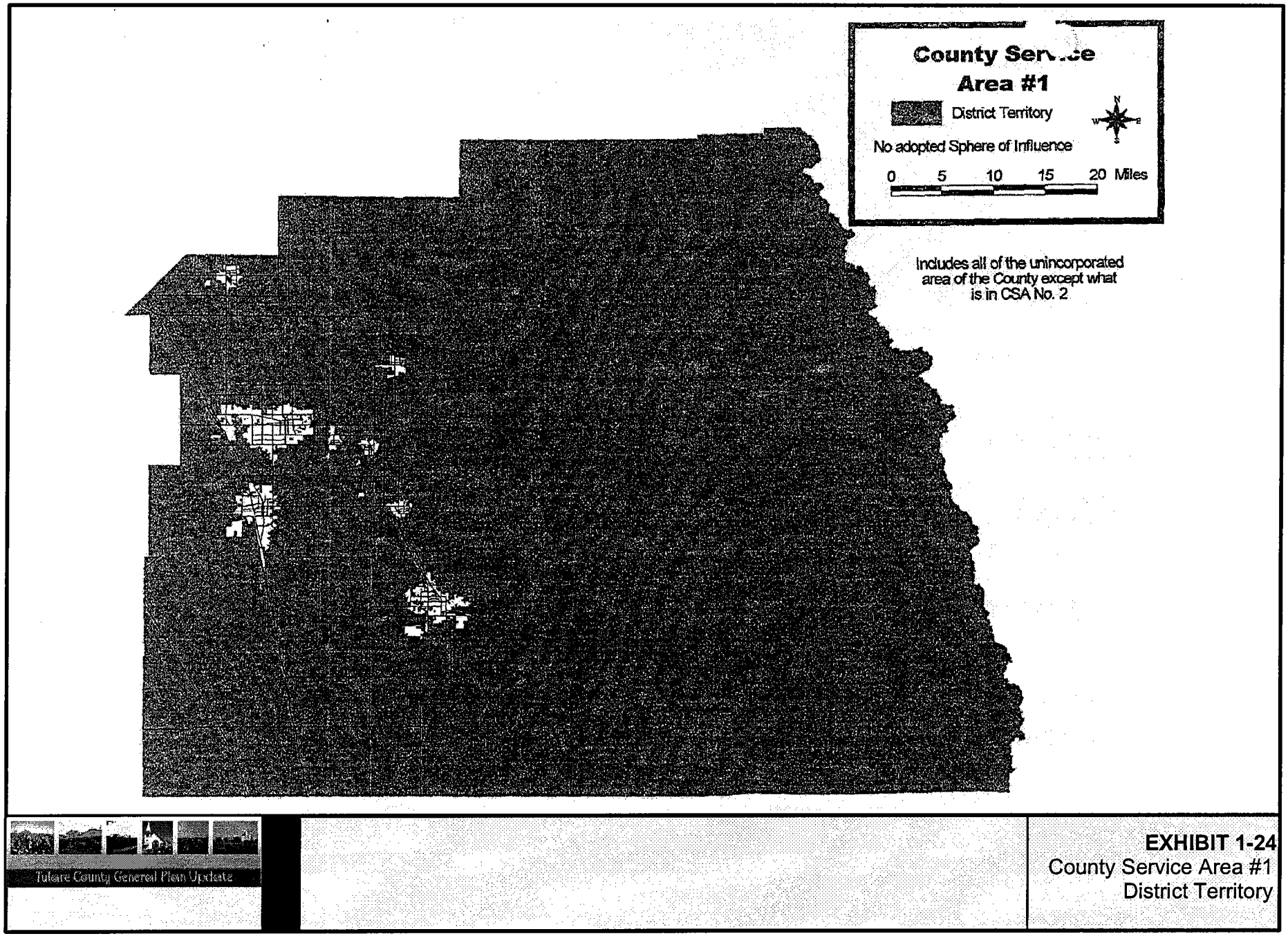


EXHIBIT 1-23
Woodville PUD
Territory and Sphere
of Influence



Tulare County General Plan Update

EXHIBIT 1-24
County Service Area #1
District Territory

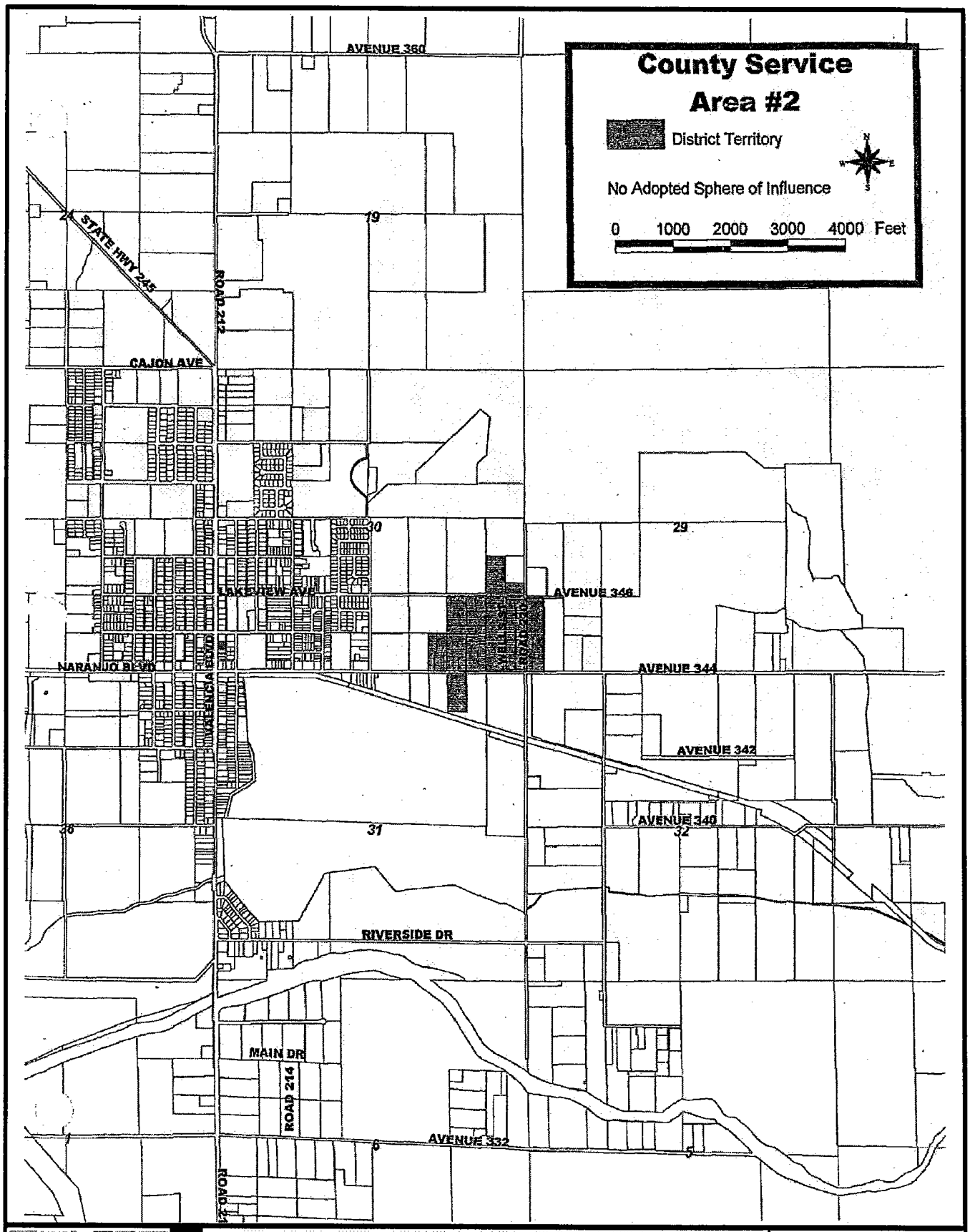


EXHIBIT 1-25
County Service Area #2
District Territory

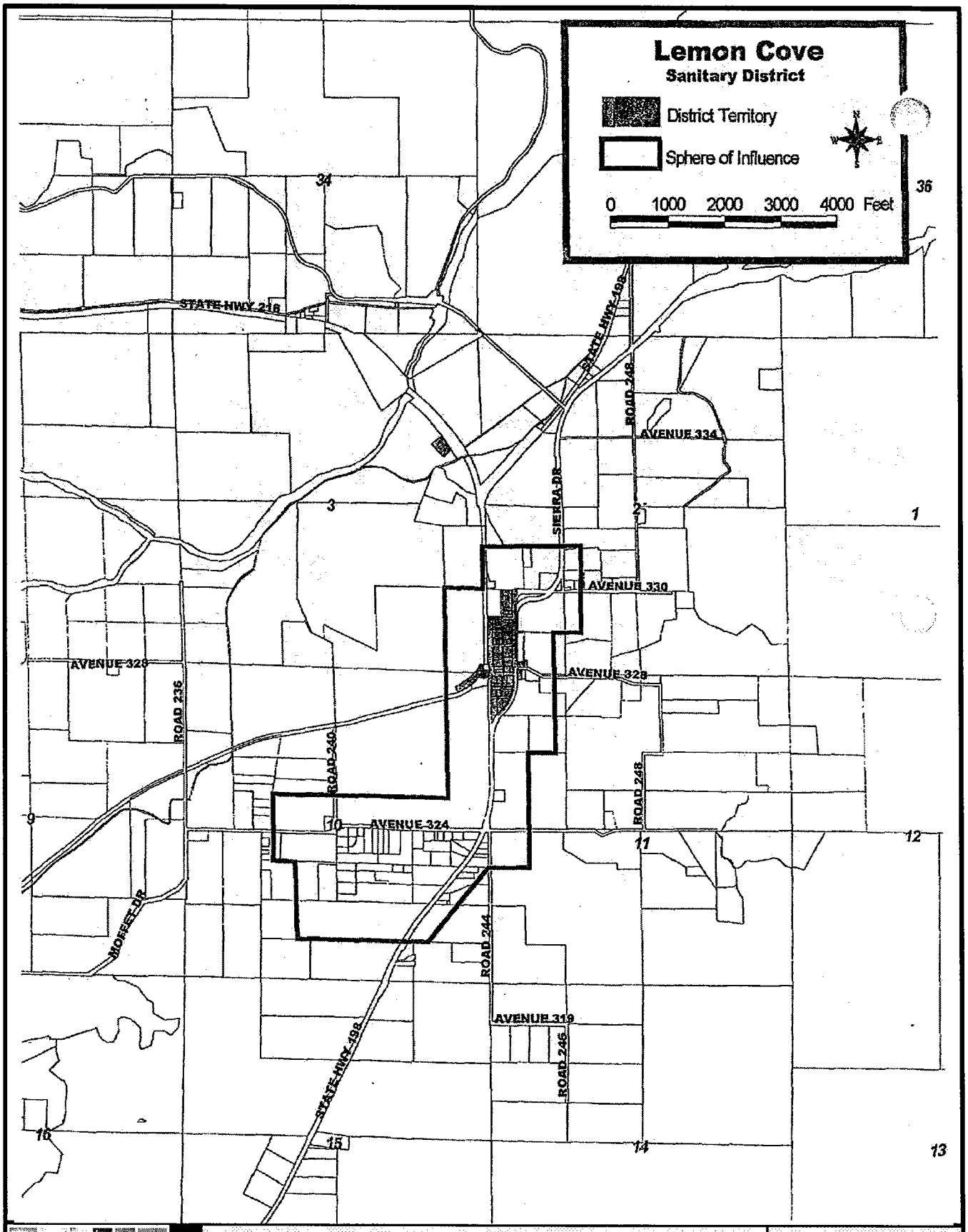


EXHIBIT 1-26
Lemon Cove Sanitary District Territory and Sphere of Influence

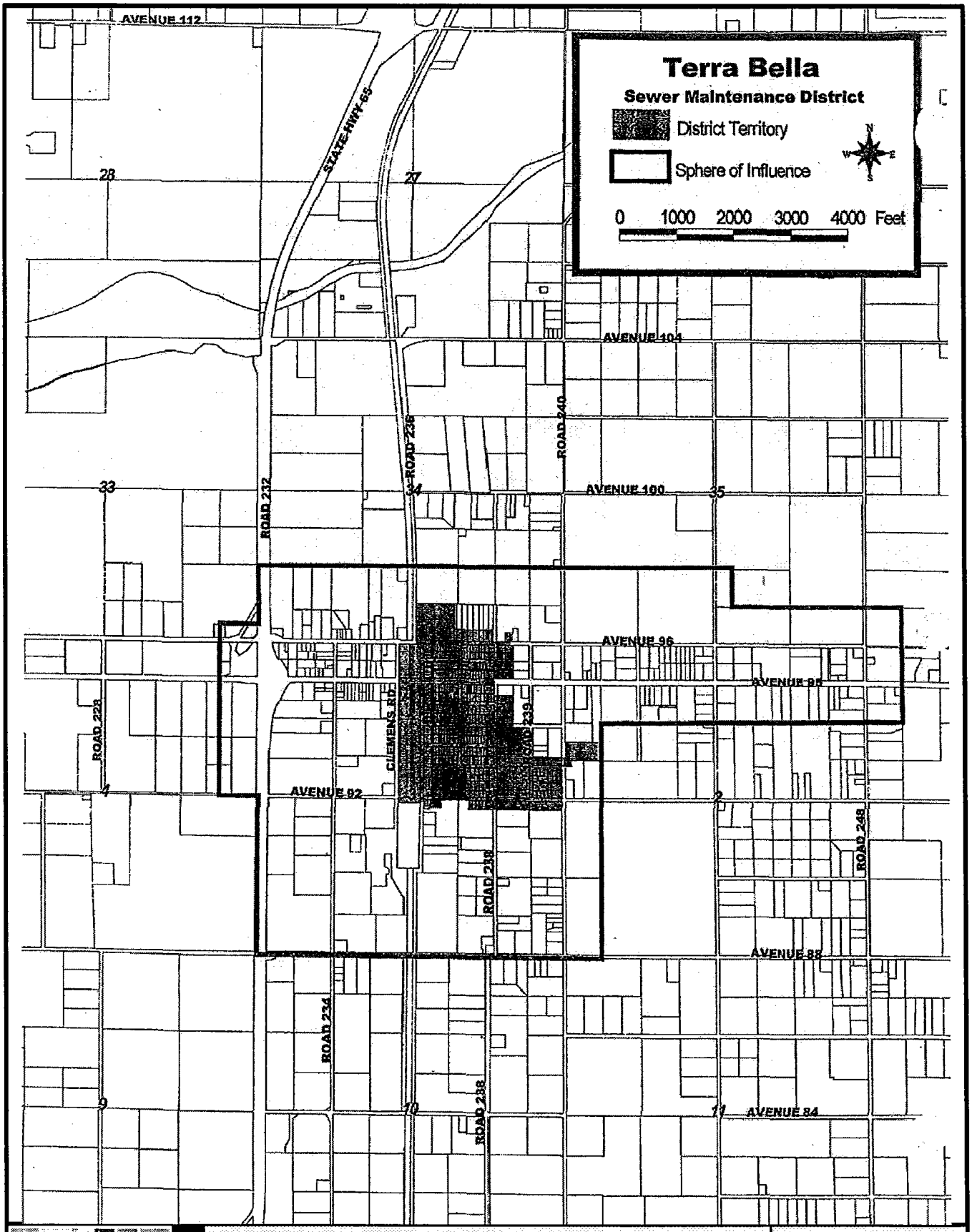


EXHIBIT 1-27
Terra Bella Sewer Maintenance District Territory and Sphere of Influence

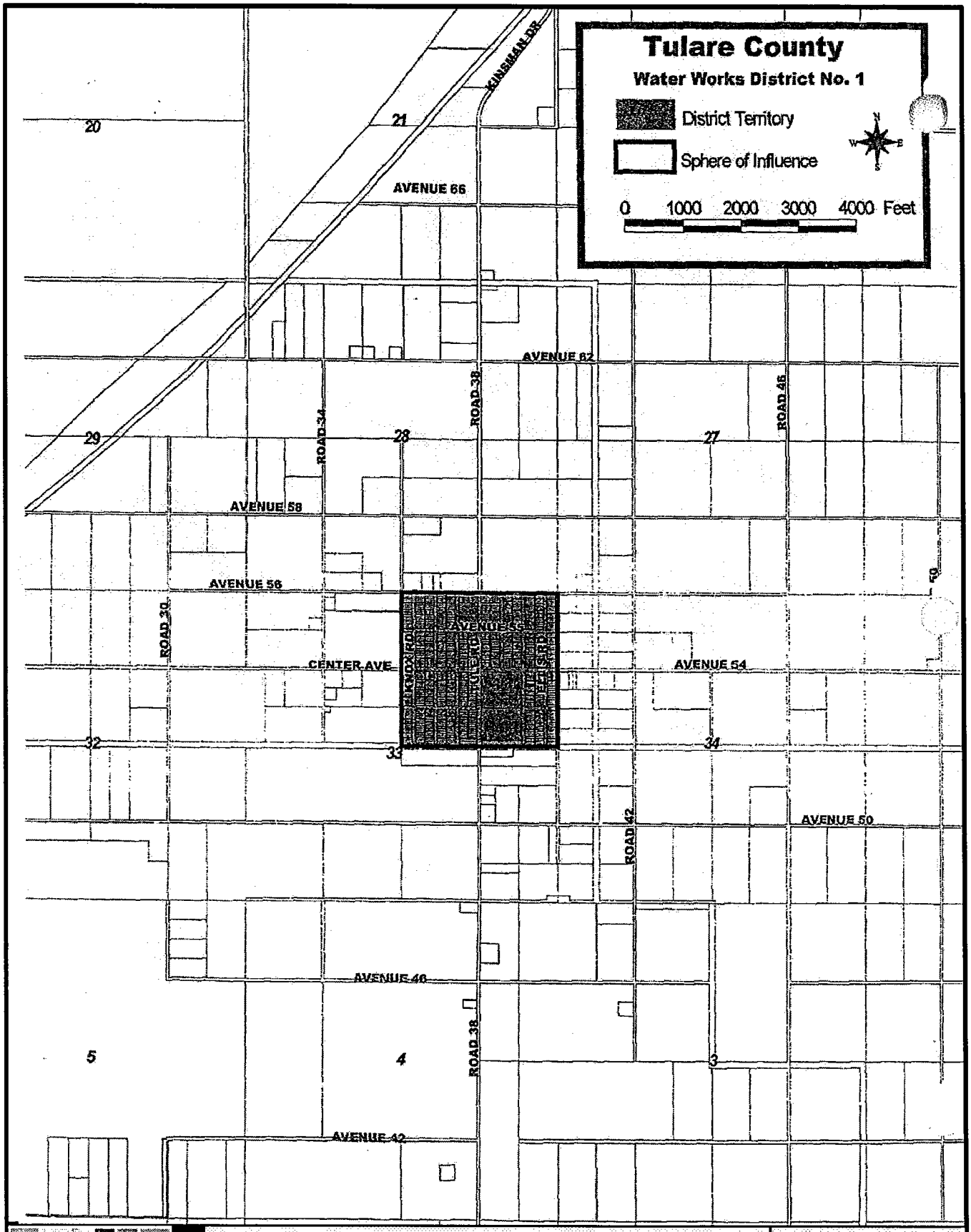
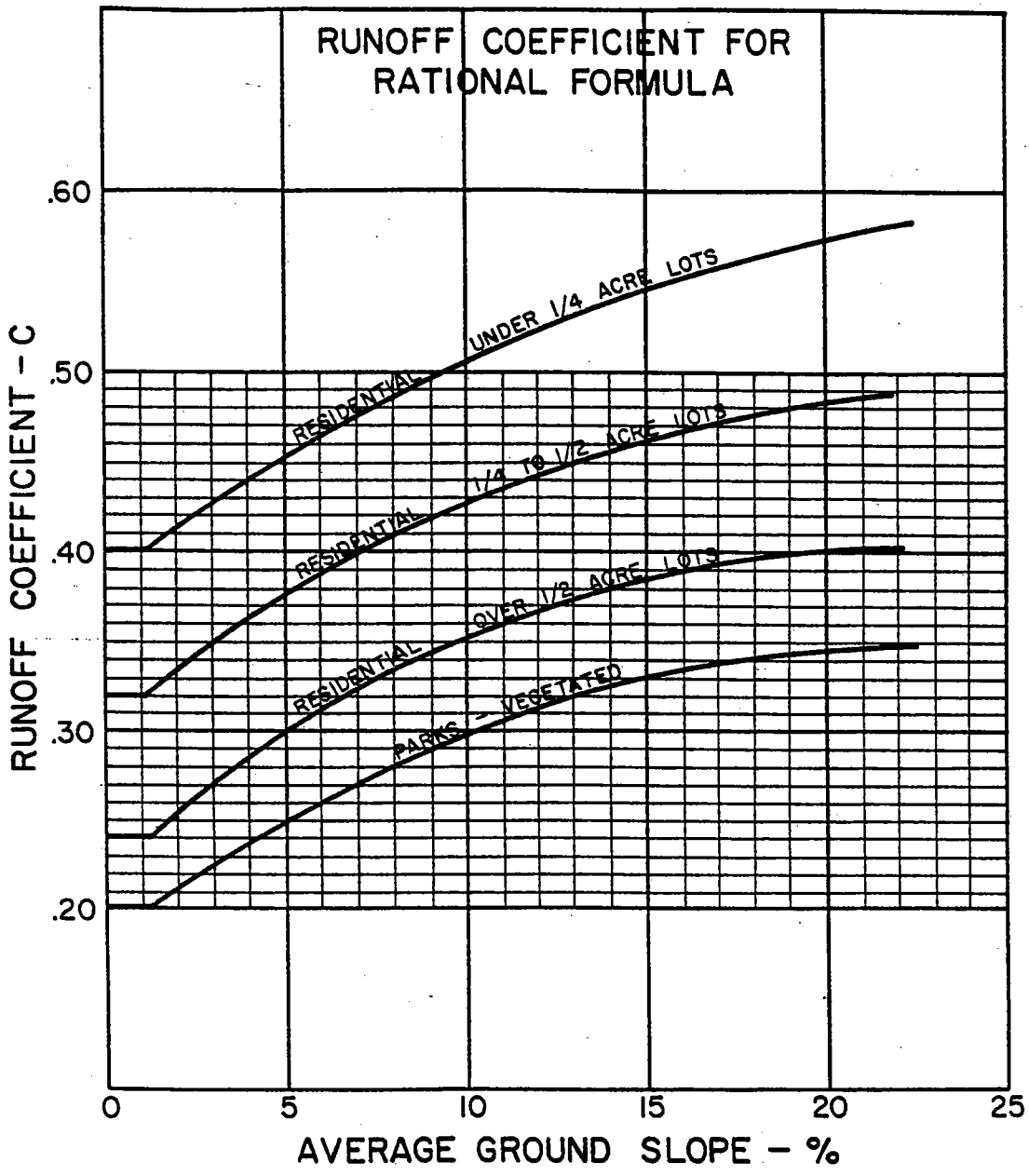


EXHIBIT 1-28
Tulare County Water Works District No. 1 Territory and Sphere of Influence



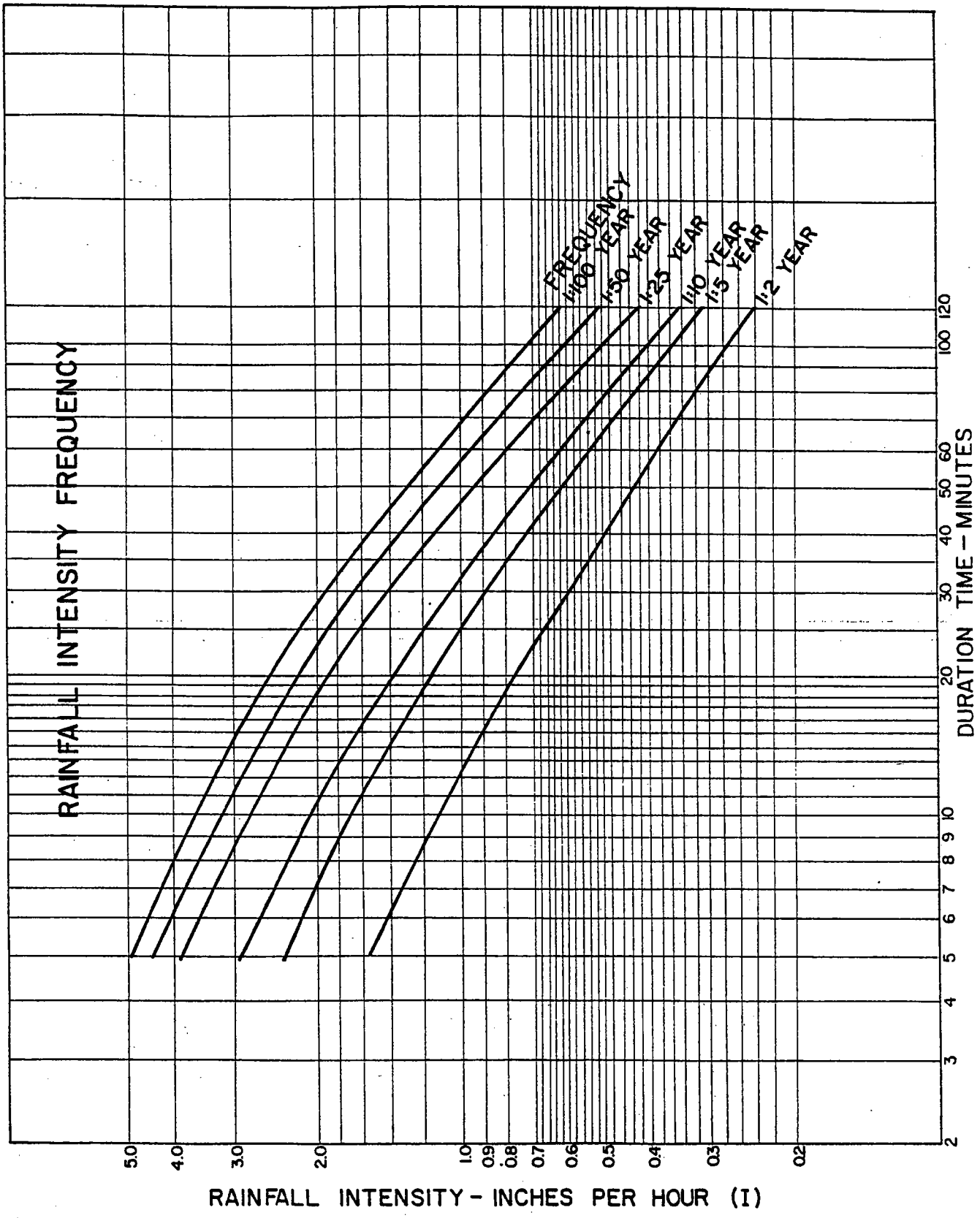
NOTE: USE C=0.85 FOR COMMERCIAL, INDUSTRIAL AND MULTIPLE RESIDENTIAL AREAS

DRAINAGE STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

RUNOFF COEFFICIENT

PLATE NO. B-1



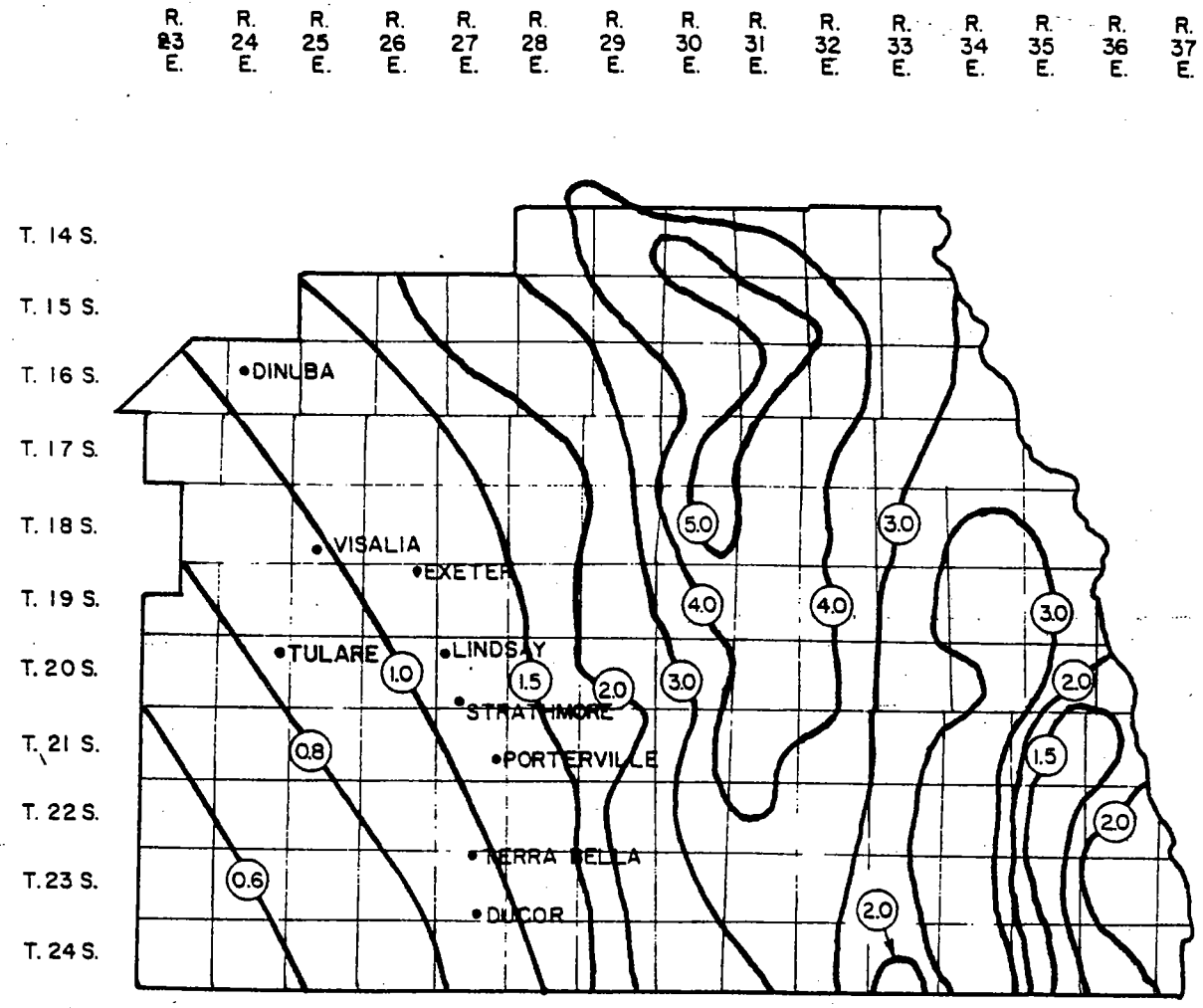
DRAINAGE STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

INTENSITY
DURATION CURVES

PLATE NO. B-2

TULARE COUNTY



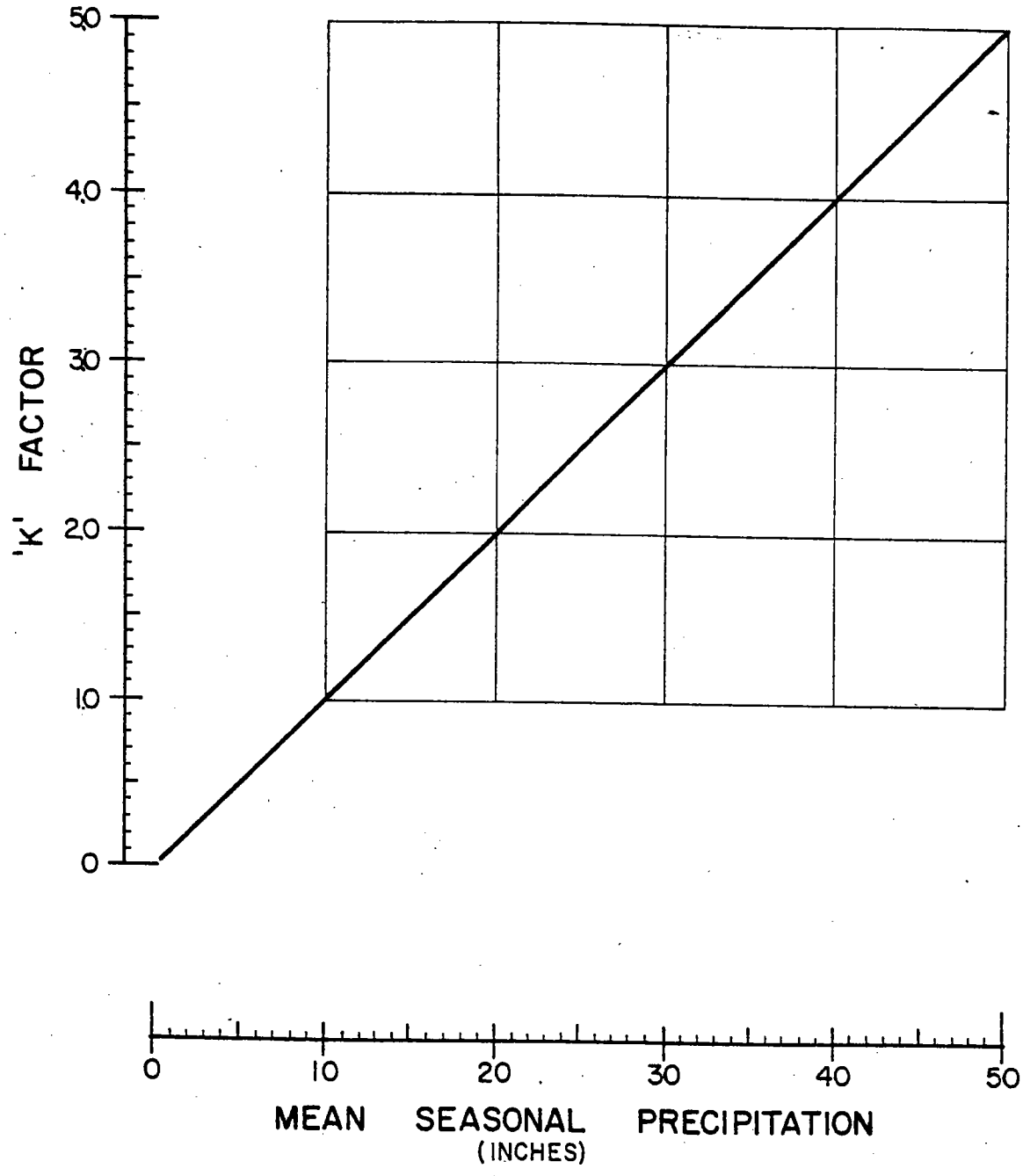
(1.0) INDICATES 'K' FACTOR TO BE USED WITH THE MODIFIED RATIONAL FORMULA (Q=KCIA)

DRAINAGE STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

RATIONAL FORMULA 'K' FACTOR

PLATE NO. B-3

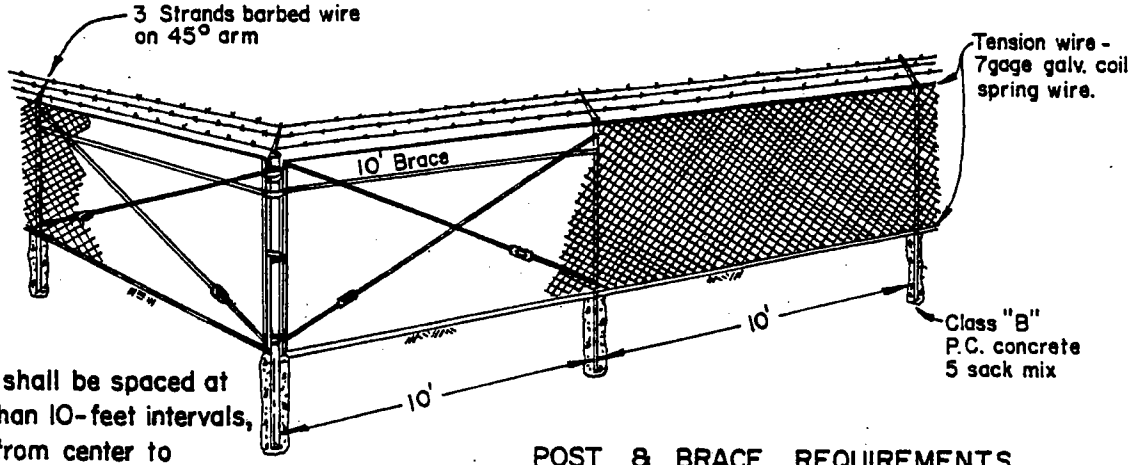


DRAINAGE STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080
'K' FACTOR TO PRECIPITATION
PLATE NO. D-1

Post tops, extension arms, stretcher bars and other required fittings and hardware shall be steel or malleable iron or wrought iron and shall be galvanized.

Wire used in the manufacture of the fabric shall be 11-gage for all fence 84" or less in height, and shall be woven into approximately 2-inch mesh.

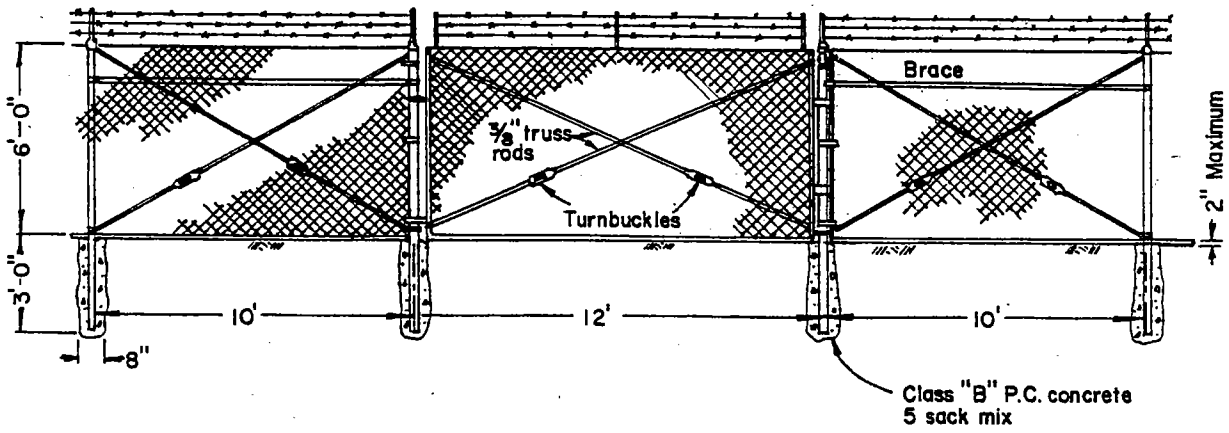


Line posts shall be spaced at not more than 10-feet intervals, measured from center to center of posts.

End, corner, and gate posts shall be braced to the nearest line post with galvanized diagonal or horizontal braces used as compression members and galvanized ⅜" steel truss rods with turnbuckles used as tension members.

POST & BRACE REQUIREMENTS

LOCATION	TYPE	MIN. SIZE	MIN. WT.(LB./FT.)
End and corner posts	Pipe	2.351 O.D.	3.10
Line posts	Pipe	1.869 O.D.	2.31
Braces	Pipe	1.630 O.D.	1.93
Gate posts	Pipe	3.960 O.D.	8.65



Gate frame shall be constructed of not less than 1½" galvanized pipe and shall be cross trussed with ⅜" adjustable truss rods. The corner of gate frames shall be fastened together with a malleable iron fitting.

The gate shall be hung by at least two (2) steel or malleable iron hinges not less than three inches (3") in width, and a malleable catch and locking attachment.

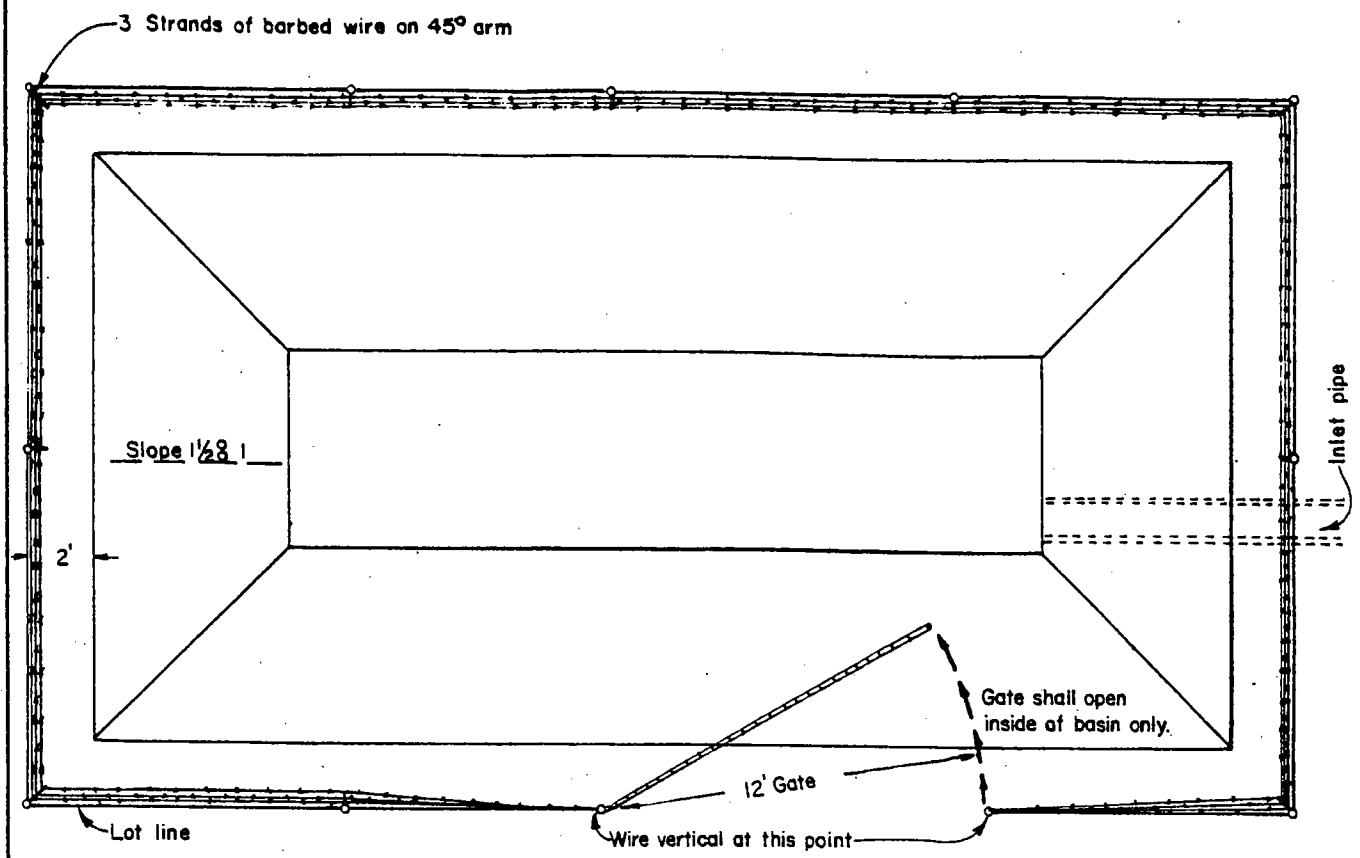
All posts shall be a minimum of 9' long.

PUBLIC ROAD STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

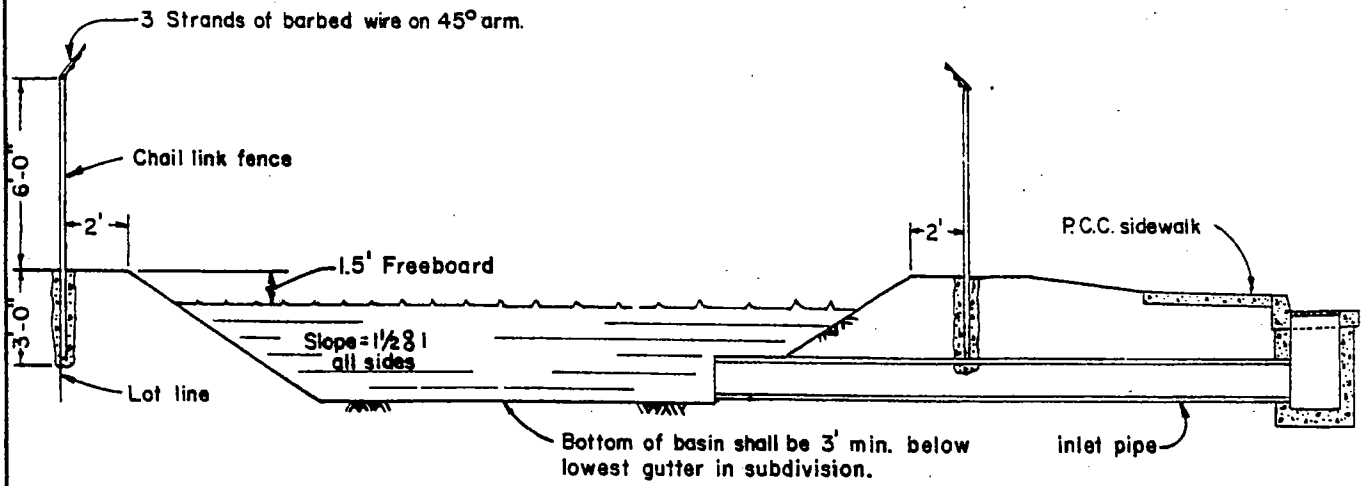
CHAIN LINK FENCING

PLATE NO. R-5



GENERAL NOTES

Fence to be placed on lot line.
Maximum depth of water in ponding basin - 3'-0".
Fence post to be placed in class "B" P.C. Concrete.
Access gate 12'-0" minimum, open inside of basin only.
Entire area of ponding lot to be treated with soil sterilant to one foot outside of fence or to back of concrete curb or sidewalk.
The soil sterilant to be used and rate of application must be approved by the Public Works Director before being applied.
Where ponding basin is on corner lot, fence shall follow curve of lot line.

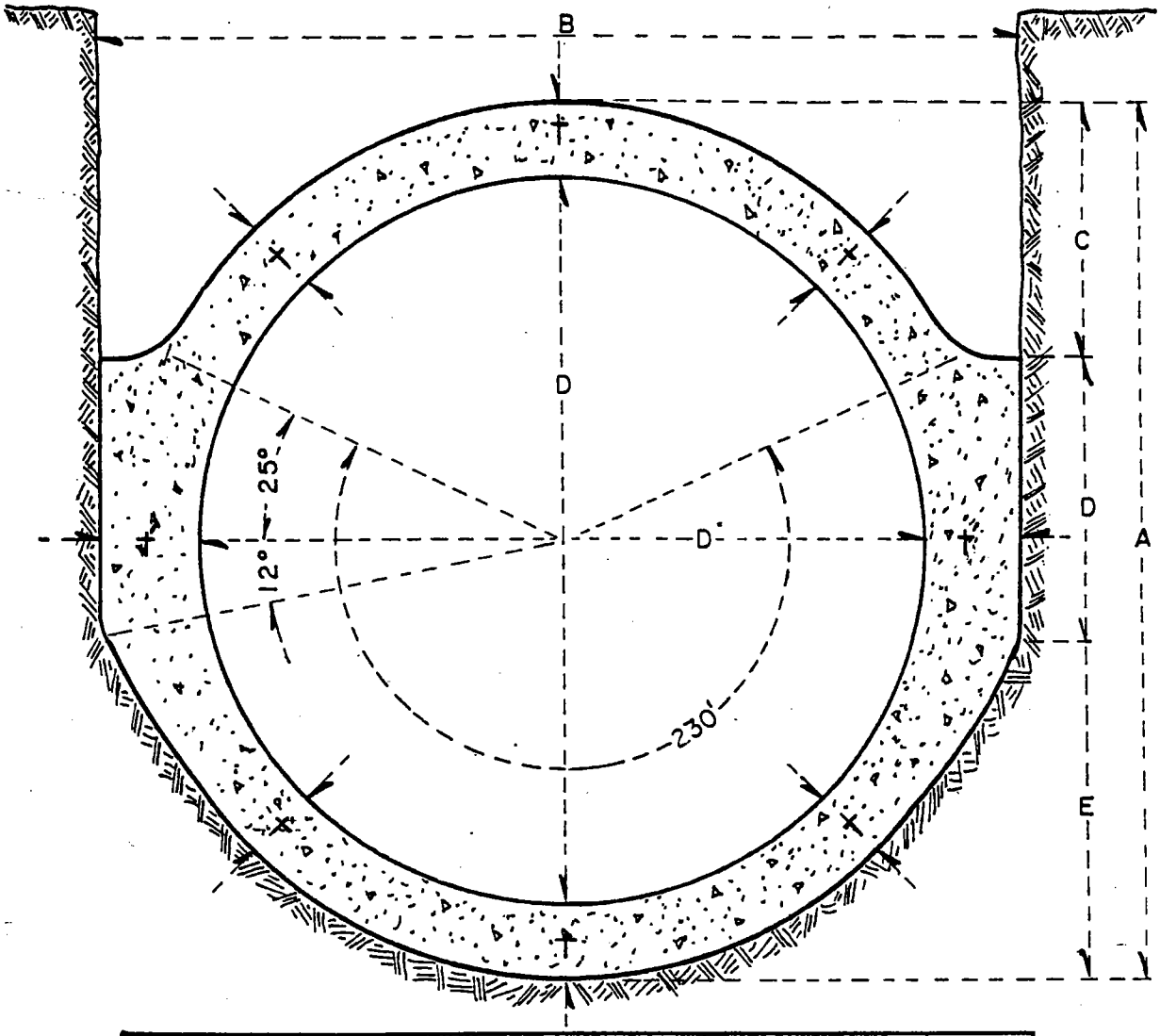


DRAINAGE STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

PONDING BASIN DETAILS

PLATE NO. R-6



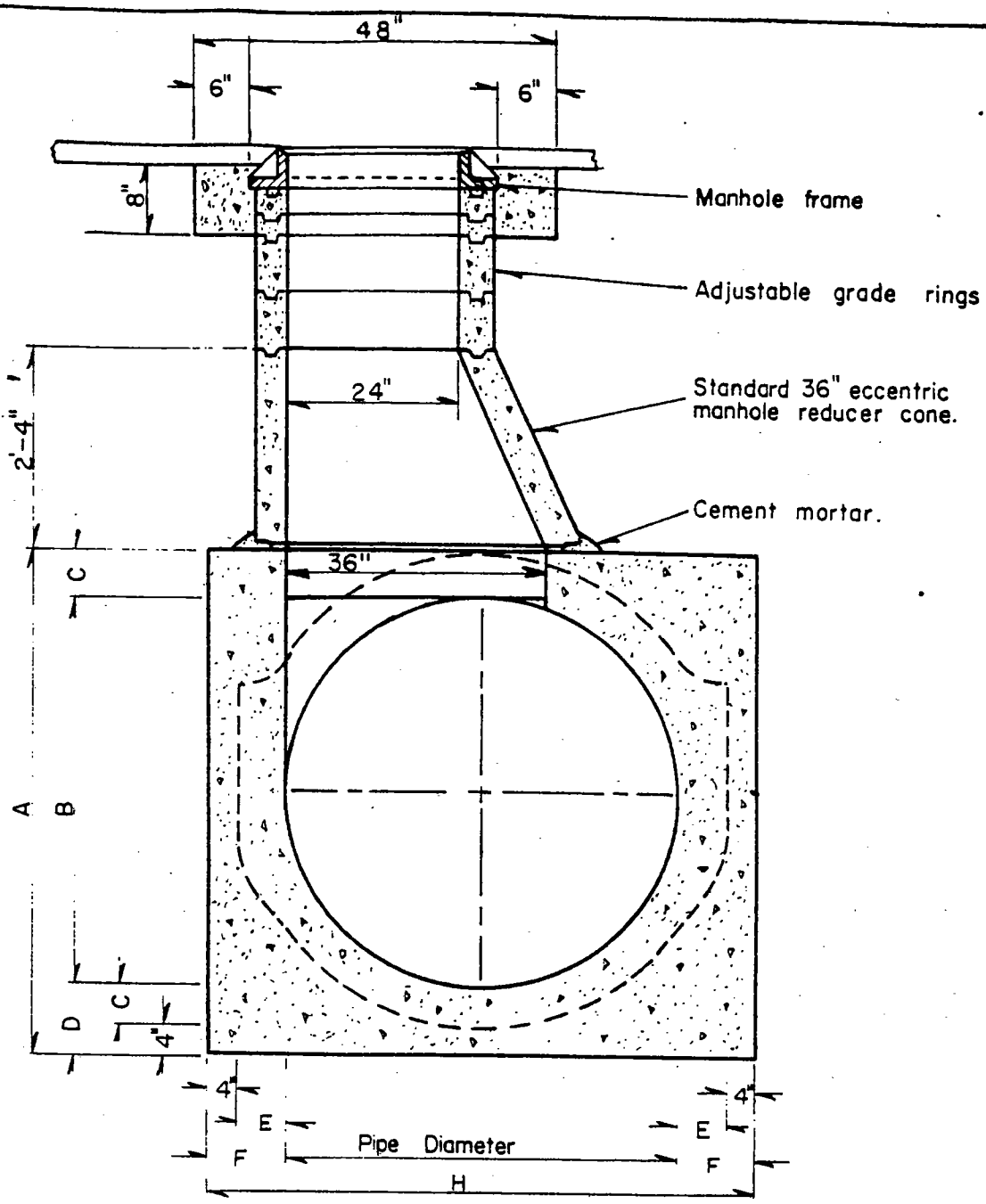
D	t	t'	B	C	D	E	A
24	3	3 3/4	31 1/2	8 1/2	10	11 1/2	30
30	3	3 3/4	37 1/2	10	12	14	36
36	3 1/2	4 1/4	44 1/2	12 1/2	14	16 1/2	43
42	4	4 3/4	51 1/2	14 1/2	16	19 1/2	50
48	5	6 1/2	61	16 1/2	19	22 1/2	58
54	5 1/2	7 1/2	69	18 1/2	21	25 1/2	65
60	6	8	76	21	23	28	72
72	7	8 1/2	89	25	27 1/2	33 1/2	86

All dimensions in inches.

DRAINAGE STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

CAST-IN-PLACE CONCRETE PIPE SECTION



*H equals width parallel to pipe flowline also.

Pipe Dia.	A	B	C	D	E	F	H*
36	49 1/2	36	3 1/2	7 1/2	4 1/2	8 1/2	53
42	56	42	4	8	5	9	60
48	63	48	5	9	6	10	68
54	69 1/2	54	5 1/2	9 1/2	6 1/2	10 1/2	75
60	76	60	6	10	7	11	82
66	83	66	6 1/2	10 1/2	7 1/2	11 1/2	89
72	90	72	7	11	8	12	96

All dimensions in inches.

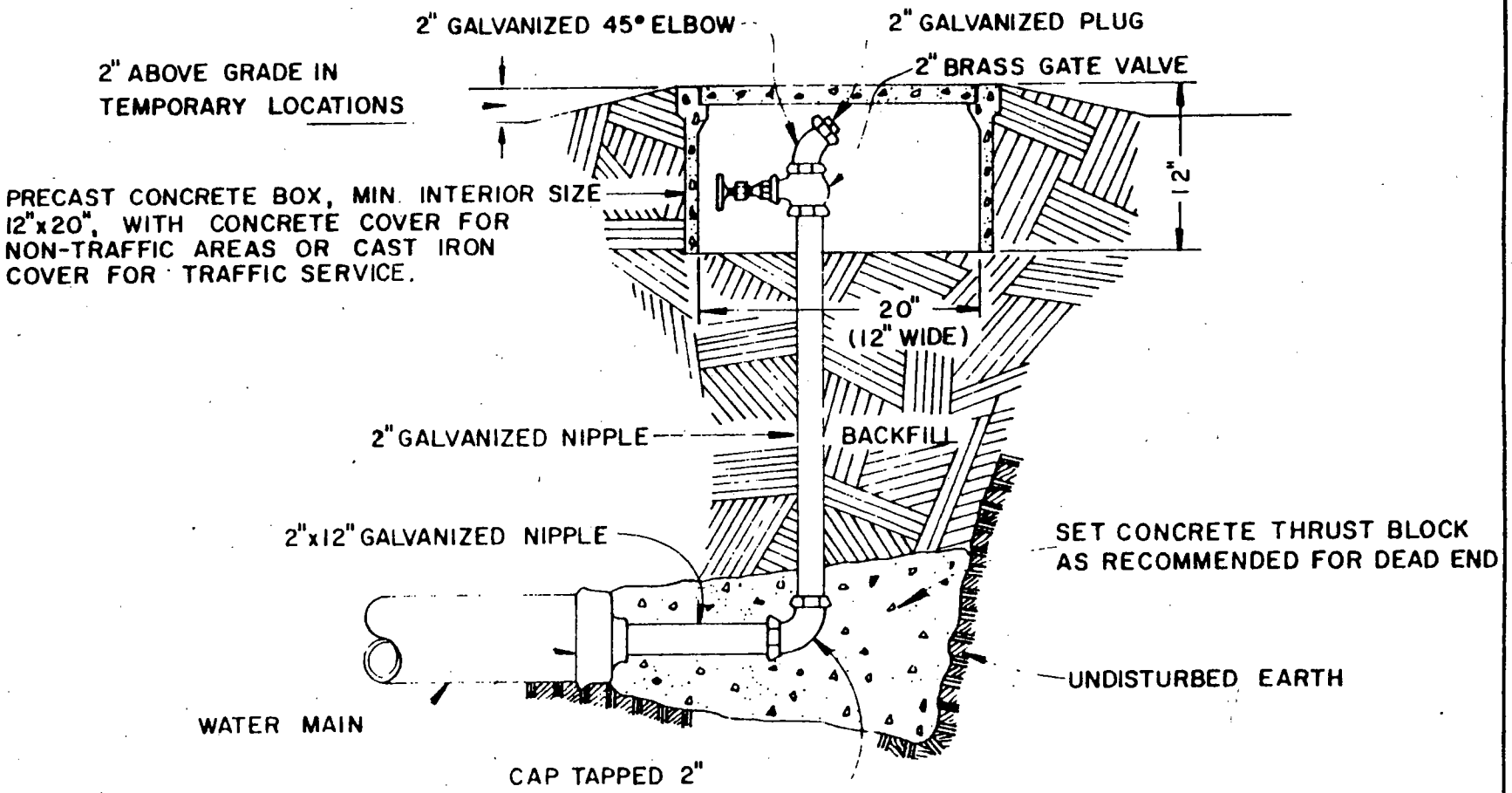
DRAINAGE STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

CAST - IN - PLACE MANHOLE

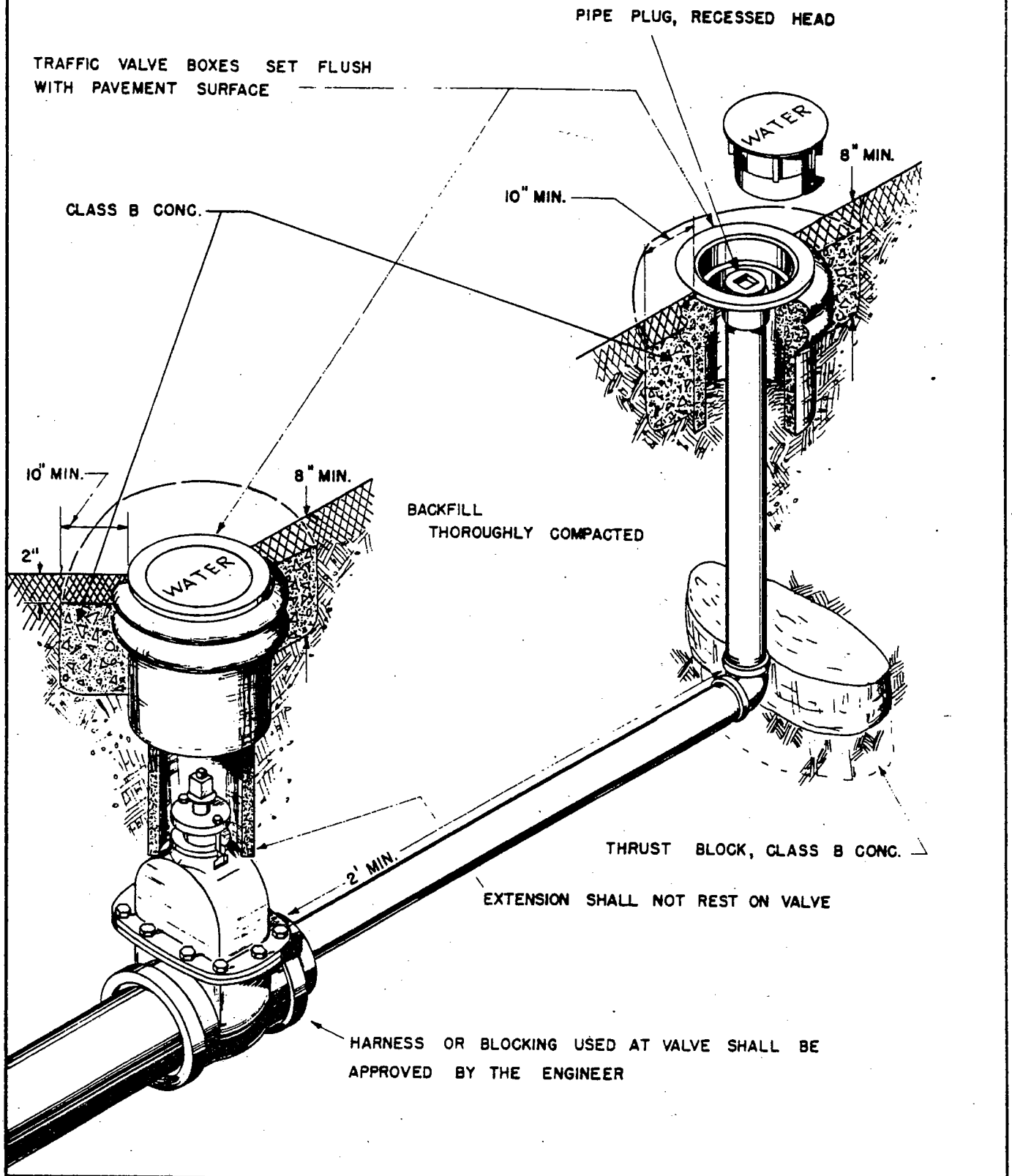
PLATE NO. B-8

WATER SYSTEM STANDARDS



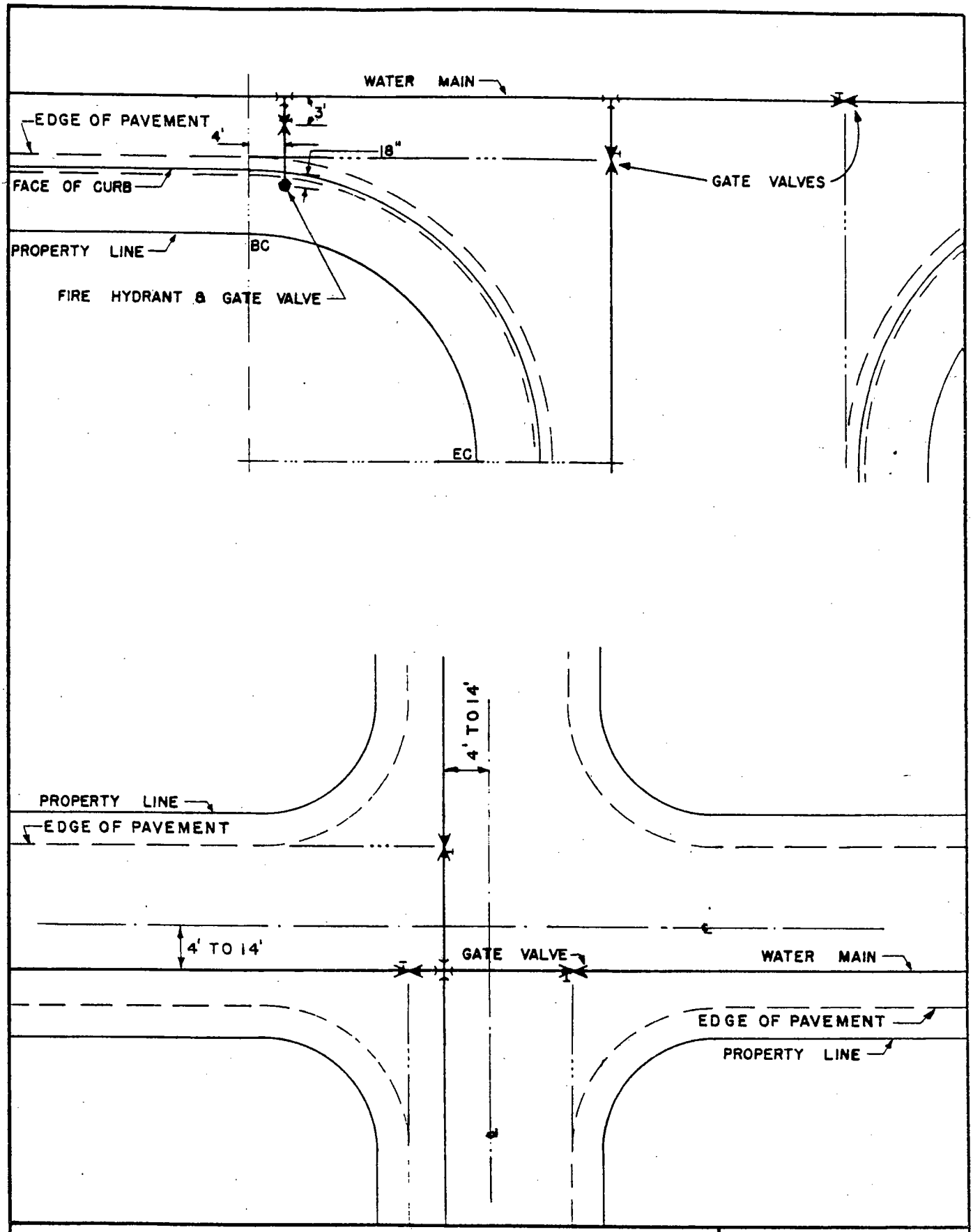
ELEVATION

TULARE COUNTY ORDINANCE CODE SECTION No. 7080	PLATE No. WS-1
BLOW-OFF WITH 2" VALVE	



WATER SYSTEM STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION No. 7080
BLOW-OFF WITH 6" VALVE
PLATE No. WS-2

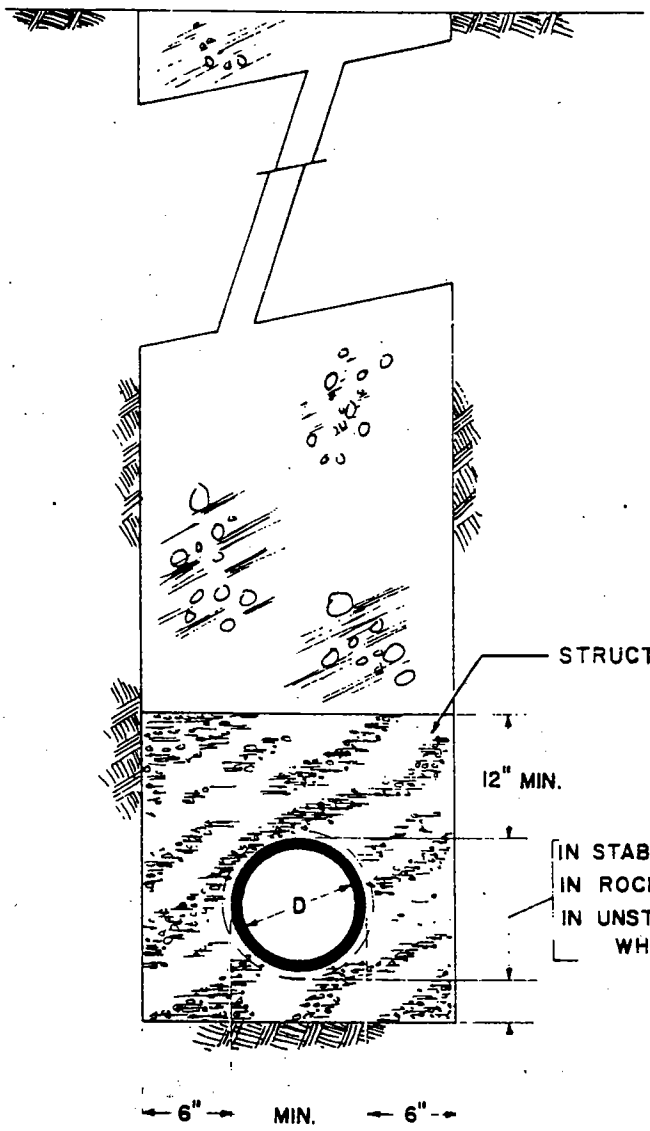


WATER SYSTEM STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

LOCATION OF VALVES
& HYDRANTS AT
INTERSECTIONS

PLATE No. WS-3



STRUCTURE BACKFILL	
SIEVE SIZE	PERCENT PASSING
3"	100
No. 4	35 — 100

ANY OVEREXCAVATION SHALL BE BACKFILLED WITH APPROVED BEDDING MATERIAL

WATER SYSTEM STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

PIPE BEDDING

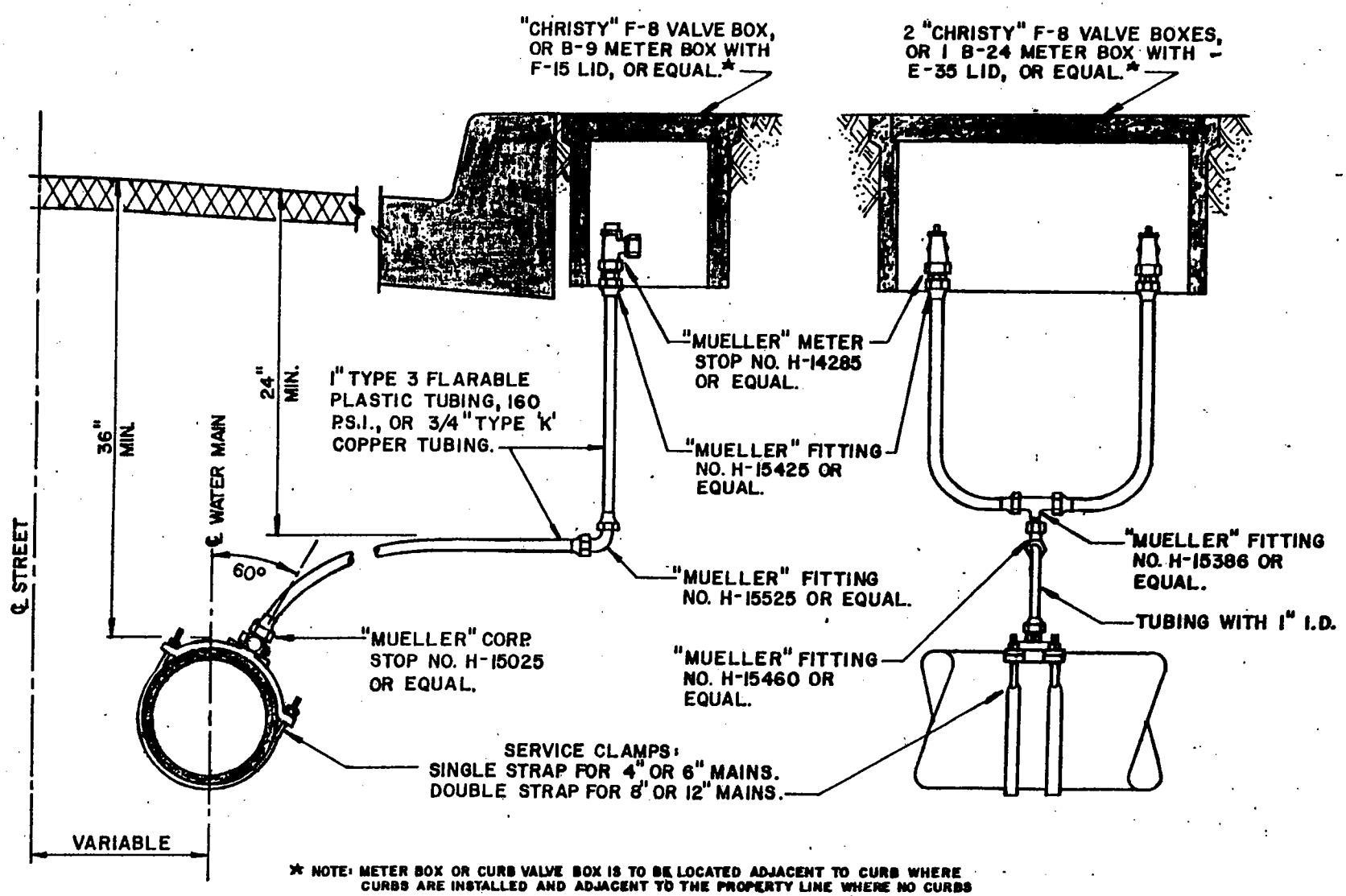
PLATE No. WS-4

WATER SYSTEM STANDARDS

TYPICAL WATER SERVICE INSTALLATION

FOR SINGLE SERVICE

FOR DOUBLE SERVICE



* NOTE: METER BOX OR CURB VALVE BOX IS TO BE LOCATED ADJACENT TO CURB WHERE CURBS ARE INSTALLED AND ADJACENT TO THE PROPERTY LINE WHERE NO CURBS ARE INSTALLED. SPLIT SERVICES ARE TO BE CENTERED ON THE PROJECTED LOT LINE.

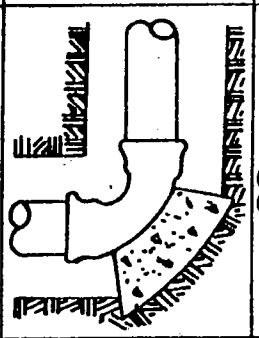
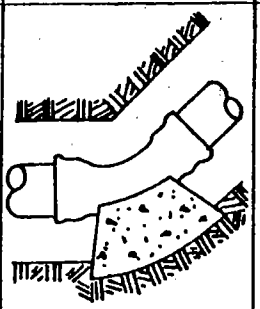
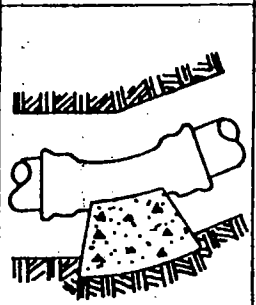
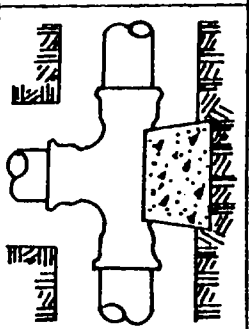
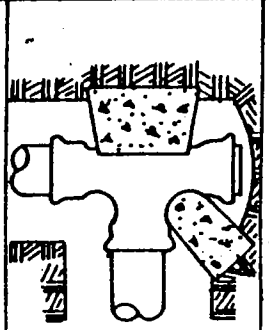
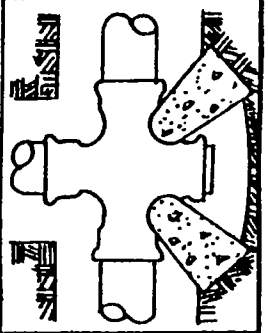
TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

DOMESTIC WATER SERVICES

PLATE NO. WS-8

WATER SYSTEM STANDARDS

REQUIRED BEARING AREA – TOTAL SQUARE FEET

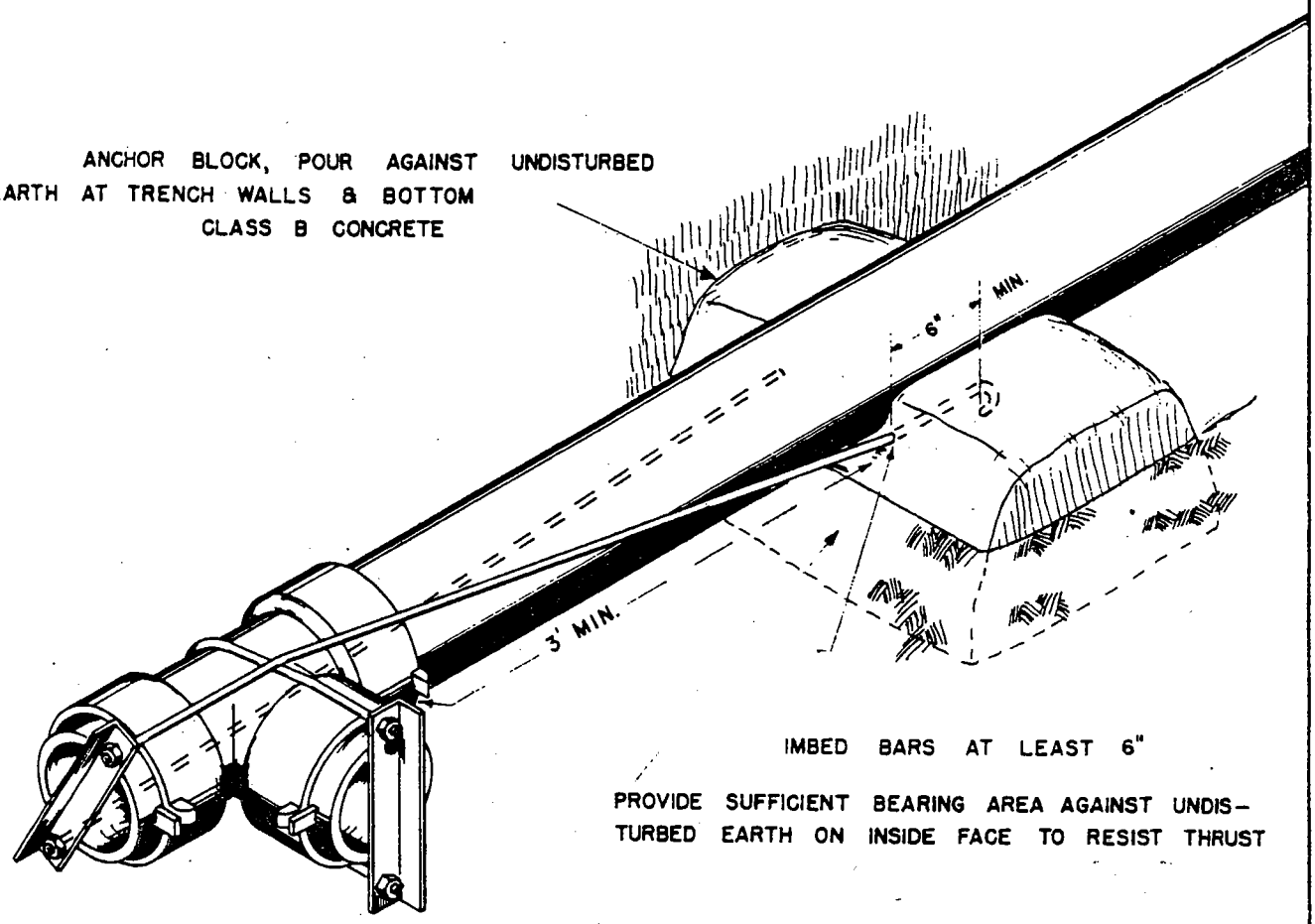
TYPE OF FITTING		90° BEND	45° BEND	11 1/4° OR 22 1/2° BEND	TEE OR DEAD END	TEE w/PLUG	CROSS w/ PLUG
TYPICAL INSTALLATION							
SIZE OF PIPE	4"	2	1	1	2	2	2
	6"	4	2	1	3	4	4
	8"	7	4	2	5	7	7
	10"	12	6	3	8	12	12
	12"	16	10	5	12	16	16

NOTES:
(1) THRUST BLOCKS TO BE CONSTRUCTED OF CLASS "B" CONCRETE
(2) AREAS GIVEN ARE FOR CLASS 150 PIPE AT PRESSURE OF 150 P.S.I. IN SOIL WITH 2000 P.S.F. BEARING CAPACITY.
INSTALLATIONS USING DIFFERENT PIPE, TEST PRESSURES, AND/OR SOIL TYPES SHOULD ADJUST AREAS ACCORDINGLY, SUBJECT TO APPROVAL OF ENGINEER.
(3) BLOCKS TO BE POURED AGAINST UNDISTURBED SOIL.
(4) JOINTS AND FACE OF PLUG TO BE KEPT CLEAR OF CONCRETE.
(5) MINIMUM THICKNESS OF THRUST BLOCKS TO BE 6 INCHES.

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

THRUST BLOCK BEARING AREA REQUIREMENTS

PLATE NO. WS-6



IMBED BARS AT LEAST 6"

PROVIDE SUFFICIENT BEARING AREA AGAINST UNDISTURBED EARTH ON INSIDE FACE TO RESIST THRUST

HARNESS & ANCHOR BLOCK SHALL BE DESIGNED TO WITHSTAND THRUSTS DEVELOPED BY THE TEST PRESSURE

BARE STEEL TO BE ASPHALT COATED

WATER SYSTEM STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

PIPE HARNESS

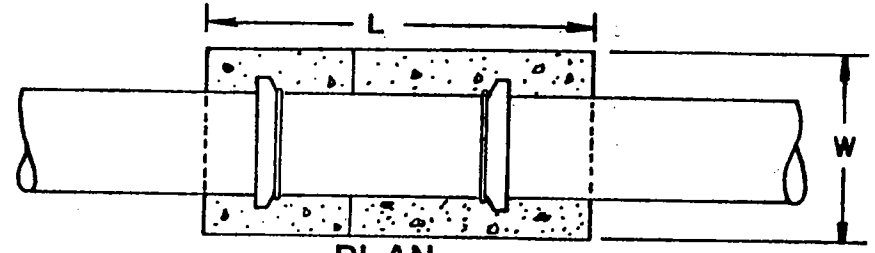
PLATE No. WS-7

WATER SYSTEM STANDARDS

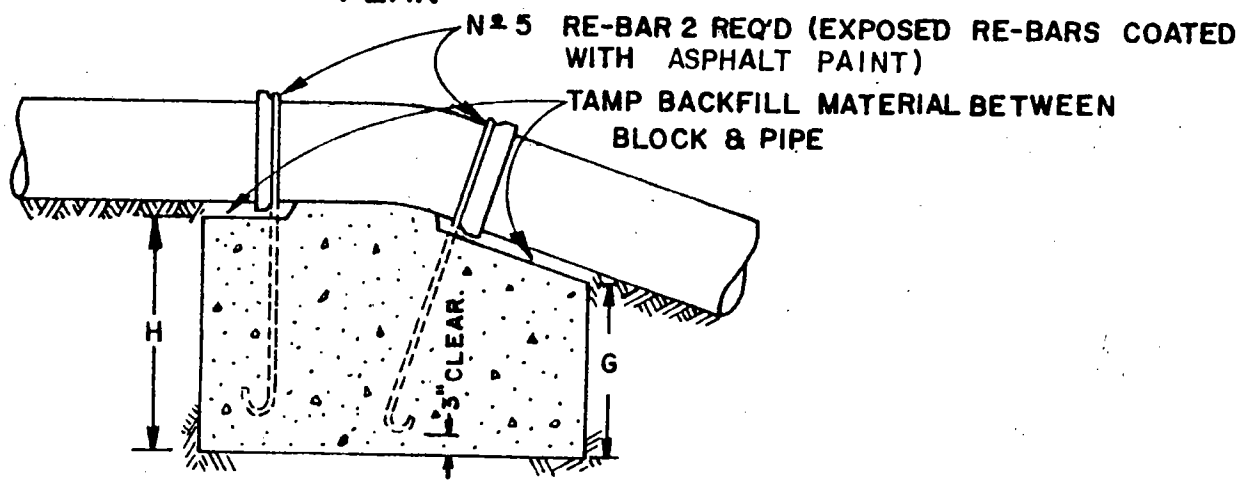
TULARE COUNTY
ORDINANCE CODE
SECTION No. 7080

THRUST BLOCKING
AT VERTICAL BENDS

PLATE No. W-8



PLAN

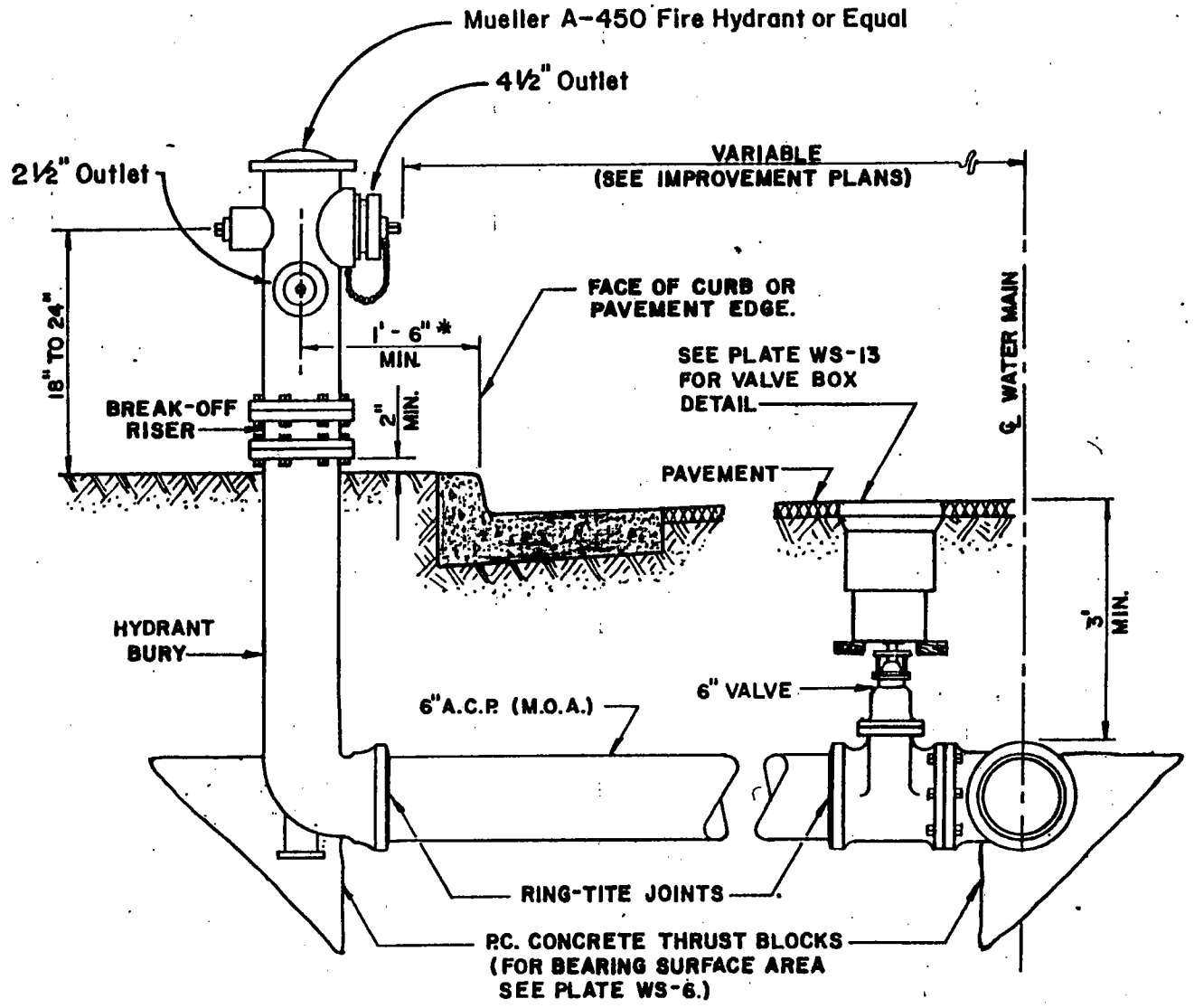


ELEVATION

THRUST BLOCK DIMENSIONS - UPWARD THRUST

PIPE SIZE	11 1/4" BEND				22 1/2" BEND				45° BEND			
	L	W	H	G	L	W	H	G	L	W	H	G
4"&6"	2'-0"	2'-0"	1'-0"	9"	2'-0"	2'-0"	2'-0"	1'-0"	3'-0"	2'-0"	2'-0"	6"
8"	2'-0"	2'-0"	1"-0"	9"	3'-0"	2'-0"	2'-0"	1'-0"	4'-6"	2'-0"	3'-0"	6"
10"	3'-0"	2'-0"	2'-0"	1'-8"	4'-0"	2'-0"	2'-0"	1"-0"	6'-0"	2'-0"	3'-8"	8"
12"	3'-0"	2'-0"	2'-0"	1'-8"	6'-0"	2'-0"	2"-0"	1'-0"	7'-0"	2'-6"	4"-0"	6"

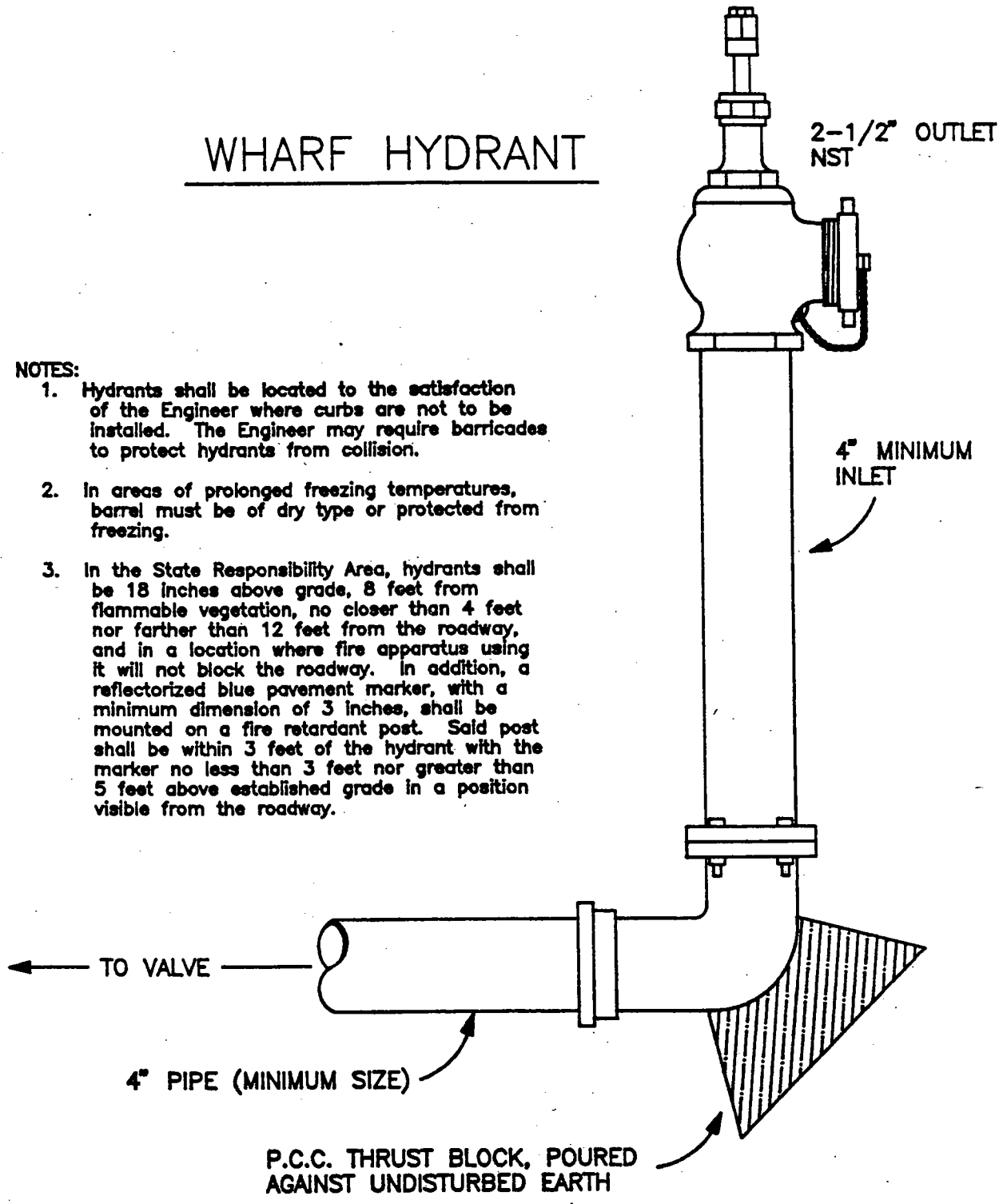
WATER SYSTEM STANDARDS



* When sidewalk is constructed, or if within Urban Improvement Area, distance shall be 5'-0" min.

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080	FIRE HYDRANT INSTALLATION (WET BARREL)	PLATE NO. WS-9

WHARF HYDRANT



NOTES:

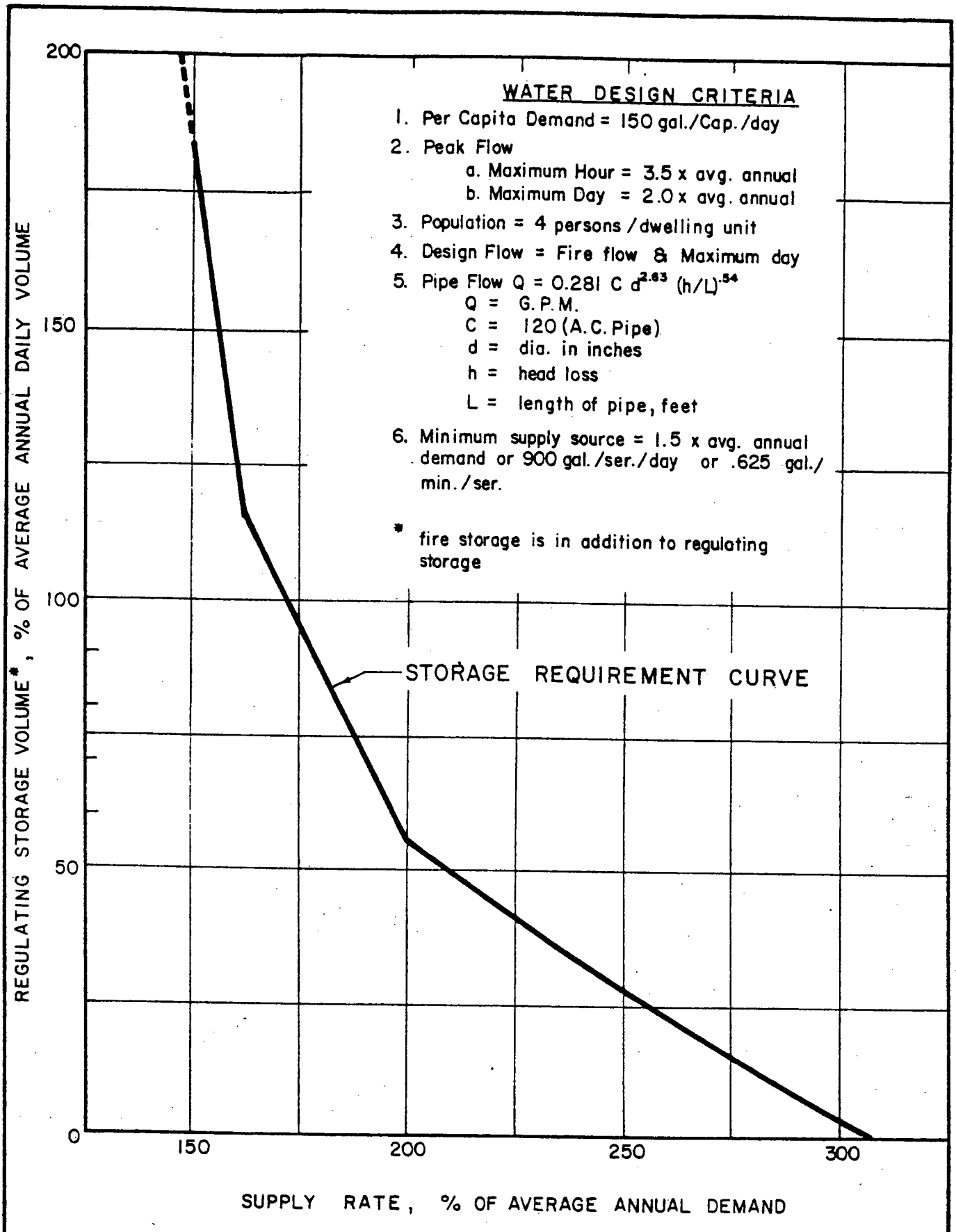
1. Hydrants shall be located to the satisfaction of the Engineer where curbs are not to be installed. The Engineer may require barricades to protect hydrants from collision.
2. In areas of prolonged freezing temperatures, barrel must be of dry type or protected from freezing.
3. In the State Responsibility Area, hydrants shall be 18 inches above grade, 8 feet from flammable vegetation, no closer than 4 feet nor farther than 12 feet from the roadway, and in a location where fire apparatus using it will not block the roadway. In addition, a reflectorized blue pavement marker, with a minimum dimension of 3 inches, shall be mounted on a fire retardant post. Said post shall be within 3 feet of the hydrant with the marker no less than 3 feet nor greater than 5 feet above established grade in a position visible from the roadway.

WATER SYSTEM STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

FIRE HYDRANT
INSTALLATION
MOUNTAINOUS AREAS

PLATE NO. WS-10

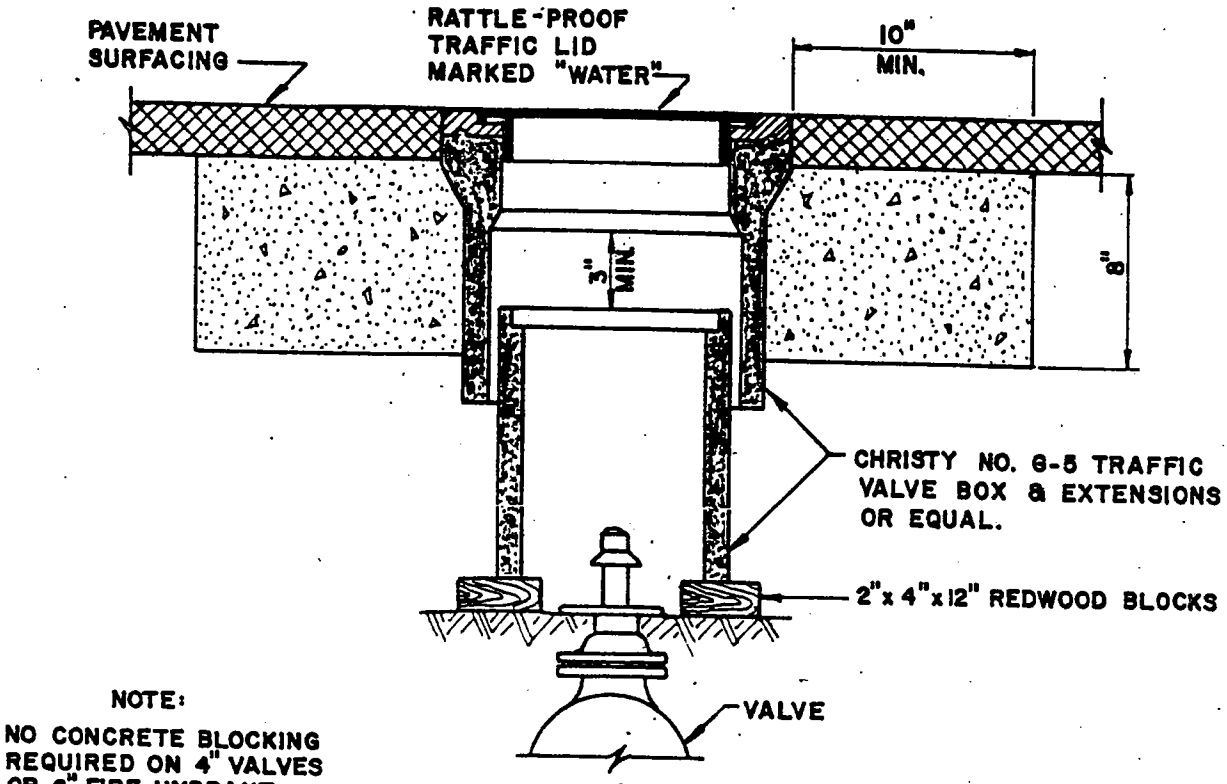


PUBLIC WATER SYSTEMS

TULARE COUNTY ORDINANCE CODE SECTION No. 7080

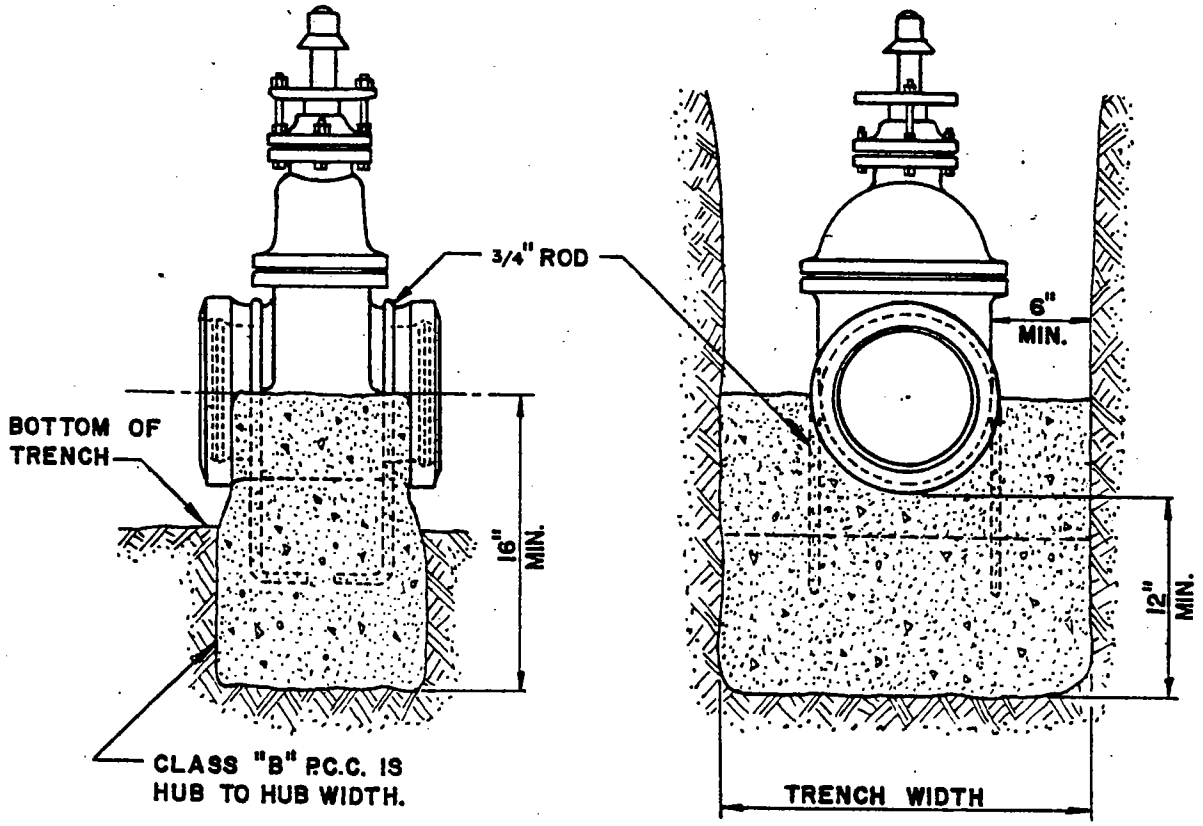
FLOW DESIGN AND STORAGE REQUIREMENTS

PLATE No. WS-11



NOTE:

NO CONCRETE BLOCKING REQUIRED ON 4" VALVES OR 6" FIRE HYDRANT VALVES.

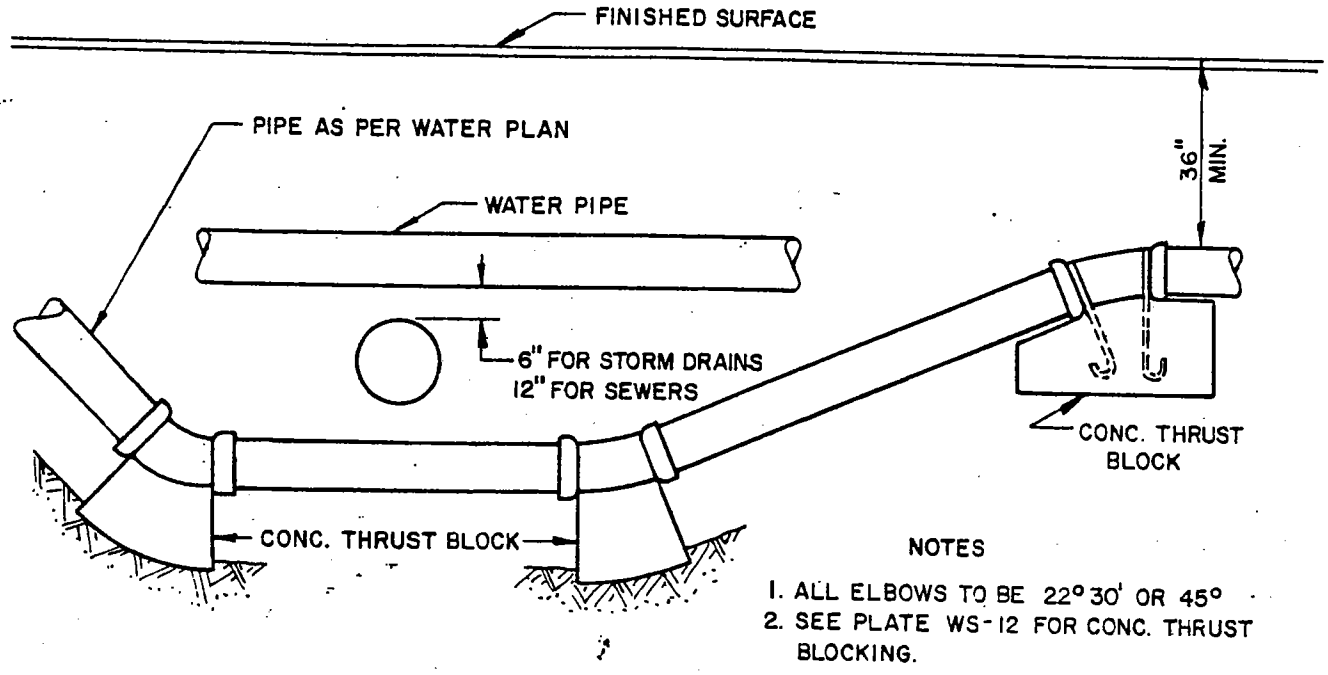


WATER SYSTEM STANDARDS

TULARE COUNTY ORDINANCE CODE SECTION NO. 7080

GATE VALVE BLOCKING & COVERS

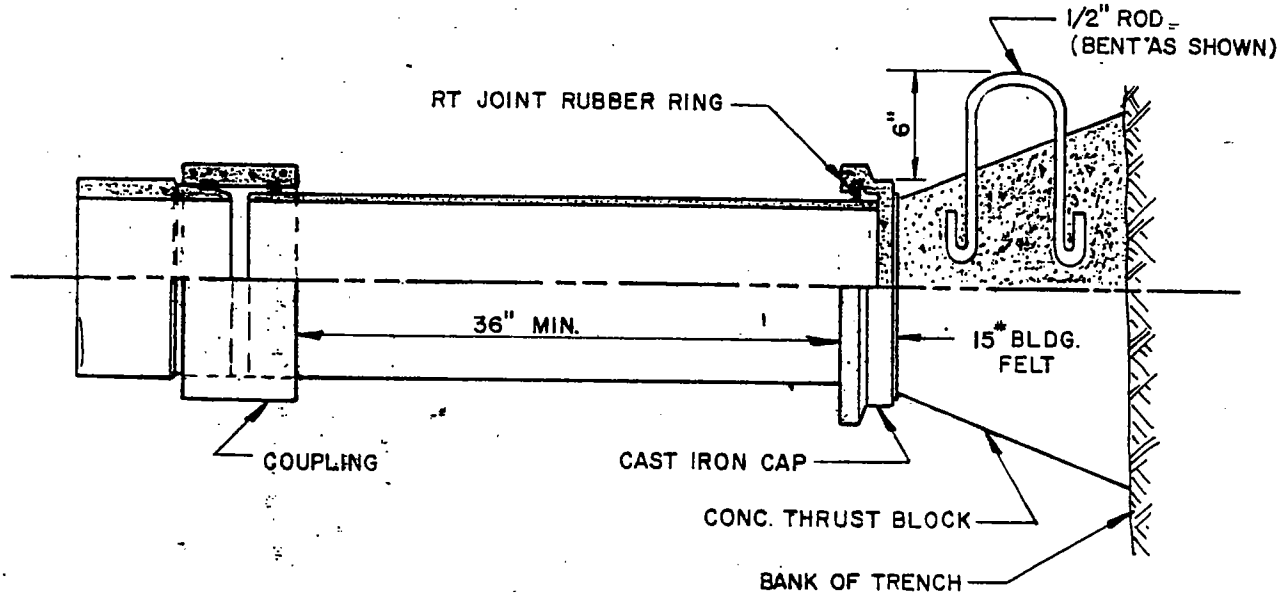
PLATE NO. W9 - 13



NOTES

1. ALL ELBOWS TO BE 22°30' OR 45°
2. SEE PLATE WS-12 FOR CONC. THRUST BLOCKING.

UNDER & OVER CROSSING DETAIL



BULL PLUG ASSEMBLY DETAIL

WATER SYSTEM STANDARDS

TULARE COUNTY
ORDINANCE CODE
SECTION NO. 7080

UTILITY CROSSINGS
AND
BULL PLUG ASSEMBLY

PLATE NO. WS-14

APPENDIX C: WATER RESOURCES
GENERAL PLAN UPDATE COUNTY OF TULARE

GENERAL PLAN

Demands for water resources within the County of Tulare (County) are met from four (4) major sources. These sources include groundwater, local streams and rivers, imported surface water and imported surface water by exchange. The purpose of this chapter is to provide an overview of those resources and their relationship to existing and projected development within the County. This overview includes the status of each of the major sources and any anticipated change in status over the planning horizon covered by the General Plan update. In addition, issues addressed include groundwater quality, groundwater overdraft and the reliability of identified surface water sources. The current status of the San Joaquin River litigation has been included and its possible implications for the future presented.

Geographically, the information in this chapter is presented by major watershed. The principal valley floor divisions are the Kings River Watershed, the Kaweah River Watershed, the Tule River Watershed and the Deer Creek/White River Watershed. Defined population centers in the foothill-mountain region has been addressed, namely, the Three Rivers corridor, the Springville corridor, the Kennedy Meadows basin, Camp Nelson and California Hot Springs. Sparsely populated areas of the County foothill and mountainous areas have not been addressed. Sequoia National Park, Sequoia National Forest, Giant Sequoia National Monument and the Tule Indian Reservation are also not specifically addressed as land use changes in these jurisdictions are not part of this General Plan update.

The Central Valley Project (CVP) supply made available through Friant Division contracts is addressed as the imported surface water supply and the federal contractor entitlements made available through the Cross Valley Canal program are discussed as the exchange surface water supply. As boundaries associated with water purveyors do not always follow watershed boundaries, the principal contractor land mass is the basis for the watershed identity.

DEFINITIONS OF KEY TERMS

- **Acre-feet**. The amount of water needed to cover one acre with one foot of water, or approximately 325,851 gallons.
- **Aquifer**. A geological formation that stores water and yields significant quantities of water to wells or springs.

- **Appropriated Right**. That right to put to reasonable beneficial use a quantity of water subordinate to the use thereof by prior appropriators and defined riparian diverters.
- **Central Valley Project.** The water supply project in California owned by the United States and managed by the Department of the Interior, Bureau of Reclamation.
- **Class 1 Water.** That supply of water stored in or flowing through Millerton Lake which, subject to defined contingencies, is available for delivery from Millerton Lake and the Friant-Kern and Madera Canals as a dependable water supply during each year.
- **Class 2 Water.** That supply of water which can be made available, subject to defined contingencies, for delivery from Millerton Lake and Friant-Kern and Madera Canals in addition to the supply of Class 1 Water. Because of its uncertainty as to availability and time of occurrence, such water is undependable in character and is furnished only if, as, and when it can be made available as determined by the Department of the Interior, Bureau of Investigation.
- **Confined Aquifer**. A water-bearing subsurface stratum that is bounded above and below by formations of impermeable, or relatively impermeable, soil or rock.
- **Groundwater Overdraft**. The condition of a groundwater basin in which the amount of water withdrawn (by pumping) exceeds the amount of water that recharges the basin.
- **Groundwater Recharge**. The natural or intentional infiltration of surface water into the zone of saturation (i.e. into groundwater).
- **Non-Transient System.** A water system serving customers who will be exposed to the water supply for an extended period of time.
- **Reasonable Beneficial Use.** This is the measure and limit of an appropriative right.
- **Safe Yield.** The maximum dependable draft that can be made continuously on a source of groundwater supply during a period of years during which the probable driest period or period of greatest deficiency in water supply is likely to occur.
- **Transient System.** A water system serving customers who will be exposed to the water supply for only a short period of time.

FIGURES

As a supplement to the text of this chapter, several figures have been developed which are presented at the end of this chapter. The figures and their relationship to the topics in the chapter presentation are as follows.

- **FIGURE 4-1 Water Resources.** The Water Resources figure has been developed to present the mountain and foothill watershed boundary information as a primary function. Shown on the figure are the locations of Lake Kaweah and Lake Success, which are operated as flood control/water conservation facilities, depending on the month of the year. Also shown is the location of Sand Creek Dam which functions solely as a flood control facility. The figure further presents the general location of major valley floor stream and irrigation distribution systems, along with the location of a few communities

and elements of the surface transportation system for reference purposes.

- **FIGURE 4-2 Valley Watershed Boundaries.** As the presentation of water resources on the valley floor is based on defined watershed boundaries, this figure has been presented to define the specific location of those boundaries.
- **FIGURE 4-3 Public Utility Districts.** Provision of defined utility services are provided to customers within many of the valley-floor unincorporated communities by public entities formed pursuant to the statutory provisions related to public utility districts. This figure provides the location and community name for each of those areas so served.
- **FIGURE 4.4 Zones of Benefit and Community Services Districts.** Prior to formation, community leaders within those unincorporated communities with defined public agency services determine the type of instrument to offer services under. This figure presents the location and name of those communities served by zones of benefit and those formed to provide services pursuant to the community services district act provisions. Information depicted on this figure identifies which of the entity structures has been chose.
- **FIGURE 4-5 California Water Districts.** Surface water provided by public entities, like domestic water, can be provided by different types of public agencies. The land areas which are served by California water districts are depicted on this figure. One of the principal features of California water districts is related to the landowner voting basis which allows for votes to be cast on a land measurement or land valuation basis.
- **FIGURE 4-6 Irrigation Districts.** The principal public entity type providing irrigation water to lands within the County is that of the irrigation district. The voting structure for this type of district is based on the one-vote principal which differs significantly from that of appurtenant to a California water district.
- **FIGURE 4-7 Groundwater Elevation Contours.** A general depiction of the elevation of groundwater above sea level is presented in this figure. The contours presented are for readings taken of elevations of unconfined aquifers. The westerly portion of the County has wells which principally are sealed through this unconfined zone and extract water from the pressurized, confined zone located below the Corcoran Clay layer. In addition to providing the information for the noted time period, the purpose of the figure is to indicate the type of information which is of available from public sources such as the State Department of Water Resources.

- **FIGURE 4-8. Average Groundwater Elevations, City of Visalia**. Of particular concern to local agencies of jurisdiction, as well as to the County, is the condition of groundwater beneath the organized communities and cities. Typical of all communities with groundwater as the principal source of supply, conversion of land from agricultural use to urban use has brought about a change in the sources supply from a conjunctive basis of surface supply and groundwater supply to one which is generated exclusively from groundwater. The impacts of such conversion where not offset by groundwater recharge mitigation measures, results in a decline in the volume of water available in the groundwater reservoir and an increase in the distance from which that groundwater needs to be mined. This figure is presented is an indication of the type of information which is available for the cities and communities located within the County.

FOOTHILL MOUNTAIN REGION

General

The predominant water supply system providing service to the foothill and mountain regions of the County is the individual system. Principal among these systems are those which utilize groundwater which is, in most cases, untreated. There exists, however, occurrences of treatment systems, which are for the most part, maintained by commercial contract service and include both transient and non-transient systems.

In order to provide background information for community planning in specific locations, this Chapter contains information on the systems associated with the areas of California Hot Springs, Camp Nelson, Kennedy Meadows, Springville and Three Rivers.

California Hot Springs

The California Hot Springs area is served by a number of small water systems, in addition to individual systems. The Campanero Oaks Mutual Water Company is the only system classified as a State small water system. The system serving the Hot Springs School is the only system classified as a non-transient system over which has County oversight. The balance of the permitted systems are all classified as transient systems and include the Deer Creek Lodge, the Quail Valley Recreation Village and the U.S. Forest Service Deer Creek/Levis Flats Center. Each of these systems utilizes groundwater as the source of supply.

With respect to quality, each of the systems complies with applicable water quality requirements. Attention is paid, on a continuous basis, as with any foothill or mountain system, to radiological test results.

Camp Nelson

The Camp Nelson Water Company diverts water from Belknap Creek for its source of supply. Once diverted, the supply is treated by means of filtration and disinfection to a level compliant with applicable state and federal drinking water standards. The system operates under a permit issued by the Department of Health Services of the State of California. In addition to being operated and monitored by trained personnel, the Company contracts with a licensed operator for operations and regulations compliance oversight.

The system operates with a storage component which offers several advantages. These include allowance for a uniform level of treatment, reliability for deliveries due to the quantity kept in storage during peak demand events and for maintaining the instantaneous diversion rate within the prescribed water rights held by the Company. The latter is a major constraining factor relative to entertainment of additional connected development.

Kennedy Meadows

Systems within the Kennedy Meadows area are classified as both individual and transient. The source of water for both types of systems are from groundwater. The transient systems report compliance with applicable state and federal drinking water quality standards.

Springville

In the Springville area, a mixture of water supply sources are utilized to meet consumer demands. For rural residential applications, the predominant source of supply is groundwater. In a limited number of cases, individual water treatment plants exist, some with maintenance oversight by commercial vendors. Some systems, like the Triple R Water Company system utilize wells for the source of supply. In several cases, development has been limited due to the limited amount of groundwater which is available and the seasonal and dry/wet cycle impacts on the dependable safe yield of groundwater wells.

This cyclic effect is addressed by the Springville Public Utility District for the Springville community area proper through the utilization of a state permitted surface water treatment facility. This facility utilizes state of the art filtration and disinfection facilities to achieve compliance with applicable state and federal drinking water standards. In addition to providing service to the customers within the Springville Public Utility District boundaries, the facilities also wheel water rights of others through the plant for delivery outside of the Springville Public Utility District boundaries. These customers include the Tulare County Housing Authority, utilizing water rights owned by the County of Tulare, riparian water rights holders along the Middle Fork of the Tule River and riparian and appropriative rights associated with the Borrer Ranch.

The Springville Public Utility District recently participated in the completion of a Watershed Sanitary Survey of the entire Tule River drainage above the Friant-Kern Canal. The report was released in August, 2005. It is also in the process of evaluating the necessity for additional treatment processes, namely clarification, in order to maintain compliance with the Surface Water Treatment Rule.

The Springville Public Utility District utilizes pre-1914 water rights conveyed to the Springville Public Utility District upon its formation. With the inclusion of both raw water and polished water storage, the diversion is maintained within the stated water right, assisted by metering of the customer base and subsequent billing by metered quantities. Water rights remain reserved for the eventual development of lands currently within the Springville Public Utility District boundaries. The remaining rights appear to be sufficient to meet the anticipated demand. Such development has been constrained since 1982 with a self-imposed sewer utility moratorium brought about by the Board of Directors in response to the lack of an adequate method of disposing of the treated wastewater stream.

Three Rivers

Service to residential and commercial users within the Three Rivers area is principally accomplished through the extraction of groundwater. This groundwater is characterized as both from deep, hard rock sources, as well as from localized alluvium associated with the forks of the Kaweah River. In some instances, principally commercial in nature, service is provided by way of the diversion of surface water which is treated to meet applicable state and federal drinking water standards. For the commercial installations, permits have been issued by the County of Tulare and compliance with operational requirements and adherence to water quality parameters are ensured by the Division of Environmental Health of the County. Water quality test results are monitored to insure compliance with applicable quality standards.

A number of single-family dwellings within the area are also equipped with point of entry water treatment units. These units have been proven to be necessary due to the quality issues related to the water available for consumption, with consumption only being tolerable following treatment. Quality parameters which are of concern are bacteriological, viral and pathogenic in nature. In addition, the impacts on plumbing fixtures and bathroom and kitchen fixture finishes are able to be minimized with the purchase and maintenance of treatment units. Another factor influencing the number and type of treatment units is the change in construction safety standards which have brought about the demise of radial spoke wells, commonly referred to as "wagon wheel" wells. The drafting of water from subterranean stream flow utilizing this type of facility,
which is no long an available option, enabled many residents to avoid searching for the groundwater available from the limited number of rock fissures.

KINGS RIVER WATERSHED

General

The Kings River Watershed has been so identified, as the dominant source of surface water to this area of Tulare County is from the Kings River. The area is predominantly agricultural in nature with many of the residents of the Kings River Watershed being employed directly in agriculture, or in agriculturally supported industries. Crops grown in the area range from permanent plantings of citrus and stone fruit, to row crops which include labor intensive truck crops. Lands within the Kings River Watershed exhibit the full range of resource utilization including lands which are able to be sustained totally on groundwater with no surface water supplement and those which rely entirely on surface water due to the lack of the availability of groundwater. In general, the majority of the lands are operated in a conjunctive use fashion, utilizing surface water, when available and resorting to the use of groundwater when surface water supplies are unavailable.

Surface Water Sources

Surface water sources in the area are predominantly from one (1) of two (2) sources. The principal source is from the Kings River, utilizing flows managed by the operations of Courtright and Wishon reservoirs in the High Sierra and by operation of Pine Flat Reservoir, located in the foothills of eastern Fresno County. The supply of water from the Kings River is made available in the County utilizing the water rights of the Alta Irrigation District. Based on the last 25 years of record, annual deliveries of the Alta Irrigation District average 163,500 acre-feet. Surface supplies are also imported into the Kings River Watershed utilizing both Friant Division and Cross Valley supplies made available by the Federal Central Valley Project. Table I presents the water contract information related to those CVP contractors which exist within the Kings River Watershed. As is noted in Table I, both of the entities importing water into the County from CVP sources serve lands located within the County, as well as lands located within Fresno County.

Groundwater Conditions

The groundwater reservoir which is appurtenant to the Kings River Watershed does not respect the political boundary between the County and Fresno County. Operations of each of the irrigation districts serving lands within the Kings River Watershed acknowledge the flow of groundwater from Fresno County into aquifers underlying the lands located within the County. The safe yield of the aquifers immediately adjacent to the foothill areas are limited, which is borne out by the nature of the allocation of surface water by the Alta Irrigation District and the increased firm contract entitlement of the Orange Cove Irrigation District. It is further borne out by the almost 2:1 ratio of surface water requested by landowners within the Hills Valley Irrigation District between contract supply and anticipated firm yield.

TABLE I: CVP Contract Quantities (1) Kings River Watershed

Entity	Friant Division		Cross Valley	
	Class 1	Class 2	FT-A (2)	FT-B (3)
Hills Valley I.D. (4)	0	0	6,259	0
Orange Cove I.D. (4)	39,000	0	0	0

(1) All quantities in acre-feet.
(2) Fresno-Tulare "A" Group contractor.
(3) Fresno-Tulare "B" Group contractor.
(4) District serves lands in Fresno County and Tulare County.

Safe yield typically increases with increasing distance from the foothills, however, withdrawals in excess of safe yield also increase, as a general rule, within increasing distance from the foothills. The static levels of groundwater within the Kings River Watershed exhibit a gradual decline, with time. For this reason, the Groundwater Management Plans of each of the entities within the Kings River Watershed emphasize conjunctive use operations and the entities each actively pursue groundwater recharge as a function of the management aspects of the adopted Groundwater Management Plans. These plans include policies to encourage recharge where conditions are conducive to such recharge efforts and to allow for delivery of surface water to areas which are not able to enjoy such recharge conditions. The principal purpose of plan policies is to abate the general decline in the amount of water in storage in the groundwater reservoir and associated static levels.

Water Quality

No single expression satisfies the water quality conditions which exist within the Kings River Watershed. In general, groundwater along the immediate fringe of the foothills tends to be high in nitrates and, in certain cases, radiological parameters. Naturally occurring contaminants are reduced in their intensity as flows extend onto the valley floor, due principally to the influence of recharge of surface water which, for the most part, is absent any naturally occurring contaminants.

Contamination problems which are experienced, once groundwater is a reasonable distance from the foothill fringe, are generally man-induced. Contaminants include those associated with fertilizers, pesticides and herbicides, many of which have been banned with residual effects now remaining. The presence of fertilizers in some samples exists due to application timing issues, as well as infrequent occurrences of over application. There are no communities which are not impacted, to some degree, by either naturally occurring or man-induced contamination within this watershed.

Project Development Considerations

There are a number of projects in stages of investigation and/or development which could play a role in the future planning efforts of the County. The first of these are the coordinated efforts of Fresno County and Tulare County surface water entities in conjunction with specific cities, in a collaborative identified as the Integrated Regional Water Management Plan for the Kings River Basin. This collaborative covers efforts in Fresno County, Kings County and Tulare County. Of principal impact on Tulare County planning issues is the groundwater recharge efforts of the Alta Irrigation District which is in the implementation stage for some projects and in the planning stages for other projects, all designed to increase the amount of water being recharged into the area south of Avenue 384 and extending between Highway 99 on the west and Road 80 on the east.

In addition to these efforts, the Alta Irrigation District has entered into a Memorandum of Understanding with the Cutler Public Utility District and the Orosi Public Utility District for the initial evaluation of a surface water treatment plant. The evaluation which is to be conducted calls for the technical and economic feasibility evaluation of a surface water treatment plant located in proximity to the Friant-Kern Canal at Avenue 416. Utilizing water from the Kings River supplies of the Alta Irrigation District, introduced into the Friant-Kern Canal by exchange, the treatment facility would provide water to the communities of East Orosi, Orosi, Cutler and Sultana. Water could also be provided to the City of Dinuba, as currently proposed. The evaluation called for in the executed Memorandum of Understanding has just been initiated and the results of the evaluation procedures will not be available for several months. If demonstrated to be a feasible alternative, the eventual construction of such a plant would resolve the groundwater quality issues which currently exist in each of the named communities and the City of Dinuba.

KAWEAH RIVER WATERSHED

General

The principal surface water feature within the Kaweah River Watershed is the Kaweah River which combines with the uncontrolled runoff from Dry Creek as it is released from Terminus Reservoir. Terminus Reservoir impounds the Kaweah River to form Lake Kaweah. The average annual yield of the Kaweah River is 430,009 acre-feet based on 100 years of record, with the principal portion of the yield of the river being delivered in the County. Enlargement of the reservoir to 183,800 acre-feet from 142,500 acre-feet was recently completed.

The portion of Kings County which receives a surface water allocation from the Kaweah River is in the same groundwater basin as lands within the County and the deliveries are of significant importance to the overall area water management efforts. Additional surface water is introduced into the Kaweah River Watershed as a result of CVP deliveries to entities located within said

Watershed. These entities are listed in Table II and include both long-term Friant Division CVP contractors, as well as Cross Valley contractors. Currently, the City of Visalia exchanges their CVP Cross Valley contractual supply with the Hills Valley Irrigation District, with the City making use of Kaweah River supplies held by a grower within the Hills Valley Irrigation District. The City's entitlement is delivered to lands in Hills Valley Irrigation District which are located in the northern portion of the County.

Lands in the westerly portion of the Kaweah River Watershed enjoy delivery of water from the Kings River which further augments the supply available from the Kaweah River.

TABLE II: CVP Contract Quantities (1) Kaweah River Watershed

Entity	Friant Division		Cross Valley	
	Class 1	Class 2	FT-A (2)	FT-B (3)
City of Visalia	0	0	300	0
Exeter I.D.	11,500	19,000	0	0
Ivanhoe I.D.	7,700	7,900	0	0
Stone Corral I.D.	10,000	0	950	0
Tulare I.D.	30,000	141,000	0	0

(1) All quantities in acre-feet.
(2) Fresno-Tulare "A" Group Contractors.
(3) Fresno-Tulare "B" Group Contractors.

The quality of the surface water is very high. This includes water from stream groups feeding on to the valley floor, as well as the water introduced into the Kaweah River Watershed from the Friant-Kern Canal.

Cropping patterns exhibit a stratified pattern leading from east to west beginning with a significant citrus belt extending from the lower foothills on to the valley floor. A sprinkling of olives and stone fruit threads through the citrus belt. Once temperature conditions become nonconductive for citrus, crops begin to transition into a nut and stone fruit pattern, with some interspersed vines and field crops. Extending farther to the west, dairies and lands growing crops to support the dairies begin to appear, interspersed with nut varieties and vines. On the westerly side of the Kaweah River Watershed, lands historically have been farmed to cotton along with a variety of rotational crops. With the poor returns associated with cotton, transitions to permanent plantings and higher value row crops are beginning to emerge. Depth to groundwater impacts and associated cost impacts

related energy consumption are further contributing to this shift in cropping patterns.

Surface Water Sources

As noted, the dominant surface water source for the Kaweah River Watershed is the Kaweah River and its tributaries. The Kaweah River, which is officially considered to be a tributary to the Tule River has been declared by the State Water Resources Control Board to be a fully appropriated stream. The diverters are made up of a mixture of riparian and appropriative diverters with many of the riparian diverters having agreements with the Kaweah and St. Johns Rivers Association. These agreements acknowledge which of their lands are riparian in nature and further address amounts of water which can be diverted from the Kaweah River to be put to reasonable beneficial use. The Association is comprised of two (2) associations operating in a joint manner to administer the appropriative water rights of the Kaweah River. These individual associations are the Kaweah River Association and the St. Johns River Association.

Augmenting the local supply are waters made available by the CVP contracting entities located within the Kaweah River Watershed. These entities are shown in Table II with CVP annual deliveries averaging 124,980 acre-feet. The City of Visalia exchange arrangement with the Hills Valley Irrigation District allows the City to hold their water in trust until a determination is made as to its future disposition.

Groundwater Trends

The Kaweah Delta Water Conservation District (KDWCD) recently completed a Water Resources Investigation which specifically examined the groundwater conditions within the KDWCD boundaries and the lands in reasonable proximity thereto. The report addressed groundwater conditions by specific hydrologic unit within the KDWCD, as well as on a KDWCD-wide basis. While the easterly unit showed approximate balance, computations utilizing different methodologies showed that the overall underground reservoir was overdrafted at a level of between 17,000 to 36,000 acre-feet per year. Groundwater trend information for the City of Visalia area is presented on Figure 4-8. As can be seen from an analysis of this figure, the static groundwater trend is ever decreasing, as is the corresponding quantity of water being held in storage in the groundwater reservoir. Parallel conditions exist on the westerly side of the Kaweah River Watershed, which have abated somewhat with the development of the State Water Project and the delivery of Project supplies to lands in Kings County. The delivery of the State Water Project supply has helped to abate the more serious decline in groundwater levels which were occurring in eastern Kings County prior to the availability of said supply. Said deliveries have helped to further abate the outflow of water from lands within Tulare County to lands within Kings County.

Water Quality

As with the Kings River Watershed, water quality trends within the Kaweah River Watershed change from east to west. Lands immediately adjacent to foothills exhibit elevated chloride and nitrate characteristics. As groundwater is tapped toward the central portion of the valley floor of the County, the water normally produced is of excellent quality. Anomalies occur where man-induced contamination has adversely influenced the quality characteristics. Influences from nematodecides such as DBCP, herbicides, pesticides and fertilizers all appear at certain locations within the Kaweah River Watershed, as do the impacts from industrial chemicals such as dry cleaning solvents and petroleum fuels.

Some water purveyors within the area have installed surface water treatment facilities on selected water extraction facilities, however, the principal method for dealing with contaminant-related issues is to shift to another area where water quality problems are absent. The County and the State of California conduct extensive programs of oversight for petroleum hydrocarbon contamination which is an on-going process which has further impacted the availability of groundwater for consumptive purposes in numerous locations.

Project Development Considerations

In a move unprecedented amongst San Joaquin Valley floor communities, the City of Visalia has adopted a very aggressive stance designed to abate the downward trend in static water elevations and declining quantity of water available in the groundwater reservoir. These procedures started with a Proposition 218 based process wherein $100,000 per year was authorized to be generated, at a minimum, from a customer surcharge to develop groundwater management programs, purchase surface water for recharge and purchase water rights for delivery into areas impacting the groundwater reservoir underneath the City. As an augmentation step, the City has now imposed a land-based charge on lands being converted from agriculture to urban uses to address the shift of water supply from a conjunctive use basis to that of exclusive groundwater. The funds are to be utilized for projects which address the mitigation steps required to abate the decline in the groundwater elevations beneath the City and, hopefully, over time, to reverse the trend of decline.

Additional projects are being addressed by the KDWCD, in partnership with the City of Visalia, in the development of multipurpose sites identified as Oaks Basin and Peoples Basin. These basins have the capability to function not only as groundwater recharge facilities, but also as storm water layoff facilities providing relief in the natural channels coursing through the City during precipitation and resulting runoff events.

As a further step to insure optimization of importation of water into the Kaweah River Watershed, the Ivanhoe Irrigation District and the KDWCD have entered into an agreement calling for an exchange of resources. The basics of the agreement call for dry year, low-flow rights to accrue to the Ivanhoe Irrigation District along with a component of storage behind Terminus Dam. The storage component will allow for better management of water rights of the Ivanhoe Irrigation District. In exchange, the KDWCD is to be the recipient of an assignment of a portion of the Friant Division CVP contract of the Ivanhoe Irrigation District.

In order to further augment the groundwater capabilities within the Kaweah River Watershed, the Tulare Irrigation District has entered into a reimbursement agreement with the KDWCD. This agreement was entered into in lieu of the proposed Main Intake Canal lining project of the Tulare Irrigation District and compensates for water seeping from the canal, thus rendering it unavailable for delivery and sale as surface water within the Tulare Irrigation District.

As a final management issue, the entities within the Kaweah River Watershed have joined together to manage available water supply under an Integrated Regional Water Management Plan. The participants have and are applying for funding under the provisions of Proposition 50 to further implement the specifics of the Plan. Funding announcements for the first round yielded mixed results. At the current time, the Cities of Exeter, Ivanhoe and Woodlake have requested to participate in the area-wide Groundwater Management Plan conducted by the KDWCD. Said cities have taken this step as a first step in participation in the integrated basin-wide management efforts.

TULE RIVER WATERSHED

General

The dominant natural watershed impacting the Tule River Watershed is the Tule River. As previously noted, the Tule River has been declared a fully appropriated stream by the State Water Resources Control Board. The waters of the Tule River are impounded behind Success Dam in Success Reservoir and regulated downstream for beneficial purposes during the irrigation season and according to an adopted flood control diagram during the flood control season. These waters are augmented by waters of the San Joaquin River which are imported by the Friant Division contractors located within the Tule River Watershed.

For the most part, the groundwater located underneath lands in the Tule River Watershed is managed in a conjunctive use fashion with available surface water supplies. Water quality issues parallel the circumstances associated with other lands located within the County with more communities adversely impacted by nitrate conditions than the other watersheds.

Cropping patterns parallel those within the Kaweah River Watershed with citrus and olives being the principal crops on the east side of the watershed with nuts, stone fruit and dairy support crops tending towards the mid-section. Dairies, dairy support lands and field and row crops dominate the landscape on Valley floor lands to the west.

Surface Water Sources

As noted above, the principal source of surface water available within the Tule River Watershed is the yield of the Tule River, controlled by the operations of Success Reservoir. Operation of the

reservoir during the conservation period is performed by the U.S. Army Corps of Engineers at the direction of the Watermaster of the Tule River acting on behalf of the member units of the Tule River Association. Operations during the flood control season are under the direction of the U.S. Army Corps of Engineers with entitlement and diversion issues being addressed by the Watermaster.

The average annual yield of the Tule River below Lake Success is 141,960 acre-feet based on 102 years of record. With the exception of infrequent uncontrolled winter runoff, when in-basin irrigation and spreading demands are met, the entire yield of the Tule River is put to reasonable beneficial use within the Tule River Watershed.

The local supply is augmented by the importation of Friant Division CVP water by several Friant Division contractors. A listing of those contractors and their contract amounts are presented in Table III.

In an effort to further optimize the management of water within the Tule River Watershed, several of the entities within the Watershed have organized to form the Deer Creek and Tule River Authority. Said Authority operates with both a Board of Directors and an Advisory Committee who have joined together to consider the optimization of the available water supplies, both local, as well as imported. Further, they have developed a Groundwater Management Plan which is currently undergoing its first major revision. One of the revisions being considered in the Plan is the inclusion of several of the domestic water purveyors located within the Tule River Watershed. A meeting has been held with the City of Porterville with regard to their potential interest in participation and discussions have taken place with regard to the inclusion of entities such as the Poplar Community Services District, the Tipton Community Services District and the Woodville Public Utility District. The goal is to coordinate, on a regional basis, issues related to both water quality and water quantity.

TABLE III: CVP Contract Quantities (1) Tulare River Watershed

Entity	Friant Division		Cross Valley	
	Class 1	Class 2	FT-A (2)	FT-B (3)
City of Lindsay	2,500	0	50	0
Lindmore I.D.	33,000	22,000	0	0
Lindsay-Strathmore I.D.	27,500	0	0	0
Lower Tule River I.D.	61,200	238,000	572	31,180
Pixley I.D.	0	0	572	31,180
Porterville I.D.	16,000	30,000	0	0
Saucelito I.D.	21,200	32,800	100	0
Strathmore I.D.	0	0	400	0
Tea Pot Dome W.D.	7,500	0	0	0

(1) All quantities in acre-feet.
(2) Fresno-Tulare "A" Group contractor.
(3) Fresno-Tulare "B" Group contractor.

Water Quality

The east side of the valley floor in the Tule River Watershed contains the highest population of individuals impacted by lower quality groundwater of any area within the County. From the foothill fringe, adverse groundwater quality extends into the valley floor for several miles in all locals, except for those immediately adjacent to the Tule River. As a result of these conditions, the City of Lindsay, the Lindsay-Strathmore Irrigation District and the Strathmore Public Utility District have all constructed and operate surface water treatment plants treating water from the Friant-Kern Canal. In the Lindsay area, adverse water quality parameters include chlorides, nitrates and DBCP. The number of wells constructed in this area which have been successfully designed to avoid groundwater containing these parameters are limited. In the Tonyville and Strathmore areas, where population concentrations are served by the Lindsay-Strathmore Irrigation District and the Strathmore Public Utility District, the primary groundwater contaminant is nitrate. These areas are served with potable water by surface water treatment plants operated by both public entities.

The east Porterville and Plainview areas exhibit similar high nitrate characteristics. Extensions of pipelines from the City of Porterville into the east Porterville unincorporated area have solved the problem for several customers in that area. The California Water Service Company has a system in the area and they are in the process of evaluating different methodologies to allow for compliance with the Maximum Contaminant Level for the nitrate parameter in their system. The Sunnyside School governing board chose to extend a pipeline from the Strathmore joint water treatment plant to the school to resolve their nitrate contamination problem. Just to the west, efforts are now being initiated to address the problems which exist in the Plainview community area.

It is anticipated, over time, that an increase in the number of well head treatment and surface water treatment facilities will develop in order to address the demands associated with both existing population and increased population within this area of the Tule River Watershed. Extending to the west, water quality improves to the extent that the only current concerns are those related to proposed changes in water quality parameters for radon and arsenic. These changes could lead to some systems, which are currently in compliance with all state and federal drinking water criteria, finding themselves out of compliance for one or more parameters.

Project Development Considerations

At the current time, the Groundwater Management Plan for the Deer Creek and Tule River Authority is in the process of being updated. Policy considerations relative to the update have been addressed and the draft final document is in the process of preparation. Following the adoption of the Plan revision, a determination has been made to invite domestic water purveyors in the area to consider participating in the Plan implementation which would be by way of approval and execution of a Memorandum of Understanding. Efforts are called for to jointly coordinate efforts to improve conjunctive management efforts.

The existence of the Deer Creek and Tule River Authority, the Tule River Sub-watershed of the Southern San Joaquin Valley Water Quality Coalition and joint efforts with the County of Tulare are the basis for the development of an Integrated Regional Water Management Plan. An application was recently submitted to the state for the funding of the development of such a plan. Funding was not allocated in the initial round of competition, but efforts to fund and develop that plan continue with the support of the majority of the irrigation and drinking water purveyors within the Tule River Watershed. A new application has been authorized to be prepared and submitted. Additional benefits are expected to be realized with the implementation of the seismic retrofit of Success Dam and the proposed enlargement of Success Reservoir. An appropriation of $25 million was recently announced by Congress for the seismic retrofit project. Current estimates of the time to completion range from 7 to 12 years, principally based on funding levels which are approved. Coordination with the County is also proposed with the initial efforts directed at the County's efforts to implement an improved program related to the destruction of abandoned wells.

DEER CREEK/WHITE RIVER WATERSHED

General

The Deer Creek/White River Watershed is characterized by having runoff available from local stream groups which have their origins in the lower elevations of the Sierra Nevada. As a result, the area is further characterized by having the least number of communities of any of the watersheds located adjacent to the foothill fringe and the highest dependency on imported surface water for maintenance of the viability of agricultural plantings.

Water quality issues exist on both the east and west sides of the Deer Creek/White River Watershed. The communities located along the Highway 99 axis, however, enjoy reasonably compliant water quality if wells are designed to extract water out of shallow and deep aquifers.

Cropping patterns still exhibit the long-term dry land farming characteristics along the east side of the Deer Creek/White River Watershed, but are now interspersed with plantings of citrus and nuts as a result of the availability of imported CVP water. Said supplies are made available by both the Friant Division and the Cross Valley exchange program. High value permanent plantings dominate the central part of the area, with an increasing number of dairies and associated support lands characteristics of the landscape to the west. Historically, this area was formed principally to upland cotton. The decreasing returns related to the production of cotton and the increasing costs, particularly that related to water, have resulted in significant reductions in the acreage planted to cotton over the last decade.

Surface Water Supplies

Limited and intermittent surface water is available from the flow of Deer Creek and White River. The area east of Highway 65 on Deer Creek experiences spring and early summer recharge with the channel exhibiting excellent recharge characteristics. Diversions downstream of Highway 65 natural flows are limited both in quantity and duration. In only the wettest of years do any substantial flows exist below Highway 99 and then, flows often result in property damage as a result of their intensity and duration.

As its watershed origins are lower than that of Deer Creek, coupled with its more southerly location, White River offers limited reliability for agricultural purposes. The upper part of the White River Watershed has historically been dry farmed, with the exception of a few areas where the groundwater reservoir is stronger in nature due to intermittent recharge from White River.

Dependable surface water for the Deer Creek/White River Watershed only became available with the construction of the Friant Division of the CVP. Contracts issued as a result of the construction of the Friant Dam and the Friant Kern Canal were designed to abate the overdraft which was occurring

in the area and, in some cases, to reverse the declining groundwater trend. Contracts were originally issued for a 40-year period of time for the Friant Division contracts and for a 20-year period, beginning in 1975, for the Cross Valley contracts. Contract quantities for these respective contracts are presented in Table IV. Due to weak natural groundwater conditions, the majority of the agricultural development within the Deer Creek/Tule River Watershed is dependent on surface water supplies for its long-term viability. In some cases, this supply demand is satisfied by the yield of the Tule River, in some cases by the federal CVP contracts and in other cases, a combination of the two. Areas relying principally on surface water have also, in some cases, made arrangements to bank within the boundaries of other Friant Division contractors who have conjunctive use capabilities in order to provide a reliable dry year source of supply.

Lands developed along the Highway 65 corridor located to the east of the long-term Friant Division contractor lands and extending into Kern County were dependent originally on groundwater as their supply source. As this supply proved to be incapable of sustaining the development which had occurred without severe overdraft conditions and adverse water quality conditions developing, the opportunity arose to contract with the Federal Government for a supply of water from the Sacramento-San Joaquin Rivers Delta. The contracts which were entered into were accomplished in conjunction with the construction of a canal and appurtenant pumping facilities extending from the California Aqueduct near Tupman and to the end of the Friant-Kern Canal at its terminus with the Kern River. This "cross valley" canal facility was financed by local Kern County and Tulare County entities with a small increment of capacity for future foothill and mountain development purchased by the County of Fresno. The initial 20-year long-term contract has been replaced with a series of Interim Renewal Contracts pending renegotiation of the long-term contract position. Draft long-term contract instruments are currently on the negotiating table.

TABLE IV: CVP River Quantities (1) Deer Creek/White River Watershed

Entity	Friant Division		Cross Valley	
	Class 1	Class 2	FT-A (2)	FT-B (3)
Atwell Island W.D.	0	0	50	0
Alpaugh I.D.	0	0	100	0
Delano-Earlimart I.D. (2)	108,800	74,500	0	0
Frasinetto Farms, LLC	0	0	400	0
Kern-Tulare W.D. (4)	0	0	40,000	0
Rag Gulch W.D. (4)	0	0	12,500	0`
Styro-Tek	0	0	45	0
Terra Bella I.D.	29,000	0	0	0

(1) All quantities in acre-feet.
(2) Fresno-Tulare "A" Group contractor.
(3) Fresno-Tulare "B" Group contractor.
(4) District serves lands in Kern County and Tulare County.

Within the boundaries of the County, contracts for Cross Valley supplies were initially entered into by several districts located in the Deer Creek/White River Watershed which are no longer participants. Entities such as the Hope Water District and the Ducor Irrigation District held contract positions for several years. A final determination was made that the mechanisms to deliver water from the Friant-Kern Canal were financially insurmountable and long-term assurances of the reliability of the base supply were not conducive to assurances required by some entities for long-term debt instruments. The supply rights and obligations associated with their original contract quantities were assumed by other entities within the County with a small quantity being assigned to the Tri-Valley Water District, located in Fresno County.

The alluvial plain of Deer Creek is comprised of a high fraction of sand. As such, recharge characteristics into the shallow zone aquifers are excellent and water available from those zones is of relatively high quality and at reasonable depths. The Terra Bella Irrigation District has a significant well field located on the Deer Creek alluvial fan located easterly of Old Stage Road. This well field provides the principal supply of water to the Terra Bella Irrigation District customers during periods of outage of the Friant-Kern Canal. This well field has recently been augmented by the modification

of facilities necessary to store water in the prism of the Friant-Kern Canal during periods of canal outage for maintenance purposes.

The recharge characteristics of the Deer Creek fan have also been the focus of a joint groundwater recharge facility located on lands adjacent to the current alignment of Deer Creek and operated by the participating entities in the Deer Creek and Tule River Authority. Said facilities lie adjacent to the Friant-Kern Canal and allow the participating districts, all CVP contractors, to introduce water from the Friant-Kern Canal into the spreading basin area for groundwater augmentation. A separate agreement exists between the participating entities as to the allocation of costs associated with the facilities.

The natural channel of Deer Creek downstream from the Friant-Kern Canal is also utilized by the Saucelito Irrigation District for recharge purposes. When spring contract flows are available to the Saucelito Irrigation District, in excess of irrigation demands, the supply is used for recharge with the Deer Creek channel being the principal facility which is utilized for said purposes.

On the White River channel, similar procedures are utilized by the Delano-Earlimart Irrigation District. As the overall recharge capabilities away from the Deer Creek and White River channels are limited due to geologic characteristics, the channels have become the primary focus for recharge activities. The Delano-Earlimart Irrigation District has augmented the White River channel capabilities with the purchase of property adjacent to White River at its intersection with Road 72 and has constructed approximately 80 acres of recharge facilities at that location. Water can be introduced into the groundwater recharge basin either by gravity flow from White River or by introduction from one of the entity's distribution laterals which historically delivered supplemental surface water supply from the Friant-Kern Canal to the property when it was farmed.

Due to the limited recharge capabilities within the area, the Friant Division CVP contract issued to the Delano-Earlimart Irrigation District obligated a significant quantity of water on a firm basis to the area. Said district currently has underway an evaluation of alternative strategies to further optimize the management of available supplies.

Groundwater Trends

The Pixley Irrigation District, the Alpaugh Irrigation District and the Atwell Island Water District are all Cross Valley contractors located in the Deer Creek/White River Watershed. Participation in this CVP contracting program was to be supplemental to participation in the Mid-Valley Canal program, which is currently in an inactive status due to the lack of available supply for long-term contracting. These entities utilize long-term relationships with existing long-term Friant Division CVP contractors located in the area, whose principal purpose in contracting with these entities is to reduce the impact of groundwater withdrawals by adjacent non-Friant Division contractors on their landowners. The delivery of temporary supplies available on a surplus basis from the yield of the San Joaquin River assists in abating further groundwater decline in this area. Out migration of the groundwater supply from entities like the Lower Tule River Irrigation District to the north, the Porterville Irrigation District and the Saucelito Irrigation District to the east and the Delano-Earlimart Irrigation District to the south is also reduced.

There also exists a fairly substantial percentage of the Deer Creek/White River Watershed which receives no surface water supply allocation. This area extends generally from Road 120 on the east to the easterly boundary of the Alpaugh Irrigation District and from the County line on the south to the Pixley Irrigation District boundary on the north. Agricultural development within this area has been sporadic depending on commodity returns. An increasing number of acres in this area have been purchased by the state and federal governments for habitat preservation and restoration purposes. For the most part, species targeted to benefit from these efforts are not dependent on the existence of significant quantities of water, as would be migratory waterfowl. Given the focus of the federal government in the Alpaugh area, it is anticipated that, should this trend continue, demand for a significant reliable surface water source will continue to diminish.

Groundwater Quality

The groundwater quality characteristics appurtenant to the Deer Creek/White River Watershed vary from east to west. In general, water quality on the east side of the valley floor of the County in this area is characterized by diminished quality where nitrates, phenols and salts are present in different concentrations and in different locals. As a result, the Terra Bella Irrigation District has embarked on a program of initially installing a surface water treatment plant and then, on a continuing basis, constructing an ever expanding distribution system allowing for the capability of delivery of water meeting current federal and state drinking water standards to areas which previously did not have certified potable sources available or to augment limited groundwater supplies. South of this area, drilling and development of wells with a design capability to select water from identified aquifers meeting current drinking water standards is the common approach. Quantities are, however, limited under this paradigm, as taking water from too shallow of a zone, or from too deep a zone, results in significant diminishment of the quality to be delivered.
Water quality trends going to the west from this area improve considerable with communities

systems along the axis of Highway 99, such as those of the Pixley Public Utility District and the Earlimart Public Utility District, experiencing no problems with the capability to deliver a potable supply of water. Other than elevated temperature conditions in Earlimart, the supply meets all current state and federal guidelines. The reliance of this area, as to safe yield of groundwater, on imported water supplies cannot be understated. In the early part of the last century, groundwater was available throughout the Highway 99 axis and westerly from there on an artesian basis. Tapping the confined aquifers below the deep clays yielded water which could be delivered to the surface without the assistance of mechanical means. Continued extractions of water eliminated the artesian characteristics and, with the development of the deep well turbine pump, the capability existed to draft water from ever increasing depths which have become characteristic of this area. Absent the imported CVP supplies, groundwater depths would reach levels where current commodity returns would not allow for economic recovery.

On the westerly side of the Deer Creek/White River Watershed, groundwater quality again declines into unacceptable conditions. Principal among these conditions are elevated levels of arsenic and microsand conditions requiring special drilling techniques and/or well head treatment to allow compliance with applicable standards. Many of these wells produce various gases including hydrogen sulfide, methane and natural gas, further aggravating the capability to deliver a potable supply. Recent efforts in the Alpaugh area have demonstrated that the microsand and hydrogen sulfide characteristics can be successfully managed through controlled drilling techniques. The reduction in the allowable level of arsenic appears to require treatment facilities to be installed as all arsenic characteristics of intercepted aquifers appear to exceed the new drinking water standard for the arsenic parameter. Continued research is occurring into a determination of whether or not an affordable method of arsenic reduction can be developed.

Project Development Considerations

As previously noted, the Delano-Earlimart Irrigation District, initially in cooperation with the Metropolitan Water District of Southern California, has initiated an evaluation of alternative water management strategies. These strategies are designed to allow the District to address the lack of capability of groundwater recharge on a District-wide basis, as well as to address the continuing conversion of lands from annual crops to permanent crops. The reliability of supply required by permanent crops is obviously more significant than that associated with annual crops.

Considerable planning is underway relative to development proposals along the Highway 99 corridor in the Deer Creek/White River Watershed. The maintenance of the groundwater reservoir through this area is dependent, as previously noted, on the continued capability to have available surface water sources available for delivery into the area. The impact of current litigation on the availability of surface water to the area remains in question at the time of the preparation of this chapter. Natural recharge of the groundwater reservoirs underlying the communities of Earlimart and Pixley is insufficient to sustain the agricultural plantings in the area and the community water systems. This was the case prior to the introduction of the Friant Division CVP water to the subject

area. The case would even be stronger today as additional plantings exist in proximity to the communities, the plantings are predominantly permanent in nature as compared to annual crops and the community demands are greater than existed prior to the delivery of Friant Division CVP supplies. As the outcome of the litigation is currently unknown, the development of a response plan to address reduction of surface water deliveries to the area remains to be developed, if necessary.

LEGISLATIVE DRIVERS

Several issues related to water resources are currently in early stages of development which are principally legislatively driven. Additional legislation is not only currently being proposed, but is anticipated to continue to be proposed in the future, all of which have influence with respect to General Plan efforts. At the current time, there are three (3) topics which are in this category. These topics are those of integrated regional water management planning, water quality and reliability of supply for subdivisions greater than 500 units. A discussion of each follows.

Integrated Regional Water Management Plans

Aside from the stratospheric an inconsequential water resources planning which takes place at the state level, the vast majority of water resources planning has been accomplished at the local level. Given the ever increasing population of California and the shifting of population concentrations to arid and semi-arid areas of the state, attention is now being given to planning on a more regional basis. The state is directing these efforts and is controlling the process utilizing the grant proceeds of state bond actions to affect that control. Funds have been offered for both the development of Integrated Regional Water Management Plans, as well as for implementation of projects in areas where plans have already been developed. Historically, these funds were administered by the Department of Water Resources with a developed set of criteria and an evaluation process designed to balance allocation of funds statewide. A planning grant has been awarded to the Kings River Watershed to develop and Integrated Plan for areas covering the Kings River Watershed in the counties of Fresno, Kings and Tulare. An application for development of a similar plan has been submitted by the entities in the Tule River Watershed, however, they were unsuccessful with their application in the last round. The Kaweah River Watershed has been determined to have in place, an acceptable Integrated Regional Water Management Plan. Their application for program implementation ranked high in the evaluation performed by the Department of Water Resources. A supplemental evaluation process was imposed on these applications, however, with the evaluation being performed by the State Water Resources Control Board. The results of their evaluation prevailed over those of the Department of Water Resources and no implementation funds were awarded in Tulare County. This was due to a determination that there were no "Issues of State Concern" incorporated into the proposed programs. The topic of Integrated Regional Water Management Plan is noted herein as this appears to be the pathway for the award of state-based funding related to water resources for the coming years. The fact that a determination has been made at the state level that high priority issues on a local level are of no significant consequence on

a state-wide level is of significant importance. The absence of any infusion of state bond money related to water resources into the county will significantly curtail both planning and implementation efforts as the county strives to deal with the demands imposed by increasing population on the available water resources. Attempts are currently being made to attempt to understand the criteria of the State Water Resources Control Board and to work at the legislative level to remedy priorities which appear to be tailored to only discreet areas of the State.

WATER QUALITY

The issue of water quality has been noted several times previously in this chapter, most notably related to established state and federal drinking water standards. Considerable legislative activity is currently taking place with respect to water quality issues related to agriculture, municipal and industrial consumptive demands.

On the agricultural side, the Regional Water Quality Control Board has taken action to terminate the 20 year agricultural water quality waiver for the Central Valley and has replaced the long-term waiver with a short-term waiver. As a result of the revisiting of this issue, individuals with both agricultural discharges and storm water discharges from agricultural lands and confined animal facilities have found themselves in a position of a choice of compliance between requesting an individual waiver, requesting individual discharge requirements or joining with other participants in watershed coalition efforts. The majority of the valley floor portion of the county is covered by the Southern San Joaquin Valley Agricultural Water Quality Coalition. Sub-watersheds of the Coalition exist for all areas of the County, with exception of the southwesterly corner. Whether the Coalition and the designated sub-watersheds can survive the significant modifications which are proposed to the Waiver program, remains to be seen. Water quality sampling, testing and reporting are now all required at identified points on waterways within the County as a result of the short-term Waiver compliance requirements. Current participation levels do not include all potential dischargers and the question remains whether or not the Waiver format will survive into the future. When combined with storm water requirements, compliance efforts are expensive on a Coalition basis, however, are even more expensive on an individual basis. Regulatory compliance is mandated and the decision pathway afforded to agricultural operators within the County is fought with compliance pitfalls and expensive testing and reporting requirements. At the current time, the legislative push related to agricultural compliance appears to be in the favor of increased testing and reporting.

With respect to municipal and industrial criteria, legislative and regulatory requirements are also tending to dictate decreasing quantities of allowable constituents and increased testing and reporting requirements. As an example, the Maximum Contaminant Level for the Arsenic parameter was recently reduced from 50 ppb to 10 ppb. This has caused noncompliance in communities such as Alpaugh where two wells were recently drilled with the most current technology, both in compliance with the old standard and both out of compliance with the new standard. Compliance brings increased costs related to construction of removal facilities, operation of those facilities and for compensation for trained and licensed operators qualified to oversee the operations of such removal

facilities. Similar impacts exist for the DBCP parameter where the historic standard was 2.0 ppm and a change in standard brought about a reduction to 0.20 ppm. This has resulted in a number of communities within the County having facilities out of compliance with the required standard and seeking alternative ways of dealing with the compliance requirement.

The planning efforts of the County should recognize the water quality implications related to the parameters noted above and the nitrate parameter in planning for the maintenance of an expansion of cities and unincorporated communities which are the topic of this General Plan.

Water Quantity Requirements

As a direct result of legislation, local planning agencies are required to obtain proof of availability of an adequate water supply for any subdivisions which are proposed in excess of 500 units. While different methodologies exist for providing the compliance assurance, the philosophy behind the legislation has taken hold within the County with the City of Visalia taking proactive steps to abate the decline in available groundwater and the associated overdraft conditions which are demonstrated by a review of Figure 4-8. Similar steps are being initiated by the City of Tulare to address groundwater conditions existing beneath their planning area. These efforts are in addition to the efforts which historically have taken place in conjunction with the Kaweah Delta Water Conservation District. These efforts extend the intent of the legislation applicable to subdivisions of greater than 500 units to all levels of development. It remains to be seen whether the philosophy exhibited by the cities of Tulare and Visalia will extend to other cities within the County with respect to overdraft mitigation requirements.

SAN JOAQUIN RIVER RESTORATION

The following section of this appendix is designed to address the potential impacts of alternative outcomes to the San Joaquin River restoration litigation. An examination of the tables in this appendix gives indication of the importance of the Friant Division of the CVP to the lands within the County. Class 1 contractual supplies available to contractors located within the County total 404,900 acre-feet annually. Class 2 supplies total 565,200 acre-feet annually. Of the average annual yield of the San Joaquin River allocated to Friant Division contractors, approximately 1,000,000 acre-feet is delivered to lands and municipalities within the County.

In 1988, a lawsuit was filed by the National Resources Defense Counsel (NRDC), representing an environmental coalition, alleging, amongst a multitude of issues, that the U.S. Bureau of Reclamation was in violation of Section 5937 of the Fish and Game Code of the State of California. The basis of the argument was that the historic adronamous fishery below Friant Dam had not been maintained, as prescribed by the referenced statute, in a good condition and, in fact, had been extirpated. The case, now referred to as NRDC v Rodgers, with Mr. Kirk Rodgers being the recently retired Regional Director of the Mid-Pacific Region of the U.S. Bureau of Reclamation, was to proceed to trial in Federal District Court on February 14, 2006. The action

was delayed to June 19, 2006, to allow for settlement discussions to continue. The principal issues to be dealt with in this phase of the trial were the compliance requirements associated with Section 5937 and the remedy associated with the restoration of the San Joaquin River if the judge determined that course of action was required. Judge Karlton is the federal magistrate who has heard the case, thus bringing rise to continued references to the potential "Karlton decision." Decisions made to date based on motions for summary judgment by the plaintiffs have, for the most part, been decided in their favor, including issues related to Endangered Species Act and National Environmental Protection Act compliance procedures related to the Friant Division long-term renewal contracts. Judge Karlton has ruled that the actions taken precedent to entering into the long-term contracts were inadequate, but has yet to rule on the disposition or the remedy related to the contracts.

Restoration of the San Joaquin River, as called for in the plaintiff's pleadings, was to be based on the restoration of a spring run salmon fishery to the San Joaquin River extending to the foot of Friant Dam. Experts on each side of the litigation differed in their opinion with respect to both the quantity of water which will be necessary to restore a spring run salmon fishery to the San Joaquin River and the resulting impacts which the withdrawal of water from the Friant Division contractors will have if the decision is rendered in favor of San Joaquin River restoration. Information contained in the Expert Report of Richard M. Moss, P.E., in his representation of the Friant Division contractors in the referenced litigation provides estimates of the degree to which water deliveries could be potentially reduced to County lands as a result of a decision to provide flows for San Joaquin River restoration purposes. While it should be recognized that the quantity impacts noted in said testimony are but one scenario of several, their purpose is to provide information related to the litigation and its potential impacts. In this fashion, a more informed basis can exist on which to make land use planning decisions. It was estimated that, through trial and appurtenant appeals, a decision may not be final for a period of five (5) to seven (7) years.

Parallel to the litigation process, settlement discussions were conducted based on an invitation from Congressman George Radanovich and Senator Diane Feinstein. Two (2) representatives from both the plaintiff and Friant Division contractor perspectives have negotiated a settlement which requires federal legislation to be implemented. It should be noted that the settlement process, if implemented, will have some degree of impact on the available water supply to Friant Division contractors in all but above-normal years. The degree of impact will be in direct response to the success in implementing the water management goal. Impacts on lands located within the County will still be experienced, even in the above-normal years, as the allocation of water to the San Joaquin River will result in the reduction in surplus water deliveries to those entities located within the County who traditionally contract for and take delivery of such surplus supplies.

From a planning perspective, the potential impact on the surface water resources available to the lands within the County will be, on one extreme, directed impact, should the settle pursuant to the existing Settlement Agreement. On the opposite end of the spectrum, a judgment bringing rise to release of water down the San Joaquin River for anadromous fisheries restoration purposes could

bring about a reduction in available surface water supplies with a potential initial reduction in contract supplies in an average year of 450,000 acre-feet, plus the elimination of surplus water deliveries to temporary contractors located within the County. This bookend could move further in an adverse direction with respect to impact over time, if the decision is made by the court to include adaptive management provisions in the restoration program. Such action could eventually require more water to be released for restoration purposes than the initial bookend.

Due to the fact that the litigation has yet to run its course, the exact outcome is currently unknown, as are the resulting impacts. The potential exists for a court decision to impact projected development and to potentially and completely undermine the existing population projection basis. Future refinement of the impact conclusions will be required at such time that a final court decision is entered. Rendering of an adverse opinion or implementation of settlement will bring rise to dramatically different conclusions. Given that a decision has yet to be rendered, it is not possible at the current time to determine the ripple effect which an adverse court opinion may have on communities not otherwise impacted by the degree of surface water importation. There is no possible way of providing an estimate of those impacts at the current time other than to indicate that both settlement and an adverse court decision will considerably modify the status quo.

WATER RESOURCES GENERAL PLAN UPDATE COUNTY OF TULARE

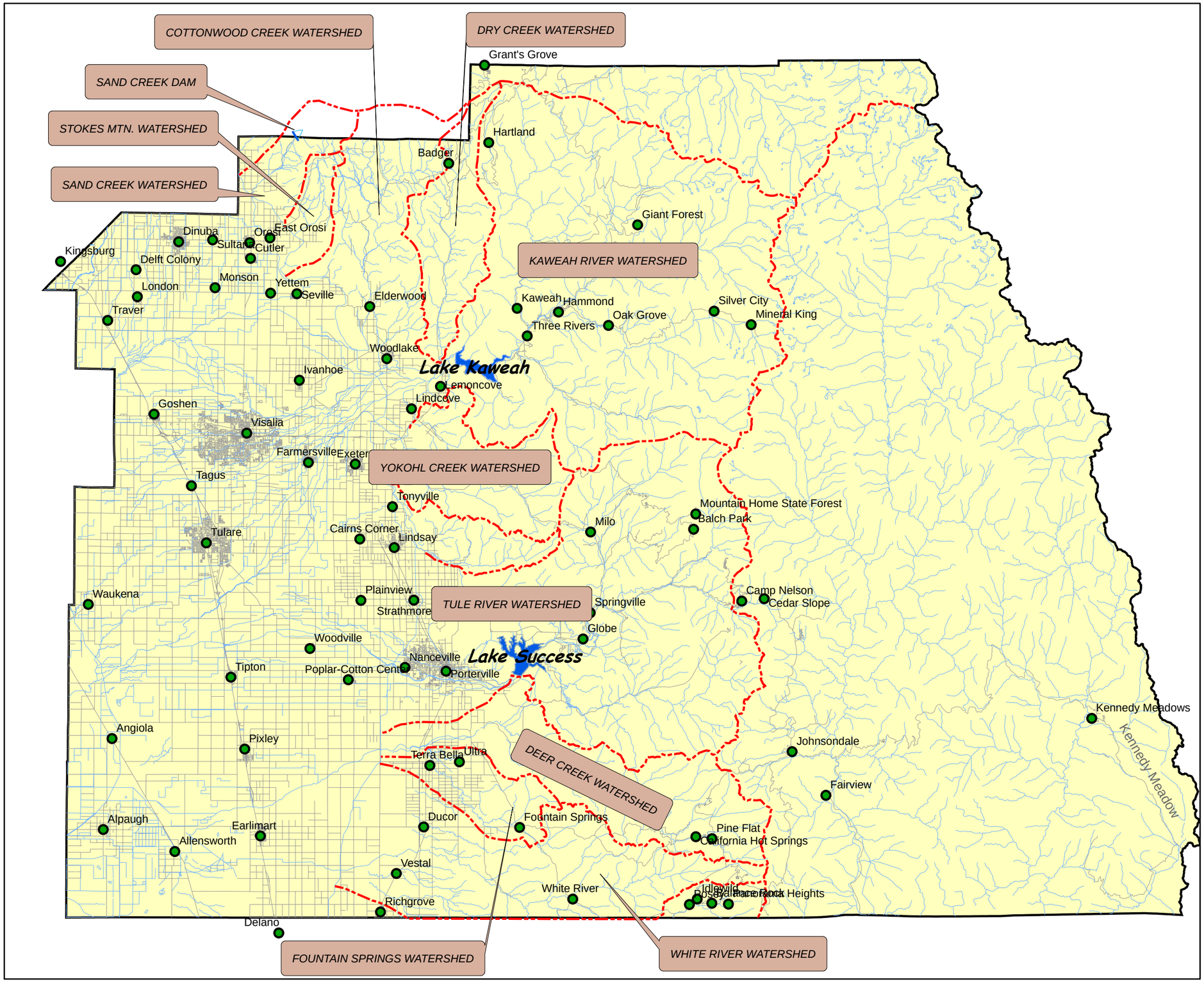
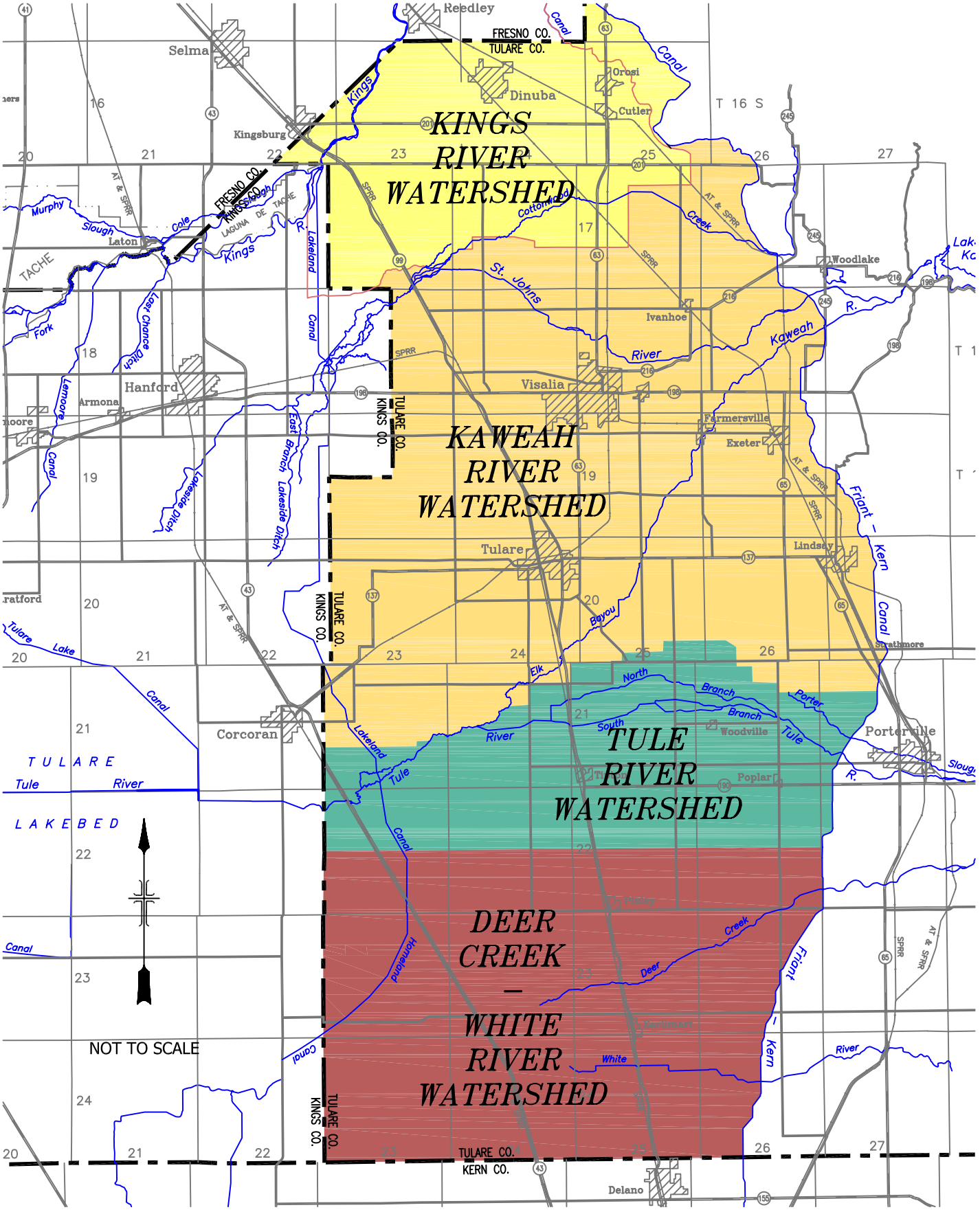
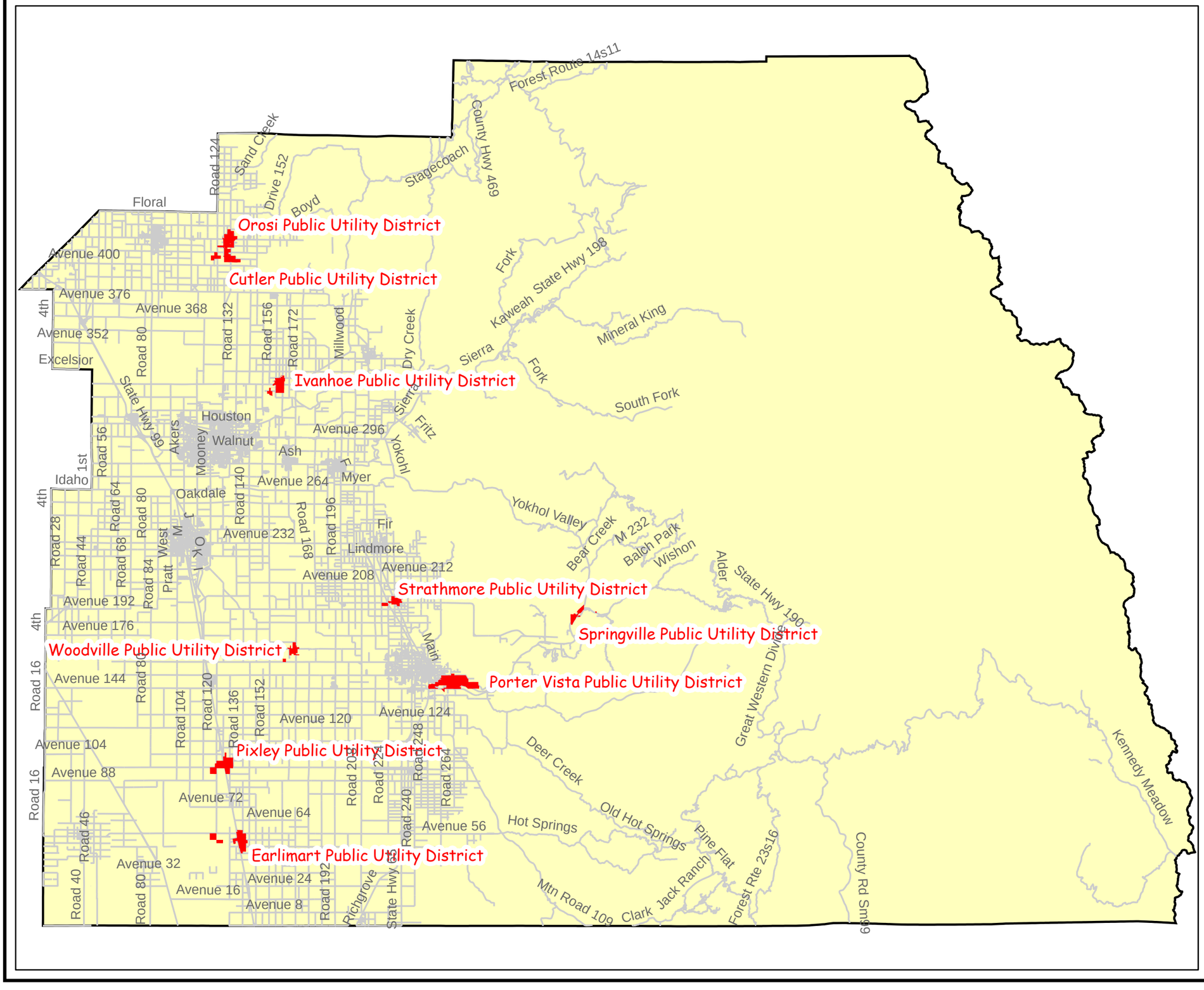


FIGURE 4-2



VALLEY WATERSHED BOUNDARIES

PUBLIC UTILITY DISTRICTS
GENERAL PLAN UPDATE
COUNTY OF TULARE

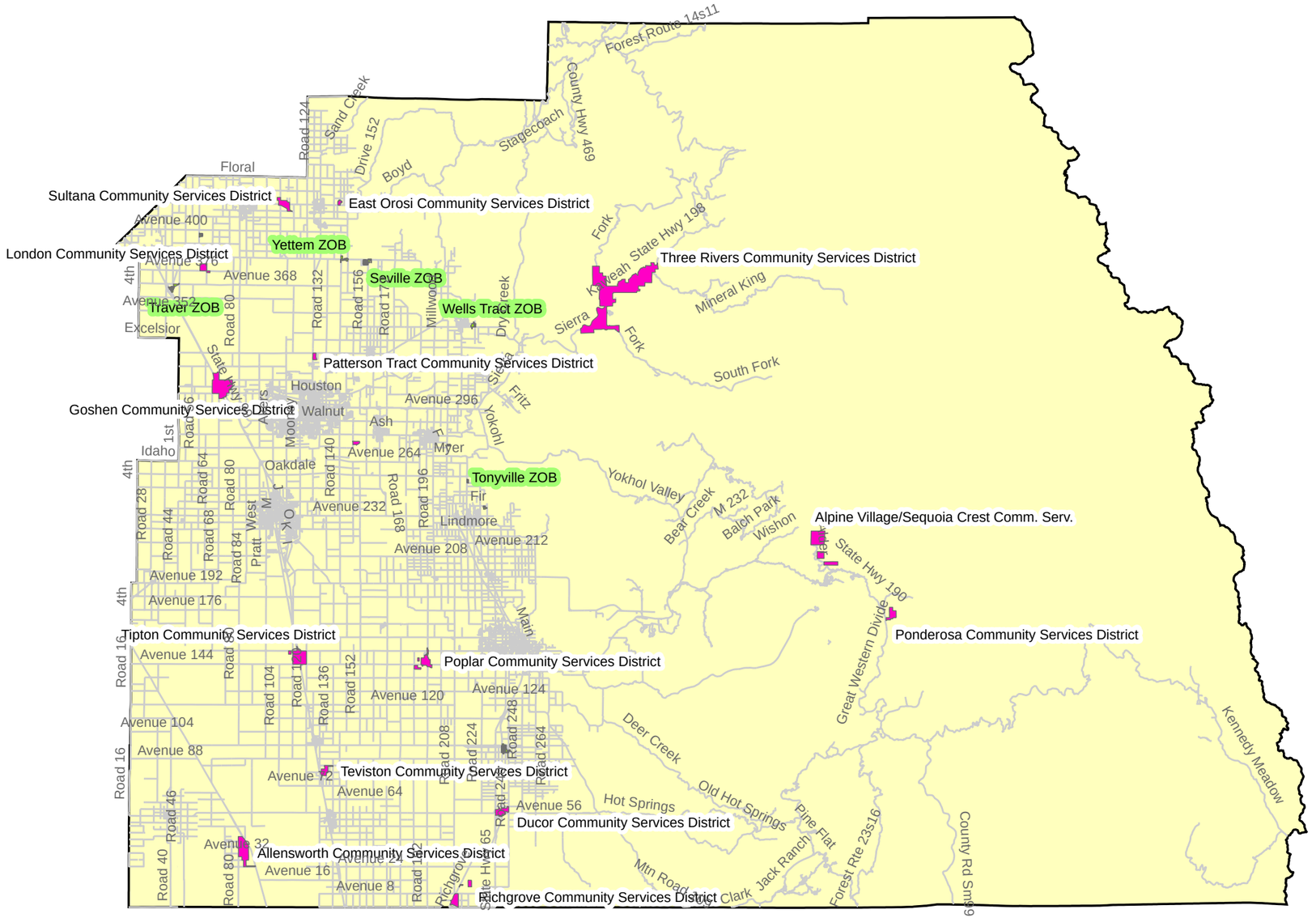


Legend

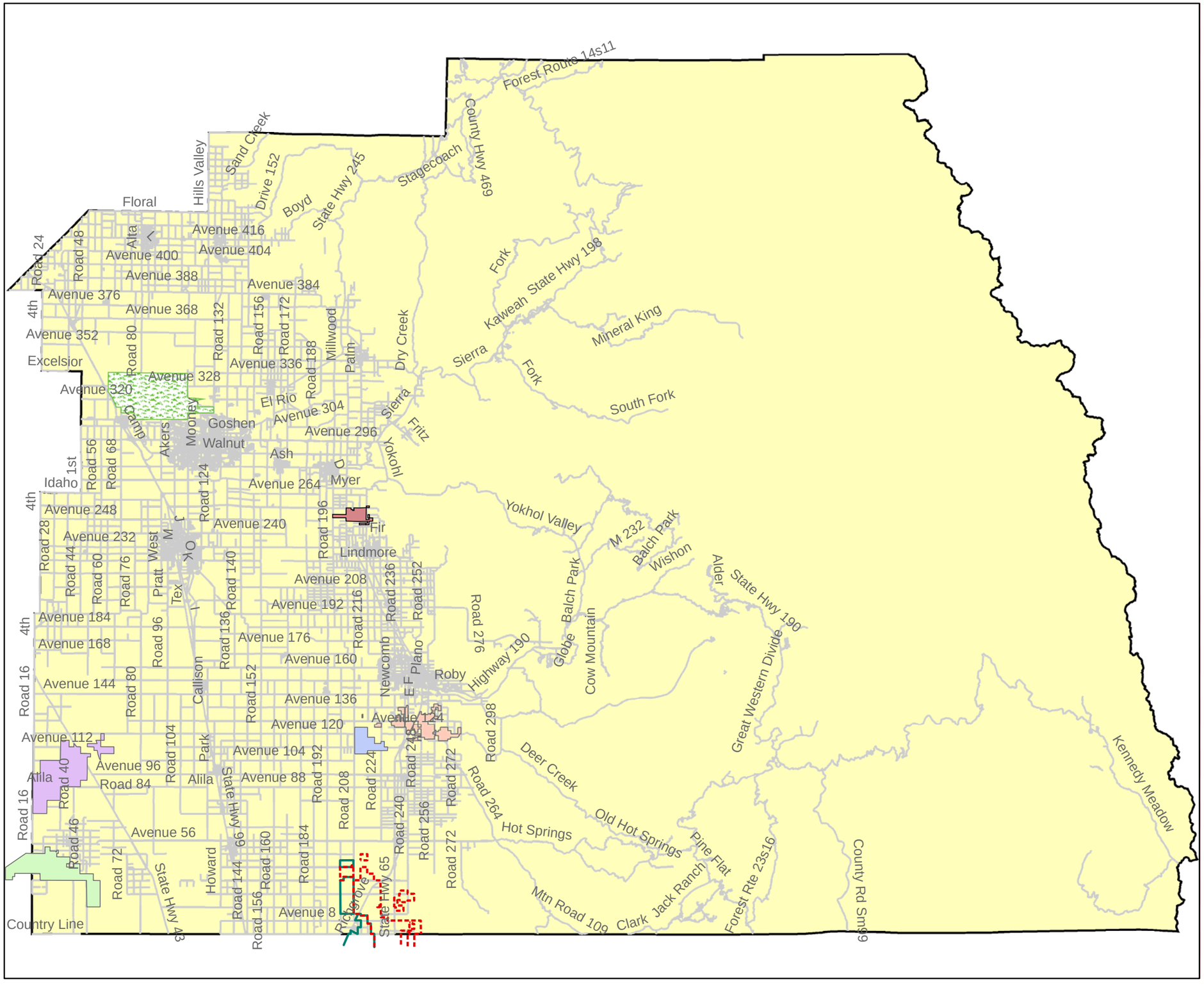
- Public Utility Districts
- Roads
- County of Tulare

0 4.5 9 18 Miles

ZONES OF BENEFIT AND COMMUNITY SERVICES DISTRICTS GENERAL PLAN UPDATE COUNTY OF TULARE



WATER DISTRICTS GENERAL PLAN UPDATE COUNTY OF TULARE

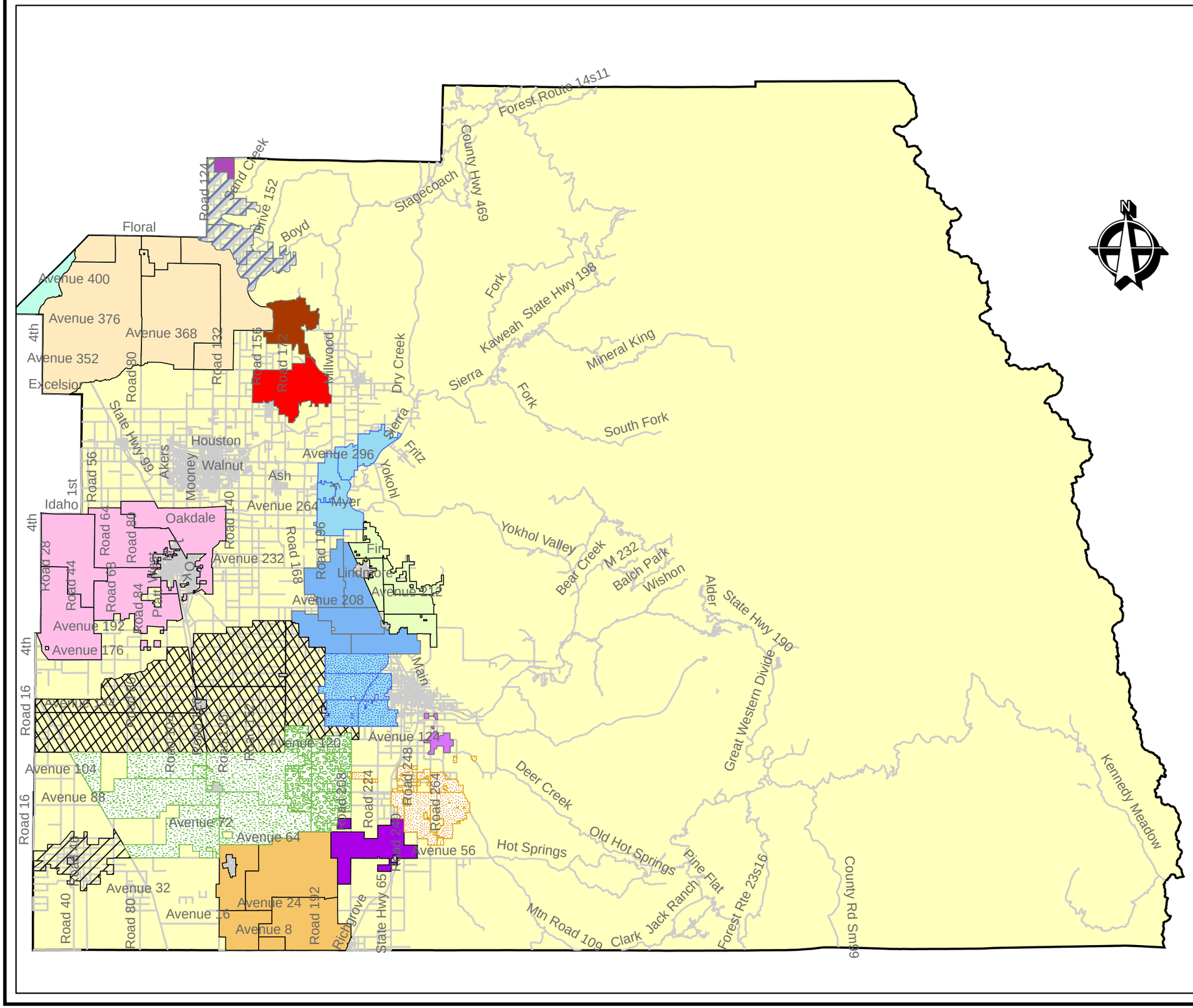


Legend

- Angiola WD
- Atwell Island WD
- Hope WD
- Kern-Tulare WD
- Lewis Creek WD
- Rag Gulch WD
- St Johns WD
- Tea Pot Dome WD
- Roads
- County of Tulare

0 4.5 9 18 Miles

IRRIGATION DISTRICTS GENERAL PLAN UPDATE COUNTY OF TULARE



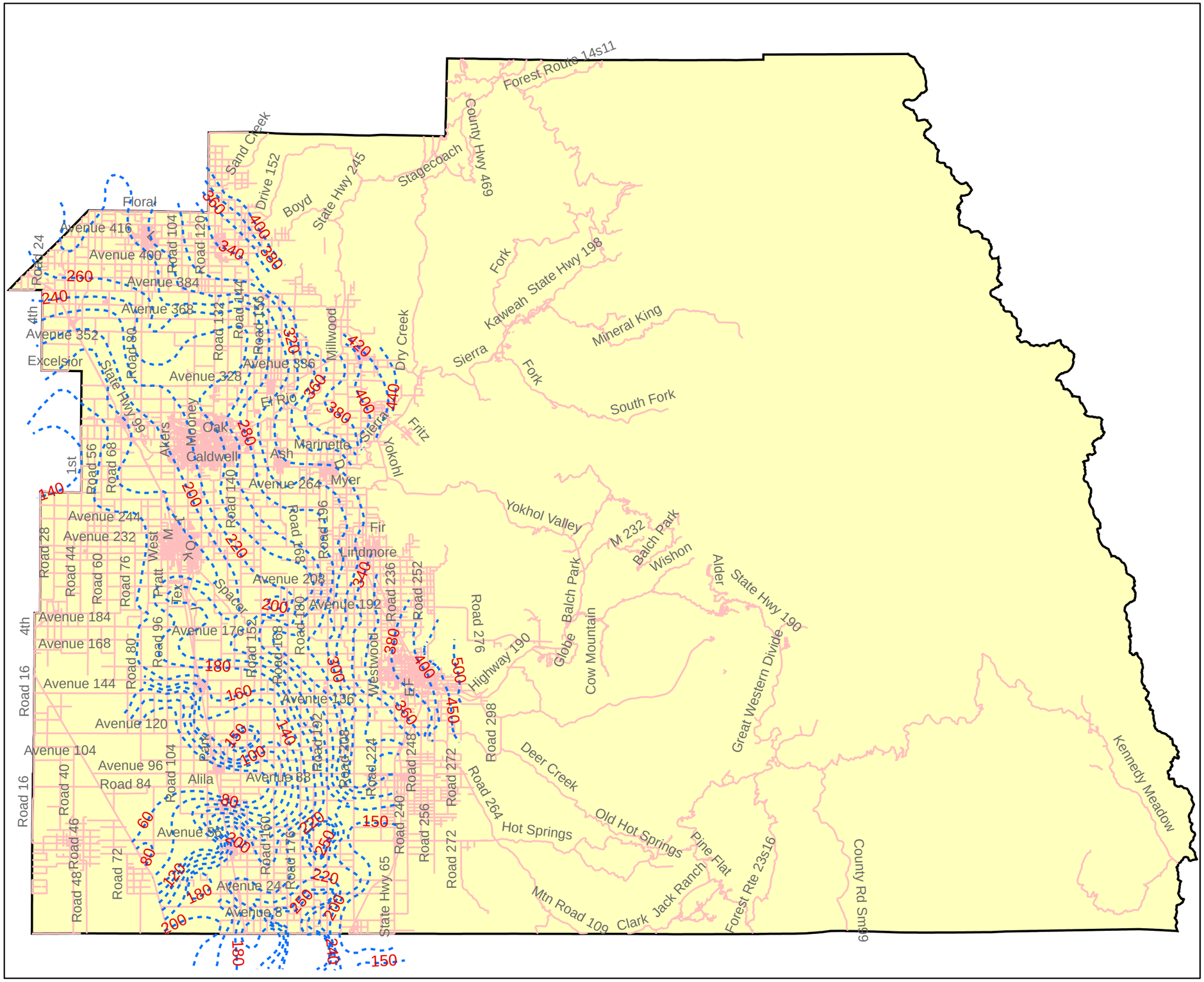
Legend

Irrigation Districts

- Alpaugh Irrigation District
- Alta Irrigation District
- Consolidated Irrigation District
- Delano/Earlimart Irrigation District
- Ducor Irrigation District
- Exeter Irrigation District
- Hills Valley Irrigation District
- Ivanhoe Irrigation District
- Lindmore Irrigation District
- Lindsay/Strathmore Irrigation District
- Lower Tule River Irrigation District
- Orange Cove Irrigation District
- Pixley Irrigation District
- Porterville Irrigation District
- Saucelito Irrigation District
- Stone Corral Irrigation District
- Terra Bella Irrigation District
- Tulare Irrigation District
- Vandalia Irrigation District
- Roads
- County of Tulare

0 4.5 9 18 Miles

GROUNDWATER ELEVATION CONTOURS GENERAL PLAN UPDATE COUNTY OF TULARE

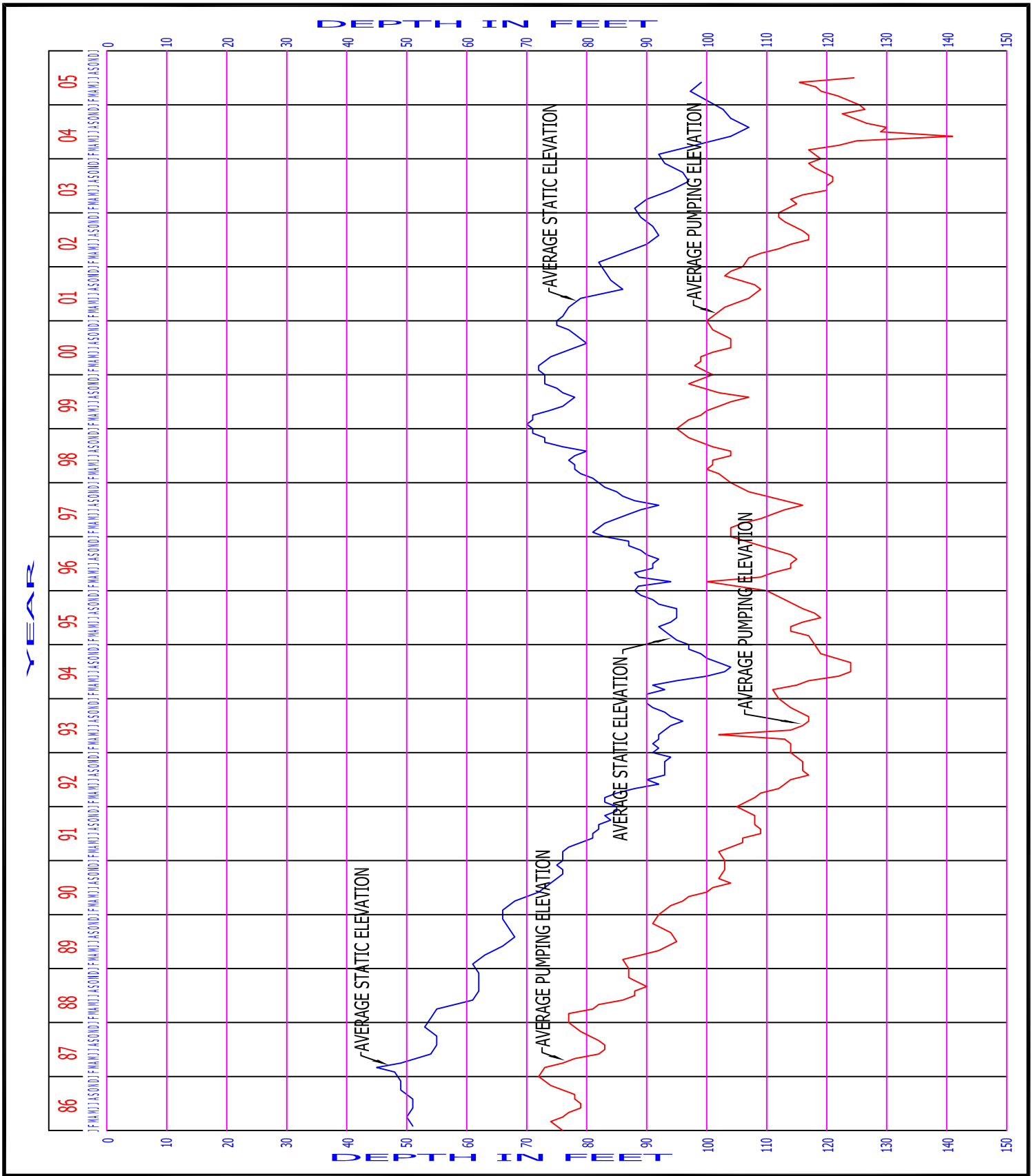


Contours from Kaweah and Tule Groundwater Basin Maps for Spring 2004, Lines of Equal Elevation of Water in Wells, Unconfined Aquifers published by California Department of Water Resources

Legend

- Roads
- Unconfined Groundwater Elevation Contour
- 160 Contour Elevation
- County of Tulare

0 4.5 9 18 Miles



AVERAGE GROUNDWATER ELEVATIONS
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CITY OF VISALIA
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GENERAL PLAN
COUNTY OF TULARE