AVAILABILITY OF WATER FOR IRRIGATION IN THE SOUTH FORK SOLOMON RIVER VALLEY, WEBSTER RESERVOIR TO WACONDA LAKE, NORTH-CENTRAL KANSAS

By

R. D. Burnett and T. B. Reed

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METRIC CONVERSIONS

Information in the following table may be used to convert the inch-pound units of measurement used in this report to the International System of Units (SI).

Inch-pound units	Multiply by	SI units
Length		
inch	25.4	millimeter
foot	0.3048	meter
mile	1.609	kilometer
Area		
square foot	0.0929	square meter
acre	0.4047	hectare
square mile	2.590	square kilometer
Volume		
cubic foot	28.32	liter
acre-foot	1,233	cubic meter
Discharge		
cubic foot per second (ft^3/s)	28.32	liter per second
gallon per minute (gal/min)	0.06309	liter per second
Specific capacity		
gallon per minute per foot [(gal/min)/ft]	0.2070	liter per second per meter
Hydraulic conductivity		
foot per second (ft/s)	0.3048	meter per second
foot per day (ft/d)	0.3048	meter per day
Transmissivity		
square foot per day (ft^2/d)	0.09290	square meter per day

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ABSTRACT

The availability of surface water for irrigation in the South Fork Solomon River valley has become less reliable in recent years. Consequently, irrigation wells have been installed to supplement surface-water supplies. These events have prompted a study, made in cooperation with the U.S. Bureau of Reclamation and the Kansas Geological Survey, to develop a model of the stream-aquifer system to gain more understanding of the hydrology and ground-water hydraulics.

The alluvial aquifer, which extends over an area of about 100 square miles, has saturated thicknesses ranging from a few feet to about 50 feet. Recharge to the aquifer is principally from precipitation and from seasonal losses in irrigation canals and laterals. Discharge from the aquifer is principally to the river and by seasonal pumpage from wells.

A transient numerical flow model was applied to evaluate the stream-aquifer system. The model was calibrated by comparing measured and simulated potentiometric surfaces in the alluvial aquifer and by comparing measured and simulated base flow in the South Fork Solomon River from March 1970 to January 1979. A model simulation indicated that pumpage could be continued at the 1978 rate through the year 2000 if recharge from streamflow diversion was equal to the 1970-78 rate.

INTRODUCTION

Purpose and Scope

This report describes the results of a study conducted to determine the hydrology of the ground-water system and to develop a ground-water model of the South Fork Solomon River valley between Webster Reservoir and Waconda Lake, as shown in figure 1.

The numerical model of the transient-flow system included the interaction of surface water and ground water in the South Fork Solomon River valley between Webster Reservoir and Waconda Lake, north-central Kansas. The model may be useful in obtaining a more complete understanding of the hydrology and ground-water hydraulics of the system. The model also may be of assistance in predicting effects of additional irrigation development within the study area on ground-water levels and ground-water discharge to the South Fork Solomon River and for planning and regulatory purposes by Federal and State agencies.

The study of the hydrology of the river valley was made by the U.S. Geological Survey as part of a cooperative program with the U.S. Bureau of Reclamation and the Kansas Geological Survey. Data for this study, obtained chiefly between 1975 and 1979, were published in a report by Stullken (1980). Additional data, covering a much longer time span, were obtained from the U.S. Bureau of Reclamation's yearly operation report for Webster Reservoir, the Webster Irrigation Unit, and the Webster Irrigation District.

Onsite work for this study consisted of locating all large-capacity wells (yields of 200 gal/min or more), collecting selected discharge data, drilling test holes to determine lithology and depths to bedrock and water, measuring stream gains or losses, collecting water samples, measuring water levels in wells, obtaining information from the water-right files of the Division of Water Resources, Kansas State Board of Agriculture, and obtaining municipal pumpage records.

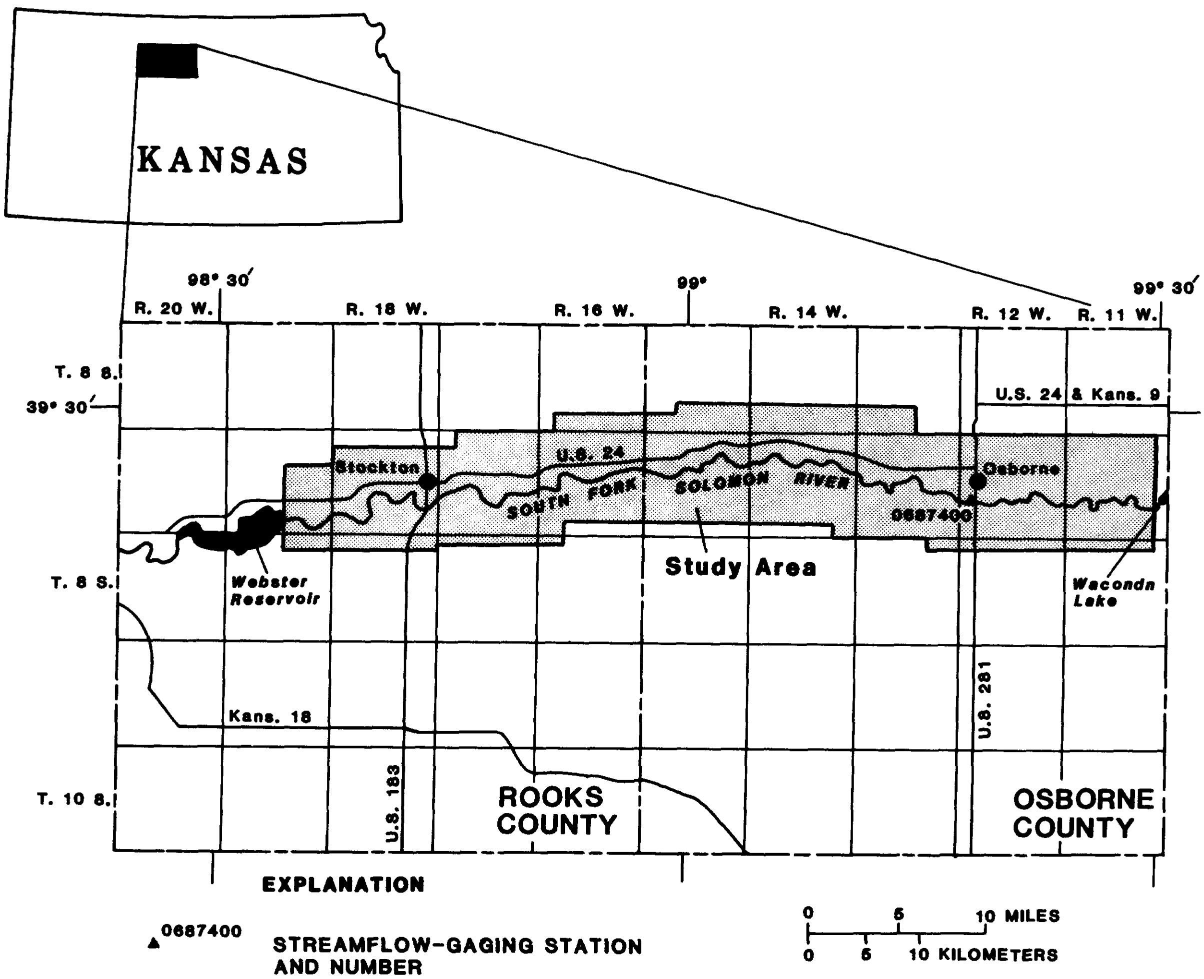

Figure 1.--Location of study area and streamflow-gaging station.

Location and Description of Study Area

The study area (fig. 1) encompasses about 100 square miles in Rooks and Osborne Counties in north-central Kansas. Included in the study area are about 10,000 acres of cultivated cropland. The valley of the South Fork Solomon River is nearly flat with terraces located along the river. The upland adjoining the alluvial valley consists of gentle hills dissected by small valleys of intermittent streams. Average annual precipitation is about 24 inches. Average annual lake evaporation is about 50 inches. Irrigation is practiced extensively using both surface water and ground water. Releases from Webster Reservoir make up a large part of the supply for surface-water irrigation, especially for the Webster Irrigation District.

During the 1970's, there were water shortages in Webster Reservoir. During 1972 and 1978, no surface water was available in the reservoir to be released to downstream users for irrigation purposes. As a result of the decreased availability of surface water, use of ground water for irrigation purposes has increased substantially since the early 1970's.

Methods of Investigation

The areal extent of geologic units was adapted from the "Geologic Map of Kansas" (Kansas Geological Survey, 1964) with modifications based on physiographic features shown on U.S. Geological Survey 7 1/2-minute topographic maps. The saturated thicknesses of the alluvial material and water-table altitudes were determined from about 180 test holes, irrigation wells, and domestic wells.

Hydraulic characteristics of the alluvium were determined primarily from aquifer tests at two locations and from lithologic logs of 16 test holes. Owing to the lack of data, the streambed leakance was determined during the process of calibrating the model. The streambed leakance (k'/b') is the ratio of the vertical hydraulic conductivity (k') to the thickness of the streambed material (b'). Discharge from the aquifer to the South Fork Solomon River was estimated principally from stream-discharge data obtained from the U.S. Geological Survey streamflow-gaging station (0687400) near Osborne (fig. 1) and from seepage investigations made during periods of low flow (November 11, 1975, and November 11, 1976).

Large-capacity irrigation wells were located, and the well discharges were estimated both from the reported acres irrigated and from estimates given by the manager of the Webster Irrigation District. Municipal-pumpage rates were determined from yearly pumpage records.

Well-Numbering System

Well and test-hole numbers used in this report give the locations of wells according to the U.S. Bureau of Land Management's system of land subdivision. The well number is composed of township, range (east or west of the Sixth Principal Meridian), and section numbers, followed by letters that indicate the subdivision of the section in which the well is located. The first letter denotes the quarter section or 160-acre tract; the second letter denotes the quarter-quarter section or 40-acre tract; and the third letter, when used, indicates the quarter-quarter-quarter section or 10-acre tract. The 160-acre, 40-acre, and 10-acre tracts are designated A, B, C, and D in a counterclockwise direction, beginning in the northeast quarter (fig. 2). When two or more wells are located within a 10-acre tract, the wells are numbered serially according to the order in which they were inventoried. For example, well 7-16W-13BBC is in the SW1/4 NW1/4 NW1/4 of sec. 13, T. 7 S., R. 16 W. and is the first well inventoried in that tract.

Acknowledgments

The writers are grateful for information provided by the U.S. Bureau of Reclamation and the Webster Irrigation District. Appreciation also is extended to the numerous drillers and property owners who provided information on wells and test holes and permitted the drilling of test holes and the installation of observation wells on their land.

WATER USE

Surface Water

Records of surface-water rights for irrigation purposes on the South Fork Solomon River date back to the early 1940's. During the late 1950's, the U.S. Bureau of Reclamation began construction of a multipurpose water project consisting of the Webster Reservoir and Dam, the Woodston Diversion Dam, the Osborne Irrigation Canal and laterals, and drainage systems required to serve about 8,500 irrigable acres. These structures collectively were entitled the Webster Irrigation Unit. The purpose of the water project was to provide flood protection and a dependable supply of water for irrigation, wildlife, and recreation. Filling of the reservoir was completed during 1961. Plates 1-4 show the specific locations of structures in the Webster Irrigation Unit.

The Webster Irrigation District began operation during the 1960 irrigation season. During that year, 4,185 acre-feet of surface water were diverted from the South Fork Solomon River at Woodston Diversion Dam to irrigate 1,159 acres of land. The quantity of irrigation water diverted at the dam increased to 23,607 acre-feet during 1966, as shown in figure 3, and the irrigated acreage increased to 7,132 acres during 1970, as shown in figure 4. During 1972 and 1978, no surface water was diverted for irrigation.

The availability of surface water for diversion by the Webster Irrigation District is related to the inflow of water to Webster Reservoir. During the 1970's, Webster and other nearby reservoirs experienced water shortages resulting from decreased inflow. No attempt has been made in this report to explain the nature of this decreased-inflow problem because it originates outside the study area. Conclusions regarding the adequacy of the ground-water system were based on the assumption that continued decreases of inflow rates to Webster Reservoir would not occur.

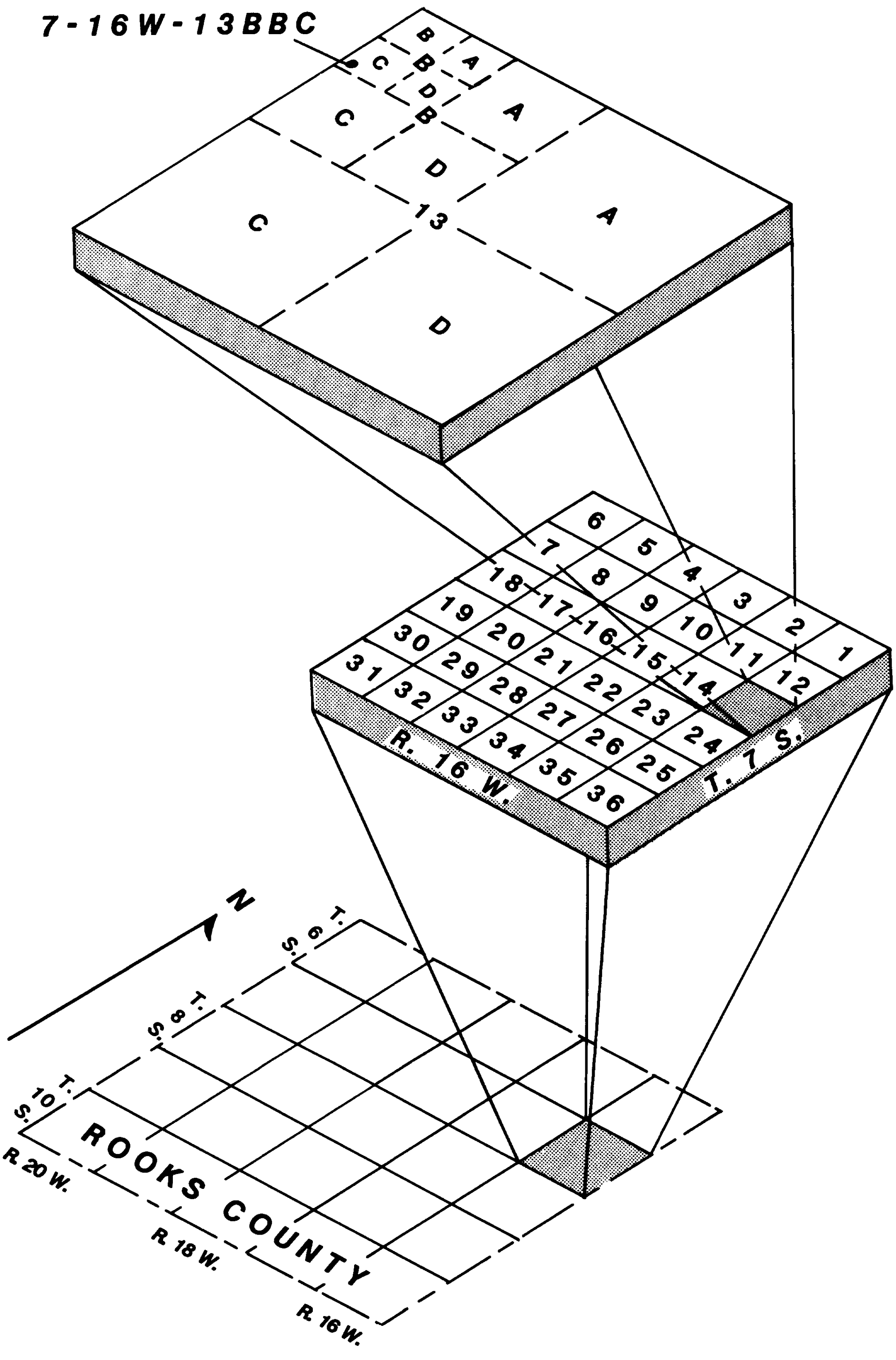

Figure 2.--Well-numbering system.

In addition to the irrigators supplied by the Webster Irrigation District, others, with either junior or senior surface-water rights, divert water directly from the South Fork Solomon River.

Ground Water

The use of ground water for irrigation has grown rapidly since 1970 in the study area. The cropland irrigated by ground water has increased from approximately 1,400 acres during 1970 to about 6,100 acres during 1978, and ground-water withdrawals for irrigation have increased from about 1,250 acre-feet during 1970 to 8,050 acre-feet during 1978. The number of large-capacity irrigation wells has increased from 12 during 1970 to about 93 during 1978. The number of wells that have been developed for irrigation from 1963 through 1978 is shown in figure 5. Typical irrigation-well yields range from 200 to 750 gal/min within the study area. Irrigation wells located within the Webster Irrigation District are used to supplement surface-water supplies, while wells located outside the district provide the only irrigation source.

The use of ground water for municipal purposes has remained constant throughout the 1960's and 70's. An annual total of about 1,000 acre-feet is withdrawn by municipal wells serving population centers of Alton, Osborne, Plainville (13 miles south of Stockton), Stockton, and Woodston. Withdrawals by domestic wells were not included in the model study and are considered to be minor.

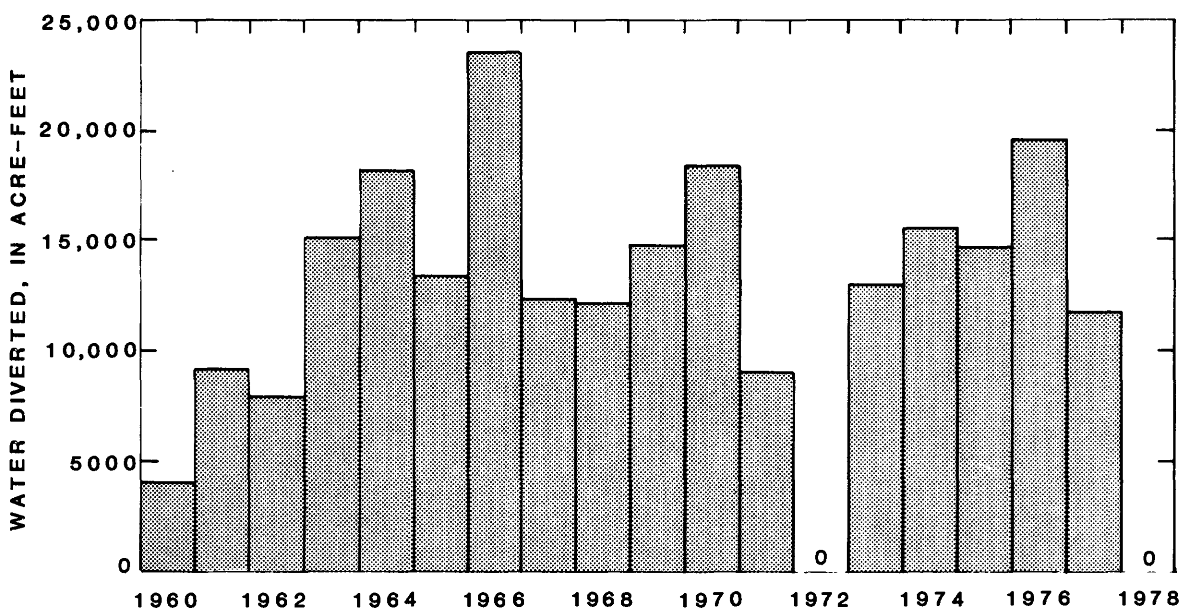

Figure 3.--Annual surface-water diversions at Woodston Diversion Dam, 1960-78.

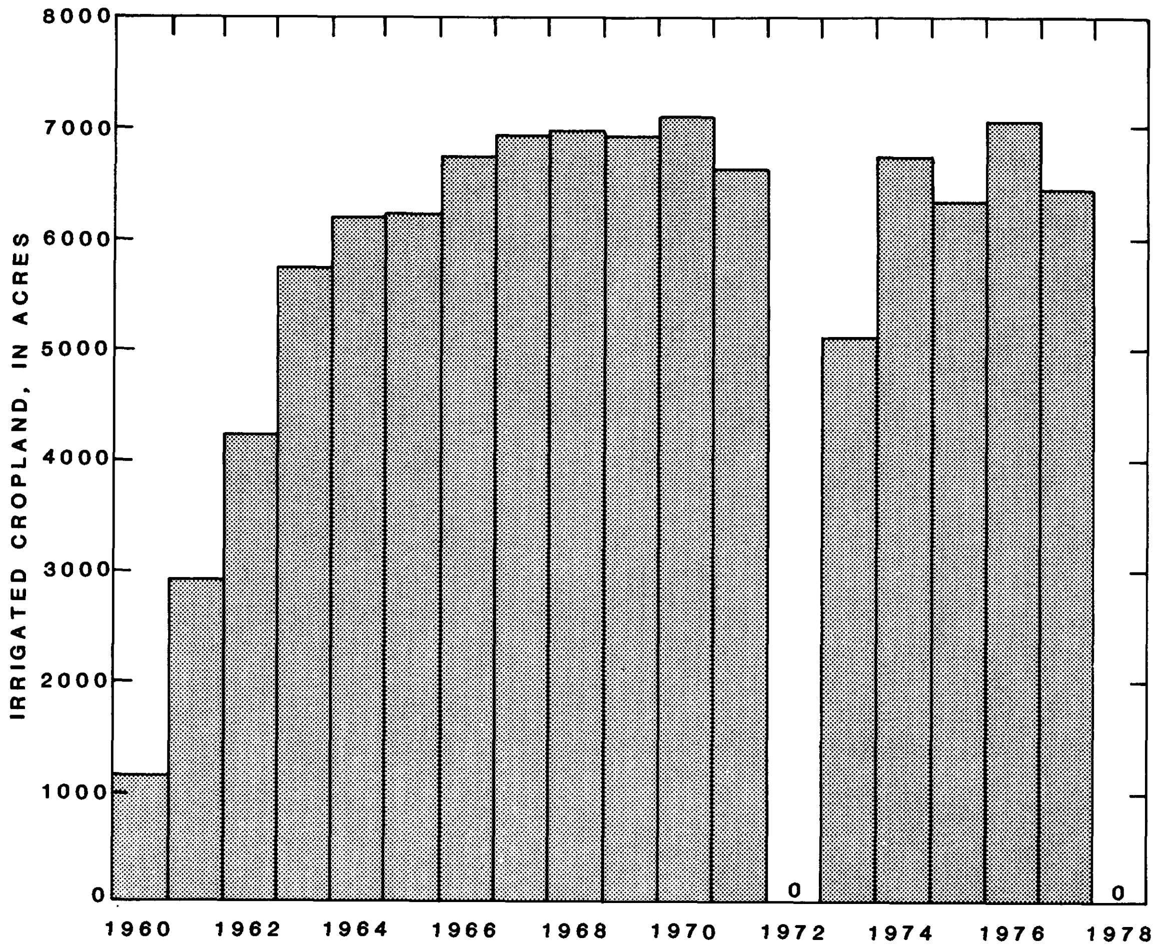

Figure 4.--Annual acreages of cropland irrigated by surface water in Webster Irrigation District, 1960-78.

HYDROLOGY OF THE AQUIFER

Description

An unconfined aquifer occurs in the unconsolidated alluvial deposits of Pleistocene age that underlie the South Fork Solomon River valley. The alluvial deposits consist generally of interbedded sand, gravel, silt, and clay. In addition, alluvial deposits of silt and clay with sand and gravel layers occur in the terraces along the edges of the river valley. The sand and gravel layers within the alluvial material are lenticular and discontinuous. Water in quantities large enough to be used for irrigation or public supply is withdrawn from the sand and gravel layers. The saturated thickness of the alluvial deposits increases from a few feet at the valley sides to about 50 feet near the center of the valley. Plate 1 shows the areal extent of the aquifer and the configuration of the base of the alluvial deposits. The contours are based on data from about 180 logs of wells and test holes.

The alluvial deposits occur in a deep channel that has been eroded through the Ogallala Formation of Miocene age and into consolidated rocks of Cretaceous age. Although the unconsolidated rocks of the Ogallala con-Formation contain water in local areas, there is essentially no hydraulic connection with the alluvial aquifer. Cretaceous rocks, which crop out along the valley walls and underlie the alluvial deposits, consist mostly of shale and chalk. The rocks are relatively impermeable and contribute very little water to the alluvial aquifer.

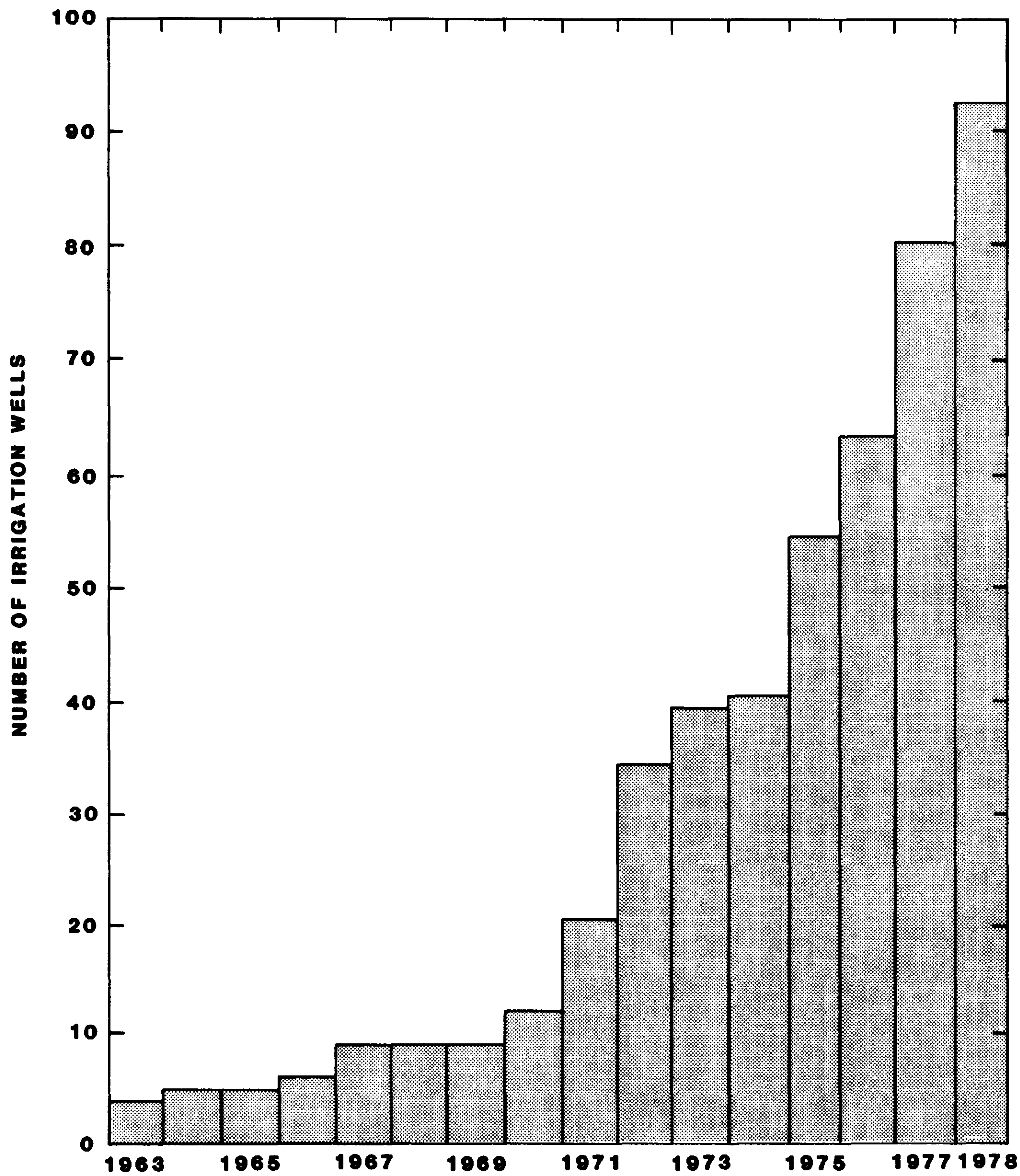

Figure 5.--Number of irrigation wells within study area, 1963-78.

Hydraulic characteristics of the alluvial material and bedrock were determined, in part, from data collected in tests of specific capacity (yield per unit of water-level drawdown in the well), as shown in table 1. Hydraulic conductivities (volume of water that will move in unit time under a unit hydraulic gradient through a unit area measured at right angles to the direction of flow) were estimated from specific capacities using a method modified from Walton (1970, p. 315), as follows:

$$\frac{Q}{s} = \frac{T}{35.3 \log \dfrac{Tt}{2693 \quad r^2 S} - 65.5} \quad , \qquad (1)$$

where

Q/s is the specific capacity, in gallons per minute per foot;

T is the coefficient of transmissivity, in square feet per day;

t is the time of pumping, in minutes;

r is the well radius, in feet; and

S is the storage coefficient.

Transmissivity is the rate at which water is transmitted through a unit width of the aquifer under a unit hydraulic gradient. Thus, hydraulic conductivity is obtained by dividing the transmissivity by the saturated thickness of the aquifer at that location. The storage coefficient, a dimensionless value, is the volume of water released from or taken into storage per unit surface area of the aquifer per unit change in head. In the determinations from test data, it was assumed that the well radius was 1 foot and the storage coefficient was 0.20. Results of the estimated values of transmissivity and hydraulic conductivity are given in table 1.

Table 1.--Estimated transmissivity and hydraulic-conductivity values based on analyses of specific-capacity tests

Location	Lithologic unit	Saturated thickness (feet)	Specific capacity (gallons per minute per foot)	Transmissivity (square feet per day)	Hydraulic conductivity (feet per day)
7-16W-12ADB	Alluvium	33.0	40.5	5,000	150
7-16W-13BBC	do.	17.0	8.5	900	53
7-17W-1ABA	Cretaceous	5.0	0.86	50	10
7-17W-9AAD	do.	17.0	4.0	360	21

Analyses of the specific-capacity test data indicate that the hydraulic conductivity of the alluvial aquifer is between 53 and 150 ft/d. The differences in values reflect the differences in lithology, which change within short distances due to the discontinuous and lenticular nature of the sediments. The test data also indicate that the hydraulic conductivity of the Cretaceous rocks is between 10 and 21 ft/d. Because most of the test holes drilled into the Cretaceous units indicate that yields would be very small, these values probably represent high hydraulic-conductivity zones and are not typical.

Values of hydraulic conductivity determined by specific-capacity tests are available only in a relatively small area for the model. Consequently, values were estimated at other locations based on applying published hydraulic-conductivity values for lithologic units (Walton, 1970) to the units established from well logs. The estimated values of hydraulic conductivity of the alluvial aquifer (table 2) range from 40 to 500 ft/d, again reflecting the heterogeneous nature of the saturated material.

Because specific-capacity tests do not provide sufficient data for determining specific yield (the change in the amount of ground water in storage per unit area per unit change in head), these values also were estimated based on lithologic logs. It was concluded that specific-yield values between 0.15 and 0.25 would reasonably characterize the storage capacity of the unconfined aquifer.

Table 2.--Estimated values of hydraulic conductivity of alluvial deposits based on data from lithologic logs

Location	Hydraulic conductivity (feet per day)	Location	Hydraulic conductivity (feet per day)
7-16W-11ADA	130	7-17W-19ADA	400
7-16W-11BCC	200	7-17W-19ADD	150
7-16W-11CCA	80	7-17W-19DDD	70
7-16W-11DDD	260	7-17W-21ADD	290
7-16W-15ABB	40	7-17W-21DDC	200
7-16W-15BBB	260	7-18W-30AAD	250
7-16W-15BCB	490	7-18W-31AAD	130
		7-19W-26DDA	200
		7-19W-36ADD	500

Inflow

The alluvial aquifer receives recharge from precipitation, irrigation return flows (both from well and stream diversions), subsurface flow from Webster Reservoir, seepage from the river, and surface inflow along the borders of the aquifer. Although the average precipitation in this area is about 24 inches per year, only a small part of that amount infiltrates to recharge the aquifer. Average annual values of precipitation are shown in figure 6 for 1970-78 (National Oceanic and Atmospheric Administration, 1971-80), as recorded at a weather station at Alton, located near the center of the study area.

Initially, an estimate of recharge from precipitation was made by assuming that the gain in base flow of the South Fork Solomon River prior to irrigation development was equal to the recharge from precipitation. Long-term data, based on flow prior to 1956 from Busby and Armentrout (1965, p. 54-55), indicated that the recharge from precipitation would be 3.7 inches per year or about 15 percent of the average annual precipitation if all of the contribution was from the area overlying the alluvial aquifer. However, if part of the gain in base flow was contributed from adjacent areas, the recharge rate from precipitation in the valley would be less. Other model studies of similar valley aquifers in Kansas (Winslow

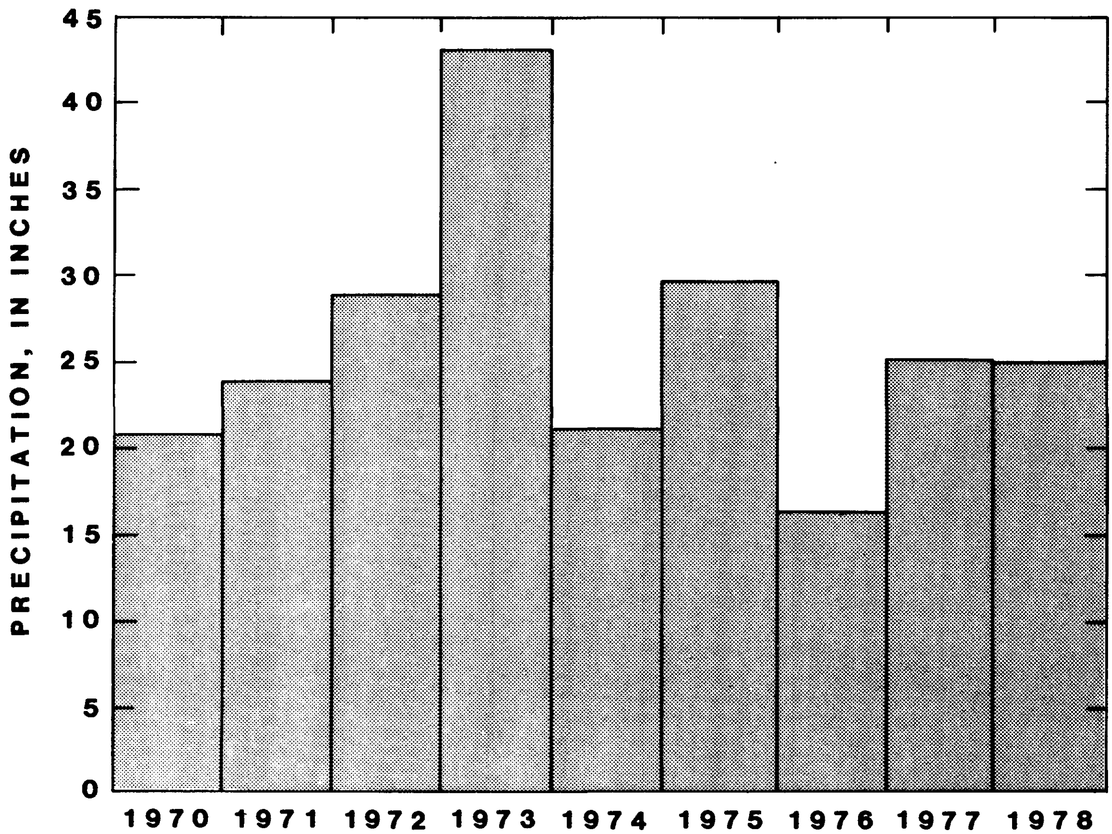

Figure 6.--Average annual precipitation at Alton, 1970-78 (data from National Oceanic and Atmospheric Administration, 1971-80).

and Nuzman, 1966; Jorgensen and Stullken, 1981) have estimated that about 10 percent of the precipitation infiltrates to the aquifer. Thus, it was estimated that about 5 to 15 percent of the precipitation goes to recharge. Based on a recharge of 10 percent of the average annual precipitation, presented in figure 6, recharge from precipitation per year for 1970-78 ranged from 1.6 inches during 1976 to 4.3 inches during 1973.

Infiltration of diverted surface water from the Osborne Irrigation Canal and laterals is a major source of recharge to the aquifer during the irrigation season. Records of the Webster Irrigation District indicate an average annual leakage of 4,256 acre-feet of water from the main canal and 555 acre-feet from the irrigation laterals during 1970-78. Quantities of water contributed annually to the aquifer during the irrigation seasons (June through August, 1970-78) by leakage from the main canal are shown in figure 7, and quantities contributed by leakage from the laterals are shown in figure 8.

Irrigation return flows of water applied to the fields also contribute to recharge. Based on information from the U.S. Soil Conservation Service (H. P. Dickey, oral commun., 1980), the return-flow rate was estimated to be 10 percent of the water applied both from wells and from surface water applied from farm laterals.

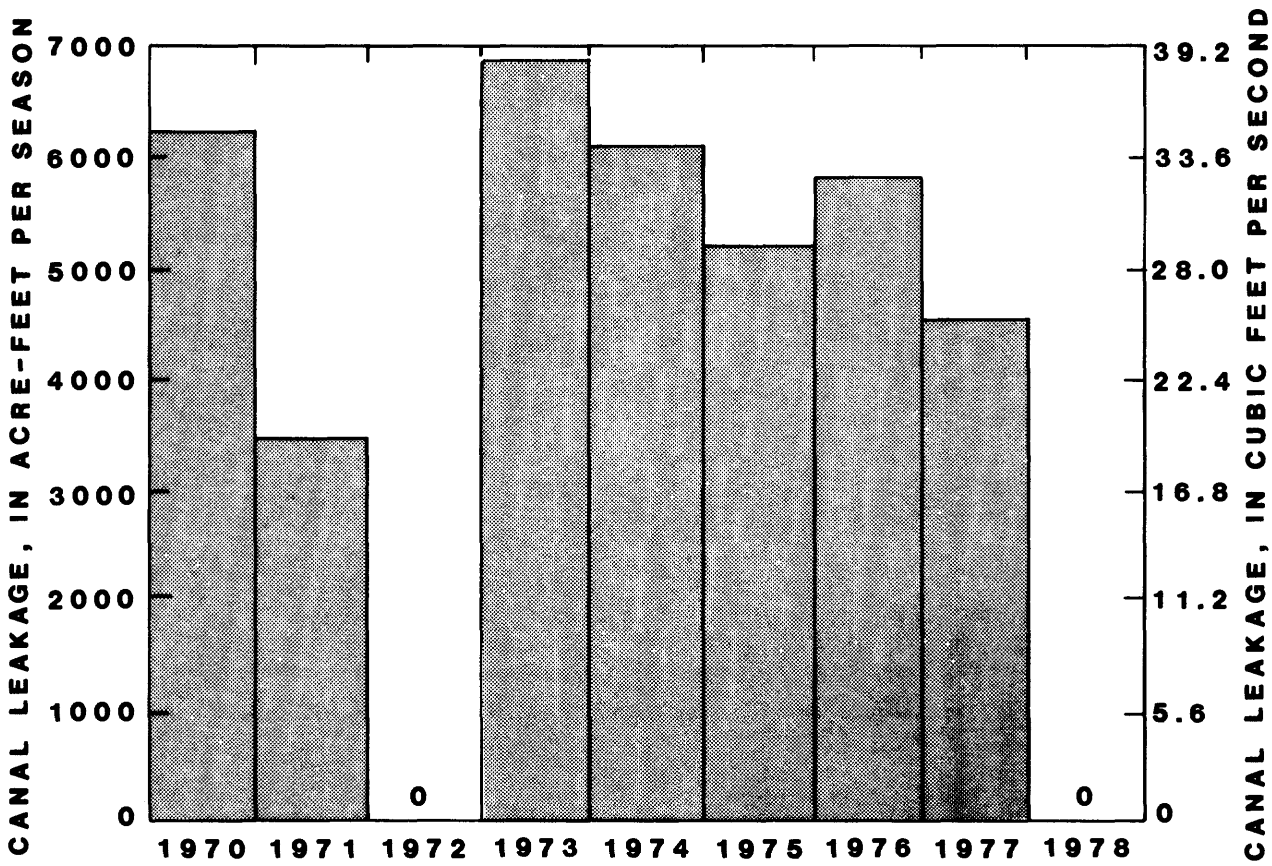

Figure 7.--Annual leakage from Osborne Irrigation Canal, 1970-78.

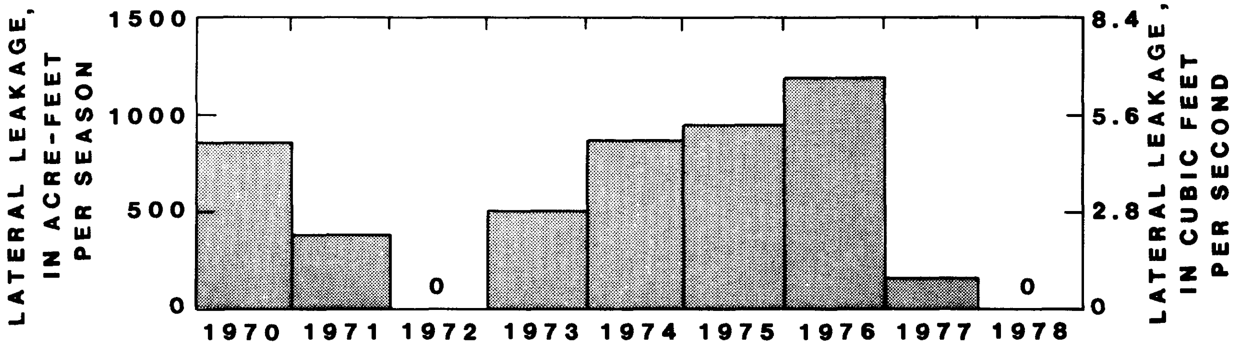

Figure 8.--Annual leakage from Osborne Irrigation Canal laterals, 1970-78.

In addition, recharge to the aquifer is provided by subsurface flow from Webster Reservoir and, to a lesser degree, from subsurface flow in tributaries along the north and south borders of the river valley. Using Darcy's law (Lohman, 1972, p. 10), an average of 155 acre-feet of ground water per year was calculated to flow into the alluvial aquifer on the downstream side of Webster Reservoir.

Seepage-investigation data indicate that there are reaches along the South Fork Solomon where there is flow from the river to the aquifer. For the most part, however, the river gains in flow within the modeled area.

Outflow

Water is discharged from the alluvial aquifer by leakage to the river, evapotranspiration, pumping from wells, and subsurface outflow to Waconda Lake. Data from the U.S. Geological Survey streamflow-gaging station near Osborne (0687400, fig. 1) were used to describe surface-water outflow from the study area. Minimum and average monthly stream-discharge values based on daily minimum and average flow, for 1970-79 at the streamflow-gaging station near Osborne are shown in figure 9. During periods of storm activity, surface runoff and flows from intermittent tributaries to the South Fork between Webster Dam and the streamflow-gaging station are partially responsible for the discharge at Osborne. The period between March 1973 and continuing through 1975 represents a time when these tributaries were flowing (D. L. Lacock, U.S. Geological Survey, Lawrence, Kans., oral commun., 1981). All other monthly minimum and average discharge values are believed to represent periods of little or no runoff. Except for the months of June through August of each year when surface water is being withdrawn for irrigation purposes, minimum and average monthly discharge values at Osborne represent the range in net gain in base flow between Webster Dam and Osborne. The fluctuations of both minimum and average monthly discharge values (fig. 9) show that base flows vary with time and that base flow is sensitive to the occurrence of precipitation. The average minimum monthly discharge or net gain in base flow, excluding June through August of each year and the "wet period" between March 1973 through 1975, was 13.6 ft^3/s or about 10,000 acre-feet per year.

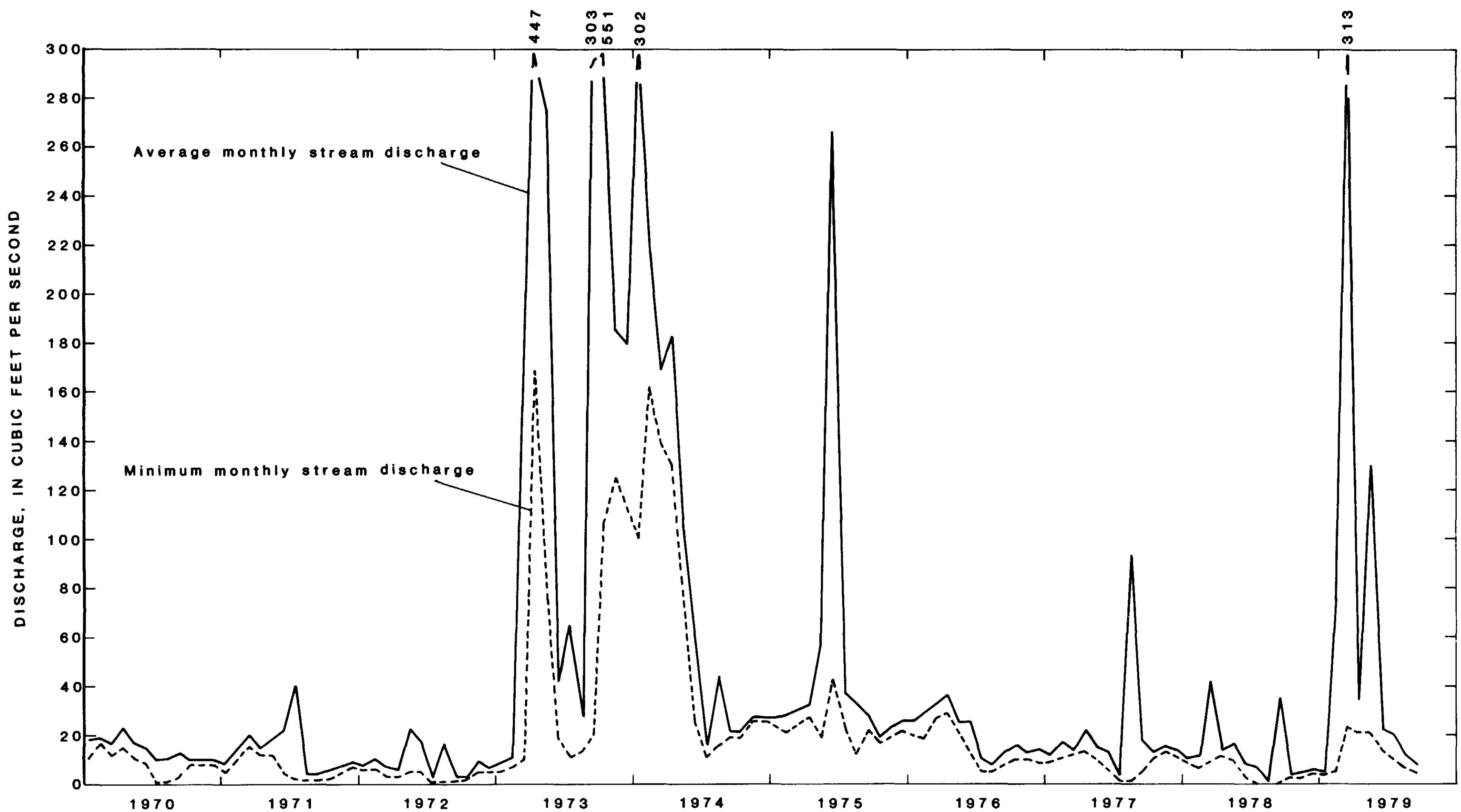

Figure 9.--Minimum and average monthly stream discharge, Osborne, 1970-79.

Water is discharged from the alluvial aquifer to the atmosphere by evaporation and by transpiration from plants in areas where the water table is at or near the land surface. Because the water level along the South Fork Solomon River and along the Osborne Irrigation Canal and laterals is near the land surface, ground water is withdrawn from the aquifer in these areas at a relatively high rate by native vegetation. Jorgensen and Stullken (1981, p. 28), using the increase in base flow after a "killing frost," estimated the average annual evapotranspiration along a 50-mile reach of the North Fork Solomon River to be 3.5 ft^3/s or about 2,500 acre-feet. Because the stream length and hydrologic conditions in the South Fork Solomon River valley are similar to those in the North Fork Solomon River valley, these figures were used to estimate evapotranspiration, with 4.76 ft^3/s for the irrigation season and 1.10 ft^3/s for the rest of the year.

Withdrawal of ground water by pumping represents significant discharge from the aquifer during the irrigation season. Irrigation wells located within the Webster Irrigation District are used to supplement surface-water supplies. Water-right records provided by the Division of Water Resources of the Kansas State Board of Agriculture were reviewed to obtain the years in which irrigation wells were put into operation and to obtain the amount of land irrigated by the wells. Ground-water diversion rates from irrigation wells were determined by applying an irrigation rate of 0.5 foot per season for lands irrigated by both surface and ground water and 1.0 foot per season for lands irrigated by ground water only. These estimated application rates were provided by Mr. Leland Stroup of the Webster Irrigation District. Annual estimated ground-water diversion rates for the 1970-78 irrigation seasons are shown in figure 10.

Discharge from the aquifer system to Waconda Lake occurs along the eastern border of the study area. It was determined, using Darcy's law (Lohman, 1972, p. 10), that an average of 87 acre-feet per year flows out of the study area near the inlet to Waconda Lake.

Ground-Water and Surface-Water Relationships

Surface-water flow in the South Fork Solomon River is related to the ground-water flow system in the study area. During sustained dry weather when no water is added to the stream by overland runoff, flow in the South Fork Solomon River consists of ground-water discharge and is referred to as base flow.

Measurements of base-flow stream discharge were made during seepage investigations at various sites or stations along the river (shown on plate 2) to determine the quantity of ground-water discharged at these locations. Results of the measurements made on November 11, 1975, and November 11, 1976 (shown in figure 11), indicate that the rate of ground-water discharge increases significantly in the lower reaches of the river downstream from Alton. This is supported also by the slope of the water table in the area downstream from Alton, which indicates that the hydraulic gradient increases toward the river and that a major part of the ground-water discharge probably occurs in this area.

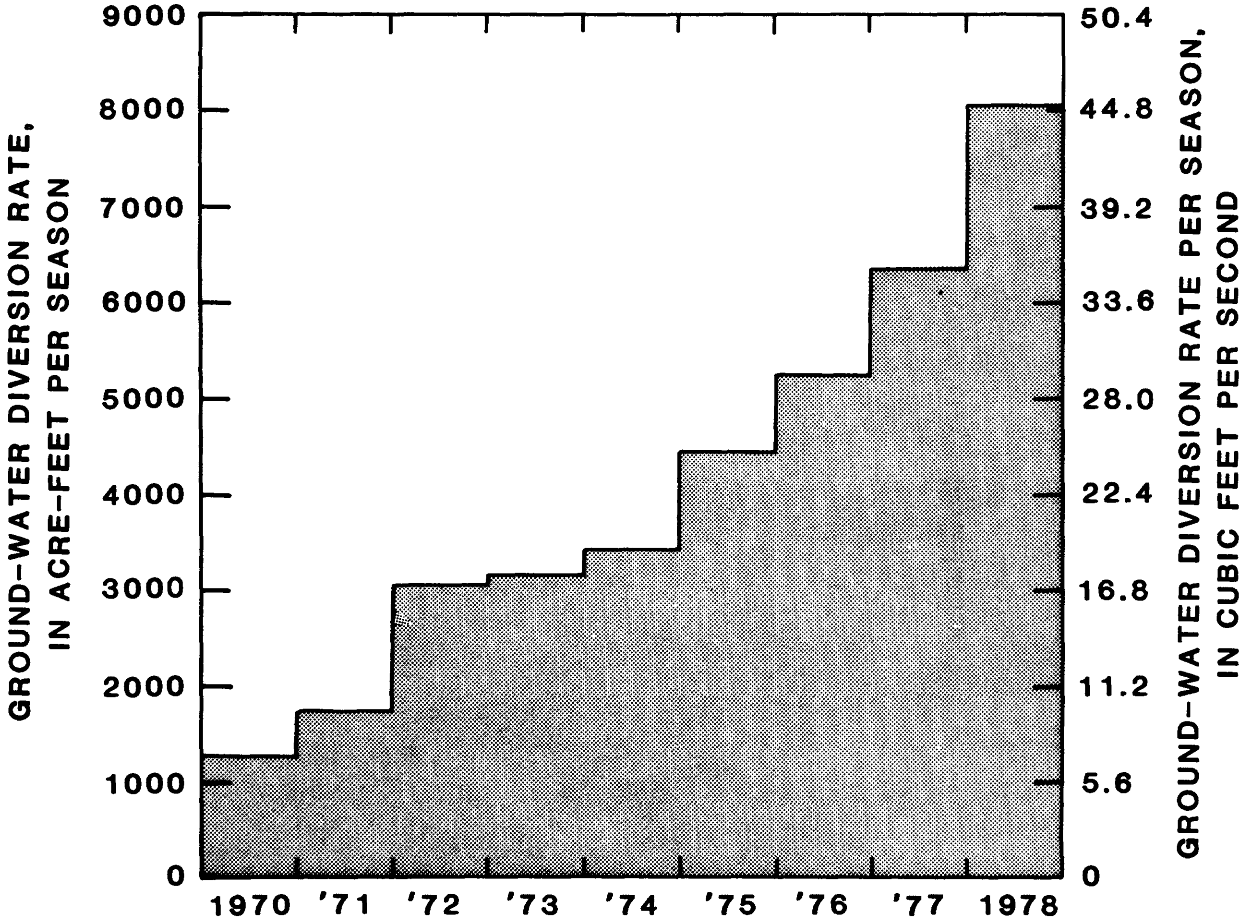

Figure 10.--Estimated ground-water diversion rates for irrigation, 1970-78.

As measured on November 11, 1976, the stream discharge at Osborne (station 8, fig. 11) was 14 ft^3/s. A value of 19.5 ft^3/s is estimated at Osborne for November 11, 1975. This estimate was obtained by applying the same slope resulting from the plotting of seepage data from station 7 to station 8 for November 11, 1976, to the November 11, 1975 data. If the two values are typical, the weighted average for the year would be a net gain to the river from Webster Dam to Osborne of 17.0 ft^3/s.

Water Levels

Water-level data from about 180 test holes, irrigation wells, and observation wells were used to construct the maps of water-level contours in the study area. Many of the observation wells were installed by the U.S. Bureau of Reclamation to monitor water-level changes, if any, caused by the construction of Webster Reservoir and by subsequent irrigation. Water-level contours for the alluvial aquifer during February 1970 are shown on plate 3. Water-level contours for the aquifer during 1979, based on measurements made in February and March, are shown on plate 4.

The relative changes in water levels in different areas are shown by hydrographs of water levels in three observation wells (fig. 12). Location of the wells is shown on plate 4. A general decline in water levels from 1971 to 1978 is shown by the hydrographs of all three wells. This decline reflects the increases in ground-water withdrawal rates and the decreases in the availability of surface water. All three hydrographs show rapid increases in water levels during 1973-74 resulting from abnormally high precipitation in the study area during 1973 (43.44 inches at Alton). The hydrographs of the selected wells generally show that the effects of ground-water withdrawals during the irrigation season are overcome by the effects of recharge from surface-water applications, resulting in rising water levels during this period. Significant water-level declines, however, did occur during 1972 and 1978 when no surface water was available for irrigation.

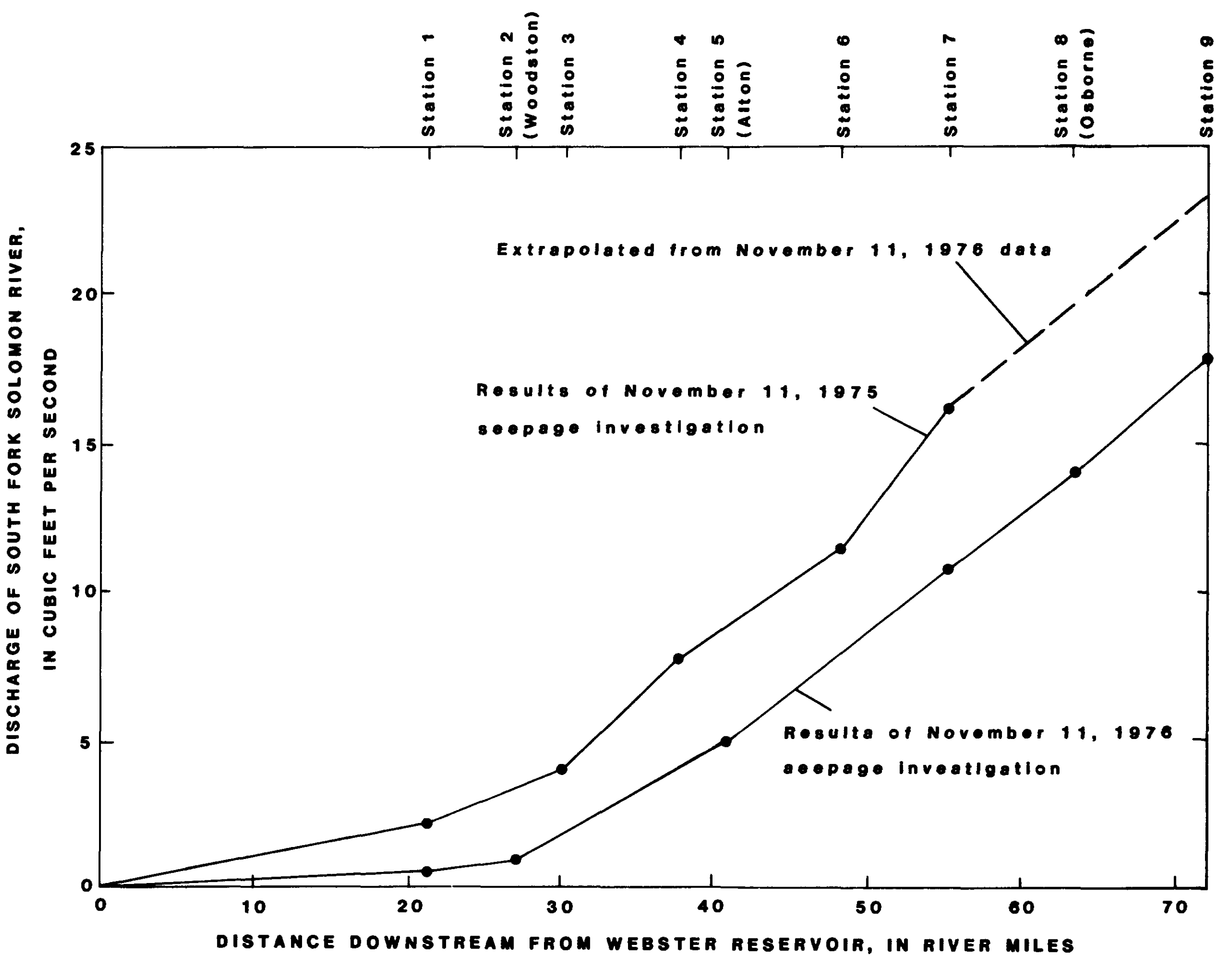

Figure 11.--Discharge of South Fork Solomon River at selected sites, November 11, 1975, and November 11, 1976.

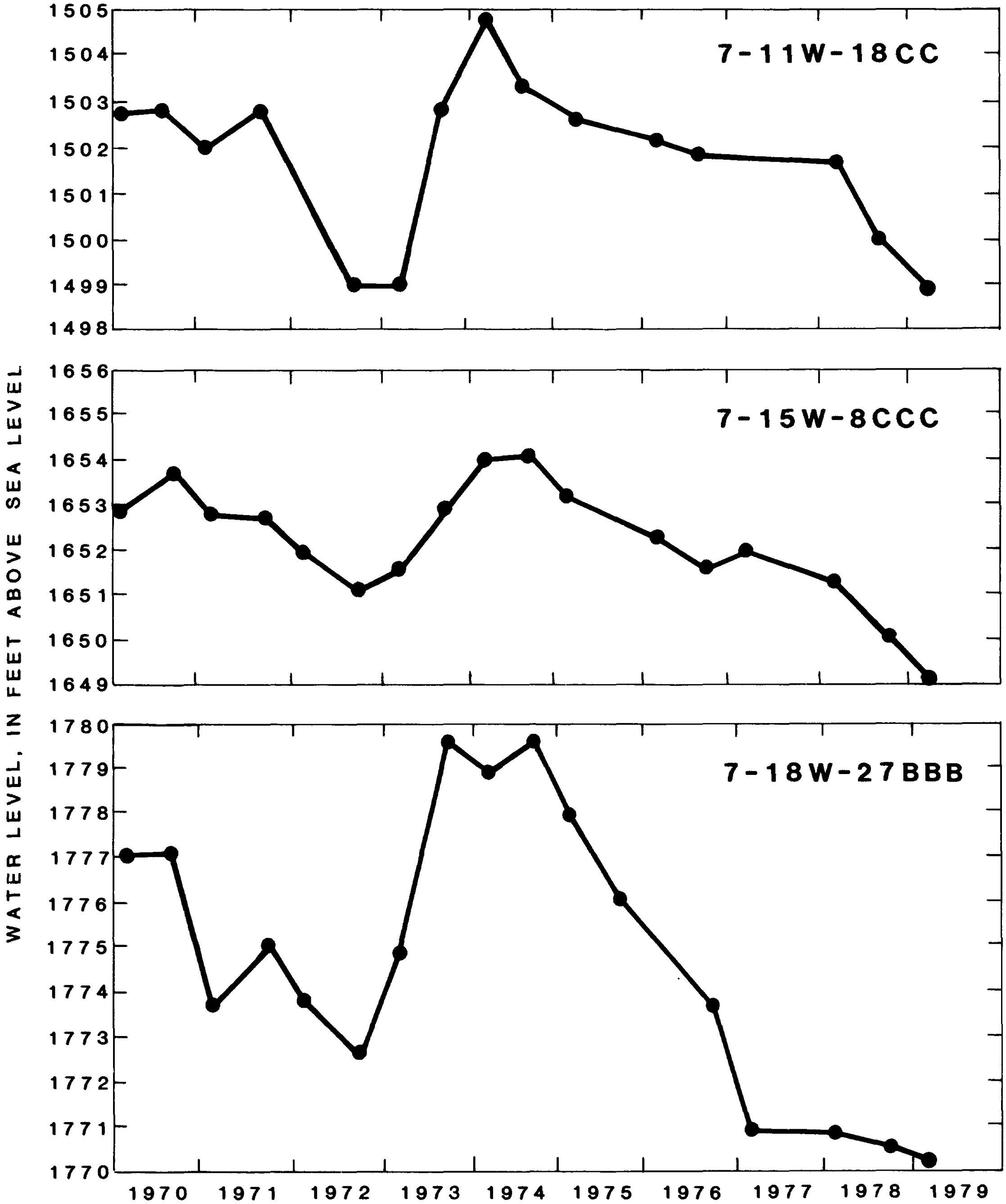

Figure 12.--Water levels in selected wells during 1970-79.

MATHEMATICAL SIMULATION OF AQUIFER SYSTEM

Numerical Model

A numerical model was used to evaluate the stream-aquifer system in the study area. A two-dimensional finite-difference model, developed by Trescott and others (1976), was adapted for use by a minicomputer in making aquifer simulations.

The model is formulated to produce an approximate solution to the linear partial-differential equation of ground-water flow in two dimensions as:

$$\frac{\partial}{\partial x}\left(Txx \frac{\partial h}{\partial x}\right) + \frac{\partial}{\partial y}\left(Tyy \frac{\partial h}{\partial y}\right) = S \frac{\partial h}{\partial t} + W(x,y,t) \ , \qquad (2)$$

where

x and y are the coordinate axes [L];

Txx and Tyy are the principal components of the transmissivity tensor $[L^2t^{-1}]$;

h is the hydraulic head [L];

S is the storage coefficient (dimensionless);

t is the time [t]; and

W(x,y,t) is the total volumetric flux of recharge or withdrawal per unit surface area of the aquifer $[Lt^{-1}]$.

The equation is written in implicit finite-difference form, and the Strongly Implicit Procedure scheme was used to generate hydraulic-head solutions. Values of the principal components of transmissivity are recomputed after each time step for simulating the water-table conditions.

The area within the model was subdivided into a finite-difference grid system, as shown on plate 2. A rectangular grid system oriented approximately parallel to section lines was used, each 80-acre grid block having a length of 0.25 mile in the north-south direction and 0.50 mile in the east-west direction. Values used in the model were assigned to nodes at the center of each block. The modeled area consisted of 800 active blocks.

The South Fork Solomon River was simulated in the numerical model as having constant head, which resulted in a variable flux to or from the river. During transient simulations, steady-state leakage was assumed, and the following equation was applied for each node simulating a section of the stream:

$$QL/A = k'/b' \ An \ (hr-ha) \ , \qquad (3)$$

where

QL is the volumetric leakage, and A is the area of the grid block; the ratio QL/A is the volumetric flux per unit area due to leakage from the river;

k' is the vertical hydraulic conductivity of the confining bed material;

b' is the thickness of the streambed material;

An is the ratio of the stream area to the area of the grid block;

hr is the river head; and

ha is the aquifer head.

The QL/A term is algebraically added to the W(x,y,t) term of the aforementioned flow equation (equation 2).

Because the surface area of the stream, where present within a block, is substantially less than the surface area of the finite-difference block simulating the stream, the parameter, An, for each "stream" block was set equal to the ratio:

$$\frac{\text{stream area}}{\text{block area}} .$$

Aerial photographs indicate phreatophyte growth occurring predominantly along the river course. Therefore, evapotranspiration was simulated by placing pumping wells along the stream nodes and pumping 4.76 ft^3/s during the irrigation season and 1.10 ft^3/s the rest of the year.

Boundary Conditions

The upstream end of the modeled area near Webster Dam and the downstream end at the inlet to Waconda Lake were treated as constant-head sources. Most of the north and south sides of the modeled area were considered as no-flow boundaries, except in areas where tributaries intercept model boundaries on the north and south sides. Constant-head values were assigned at 12 nodes, as shown on plate 2, representing those sites where subsurface inflow in tributary valleys contributes to the aquifer system. The values of flux moving from these nodes into the aquifer were adjusted during calibration within reasonable limits.

The South Fork Solomon River was simulated, using the leak-option routine in the finite-difference model, by assuming that the river head remains constant throughout each time step of the simulated period. The vertical hydraulic conductivity of the semiconfining layer between the river and the aquifer was given a value of 0.13×10^{-5} ft/s, a value typical of silt and clay materials (Walton, 1970). Semiconfining-bed thicknesses were assigned values ranging from 0.6 to 12.0 feet.

Depletions by irrigation and municipal wells were treated as constant fluxes. Net withdrawals by municipal wells were applied at a uniform rate throughout the simulated period, and those by irrigation wells were applied at a uniform rate for 3 months (June through August) during the irrigation seasons. Leakage from the main section of the Osborne Irrigation Canal also was treated as a constant flux and applied at nodes representing the location of the main canal. The annual leakage from the canal was divided equally among the canal nodes and applied during the 3-month irrigation season.

Modifications to Calibrated Model

Modifications to the two-dimensional finite-difference model developed by Trescott and others (1976) were necessary in order to simulate projections beyond 1979. In the original two-dimensional model, the coding was such that when well nodes were completely desaturated simulations stopped with a message, indicating which node or nodes had gone dry. This procedure was satisfactory for model-calibration simulations, but code changes were made to the predictive model so that simulations would continue after nodes containing pumping wells had been desaturated. This was accomplished by assigning zero pumping rates to those wells designated as desaturated nodal elements. The model program was coded so that future pumping rates (after 1978-79) would be read from separate files containing the updated pumping values for each particular management alternative.

Further, an additional program modification was made by making dry nodes active during each time step by arbitrarily assigning a saturated thickness of 2 feet to these nodes. This modification was made to allow the nodes to remain active and, thus, to receive recharge, return flow, and ground-water flows from surrounding nodes. Wells, which actually went dry, however, remained dry. Also, modifications were made to allow the constant-flux values representing canal leakage and surface-water return to remain active after a node goes dry.

Model Calibration and Transient Simulations

Because ground-water development was not significant in the study area prior to 1970, the model was calibrated to simulate the changing conditions in the aquifer beginning in March 1970 and continuing to January 1979. Nineteen pumping periods were used in making the transient simulations from 1970 to 1979. Basically, the pumping periods were set up to simulate two pumping patterns per year--one pumping period simulating the nonirrigation season (September through May) of each year and another period simulating the irrigation season (June through August) of each year.

During calibration of the model, reasonable adjustments to hydraulic-conductivity and specific-yield values were applied uniformly at all nodes. In the final analysis, average values of 130 ft/d for hydraulic conductivity and 0.20 for specific yield produced the best results and were assigned to every active node. Because the real boundary of the aquifer is not well defined, adjustments also were made in the location of the no-flow boundary in a few areas for the best simulation of the aquifer system.

Recharge from precipitation was applied at a uniform rate throughout the modeled area during each pumping period. Recharge to the aquifer from precipitation was adjusted within reason during the modeling calibrations and varied between 5 to 15 percent of the precipitation occurring during each pumping period. Total precipitation recorded at the weather station at Alton during each of the 19 simulated pumping periods is shown in figure 13. A 5-percent recharge rate to the saturated zone was applied for each of the pumping periods, except when greater precipitation indicated larger percentages should be used. During periods 7 and 8, a rate of 10 percent was used, and 15 percent was used during period 9. Based upon the aforementioned percentage-rate values, precipitation recharge varied from a total of 0.8 inch for 1976 to 4.3 inches for 1973 and averaged 2.0 inches (10,000 acre-feet) annually for 1970-79.

Adjustments were made to the leakance (k'/b') values at the nodes used to simulate the interaction of the stream-aquifer system by adjusting the value of b' between 0.6 and 12.0 feet, while maintaining a constant k' value of 0.13 x 10^{-5} ft/s. The parameter, b', was adjusted such that the resultant net leakage to the river was in reasonable agreement with the measured increases in flow during seepage investigations and with the minimum and average measured stream-discharge values recorded at Osborne. The average of two sets of measured stream-discharge values made during the seepage investigations (1975-76) are compared in figure 14 with the average 1975-76 simulated values of stations located along the river. The average simulated stream-discharge values are compared in figure 15 with the average (average of 9-month minimum discharge) minimum stream-discharge values at Osborne throughout each nonirrigation period.

The simulated potentiometric surface during 1979 was compared with the potentiometric surface based on 1979 measurements of water levels, as shown on plate 4. The differences between January 1979 simulated hydraulic heads and January 1979 measured hydraulic heads were calculated for 111 out of the 800 active nodes (fig. 16). The simulated hydraulic heads were within $\pm$ 5 feet of the measured hydraulic head at 49 percent of the sites and were within $\pm$ 10 feet of the measured hydraulic head at 82 percent of the sites.

Rates of flow at the end of each period into and out of the aquifer system, as simulated for the last two pumping periods (periods 18 and 19, June 1978 to January 1979), are given in table 3. Average component rates of flows for all irrigation and nonirrigation periods simulated are shown in table 4. Period 18 represents the 1978 irrigation season, and period 19 represents part of the following nonirrigation season from September 1978 to January 1979. The greatest rate of inflow to the system during the 1978 irrigation season (table 3) was by recharge from precipitation (+13.26 ft^3/s). Discharge from wells (-46.5 ft^3/s) and evapotranspiration (-4.76 ft^3/s) provided the major outflow components to the system. Compared to past irrigation seasons (table 4), a significantly greater part of the outflow was derived from aquifer storage (+25.66 ft^3/s) during the 1978 irrigation season. During the irrigation pumping periods, 1970-78, an average net gain in storage (-7.82 ft^3/s) occurred as a result of recharge from return flow (+3.43 ft^3/s) and from canal and lateral leakage (+26.51 ft^3/s). The 1970-78 average annual discharge from the aquifer to the river (base flow) was estimated to be about 12,200 acre-feet (7,800 acre-feet during irrigation and 13,700 acre-feet during nonirrigation periods).

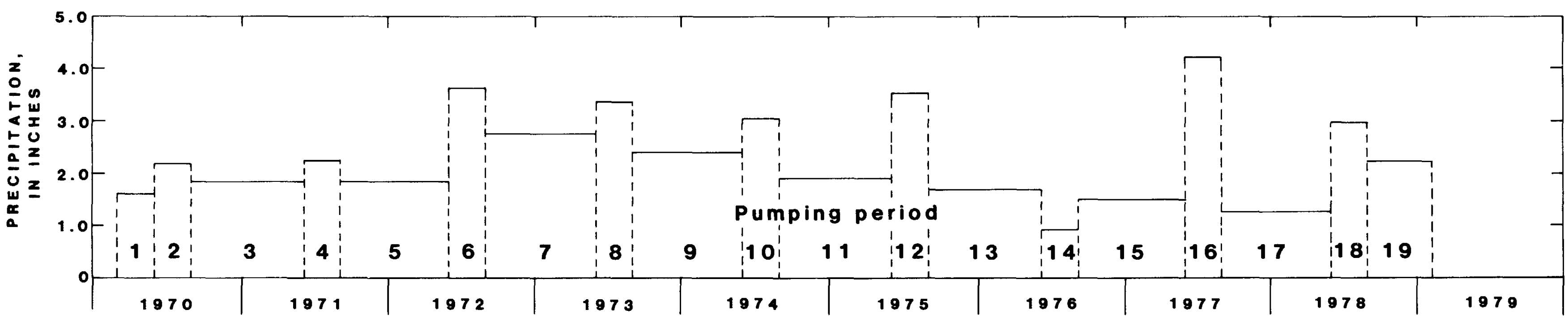

Figure 13.--Total precipitation recorded at Alton during each of 19 simulated pumping periods, 1970-79 (data from National Oceanic and Atmospheric Administration, 1971-80).

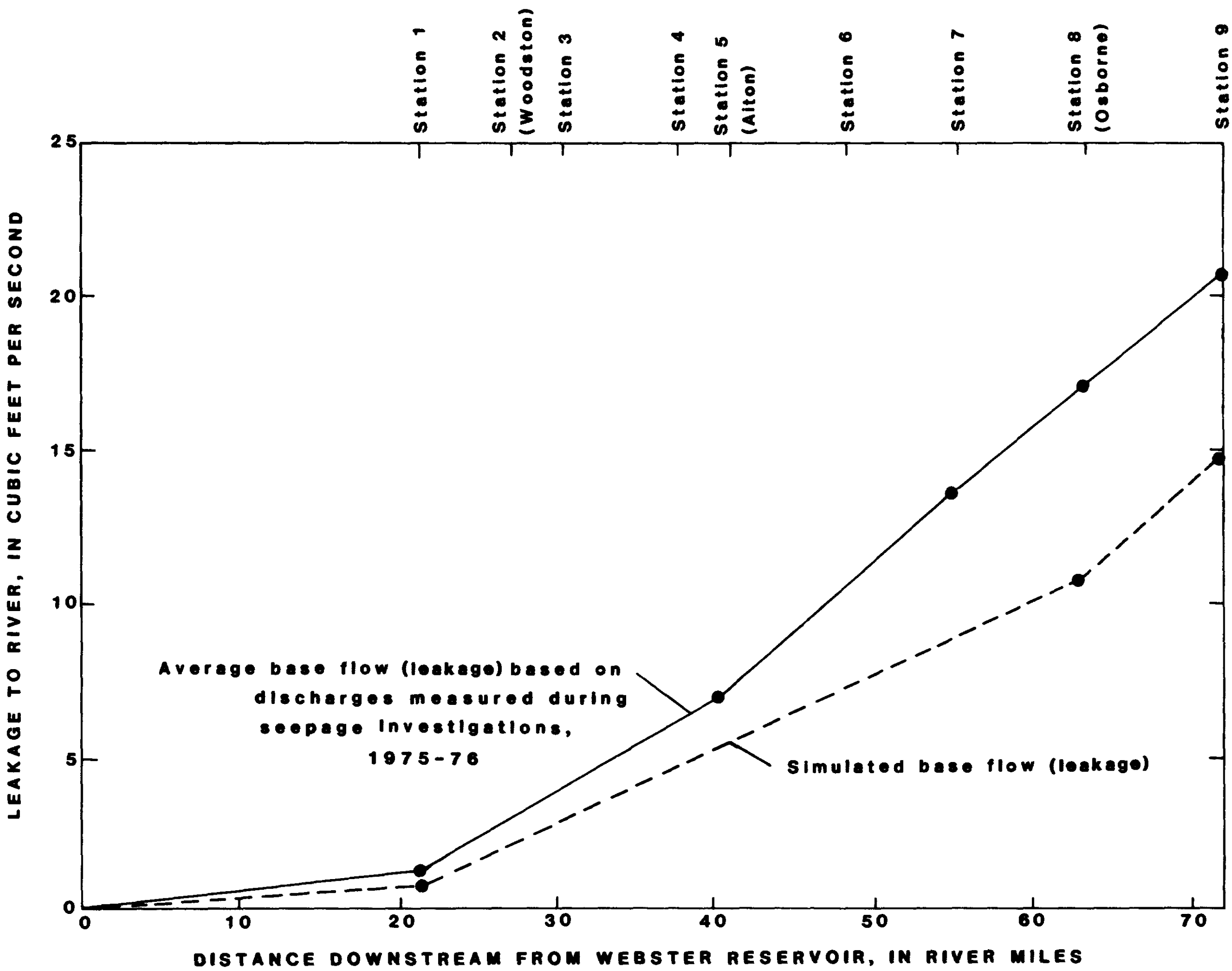

Figure 14.--Comparison of average measured and average simulated leakage to the river during 1975-76.

During the nonirrigation period of 1978-79 (table 3), recharge from precipitation provided the greatest rate of inflow to the system (+7.96 ft^3/s), and leakage to the river provided the greatest rate of outflow (-9.26 ft^3/s). The average recharge rate from precipitation simulated for all nonirrigation periods (1970-78, table 4) was +11.84 ft^3/s, and the average net leakage rate to the river was -18.87 ft^3/s.

Two predictive simulations were made, using different rates of recharge from streamflow diversions, to determine the adequacy of ground-water supplies by the year 2000. The first simulation assumed that water would be available from Webster Reservoir at the 1970-78 rate. The second simulation assumed that the available water supply would be reduced to one-half of the 1970-78 rate.

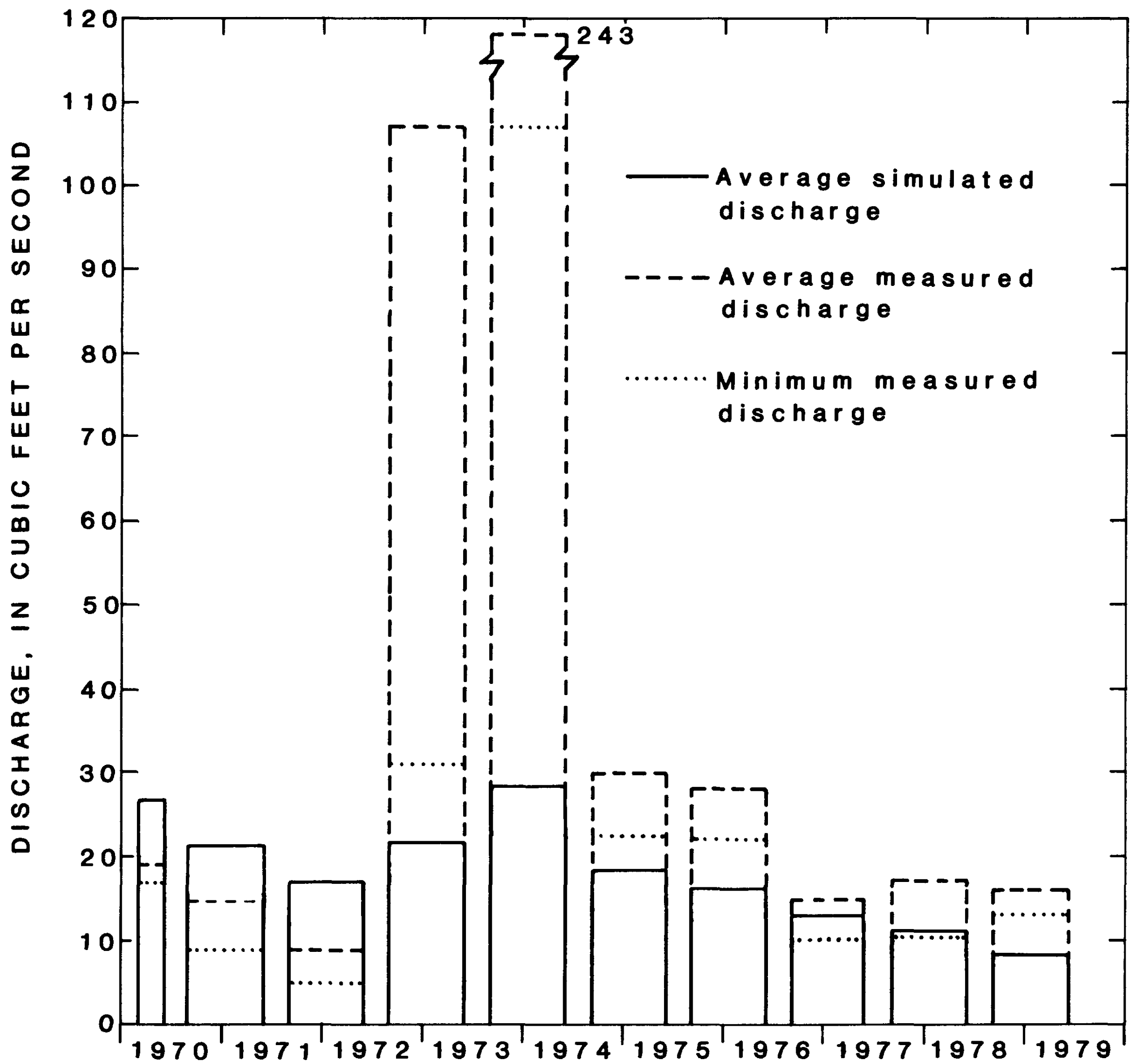

Figure 15.--Average simulated and minimum and average measured stream-discharge values for each simulated nonirrigation period (September through May), Osborne, 1970-79.

In the first simulation, the 1970-78 average net surface-water supply of 11,375 acre-feet per season and a main and lateral canal loss of 24.37 ft^3/s were used. Surface-water return to the aquifer was assumed to be 10 percent of the surface water applied. In addition, it was assumed that recharge from precipitation was equal to the average 1970-78 rates and that pumpage continued at the 1978 rate (table 3) for irrigation and non-irrigation pumping periods.

Projected flow rates for the year 2000 (table 5) are compared with flow rates for 1970-78 (table 4). Net leakage to the river decreased from -10.74 to +3.69 ft^3/s to the aquifer during the irrigation period and from -18.87 to

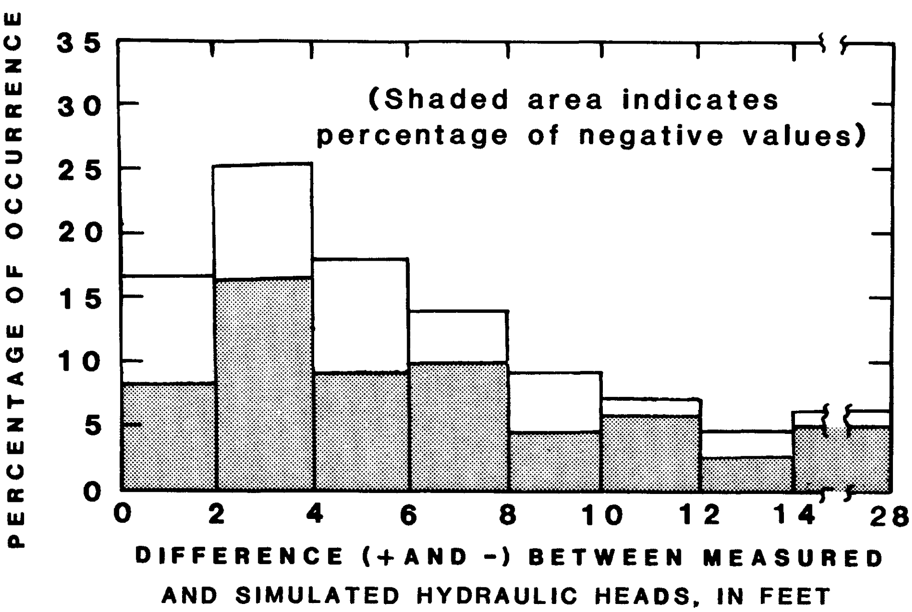

Figure 16.--Differences between measured and simulated hydraulic heads at 111 active nodes during January 1979.

Table 3.--Rates of flow at the end of each period for pumping periods 18 and 19, June 1978 to January 1979

	Rates of flow (cubic feet per second)	
Inflow components	period 18 (90 days)	period 19 (155 days)
Recharge from precipitation	+13.26	+7.96
Leakage from Osborne Irrigation Canal	0	0
Subsurface inflow	+2.10	+1.99
Recharge from surface-water irrigation (return flow)	0	0
Recharge from ground-water irrigation	+4.51	0
Outflow components		
Ground-water evapotranspiration	-4.76	-1.10
Subsurface outflow	- .39	- .41
Discharge from wells (municipal and irrigation wells)	-46.50	-1.42
Net river leakage	+6.12	-9.26
Change in storage	+25.66	+2.24

Table 4.--Average rates of flow during 1970-78

	Rates of flow (cubic feet per second)	
	Irrigation period (90 days)	Nonirrigation period (275 days)
Inflow components		
Recharge from precipitation	+13.85	+11.84
Leakage from Osborne Irrigation Canal	+26.51	0
Subsurface inflow	+1.91	+1.85
Recharge from surface-water irrigation (return flow)	+3.43	0
Recharge from ground-water irrigation	+2.28	0
Outflow components		
Ground-water evapotranspiration	-4.76	-1.10
Subsurface outflow	- .41	- .41
Discharge from wells (municipal and irrigation wells)	-24.25	-1.42
Net river leakage	-10.74	-18.87
Change in storage	-7.82	+8.11

-11.77 ft^3/s during the nonirrigation period. The decrease in river leakage during the irrigation period results from the increase in pumpage rates from -24.25 (1970-78 average) to -40.23 ft^3/s by 2000. Nodes going dry caused the pumpage from all sources to decrease from -46.50 (table 3) to -40.23 ft^3/s (table 5) by 2000. The diminishing change in storage in this simulation indicates that inflow and outflow are nearly equal, and the ground-water supply is adequate for sustaining pumpage at the 1978 rate through the year 2000, provided surface-water supplies are applied at the 1970-78 average rate.

In the second simulation, it was assumed that diversions were reduced to one-half of the 1970-78 average rate and that main and lateral canal leakage was 12.56 ft^3/s. Surface-water return was assumed to be 10 percent of the surface water applied. As in the first simulation, recharge from precipitation was assumed to be equal to the average 1970-78 rate, and the initial pumpage would continue at the 1978 rate.

Projected flow rates for the year 2000 in the second simulation (table 6) are compared with projected flow rates for the same year in the first simulation (table 5). Net leakage from the river increased additionally from +3.69 to +4.22 ft^3/s during the irrigation period, and leakage to the river decreased from -11.77 to -9.39 ft^3/s during the nonirrigation period. Well discharges during the irrigation period decreased from -46.5 (table 3) to -37.93 ft^3/s (or about 81 percent of the initial rate) as a result of reduced water levels in areas of intensive pumping. The net flow to storage during the same period decreased from -5.69 ft^3/s in the first simulation to +5.25 ft^3/s from storage in the second simulation, reflecting the decreasing rate of recharge from streamflow diversions.

Table 5.--Projected rates of flow at the end of each period during the year 2000, based on 1970-78 average surface-water supplies and 1978 ground-water withdrawals

	Rates of flow (cubic feet per second)	
Inflow components	Irrigation period	Nonirrigation period
Recharge from precipitation	+13.84	+11.67
Leakage from Osborne Irrigation Canal	+24.37	0
Subsurface inflow	+2.05	+1.90
Recharge from surface-water irrigation (return flow)	+3.25	0
Recharge from ground-water irrigation	+3.88	0
Outflow components		
Ground-water evapotranspiration	-4.76	-1.10
Subsurface outflow	- .40	- .42
Discharge from wells (municipal and irrigation wells)	-40.23	-1.42
Net river leakage	+3.69	-11.77
Change in storage	-5.69	+1.14

Table 6.--Projected rates of flow at the end of each period during the year 2000, based on one-half of 1970-78 average surface-water supplies and 1978 ground-water withdrawals

	Rates of flow (cubic feet per second)	
Inflow components	Irrigation period	Nonirrigation period
Recharge from precipitation	+13.84	+11.67
Leakage from Osborne Irrigation Canal	+12.56	0
Subsurface inflow	+2.07	+1.91
Recharge from surface-water irrigation (return flow)	+1.49	0
Recharge from ground-water irrigation	+3.65	0
Outflow components		
Ground-water evapotranspiration	-4.76	-1.10
Subsurface outflow	-0.39	- .42
Discharge from wells (municipal and irrigation wells)	-37.93	-1.42
Net river leakage	+4.22	-9.39
Change in storage	+5.25	-1.25

Analysis of Sensitivity

The sensitivity of the model to changes in aquifer characteristics was tested. The sensitivity analysis was made for hydraulic conductivity of the aquifer (K), vertical hydraulic conductivity of the streambed material (k'), and specific yield (Sy). Changes in aquifer charcteristics result in effects of different magnitudes on the values calculated during the simulation, including the rates of flow within the system and the volume of water withdrawn from storage. The results, shown in figures 17-19, are given in terms of volume withdrawn from storage in the aquifer and the average leakage rate to the river within the study area for the entire simulation period (March 1970 to January 1979).

The sensitivity of storage depletion and stream leakage to aquifer hydraulic conductivity is shown in figure 17. Hydraulic-conductivity values were tested in the range from 0.0010 to 0.0025 ft/s while maintaining constant values of vertical hydraulic conductivity at 0.13 X 10^{-5} ft/s and specific yield at 0.20. Results of the simulations indicated that storage depletion ranged from 5.73 X 10^{8} cubic feet (13,000 acre-feet) to 13.69 X 10^{-8} cubic feet (31,400 acre-feet). At the calibrated hydraulic-conductivity value of 0.0015 ft/s, the storage depletion was 9.95 X 10^{-8} cubic feet. Thus, the possible storage-depletion error that may be expected from model simulations ranges from -4.2 X 10^{8} to 3.7 X 10^{8} cubic feet. By

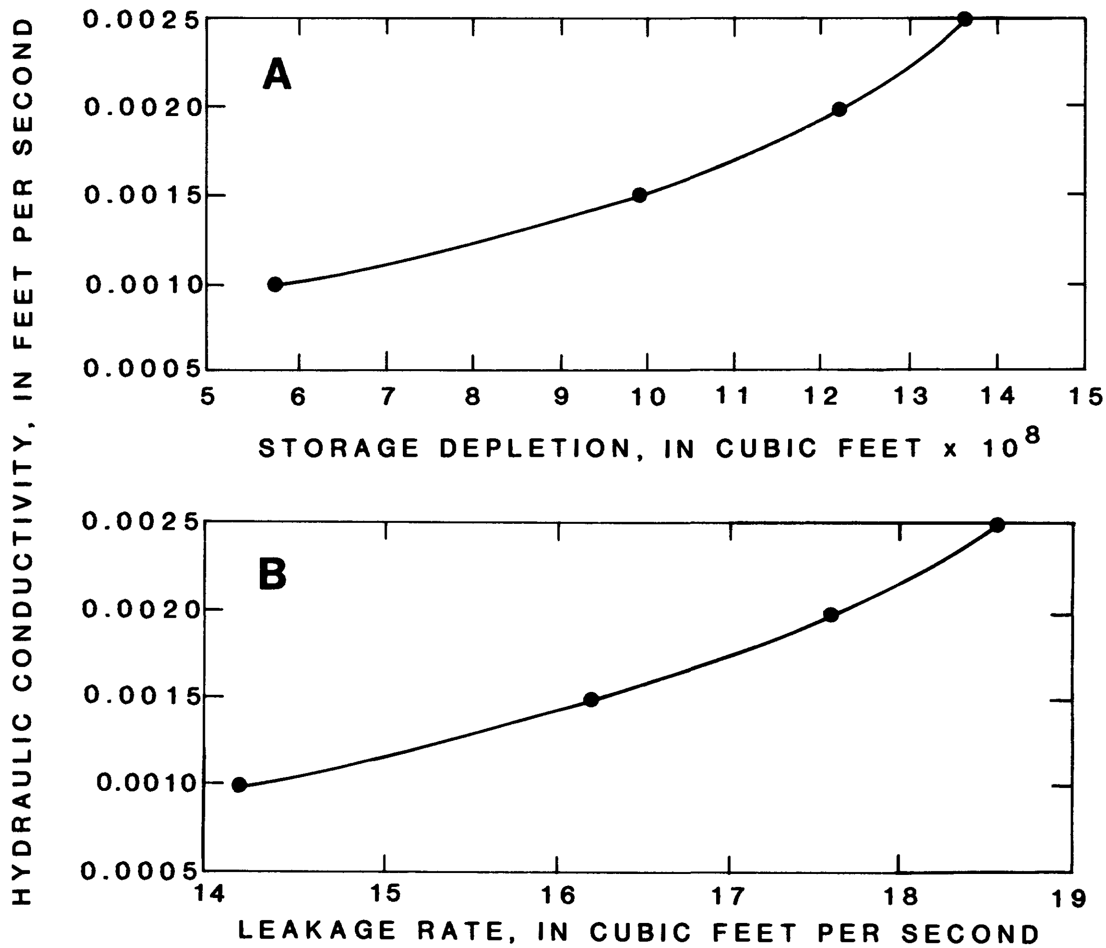

Figure 17.--Variation of (A) storage depletion and (B) stream leakage resulting from differences in hydraulic conductivity of the aquifer.

relating these values to the area of the aquifer in the model (2.74×10^9 square feet) and using a storage coefficient of 0.20, the computed average difference in water levels would range between -0.8 and +0.7 foot.

In terms of average leakage to the South Fork Solomon River, the range of hydraulic-conductivity values from 0.0010 to 0.0025 ft/s indicates a range in leakance rate from 14.21 to 18.61 ft^3/s. At the calibrated hydraulic-conductivity value of 0.0015 ft/s, the average leakage value is 16.21 ft^3/s. Thus, the leakage error that may be expected ranges from -2.0 to +2.4 ft^3/s.

The sensitivity of storage depletion and stream leakage to vertical hydraulic conductivity is shown in figure 18. Vertical hydraulic-conductivity values of the streambed material were tested in the range from 0.13×10^{-6} to 0.13×10^{-3} ft/s while maintaining constant values of hydraulic conductivity at 0.0015 ft/s and specific yield at 0.20. Results of the simulations indicated that the storage depletion ranged from 9.07×10^{-8} to 10.05×10^8 cubic feet. Also, within the same range of vertical hydraulic conductivity of streambed material, the average rate of leakage to the stream ranged from 15.95 ft^3/s for a vertical hydraulic-conductivity value of 0.13×10^{-6} ft/s to 16.21 ft^3/s for a vertical hydraulic-conductivity value of 0.13×10^{-3} ft/s.

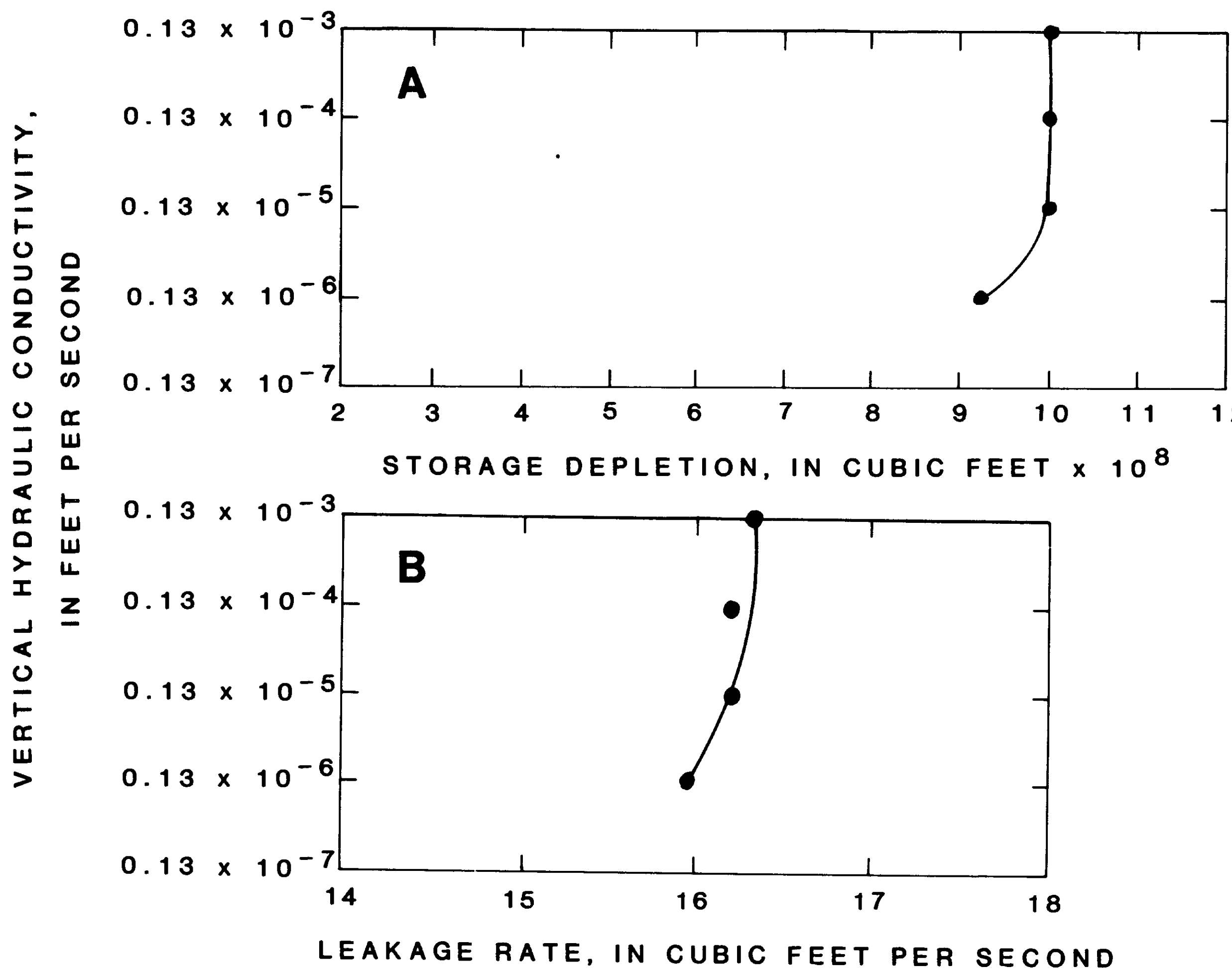

Figure 18.--Variation of (A) storage depletion and (B) stream leakage resulting from differences in vertical hydraulic conductivity of streambed material.

The sensitivity of storage depletion and stream leakage to specific yield is shown in figure 19. Specific yield was tested in the range from 0.15 to 0.25 while maintaining constant values of hydraulic conductivity at 0.0015 and vertical hydraulic conductivity at 0.13 X 10^{-5} ft/s. Results of the simulations indicate that the storage depletion ranged from 8.17 X 10^8 to 11.49 X 10^8 cubic feet. Also within the same range of specific yield, the average rate of leakage to the stream ranged from 15.62 to 16.73 ft^3/s.

The foregoing analysis indicates that stream leakage is relatively sensitive to hydraulic conductivity but not to vertical hydraulic conductivity within the range tested or to specific yield. Storage depletion is sensitive to hydraulic conductivity and specific yield but not to vertical hydraulic conductivity.

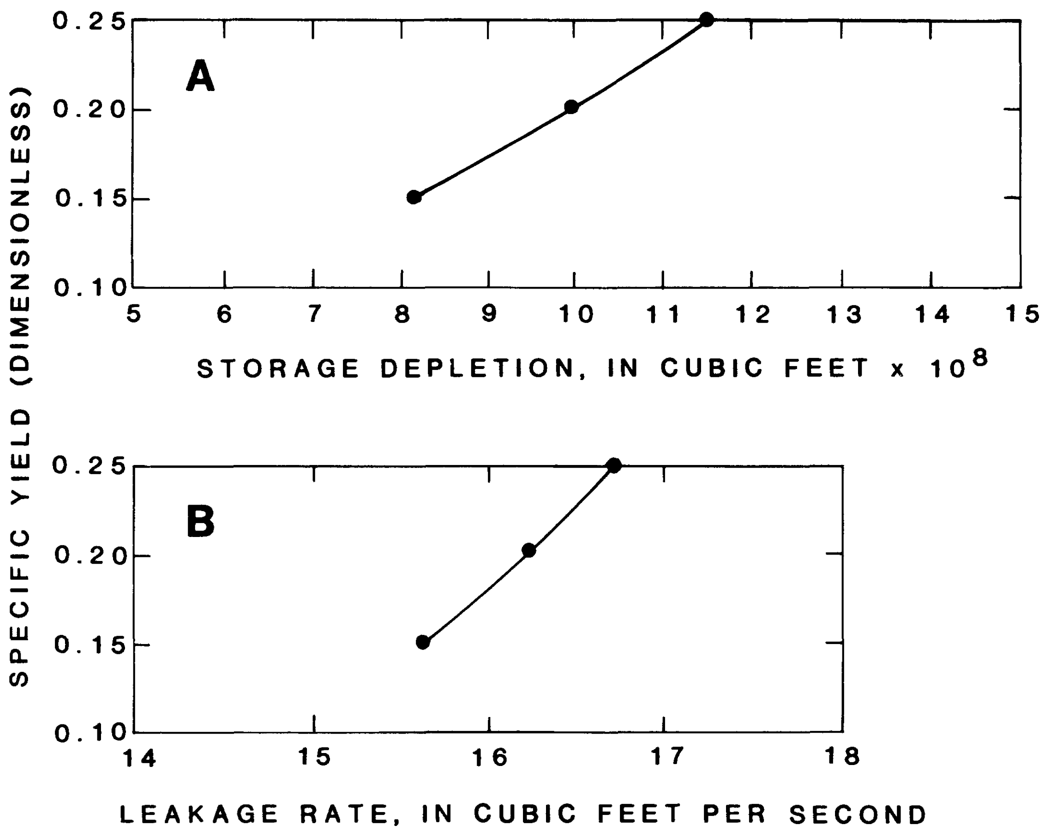

Figure 19.--Variation of (A) storage depletion and (B) stream leakage resulting from differences in specific yield of the aquifer.

SUMMARY AND CONCLUSIONS

The alluvial aquifer in the South Fork Solomon River valley between Webster Reservoir and Waconda Lake extends over an area of about 100 square miles and has saturated thicknesses ranging from a few feet to about 50 feet. Alluvial material in the aquifer consists of silt, clay, sand, and gravel that contain sufficient quantities of water to sustain municipal and irrigation wells.

A transient model of ground-water flow was developed to study the alluvial aquifer. The numerical model was used to simulate ground-water and base-flow conditions between March 1970 and January 1979. Results of the study indicated average values of 130 ft/d for the hydraulic conductivity and 0.20 for the storage coefficient in the aquifer. Vertical hydraulic conductivity of the semiconfining layer between the river and the aquifer averaged 0.13×10^{-5} ft/s, and the thickness of the layer ranged from 0.6 to 12.0 feet. Sensitivity analysis indicated that the model is relatively sensitive both to hydraulic conductivity and specific yield of the aquifer.

Annual recharge to the aquifer from precipitation was determined to range from 0.8 inch (1976) to 4.3 inches (1973) and averaged 2.0 inches (10,000 acre-feet) for 1970-78. Average annual recharge from canal and lateral leakage for 1970-78 was estimated to be about 4,800 acre-feet.

Average annual discharge from the aquifer by ground-water evapotranspiration was estimated to be about 2,500 acre-feet. Withdrawals of ground water by municipal wells averaged about 1,000 acre-feet per year, and seasonal withdrawals by irrigation wells increased from about 1,250 acre-feet during 1970 to about 8,050 acre-feet during 1978. The 1970-78 average annual discharge from the aquifer to the river (base flow) was estimated to be about 12,200 acre-feet.

Model simulations were made, using different rates of recharge from streamflow diversions, to predict the adequacy of ground-water supplies by the year 2000. The first simulation indicated that the supply would be adequate to sustain pumpage at the 1978 rate if recharge from surface-water diversions was available at the 1970-78 rate. The second simulation indicated that 1978 pumpage would be reduced to about 81 percent of the 1978 rate if recharge from surface-water diversions was reduced to one-half of the 1970-78 rate.

REFERENCES

Busby, M. W., and Armentrout, G. W., 1965, Kansas streamflow characteristics, base flow data: Kansas Water Resources Board Technical Report 6A, 207 p.

Jorgensen, D. G., and Stullken, L. E., 1981, Hydrology and model of North Fork Solomon River valley, Kirwin Dam to Waconda Lake, north-central Kansas: Kansas Geological Survey Irrigation Series 6, 34 p.

Kansas Geological Survey, 1964, Geologic map of Kansas: Kansas Geological Survey Map Series M-1, scale: 1:500,000, 1 sheet.

Lohman, S. W., 1972, Ground-water hydraulics: U.S. Geological Survey Professional Paper 708, 70 p.

National Oceanic and Atmospheric Administration, 1971-80, Climatological data for Kansas--annual summary: U.S. Department of Commerce (published annually).

Prescott, G. C., Jr., 1955, Geology and ground-water resources of Graham County, Kansas: Kansas Geological Survey Bulletin 110, 98 p.

Remson, Irwin, Hornberger, G. M., and Molz, F. J., 1971, Numerical methods in subsurface hydrology--with an introduction to the finite element method: New York, John Wiley & Sons, Inc., 389 p.

Stullken, L. E., 1980, Hydrogeologic data from north-central Kansas: Kansas Geological Survey Basic Data Series, Ground-Water Release 7, 46 p.

Trescott, P. C., Pinder, G. F., and Larson, S. P., 1976, Finite-difference model for aquifer simulation in two dimensions with results of numerical experiments: U.S. Geological Survey Techniques of Water-Resources Investigations, Book 7, Chapter C-1, p. 2-31.

Walton, W. C., 1970, Groundwater resource evaluation: New York, McGraw-Hill, Inc., 664 p.

Winslow, J. D., and Nuzman, C. E., 1966, Electronic simulation of ground-water hydrology in the Kansas River valley near Topeka, Kansas: Kansas Geological Survey Special Distribution Publication 29, 24 p.

MODEL DATA

A two-dimensional finite-difference flow model, as developed and documented by Trescott and others (1976) (see "References"), was used to evaluate the stream-aquifer system. The code used for evaluation is the same as the aforementioned documented code except code changes have been made so that the code could be executed on the Harris S125 minicomputer. Code changes also were made so that a new recharge rate from precipitation could be read before each new pumping period and so that a printout of fluxes across each constant-head and river node could be accomplished.

The model was set up to handle a water-table aquifer that included leakage from a stream. Options used, as documented, included evapotranspiration and recharge from precipitation. The Strongly Implicit Procedure for solving the equations was used along with an error criterion of 0.005 for closure.

A constant aquifer hydraulic conductivity of 0.0015 ft/s and a storage coefficient of 0.20 were used uniformly throughout the modeled area. Further, a vertical hydraulic-conductivity value of 1.3×10^{-6} ft/s was used at all river nodes.

The data listing that follows includes the matrix printout of initial water table (starting head matrix), aquifer base, and river and land-surface elevations. The thickness of the streambed material is also included.

Following the printout of the matrixes mentioned above, recharge and well data are presented by pumping period. The first line of the printout shows the recharge value in feet per second. This value is applied uniformly throughout the modeled area for the pumping period. Well data are given next with the first card indicating parameters as described in the model documentation. Negative and positive well-pumpage values, in cubic feet per second, follow. Negative values represent pumping wells, and positive values represent recharge wells.

STARTING-HEAD MATRIX

1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	634.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	631.3	631.9	631.6	630.9	630.4	627.5	622.0	607.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	627.7	624.0	630.0	628.1	626.9	622.5	612.9	604.8
	600.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	631.2	625.6	622.0	623.7	620.1	618.4	619.7	617.0	615.5	609.1	602.3
	599.1	596.3	594.4	594.2	0.0	588.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	622.3	627.1	620.4	611.1	619.5	617.2	612.9	610.6	602.8	602.1	600.5	598.3
	596.6	593.8	591.4	589.2	586.1	583.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	620.0	619.1	622.7	612.2	610.0	615.7	612.8	606.6	603.2	588.3	587.2	590.7	592.9
	592.1	589.0	586.1	580,6	577.5	576.8	572.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	664.1	662.5	660.8	657.0	653.0	638.2	621.1	619.1	619.8	614.0	608.1	613.2	607.6	601.8	599.6	590.1	588.6	586.0	586.4
	584.8	582.7	579.6	574.4	572.3	571.7	569.6	567.0	565.9	565.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	676.2	672.4	665.8
	662.2	661.8	660.6	658.8	655.3	650.4	638.5	627.5	623.0	618.3	615.9	606.1	609.8	602.2	597.2	597.3	593.0	589.9	584.1	583.4
	580.1	578.1	574.3	568.3	566.2	568.0	566.8	565.8	565.3	564.5	563.2	562.0	560.0	555.0	553.0	550.0	545.0	544.0	540.0	535.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	680.8	679.3	677.6	676.4	676.2	675.0	670.4	663.3
	660.4	659.0	657.2	654.4	652.5	648.3	638.1	631.7	625.0	622.0	618.4	604.1	603.2	600.0	597.7	595.1	593.6	590.6	583.0	581.1
	579.9	575.1	570.2	568.4	564.1	565.3	564.3	563.7	564.2	563.0	561.2	556.9	553.0	547.2	541.5	539.8	539.2	539.3	537.9	530.3
	528.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	679.4	677.7	676.5	675.7	675.7	673.7	666.6	660.4
	658.0	656.1	653.3	650.1	649.0	644.4	637.1	634.0	628.0	625.1	622.3	0.0	602.0	0.0	0.0	0.0	0.0	0.0	584.7	582.8
	581.0	576.7	572.0	569.2	565.0	562.8	561.7	560.4	561.9	559.2	557.7	554.0	550.1	544.1	540.2	538.6	537.8	537.0	534.2	528.2
	526.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	726.0	0.0	0.0	0.0	0.0	0.0	0.0	677.1	676.0	674.8	674.7	673.8	668.9	660.1	658.1
	655.1	653.1	650.1	648.1	646.4	640.1	638.9	635.1	630.0	627.4	624.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	582.4	578.7	574.2	570.4	565.7	560.1	558.1	556.0	557.1	552.5	552.6	549.1	545.0	538.5	537.5	536.8	535.7	534.3	530.9	525.7
	524.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	722.6	719.2	0.0	0.0	0.0	697.0	687.9	678.1	675.1	673.0	673.2	670.8	663.2	661.5	659.7
	656.0	654.0	650.3	648.5	646.0	642.0	640.3	636.1	631.9	628.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	575.9	571.8	566.7	560.5	556.9	554.0	550.4	545.1	546.5	543.3	539.0	530.1	533.5	533.6	532.1	529.8	524.7	523.3
	522.3	521.5	523.2	523.1	521.7	508.1	500.4	498.2	497.6	498.2	498.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	756.0	0.0	0.0	0.0
	730.0	727.5	724.4	721.8	718.9	718.8	715.9	710.9	705.9	698.9	694.2	688.5	680.1	677.1	671.1	671.9	669.6	665.0	662.4	660.9
	659.7	655.8	651.4	649.4	647.4	644.0	642.0	637.2	633.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	572.7	567.0	561.2	556.0	552.0	546.1	544.0	538.1	536.1	533.1	529.0	529.3	530.0	527.7	524.8	520.9	520.4
	519.3	517.9	519.5	517.2	512.3	502.9	498.3	495.9	495.8	497.0	497.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	770.3	763.8	757.7	754.9	0.0	0.0	734.8
	730.3	727.3	723.3	720.0	716.7	714.9	711.8	707.8	703.7	697.6	693.6	689.3	683.7	679.6	673.2	670.0	668.0	665.7	666.0	665.0
	0.0	0.0	651.9	0.0	0.0	0.0	0.0	638.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	560.8	555.5	550.0	547.9	543.0	540.0	537.0	533.0	528.1	525.1	527.3	524.0	521.2	517.9	517.2
	516.6	515.3	514.8	511.3	506.8	499.9	495.5	493.0	493.6	495.2	495.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	459.0
	0.0																			

16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	782.0	776.3	771.4	764.0	757.7	753.6	745.9	740.6	734.7
	730.1	727.0	722.8	718.0	715.3	712.5	708.4	704.0	700.7	696.1	693.0	690.0	687.0	681.8	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	543.8	540.0	538.0	536.4	532.1	527.0	526.0	524.1	521.9	516.8	516.0
	514.7	513.5	511.7	506.6	504.3	497.0	490.0	488.0	491.2	493.0	493.5	490.5	0.0	0.0	0.0	0.0	0.0	0.0	458.4	456.0
	0.0																			
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	782.0	779.9	778.0	772.8	764.1	757.9	753.9	745.3	740.2	733.6
	730.9	726.8	721.9	716.5	714.2	710.6	705.7	700.1	698.1	696.4	693.7	690.3	688.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	544.5	539.2	540.2	539.2	535.8	530.8	528.0	524.2	520.0	516.3	514.5
	512.5	510.7	507.0	499.1	500.7	493.0	490.0	485.0	488.3	490.1	490.4	486.9	0.0	0.0	0.0	463.0	463.7	456.0	457.0	452.0
	0.0																			
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	791.6	784.7	780.1	778.5	775.7	763.6	756.7	752.0	744.3	740.2	735.9
	732.1	726.8	720.6	715.1	713.1	709.1	704.4	700.5	698.5	696.9	694.2	690.7	689.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	545.4	542.6	542.4	541.1	538.3	533.5	529.9	524.4	518.1	515.1	513.0
	510.0	506.6	502.0	500.0	497.0	490.1	487.0	485.0	485.0	486.5	486.2	477.2	475.0	478.0	468.0	467.0	464.0	460.0	456.0	451.0
	0.0																			
19	0.0	0.0	0.0	0.0	0.0	0.0	821.0	0.0	798.7	793.2	786.9	783.2	779.7	774.9	763.4	755.7	750.0	743.5	740.2	737.3
	733.9	0.0	719.4	714.3	712.3	707.9	705.3	702.0	700.0	700.0	694.2	691.0	691.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	546.9	545.2	544.7	542.5	539.9	535.6	531.8	528.0	518.7	516.3	513.9
	510.5	503.3	499.1	498.0	490.1	490.6	488.2	486.9	484.0	482.1	481.1	478.9	473.0	471.5	470.0	467.4	463.1	461.0	454.0	450.0
	0.0																			
20	0.0	0.0	0.0	0.0	0.0	0.0	817.4	808.8	799.7	794.6	788.5	786.6	781.7	776.0	767.0	755.4	748.1	743.0	740.2	737.5
	735.2	0.0	0.0	718.0	712.0	710.0	0.0	0.0	0.0	0.0	0.0	0.0	692.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	548.6	547.1	545.6	0.0	0.0	537.0	0.0	0.0	520.2	517.6	514.7
	511.3	506.0	502.4	498.3	493.5	491.8	489.2	488.2	486.2	484.1	480.1	479.6	472.2	471.0	471.1	468.5	464.8	461.8	453.1	451.0
	0.0																			
21	0.0	0.0	0.0	0.0	0.0	0.0	814.5	807.8	800.8	795.9	791.5	789.8	783.3	778.8	0.0	0.0	746.3	742.8	0.0	737.7
	736.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	693.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	549.9	548.6	0.0	0.0	0.0	0.0	0.0	0.0	522.7	518.6	515.3
	512.0	507.7	505.3	501.3	496.4	493.8	490.7	489.6	488.1	486.2	483.2	481.5	476.7	474.3	472.7	470.1	466.5	463.2	455.0	452.0
	0.0																			
22	0.0	835.0	0.0	828.0	821.7	817.2	813.4	807.5	801.4	797.2	793.4	791.9	784.5	781.3	0.0	0.0	0.0	742.3	0.0	0.0
	738.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	526.1	521.0	517.0
	514.0	510.0	507.5	504.7	499.1	496.0	493.0	491.6	490.0	488.1	485.0	483.0	480.1	477.2	474.9	472.1	468.2	465.4	458.7	456.0
	0.0																			
23	0.0	835.0	830.5	826.6	821.7	817.5	813.1	807.3	801.6	798.4	794.4	0.0	783.7	782.7	0.0	0.0	0.0	0.0	0.0	0.0
	740.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	529.0	0.0	0.0
	0.0	0.0	509.6	507.3	501.0	497.7	494.5	493.1	491.5	489.9	0.0	0.0	482.2	479.0	477.3	474.2	0.0	0.0	0.0	0.0
	0.0																			
24	0.0	835.0	830.0	825.6	821.9	818.0	813.5	808.1	802.3	799.9	795.8	0.0	781.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	491.4	0.0	0.0	483.5	0.0	479.7	0.0	0.0	0.0	0.0	0.0
	0.0																			
25	0.0	835.0	829.5	825.0	822.1	818.5	814.7	809.8	803.5	798.3	796.0	0.0	785.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	493.0	0.0	0.0	0.0	0.0	482.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
26	0.0	0.0	0.0	824.5	822.5	818.9	816.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
27	0.0	0.0	0.0	824.9	823.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
28	0.0	0.0	0.0	826.4	824.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
29	0.0	0.0	0.0	0.0	825.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			

AQUIFER-BASE MATRIX

1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	622.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	619.0	0.0	0.0	0.0	0.0	600.0	605.0	600.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	616.0	0.0	0.0	610.0	610.0	600.0	594.0	586.0
	584.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	610.0	610.0	614.0	613.0	608.0	610.0	600.0	600.0	600.0	590.0	583.0
	580.0	580.0	580.0	582.0	0.0	580.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	605.0	600.0	600.0	600.0	610.0	607.0	600.0	590.0	590.0	595.0	590.0	585.0
	580.0	577.0	575.0	580.0	580.0	570.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	600.0	600.0	590.0	590.0	580.0	605.0	605.0	580.0	570.0	560.0	560.0	580.0	588.0
	584.0	572.0	564.0	560.0	550.0	555.0	552.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	645.0	640.0	652.0	640.0	646.0	630.0	600.0	600.0	585.0	571.0	570.0	603.0	600.0	560.0	558.0	555.0	552.0	550.0	570.0
	575.0	565.0	560.0	530.0	530.0	540.0	547.0	550.0	552.0	551.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	664.0	664.0	650.0
	630.0	630.0	640.0	641.0	638.0	630.0	625.0	615.0	600.0	580.0	575.0	570.0	607.0	580.0	560.0	565.0	565.0	565.0	560.0	550.0
	550.0	540.0	538.0	540.0	535.0	530.0	540.0	550.0	551.0	551.0	550.0	550.0	550.0	550.0	547.0	547.0	540.0	545.0	545.0	540.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	664.0	670.0	660.0	650.0	650.0	645.0	640.0	635.0
	620.0	622.0	635.0	640.0	638.0	630.0	620.0	615.0	590.0	578.0	578.0	575.0	565.0	562.0	562.0	568.0	570.0	568.0	565.0	560.0
	560.0	550.0	543.0	545.0	543.0	535.0	530.0	545.0	551.0	551.0	545.0	542.0	540.0	540.0	537.0	535.0	530.0	535.0	537.0	520.0
	512.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	662.0	660.0	655.0	650.0	660.0	655.0	653.0	610.0
	610.0	610.0	630.0	630.0	634.0	636.0	610.0	600.0	580.0	581.0	583.0	0.0	570.0	0.0	0.0	0.0	0.0	0.0	575.0	573.0
	570.0	565.0	555.0	550.0	548.0	542.0	530.0	540.0	553.0	548.0	540.0	530.0	530.0	533.0	530.0	525.0	522.0	530.0	532.0	512.0
	510.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	715.0	0.0	0.0	0.0	0.0	0.0	0.0	660.0	650.0	640.0	645.0	660.0	655.0	630.0	612.0
	615.0	615.0	600.0	600.0	600.0	590.0	585.0	580.0	580.0	584.0	585.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	572.0	572.0	565.0	560.0	550.0	544.0	540.0	530.0	551.0	535.0	530.0	525.0	525.0	525.0	525.0	525.0	521.0	525.0	530.0	508.0
	511.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	711.0	713.0	0.0	0.0	0.0	690.0	670.0	650.0	630.0	635.0	635.0	640.0	630.0	615.0	630.0
	630.0	630.0	620.0	620.0	620.0	637.0	600.0	590.0	590.0	588.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	570.0	565.0	555.0	546.0	540.0	525.0	535.0	518.0	520.0	515.0	515.0	515.0	518.0	522.0	520.0	520.0	515.0	507.0
	512.0	517.0	520.0	520.0	520.0	500.0	490.0	488.0	484.0	480.0	475.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	720.0	0.0	0.0	0.0
	700.0	700.0	700.0	715.0	705.0	700.0	700.0	700.0	690.0	680.0	660.0	650.0	645.0	652.0	650.0	630.0	630.0	620.0	630.0	640.0
	640.0	640.0	641.0	640.0	639.0	638.0	620.0	610.0	600.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	567.0	0.0	548.0	541.0	530.0	520.0	522.0	520.0	515.0	510.0	507.0	515.0	515.0	515.0	515.0	507.0	506.0
	512.0	515.0	515.0	515.0	510.0	490.0	488.0	484.0	480.0	475.0	468.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	750.0	740.0	735.0	719.0	0.0	0.0	700.0
	684.0	682.0	700.0	715.0	709.0	700.0	695.0	690.0	682.0	670.0	640.0	650.0	655.0	655.0	655.0	650.0	650.0	650.0	650.0	650.0
	0.0	0.0	643.0	0.0	0.0	0.0	0.0	620.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	550.0	541.0	535.0	530.0	525.0	521.0	522.0	518.0	512.0	503.0	501.0	500.0	505.0	505.0	501.0
	510.0	510.0	510.0	505.0	490.0	486.0	486.0	482.0	476.0	470.0	465.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	450.0
	0.0																			

16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	766.0	755.0	730.0	730.0	730.0	715.0	726.0	720.0	686.0
	710.0	700.0	680.0	705.0	708.0	700.0	695.0	688.0	680.0	645.0	660.0	665.0	660.0	660.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	524.0	522.0	528.0	525.0	520.0	513.0	505.0	495.0	500.0	502.0	501.0
	505.0	506.0	504.0	500.0	489.0	483.0	484.0	480.0	472.0	468.0	464.0	465.0	0.0	0.0	0.0	0.0	0.0	0.0	449.0	448.0
	0.0																			
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	766.0	764.0	750.0	720.0	710.0	725.0	712.0	724.0	710.0	702.0
	710.0	705.0	700.0	700.0	704.0	700.0	690.0	680.0	670.0	660.0	677.0	670.0	665.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	526.0	524.0	527.0	525.0	525.0	516.0	510.0	500.0	494.0	500.0	501.0
	502.0	504.0	501.0	485.0	480.0	481.0	481.0	470.0	469.0	467.0	462.0	464.0	0.0	0.0	0.0	460.0	450.0	448.0	446.0	445.0
	0.0																			
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	770.0	764.0	762.0	730.0	730.0	740.0	710.0	708.0	722.0	700.0	720.0
	715.0	710.0	705.0	675.0	690.0	690.0	680.0	660.0	655.0	678.0	678.0	672.0	670.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	530.0	526.0	531.0	532.0	530.0	520.0	513.0	505.0	496.0	493.0	495.0
	500.0	500.0	480.0	478.0	475.0	472.0	470.0	470.0	465.0	462.0	461.0	463.0	462.0	461.0	460.0	450.0	449.0	446.0	444.0	442.0
	0.0																			
19	0.0	0.0	0.0	0.0	0.0	0.0	774.0	0.0	772.0	766.0	762.0	760.0	730.0	740.0	745.0	720.0	705.0	720.0	690.0	725.0
	715.0	0.0	705.0	675.0	680.0	680.0	660.0	675.0	675.0	675.0	680.0	674.0	672.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	533.0	528.0	532.0	534.0	532.0	522.0	515.0	510.0	499.0	495.0	490.0
	488.0	484.0	483.0	483.0	480.0	472.0	480.0	480.0	470.0	462.0	460.0	461.0	461.0	458.0	454.0	449.0	446.0	442.0	439.0	438.0
	0.0																			
20	0.0	0.0	0.0	0.0	0.0	0.0	772.0	800.0	770.0	762.0	758.0	700.0	725.0	750.0	757.0	730.0	700.0	710.0	700.0	725.0
	717.0	0.0	0.0	0.0	670.0	663.0	0.0	0.0	0.0	0.0	0.0	0.0	674.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	537.0	530.0	0.0	0.0	0.0	524.0	0.0	0.0	500.0	498.0	492.0
	492.0	491.0	490.0	488.0	483.0	482.0	481.0	482.0	471.0	464.0	463.0	460.0	453.0	451.0	449.0	446.0	443.0	440.0	439.0	435.0
	0.0																			
21	0.0	0.0	0.0	0.0	0.0	0.0	770.0	765.0	762.0	758.0	753.0	740.0	730.0	752.0	0.0	0.0	710.0	696.0	0.0	730.0
	719.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	676.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	540.0	532.0	0.0	0.0	0.0	0.0	0.0	0.0	503.0	500.0	495.0
	494.0	492.0	491.0	490.0	486.0	484.0	482.0	483.0	475.0	468.0	468.0	467.0	465.0	466.0	450.0	449.0	448.0	445.0	442.0	440.0
	0.0																			
22	0.0	826.0	0.0	825.0	800.0	760.0	750.0	750.0	750.0	750.0	730.0	735.0	747.0	754.0	0.0	0.0	0.0	700.0	0.0	0.0
	721.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	508.0	505.0	500.0
	498.0	495.0	492.0	491.0	490.0	486.0	483.0	484.0	478.0	470.0	470.0	473.0	470.0	467.0	460.0	455.0	455.0	455.0	455.0	450.0
	0.0																			
23	0.0	800.0	800.0	820.0	800.0	770.0	770.0	770.0	740.0	730.0	730.0	0.0	750.0	756.0	0.0	0.0	0.0	0.0	0.0	0.0
	723.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	510.0	0.0	0.0
	0.0	0.0	500.0	498.0	496.0	490.0	485.0	484.0	480.0	472.0	0.0	0.0	472.0	470.0	460.0	465.0	0.0	0.0	0.0	0.0
	0.0																			
24	0.0	800.0	790.0	800.0	790.0	775.0	790.0	795.0	780.0	750.0	745.0	0.0	752.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	474.0	0.0	0.0	474.0	0.0	465.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
25	0.0	820.0	800.0	790.0	780.0	780.0	800.0	800.0	790.0	760.0	750.0	0.0	754.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	476.0	0.0	0.0	0.0	0.0	470.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
26	0.0	0.0	0.0	785.0	778.0	795.0	802.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
27	0.0	0.0	0.0	810.0	800.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
28	0.0	0.0	0.0	810.0	805.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
29	0.0	0.0	0.0	0.0	810.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			

RIVER-HEAD MATRIX

1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	611.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	620.0	619.0	0.0	612.0	610.0	0.0	0.0	0.0	0.0	588.0	587.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	621.0	619.0	0.0	614.0	608.0	0.0	0.0	0.0	0.0	590.0	0.0	586.0	0.0
	577.0	0.0	0.0	567.0	566.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	623.0	618.0	616.0	606.0	0.0	0.0	597.0	0.0	593.0	0.0	584.0	0.0
	580.0	0.0	0.0	568.0	566.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	625.0	0.0	0.0	604.0	0.0	600.0	0.0	595.0	0.0	0.0	583.0	581.0
	0.0	575.0	570.0	0.0	564.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	637.0	634.0	628.0	0.0	0.0	0.0	602.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	565.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	677.0	676.0	0.0	0.0	0.0	0.0	660.0	658.0
	655.0	653.0	650.0	648.0	0.0	640.0	0.0	0.0	630.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	560.0	558.0	556.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	678.0	675.0	673.0	0.0	0.0	663.0	0.0	0.0
	0.0	0.0	0.0	0.0	646.0	642.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	554.0	0.0	545.0	0.0	0.0	0.0	530.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	680.0	0.0	671.0	0.0	0.0	665.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	644.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	552.0	546.0	544.0	538.0	536.0	533.0	529.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	723.0	720.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	670.0	668.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	550.0	548.0	543.0	540.0	537.0	533.0	528.0	525.0	0.0	524.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			

16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	756.0	0.0	0.0	0.0	0.0
	730.0	727.0	0.0	718.0	0.0	0.0	0.0	0.0	0.0	696.0	693.0	690.0	687.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	540.0	538.0	0.0	0.0	527.0	526.0	0.0	522.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	490.0	488.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	782.0	780.0	778.0	0.0	0.0	758.0	754.0	0.0	0.0	733.0
	0.0	0.0	0.0	717.0	0.0	0.0	702.0	700.0	698.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	539.0	0.0	0.0	0.0	0.0	0.0	0.0	520.0	0.0	0.0
	0.0	0.0	0.0	499.0	0.0	493.0	490.0	485.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	463.0	0.0	456.0	457.0	0.0
	0.0																			
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	784.0	0.0	0.0	776.0	760.0	0.0	752.0	0.0	736.0	0.0
	0.0	0.0	0.0	715.0	0.0	0.0	704.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	518.0	515.0	513.0
	510.0	0.0	502.0	500.0	0.0	490.0	487.0	485.0	485.0	0.0	0.0	477.0	475.0	0.0	468.0	467.0	464.0	460.0	456.0	0.0
	0.0																			
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	786.0	0.0	0.0	773.0	763.0	0.0	750.0	0.0	738.0	0.0
	0.0	0.0	0.0	714.0	0.0	707.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	503.0	499.0	0.0	490.0	0.0	0.0	0.0	484.0	482.0	481.0	479.0	473.0	0.0	470.0	0.0	463.0	461.0	454.0	451.0
	0.0																			
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	788.0	0.0	0.0	770.0	767.0	0.0	748.0	0.0	740.0	0.0
	0.0	0.0	0.0	0.0	712.0	710.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	506.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	480.0	0.0	472.0	471.0	0.0	0.0	0.0	0.0	453.0	452.0
	0.0																			
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	790.0	0.0	0.0	0.0	0.0	746.0	743.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
22	0.0	0.0	0.0	0.0	0.0	0.0	807.0	805.0	0.0	0.0	0.0	792.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
23	0.0	0.0	0.0	0.0	0.0	0.0	808.0	0.0	802.0	0.0	794.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
24	0.0	0.0	835.0	0.0	0.0	0.0	810.0	0.0	0.0	800.0	796.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
25	0.0	0.0	0.0	830.0	0.0	817.0	0.0	0.0	0.0	798.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
26	0.0	0.0	0.0	0.0	825.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			

LAND-SURFACE ELEVATION MATRIX

```
 1  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.D   0.D   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0
 2  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0 651.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0
 3  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0 644.9 643.9 646.9 652.0 654.1 647.9 635.7 622.4
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0
 4  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0 640.8 637.7 643.9 650.0 650.0 639.8 629.6 617.3

  615.2   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0
 5  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0 658.2 643.9 641.8 637.7 635.7 635.7 631.6 627.5 626.5 622.4 613.2
  612.2 612.2 609.1 611.2   0.0 605.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0
 6  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0 637.7 654.1 640.8 637.7 634.7 630.6 630.6 625.5 617.3 624.4 614.2 610.1
  610.1 609.1 608.1 606.0 611.2 603.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0
 7  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0 638.7 633.6 634.7 633.6 629.6 629.6 626.5 625.5 619.3 607.1 604.0 605.0 608.1

  607.1 606.0 605.0 600.9 595.8 590.7 585.6   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0
 8  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0 684.7 679.6 676.6 673.5 671.5 654.1 639.8 639.8 633.6 632.6 628.5 628.5 622.4 619.3 612.2 608.1 605.0 603.0 600.9
  596.8 593.8 593.8 582.5 580.5 581.5 582.5 579.5 578.5 577.4   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0
 9  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0 692.9 688.8 686.8
  684.7 680.7 677.6 673.5 671.5 667.4 650.0 644.9 639.8 634.7 633.6 627.5 627.5 619.3 612.2 611.2 609.1 606.0 600.9 597.9
  591.7 587.6 582.5 580.5 578.5 578.5 579.5 578.5 577.4 577.4 576.4 574.4 572.3 567.2 565.2 562.1 557.0 556.0 551.9 546.8
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0
10  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0 698.0 695.0 693.9 691.9 691.9 690.9 688.8 677.6
  675.5 672.5 670.4 668.4 667.4 664.3 650.0 649.0 640.8 638.7 635.7 627.5 620.4 615.2 616.3 612.2 610.1 607.1 598.9 596.8
  591.7 587.6 583.6 580.5 576.4 576.4 576.4 578.5 577.4 576.4 575.4 572.3 567.2 560.1 552.9 551.9 551.9 551.9 549.8 544.7
  540.6   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0
11  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0 696.0 693.9 692.9 689.8 690.9 691.9 687.8 670.4
  669.4 668.4 666.3 663.3 664.3 663.3 662.3 644.9 641.8 642.8 638.7   0.0 623.4   0.0   0.0   0.0   0.0   0.0 599.9 597.9
  593.8 589.7 584.6 581.5 575.4 572.3 571.3 576.4 575.4 575.4 574.4 570.3 566.2 559.0 552.9 550.9 549.8 548.8 545.7 540.6
  538.6   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0
12  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0 746.1   0.0   0.0   0.0   0.0   0.0   0.0 695.0 692.9 691.9 690.9 689.8 691.9 673.5 671.5
  668.4 666.3 664.3 663.3 663.3 662.3 662.3 643.9 642.8 643.9 642.8   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
  596.8 592.8 587.6 583.6 577.4 570.3 569.3 570.3 572.3 572.3 571.3 566.2 562.1 551.9 549.8 549.8 548.8 547.8 542.7 535.5
  534.5   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0
13  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0 738.9 735.8   0.0   0.0   0.0 714.4 705.2 692.9 691.9 691.9 690.9 689.8 679.6 676.6 673.5
  670.4 668.4 664.3 663.3 663.3 662.3 662.3 646.9 646.9 644.9   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0 589.7 584.6 579.5 571.3 568.2 564.1 567.2 559.0 569.3 552.9 549.8 543.7 545.7 545.7 543.7 541.7 537.6 535.5
  533.5 533.5 535.5 535.5 535.5 526.3 511.0 511.0 511.0 511.0 511.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0
14  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0 774.7   0.0   0.0   0.0
  746.1 744.0 742.0 737.9 735.8 734.8 733.8 730.7 725.6 715.4 710.3 704.2 693.9 693.9 690.9 689.8 688.8 679.6 679.6 678.6
  674.5 669.4 665.3 664.3 663.3 663.3 651.0 650.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0 586.6 582.5 572.3 567.2 562.1 559.0 558.0 554.9 549.8 545.7 542.7 543.7 542.7 539.6 534.5 533.5 531.4
  529.4 528.4 531.4 528.4 523.3 510.0 509.0 505.9 504.9 509.0 510.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0
15  0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0 789.0 780.8 773.7 770.6   0.0   0.0 756.3
  745.0 743.0 738.9 732.8 730.7 728.7 725.6 725.6 724.6 716.4 710.3 702.1 697.0 696.0 690.9 684.7 680.7 680.7 680.7 679.6
    0.0   0.0 666.3   0.0   0.0   0.0   0.0 654.1   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0
    0.0   0.0   0.0   0.0   0.0 574.4 567.2 561.1 560.1 557.0 553.9 549.8 546.8 541.7 540.6 539.6 535.5 530.4 529.4 528.4
  527.4 526.3 525.3 523.3 520.2 509.0 506.9 503.8 503.8 505.9 507.9   0.0   0.0   0.0   0.0   0.0   0.0   0.0   0.0 469.1
    0.0
```

16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	796.1	790.0	788.0	778.8	769.6	766.5	762.4	759.3	755.3
	746.1	742.0	737.9	730.7	730.7	727.7	723.6	717.4	714.4	710.3	709.3	705.2	700.1	698.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	558.0	551.9	550.9	550.9	544.7	538.6	536.5	533.5	529.4	528.4	527.4
	526.3	525.3	524.3	521.2	519.2	506.9	504.9	501.8	502.8	504.9	506.9	505.9	0.0	0.0	0.0	0.0	0.0	0.0	470.1	466.0
	0.0																			
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	798.2	792.0	792.0	788.0	776.7	770.6	763.4	758.3	757.3	753.2
	746.1	742.0	736.9	728.7	730.7	726.6	721.5	712.3	711.3	711.3	709.3	704.2	702.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	559.0	551.9	551.9	551.9	549.8	542.7	540.6	535.5	528.4	527.4	525.3
	523.3	522.2	521.2	519.2	518.2	504.9	502.8	501.8	500.8	501.8	504.9	504.9	0.0	0.0	0.0	480.3	475.2	470.1	466.0	461.9
	0.0																			
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	808.4	798.2	792.0	793.1	786.9	777.7	771.6	762.4	757.3	756.3	754.2
	747.1	743.0	735.8	730.7	729.7	725.6	719.5	715.4	714.4	713.4	710.3	704.2	704.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	556.0	553.9	553.9	552.9	550.9	545.7	541.7	537.6	527.4	526.3	523.3
	519.2	518.2	514.1	510.0	510.0	502.8	499.8	498.7	497.7	498.7	504.9	502.8	494.6	488.5	479.3	477.3	473.2	470.1	465.0	460.9
	0.0																			
19	0.0	0.0	0.0	0.0	0.0	0.0	843.1	0.0	817.6	810.4	803.3	799.2	794.1	785.9	779.8	772.6	759.3	756.3	755.3	755.3
	749.1	0.0	735.8	731.8	727.7	723.6	721.5	717.4	715.4	715.4	710.3	705.2	706.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	559.0	557.0	557.0	554.9	552.9	547.8	544.7	539.6	528.4	527.4	524.3
	521.2	517.1	512.0	505.9	502.8	501.8	498.7	498.7	496.7	494.6	492.6	490.6	487.5	482.4	478.3	476.3	472.2	471.1	464.0	459.9
	0.0																			
20	0.0	0.0	0.0	0.0	0.0	0.0	838.0	827.8	817.6	812.5	806.4	801.2	794.1	784.9	780.8	773.7	758.3	755.3	755.3	752.2
	750.1	0.0	0.0	733.8	726.6	723.6	0.0	0.0	0.0	0.0	0.0	0.0	708.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	561.1	560.1	558.0	0.0	0.0	549.8	0.0	0.0	530.4	529.4	526.3
	523.3	518.2	514.1	506.9	503.8	501.8	498.7	498.7	497.7	495.7	494.6	491.6	487.5	483.4	480.3	477.3	473.2	472.2	463.0	460.9
	0.0																			
21	0.0	0.0	0.0	0.0	0.0	0.0	832.9	826.8	816.6	814.5	806.4	804.3	798.2	791.0	0.0	0.0	757.3	756.3	0.0	754.2
	752.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	710.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	563.1	562.1	0.0	0.0	0.0	0.0	0.0	0.0	533.5	531.4	527.4
	524.3	520.2	516.1	510.0	506.9	503.8	499.8	499.8	498.7	497.7	495.7	493.6	488.5	485.4	483.4	479.3	476.3	474.2	461.9	461.9
	0.0																			
22	0.0	848.3	0.0	846.2	842.1	838.0	825.8	823.7	814.5	812.5	807.4	806.4	804.3	798.2	0.0	0.0	0.0	758.3	0.0	0.0
	754.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	539.6	532.5	528.4
	525.3	521.2	519.2	517.1	510.0	506.9	503.8	501.8	500.8	498.7	496.7	494.6	491.6	487.5	485.4	484.4	480.3	478.3	470.1	466.0
	0.0																			
23	0.0	848.3	847.2	845.2	841.1	837.0	826.8	824.8	814.5	810.4	807.4	0.0	807.4	803.3	0.0	0.0	0.0	0.0	0.0	0.0
	756.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	542.7	0.0	0.0
	0.0	0.0	523.3	521.2	512.0	510.0	505.9	504.9	503.8	499.8	0.0	0.0	493.6	490.6	487.5	485.4	0.0	0.0	0.0	0.0
	0.0																			
24	0.0	848.3	846.2	843.1	840.1	835.0	827.8	824.8	818.6	807.4	807.4	0.0	811.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	501.8	0.0	0.0	494.6	0.0	490.6	0.0	0.0	0.0	0.0	0.0
	0.0																			
25	0.0	848.3	847.2	842.1	840.1	834.0	831.9	829.9	825.8	807.4	809.4	0.0	815.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	503.8	0.0	0.0	0.0	0.0	492.6	0.0	0.0	0.0	0.0	0.0
	0.0																			
26	0.0	0.0	0.0	842.1	839.1	837.0	836.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
27	0.0	0.0	0.0	842.1	841.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
28	0.0	0.0	0.0	846.2	842.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
29	0.0	0.0	0.0	0.0	844.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			

STREAMBED-THICKNESS MATRIX

1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	1.2	1.1	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.2	0.0	1.0	1.2	0.0	0.0	0.0	0.0	1.2	0.0	1.2	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.7	1.8	1.2	0.0	0.0	0.9	0.0	1.2	0.0	1.2	0.0
	1.3	0.0	0.0	1.5	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	1.2	0.0	1.0	0.0	2.1	0.0	0.0	0.9	1.0
	0.0	1.7	1.5	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.2	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	1.2	0.0	0.0	0.0	0.0	0.0	1.2	1.2
	1.5	1.0	1.2	1.8	0.0	1.2	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	1.2	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	1.7	1.0	0.0	0.0	1.2	0.0	0.0
	0.0	0.0	0.0	0.0	1.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.8	0.0	1.2	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0	1.2	0.0	0.0	1.2	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.2	1.0	0.8	0.6	0.6	2.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	9.6	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	2.0	1.2	1.2	0.8	0.6	1.0	1.0	0.0	0.9	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			

16	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3.6	10.8	0.0	2.0	0.0	0.0	0.0	0.0	0.0	1.5	1.2	1.7	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.6	1.1	0.0	1.7	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	10.8	1.0	0.0	0.0	4.8	2.0	0.0	0.0	7.2
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
	0.0	0.0	0.0	1.0	0.0	1.0	1.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	1.1	1.0	0.0
	0.0																			
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0	0.0
	0.0	0.0	0.0	12.0	0.0	0.0	10.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.3	1.2
	1.0	0.0	1.0	1.0	0.0	1.7	1.0	0.8	1.0	0.0	0.0	1.5	1.2	0.0	0.7	2.4	2.4	2.0	1.7	0.0
	0.0																			
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.4	0.0	0.0	0.0
	0.0	0.0	0.0	11.4	0.0	11.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	4.8	1.0	0.0	0.9	0.0	0.0	0.0	1.5	1.1	1.3	4.8	1.2	0.0	4.8	0.0	2.0	2.0	0.7	1.5
	0.0																			
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.6	0.0	0.0	0.0	1.5	0.0	3.6	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	1.5	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	3.0	0.7	0.0	0.0	0.0	0.0	1.2	1.3
	0.0																			
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.0	0.0	11.4	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
23	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
24	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	9.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
29	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.0																			

PUMPING-PERIOD CONTROL PARAMETERS
(see Trescott and others, 1976, p. 54)

0.000000003							
1	0	17	90	20		1.5	12
18	12	-0.1028	City pumpage				
19	12	-0.1028	City pumpage				
18	14	-0.1044	City pumpage				
19	14	-0.1044	City pumpage				
17	15	-0.0240	City pumpage				
18	15	-0.1044	City pumpage				
19	15	-0.1044	City pumpage				
17	16	-0.0240	City pumpage				
16	17	-0.1068	City pumpage				
11	36	-0.0296	City pumpage				
8	52	-0.0296	City pumpage				
15	78	-0.0964	City pumpage				
16	78	-0.0964	City pumpage				
14	79	-0.0964	City pumpage				
15	79	-0.0964	City pumpage				
16	79	-0.0964	City pumpage				
15	80	-0.0964	City pumpage				
.000000004							
2	1	190	90	20		1.5	12
14	38	-0.9635	Gw irrigation	0	1964	172	
14	38	0.0963	Return-GW irr				
10	41	-0.6442	Gw irrigation	0	1957	115	
10	41	0.0644	Return-Gw irr				
13	48	-0.9523	Gw irrigation	0	1957	170	
13	48	0.0952	Return-Gw irr				
24	5	-0.8963	Gw irrigation	0	1963	160	
24	5	0.0896	Return-Gw irr				
15	16	-0.3697	Gw irrigation	0	1964	66	
15	16	0.0370	Return-Gw irr				
15	17	-0.3249	Gw irrigation	0	1963	58	
15	17	0.0325	Return-Gw irr				
20	18	-0.2801	Gw irrigation	0	1956	50	
20	18	0.0280	Return-Gw irr				
19	19	-0.9915	Gw irrigation	0	1963	177	
19	19	0.0991	Return-Gw irr				
19	25	-0.7338	Gw irrigation	0	1959	131	
19	25	0.0734	Return-Gw irr				
16	29	-0.4201	Gw irrigation	0	1959	75	
16	29	0.0420	Return-Gw irr				
18	12	-0.1028	City pumpage				
19	12	-0.1028	City pumpage				
18	14	-0.1044	City pumpage				
19	14	-0.1044	City pumpage				
17	15	-0.0240	City pumpage				
18	15	-0.1044	City pumpage				
19	15	-0.1044	City pumpage				
17	16	-0.0240	City pumpage				

0.000000004--Continued

7	62	0.0381	Return-Gw irr
16	17	-0.1068	City pumpage
12	33	0.6626	Canl&lat loss
12	34	0.6626	Canl&lat loss
13	35	0.6626	Canl&lat loss
11	36	-0.0296	City pumpage
13	36	0.6626	Canl&lat loss
13	37	0.6626	Canl&lat loss
12	38	0.6626	Canl&lat loss
9	39	0.0675	Sw irr-return
10	39	0.0675	Sw irr-return
11	39	0.6626	Canl&lat loss

.000000003

9	40	0.0675	Sw irr-return
10	40	0.6626	Canl&lat loss
11	40	0.0675	Sw irr-return
10	41	0.6626	Canl&lat loss
8	42	0.0675	Sw irr-return
10	42	0.6626	Canl&lat loss
10	43	0.6626	Canl&lat loss
8	44	0.0675	Sw irr-return
10	44	0.6626	Canl&lat loss
10	44	0.0675	Sw irr-return
11	44	0.0675	Sw irr-return
8	45	0.0675	Sw irr-return
9	45	0.6626	Canl&lat loss
9	45	0.0675	Sw irr-return
10	45	0.0675	Sw irr-return
11	45	0.0675	Sw irr-return
12	45	0.0675	Sw irr-return
8	46	0.0675	Sw irr-return
9	46	0.6626	Canl&lat loss
9	46	0.0675	Sw irr-return
10	46	0.0675	Sw irr-return
12	46	0.0675	Sw irr-return
8	47	0.6626	Canl&lat loss
9	47	0.6626	Canl&lat loss
10	47	0.0675	Sw irr-return
7	48	0.6626	Canl&lat loss
7	49	0.6626	Canl&lat loss
7	50	0.6626	Canl&lat loss
6	51	0.6626	Canl&lat loss
6	52	0.6626	Canl&lat loss
8	52	-0.0296	City pumpage
4	53	0.6626	Canl&lat loss
5	54	0.6626	Canl&lat loss
5	55	0.6626	Canl&lat loss
5	55	0.0675	Sw irr-return

0.000000003--Continued

6	55	0.0675	Sw irr-return
7	55	0.0675	Sw irr-return
4	56	0.6626	Canl&lat loss
6	56	0.0675	Sw irr-return
7	56	0.0675	Sw irr-return
3	58	0.6626	Canl&lat loss
3	58	0.0675	Sw irr-return
4	58	0.0675	Sw irr-return
4	59	0.6626	Canl&lat loss
3	60	0.6626	Canl&lat loss
3	60	0.0675	Sw irr-return
4	60	0.0675	Sw irr-return
5	60	0.0675	Sw irr-return
6	60	0.0675	Sw irr-return
7	60	0.0675	Sw irr-return
8	60	0.0675	Sw irr-return
4	61	0.6626	Canl&lat loss
4	61	0.0675	Sw irr-return
5	61	0.0675	Sw irr-return
6	61	0.0675	Sw irr-return
7	61	0.0675	Sw irr-return
8	61	0.0675	Sw irr-return
5	62	0.6626	Canl&lat loss
5	62	0.0675	Sw irr-return
6	62	0.0675	Sw irr-return
8	62	0.0675	Sw irr-return
6	63	0.6626	Canl&lat loss
6	63	0.0675	Sw irr-return
7	63	0.0675	Sw irr-return
6	64	0.6626	Canl&lat loss
6	65	0.6626	Canl&lat loss
6	65	0.0675	Sw irr-return
5	66	0.6626	Canl&lat loss
7	67	0.6626	Canl&lat loss
8	67	0.0675	Sw irr-return
8	68	0.6626	Canl&lat loss
8	68	0.0675	Sw irr-return
9	68	0.0675	Sw irr-return
10	68	0.0675	Sw irr-return
11	68	0.0675	Sw irr-return
8	69	0.6626	Canl&lat loss
10	69	0.0675	Sw irr-return
11	69	0.0675	Sw irr-return
12	69	0.0675	Sw irr-return
8	70	0.6626	Canl&lat loss
8	70	0.0675	Sw irr-return
9	70	0.0675	Sw irr-return
10	70	0.0675	Sw irr-return
11	70	0.0675	Sw irr-return
12	70	0.0675	Sw irr-return

0.000000003--Continued

9	71	0.6626	Canl&lat loss		
9	71	0.0675	Sw irr-return		
12	71	0.0675	Sw irr-return		
13	71	0.0675	Sw irr-return		
10	72	0.6626	Canl&lat loss		
11	73	0.6626	Canl&lat loss		
16	73	-0.4481	Gw irrigation	2 1970	80
16	73	0.0448	Return-Gw irr		
11	74	0.6626	Canl&lat loss		
11	74	0.0675	Sw irr-return		
12	74	0.0675	Sw irr-return		
11	75	0.6626	Canl&lat loss		
13	75	0.0675	Sw irr-return		
14	75	0.0675	Sw irr-return		
11	76	0.6626	Canl&lat loss		
11	76	0.0675	Sw irr-return		
12	76	0.0675	Sw irr-return		
13	76	0.0675	Sw irr-return		
14	76	0.0675	Sw irr-return		
11	77	0.6626	Canl&lat loss		
11	77	0.0675	Sw irr-return		
14	77	0.0675	Sw irr-return		
11	78	0.6626	Canl&lat loss		
11	78	0.0675	Sw irr-return		
13	78	0.0675	Sw irr-return		
14	78	0.0675	Sw irr-return		
15	78	-0.0964	City pumpage		
16	78	-0.0964	City pumpage		
11	79	0.6626	Canl&lat loss		
13	79	0.0675	Sw irr-return		
14	79	-0.0964	City pumpage		
15	79	-0.0964	City pumpage		
16	79	-0.0964	City pumpage		
11	80	0.6626	Canl&lat loss		
11	80	0.0675	Sw irr-return		
12	80	0.0675	Sw irr-return		
15	80	-0.0964	City pumpage		
12	81	0.6626	Canl&lat loss		
13	82	0.6626	Canl&lat loss		
13	82	0.0675	Sw irr-return		
14	82	0.0675	Sw irr-return		
15	82	0.0675	Sw irr-return		
14	83	0.6626	Canl&lat loss		
16	83	0.0675	Sw irr-return		
17	83	0.0675	Sw irr-return		
14	84	0.6626	Canl&lat loss		
14	85	0.6626	Canl&lat loss		
14	85	0.0675	Sw irr-return		
14	86	0.6626	Canl&lat loss		

0.000000003--Continued

14	86	0.0675	Sw irr-return			
15	86	0.0675	Sw irr-return			
16	86	0.0675	Sw irr-return			
17	86	0.0675	Sw irr-return			
14	87	0.6626	Canl&lat loss			
14	87	0.0675	Sw irr-return			
14	88	0.6626	Canl&lat loss			
14	88	0.0675	Sw irr-return			
14	89	0.6626	Canl&lat loss			
15	90	0.6626	Canl&lat loss			
16	90	0.6626	Canl&lat loss			
16	90	0.0675	Sw irr-return			
17	90	0.0675	Sw irr-return			
16	91	0.0675	Sw irr-return			
17	91	0.6626	Canl&lat loss			
17	91	0.0675	Sw irr-return			
3	2	17	275	20	1.5	12
18	12	-0.1028	City pumpage			
19	12	-0.1028	City pumpage			
18	14	-0.1044	City pumpage			
19	14	-0.1044	City pumpage			
17	15	-0.0240	City pumpage			
18	15	-0.1044	City pumpage			
19	15	-0.1044	City pumpage			
17	16	-0.0240	City pumpage			
16	17	-0.1068	City pumpage			
11	36	-0.0296	City pumpage			
8	52	-0.0296	City pumpage			
15	78	-0.0964	City pumpage			
16	78	-0.0964	City pumpage			
14	79	-0.0964	City pumpage			
15	79	-0.0964	City pumpage			
16	79	-0.0964	City pumpage			
15	80	-0.0964	City pumpage			
4	3	204	90	20	1.5	12
14	38	-0.9635	Gw irrigation	0 1964	172	
14	38	0.0963	Return-Gw irr			
10	41	-0.6442	Gw irrigation	0 1957	115	
10	41	0.0644	Return-Gw irr			
13	48	-0.9523	Gw irrigation	0 1957	170	
13	48	0.0952	Return-Gw irr			
24	5	-0.8963	Gw irrigation	0 1963	160	
24	5	0.0896	Return-Gw irr			
15	16	-0.3697	Gw irrigation	0 1964	66	
15	16	0.0370	Return-Gw irr			
15	17	-0.3249	Gw irrigation	0 1963	58	
15	17	0.0325	Return-Gw irr			
20	18	-0.2801	Gw irrigation	0 1956	50	

0.000000003

20	18	0.0280	Return-Gw irr			
19	19	-0.9915	Gw irrigation	0	1963	177
19	19	0.0991	Return-Gw irr			
19	25	-0.7338	Gw irrigation	0	1959	131
19	25	0.0734	Return-Gw irr			
16	29	-0.4201	Gw irrigation	0	1959	75
16	29	0.0420	Return-Gw irr			
25	3	-0.2633	Gw irrigation	4	1971	47
25	3	0.0263	Return-Gw irr			
19	10	-0.3081	Gw irrigation	4	1971	110*
19	10	0.0308	Return-Gw irr			
18	12	-0.1028	City pumpage			
19	12	-0.1028	City pumpage			
17	13	-0.2969	Gw irrigation	4	1971	53
17	13	0.0297	Return-Gw irr			
18	14	-0.1044	City pumpage			
19	14	-0.1044	City pumpage			
17	15	-0.0240	City pumpage			
18	15	-0.1044	City pumpage			
19	15	-0.1044	City pumpage			
17	16	-0.0240	City pumpage			
16	17	-0.1068	City pumpage			
18	23	-0.3641	Gw irrigation	4	1971	65
18	23	0.0364	Return-Gw irr			
19	24	-0.7731	Gw irrigation	4	1971	138
19	24	0.0773	Return-Gw irr			
12	33	0.3489	Canl&lat loss			
12	34	0.3489	Canl&lat loss			
13	35	0.3489	Canl&lat loss			
11	36	-0.0296	City pummpage			
13	36	0.3489	Canl&lat loss			
13	37	0.3489	Canl&lat loss			
12	38	0.3489	Canl&lat loss			
9	39	0.0322	Sw irr-return			
10	39	0.0322	Sw irr-return			
11	39	0.3489	Canl&lat loss			
9	40	0.0322	Sw irr-return			
10	40	0.3489	Canl&lat loss			
11	40	0.0322	Sw irr-return			
10	41	0.3489	Canl&lat loss			
8	42	0.0322	Sw irr-return			
10	42	0.3489	Canl&lat loss			
10	43	0.3489	Canl&lat loss			
8	44	0.0322	Sw irr-return			
10	44	0.3489	Canl&lat loss			
10	44	0.0322	Sw irr-return			
11	44	0.0322	Sw irr-return			
8	45	0.0322	Sw irr-return			
9	45	0.3489	Canl&lat loss			

0.000000003--Continued

9	45	0.0322	Sw irr-return			
10	45	0.0322	Sw irr-return			
11	45	0.0322	Sw irr-return			
12	45	0.0322	Sw irr-return			
8	46	0.0322	Sw irr-return			
9	46	0.3489	Canl&lat loss			
9	46	0.0322	Sw irr-return			
10	46	0.0322	Sw irr-return			
12	46	0.0322	Sw irr-return			
8	47	0.3489	Canl&lat loss			
9	47	0.3489	Canl&lat loss			
10	47	0.0322	Sw irr-return			
7	48	0.3489	Canl&lat loss			
7	49	0.3489	Canl&lat loss			
7	50	0.3489	Canl&lat loss			
6	51	0.3489	Canl&lat loss			
6	51	-0.2689	Gw irrigation	4	1971	48
6	51	0.0269	Return-Gw irr			
6	52	0.3489	Canl&lat loss			
6	52	-0.2689	Gw irrigation	4	1971	48
6	52	0.0269	Return-Gw irr			
8	52	-0.0296	City pumpage			
4	53	0.3489	Canl&lat loss			
5	54	0.3489	Canl&lat loss			
5	55	0.3489	Canl&lat loss			
5	55	0.0322	Sw irr-return			
6	55	0.0322	Sw irr-return			
7	55	0.0322	Sw irr-return			
4	56	0.3489	Canl&lat loss			
6	56	0.0322	Sw irr-return			
7	56	0.0322	Sw irr-return			
4	57	0.3489	Canl&lat loss			
3	58	0.3489	Canl&lat loss			
3	58	0.0322	Sw irr-return			
4	58	0.0322	Sw irr-return			
4	59	0.3489	Canl&lat loss			
3	60	0.3489	Canl&lat loss			
3	60	0.0322	Sw irr-return			
4	60	0.0322	Sw irr-return			
5	60	0.0322	Sw irr-return			
6	60	0.0322	Sw irr-return			
7	60	0.0322	Sw irr-return			
8	60	0.0322	Sw irr-return			
4	61	0.3489	Canl&lat loss			
4	61	0.0322	Sw irr-return			
5	61	0.0322	Sw irr-return			
6	61	0.0322	Sw irr-return			
7	61	0.0322	Sw irr-return			
8	61	0.0322	Sw irr-return			

0.00000003--Continued

5	62	0.3489	Canl&lat loss		
5	62	0.0322	Sw irr-return		
6	62	0.0322	Sw irr-return		
8	62	0.0322	Sw irr-return		
6	63	0.3489	Canl&lat loss		
6	63	0.0322	Sw irr-return		
7	63	0.0322	Sw irr-return		
6	64	0.3489	Canl&lat loss		
6	65	0.3489	Canl&lat loss		
6	65	0.0322	Sw irr-return		
5	66	0.3489	Canl&lat loss		
7	67	0.3489	Canl&lat loss		
8	67	0.0322	Sw irr-return		
8	68	0.3489	Canl&lat loss		
8	68	0.0322	Sw irr-return		
9	68	0.0322	Sw irr-return		
10	68	0.0322	Sw irr-return		
11	68	0.0322	Sw irr-return		
8	69	0.3489	Canl&lat loss		
10	69	0.0322	Sw irr-return		
11	69	0.0322	Sw irr-return		
12	69	0.0322	Sw irr-return		
8	70	0.3489	Canl&lat loss		
8	70	0.0322	Sw irr-return		
9	70	0.0322	Sw irr-return		
10	70	0.0322	Sw irr-return		
11	70	0.0322	Sw irr-return		
12	70	0.0322	Sw irr-return		
9	71	0.3489	Canl&lat loss		
9	71	0.0322	Sw irr-return		
12	71	0.0322	Sw irr-return		
13	71	0.0322	Sw irr-return		
10	72	0.3489	Canl&lat loss		
11	73	0.3489	Canl&lat loss		
16	73	-0.4481	Gw irrigation	2 1970	80
16	73	0.0448	Return-Gw irr		
11	74	0.3489	Canl&lat loss		
11	74	0.0322	Sw irr-return		
12	74	0.0322	Sw irr-return		
11	75	0.3489	Canl&lat loss		
13	75	0.0322	Sw irr-return		
14	75	0.0322	Sw irr-return		
11	76	0.3489	Canl&lat loss		
11	76	0.0322	Sw irr-return		
12	76	0.0322	Sw irr-return		
13	76	0.0322	Sw irr-return		
14	76	0.0322	Sw irr-return		
11	77	0.3489	Canl&lat loss		
11	77	0.0322	Sw irr-return		

0.000000003--Continued

14	77	0.0322	Sw irr-retern			
11	78	0.3489	Canl&lat loss			
11	78	0.0322	Sw irr-return			
13	78	0.0322	Sw irr-return			
14	78	0.0322	Sw irr-return			
15	78	-0.0964	City pumpage			
16	78	-0.0964	City pumpage			
11	79	0.3489	Canl&lat loss			
13	79	0.0322	Sw irr-return			
14	79	-0.0964	City pumpage			
15	79	-0.0964	City pumpage			
16	79	-0.0964	City pumpage			
11	80	0.3489	Canl&lat loss			
11	80	0.0322	Sw irr-return			
12	80	0.0322	Sw irr-return			
15	80	-0.0964	City pumpage			
12	81	0.3489	Canl&lat loss			
13	82	0.3489	Canl&lat loss			
13	82	0.0322	Sw irr-return			
14	82	0.0322	Sw irr-return			
15	82	0.0322	Sw irr-return			
14	83	0.3489	Canl&lat loss			
16	83	0.0322	Sw irr-return			
17	83	0.0322	Sw irr-return			
14	84	0.3489	Canl&lat loss			
14	85	0.3489	Canl&lat loss			
14	85	0.0322	Sw irr-return			
14	86	0.3489	Canl&lat loss			
14	86	0.0322	Sw irr-return			
15	86	0.0322	Sw irr-return			
16	86	0.0322	Sw irr-return			
17	86	0.0322	Sw irr-return			
14	87	0.3489	Canl&lat loss			
14	87	0.0322	Sw irr-return			
14	88	0.3489	Canl&lat loss			
14	88	0.0322	Sw irr-return			
14	89	0.3489	Canl&lat loss			
15	90	0.3489	Canl&lat loss			
16	90	0.3489	Canl&lat loss			
16	90	0.0322	Sw irr-return			
17	90	0.0322	Sw irr-return			
16	91	0.0322	Sw irr-return			
17	91	0.3489	Canl&lat loss			
17	91	0.0322	Sw irr-return			
5	4	17	275	20	1.5	12
18	12	-0.1028	City pumpage			
19	12	-0.1028	City pumpage			
18	14	-0.1044	City pumpage			
19	14	-0.1044	City pumpage			

PUMPING-PERIOD CONTROL PARAMETERS--Continued

0.000000003--Continued

17	15	-0.0240	City pumpage				
18	15	-0.1044	City pumpage				
19	15	-0.1044	City pumpage				
17	16	-0.0240	City pumpage				
16	17	-0.1068	City pumpage				
11	36	-0.0296	City pumpage				
8	52	-0.0296	City pumpage				
15	78	-0.0964	City pumpage				
16	78	-0.0964	City pumpage				
14	79	-0.0964	City pumpage				
15	79	-0.0964	City pumpage				
16	79	-0.0964	City pumpage				
15	80	-0.0964	City pumpage				

.000000006

6	5	83	90	20		1.5	12
14	38	-0.9635	Gw irrigation	0	1964	172	
14	38	0.0963	Return-Gw irr				
10	41	-0.6442	Gw irrigation	0	1957	115	
10	41	0.0644	Return-Gw irr				
13	48	-0.9523	Gw irrigation	0	1957	170	
13	48	0.0952	Return-Gw irr				
24	5	-0.8963	Gw irrigation	0	1963	160	
24	5	0.0896	Return-Gw irr				
15	16	-0.3697	Gw irrigation	0	1964	66	
15	16	0.0370	Return-Gw irr				
15	17	-0.3249	Gg irrigation	0	1963	58	
15	17	0.0325	Return-Gw irr				
20	18	-0.2801	Gw irrigation	0	1956	50	
20	18	0.0280	Return-Gw irr				
19	19	-0.9915	Gw irrigation	0	1963	177	
19	19	0.0991	Return-Gw irr				
19	25	-0.7338	Gw irrigation	0	1959	131	
19	25	0.0734	Return-Gw irr				
16	29	-0.4201	Gw irrigation	0	1959	75	
16	29	0.0420	Return-Gw irr				
25	3	-0.2633	Gw irrigation	4	1971	47	
25	3	0.0263	Return-Gw irr				
19	10	-0.6162	Gw irrigation	4	1971	110*	
19	10	0.0616	Return Gw irr				
18	12	-0.1028	City pumpage				
19	12	-0.1028	City pumpage				
17	13	-0.2969	Gw irrigation	4	1971	53	
17	13	0.0297	Return-Gw irr				
18	14	-0.1044	City pumpage				
19	14	-0.1044	City pumpage				
17	15	-0.0240	City pumpage				
18	15	-0.1044	City pumpage				
19	15	-0.1044	City pumpage				

0.000000006--Continued

17	16	-0.0240	City pumpage			
16	17	-0.1068	City pumpage			
18	23	-0.3641	Gw irrigation	4	1971	65
18	23	0.0364	Return-Gw irr			
19	24	-0.7731	Gw irrigation	4	1971	138
19	24	0.0773	Return-Gw irr			
12	26	-0.1681	Gw irrigation	6	1972	30
12	26	0.0168	Return-Gw irr			
15	26	-0.7114	Gw irrigation	6	1972	127
15	26	0.0711	Return-Gw irr			
15	27	-0.4425	Gw irrigation	6	1972	79
15	27	0.0443	Return-Gw irr			
13	35	-0.7282	Gw irrigation	6	1972	130
13	35	0.0728	Return-Gw irr			
11	36	-0.0296	City pumpage			
11	36	-0.2521	Gw irrigation	6	1972	45
11	36	0.0252	Return-Gw irr			
9	45	-0.4706	Gw irrigation	6	1972	84
9	45	-0.3977	Gw irrigation	6	1972	71
9	45	0.0471	Return-Gw irr			
9	45	0.0398	Return-Gw irr			
9	46	-0.6218	Gw irrigation	6	1972	111*
9	46	0.0622	Return-Gw irr			
10	46	-0.8627	Gw irrigation	6	1972	154*
10	46	0.0863	Return-Gw irr			
11	48	-0.5322	Gw irrigation	6	1972	95
11	48	0.0532	Return-Gw irr			
7	49	-0.3137	Gw irrigation	6	1972	56
7	49	0.0314	Return-Gw irr			
11	49	-0.5322	Gw irrigation	6	1972	95
11	49	0.0532	Return-Gw irr			
6	51	-0.2689	Gw irrigation	4	1971	48
6	51	0.0269	Return-Gw irr			
6	52	-0.2689	Gw irrigation	4	1971	48
6	52	0.0269	Return-Gw irr			
8	52	-0.0296	City pumpage			
6	56	-0.2633	Gw irrigation	6	1972	47
6	56	0.0263	Return-Gw irr			
12	68	-0.4593	Gw irrigation	6	1972	82
12	68	0.0459	Return-Gw irr			
16	73	-0.4481	Gw irrigation	2	1970	80
16	73	0.0448	Return-Gw irr			
17	73	-0.5658	Gw irrigation	6	1972	101*
17	73	0.0566	Return-Gw irr			
15	78	-0.0964	City pumpage			
16	78	-0.0964	City pumpage			
14	79	-0.0964	City pumpage			
15	79	-0.0964	City pumpage			
16	79	-0.0964	City pumpage			
15	80	-0.0964	City pumpage			

PUMPING-PERIOD CONTROL PARAMETERS--Continued

0.000000010								
7	6	17	275	20			1.5	12
18	12	-0.1028	City pumpage					
19	12	-0.1028	City pumpage					
18	14	-0.1044	City pumpage					
19	14	-0.1044	City pumpage					
17	15	-0.0240	City pumpage					
18	15	-0.1044	City pumpage					
19	15	-0.1044	City pumpage					
17	16	-0.0240	City pumpage					
16	17	-0.1068	City pumpage					
11	36	-0.0296	City pumpage					
8	52	-0.0296	City pumpage					
15	78	-0.0964	City pumpage					
16	78	-0.0964	City pumpage					
14	79	-0.0964	City pumpage					
15	79	-0.0964	City pumpage					
16	79	-0.0964	City pumpage					
15	80	-0.0964	City pumpage					
8	7	244	90	20			1.5	12
14	38	-0.9635	Gw irrigation	0	1964	172		
14	38	0.0963	Return-Gw irr					
10	41	-0.6442	Gw irrigation	0	1957	115		
10	41	0.0644	Return-Gw irr					
13	48	-0.9523	Gw irrigation	0	1957	170		
13	48	0.0952	Return-Gw irr					
24	5	-0.8963	Gw irrigation	0	1963	160		
24	5	0.0896	Return-Gw irr					
15	16	-0.3697	Gw irrigation	0	1964	66		
15	16	0.0370	Return-Gw irr					
15	17	-0.3249	Gw irrigation	0	1963	58		
15	17	0.0325	Return-Gw irr					
20	18	-0.2801	Gw irrigation	0	1956	50		
20	18	0.0280	Return-Gw irr					
19	19	-0.9915	Gw irrigation	0	1963	177		
19	19	0.0991	Return-Gw irr					
19	25	-0.7338	Gw irrigation	0	1959	131		
19	25	0.0734	Return-Gw irr					
16	29	-0.4201	Gw irrigation	0	1959	75		
16	29	0.0420	Return-Gw irr					
25	3	-0.2633	Gw irrigation	4	1971	47		
25	3	0.0263	Return-Gw irr					
19	10	-0.3081	Gw irrigation	4	1971	110*		
19	10	0.0308	Return-Gw irr					
18	12	-0.1028	City pumpage					
19	12	-0.1028	City pumpage					
17	13	-0.2969	Gw irrigation	4	1971	53		
17	13	0.0297	Return-Gw irr					
18	14	-0.1044	City pumpage					
19	14	-0.1044	City pumpage					

PUMPING-PERIOD CONTROL PARAMETERS--Continued

0.000000010--Continued

17	15	-0.0240	City pumpage			
18	15	-0.1044	City pumpage			
19	15	-0.1044	City pumpage			
17	16	-0.0240	City pumpage			
16	17	-0.1068	City pumpage			
18	23	-0.3641	Gw irrigation	4	1971	65
18	23	0.0364	Return-Gw irr			
19	24	-0.7731	Gw irrigation	4	1971	138
19	24	0.0773	Return-Gw irr			
12	26	-0.1681	Gw irrigation	6	1972	30
12	26	0.0168	Return-Gw irr			
15	26	-0.7114	Gw irrigation	6	1972	127
15	26	0.0711	Return-Gw irr			
15	27	-0.4425	Gw irrigation	6	1972	79
15	27	0.0443	Return-Gw irr			
12	33	0.6774	Canl&lat loss			
12	34	0.6774	Canl&lat loss			
13	35	0.6774	Canl&lat loss			
13	35	-0.7282	Gw irrigation	6	1972	130
13	35	0.0728	Return-Gw irr			
11	36	-0.0296	City pumpage			
11	36	-0.2521	Gw irrigation	6	1972	45
11	36	0.0252	return-Gw irr			
13	36	0.6774	Canl&lat loss			
13	37	0.6774	Canl&lat loss			
12	38	0.6774	Canl&lat loss			
9	39	0.0312	Sw irr-return			
10	39	0.0312	Sw irr-return			
11	39	0.6774	Canl&lat loss			
9	40	0.0312	Sw irr-return			
10	40	0.6774	Canl&lat loss			
11	40	-0.2241	Gw irrigation	8	1973	40
11	40	0.0224	Return-Gw irr			
11	40	0.0312	Sw irr-return			
12	40	-0.1008	Gw irrigation	8	1973	18
12	40	0.0101	Return-Gw irr			
10	41	0.6774	Canl&lat loss			
11	41	-0.3361	Gw irrigation	8	1973	60
11	41	0.0336	Return-Gw irr			
8	42	0.0312	Sw irr-return			
10	42	0.6774	Canl&lat loss			
10	43	0.6774	Canl&lat loss			
8	44	0.0312	Sw irr-return			
10	44	0.6774	Canl&lat loss			
10	44	0.0312	Sw irr-return			
11	44	0.0312	Sw irr-return			
8	45	0.0312	Sw irr-return			
9	45	0.6774	Canl&lat loss			
9	45	-0.4706	Gw irrigation	6	1972	84
9	45	-0.3977	Gw irrigation	6	1972	71

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9	45	0.0471	Return-Gw irr			
9	45	0.0398	Return-Gw irr			
9	45	0.0312	Sw irr-return			
10	45	0.0312	Sw irr-return			
11	45	0.0312	Sw irr-return			
12	45	0.0312	Sw irr-return			
8	46	0.0312	Sw irr-return			
9	46	0.6774	Canl&lat loss			
9	46	-0.3109	Gw irrigation	6	1972	111*
9	46	0.0311	Return-Gw irr			
9	46	0.0312	Sw irr-return			
10	46	-0.4313	Gw irrigation	6	1972	154*
10	46	0.0431	Return-Gw irr			
10	46	0.0312	Sw irr-return			
12	46	0.0312	Sw irr-return			
8	47	0.6774	Canl&lat loss			
9	47	0.6774	Canl&lat loss			
10	47	0.0312	Sw irr-return			

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7	48	0.6774	Canl&lat loss			
11	48	-0.5322	Gw irrigation	6	1972	95
11	48	0.0532	Return-Gw irr			
7	49	0.6774	Canl&lat loss			
7	49	-0.3137	Gw irrigation	6	1972	56
7	49	0.0314	Return-Gw irr			
11	49	-0.5322	Gw irrigation	6	1972	95
11	49	0.0532	Return-Gw irr			
7	50	0.6774	Canl&lat loss			
6	51	0.6774	Canl&lat loss			
6	51	-0.2689	Gw irrigation	4	1971	48
6	51	0.0269	Return-Gw irr			
6	52	0.6774	Canl&lat loss			
6	52	-0.2689	Gw irrigation	4	1971	48
6	52	0.0269	Return-Gw irr			
8	52	-0.0296	City pumpage			
4	53	0.6774	Canl&lat loss			
5	54	0.6774	Canl&lat loss			
5	55	0.6774	Canl&lat loss			
5	55	0.0312	Sw irr-return			
6	55	0.0312	Sw irr-return			
7	55	0.0312	Sw irr-return			
4	56	0.6774	Canl&lat loss			
6	56	-0.2633	Gw irrigation	6	1972	47
6	56	0.0263	Return-Gw irr			
6	56	0.0312	Sw irr-return			
7	56	0.0312	Sw irr-return			
4	57	0.6774	Canl&lat loss			
3	58	0.6774	Canl&lat loss			
3	58	0.0312	Sw irr-return			

0.000000003--Continued

4	58	0.0312	Sw irr-return			
4	59	0.6774	Canl&lat loss			
3	60	0.6774	Canl&lat loss			
3	60	0.0312	Sw irr-return			
4	60	-0.8515	Gw irrigation	8	1973	152
4	60	0.0851	Return-Gw irr			
4	60	0.0312	Sw irr-return			
5	60	0.0312	Sw irr-return			
6	60	0.0312	Sw irr-return			
7	60	0.0312	Sw irr-return			
8	60	0.0312	Sw irr-return			
4	61	0.6774	Canl&lat loss			
4	61	0.0312	Sw irr-return			
5	61	0.0312	Sw irr-return			
6	61	0.0312	Sw irr-return			
7	61	0.0312	Sw irr-return			
8	61	0.0312	Sw irr-return			
5	62	0.6774	Canl&lat loss			
5	62	0.0312	Sw irr-return			
6	62	0.0312	Sw irr-return			
8	62	0.0312	Sw irr-return			
6	63	0.6774	Canl&lat loss			
6	63	0.0312	Sw irr-return			
7	63	0.0312	Sw irr-return			
6	64	0.6774	Canl&lat loss			
6	65	0.6774	Canl&lat loss			
6	65	0.0312	Sw irr-return			
5	66	0.6774	Canl&lat loss			
7	67	0.6774	Canl&lat loss			
8	67	0.0312	Sw irr-return			
8	68	0.6774	Canl&lat loss			
8	68	0.0312	Sw irr-return			
9	68	0.0312	Sw irr-return			
10	68	0.0312	Sw irr-return			
11	68	0.0312	Sw irr-return			
12	68	-0.4593	Gw irrigation	6	1972	82
12	68	0.0459	Return-Gw irr			
8	69	0.6774	Canl&lat loss			
10	69	0.0312	Sw irr-return			
11	69	0.0312	Sw irr-return			
12	69	0.0312	Sw irr-return			
8	70	0.6774	Canl&lat loss			
8	70	0.0312	Sw irr-return			
9	70	0.0312	Sw irr-return			
10	70	0.0312	Sw irr-return			
11	70	0.0312	Sw irr-return			
12	70	0.0312	Sw irr return			
9	71	0.6774	Canl&lat loss			
9	71	0.0312	Sw irr-return			
12	71	0.0312	Sw irr-return			

0.000000003--Continued

13	71	0.0312	Sw irr-return			
10	72	0.6774	Canl&lat loss			
11	73	0.6774	Canl&lat loss			
16	73	-0.4481	Gw irrigation	2	1970	80
16	73	0.0448	Return-Gw irr			
17	73	-0.2829	Gw irrigation	6	1972	101*
17	73	0.0283	Return-Gw irr			
11	74	0.6774	Canl&lat loss			
11	74	0.0312	Sw irr-return			
12	74	0.0312	Sw irr-return			
11	75	0.6774	Canl&lat loss			
13	75	0.0312	Sw irr-return			
14	75	0.0312	Sw irr-return			
11	76	0.6774	Canl&lat loss			
11	76	0.0312	Sw irr-return			
12	76	0.0312	Sw irr-return			
13	76	0.0312	Sw irr-return			
14	76	0.0312	Sw irr-return			
11	77	0.6774	Canl&lat loss			
11	77	0.0312	Sw irr-return			
14	77	0.0312	Sw irr-return			
11	78	0.6774	Canl&lat loss			
11	78	0.0312	Sw irr-return			
13	78	0.0312	Sw irr-return			
14	78	0.0312	Sw irr-return			
15	78	-0.0964	City pumpage			
16	78	-0.0964	City pumpage			
11	79	0.6774	Canl&lat loss			
13	79	0.0312	Sw irr-return			
14	79	-0.0964	City pumpage			
15	79	-0.0964	City pumpage			
16	79	-0.0964	City pumpage			
11	80	0.6774	Canl&lat loss			
11	80	0.0312	Sw irr-return			
12	80	0.0312	Sw irr-return			
15	80	-0.0964	City pumpage			
12	81	0.6774	Canl&lat loss			
13	82	0.6774	Canl&lat loss			
13	82	0.0312	Sw irr-return			
14	82	0.0312	Sw irr-return			
15	82	0.0312	Sw irr-return			
14	83	0.6774	Canl&lat loss			
16	83	0.0312	Sw irr-return			
17	83	0.0312	Sw irr-return			
18	83	-0.1400	Gw irrigation	8	1973	25
18	83	0.0140	Return-Gw irr			
14	84	0.6774	Canl&lat loss			
14	85	0.6774	Canl&lat loss			
14	85	0.0312	Sw irr-return			
14	86	0.6774	Canl&lat loss			

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      14       86    0.0312  Sw irr-return
      15       86    0.0312  Sw irr-return
      16       86    0.0312  Sw irr-return
      17       86    0.0312  Sw irr-return
      14       87    0.6774  Canl&lat loss
      14       87    0.0312  Sw irr-return
      14       88    0.6774  Canl&lat loss
      14       88    0.0312  Sw irr-return
      14       89    0.6774  Canl&lat loss
      15       90    0.6774  Canl&lat loss
      16       90    0.6774  Canl&lat loss
      16       90    0.0312  Sw irr-return
      17       90    0.0312  Sw irr-return
      16       91    0.0312  Sw irr-return
      17       91    0.6774  Canl&lat loss
      17       91    0.0312  Sw irr-return

.000000012
       9        8        17       275         20          1.5       12
      18       12   -0.1028  City pumpage
      19       12   -0.1028  City pumpage
      18       14   -0.1044  City pumpage
      19       14   -0.1044  City pumpage
      17       15   -0.0240  City pumpage
      18       15   -0.1044  City pumpage
      19       15   -0.1044  City pumpage
      17       16   -0.0240  City pumpage
      16       17   -0.1068  City pumpage
      11       36   -0.0296  City pumpage
       8       52   -0.0296  City pumpage
      15       78   -0.0964  City pumpage
      16       78   -0.0964  City pumpage
      14       79   -0.0964  City pumpage
      15       79   -0.0964  City pumpage
      16       79   -0.0964  City pumpage
      15       80   -0.0964  City pumpage

.000000005
      10        9       248        90         20          1.5       12
      14       38   -0.9635  Gw irrigation   0 1964  172
      14       38    0.0963  Return-Gw irr
      10       41   -0.6442  Gw irrigation   0 1957  115
      10       41    0.0644  Return-Gw irr
      13       48   -0.9523  Gw irrigation   0 1957  170
      13       48    0.0952  Return-Gw irr
      24        5   -0.8963  Gw irrigation   0 1963  160
      24        5    0.0896  Return-Gw irr
      15       16   -0.3697  Gw irrigation   0 1964   66
      15       16    0.0370  Return-Gw irr
      15       17   -0.3249  Gw irrigation   0 1963   58
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15	17	0.0325	Return-Gw irr			
20	18	-0.2801	Gw irrigation	0	1956	50
20	18	0.0280	Return-Gw irr			
19	19	-0.9915	Gw irrigation	0	1963	177
19	19	0.0991	Return-Gw irr			
19	25	-0.7338	Gw irrigation	0	1959	131
19	25	0.0734	Return-Gw irr			
16	29	-0.4201	Gw irrigation	0	1959	75
16	29	0.0420	Return-Gw irr			
25	3	-0.2633	Gw irrigation	4	1971	47
25	3	0.0263	Return-Gw irr			
22	6	-1.1428	Gw irrigation	10	1974	408*
22	6	0.1143	Return-Gw irr			
19	10	-0.3081	Gw irrigation	4	1971	110*
19	10	0.0308	Return-Gw irr			
18	12	-0.1028	City pumpage			
19	12	-0.1028	City pumpage			
17	13	-0.2969	Gw irrigation	4	1971	53
17	13	0.0297	Return-Gw irr			
18	14	-0.1044	City pumpage			
19	14	-0.1044	City pumpage			
17	15	-0.0240	City pumpage			
18	15	-0.1044	City pumpage			
19	15	-0.1044	City pumpage			
17	16	-0.0240	City pumpage			
16	17	-0.1068	City pumpage			
18	23	-0.3641	Gw irrigation	4	1971	65
18	23	0.0364	Return-Gw irr			
19	24	-0.7731	Gw irrigation	4	1971	138
19	24	0.0773	Return-Gw irr			
12	26	-0.1681	Gw irrigation	6	1972	30
12	26	0.0168	Return-Gw irr			
15	26	-0.7114	Gw irrigation	6	1972	127
15	26	0.0711	Return-Gw irr			
15	27	-0.4425	Gw irrigation	6	1972	79
15	27	0.0443	Return-Gw irr			
12	33	0.6333	Canl&lat loss			
12	34	0.6333	Canl&lat loss			
13	35	0.6333	Canl&lat loss			
13	35	-0.7282	Gw irrigation	6	1972	130
13	35	0.0728	Return-Gw irr			
11	36	-0.0296	City pumpage			
11	36	-0.2521	Gw irrigation	6	1972	45
11	36	0.0252	Return-Gw irr			
13	36	0.6333	Canl&lat loss			
13	37	0.6333	Canl&lat loss			
12	38	0.6333	Canl&lat loss			
9	39	0.0513	Sw irr-return			
10	39	0.0513	Sw irr-return			
11	39	0.6333	Canl&lat loss			
9	40	0.0513	Sw irr-return			

0.000000005--Continued						
10	40	0.6333	Canl&lat loss			
11	40	-0.2241	Gw irrigation	8	1973	40
11	40	0.0224	Return-Gw irr			
11	40	0.0513	Sw irr-return			
12	40	-0.1008	Gw irrigation	8	1973	18
12	40	0.0101	Return-Gw irr			
10	41	0.6333	Canl&lat loss			
11	41	-0.3361	Gw irrigation	8	1973	60
11	41	0.0336	Return-Gw irr			
8	42	0.0513	Sw irr-return			
10	42	0.6333	Canl&lat loss			
.000000003						
10	43	0.6333	Canl&lat loss			
8	44	0.0513	Sw irr-return			
10	44	0.6333	Canl&lat loss			
10	44	0.0513	Sw irr-return			
11	44	0.0513	Sw irr-return			
8	45	0.0513	Sw irr-return			
9	45	0.6333	Canl&lat loss			
9	45	-0.3977	Gw irrigation	6	1972	71
9	45	-0.4706	Gw irrigation	6	1972	84
9	45	0.0471	Return-Gw irr			
9	45	0.0398	Return-Gw irr			
9	45	0.0513	Sw irr-return			
10	45	0.0513	Sw irr-return			
11	45	0.0513	Sw irr-return			
12	45	0.0513	Sw irr-return			
8	46	0.0513	Sw irr-return			
9	46	0.6333	Canl&lat loss			
9	46	-0.3109	Gw irrigation	6	1972	111*
9	46	0.0311	Return-Gw irr			
9	46	0.0513	Sw irr-return			
10	46	-0.4313	Gw irrigation	6	1972	154*
10	46	0.0431	Return-Gw irr			
10	46	0.0513	Sw irr-return			
12	46	0.0513	Sw irr-return			
8	47	0.6333	Canl&lat loss			
9	47	0.6333	Canl&lat loss			
10	47	0.0513	Sw irr-return			
7	48	0.6333	Canl&lat loss			
11	48	-0.5322	Gw irrigation	6	1972	95
11	48	0.0532	Return-Gw irr			
7	49	0.6333	Canl&lat loss			
7	49	-0.5602	Gw irrigation	10	1974	100
7	49	-0.3137	Gw irrigation	6	1972	56
7	49	0.0560	Return-Gw irr			
7	49	0.0314	Return-Gw irr			
11	49	-0.5322	Gw irrigation	6	1972	95
11	49	0.0532	Return-Gw irr			

0.000000003--Continued

7	50	0.6333	Canl&lat loss		
6	51	0.6333	Canl&lat loss		
6	51	-0.2689	Gw irrigation	4 1971	48
6	51	0.0269	Return-Gw irr		
6	52	0.6333	Canl&lat loss		
6	52	-0.2689	Gw irrigation	4 1971	48
6	52	0.0269	Return-Gw irr		
8	52	-0.0296	City pumpage		
4	53	0.6333	Canl&lat loss		
5	54	0.6333	Canl&lat loss		
5	55	0.6333	Canl&lat loss		
5	55	0.0513	Sw irr-return		
6	55	0.0513	Sw irr-return		
7	55	0.0513	Sw irr-return		
4	56	0.6333	Canl&lat loss		
6	56	-0.2633	Gw irrigation	6 1972	47
6	56	0.0263	Return-Gw irr		
6	56	0.0513	Sw irr-return		
7	56	0.0513	Sw irr-return		
4	57	0.6333	Canl&lat loss		
3	58	0.6333	Canl&lat loss		
3	58	0.0513	Sw irr return		
4	58	0.0513	Sw irr-return		
4	59	0.6333	Canl&lat loss		
3	60	0.6333	Canl&lat loss		
3	60	0.0513	Sw irr-return		
4	60	-0.8515	Gw irrigation	8 1973	152
4	60	0.0851	Return-Gw irr		
4	60	0.0513	Sw irr-return		
5	60	0.0513	Sw irr-return		
6	60	0.0513	Sw irr-return		
7	60	0.0513	Sw irr-return		
8	60	0.0513	Sw irr-return		
4	61	0.6333	Canl&lat loss		
4	61	0.0513	Sw irr-return		
5	61	0.0513	Sw irr-return		
6	61	0.0513	Sw irr-return		
7	61	0.0513	Sw irr-return		
8	61	0.0513	Sw irr-return		
5	62	0.6333	Canl&lat loss		
5	62	0.0513	Sw irr-return		
6	62	0.0513	Sw irr-return		
8	62	0.0513	Sw irr-return		
6	63	0.6333	Canl&lat loss		
6	63	0.0513	Sw irr-return		
7	63	0.0513	Sw irr-return		
6	64	0.6333	Canl&lat loss		
6	65	0.6333	Canl&lat loss		
6	65	0.0513	Sw irr-return		
5	66	0.6333	Canl&lat loss		

0.000000003--Continued

7	67	0.6333	Canl&lat loss		
8	67	0.0513	Sw irr-return		
8	68	0.6333	Canl&lat loss		
8	68	0.0513	Sw irr-return		
9	68	0.0513	Sw irr-return		
10	68	0.0513	Sw irr-return		
11	68	0.0513	Sw irr-return		
12	68	-0.4593	Gw irrigation	6 1972	82
12	68	0.0459	Return-Gw irr		
8	69	0.6333	Canl&lat loss		
10	69	0.0513	Sw irr-return		
11	69	0.0513	Sw irr-return		
12	69	0.0513	Sw irr-return		
8	70	0.6333	Canl&lat loss		
8	70	0.0513	Sw irr-return		
9	70	0.0513	Sw irr-return		
10	70	0.0513	Sw irr-return		
11	70	0.0513	Sw irr-return		
12	70	0.0513	Sw irr-return		
9	71	0.6333	Canl&lat loss		
9	71	0.0513	Sw irr-return		
12	71	0.0513	Sw irr-return		
13	71	0.0513	Sw irr-return		
10	72	0.6333	Canl&lat loss		
11	73	0.6333	Canl&lat loss		
16	73	-0.4481	Gw irrigation	2 1970	80
16	73	0.0448	Return-Gw irr		
17	73	-0.2829	Gw irrigation	6 1972	101*
17	73	0.0283	Return-Gw irr		
11	74	0.6333	Canl&lat loss		
11	74	0.0513	Sw irr-return		
12	74	0.0513	Sw irr-return		
11	75	0.6333	Canl&lat loss		
13	75	0.0513	Sw irr-return		
14	75	0.0513	Sw irr-return		
11	76	0.6333	Canl&lat loss		
11	76	0.0513	Sw irr-return		
12	76	0.0513	Sw irr-return		
13	76	0.0513	Sw irr-return		
14	76	0.0513	Sw irr-return		
11	77	0.6333	Canl&lat loss		
11	77	0.0513	Sw irr-return		
14	77	0.0513	Sw irr-return		
11	78	0.6333	Canl&lat loss		
11	78	0.0513	Sw irr-return		
13	78	0.0513	Sw irr-return		
14	78	0.0513	Sw irr-return		
15	78	-0.0964	City pumpage		
16	78	-0.0964	City pumpage		
11	79	0.6333	Canl&lat loss		

0.000000003--Continued

13	79	0.0513	Sw irr-return				
14	79	-0.0964	City pumpage				
15	79	-0.0964	City pumpage				
16	79	-0.0964	City pumpage				
11	80	0.6333	Canl&lat loss				
11	80	0.0513	Sw irr-return				
12	80	0.0513	Sw irr-return				
15	80	-0.0964	City pumpage				
12	81	0.6333	Canl&lat loss				
13	82	0.6333	Canl&lat loss				
13	82	0.0513	Sw irr-return				
14	82	0.0513	Sw irr-return				
15	82	0.0513	Sw irr-return				
14	83	0.6333	Canl&lat loss				
16	83	0.0513	Sw irr-return				
17	83	0.0513	Sw irr-return				
18	83	-0.1400	Gw irrigation	8 1973	25		
18	83	0.0140	Return-Gw irr				
14	84	0.6333	Canl&lat loss				
14	85	0.6333	Canl&lat loss				
14	85	0.0513	Sw irr-return				
14	86	0.6333	Canl&lat loss				
14	86	0.0513	Sw irr-return				
15	86	0.0513	Sw irr-return				
16	86	0.0513	Sw irr-return				
17	86	0.0513	Sw irr-return				
14	87	0.6333	Canl&lat loss				
14	87	0.0513	Sw irr-return				
14	88	0.6333	Canl&lat loss				
14	88	0.0513	Sw irr-return				
14	89	0.6333	Canl&lat loss				
15	90	0.6333	Canl&lat loss				
16	90	0.6333	Canl&lat loss				
16	90	0.0513	Sw irr-return				
17	90	0.0513	Sw irr-return				
16	91	0.0513	Sw irr-return				
17	91	0.6333	Canl&lat loss				
17	91	0.0513	Sw irr-return				
11	10	17	275	20		1.5	12
18	12	-0.1028	City pumpage				
19	12	-0.1028	City pumpage				
18	14	-0.1044	City pumpage				
19	14	-0.1044	City pumpage				
17	15	-0.0240	City pumpage				
18	15	-0.1044	City pumpage				
19	15	-0.1044	City pumpage				
17	16	-0.0240	City pumpage				
16	17	-0.1068	City pumpage				
11	36	-0.0296	City pumpage				
8	52	-0.0296	City pumpage				
15	78	-0.0964	City pumpage				

0.000000003--Continued

16	78	-0.0964	City pumpage				
14	79	-0.0964	City pumpage				
15	79	-0.0964	City pumpage				
16	79	-0.0964	City pumpage				
15	80	-0.0964	City pumpage				

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12	11	266	90	20		1.5	12
14	38	-0.9635	Gw irrigation	0	1964	172	
14	38	0.0963	Return-Gw irr				
10	41	-0.6442	Gw irrigation	0	1957	115	
10	41	0.0644	Return-Gw irr				
13	48	-0.9523	Gw irrigation	0	1957	170	
13	48	0.0952	Return-Gw irr				
24	5	-0.8963	Gw irrigation	0	1963	160	
24	5	0.0896	Return-Gw irr				
15	16	-0.3697	Gw irrigation	0	1964	66	
15	16	0.0370	Return-Gw irr				
15	17	-0.3249	Gw irrigation	0	1963	58	
15	17	0.0325	Return-Gw irr				
20	18	-0.2801	Gw irrigation	0	1956	50	
20	18	0.0280	Return-Gw irr				
19	19	-0.9915	Gw irrigation	0	1963	177	
19	19	0.0991	Return-Gw irr				
19	25	-0.7338	Gw irrigation	0	1959	131	
19	25	0.0734	Return-Gw irr				
16	29	-0.4201	Gw irrigation	0	1959	75	
16	29	0.0420	Return-Gw irr				
25	3	-0.2633	Gw irrigation	4	1971	47	
25	3	0.0263	Return-Gw irr				
26	4	-0.6330	Gw irrigation	12	1975	113	
26	4	0.0633	Return-Gw irr				
28	4	-0.1120	Gw irrigation	12	1975	20	
28	4	0.0112	Return-Gw irr				
22	6	-1.1428	Gw irrigation	10	1974	408*	
22	6	0.1143	Return-Gw irr				
23	9	-1.0083	Gw irrigation	12	1975	180	
23	9	0.1008	Return-Gw irr				
24	9	-1.0083	Gw irrigation	12	1975	180	
24	9	0.1008	Return-Gw irr				
19	10	-0.3081	Gw irrigation	4	1971	110*	
19	10	0.0308	Return-Gw irr				
24	10	-0.4089	Gw irrigation	12	1975	73	
24	10	0.0409	Return-Gw irr				
25	10	-0.4089	Gw irrigation	12	1975	73	
25	10	0.0409	Return-Gw irr				
22	11	-0.8235	Gw irrigation	12	1975	147	
22	11	0.0823	Return-Gw irr				
23	11	-0.8235	Gw irrigation	12	1975	147	
23	11	0.0823	Return-Gw irr				
18	12	-0.1028	City pumpage				

0.000000006--Continued

19	12	-0.1028	City pumpage			
17	13	-0.2969	Gw irrigation	4	1971	53

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17	13	0.0297	Return-Gw irr			
18	14	-0.1044	City pumpage			
19	14	-0.1044	City pumpage			
17	15	-0.0240	City pumpage			
18	15	-0.1044	City pumpage			
19	15	-0.1044	City pumpage			
17	16	-0.0240	City pumpage			
16	17	-0.1068	City pumpage			
18	23	-0.3641	Gw irrigation	4	1971	65
18	23	0.0364	Return-Gw irr			
19	24	-0.7731	Gw irrigation	4	1971	138
19	24	0.0773	Return-Gw irr			
12	26	-0.1681	Gw irrigation	6	1972	30
12	26	0.0168	Return-Gw irr			
15	26	-0.7114	Gw irrigation	6	1972	127
15	26	0.0711	Return-Gw irr			
15	27	-0.4425	Gw irrigation	6	1972	79
15	27	0.0443	Return-Gw irr			
12	33	0.5682	Canl&lat loss			
12	34	0.5682	Canl&lat loss			
13	35	0.5682	Canl&lat loss			
13	35	-0.7282	Gw irrigation	6	1972	130
13	35	0.0728	Return-Gw irr			
11	36	-0.0296	City pumpage			
11	36	-0.2521	Gw irrigation	6	1972	45
11	36	0.0252	Return-Gw irr			
13	36	0.5682	Canl&lat loss			
13	37	0.5682	Canl&lat loss			
12	38	0.5682	Canl&lat loss			
9	39	0.0494	Sw irr-return			
10	39	0.0494	Sw irr-return			
11	39	0.5682	Canl&lat loss			
9	40	0.0494	Sw irr-return			
10	40	0.5682	Canl&lat loss			
11	40	-0.2241	Gw irrigation	8	1973	40
11	40	0.0224	Return-Gw irr			
11	40	0.0494	Sw irr-return			
12	40	-0.1008	Gw irrigation	8	1973	18
12	40	0.0101	Return-Gw irr			
10	41	0.5682	Canl&lat loss			
11	41	-0.3361	Gw irrigation	8	1973	60
11	41	0.0336	Return-Gw irr			
8	42	0.0494	Sw irr-return			
10	42	0.5682	Canl&lat loss			
10	43	0.5682	Canl&lat loss			
8	44	0.0494	Sw irr-return			

0.000000003--Continued

10	44	0.5682	Canl&lat loss			
10	44	0.0494	Sw irr-return			
11	44	0.0494	Sw irr-return			
8	45	0.0494	Sw irr-return			
9	45	0.5682	Canl&lat loss			
9	45	-0.3977	Gw irrigation	6	1972	71
9	45	-0.4706	Gw irrigation	6	1972	84
9	45	0.0471	Return-Gw irr			
9	45	0.0398	Return-Gw irr			
9	45	0.0494	Sw irr-return			
10	45	0.0494	Sw irr-return			
11	45	0.0494	Sw irr-return			
12	45	0.0494	Sw irr-return			
8	46	0.0494	Sw irr-return			
9	46	0.5682	Canl&lat loss			
9	46	-0.3109	Gw irrigation	6	1972	111*
9	46	0.0311	Return-Gw irr			
9	46	0.0494	Sw irr-return			
10	46	-0.4313	Gw irrigation	6	1972	154*
10	46	0.0431	Return-Gw irr			
10	46	0.0494	Sw irr-return			
12	46	0.0494	Sw irr-return			
8	47	0.5682	Canl&lat loss			
9	47	0.5682	Canl&lat loss			
10	47	0.0494	Sw irr-return			
7	48	0.5682	Canl&lat loss			
11	48	-0.5322	Gw irrigation	6	1972	95
11	48	0.0532	Return-Gw irr			
7	49	0.5682	Canl&lat loss			
7	49	-0.5602	Gw irrigation	10	1974	100
7	49	-0.3137	Gw irrigation	6	1972	56
7	49	0.0560	Return-Gw irr			
7	49	0.0314	Return-Gw irr			
11	49	-0.5322	Gw irrigation	6	1972	95
11	49	0.0532	Return-Gw irr			
7	50	0.5682	Canl&lat loss			
6	51	0.5682	Canl&lat loss			
6	51	-0.2689	Gw irrigation	4	1971	48
6	51	0.0269	Return-Gw irr			
6	52	0.5682	Canl&lat loss			
6	52	-0.2689	Gw irrigation	4	1971	48
6	52	0.0269	Return-Gw irr			
8	52	-0.0296	City pumpage			
4	53	0.5682	Canl&lat loss			
5	54	0.5682	Canl&lat loss			
5	55	0.5682	Canl&lat loss			
5	55	0.0494	Sw irr-return			
6	55	0.0494	Sw irr-return			
7	55	0.0494	Sw irr-return			
4	56	0.5682	Canl&lat loss			

PUMPING-PERIOD CONTROL PARAMETERS--Continued

0.000000003--Continued

6	56	-0.2633	Gw irrigation	6	1972	47
6	56	0.0263	Return-Gw irr			
6	56	0.0494	Sw irr-return			
7	56	0.0494	Sw irr-return			
4	57	0.5682	Canl&lat loss			
3	58	0.5682	Canl&lat loss			
3	58	0.0494	Sw irr-return			
4	58	0.0494	Sw irr-return			
4	59	0.5682	Canl&lat loss			
3	60	0.5682	Canl&lat loss			
3	60	0.0494	Sw irr-return			
4	60	-0.8515	Gw irrigation	8	1973	152
4	60	0.0851	Return-Gw irr			
4	60	0.0494	Sw irr-return			
5	60	0.0494	Sw irr-return			
6	60	0.0494	Sw irr-return			
7	60	0.0494	Sw irr-return			
8	60	0.0494	Sw irr-return			
4	61	0.5682	Canl&lat loss			
4	61	-0.5714	Gw irrigation	12	1975	102
4	61	0.0571	Return-Gw irr			
4	61	0.0494	Sw irr-return			
5	61	0.0494	Sw irr-return			
6	61	0.0494	Sw irr-return			
7	61	0.0494	Sw irr-return			
8	61	0.0494	Sw irr-return			
5	62	0.5682	Canl&lat loss			
5	62	0.0494	Sw irr-return			
6	62	0.0494	Sw irr-return			
8	62	0.0494	Sw irr-return			
6	63	0.5682	Canl&lat loss			
6	63	0.0494	Sw irr-return			
7	63	0.0494	Sw irr-return			
6	64	0.5682	Canl&lat loss			
6	65	0.5682	Canl&lat loss			
6	65	0.0494	Sw irr-return			
5	66	0.5682	Canl&lat loss			
7	67	0.5682	Canl&lat loss			
8	67	0.0494	Sw irr-return			
8	68	0.5682	Canl&lat loss			
8	68	0.0494	Sw irr-return			
9	68	0.0494	Sw irr-return			
10	68	0.0494	Sw irr-return			
11	68	0.0494	Sw irr-return			
12	68	-0.4593	Gw irrigation	6	1972	82
12	68	0.0459	Return-Gw irr			
8	69	0.5682	Canl&lat loss			
10	69	0.0494	Sw irr-return			
11	69	0.0494	Sw irr-return			
12	69	0.0494	Sw irr-return			

0.000000003--Continued

8	70	0.5682	Canl&lat loss			
8	70	0.0494	Sw irr-return			
9	70	0.0494	Sw irr-return			
10	70	0.0494	Sw irr-return			
11	70	0.0494	Sw irr-return			
12	70	0.0494	Sw irr-return			
9	71	0.5682	Canl&lat loss			
9	71	0.0494	Sw irr-return			
12	71	0.0494	Sw irr-return			
13	71	0.0494	Sw irr-return			
10	72	0.5682	Canl&lat loss			
11	73	0.5682	Canl&lat loss			
16	73	-0.4481	Gw irrigation	2	1970	80
16	73	0.0448	Return-Gw irr			
17	73	-0.2829	Gw irrigation	6	1972	101*
17	73	0.0283	Return-Gw irr			
11	74	0.5682	Canl&lat loss			
11	74	0.0494	Sw irr-return			
12	74	0.0494	Sw irr-return			
11	75	0.5682	Canl&lat loss			
13	75	0.0494	Sw irr-return			
14	75	0.0494	Sw irr-return			
11	76	0.5682	Canl&lat loss			
11	76	0.0494	Sw irr-return			
12	76	0.0494	Sw irr-return			
13	76	0.0494	Sw irr-return			
14	76	0.0494	Sw irr-return			
11	77	0.5682	Canl&lat loss			
11	77	0.0494	Sw irr-return			
14	77	0.0494	Sw irr-return			
11	78	0.5682	Canl&lat loss			
11	78	0.0494	Sw irr-return			
13	78	0.0494	Sw irr-return			
14	78	0.0494	Sw irr-return			
15	78	-0.0964	City pumpage			
16	78	-0.0964	City pumpage			
11	79	0.5682	Canl&lat loss			
13	79	0.0494	Sw irr-return			
14	79	-0.0964	City pumpage			
15	79	-0.0964	City pumpage			
16	79	-0.0964	City pumpage			
11	80	0.5682	Canl&lat loss			
11	80	0.0494	Sw irr-return			
12	80	0.0494	Sw irr-return			
15	80	-0.0964	City pumpage			
12	81	0.5682	Canl&lat loss			
13	82	0.5682	Canl&lat loss			
13	82	0.0494	Sw irr-return			
14	82	0.0494	Sw irr-return			
15	82	0.0494	Sw irr-return			

0.000000003--Continued

14	83	0.5682	Canl&lat loss				
16	83	0.0494	Sw irr-return				
17	83	0.0494	Sw irr-return				
18	83	-0.1400	Gw irrigation	8	1973	25	
18	83	0.0140	Return-Gw irr				
14	84	0.5682	Canl&lat loss				
14	85	0.5682	Canl&lat loss				
14	85	0.0494	Sw irr-return				
14	86	0.5682	Canl&lat loss				
14	86	0.0494	Sw irr-return				
15	86	0.0494	Sw irr-return				
16	86	0.0494	Sw irr-return				
17	86	0.0494	Sw irr-return				
14	87	0.5682	Canl&lat loss				
14	87	0.0494	Sw irr-return				
14	88	0.5682	Canl&lat loss				
14	88	0.0494	Sw irr-return				
14	89	0.5682	Canl&lat loss				
15	90	0.5682	Canl&lat loss				
16	90	0.5682	Canl&lat loss				
16	90	0.0494	Sw irr-return				
17	90	0.0494	Sw irr-return				
16	91	0.0494	Sw irr-return				
17	91	0.5682	Canl&lat loss				
17	91	0.0494	Sw irr-return				
13	12	17	275	20		1.5	12
18	12	-0.1028	City pumpage				
19	12	-0.1028	City pumpage				
18	14	-0.1044	City pumpage				
19	14	-0.1044	City pumpage				
17	15	-0.0240	City pumpage				
18	15	-0.1044	City pumpage				
19	15	-0.1044	City pumpage				
17	16	-0.0240	City pumpage				
16	17	-0.1068	City pumpage				
11	36	-0.0296	City pumpage				
8	52	-0.0296	City pumpage				
15	78	-0.0964	City pumpage				
16	78	-0.0964	City pumpage				
14	79	-0.0964	City pumpage				
15	79	-0.0964	City pumpage				
16	79	-0.0964	City pumpage				
15	80	-0.0964	City pumpage				

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14	13	284	90	20		1.5	12
14	38	-0.9635	Gw irrigation	0	1964	172	
14	38	0.0963	Return-Gw irr				
10	41	-0.6442	Gw irrigation	0	1957	115	
10	41	0.0644	Return-Gw irr				

0.000000001--Continued

13	48	-0.9523	Gw irrigation	0	1957	170
13	48	0.0952	Return-Gw irr			
24	5	-0.8963	Gw irrigation	0	1963	160
24	5	0.0896	Return-Gw irr			
15	16	-0.3697	Gw irrigation	0	1964	66
15	16	0.0370	Return-Gw irr			
15	17	-0.3249	Gw irrigation	0	1963	58
15	17	0.0325	Return-Gw irr			
20	18	-0.2801	Gw irrigation	0	1956	50
20	18	0.0280	Return-Gw irr			
19	19	-0.9915	Gw irrigation	0	1963	177
19	19	0.0991	Return-Gw irr			
19	25	-0.7338	Gw irrigation	0	1959	131
19	25	0.0734	Return-Gw irr			
16	29	-0.4201	Gw irrigation	0	1959	75
16	29	0.0420	Return-Gw irr			
25	3	-0.2633	Gw irrigation	4	1971	47
25	3	0.0263	Return-Gw irr			
26	4	-0.6330	Gw irrigation	12	1975	113
26	4	0.0633	Return-Gw irr			
28	4	-0.1120	Gw irrigation	12	1975	20
28	4	0.0112	Return-Gw irr			
22	6	-1.1428	Gw irrigation	10	1974	408*
22	6	0.1143	Return-Gw irr			
21	8	-1.2380	Gw irrigation	14	1976	221
21	8	0.1238	Return-Gw irr			
23	9	-1.0083	Gw irrigation	12	1975	180
23	9	0.1008	Return-Gw irr			
24	9	-1.0083	Gw irrigation	12	1975	180
24	9	0.1008	Return-Gw irr			
19	10	-0.3081	Gw irrigation	4	1971	110*
19	10	0.0308	Return-Gw irr			
24	10	-0.4089	Gw irrigation	12	1975	73
24	10	0.0409	Return-Gw irr			
25	10	-0.4089	Gw irrigation	12	1975	73
25	10	0.0409	Return-Gw irr			
22	11	-0.8235	Gw irrigation	12	1975	147
22	11	0.0823	Return-Gw irr			
23	11	-0.8235	Gw irrigation	12	1975	147
23	11	0.0823	Return-Gw irr			
18	12	-0.1028	City pumpage			
19	12	-0.1028	City pumpage			
17	13	-0.2969	Gw irrigation	4	1971	53
17	13	0.0297	Return-Gw irr			
18	14	-0.1044	City pumpage			
19	14	-0.1044	City pumpage			
17	15	-0.0240	City pumpage			
18	15	-0.1044	City pumpage			
19	15	-0.1044	City pumpage			
17	16	-0.0240	City pumpage			

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16	17	-0.1068	City pumpage			
18	23	-0.3641	Gw irrigation	4	1971	65
18	23	0.0364	Return-Gw irr			
19	24	-0.7731	Gw irrigation	4	1971	138
19	24	0.0773	Return-Gw irr			
12	26	-0.1681	Gw irrigation	6	1972	30
12	26	0.0168	Return-Gw irr			
15	26	-0.7114	Gw irrigation	6	1972	127
15	26	0.0711	Return-Gw irr			
15	27	-0.4425	Gw irrigation	6	1972	79
15	27	0.0443	Return-Gw irr			
12	33	0.6452	Canl&lat loss			
12	34	0.6452	Canl&lat loss			
13	35	0.6452	Canl&lat loss			
13	35	-0.7282	Gw irrigation	6	1972	130
13	35	0.0728	Return-Gw irr			
11	36	-0.0296	City pumpage			
11	36	-0.2521	Gw irrigation	6	1972	45
11	36	0.0252	Return-Gw irr			
13	36	0.6452	Canl&lat loss			
13	37	0.6452	Canl&lat loss			
11	38	-0.4593	Gw irrigation	14	1976	82
11	38	0.0459	Return-Gw irr			
12	38	0.6452	Canl&lat loss			
13	38	-0.7338	Gw irrigation	14	1976	131
13	38	0.0734	Return-Gw irr			
9	39	0.0728	Sw irr-return			
10	39	0.0728	Sw irr-return			
11	39	0.6452	Canl&lat loss			
9	40	0.0728	Sw irr-return			
10	40	0.6452	Canl&lat loss			
11	40	-0.2241	Gw irrigation	8	1973	40
11	40	0.0224	Return-Gw irr			
11	40	0.0728	Sw irr-return			
12	40	-0.1008	Gw irrigation	8	1973	18
12	40	0.0101	Return-Gw irr			
10	41	0.6452	Canl&lat loss			
11	41	-0.3361	Gw irrigation	8	1973	60
11	41	0.0336	Return-Gw irr			
8	42	0.0728	Sw irr-return			
10	42	0.6452	Canl&lat loss			
16	43	0.6452	Canl&lat loss			
8	44	0.0728	Sw irr-return			
10	44	0.6452	Canl&lat loss			
10	44	0.0728	Sw irr-return			
11	44	0.0728	Sw irr-return			
8	45	0.0728	Sw irr-return			
9	45	0.6452	Canl&lat loss			
9	45	-0.4706	Gw irrigation	6	1972	84
9	45	-0.3977	Gw irrigation	6	1972	71

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9	45	0.0471	Return-Gw irr			
9	45	0.0398	Return-Gw irr			
9	45	0.0728	Sw irr-return			
10	45	0.0728	Sw irr-return			
11	45	0.0728	Sw irr-return			
12	45	0.0728	Sw irr-return			
8	46	0.0728	Sw irr-return			
9	46	0.6452	Canl&lat loss			
9	46	-0.3109	Gw irrigation	6	1972	111*
9	46	0.0311	Return-Gw irr			
9	46	0.0728	Sw irr-return			
10	46	-0.4313	Gw irrigation	6	1972	154*
10	46	0.0431	Return-Gw irr			
10	46	0.0728	Sw irr-return			
12	46	0.0728	Sw irr-return			
13	46	-0.2241	Gw irrigation	14	1976	40
13	46	0.0224	Return-Gw irr			
8	47	0.6452	Canl&lat loss			
9	47	0.6452	Canl&lat loss			
10	47	0.0728	Sw irr-return			
13	47	-0.2241	Gw irrigation	14	1976	40
13	47	0.0224	Return-Gw irr			
7	48	0.6452	Canl&lat loss			
11	48	-0.5322	Gw irrigation	6	1972	95
11	48	0.0532	Return-Gw irr			
7	49	0.6452	Canl&lat loss			
7	49	-0.5602	Gw irrigation	10	1974	100
7	49	-0.3137	Gw irrigation	6	1972	56
7	49	0.0560	Return-Gw irr			
7	49	0.0314	Return-Gw irr			
11	49	-0.5322	Gw irrigation	6	1972	95
11	49	0.0532	Return-Gw irr			
7	50	0.6452	Canl&lat loss			
6	51	0.6452	Canl&lat loss			
6	51	-0.2689	Gw irrigation	4	1971	48
6	51	0.0269	Return-Gw irr			
6	52	0.6452	Canl&lat loss			
6	52	-0.2689	Gw irrigation	4	1971	48
6	52	0.0269	Return-Gw irr			
8	52	-0.0296	City pumpage			
4	53	0.6452	Canl&lat loss			
5	54	0.6452	Canl&lat loss			
5	55	0.6452	Canl&lat loss			
5	55	0.0728	Sw irr-return			
6	55	0.0728	Sw irr-return			
7	55	0.0728	Sw irr-return			
4	56	0.6452	Canl&lat loss			
6	56	-0.2633	Gw irrigation	6	1972	47
6	56	0.0263	Return-Gw irr			
6	56	0.0728	Sw irr-return			

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7	56	0.0728	Sw irr-return			
4	57	0.6452	Canl&lat loss			
3	58	0.6452	Canl&lat loss			
3	58	0.0728	Sw irr-return			
4	58	0.0728	Sw irr-return			
4	59	0.6452	Canl&lat loss			
4	59	-0.4285	Gw irrigation	14	1976	153*
4	59	0.0428	Return-Gw irr			
3	60	0.6452	Canl&lat loss			
3	60	0.0728	Sw irr-return			
4	60	-0.8515	Gw irrigation	8	1973	152
4	60	0.0851	Return-Gw irr			
4	60	0.0728	Sw irr-return			
5	60	0.0728	Sw irr-return			
6	60	0.0728	Sw irr-return			
7	60	0.0728	Sw irr-return			
8	60	0.0728	Sw irr-return			
4	61	0.6452	Canl&lat loss			
4	61	-0.5714	Gw irrigation	12	1975	102
4	61	0.0571	Return-Gw irr			
4	61	0.0728	Sw irr-return			
5	61	0.0728	Sw irr-return			
6	61	0.0728	Sw irr-return			
7	61	0.0728	Sw irr-return			
8	61	0.0728	Sw irr-return			
5	62	0.6452	Canl&lat loss			
5	62	0.0728	Sw irr-return			
6	62	0.0728	Sw irr-return			
7	62	-0.3809	Gw irrigation	14	1976	68
7	62	0.0381	Return-Gw irr			
8	62	0.0728	Sw irr-return			
6	63	0.6452	Canl&lat loss			
6	63	0.0728	Sw irr-return			
7	63	0.0728	Sw irr-return			
6	64	0.6452	Canl&lat loss			
6	65	0.6452	Canl&lat loss			
6	65	0.0728	Sw irr-return			
10	65	-0.2913	Gw irrigation	14	1976	52
10	65	0.0291	Return-Gw irr			
5	66	0.6452	Canl&lat loss			
7	67	0.6452	Canl&lat loss			
8	67	-0.3529	Gw irrigation	14	1976	63
8	67	0.0353	Return-Gw irr			
8	67	0.0728	Sw irr-return			
8	68	0.6452	Canl&lat loss			
8	68	0.0728	Sw irr-return			
9	68	0.0728	Sw irr-return			
10	68	0.0728	Sw irr-return			
11	68	0.0728	Sw irr-return			
12	68	-0.4593	Gw irrigation	6	1972	82

0.000000003--Continued

12	68	0.0459	Return-Gw irr			
8	69	0.6452	Canl&lat loss			
10	69	0.0728	Sw irr-return			
11	69	0.0728	Sw irr-return			
12	69	0.0728	Sw irr-return			
8	70	0.6452	Canl&lat loss			
8	70	0.0728	Sw irr-return			
9	70	0.0728	Sw irr-return			
10	70	0.0728	Sw irr-return			
11	70	0.0728	Sw irr-return			
12	70	0.0728	Sw irr-return			
9	71	0.6452	Canl&lat loss			
9	71	0.0728	Sw irr-return			
12	71	0.0728	Sw irr-return			
13	71	0.0728	Sw irr-return			
10	72	0.6452	Canl&lat loss			
11	73	0.6452	Canl&lat loss			
16	73	-0.4481	Gw irrigation	2	1970	80
16	73	0.0448	Return-Gw irr			
17	73	-0.2829	Gw irrigation	6	1972	101*
17	73	0.0283	Return-Gw irr			
11	74	0.6452	Canl&lat loss			
11	74	0.0728	Sw irr-return			
12	74	0.0728	Sw irr-return			
11	75	0.6452	Canl&lat loss			
13	75	0.0728	Sw irr-return			
14	75	0.0728	Sw irr-return			
11	76	0.6452	Canl&lat loss			
11	76	0.0728	Sw irr-return			
12	76	0.0728	Sw irr-return			
13	76	0.0728	Sw irr-return			
14	76	0.0728	Sw irr-return			
11	77	0.6452	Canl&lat loss			
11	77	0.0728	Sw irr-return			
14	77	0.0728	Sw irr-return			
11	78	0.6452	Canl&lat loss			
11	78	0.0728	Sw irr-return			
13	78	0.0728	Sw irr-return			
14	78	0.0728	Sw irr-return			
15	78	-0.0964	City pumpage			
16	78	-0.0964	City pumpage			
11	79	0.6452	Canl&lat loss			
13	79	0.0728	Sw irr-return			
14	79	-0.0964	City pumpage			
15	79	-0.0964	City pumpage			
16	79	-0.0964	City pumpage			
11	80	0.6452	Canl&lat loss			
11	80	0.0728	Sw irr-return			
12	80	0.0728	Sw irr-return			
15	80	-0.0964	City pumpage			

0.000000003--Continued

12	81	0.6452	Canl&lat loss			
13	82	0.6452	Canl&lat loss			
13	82	0.0728	Sw irr-return			
14	82	0.0728	Sw irr-return			
15	82	0.0728	Sw irr-return			
14	83	0.6452	Canl&lat loss			
16	83	0.0728	Sw irr-return			
17	83	0.0728	Sw irr-return			
18	83	-0.1400	Gw irrigation	8 1973	25	
18	83	0.0140	Return-Gw irr			
14	84	0.6452	Canl&lat loss			
14	85	0.6452	Canl&lat loss			
14	85	0.0728	Sw irr-return			
14	86	0.6452	Canl&lat loss			
14	86	0.0728	Sw irr-return			
15	86	0.0728	Sw irr-return			
16	86	0.0728	Sw irr-return			
17	86	0.0728	Sw irr-return			
14	87	0.6452	Canl&lat loss			
14	87	0.0728	Sw irr-return			
14	88	0.6452	Canl&lat loss			
14	88	0.0728	Sw irr-return			
14	89	0.6452	Canl&lat loss			
15	90	0.6452	Canl&lat loss			
16	90	0.6452	Canl&lat loss			
16	90	0.0728	Sw irr-return			
17	90	0.0728	Sw irr-return			
16	91	0.0728	Sw irr-return			
17	91	0.6452	Canl&lat loss			
17	91	0.0728	Sw irr-return			

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15	14	17	275	20	1.5	12
18	12	-0.1028	City pumpage			
19	12	-0.1028	City pumpage			
18	14	-0.1044	City pumpage			
19	14	-0.1044	City pumpage			
17	15	-0.0240	City pumpage			
18	15	-0.1044	City pumpage			
19	15	-0.1044	City pumpage			
17	16	-0.0240	City pumpage			
16	17	-0.1068	City pumpage			
11	36	-0.0296	City pumpage			
8	52	-0.0296	City pumpage			
15	78	-0.0964	City pumpage			
16	78	-0.0964	City pumpage			
14	79	-0.0964	City pumpage			
15	79	-0.0964	City pumpage			
16	79	-0.0964	City pumpage			
15	80	-0.0964	City pumpage			

PUMPING-PERIOD CONTROL PARAMETERS--Continued

0.000000007							
16	15	312	90	20		1.5	12
14	38	-0.9635	Gw irrigation	0	1964	172	
14	38	0.0963	Return-Gw irr				
10	41	-0.6442	Gw irrigation	0	1957	115	
10	41	0.0644	Return-Gw irr				
13	48	-0.9523	Gw irrigation	0	1957	170	
13	48	0.0952	Return-Gw irr				
24	5	-0.8963	Gw irrigation	0	1963	160	
24	5	0.0896	Return-Gw irr				
15	16	-0.3697	Gw irrigation	0	1964	66	
15	16	0.0370	Return-Gw irr				
15	17	-0.3249	Gw irrigation	0	1963	58	
15	17	0.0325	Return-Gw irr				
20	18	-0.2801	Gw irrigation	0	1956	50	
20	18	0.0280	Return-Gw irr				
19	19	-0.9915	Gw irrigation	0	1963	177	
19	19	0.0991	Return-Gw irr				
19	25	-0.7338	Gw irrigation	0	1959	131	
19	25	0.0734	Return-Gw irr				
16	29	-0.4201	Gw irrigation	0	1959	75	
16	29	0.0420	Return-Gw irr				
25	3	-0.2633	Gw irrigation	4	1971	47	
25	3	0.0263	Return-Gw irr				
26	4	-0.6330	Gw irrigation	12	1975	113	
26	4	0.0633	Return-Gw irr				
28	4	-0.1120	Gw irrigation	12	1975	20	
28	4	0.0112	Return-Gw irr				
22	6	-1.1428	Gw irrigation	10	1974	408*	
22	6	0.1143	Return-Gw irr				
21	8	-1.2380	Gw irrigation	14	1976	221	
21	8	0.1238	Return-Gw irr				
23	9	-1.0083	Gw irrigation	12	1975	180	
23	9	0.1008	Return-Gw irr				
24	9	-1.0083	Gw irrigation	12	1975	180	
24	9	0.1008	Return-Gw irr				
19	10	-0.3081	Gw irrigation	4	1971	110*	
19	10	0.0308	Return-Gw irr				
24	10	-0.4089	Gw irrigation	12	1975	73	
24	10	0.0409	Return-Gw irr				
25	10	-0.4089	Gw irrigation	12	1975	73	
25	10	0.0409	Return-Gw irr				
22	11	-0.8235	Gw irrigation	12	1975	147	
22	11	0.0823	Return-Gw irr				
23	11	-0.8235	Gw irrigation	12	1975	147	
23	11	0.0823	Return-Gw irr				
18	12	-0.1028	City pumpage				
19	12	-0.1028	City pumpage				
17	13	-0.2969	Gw irrigation	4	1971	53	
17	13	0.0297	Return-Gw irr				
18	14	-0.1044	City pumpage				

0.000000007--Continued

19	14	-0.1044	City pumpage			
17	15	-0.0240	City pumpage			
18	15	-0.1044	City pumpage			
19	15	-0.1044	City pumpage			

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17	16	-0.0240	City pumpage			
16	17	-0.1068	City pumpage			
18	23	-0.3641	Gw irrigation	4	1971	65
18	23	0.0364	Return-Gw irr			
19	24	-0.7731	Gw irrigation	4	1971	138
19	24	0.0773	Return-Gw irr			
12	26	-0.1681	Gw irrigation	6	1972	30
12	26	0.0168	Return-Gw irr			
14	26	-0.3557	Gw irrigation	16	1977	127*
14	26	0.0356	Return-Gw irr			
15	26	-0.7114	Gw irrigation	6	1972	127
15	26	0.0711	Return-Gw irr			
15	27	-0.4425	Gw irrigation	6	1972	79
15	27	0.0443	Return-Gw irr			
17	30	-0.1793	Gw irrigation	16	1977	32
17	30	0.0179	Return-Gw irr			
17	32	-0.8739	Gw irrigation	16	1977	156
17	32	0.0874	Return-Gw irr			
12	33	0.4413	Canl&lat loss			
12	34	0.4413	Canl&lat loss			
13	35	0.4413	Canl&lat loss			
13	35	-0.7282	Gw irrigation	6	1972	130
13	35	0.0728	Return Gw irr			
11	36	-0.0296	City pumpage			
11	36	-0.2521	Gw irrigation	6	1972	45
11	36	0.0252	Return-Gw irr			
13	36	0.4413	Canl&lat loss			
13	37	0.4413	Canl&lat loss			
11	38	-0.4593	Gw irrigation	14	1976	82
11	38	0.0459	Return-Gw irr			
12	38	0.4413	Canl&lat loss			
13	38	-0.7338	Gw irrigation	14	1976	131
13	38	0.0734	Return-Gw irr			
9	39	0.0382	Sw irr-return			
10	39	-0.4874	Gw irrigation	16	1977	87
10	39	0.0487	Return-Gw irr			
10	39	0.0382	Sw irr-return			
11	39	0.4413	Canl&lat loss			
9	40	0.0382	Sw irr-return			
10	40	0.4413	Canl&lat loss			
11	40	-0.2241	Gw irrigation	8	1973	40
11	40	0.0224	Return-Gw irr			
11	40	0.0382	Sw irr-return			
12	40	-0.1008	Gw irrigation	8	1973	18

0.000000003--Continued

12	40	0.0101	Return-Gw irr			
10	41	0.4413	Canl&lat loss			
11	41	-0.3361	Gw irrigation	8	1973	60
11	41	0.0336	Return-Gw irr			
8	42	0.0382	Sw irr-return			
10	42	0.4413	Canl&lat loss			
10	43	0.4413	Canl&lat loss			
11	43	-0.3921	Gw irrigation	16	1977	70
11	43	0.0392	Return-Gw irr			
8	44	0.0382	Sw irr-return			
9	44	-0.1905	Gw irrigation	16	1977	68*
9	44	0.0190	Return-Gw irr			
10	44	0.4413	Canl&lat loss			
10	44	0.0382	Sw irr-return			
11	44	-0.9075	Gw irrigation	16	1977	162
11	44	0.0907	Return-Gw irr			
11	44	0.0382	Sw irr-return			
8	45	0.0382	Sw irr-return			
9	45	0.4413	Canl&lat loss			
9	45	-0.3977	Gw irrigation	6	1972	71
9	45	-0.4706	Gw irrigation	6	1972	84
9	45	0.0471	Return-Gw irr			
9	45	0.0398	Return-Gw irr			
9	45	0.0382	Sw irr-return			
10	45	0.0382	Sw irr-return			
11	45	0.0382	Sw irr-return			
12	45	0.0382	Sw irr-return			
8	46	0.0382	Sw irr-return			
9	46	0.4413	Canl&lat loss			
9	46	-0.3109	Gw irrigation	6	1972	111*
9	46	0.0311	Return-Gw irr			
9	46	0.0382	Sw irr-return			
10	46	-0.4313	Gw irrigation	6	1972	154*
10	46	0.0431	Return-Gw irr			
10	46	0.0382	Sw irr-return			
12	46	0.0382	Sw irr-return			
13	46	-0.2241	Gw irrigation	14	1976	40
13	46	0.0224	Return-Gw irr			
8	47	0.4413	Canl&lat loss			
9	47	0.4413	Canl&lat loss			
10	47	0.0382	Sw irr-return			
13	47	-0.2241	Gw irrigation	14	1976	40
13	47	0.0224	Return-Gw irr			
7	48	0.4413	Canl&lat loss			
11	48	-0.5322	Gw irrigation	6	1972	95
11	48	0.0532	Return-Gw irr			
7	49	0.4413	Canl&lat loss			
7	49	-0.5602	Gw irrigation	10	1974	100
7	49	-0.3137	Gw irrigation	6	1972	56
7	49	0.0560	Return-Gw irr			

0.000000003--Continued

7	49	0.0314	Return-Gw irr			
11	49	-0.5322	Gw irrigation	6	1972	95
11	49	0.0532	Return-Gw irr			
7	50	0.4413	Canl&lat loss			
6	51	0.4413	Canl&lat loss			
6	51	-0.2689	Gw irrigation	4	1971	48
6	51	0.0269	Return-Gw irr			
6	52	0.4413	Canl&lat loss			
6	52	-0.2689	Gw irrigation	4	1971	48
6	52	0.0269	Return-Gw irr			
8	52	-0.0296	City pumpage			
4	53	0.4413	Canl&lat loss			
5	54	0.4413	Canl&lat loss			
5	55	0.4413	Canl&lat loss			
5	55	0.0382	Sw irr-return			
6	55	0.0382	Sw irr-return			
7	55	0.0382	Sw irr-return			
4	56	0.4413	Canl&lat loss			
6	56	-0.2633	Gw irrigation	6	1972	47
6	56	0.0263	Return-Gw irr			
6	56	0.0382	Sw irr-return			
7	56	0.0382	Sw irr-return			
4	57	0.4413	Canl&lat loss			
3	58	0.4413	Canl&lat loss			
3	58	-0.1905	Gw irrigation	16	1977	68*
3	58	0.0190	Return-Gw irr			
3	58	0.0382	Sw irr-return			
4	58	0.0382	Sw irr-return			
4	59	0.4413	Canl&lat loss			
4	59	-0.4285	Gw irrigation	14	1976	153*
4	59	0.0428	Return-Gw irr			
3	60	0.4413	Canl&lat loss			
3	60	0.0382	Sw irr-return			
4	60	-0.8515	Gw irrigation	8	1973	152
4	60	0.0851	Return-Gw irr			
4	60	0.0382	Sw irr-return			
5	60	0.0382	Sw irr-return			
6	60	0.0382	Sw irr-return			
7	60	0.0382	Sw irr-return			
8	60	0.0382	Sw irr-return			
4	61	0.4413	Canl&lat loss			
4	61	-0.5714	Gw irrigation	12	1975	102
4	61	0.0571	Return-Gw irr			
4	61	0.0382	Sw irr-return			
5	61	0.0382	Sw irr-return			
6	61	0.0382	Sw irr-return			
7	61	0.0382	Sw irr-return			
8	61	0.0382	Sw irr-return			
5	62	0.4413	Canl&lat loss			

0.000000003--Continued

5	62	0.0382	Sw irr-return			
6	62	0.0382	Sw irr-return			
7	62	-0.3809	Gw irrigation	14	1976	68
7	62	0.0381	Return-Gw irr			
8	62	0.0382	Sw irr-return			
6	63	0.4413	Canl&lat loss			
6	63	0.0382	Sw irr-return			
7	63	0.0382	Sw irr-return			
6	64	0.4413	Canl&lat loss			
6	65	0.4413	Canl&lat loss			
6	65	0.0382	Sw irr-return			
10	65	-0.2913	Gw irrigation	14	1976	52
10	65	0.0291	Return-Gw irr			
5	66	0.4413	Canl&lat loss			
7	67	0.4413	Canl&lat loss			
8	67	-0.3529	Gw irrigation	14	1976	63
8	67	0.0353	Return-Gw irr			
8	67	0.0382	Sw irr-return			
8	68	0.4413	Canl&lat loss			
8	68	0.0382	Sw irr-return			
9	68	0.0382	Sw irr-return			
10	68	0.0382	Sw irr-return			
11	68	0.0382	Sw irr-return			
12	68	-0.4593	Gw irrigation	6	1972	82
12	68	0.0459	Return-Gw irr			
8	69	0.4413	Canl&lat loss			
10	69	0.0382	Sw irr-return			
11	69	0.0382	Sw irr-return			
12	69	0.0382	Sw irr-return			
8	70	0.4413	Canl&lat loss			
8	70	0.0382	Sw irr-return			
9	70	0.0382	Sw irr-return			
10	70	0.0382	Sw irr-return			
11	70	0.0382	Sw irr-return			
12	70	0.0382	Sw irr-return			
9	71	0.4413	Canl&lat loss			
9	71	-0.3641	Gw irrigation	16	1977	130*
9	71	0.0364	Return-Gw irr			
9	71	0.0382	Sw irr-return			
10	71	-0.1905	Gw irrigation	16	1977	68*
10	71	0.0190	Return-Gw irr			
11	71	-0.3809	Gw irrigation	16	1977	68
11	71	0.0381	Return-Gw irr			
12	71	0.0382	Sw irr-return			
13	71	0.0382	Sw irr-return			
16	71	-0.4537	Gw irrigation	16	1977	81
16	71	0.0454	Return-Gw irr			
10	72	0.4413	Canl&lat loss			
11	72	-0.8291	Gw irrigation	16	1977	296*
11	72	0.0829	Return-Gw irr			

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11	73	0.4413	Canl&lat loss			
11	73	-0.4061	Gw irrigation	16	1977	145*
11	73	0.0406	Return-Gw irr			
16	73	-0.4481	Gw irrigation	2	1970	80
16	73	0.0448	Return-Gw irr			
17	73	-0.2829	Gw irrigation	6	1972	101*
17	73	0.0283	Return-Gw irr			
11	74	0.4413	Canl&lat loss			
11	74	0.0382	Sw irr-return			
12	74	0.0382	Sw irr-return			
11	75	0.4413	Canl&lat loss			
13	75	0.0382	Sw irr-return			
14	75	0.0382	Sw irr-return			
11	76	0.4413	Canl&lat loss			
11	76	0.0382	Sw irr-return			
12	76	0.0382	Sw irr-return			
13	76	0.0382	Sw irr-return			
14	76	0.0382	Sw irr-return			
11	77	0.4413	Canl&lat loss			
11	77	0.0382	Sw irr-return			
14	77	0.0382	Sw irr-return			
11	78	0.4413	Canl&lat loss			
11	78	0.0382	Sw irr-return			
13	78	0.0382	Sw irr-return			
14	78	0.0382	Sw irr-return			
15	78	-0.0964	City pumpage			
16	78	-0.0964	City pumpage			
11	79	0.4413	Canl&lat loss			
13	79	0.0382	Sw irr-return			
14	79	-0.0964	City pumpage			
15	79	-0.0964	City pumpage			
16	79	-0.0964	City pumpage			
11	80	0.4413	Canl&lat loss			
11	80	0.0382	Sw irr-return			
12	80	0.0382	Sw irr-return			
15	80	-0.0964	City pumpage			
12	81	0.4413	Canl&lat loss			
13	82	0.4413	Canl&lat loss			
13	82	0.0382	Sw irr-return			
14	82	0.0382	Sw irr-return			
15	82	0.0382	Sw irr-return			
14	83	0.4413	Canl&lat loss			
16	83	0.0382	Sw irr-return			
17	83	0.0382	Sw irr-return			
18	83	-0.1400	Gw irrigation	8	1973	25
18	83	0.0140	Return-Gw irr			
14	84	0.4413	Canl&lat loss			
14	85	0.4413	Canl&lat loss			
14	85	0.0382	Sw irr-return			
14	86	0.4413	Canl&lat loss			

PUMPING-PERIOD CONTROL PARAMETERS--Continued

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14	86	0.0382	Sw irr-return				
15	86	0.0382	Sw irr-return				
16	86	0.0382	Sw irr-return				
17	86	0.0382	Sw irr-return				
14	87	0.4413	Canl&lat loss				
14	87	0.0382	Sw irr-return				
14	88	0.4413	Canl&lat loss				
14	88	0.0382	Sw irr-return				
14	89	0.4413	Canl&lat loss				
15	90	0.4413	Canl&lat loss				
16	90	0.4413	Canl&lat loss				
16	90	0.0382	Sw irr-return				
17	90	0.0382	Sw irr-return				
16	91	0.0382	Sw irr-return				
17	91	0.4413	Canl&lat loss				
17	91	0.0382	Sw irr-return				

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17	16	17	275	20		1.5	12
18	12	-0.1028	City pumpage				
19	12	-0.1028	City pumpage				
18	14	-0.1044	City pumpage				
19	14	-0.1044	City pumpage				
17	15	-0.0240	City pumpage				
18	15	-0.1044	City pumpage				
19	15	-0.1044	City pumpage				
17	16	-0.0240	City pumpage				
16	17	-0.1068	City pumpage				
11	36	-0.0296	City pumpage				
8	52	-0.0296	City pumpage				
15	78	-0.0964	City pumpage				
16	78	-0.0964	City pumpage				
14	79	-0.0964	City pumpage				
15	79	-0.0964	City pumpage				
16	79	-0.0964	City pumpage				
15	80	-0.0964	City pumpage				

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18	17	175	90	20		1.5	12
14	38	-0.9635	Gw irrigation	0 1964	172		
14	38	0.0963	Return-Gw irr				
10	41	-0.6442	Gw irrigation	0 1957	115		
10	41	0.0644	Return-Gw irr				
13	48	-0.9523	Gw irrigation	0 1957	170		
13	48	0.0952	Return-Gw irr				
24	5	-0.8963	Gw irrigation	0 1963	160		
24	5	0.0896	Return-Gw irr				
15	16	-0.3697	Gw irrigation	0 1964	66		
15	16	0.0370	Return-Gw irr				
15	17	-0.3249	Gw irrigation	0 1963	58		

0.000000005--Continued						
15	17	0.0325	Return-Gw irr			
20	18	-0.2801	Gw irrigation	0	1956	50
20	18	0.0280	Return-Gw irr			
19	19	-0.9915	Gw irrigation	0	1963	177
19	19	0.0991	Return-Gw irr			
19	25	-0.7338	Gw irrigation	0	1959	131
19	25	0.0734	Return-Gw irr			
16	29	-0.4201	Gw irrigation	0	1959	75
16	29	0.0420	Return-Gw irr			
.000000003						
25	3	-0.2633	Gw irrigation	4	1971	47
25	3	0.0263	Return-Gw irr			
26	4	-0.6330	Gw irrigation	12	1975	113
26	4	0.0633	Return-Gw irr			
28	4	-0.1120	Gw irrigation	12	1975	20
28	4	0.0112	Return-Gw irr			
22	6	-2.2856	Gw irrigation	10	1974	408*
22	6	0.2286	Return-Gw irr			
25	7	-0.9243	Gw irrigation	18	1978	165
25	7	0.0924	Return-Gw irr			
21	8	-1.2380	Gw irrigation	14	1976	221
21	8	0.1238	Return-Gw irr			
23	9	-1.0083	Gw irrigation	12	1975	180
23	9	0.1008	Return-Gw irr			
24	9	-1.0083	Gw irrigation	12	1975	180
24	9	0.1008	Return-Gw irr			
19	10	-0.6162	Gw irrigation	4	1971	110*
19	10	0.0616	Return-Gw irr			
24	10	-0.4089	Gw irrigation	12	1975	73
24	10	0.0409	Return-Gw irr			
25	10	-0.4089	Gw irrigation	12	1975	73
25	10	0.0409	Return-Gw irr			
22	11	-0.8235	Gw irrigation	12	1975	147
22	11	0.0823	Return-Gw irr			
23	11	-0.8235	Gw irrigation	12	1975	147
23	11	0.0823	Return-Gw irr			
18	12	-0.1028	City pumpage			
19	12	-0.1028	City pumpage			
17	13	-0.2969	Gw irrigation	4	1971	53
17	13	0.0297	Return-Gw irr			
18	14	-0.1044	City pumpage			
19	14	-0.1044	City pumpage			
17	15	-0.0240	City pumpage			
18	15	-0.1044	City pumpage			
19	15	-0.1044	City pumpage			
17	16	-0.0240	City pumpage			
16	17	-0.1068	City pumpage			
18	23	-0.3641	Gw irrigation	4	1971	65
18	23	0.0364	Return-Gw irr			
19	24	-0.7731	Gw irrigation	4	1971	138

0.000000003--Continued

19	24	0.0773	Return-Gw irr			
12	26	-0.1681	Gw irrigation	6	1972	30
12	26	0.0168	Return-Gw irr			
14	26	-0.7114	Gw irrigation	16	1977	127*
14	26	0.0711	Return-Gw irr			
15	26	-0.7114	Gw irrigation	6	1972	127
15	26	0.0711	Return-Gw irr			
15	27	-0.4425	Gw irrigation	6	1972	79
15	27	0.0443	Return-Gw irr			
17	30	-0.1793	Gw irrigation	16	1977	32
17	30	0.0179	Return-Gw irr			
17	32	-0.8739	Gw irrigation	16	1977	156
17	32	0.0874	Return-Gw irr			
13	35	-0.7282	Gw irrigation	6	1972	130
13	35	0.0728	Return-Gw irr			
11	36	-0.0296	City pumpage			
11	36	-0.2521	Gw irrigation	6	1972	45
11	36	0.0252	Return-Gw irr			
11	38	-0.4593	Gw irrigation	14	1976	82
11	38	0.0459	Return-Gw irr			
13	38	-0.7338	Gw irrigation	14	1976	131
13	38	0.0734	Return-Gw irr			
10	39	-0.4874	Gw irrigation	16	1977	87
10	39	0.0487	Return-Gw irr			
11	40	-0.2241	Gw irrigation	8	1973	40
11	40	0.0224	Return-Gw irr			
12	40	-0.1008	Gw irrigation	8	1973	18
12	40	0.0101	Return-Gw irr			
11	41	-0.3361	Gw irrigation	8	1973	60
11	41	0.0336	Return-Gw irr			
11	43	-0.3921	Gw irrigation	16	1977	70
11	43	0.0392	Return-Gw irr			
9	44	-0.3809	Gw irrigation	16	1977	68*
9	44	0.0381	Return-Gw irr			
11	44	-0.9075	Gw irrigation	16	1977	162
11	44	0.0907	Return-Gw irr			
9	45	-0.4706	Gw irrigation	6	1972	84
9	45	-0.3977	Gw irrigation	6	1972	71
9	45	0.0471	Return-Gw irr			
9	45	0.0398	Return-Gw irr			
9	46	-0.6218	Gw irrigation	6	1972	111*
9	46	0.0622	Return-Gw irr			
10	46	-0.8627	Gw irrigation	6	1972	154*
10	46	0.0863	Return-Gw irr			
13	46	-0.2241	Gw irrigation	14	1976	40
13	46	0.0224	Return-Gw irr			
13	47	-0.2241	Gw irrigation	14	1976	40
13	47	0.0224	Return-Gw irr			
11	48	-0.5322	Gw irrigation	6	1972	95
11	48	0.0532	Return-Gw irr			

0.000000003--Continued

7	49	-0.5602	Gw irrigation	10	1974	100
7	49	-0.3137	Gw irrigation	6	1972	56
7	49	0.0560	Return-Gw irr			
7	49	0.0314	Return-Gw irr			
11	49	-0.5322	Gw irrigation	6	1972	95
11	49	0.0532	Return-Gw irr			
6	51	-0.2689	Gw irrigation	4	1971	48
6	51	0.0269	Return-Gw irr			
6	52	-0.2689	Gw irrigation	4	1971	48
6	52	0.0269	Return-Gw irr			
8	52	-0.0296	City pumpage			
6	56	-0.2633	Gw irrigation	6	1972	47
6	56	0.0263	Return-Gw irr			
8	56	-0.4649	Gw irrigation	18	1978	83
8	56	0.0465	Return-Gw irr			
3	58	-0.3809	Gw irrigation	16	1977	68*
3	58	0.0381	Return-Gw irr			
4	59	-0.8571	Gw irrigation	14	1976	153*
4	59	0.0857	Return-Gw irr			
4	60	-0.8515	Gw irrigation	8	1973	152
4	60	0.0851	Return-Gw irr			
9	60	-0.5042	Gw irrigation	18	1978	90
9	60	0.0504	Return-Gw irr			
4	61	-0.5714	Gw irrigation	12	1975	102
4	61	0.0571	Return-Gw irr			
6	61	-0.6050	Gw irrigation	18	1978	108
6	61	0.0605	Return-Gw irr			
7	62	-0.3809	Gw irrigation	14	1976	68
7	62	0.0381	Return-Gw irr			
7	65	-0.4313	Gw irrigation	18	1978	77
7	65	0.0431	Return-Gw irr			
10	65	-0.2913	Gw irrigation	14	1976	52
10	65	0.0291	Return-Gw irr			
10	66	-0.3921	Gw irrigation	18	1978	70
10	66	0.0392	Return-Gw irr			
8	67	-0.3529	Gw irrigation	14	1976	63
8	67	0.0353	Return-Gw irr			
12	68	-0.4593	Gw irrigation	6	1972	82
12	68	0.0459	Return-Gw irr			
9	71	-0.7282	Gw irrigation	16	1977	130*
9	71	0.0728	Return-Gw irr			
10	71	-0.3809	Gw irrigation	16	1977	68*
10	71	0.0381	Return-Gw irr			
11	71	-0.3809	Gw irrigation	16	1977	68
11	71	0.0381	Return-Gw irr			
16	71	-0.4537	Gw irrigation	16	1977	81
16	71	0.0454	Return-Gw irr			
11	72	-1.6581	Gw irrigation	16	1977	296*
11	72	0.1658	Return-Gw irr			
11	73	-0.8123	Gw irrigation	16	1977	145*

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11	73	0.0812	Return-Gw irr				
16	73	-0.4481	Gw irrigation	2	1970	80	
16	73	0.0448	Return-Gw irr				
17	73	-0.5658	Gw irrigation	6	1972	101*	
17	73	0.0566	Return-Gw irr				
13	75	-0.7843	Gw irrigation	18	1978	140	
13	75	0.0784	Return-Gw irr				
15	78	-0.0964	City pumpage				
16	78	-0.0964	City pumpage				
14	79	-0.0964	City pumpage				
15	79	-0.0964	City pumpage				
16	79	-0.0964	City pumpage				
15	80	-0.0964	City pumpage				
18	83	-0.1400	Gw irrigation	8	1973	25	
18	83	0.0140	Return-Gw irr				
19	18	17	180	20		1.5	12
18	12	-0.1028	City pumpage				
19	12	-0.1028	City pumpage				
18	14	-0.1044	City pumpage				
18	15	-0.1044	City pumpage				
19	14	-0.1044	City pumpage				
19	15	-0.1044	City pumpage				
17	15	-0.0240	City pumpage				
17	16	-0.0240	City pumpage				
16	17	-0.1068	City pumpage				
11	36	-0.0296	City pumpage				
8	52	-0.0296	City pumpage				
15	80	-0.0964	City pumpage				
15	79	-0.0964	City pumpage				
16	79	-0.0964	City pumpage				
15	78	-0.0964	City pumpage				
14	79	-0.0964	City pumpage				
16	78	-0.0964	City pumpage				