

**U. S. DEPARTMENT OF INTERIOR
U.S. GEOLOGICAL SURVEY**

rec'd
9/8/98

**In Cooperation with the Oklahoma Water Resources Board
and Oklahoma Geological Survey**

Steady-State Simulation of Ground-Water Flow in the Rush Springs Aquifer, Western Oklahoma

Water-Resources Investigations Report 98-4082

**U. S. DEPARTMENT OF INTERIOR
U.S. GEOLOGICAL SURVEY**

Steady-State Simulation of Ground-Water Flow in the Rush Springs Aquifer, Western Oklahoma

By Mark F. Becker

Water-Resources Investigations Report 98-4082

**In Cooperation with the Oklahoma Water Resources Board
and Oklahoma Geological Survey**

U.S. DEPARTMENT OF THE INTERIOR

BRUCE BABBITT, Secretary

U.S. GEOLOGICAL SURVEY

THOMAS J. CASADEVALL, Acting Director

Any use of trade names in this publication is for descriptive purposes only and does not imply endorsement by the U.S. Government.

UNITED STATES GOVERNMENT PRINTING OFFICE: OKLAHOMA CITY 1998

For additional information write to:

District Chief

U.S. Geological Survey

Water Resources Division

202 NW 66th Street, Building 7

Oklahoma City, OK 73116

**Copies of this report can be
purchased from:**

U.S. Geological Survey

Branch of Information Services

Box 25286

Denver, CO 80225-0286

CONTENTS

	Page
Abstract	1
Introduction	1
Purpose and scope	1
Location of the study area	1
Geology	3
Hydrology	3
Model description	6
Boundary conditions	6
Recharge	10
Discharge	10
Steady-state simulation	12
Model adjustments	12
Simulation results	12
Summary and conclusions	12
Selected references	15
Appendix A: Modular model results for a steady state simulation of ground-water flow in the rush springs aquifer, western Oklahoma	17
Appendix B: Modular model post-processor results of a steady state simulation of ground-water flow in the rush springs aquifer, western Oklahoma	73

ILLUSTRATIONS

Figures 1-9 Maps showing:

1. Geographic features within the study area.	2
2. Location of Anadarko basin.	4
3. Surficial geologic units in the Rush Springs study area.	5
4. Predevelopment potentiometric surface of the Rush Springs aquifer.	7
5. Range of saturated thickness in predevelopment steady-state model.	8
6. Active cells and boundaries of the Rush Springs model.	9
7. Distribution of hydraulic conductivity in feet per day in the Rush Springs model.	11
8. Distribution of recharge in inches per year in the Rush Springs model.	13
9. Comparison of predevelopment potentiometric surface and simulated potentiometric surface.	14

TABLES

1. Measured base flow and simulated discharge to rivers and creeks	12
--	----

CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
foot (ft)	0.3048	meter
inch (in.)	25.4	millimeter
mile (mi)	1.609	kilometer
square mile (mi ²)	2.590	square kilometer
acre	4,047	square meter
gallon	0.133	cubic feet
acre-foot	1,233	cubic meter
foot per day (ft/d)	0.3048	meter per day
foot squared per day (ft ² /d)	0.09290	meter squared per day
cubic foot per second (ft ³ /s)	0.02832	cubic meter per second

Degree Celsius (°C) may be converted to degree Fahrenheit (°F) by using the following equation:

$$^{\circ}\text{F} = 1.8 (^{\circ}\text{C}) + 32.$$

Degree Fahrenheit (°F) may be converted to degree Celsius (°C) by using the following equation:

$$^{\circ}\text{C} = .55 (^{\circ}\text{F}-32).$$

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)— a geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

Steady-State Simulation of Ground-Water Flow in the Rush Springs Aquifer, Western Oklahoma

By Mark F. Becker

ABSTRACT

A simplified steady-state ground-water flow model was prepared for the Rush Springs aquifer in western Oklahoma. A 3-kilometer square grid was established over the area containing two layers with 674 active nodes simulated in the model. The steady-state model simulation used a mean recharge rate of 3.05×10^{-4} feet per day and a hydraulic conductivity range from 0.8 to 10 feet per day. The error at each node in the model is defined as the difference between the measured and simulated water levels. The arithmetic mean error for 170 of the 674 active nodes was -0.11 feet, the absolute value mean error was 7.55 feet, and the standard deviation of the error was 10.21 feet. A net simulated recharge of 231 cubic feet per second is balanced by a discharge to drains and seeps of 190.6 cubic feet per second about 82 percent of the total recharge. Discharge to the main stem of the Washita River is about 41 cubic feet per second about 18 percent of the recharge.

INTRODUCTION

Irrigators, municipalities, industry, and ranchers in western Oklahoma rely on the Rush Springs aquifer as a principal water supply. The Oklahoma Water Resources Board (OWRB) requires information on the ability of the aquifer to sustain this water supply. A simplified, steady-state model of the Rush Springs aquifer was prepared to simulate average conditions in the aquifer. The U.S. Geological Survey in cooperation with the OWRB and the Oklahoma Geological Survey (OGS) began a study of the hydrology of the Rush Springs aquifer in 1988.

Purpose and Scope

The purpose of this report is to present a simplified conceptual model of the ground-water hydrology of the Rush Springs aquifer, to test the conceptual model using a

numerical model of ground-water flow, and to make the numerical model available for use and modification by the OWRB and others. This report will provide the OWRB with a ground-water model fulfilling a legislative mandate by the State of Oklahoma that the OWRB determine the changes in storage from a transient simulation. This report is the steady-state step in this process where the transient simulation will be completed by the OWRB. Also available in the report is the general geologic setting, boundaries, input data to the model, and final model output.

The scope of the project is to create a numerical model of the ground water flow system and to make the numerical model available for use and modification by the OWRB and others. The model was developed to represent steady-state conditions prior to irrigation. The predevelopment period considered is before 1950.

Location of the Study Area

The study area comprises all or parts of Blaine, Caddo, Canadian, Comanche, Custer, Dewey, Grady, Kiowa, Stephens, and Washita Counties (fig. 1). The southern and eastern boundary is the erosional extent of the Rush Springs Formation¹. The northern and northeastern boundary is the Canadian River. The western boundary of the study area is the Washita River to Barnitz Creek and up the Dry Creek tributary of Barnitz Creek almost to the Canadian River. The approximate area of the study is 2,400 square miles.

The boundary of the study area was selected based on two criteria: the areal extent of the aquifer where considerable use occurs and hydrologic boundaries that can be realistically simulated. The Canadian River is a very good flow boundary to simulate. Likewise to the west the Washita River, Barnitz Creek, and Dry Creek combined to provide boundaries that are plausible.

¹ Geologic names and stratigraphic ages in this report are accepted by the Oklahoma Geological Survey and are not necessarily the same as those used by the U.S. Geological Survey.

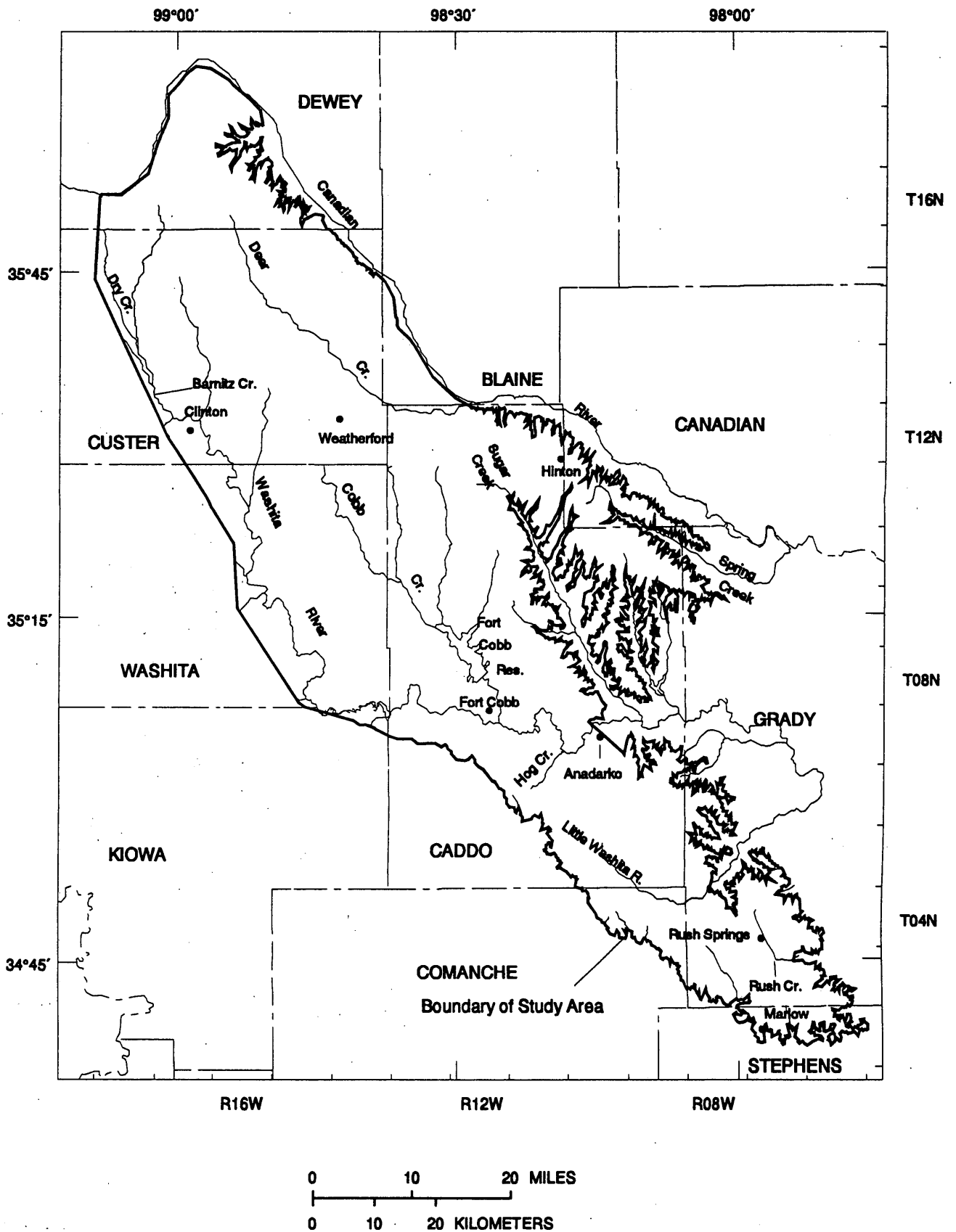


Figure 1. Geographic features within the study area.

Geology

The study area is in the southeastern Anadarko basin (fig 2), which extends from south-central Oklahoma west-northwest into Texas. Dips of the Permian strata are mostly south-southwest and up to 20 feet per mile but can exceed 50 to 100 feet per mile from the Wichita uplift north-northeast into the basin.

Overlying the Rush Springs Formation along the portions of the western boundary and northern half of the study area is the Cloud Chief Formation of Permian age (fig. 3). Most of the Cloud Chief in the study area occurs as erosional remnants on hills and uplands. On the western portion of the study area the Cloud Chief is present as the easternmost extent of the main deposit of Cloud Chief in the Anadarko Basin. The Cloud Chief Formation is characterized by massive gypsum units interbedded with reddish-brown shales and siltstones. The Cloud Chief maximum thickness is more than 100 feet in the study area but generally is highly eroded and where gypsum is near land surface can develop karst topography.

The Rush Springs Formation of Permian age is a massive to highly cross-bedded sandstone with some interbedded dolomite or gypsum. The textural maturity and high degree of sorting support the hypothesis that the sandstones were primarily eolian in origin. Tanaka and Davis (1963) showed that the Rush Springs Formation in Caddo County is primarily very-fine grain. The sand tends to be subangular to subround and poorly cemented in most places. Within the study area the Rush Springs Formation is usually less than 250 feet thick but can exceed 300 feet thick in areas where the entire section is present.

Underlying the Rush Springs Formation is the Marlow Formation that is composed of interbedded sandstones, siltstones, mudstones, gypsum-anhydrite, and dolomite beds. The Marlow Formation, also of Permian age, is moderate to well-cemented throughout. According to Tanaka and Davis (1963) the Marlow Formation is as thick as 128 feet but it is generally 90 to 100 feet thick in the study area. Underlying the Marlow Formation is the El Reno Group, also of Permian age.

HYDROLOGY

The Rush Springs aquifer, for the purposes of this report, consists of the Rush Springs Formation, alluvium within the study area, and parts of the Marlow Formation, particularly on the eastern edge of the study area. Parts of the Marlow are included in areas where permeability and porosity are greater due to weathering of the outcrop. In contrast, well-cemented units in the Marlow generally appear to have extremely low permeability. Cores examined immediately following extraction contained sections that were dry, which indicates little or no flow through these sections. The Marlow acts as a lower

confining layer to the Rush Springs aquifer throughout most of the study area.

The Rush Springs aquifer extends north and west into Kansas and Texas. Westward the aquifer becomes deeply buried and contains saline water. Northwest of the study area water from the Rush Springs aquifer has increasing concentrations of dissolved calcium and sulfate from the overlying gypsum-bearing Cloud Chief Formation. Well yields decrease as the aquifer thins northwest of the study area. For these reasons the highest water use from the Rush Springs aquifer is in Caddo, Custer, Blaine, Grady, and Stephens Counties. In the western part of the study area, the Cloud Chief acts as an upper confining layer of the Rush Springs aquifer.

Well yields from the Rush Springs aquifer vary, but the most productive irrigation wells are reported to yield more than 1,000 gallons per minute. The OWRB provided drillers' logs for 89 wells with reported discharges ranging from 11 to 850 gallons per minute with a mean discharge of 209 gallons per minute. Specific capacity is the pumping volumetric rate divided by the water-level drawdown within the well resulting from the pumping, for a given period of time. Specific capacities calculated for these wells from the 89 drillers' logs ranged from 0.7 to 15 gallons per minute per foot of drawdown with a mean of 2.3. Tanaka and Davis (1963) reported specific yields in the range of 13 to 34 percent and transmissivities calculated from four aquifer tests ranged from 670 to 1,870 feet squared per day.

The Rush Springs aquifer is recharged by the infiltration of precipitation. The 30-year average annual precipitation ranges from more than 26 inches per year to greater than 32.5 inches per year in the study area. Estimates of recharge range from less than 0.5 inch per year (Pettyjohn, White, and Dunn, 1983) to over 2 inches per year (Tanaka and Davis, 1963).

Ground water from the Rush Springs aquifer discharges to streams and rivers, primarily the Washita River, in much of the study area where the Rush Springs aquifer crops out or is overlain by the Cloud Chief Formation but is hydraulically connected to the stream. Springs and seeps also are points of discharge and generally occur where the Rush Springs aquifer is deeply incised and the water table intersects steep valley walls. The Marlow Formation impedes flow because it is well-cemented and less permeable and results in springs and seeps where the Rush Springs Formation and Marlow Formation contact near land surface. Springs and seeps are observed near Hinton, in northern Caddo County, and within the town of Rush Springs in Grady County. There are hillside seeps at the Rush Springs Formation and Marlow Formation contact along the Canadian River, Spring Creek, and Sugar Creek drainage basins, and within valleys along the southern

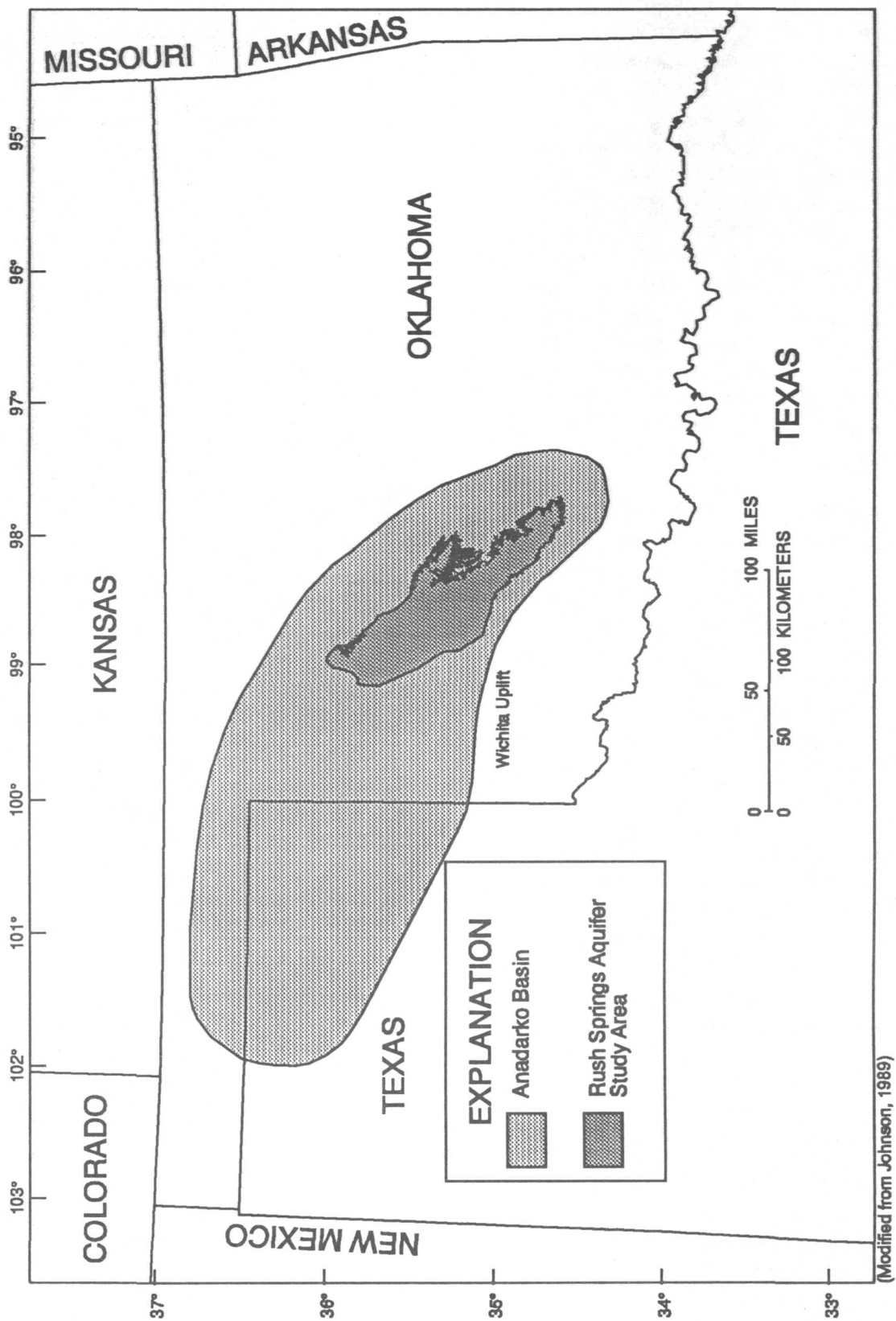


Figure 2. Location of Anadarko basin.

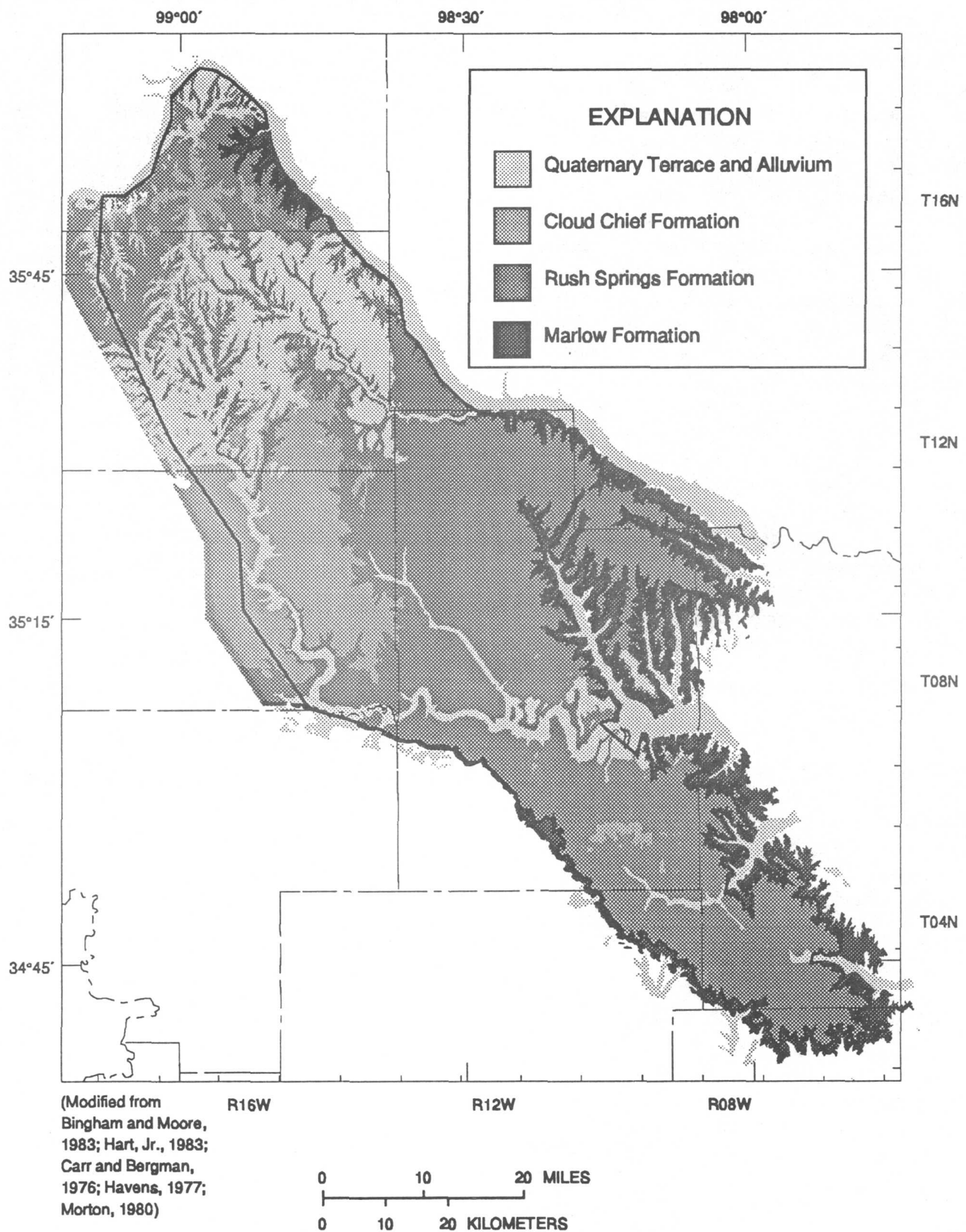


Figure 3. Surficial geologic units in the Rush Springs study area.

and eastern extent of the Rush Springs Formation. It is not known if there is vertical flow to the El Reno Group and there are no data to show if there is downward flow from the Rush Springs through the Marlow Formation to the El Reno Group.

The predevelopment potentiometric surface (fig. 4) represents water-level elevations prior to 1950, before the development of irrigation wells. A lack of water-level data from the predevelopment period resulted in assumptions of flow conditions and water-level altitudes during predevelopment. Stream elevations, well data, and land surface elevations were used to determine the elevation of the water levels and flow paths. Water-level measurements were poorly distributed spatially. Nineteen wells were selected to develop this surface, most of which were found in Caddo County. Measurements from wells in 1986 were used primarily from Custer, Dewey, and Washita Counties. These more recent measurements were used due to the lack of pre-1950 measurements and based on the assumption that irrigation no longer existed in these areas and the water table had returned to predevelopment conditions. With the introduction of irrigation in areas this conceptual flow is probably disrupted during periods when withdrawals occur. Flow to some minor tributaries probably was perennial during predevelopment and has become intermittent during periods of large withdrawals.

Regionally the direction of ground-water flow is to the southeast. Ground water flows perpendicular to the water-level contours, from highest water-table altitudes to lowest water-table altitudes until the flow path intercepts land surface and discharges as base flow for streams, springs, and seeps. The predevelopment water table was about 1,800 feet above sea level in the northwest and 1,300 feet above sea level in the southeast.

The saturated thickness shown in figure 5 is the measured length from the top of the water table to the base of the aquifer used in the model. This saturated thickness represents predevelopment conditions. Saturated thickness ranged from less than 50 to greater than 300 feet. Along the erosional extent of the aquifer on the east and southern half of the study area the saturated thickness ranged from 0 to 50 feet. The thickest saturation is in the northern and western portion of the aquifer where the Anadarko Basin deepens. Saturated thickness here was greater than 300 feet. In central and northern Caddo County where the highest number of irrigation wells are concentrated the saturated thickness ranged from less than 200 to over 300 feet.

MODEL DESCRIPTION

A geographic information system (GIS) interface was used to prepare, edit, and calibrate the ground-water flow model. The interface used was MODFLOWARC (Orzol and McGrath, 1992), which utilizes the GIS software ARC/INFO. The model grid was developed using ARC/INFO to cover a larger area than the final study area required. Due to the availability of sufficient computer resources the model grid was not changed during the study.

A simplified, steady-state model of the Rush Springs aquifer was prepared to simulate average conditions in the aquifer. The predevelopment setting is based on reasonable assumptions from the past and current observations of the hydrology of the aquifer. The assumptions are that: 1) predevelopment water-level altitudes exceeded current water-level elevations and 2) ground-water discharge is primarily to streams and that the altitude of the stream is a close approximation of the water table altitude. The area was divided into a 3-kilometer square model grid (fig 6). A total of 82 rows and 34 columns with nodes representing each cell were used. Only 674 of the 2,788 nodes represent active nodes with a total active area of 2,349 square miles.

Two layers were used to represent the hydrologic setting of the Rush Springs aquifer. The first layer is active in only 31 cells on the western edge of the study area and represents the Cloud Chief Formation where the thickness exceeds 50 feet and enough mudstone interbedded with the gypsum to be a confining layer to the Rush Springs aquifer. Layer two represents the Rush Springs aquifer.

The finite-difference modular model code of McDonald and Harbaugh (1988) was used in the simulation. The results are listed in Appendix A. The modular model uses consistent units in simulations. The length units used in this simulation are feet and the time units are days. The reader needs to refer to the model documentation (McDonald and Harbaugh, 1988) when interpreting these results. The simulation was evaluated using the Modular Model Statistical Program (MMSP) of Scott (1990). These results are in Appendix B.

Boundary Conditions

The Rush Springs model area is bounded by the erosional extent of the Rush Springs Formation, the Canadian River to the north, the Washita River to the west, with tributaries of the Washita River, Barnitz Creek and Dry Creek extending north to near the Canadian River completing the western boundary. Springs and seeps occur along the erosional extent of the Rush Springs eventually discharging to streams.

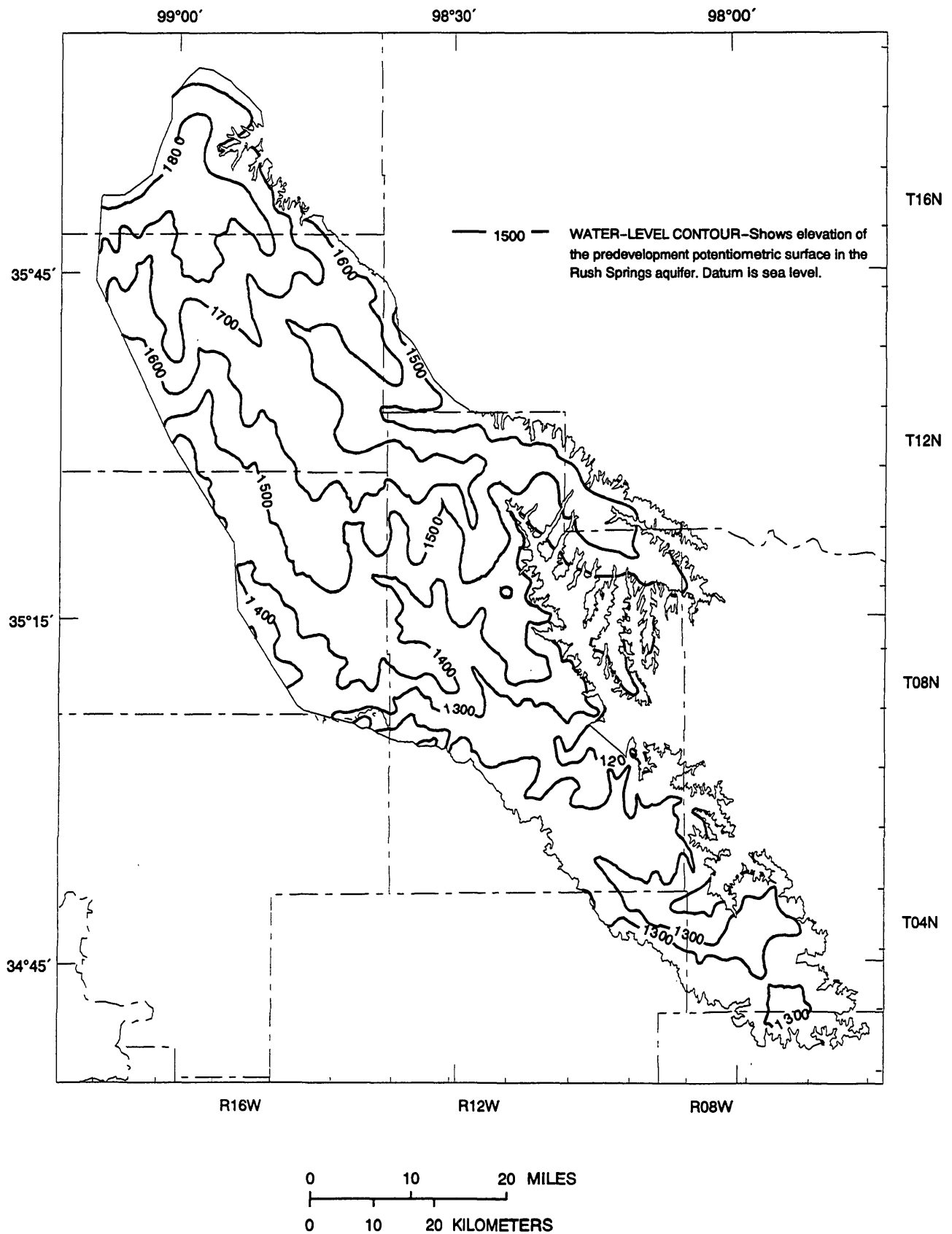


Figure 4. Predevelopment potentiometric surface of the Rush Springs aquifer.

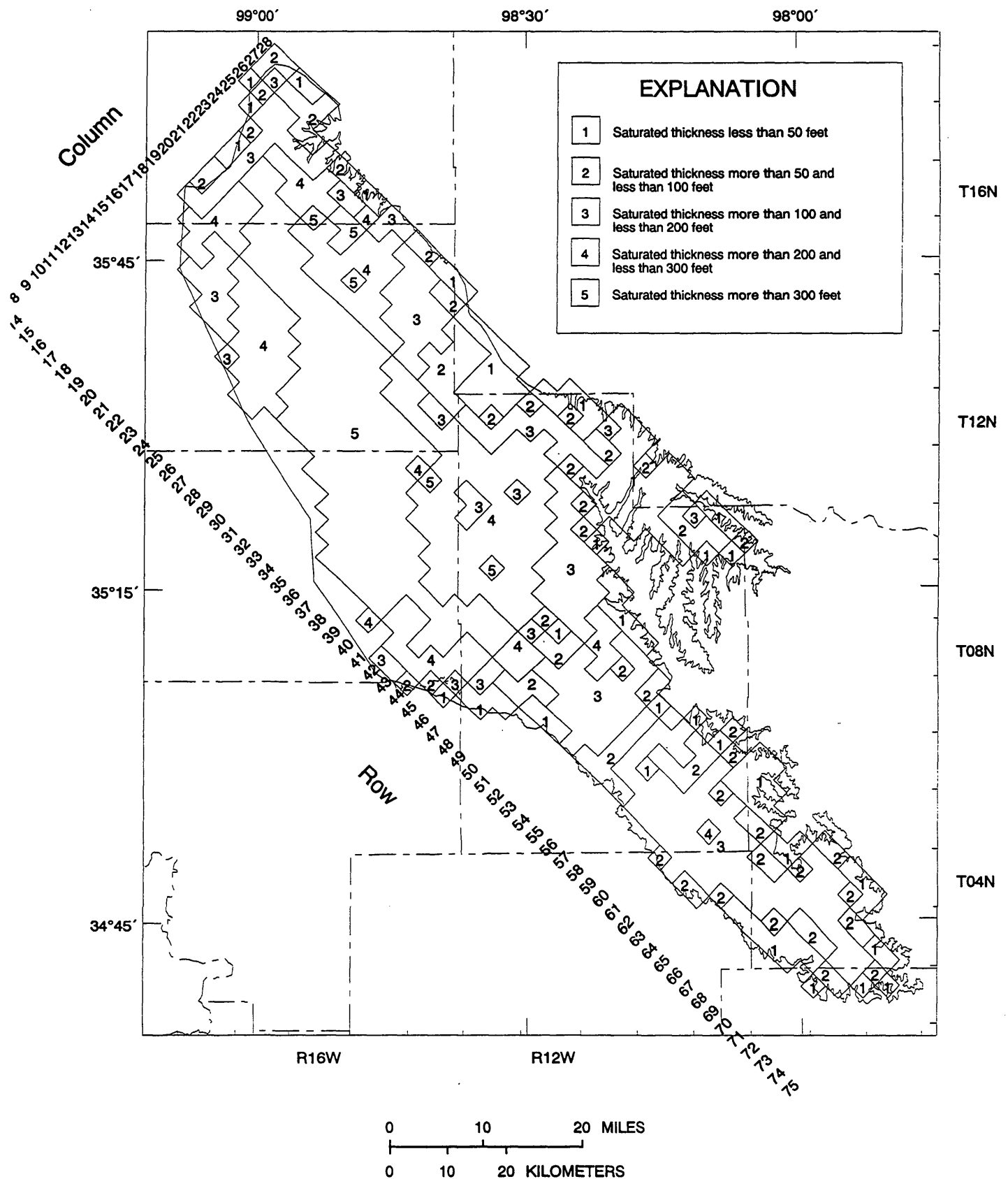


Figure 5. Range of saturated thickness in predevelopment steady-state model.

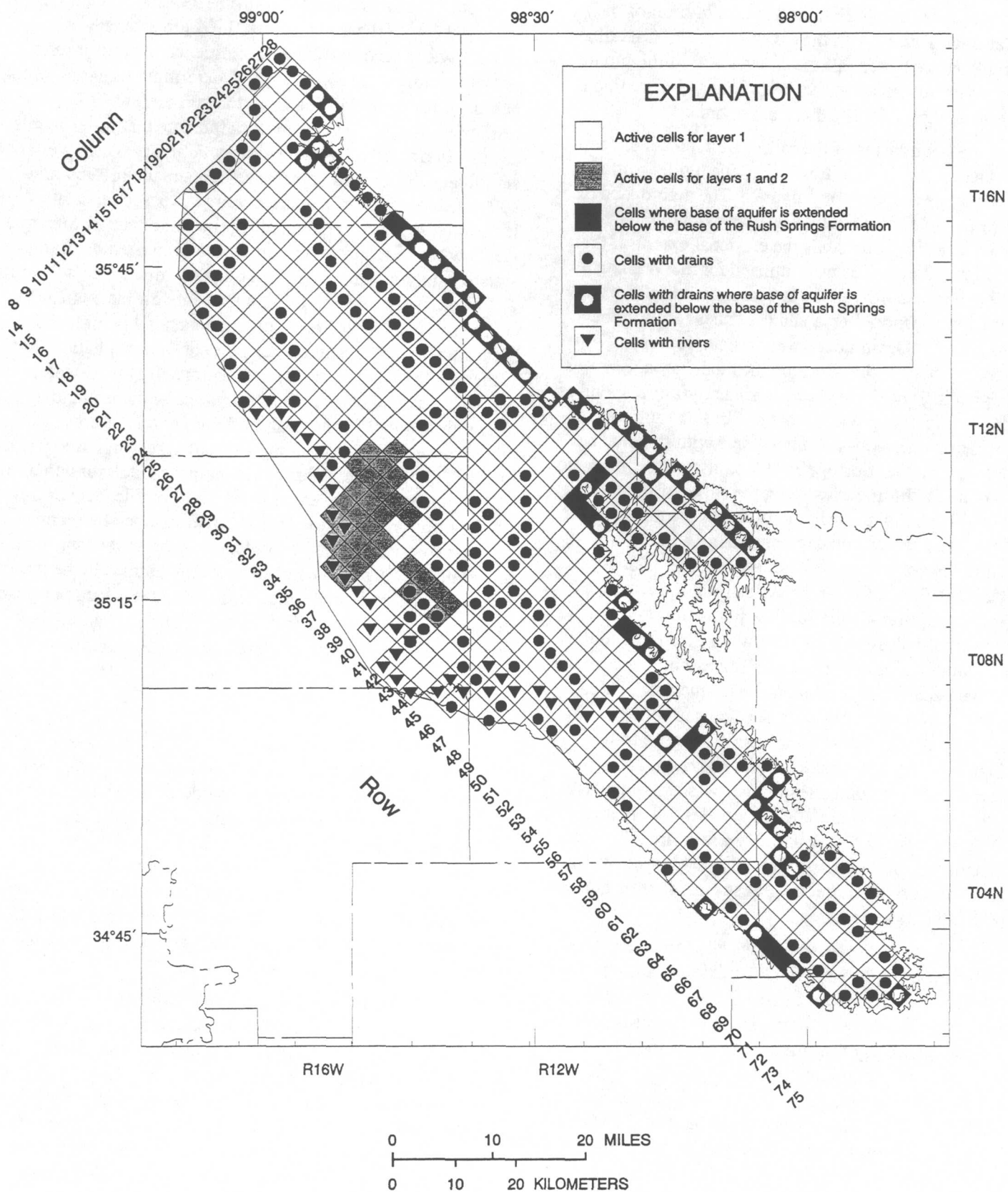


Figure 6. Active cells and boundaries of the Rush Springs model.

Cross-formation flow is probably limited but is likely to occur from the Rush Springs Formation into the weathered Marlow Formation and alluvium of the Canadian River. With the exception of the Canadian and Washita Rivers all the streams within the model boundary originate in the Rush Springs Formation or the overlying Cloud Chief Formation.

The boundaries of the model are represented as rivers, drains, and no flow cells. The model grid and boundaries are shown in figure 6. The active area of the model is bounded by a no-flow boundary. This boundary also represents the erosional extent of the aquifer. River nodes were utilized for the Washita River because flow in the stream is maintained prior to entering the model area and continues through the model area. Drain nodes were used to represent streams that originate within the model area. Streams originating within the Rush Springs aquifer respond as drains, removing water from the area as long as a hydraulic connection is maintained with the channel and water table. Springs and seeps also are represented as drains in boundaries along the edges of the model. They also behave similar to drains as discharge areas for ground water and cease discharge when the hydraulic connection with the water table is disrupted. The Canadian River is separated from the Rush Springs aquifer by the Marlow Formation and Quaternary alluvium. Ground water discharge to the Canadian River cannot be totally accounted for by the model because of discharge outside the model area. The northern, northeastern, and southern boundaries are represented as drains to show discharge to the Canadian River, Canadian River alluvium, springs, seeps, and perennial streams. The western boundary that depicts the Washita River represents a river and a drain for Barnitz Creek and Dry Creek. Interior boundaries include river nodes that depict the Washita River and drains that represent streams that originate within the modeled area.

The base of the Rush Springs Formation represents a no-flow boundary for the Rush Springs aquifer through most of the model. The base of the aquifer is modeled below the stratigraphic top of the Marlow Formation mostly in some eastern nodes to account for the increased hydraulic conductivity of the Marlow where it crops out (fig. 7). The top of the Rush Springs aquifer is either land surface or the base of the Cloud Chief Formation in the western part of the model.

Recharge

An initial estimate of recharge was made by assuming that the system was in dynamic equilibrium with total discharge from the aquifer, therefore recharge was

approximately equal to ground-water discharge to rivers, streams, springs and seeps. Stream discharge measurements were made at 31 locations in March 1989 and 38 locations in February 1991 (Blazs and others, 1992) to estimate ground-water runoff without the influence of surface runoff or evapotranspiration were used to determine recharge. Most pumpage for irrigation occurs in the summer; wells instrumented with water-level recorders indicate that water-levels have fully or near fully recovered by February. There were no significant differences in measurements made in 1989 and 1991. The estimate of annual recharge is based on data collected in 1989 and 1991 including the following: 1) Measurements within each stream basin were normalized by drainage area to estimate a mean-yield per square mile for each basin; 2) The surface area used for this recharge estimate is 2,400 square miles of study area; 3) A mean annual rainfall of 29 inches was used to estimate the percent of precipitation that recharges the aquifer; and 4) The estimated ground-water used in 1989 and 1991 in the study area by domestic, irrigation, public supply, industrial, and commercial users is 50,000 acre-feet. The resulting estimated recharge is approximately 7.0 percent of the average annual rainfall for a total of 310,000 acre-feet per year or 0.369×10^8 cubic feet per day for the entire model area. This is equal to about two inches per year distributed over the outcrop of the study area. The model utilizes a variable rate of recharge applied to the upper boundary. The recharge varies from less than 1 inch per year to over 2 inches per year (fig. 8) based upon variations in rainfall, topography, and model responses to calibration.

Discharge

Water is discharged from the aquifer to rivers, springs, seeps and perennial streams within the modeled area and to peripheral rivers and creeks along the boundaries of the modeled area. The peripheral rivers and creeks can gain water from sources outside the simulated area, so only the reaches of rivers and perennial streams that are within the modeled area were used for the model adjustments. The streambed altitudes and streambed conductances of rivers and creeks simulated as drains are listed in Appendix A.

Streambed conductances were initially estimated by using the method described in McDonald and Harbaugh (1988, pg. 6-4). During the calibration the conductances were adjusted by using a multiplier to get surrounding simulated heads to match observed heads and to approximate simulated stream discharge with measured stream discharges. Adjustments to streambed conductances resulted in slight variations from cell to cell in some cases. These differences are probably not significant and are simply an artifact of the adjustment method.

Discharge simulated from nodes representing the internal drains was summarized using the program MMSP (Scott, 1990). This program compiles and presents summary

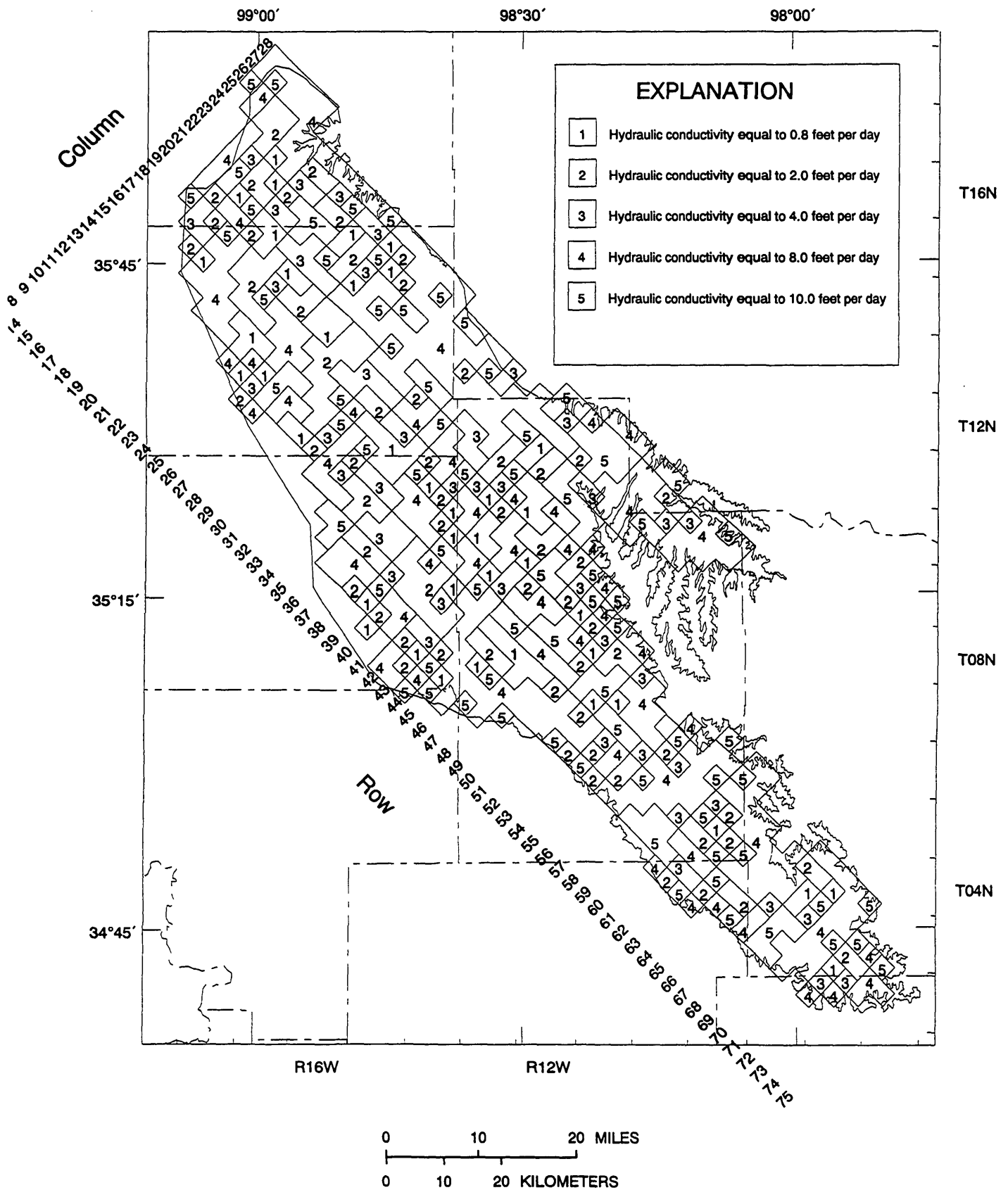


Figure 7. Distribution of hydraulic conductivity in feet per day in the Rush Springs model.

statistics of the discharge of specified zones representing streams. The simulation results for these and other nodes, as summarized by MMSP, are listed in Appendix B.

STEADY-STATE SIMULATION

A steady-state simulation of the Rush Springs aquifer was run by adjusting hydraulic conductivity, streambed conductance of streams and drains, and areal recharge to minimize the difference between measured and simulated heads and between measured and simulated discharge to internal rivers and creeks. Implicit in the simulation is the assumption the aquifer was in long-term equilibrium and that a steady-state simulation of the predevelopment water levels and stream-flow gains are a reasonable approximation of the predevelopment conditions.

Model Adjustments

Initially, a uniform hydraulic conductivity of 5 feet per day and a 7 percent recharge of mean annual precipitation over the study area was used. A uniform hydraulic conductivity did not reproduce the distribution of head throughout the modeled area. Hydraulic conductivity was adjusted throughout the model within a range of 0.8 to 10 feet per day. This range of hydraulic conductivity is within the range that would be found in a friable sandstone (Freeze and Cherry, 1979, p. 29) and estimated from specific capacities of drillers' logs within the study area. Distribution of hydraulic conductivities throughout the modeled area is shown in figure 7.

When adjustments of hydraulic conductivities no longer improved the calibration the net recharge rate was adjusted until a reasonable agreement between measured and simulated heads and between measured and simulated total discharge to interior drains was achieved (Appendix B). Total recharge applied to the model was 231 cubic feet per second. Modeled recharge ranged from 1.94×10^{-5} to 7.29×10^{-4} feet per day (fig. 8) with a mean of 3.05×10^{-4} feet per day.

Model simulations showed that saturation was reduced to zero in areas represented by the northeastern, eastern and the southern boundary cells along with interior cells containing streams. The saturated thickness in the Rush Springs aquifer is thin at these locations and the Marlow Formation probably is functioning as an aquifer. In the model, the base of the aquifer was lowered to account for this.

Simulation Results

The error at each node in the model is defined as the difference between the measured and simulated water levels. Because of the sparse amount of measured water-level data from predevelopment the error was only computed in the modeled areas where measured water-level data existed. After adjustment the arithmetic mean error for the 170 of the 674 active nodes was -0.11 feet, the absolute value mean error (the average of the errors for active nodes, regardless of sign) was 7.55 feet, and the standard deviation of the error was 10.21 feet. A comparison of the predevelopment water table elevations and the simulated water table elevations is shown in figure 9. Simulated elevations were machine contoured and predevelopment elevations were manually contoured resulting in some discrepancies.

A net simulated recharge of 231 cubic feet per second is balanced by a discharge to drains and seeps of 190.6 cubic feet per second or about 82 percent of the total recharge. Discharge to the main stem of the Washita River is about 41 cubic feet per second or about 18 percent of the recharge. Measured and simulated discharges are in general agreement. Most streams show a simulated discharge less than the measured discharges with the exception of Rush Creek and the Little Washita River. Varying the streambed conductances of streams and drains was insufficient to correct the imbalance in discharges. This could be due to errors in the assigned distributions of hydraulic conductivity or recharge. Many streams within the study area are regulated by water retention structures and probably do not reflect predevelopment conditions.

Table 1. Measured base flow and simulated discharge to rivers and creeks

[ft³/s, cubic feet per second]

Stream	Average measured, 1989 and 1991 (ft ³ /s)		Simulated (ft ³ /s)
Deer Creek	35.7	>	31.2
Rush Creek	0.87	<	3.8
Hog Creek	4.29	>	1.3
Sugar Creek	17.0	>	12.7
Little Washita River	6.7	<	7.1
Cobb Creek	25.5	>	21.7
Total	90.0	>	77.8

SUMMARY AND CONCLUSIONS

A simplified steady state model of the Rush Springs aquifer reasonably simulates predevelopment conditions. The predevelopment setting is based on reasonable assumptions from the past and current observations of the hydrology of the

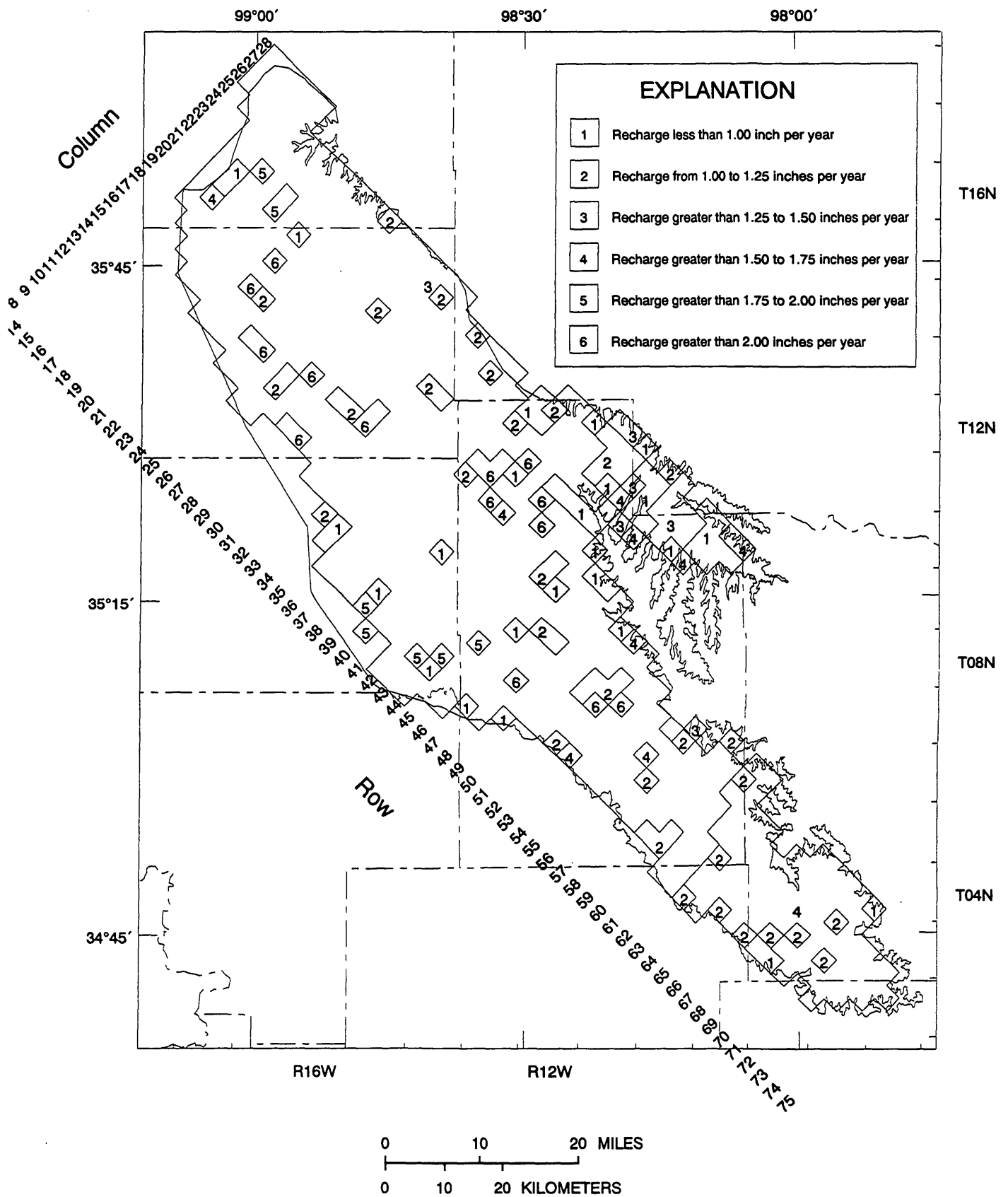


Figure 8. Distribution of recharge in inches per year in the Rush Springs model.

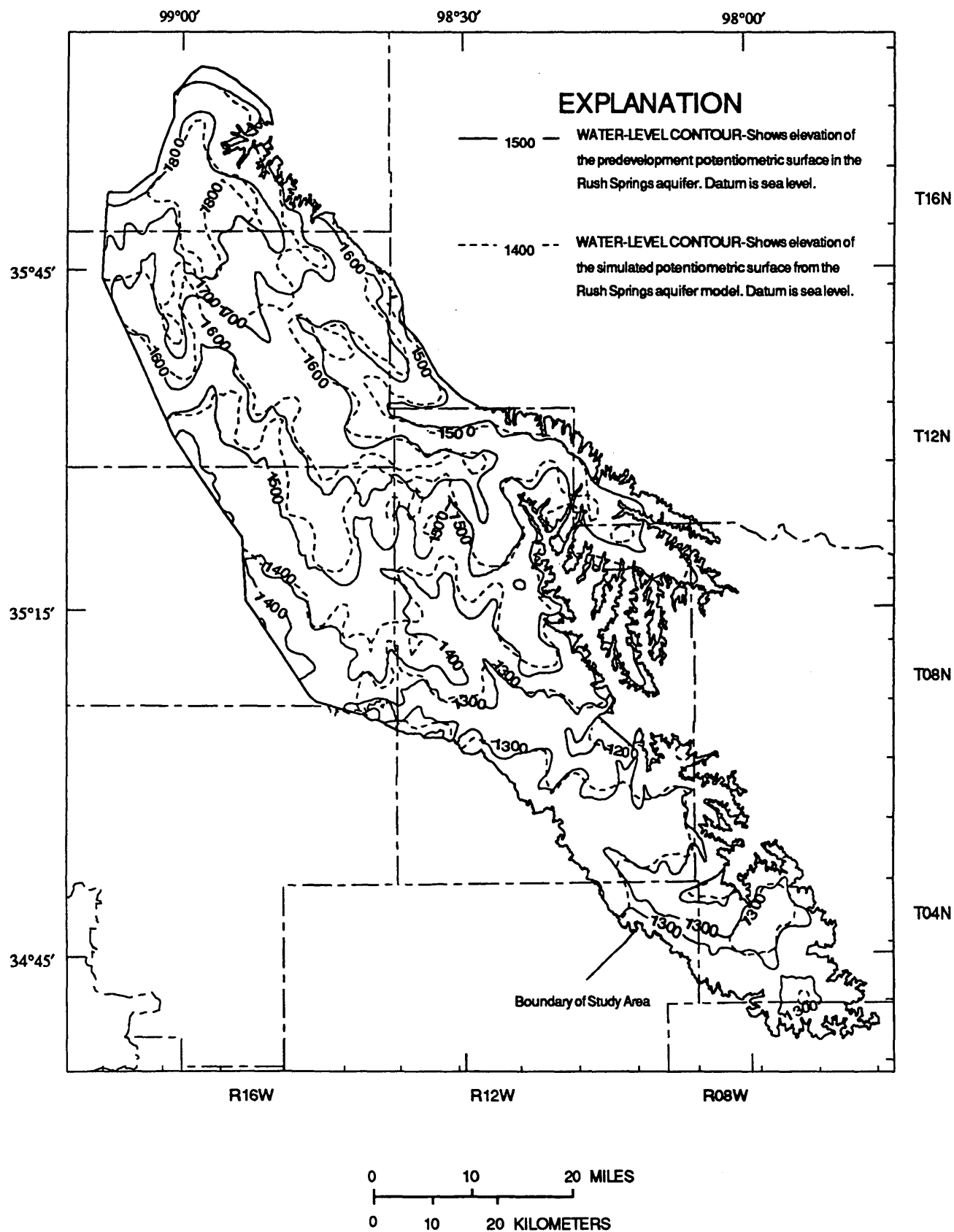


Figure 9. Comparison of predevelopment potentiometric surface and simulated potentiometric surface.

aquifer. The assumptions are that: 1) predevelopment water-level altitudes exceeded current water-level elevations and 2) ground-water discharge is primarily to streams and that the altitude of the stream is a close approximation of the water table altitude.

The study area comprises all or parts of Blaine, Caddo, Comanche, Canadian, Custer, Dewey, Grady, Stephens, and Washita Counties. The approximate area of the study is 2,400 square miles. The study area is in the southeastern Anadarko basin which extends from south-central Oklahoma and west-northwest into Texas. The term Rush Springs aquifer is used in this report to focus on the hydrogeologic properties of the Rush Springs Formation.

Underlying the Rush Springs Formation is the Marlow Formation that is composed of interbedded sandstones, siltstones, mudstones, gypsum-anhydrite, and dolomite beds. According to Tanaka and Davis (1963) the Marlow Formation is as thick as 128 feet but it is generally 90 to 100 feet thick in the study area. The Rush Springs Formation is a massive to highly cross-bedded sandstone with some interbedded dolomite or gypsum. Within the study area the Rush Springs Formation is usually less than 250 feet thick but can exceed 300 feet thick in areas where the entire section is present. Overlying the Rush Springs Formation along the portions of the western boundary and northern half of the study area is the Cloud Chief Formation. The Cloud Chief maximum thickness is more than 100 feet in the study area but it generally is highly eroded and where, gypsum is near land surface, can develop karst topography. The Rush Springs aquifer is equivalent to the Rush Springs Formation. For this report and model the Rush Springs aquifer will include alluvium within the study area and parts of the Marlow Formation, particularly on the eastern part of the study area.

Well yields in the Rush Springs aquifer vary, but the most productive irrigation wells are reported to yield more than 1,000 gallons per minute. Specific capacities calculated for these wells ranged from 0.7 to 15 gallons per minute per foot of drawdown with a mean of 2.3. Reported specific yields range from 13 to 34 percent and transmissivities calculated from four aquifer tests ranged from 670 to 1,870 feet squared per day.

The Rush Springs aquifer is recharged by the infiltration of precipitation. Estimates of recharge range from less than 0.5 inch per year to over 2 inches per year. Ground water from the Rush Springs aquifer discharges to streams and rivers, primarily the Washita River. Springs and seeps also are points of discharge and generally occur where the Rush Springs aquifer is deeply incised and the water table intersects steep valley walls. Regionally the direction of ground-water flow is to the southeast.

A simplified, steady-state model of the Rush Springs aquifer was prepared to simulate average conditions in the aquifer. The area was divided into a 3 kilometer square model grid with a total of 82 rows and 34 columns and 674 active

cells. Two layers were used to represent the hydrologic setting of the Rush Springs aquifer. The estimated recharge is approximately 7.0 percent of the average annual rainfall and a total of 310,000 acre-feet per year or 0.369×10^8 cubic feet per day for the entire model area. The hydraulic conductivity and the net recharge rate were adjusted until a reasonable agreement between measured and simulated heads and between measured and simulated total discharge to interior drains was achieved.

The arithmetic mean error for the 170 of the 674 active nodes was -0.11 feet, the absolute value mean error was 7.55 feet, and the standard deviation of the error was 10.21 feet. A net simulated recharge of 231 cubic feet per second is balanced by discharge to drains and seeps of 190.6 cubic feet per second or about 82 percent of the total recharge. Discharge to the main stem of the Washita River is about 41 cubic feet per second or about 18 percent of the recharge.

SELECTED REFERENCES

- Bingham, R. H. and Moore, R. L., 1983, Reconnaissance of the water resources of the Oklahoma City Quadrangle, Central Oklahoma: Oklahoma Geological Survey Hydrologic Atlas 4.
- Blazs, R.L., Walters, D.M., Coffey, T.E., White, D.K., Boyle, D.L., and Kerestes, J.K., 1992, Water resources data Oklahoma water year 1992: U. S. Geological Survey Water-Data Report OK-92-1, p. 524.
- Carr, J. E. and Bergman, D. L., 1976, Reconnaissance of the water resources of the Clinton Quadrangle, West-Central Oklahoma: Oklahoma Geological Survey Hydrologic Atlas 5.
- Davis, Leon V., 1955, Geology and groundwater resources of Grady and northern Stephens counties, Oklahoma: Oklahoma Geological Survey Bulletin 73, 140 p.
- Freeze, Allan R., and Cherry, John A., 1979, Groundwater: Englewood Cliffs, N.J., Prentice Hall, p. 29.
- Hart, Jr., Donald L., 1983, Reconnaissance of the water resources of the Ardmore and Sherman Quadrangles, Southern Oklahoma: Oklahoma Geological Survey Hydrologic Atlas 3.
- Havens, John S., 1977, Reconnaissance of the water resources of the Lawton Quadrangle Southwestern Oklahoma: Oklahoma Geological Survey Hydrologic Atlas 6.
- Johnson, K. S., 1989, Geologic evolution of the Anadarko Basin; in Anadarko basin Symposium, 1988; Oklahoma Geological Survey Circ. 90, p. 3-12.
- McDonald, M.G., and Harbaugh, A.W., 1988, A modular three-dimensional finite-difference ground-water flow model: U. S. Geological Survey Techniques of Water-Resources Investigations, Book 6, Chapter A1, 586 p.
- Morton, Robert B., 1980, Reconnaissance of the water resources of the Woodward Quadrangle, Northwestern

- Oklahoma: Oklahoma Geological Survey Hydrologic Atlas 8.
- O'Brien, B. E., 1963, Geology of east-central Caddo County, Oklahoma: Norman, University of Oklahoma, master's thesis, 72 p.
- Orzol, Leonard L. and McGrath, Timothy S., 1992, Modifications of the U.S. Geological Survey modular, finite difference, ground-water flow model to read and write geographic information systems files: U. S. Geological Survey Open-File Report 92-50, p. 202.
- Pettyjohn, Wayne A., White, Hal, and Dunn, Shari, 1983, Water atlas of Oklahoma: University Center for Water Research, Oklahoma State University, Stillwater, p. 71.
- Scott, J.C., 1990, A statistical processor for analyzing simulations made using the modular finite-difference ground-water flow model: U.S. Geological Survey Water-Resources Investigations Report 89-4159, 218 p.
- Tanaka, Harry H., and Davis, Leon V., 1963, Ground-water resources of the Rush Springs Sandstone in the Caddo County area, Oklahoma: Oklahoma Geological Survey Circular 61, 63 p.

Appendix A: Modular Model Results for a Steady State Simulation of Ground-Water Flow in the Rush Springs Aquifer, Western Oklahoma

U.S. GEOLOGICAL SURVEY MODULAR FINITE-DIFFERENCE GROUND-WATER MODEL

Steady state model of Rush Springs Aquifer
 2 LAYERS 82 ROWS 34 COLUMNS
 1 STRESS PERIOD(S) IN SIMULATION
 MODEL TIME UNIT IS DAYS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

I/O UNITS:

ELEMENT OF IUNIT: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
 I/O UNIT: 8 0 9 11 0 0 0 18 16 0 0 19 0 0 0 0 0 0 0 0 0 0 0 0

BAS1 -- BASIC MODEL PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 5

START HEAD WILL BE SAVED

58672 ELEMENTS IN X ARRAY ARE USED BY BAS

58672 ELEMENTS OF X ARRAY USED OUT OF 350000

BCF2 -- BLOCK-CENTERED FLOW PACKAGE, VERSION 2, 7/1/91 INPUT READ FROM UNIT 8

STEADY-STATE SIMULATION

CELL-BY-CELL FLOWS WILL BE RECORDED ON UNIT 77

HEAD AT CELLS THAT CONVERT TO DRY= 0.00000E+00

WETTING CAPABILITY IS NOT ACTIVE

LAYER AQUIFER TYPE

1 1

2 3

13942 ELEMENTS IN X ARRAY ARE USED BY BCF

72614 ELEMENTS OF X ARRAY USED OUT OF 350000

DRN1 -- DRAIN PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 9

MAXIMUM OF 238 DRAINS

CELL-BY-CELL FLOWS WILL BE RECORDED ON UNIT 77

1190 ELEMENTS IN X ARRAY ARE USED FOR DRAINS

73804 ELEMENTS OF X ARRAY USED OUT OF 350000

RCH1 -- RECHARGE PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 18

OPTION 3 -- RECHARGE TO HIGHEST ACTIVE NODE IN EACH VERTICAL COLUMN

CELL-BY-CELL FLOW TERMS WILL BE RECORDED ON UNIT 78

2788 ELEMENTS OF X ARRAY USED FOR RECHARGE

76592 ELEMENTS OF X ARRAY USED OUT OF 350000

RIV1 -- RIVER PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 11

MAXIMUM OF 41 RIVER NODES

CELL-BY-CELL FLOWS WILL BE RECORDED ON UNIT 77

246 ELEMENTS IN X ARRAY ARE USED FOR RIVERS

76838 ELEMENTS OF X ARRAY USED OUT OF 350000

SIP1 -- STRONGLY IMPLICIT PROCEDURE SOLUTION PACKAGE, VERSION 1, 9/1/87 INPUT READ FROM UNIT 16

MAXIMUM OF 500 ITERATIONS ALLOWED FOR CLOSURE

5 ITERATION PARAMETERS

24309 ELEMENTS IN X ARRAY ARE USED BY SIP

101147 ELEMENTS OF X ARRAY USED OUT OF 350000

AQUIFER HEAD WILL BE SET TO 0.00000E+00 AT ALL NO-FLOW NODES (IBOUND=0).

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

INITIAL HEAD FOR LAYER 2 WILL BE READ ON UNIT 23 USING FORMAT: (8F10.2)

[illegible]

[illegible]

	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
17	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1815.	1813.	1820.
	1805.	1806.	1810.	1836.	1823.	1800.	1753.	1652.	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
18	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1779.	1786.	1804.	1802.
	1839.	1853.	1856.	1840.	1753.	1736.	1737.	1694.	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
19	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1702.	1747.	1724.	1750.	1772.
	1802.	1859.	1866.	1812.	1765.	1703.	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
20	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1685.	1679.	1692.	1748.	1799.
	1845.	1855.	1851.	1826.	1789.	1741.	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
21	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1639.	1637.	1688.	1747.	1780.	1833.
	1853.	1834.	1819.	1817.	1794.	1704.	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
22	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1606.	1659.	1726.	1760.	1784.	1822.
	1817.	1780.	1791.	1814.	1764.	1686.	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
23	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1605.	1691.	1711.	1682.	1735.	1796.
	1789.	1753.	1773.	1806.	1736.	1645.	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
24	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	1575.	1650.	1713.	1676.	1646.	1706.	1754.
	1742.	1709.	1797.	1797.	1719.	1607.	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
25	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	1589.	1646.	1656.	1602.	1643.	1698.	1723.
	1696.	1747.	1757.	1744.	1652.	1610.	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
26	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	1543.	1554.	1600.	1571.	1562.	1629.	1691.	1705.
	1651.	1710.	1711.	1707.	1698.	1602.	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
27	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	1488.	1502.	1507.	1522.	1589.	1635.	1689.	1695.
	1649.	1642.	1657.	1703.	1671.	1590.	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
28	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	1486.	1501.	1536.	1617.	1666.	1683.	1667.
	1611.	1625.	1644.	1674.	1652.	1587.	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
29	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	1495.	1536.	1588.	1632.	1655.	1669.	1654.
	1614.	1594.	1612.	1654.	1637.	1594.	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						

30	0.0000E+00 0.0000E+00 1591. 0.0000E+00	0.0000E+00 0.0000E+00 1571. 0.0000E+00	0.0000E+00 0.0000E+00 1604. 0.0000E+00	0.0000E+00 1494. 1631. 0.0000E+00	0.0000E+00 1555. 1602. 0.0000E+00	0.0000E+00 1601. 1564. 0.0000E+00	0.0000E+00 1599. 0.0000E+00	0.0000E+00 1650. 0.0000E+00	0.0000E+00 1653. 0.0000E+00	0.0000E+00 1630. 0.0000E+00
31	0.0000E+00 0.0000E+00 1565. 0.0000E+00	0.0000E+00 0.0000E+00 1564. 0.0000E+00	0.0000E+00 0.0000E+00 1615. 0.0000E+00	0.0000E+00 1468. 1626. 0.0000E+00	0.0000E+00 1534. 1594. 0.0000E+00	0.0000E+00 1545. 1508. 0.0000E+00	0.0000E+00 1601. 0.0000E+00	0.0000E+00 1655. 0.0000E+00	0.0000E+00 1648. 0.0000E+00	0.0000E+00 1616. 0.0000E+00
32	0.0000E+00 0.0000E+00 1580. 0.0000E+00	0.0000E+00 0.0000E+00 1557. 0.0000E+00	0.0000E+00 1429. 1612. 0.0000E+00	0.0000E+00 1472. 1607. 0.0000E+00	0.0000E+00 1519. 1553. 0.0000E+00	0.0000E+00 1568. 0.0000E+00	0.0000E+00 1647. 0.0000E+00	0.0000E+00 1661. 0.0000E+00	0.0000E+00 1651. 0.0000E+00	0.0000E+00 1619. 0.0000E+00
33	0.0000E+00 0.0000E+00 1575. 0.0000E+00	0.0000E+00 0.0000E+00 1557. 0.0000E+00	0.0000E+00 1428. 1604. 0.0000E+00	0.0000E+00 1487. 1604. 0.0000E+00	0.0000E+00 1551. 1543. 0.0000E+00	0.0000E+00 1585. 0.0000E+00	0.0000E+00 1654. 0.0000E+00	0.0000E+00 1651. 0.0000E+00	0.0000E+00 1628. 0.0000E+00	0.0000E+00 1630. 0.0000E+00
34	0.0000E+00 0.0000E+00 1565. 0.0000E+00	0.0000E+00 1432. 1537. 0.0000E+00	0.0000E+00 1470. 1601. 0.0000E+00	0.0000E+00 1530. 1583. 0.0000E+00	0.0000E+00 1567. 1473. 0.0000E+00	0.0000E+00 1618. 0.0000E+00	0.0000E+00 1655. 0.0000E+00	0.0000E+00 1632. 0.0000E+00	0.0000E+00 1592. 0.0000E+00	0.0000E+00 1565. 0.0000E+00
35	0.0000E+00 1410. 1526. 0.0000E+00	0.0000E+00 1421. 1492. 0.0000E+00	0.0000E+00 1492. 1549. 0.0000E+00	0.0000E+00 1539. 1545. 0.0000E+00	0.0000E+00 1570. 1448. 0.0000E+00	0.0000E+00 1613. 0.0000E+00	0.0000E+00 1650. 0.0000E+00	0.0000E+00 1642. 0.0000E+00	0.0000E+00 1599. 0.0000E+00	0.0000E+00 1575. 0.0000E+00
36	0.0000E+00 1432. 1593. 0.0000E+00	0.0000E+00 1477. 1490. 0.0000E+00	0.0000E+00 1506. 1498. 0.0000E+00	0.0000E+00 1546. 1533. 0.0000E+00	0.0000E+00 1561. 1421. 0.0000E+00	0.0000E+00 1574. 0.0000E+00	0.0000E+00 1573. 0.0000E+00	0.0000E+00 1622. 0.0000E+00	0.0000E+00 1612. 0.0000E+00	1393. 1608. 0.0000E+00
37	0.0000E+00 1424. 1606. 0.0000E+00	0.0000E+00 1490. 1521. 0.0000E+00	0.0000E+00 1513. 1474. 0.0000E+00	0.0000E+00 1530. 1437. 0.0000E+00	0.0000E+00 1526. 0.0000E+00	0.0000E+00 1540. 0.0000E+00	0.0000E+00 1605. 0.0000E+00	0.0000E+00 1591. 0.0000E+00	0.0000E+00 1605. 0.0000E+00	1380. 1620. 0.0000E+00
38	0.0000E+00 1422. 1605. 0.0000E+00	0.0000E+00 1478. 1579. 0.0000E+00	0.0000E+00 1508. 1527. 0.0000E+00	0.0000E+00 1518. 1452. 0.0000E+00	0.0000E+00 1503. 1434. 0.0000E+00	0.0000E+00 1493. 0.0000E+00	0.0000E+00 1550. 0.0000E+00	0.0000E+00 1568. 0.0000E+00	0.0000E+00 1561. 0.0000E+00	1387. 1620. 0.0000E+00
39	0.0000E+00 1418. 1622. 0.0000E+00	0.0000E+00 1469. 1613. 0.0000E+00	0.0000E+00 1507. 1556. 0.0000E+00	0.0000E+00 1510. 1544. 0.0000E+00	0.0000E+00 1475. 1472. 0.0000E+00	0.0000E+00 1500. 1381. 0.0000E+00	0.0000E+00 1547. 0.0000E+00	0.0000E+00 1481. 0.0000E+00	0.0000E+00 1573. 0.0000E+00	1395. 1616. 0.0000E+00
40	0.0000E+00 1425. 1556. 0.0000E+00	0.0000E+00 1467. 1619. 0.0000E+00	0.0000E+00 1494. 1607. 0.0000E+00	0.0000E+00 1471. 1567. 0.0000E+00	0.0000E+00 1427. 1480. 0.0000E+00	0.0000E+00 1495. 1438. 0.0000E+00	0.0000E+00 1460. 0.0000E+00	0.0000E+00 1501. 0.0000E+00	1383. 1562. 0.0000E+00	1401. 1556. 0.0000E+00
41	0.0000E+00 1408. 1576. 0.0000E+00	0.0000E+00 1460. 1589. 0.0000E+00	0.0000E+00 1476. 1576. 0.0000E+00	0.0000E+00 1467. 1570. 0.0000E+00	0.0000E+00 1396. 1545. 0.0000E+00	0.0000E+00 1409. 1476. 0.0000E+00	0.0000E+00 1505. 0.0000E+00	0.0000E+00 1540. 0.0000E+00	0.0000E+00 1502. 0.0000E+00	1346. 1488. 0.0000E+00
42	0.0000E+00 1414. 1614. 0.0000E+00	0.0000E+00 1452. 1540. 0.0000E+00	0.0000E+00 1456. 1479. 0.0000E+00	0.0000E+00 1455. 1560. 0.0000E+00	0.0000E+00 1407. 1560. 0.0000E+00	0.0000E+00 1408. 1525. 0.0000E+00	0.0000E+00 1459. 1455. 0.0000E+00	1330. 1445. 0.0000E+00	1343. 1445. 0.0000E+00	1365. 1530. 0.0000E+00

43	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1326.	1371.	1407.
	1416.	1436.	1440.	1404.	1360.	1418.	1401.	1433.	1489.	1580.
	1552.	1510.	1432.	1505.	1500.	1520.	1452.	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
44	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1305.	1348.	1350.
	1410.	1396.	1410.	1392.	1342.	1352.	1403.	1490.	1526.	1540.
	1530.	1475.	1400.	1440.	1505.	1540.	1475.	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
45	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1291.	1320.	
	1357.	1379.	1418.	1413.	1344.	1359.	1425.	1450.	1472.	1495.
	1461.	1407.	1408.	1450.	1531.	1545.	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
46	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1296.	1292.	
	1299.	1304.	1399.	1417.	1339.	1356.	1389.	1400.	1480.	1480.
	1382.	0.0000E+00	1407.	1456.	1515.	1528.	1470.	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
47	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1303.
	1301.	1256.	1362.	1410.	1343.	1345.	1411.	1457.	1466.	1419.
	0.0000E+00	0.0000E+00	1411.	1460.	1550.	1526.	1500.	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
48	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1322.
	1305.	1253.	1351.	1397.	1310.	1358.	1412.	1464.	1428.	1407.
	0.0000E+00	0.0000E+00	0.0000E+00	1454.	1541.	1530.	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
49	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1300.	1294.	1253.	1330.	1295.	1361.	1414.	1433.	1349.	1365.
	0.0000E+00	0.0000E+00	0.0000E+00	1432.	1493.	1503.	1442.	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
50	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	1313.	1260.	1295.	1282.	1356.	1414.	1412.	1350.	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	1381.	1447.	1474.	1437.	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
51	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	1305.	1281.	1247.	1268.	1296.	1375.	1399.	1311.	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1419.	1458.	1402.	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0								

	0.0000E+00	1329.	1357.	1342.	1290.	1235.	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
57	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	1303.	1353.	1300.	1255.	1288.	1213.	1198.	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
58	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	1347.	1370.	1358.	1331.	1309.	1248.	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
59	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	1338.	1347.	1371.	1347.	1270.	1274.	1259.	1305.	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
60	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	1320.	1305.	1375.	1376.	1345.	1310.	1293.	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
61	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1302.	1308.	1276.	1351.	1391.	1388.	1338.	1281.	1253.	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
62	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1350.	1313.	1247.	1327.	1363.	1360.	1252.	1212.	1244.	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
63	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	1287.	1303.	1243.	1247.	1314.	1297.	1249.	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
64	0.0000E+00	0.0000E+00	0.0000E+00							

[illegible]

0.0000E+00 0.0000E+00 0.0000E+00 0.0000E+00

HEAD PRINT FORMAT IS FORMAT NUMBER -7 DRAWDOWN PRINT FORMAT IS FORMAT NUMBER -7

HEADS WILL BE SAVED ON UNIT 79 DRAWDOWNS WILL BE SAVED ON UNIT 80

OUTPUT CONTROL IS SPECIFIED EVERY TIME STEP

COLUMN TO ROW ANISOTROPY = 1.000000

DELR = 9840.000

DELC = 9840.000

HYD. COND. ALONG ROWS = 0.5000000 FOR LAYER 1

BOTTOM FOR LAYER 1 WILL BE READ ON UNIT 33 USING FORMAT: (8F10.2)

VERT HYD COND /THICKNESS = 0.1000000E-04 FOR LAYER 1

HYD. COND. ALONG ROWS FOR LAYER 2 WILL BE READ ON UNIT 32 USING FORMAT: (8F10.2)

BOTTOM FOR LAYER 2 WILL BE READ ON UNIT 38 USING FORMAT: (8F10.2)

TOP FOR LAYER 2 WILL BE READ ON UNIT 36 USING FORMAT: (8F10.2)

SOLUTION BY THE STRONGLY IMPLICIT PROCEDURE

MAXIMUM ITERATIONS ALLOWED FOR CLOSURE = 500
ACCELERATION PARAMETER = 1.0000
HEAD CHANGE CRITERION FOR CLOSURE = 0.10000E-02
SIP HEAD CHANGE PRINTOUT INTERVAL = 1

5 ITERATION PARAMETERS CALCULATED FROM SPECIFIED WSEED = 0.00100000 :

0.0000000E+00 0.8221720E+00 0.9683772E+00 0.9943766E+00 0.9990000E+00

STRESS PERIOD NO. 1, LENGTH = 1.000000

NUMBER OF TIME STEPS = 1

MULTIPLIER FOR DELT = 1.000

INITIAL TIME STEP SIZE = 1.000000

238 DRAINS

LAYER	ROW	COL	ELEVATION	CONDUCTANCE	DRAIN NO.
2	14	26	1682.	0.5510E+05	1
2	14	27	1662.	0.1291E+05	2
2	14	28	1650.	107.6	3
2	15	25	1695.	6457.	4
2	15	28	1647.	0.1291E+05	5
2	16	20	1745.	0.1722E+05	6
2	16	21	1735.	1722.	7
2	16	22	1725.	0.2690E+05	8
2	16	23	1712.	6457.	9
2	16	24	1705.	645.7	10
2	16	28	1645.	1722.	11
2	17	18	1817.	0.7000	12
2	17	23	1770.	1099.	13
2	17	28	1645.	0.1291E+05	14
2	18	17	1740.	1125.	15
2	18	25	1728.	5166.	16
2	18	26	1720.	3444.	17
2	18	27	1725.	1722.	18
2	18	28	1660.	1076.	19
2	19	16	1700.	3400.	20
2	19	20	1750.	6800.	21
2	19	25	1750.	6888.	22
2	19	26	1700.	0.1722E+05	23
2	20	16	1665.	1913.	24
2	20	17	1665.	8500.	25
2	20	18	1685.	0.3400E+05	26
2	20	19	1715.	1700.	27
2	20	26	1702.	860.9	28
2	21	15	1615.	1700.	29
2	21	16	1625.	8500.	30
2	21	26	1710.	0.2583E+05	31
2	22	15	1600.	5313.	32
2	22	26	1645.	2152.	33
2	23	15	1575.	3400.	34
2	23	26	1615.	3444.	35
2	24	14	1558.	4250.	36
2	24	18	1633.	0.2258E+05	37
2	24	26	1580.	4305.	38
2	25	14	1550.	850.0	39
2	25	17	1600.	7056.	40
2	26	13	1510.	318.8	41
2	26	17	1560.	0.2205E+05	42
2	26	26	1567.	2583.	43
2	27	16	1538.	0.9032E+05	44
2	27	26	1570.	6888.	45
2	28	15	1500.	0.2258E+05	46
2	28	26	1570.	6457.	47
2	29	26	1590.	8609.	48
2	30	26	1550.	8609.	49
2	31	16	1561.	0.3125E+05	50
2	31	25	1560.	1291.	51

2	31	26	1496.	2690.	52
2	32	14	1460.	0.2109E+05	53
2	32	15	1480.	2.740	54
2	32	25	1470.	766.1	55
2	33	25	1465.	390.6	56
2	34	25	1465.	0.1291E+05	57
2	35	25	1438.	8609.	58
2	36	17	1550.	1953.	59
2	36	25	1426.	0.1051E+05	60
2	37	16	1500.	385.5	61
2	37	24	1445.	0.8438E+05	62
2	38	16	1470.	0.1735E+05	63
2	38	24	1440.	0.1290E+05	64
2	38	25	1430.	0.1500E+05	65
2	39	18	1476.	0.3084E+05	66
2	39	26	1393.	0.3444E+05	67
1	40	12	1465.	0.3000	68
2	40	17	1435.	3084.	69
2	40	18	1482.	192.8	70
2	40	21	1550.	4819.	71
2	40	26	1450.	0.3405E+05	72
2	41	11	1375.	5.850	73
2	41	12	1430.	0.3000	74
2	41	16	1400.	0.3084E+05	75
2	41	20	1462.	8674.	76
2	41	26	1475.	0.1722E+05	77
2	42	11	1403.	0.6100	78
1	42	12	1489.	0.9600	79
2	42	16	1370.	771.0	80
2	42	18	1443.	771.0	81
2	42	19	1430.	0.3084E+05	82
2	42	27	1445.	0.1291E+05	83
2	43	14	1410.	96.37	84
2	43	15	1370.	0.3084E+05	85
2	43	17	1380.	7710.	86
2	43	18	1395.	1735.	87
2	43	23	1403.	2950.	88
2	43	27	1450.	0.1291E+05	89
2	44	12	1365.	759.4	90
2	44	14	1380.	12.04	91
2	44	15	1341.	0.3084E+05	92
2	44	16	1331.	0.1157E+05	93
2	44	23	1365.	2517.	94
2	44	24	1415.	2655.	95
2	44	27	1430.	968.5	96
2	45	11	1315.	225.0	97
2	45	16	1341.	7710.	98
2	45	22	1334.	1563.	99
2	45	23	1403.	0.1007E+05	100
2	45	24	1405.	1062.	101
2	45	25	1410.	140.6	102
2	46	11	1295.	6328.	103
2	46	16	1340.	0.1542E+05	104
2	46	17	1365.	3084.	105
2	46	21	1374.	0.2014E+05	106
2	46	23	1403.	3146.	107
2	46	24	1460.	0.1007E+05	108
2	46	25	1500.	1500.	109
2	46	27	1499.	0.2500E+05	110
2	47	13	1360.	0.6100	111
2	47	15	1310.	1542.	112
2	47	23	1340.	700.7	113
2	47	26	1495.	1406.	114
2	47	27	1485.	1614.	115
2	48	15	1290.	6168.	116
2	48	20	1400.	0.1007E+05	117

2	48	24	1460.	0.1229E+05	118
2	48	26	1475.	527.3	119
2	49	15	1270.	4626.	120
2	49	19	1342.	7866.	121
2	49	20	1359.	2458.	122
2	49	24	1400.	1259.	123
2	49	27	1420.	1875.	124
2	50	15	1245.	2168.	125
2	50	24	1352.	2517.	126
2	50	25	1435.	2517.	127
2	50	27	1390.	703.1	128
2	51	19	1285.	2212.	129
2	51	25	1405.	5034.	130
2	51	27	1415.	0.3955E+05	131
2	52	19	1310.	0.1007E+05	132
2	52	26	1440.	1875.	133
2	52	27	1381.	4688.	134
2	53	18	1305.	1.030	135
2	54	17	1200.	2930.	136
2	54	18	1305.	1259.	137
2	55	13	1266.	0.1500E+05	138
2	55	14	1242.	1875.	139
2	56	12	1315.	5000.	140
2	57	12	1310.	0.4395E+05	141
2	57	18	1198.	0.1000E+05	142
2	58	17	1210.	2250.	143
2	59	16	1256.	7500.	144
2	60	18	1272.	3750.	145
2	61	11	1290.	2500.	146
2	61	13	1250.	5863.	147
2	61	19	1240.	3000.	148
2	62	13	1246.	0.5863E+05	149
2	62	17	1250.	5859.	150
2	62	18	1200.	7500.	151
2	62	19	1228.	1500.	152
2	63	13	1230.	0.2931E+05	153
2	63	17	1236.	3750.	154
2	64	11	1249.	0.2000E+05	155
2	64	14	1210.	0.1466E+05	156
2	64	17	1230.	0.1500E+05	157
2	65	12	1220.	187.5	158
2	65	14	1180.	0.1173E+05	159
2	65	15	1175.	5863.	160
2	65	16	1160.	2931.	161
2	66	12	1240.	953.7	162
2	66	16	1170.	2500.	163
2	66	17	1202.	1875.	164
2	67	16	1220.	1500.	165
2	67	18	1233.	5000.	166
2	69	13	1233.	1875.	167
2	69	16	1295.	0.3189E+05	168
2	70	12	1213.	3750.	169
2	70	18	1216.	4000.	170
2	71	13	1205.	7500.	171
2	71	16	1215.	6719.	172
2	71	17	1220.	4031.	173
2	72	12	1235.	0.1500E+05	174
2	73	13	1250.	1875.	175
2	73	16	1220.	0.1500E+05	176
2	74	14	1223.	3662.	177
2	74	16	1236.	0.3708E+05	178
2	75	15	1190.	1875.	179
2	21	23	1794.	1.640	180
2	22	23	1761.	1948.	181
2	23	22	1735.	6299.	182
2	24	22	1716.	0.1055E+05	183

2	25	21	1662.	2126.	184
2	26	21	1630.	0.1008E+05	185
2	27	21	1625.	1594.	186
2	28	21	1600.	0.1075E+05	187
2	29	22	1580.	0.1075E+05	188
2	30	22	1565.	0.1290E+05	189
2	31	22	1550.	0.1075E+05	190
2	32	22	1541.	0.1075E+05	191
2	33	22	1530.	3189.	192
2	35	22	1469.	4031.	193
2	36	22	1467.	2016.	194
2	36	23	1465.	2126.	195
2	37	23	1458.	2834.	196
2	35	21	1510.	0.1075E+05	197
2	37	22	1495.	4031.	198
2	31	21	1560.	0.1344E+05	199
2	29	23	1636.	0.1266E+06	200
2	28	23	1640.	0.1134E+05	201
2	27	23	1650.	0.1075E+05	202
2	26	23	1705.	1.310	203
2	34	22	1505.	3189.	204
2	34	20	1560.	0.1075E+05	205
2	34	19	1565.	3543.	206
2	59	17	1231.	1000.	207
2	59	18	1239.	6000.	208
2	57	15	1235.	8000.	209
2	56	16	1205.	2400.	210
2	46	9	1298.	4000.	211
2	48	10	1312.	4000.	212
2	48	11	1295.	8000.	213
2	50	12	1280.	250.0	214
2	51	12	1279.	781.3	215
2	52	13	1270.	2250.	216
2	67	15	1246.	4500.	217
2	66	15	1180.	0.1200E+05	218
2	73	14	1245.	195.3	219
2	74	15	1245.	0.6000E+05	220
2	69	18	1233.	1250.	221
2	67	12	1195.	4000.	222
2	68	18	1245.	500.0	223
2	70	13	1200.	0.1172E+05	224
2	70	16	1250.	0.2150E+05	225
2	71	14	1250.	9375.	226
2	45	26	1520.	375.0	227
2	40	25	1450.	2500.	228
2	42	23	1450.	4688.	229
2	43	25	1512.	2500.	230
2	25	25	1626.	3000.	231
2	19	18	1712.	5000.	232
2	30	25	1595.	3000.	233
2	39	15	1439.	2813.	234
2	40	14	1470.	5000.	235
2	41	15	1401.	0.1221E+05	236
2	40	15	1425.	6500.	237
2	46	18	1390.	5000.	238

 RECHARGE WILL BE READ ON UNIT 75 USING FORMAT: (8E10.3)

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34						

[illegible]

14	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.8633E-04	2.8633E-04	2.8644E-04	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00					
15	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.8809E-04	2.8809E-04	2.8820E-04	2.8820E-04	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00					
16	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.9238E-04	2.9161E-04
	2.9095E-04	2.9051E-04	2.9018E-04	2.8996E-04	2.8996E-04	2.8996E-04	2.8996E-04	2.9007E-04	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00					
17	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.9579E-04	2.9491E-04
	1.6500E-04	1.6478E-04	2.9238E-04	2.9216E-04	2.9194E-04	2.9172E-04	2.9172E-04	2.9183E-04	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00					
18	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.9909E-04	2.9821E-04	2.9744E-04
	2.9590E-04	2.9524E-04	4.4220E-04	2.9425E-04	2.9370E-04	2.9348E-04	2.9348E-04	2.9348E-04	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00					
19	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	3.0206E-04	3.0151E-04	3.0074E-04	2.9997E-04
	2.9843E-04	2.9777E-04	2.9722E-04	2.9634E-04	2.9546E-04	2.9524E-04	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00					
20	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	3.0437E-04	3.0393E-04	3.0327E-04	3.0250E-04
	3.0107E-04	4.5056E-04	4.4902E-04	2.9788E-04	2.9700E-04	2.9700E-04	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00					
21	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	3.0668E-04	3.0657E-04	3.0624E-04	3.0569E-04	3.0503E-04
	3.0371E-04	3.0261E-04	3.0085E-04	2.9920E-04	2.9865E-04	2.9876E-04	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00					

27	0.0000E+00 0.0000E+00 3.1009E-04 0.0000E+00	0.0000E+00 0.0000E+00 3.0855E-04 0.0000E+00	0.0000E+00 3.1383E-04 3.0833E-04 0.0000E+00	0.0000E+00 3.1361E-04 3.0855E-04 0.0000E+00	0.0000E+00 2.3518E-04 3.0855E-04 0.0000E+00	0.0000E+00 2.3562E-04 3.0844E-04 0.0000E+00	0.0000E+00 3.1383E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1416E-04 3.1350E-04 0.0000E+00	0.0000E+00 3.1394E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1251E-04 0.0000E+00 0.0000E+00
28	0.0000E+00 0.0000E+00 3.1097E-04 0.0000E+00	0.0000E+00 0.0000E+00 2.3232E-04 0.0000E+00	0.0000E+00 0.0000E+00 3.0932E-04 0.0000E+00	0.0000E+00 3.1405E-04 3.0987E-04 0.0000E+00	0.0000E+00 3.1361E-04 3.0987E-04 0.0000E+00	0.0000E+00 3.1339E-04 3.0987E-04 0.0000E+00	0.0000E+00 4.9005E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1350E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1372E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1207E-04 0.0000E+00 0.0000E+00
29	0.0000E+00 0.0000E+00 3.1218E-04 0.0000E+00	0.0000E+00 0.0000E+00 3.1108E-04 0.0000E+00	0.0000E+00 0.0000E+00 3.1053E-04 0.0000E+00	0.0000E+00 4.9082E-04 3.1108E-04 0.0000E+00	0.0000E+00 3.1416E-04 3.1119E-04 0.0000E+00	0.0000E+00 3.1372E-04 3.1119E-04 0.0000E+00	0.0000E+00 3.1350E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1350E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1350E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1317E-04 0.0000E+00 0.0000E+00
30	0.0000E+00 0.0000E+00 3.1295E-04 0.0000E+00	0.0000E+00 0.0000E+00 3.1729E-04 0.0000E+00	0.0000E+00 0.0000E+00 3.1196E-04 0.0000E+00	0.0000E+00 4.9082E-04 3.1229E-04 0.0000E+00	0.0000E+00 3.1416E-04 2.3430E-04 0.0000E+00	0.0000E+00 3.1416E-04 3.1240E-04 0.0000E+00	0.0000E+00 2.3529E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1350E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1350E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1339E-04 0.0000E+00 0.0000E+00
31	0.0000E+00 0.0000E+00 3.1317E-04 0.0000E+00	0.0000E+00 0.0000E+00 3.1306E-04 0.0000E+00	0.0000E+00 0.0000E+00 3.1306E-04 0.0000E+00	0.0000E+00 3.1416E-04 3.1339E-04 0.0000E+00	0.0000E+00 3.1416E-04 3.1350E-04 0.0000E+00	0.0000E+00 3.1416E-04 3.1361E-04 0.0000E+00	0.0000E+00 2.3551E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1350E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1350E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1328E-04 0.0000E+00 0.0000E+00
32	0.0000E+00 0.0000E+00 3.1339E-04 0.0000E+00	0.0000E+00 0.0000E+00 3.1350E-04 0.0000E+00	0.0000E+00 3.1416E-04 3.1405E-04 0.0000E+00	0.0000E+00 3.1416E-04 3.1438E-04 0.0000E+00	0.0000E+00 3.1416E-04 3.1460E-04 0.0000E+00	0.0000E+00 3.1416E-04 0.0000E+00 0.0000E+00	0.0000E+00 4.7069E-04 0.0000E+00 0.0000E+00	0.0000E+00 4.7025E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1339E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1328E-04 0.0000E+00 0.0000E+00
33	0.0000E+00 0.0000E+00 2.3529E-04 0.0000E+00	0.0000E+00 0.0000E+00 3.1405E-04 0.0000E+00	0.0000E+00 3.1097E-04 3.1460E-04 0.0000E+00	0.0000E+00 3.1185E-04 3.1537E-04 0.0000E+00	0.0000E+00 3.1284E-04 2.3672E-04 0.0000E+00	0.0000E+00 3.1262E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1295E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1350E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1328E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1339E-04 0.0000E+00 0.0000E+00
34	0.0000E+00 0.0000E+00 2.3562E-04 0.0000E+00	0.0000E+00 2.2913E-04 3.1482E-04 0.0000E+00	0.0000E+00 3.0701E-04 3.1537E-04 0.0000E+00	0.0000E+00 3.0811E-04 3.1636E-04 0.0000E+00	0.0000E+00 3.0910E-04 3.1669E-04 0.0000E+00	0.0000E+00 3.1009E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1141E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1295E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1339E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1372E-04 0.0000E+00 0.0000E+00
35	0.0000E+00 2.2462E-04 3.1482E-04 0.0000E+00	0.0000E+00 2.2594E-04 3.1559E-04 0.0000E+00	0.0000E+00 3.0272E-04 3.1647E-04 0.0000E+00	0.0000E+00 3.0426E-04 2.3782E-04 0.0000E+00	0.0000E+00 3.0602E-04 3.1768E-04 0.0000E+00	0.0000E+00 3.0811E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.0998E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1196E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1350E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1405E-04 0.0000E+00 0.0000E+00
36	0.0000E+00 2.9601E-04 3.1526E-04 0.0000E+00	0.0000E+00 2.9733E-04 3.1647E-04 0.0000E+00	0.0000E+00 2.9909E-04 3.1713E-04 0.0000E+00	0.0000E+00 3.0129E-04 3.1801E-04 0.0000E+00	0.0000E+00 3.0404E-04 3.1834E-04 0.0000E+00	0.0000E+00 3.0723E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.0976E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1218E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1372E-04 0.0000E+00 0.0000E+00	2.9502E-04 3.1438E-04 0.0000E+00 0.0000E+00
37	0.0000E+00 2.9293E-04 3.1559E-04 0.0000E+00	0.0000E+00 2.9436E-04 3.1680E-04 0.0000E+00	0.0000E+00 2.9656E-04 3.1790E-04 0.0000E+00	0.0000E+00 2.9953E-04 3.1867E-04 0.0000E+00	0.0000E+00 3.0305E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.0701E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.0998E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1196E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1372E-04 0.0000E+00 0.0000E+00	2.9183E-04 3.1449E-04 0.0000E+00 0.0000E+00
38	0.0000E+00 2.9073E-04 3.1537E-04 0.0000E+00	0.0000E+00 2.9238E-04 3.1658E-04 0.0000E+00	0.0000E+00 2.9502E-04 2.3848E-04 0.0000E+00	0.0000E+00 2.9832E-04 1.5950E-04 0.0000E+00	0.0000E+00 3.0261E-04 1.5972E-04 0.0000E+00	0.0000E+00 3.0701E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.0998E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1163E-04 0.0000E+00 0.0000E+00	0.0000E+00 2.3474E-04 0.0000E+00 0.0000E+00	2.8974E-04 4.7113E-04 0.0000E+00 0.0000E+00
39	0.0000E+00 2.1703E-04 4.7102E-04 0.0000E+00	0.0000E+00 2.9106E-04 3.1526E-04 0.0000E+00	0.0000E+00 2.9392E-04 3.1691E-04 0.0000E+00	0.0000E+00 2.9788E-04 1.5939E-04 0.0000E+00	0.0000E+00 3.0261E-04 2.3969E-04 0.0000E+00	0.0000E+00 3.0701E-04 3.2010E-04 0.0000E+00	0.0000E+00 3.0965E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1097E-04 0.0000E+00 0.0000E+00	0.0000E+00 3.1185E-04 0.0000E+00 0.0000E+00	4.5001E-04 4.6948E-04 0.0000E+00 0.0000E+00
40	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	4.4704E-04	2.8710E-04

	2.8853E-04	2.9040E-04	2.9370E-04	2.9799E-04	2.2704E-04	3.0624E-04	3.0844E-04	3.0987E-04	4.6618E-04	3.1174E-04
	1.1726E-04	4.7135E-04	3.1614E-04	3.1823E-04	3.1944E-04	3.2043E-04	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
41	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.8688E-04
	2.8853E-04	2.9062E-04	2.9414E-04	2.9865E-04	3.0294E-04	3.0558E-04	3.0723E-04	3.0866E-04	3.8731E-04	3.1086E-04
	3.1185E-04	3.1328E-04	3.1515E-04	3.1702E-04	3.1900E-04	1.6027E-04	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
42	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.8567E-04	2.8633E-04	2.8765E-04
	2.8941E-04	2.9161E-04	2.9535E-04	2.9920E-04	3.0272E-04	3.0503E-04	3.0635E-04	3.0778E-04	3.0899E-04	3.1020E-04
	7.2985E-04	1.5642E-04	3.1460E-04	3.1658E-04	3.1845E-04	2.4024E-04	3.2208E-04	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
43	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.8787E-04	2.8864E-04	4.3450E-04
	2.9106E-04	2.9337E-04	2.9678E-04	2.9964E-04	3.0217E-04	3.0415E-04	3.0569E-04	3.0712E-04	3.0855E-04	4.6497E-04
	3.1141E-04	1.5653E-04	3.1471E-04	2.3738E-04	2.3870E-04	2.4013E-04	3.2219E-04	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
44	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.9051E-04	2.9117E-04	2.1901E-04
	4.4011E-04	2.9568E-04	2.9799E-04	2.9997E-04	3.0195E-04	3.0382E-04	3.0536E-04	3.0679E-04	3.0844E-04	3.1009E-04
	3.1174E-04	7.8320E-05	3.1526E-04	1.5851E-04	2.3914E-04	2.4035E-04	1.6115E-04	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
45	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.9403E-04	2.9502E-04
	2.9612E-04	2.9755E-04	4.4869E-04	3.0063E-04	3.0239E-04	3.0415E-04	3.0558E-04	2.3034E-04	2.3166E-04	3.1075E-04
	3.1251E-04	1.9888E-04	1.5807E-04	3.5783E-04	3.1988E-04	1.0043E-04	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
46	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.9689E-04	2.9755E-04
	2.9843E-04	2.9931E-04	3.0041E-04	3.0184E-04	2.2759E-04	3.0492E-04	3.0635E-04	1.7325E-04	3.0998E-04	3.1185E-04
	1.5686E-04	0.0000E+00	3.1746E-04	1.5972E-04	1.6071E-04	8.0630E-05	2.4343E-04	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
47	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.2462E-04
	3.0019E-04	3.0096E-04	3.0228E-04	3.0360E-04	3.0514E-04	2.2990E-04	3.0789E-04	3.0954E-04	3.1152E-04	7.8320E-05
	0.0000E+00	0.0000E+00	3.5871E-04	4.0150E-05	3.2384E-04	3.2560E-04	3.2725E-04	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
48	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	3.0129E-04
	3.0206E-04	3.0316E-04	4.5694E-04	3.0602E-04	3.0723E-04	2.3133E-04	3.0965E-04	3.1152E-04	3.1328E-04	1.5741E-04
	0.0000E+00	0.0000E+00	0.0000E+00	3.2307E-04	3.2626E-04	3.3000E-04	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
49	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	2.2825E-04	3.0558E-04	3.0745E-04	3.0855E-04	3.0943E-04	3.1042E-04	3.1152E-04	3.1273E-04	3.1372E-04	3.1471E-04
	0.0000E+00	0.0000E+00	0.0000E+00	1.6247E-04	3.2879E-04	3.3308E-04	1.6885E-04	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
50	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	3.0811E-04	3.0998E-04	3.1130E-04	3.1185E-04	3.1229E-04	3.1306E-04	3.1350E-04	1.9580E-05	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	3.6762E-04	1.6566E-04	1.6808E-04	1.7061E-04	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
51	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	3.1174E-04	3.1295E-04	3.1350E-04	2.3518E-04	2.3518E-04	3.1350E-04	3.1295E-04	3.5200E-04	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.6687E-04	1.6951E-04	3.4463E-04	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
52	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	2.3628E-04	3.1592E-04	3.1504E-04	4.9016E-04	2.3518E-04	2.3485E-04	3.1284E-04	3.1284E-04	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.7083E-04	3.4749E-04	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00						
53	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	3.9809E-04	3.1823E-04	3.1636E-04	3.1416E-04	4.8983E-04	3.1295E-04	3.1284E-04	0.0000E+00	0.0000E+00

[illegible]

[illegible]

80	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00							
81	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00							
82	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00							

41 RIVER REACHES

LAYER	ROW	COL	STAGE	CONDUCTANCE	BOTTOM ELEVATION	RIVER REACH
2	27	13	1490.	0.2500E+05	1487.	1
2	27	14	1487.	850.0	1484.	2
2	28	14	1485.	0.1500E+05	1482.	3
2	29	14	1465.	2500.	1462.	4
2	30	14	1450.	1000.	1447.	5
2	31	14	1444.	0.4000E+05	1441.	6
2	32	13	1430.	0.2000E+05	1427.	7
2	33	13	1423.	0.4000E+05	1420.	8
1	34	12	1413.	0.5000E+05	1410.	9
1	35	11	1393.	0.5000E+05	1390.	10
1	35	12	1420.	0.5000E+05	1417.	11
2	36	10	1385.	0.1500E+05	1382.	12
2	37	10	1375.	0.2500E+05	1372.	13
2	38	10	1365.	0.2500E+05	1362.	14
2	39	10	1360.	2500.	1357.	15
2	40	9	1355.	1500.	1352.	16
2	41	10	1345.	0.3000E+05	1342.	17
2	42	8	1325.	0.1000E+05	1322.	18
2	42	9	1335.	0.1500E+05	1332.	19
2	42	10	1340.	0.1000E+05	1337.	20
2	43	8	1325.	0.1000E+05	1322.	21
2	44	8	1315.	0.1000E+05	1312.	22
2	45	9	1295.	0.1000E+05	1292.	23
2	45	10	1285.	3000.	1282.	24
2	46	10	1280.	0.1500E+05	1277.	25
2	46	12	1265.	4000.	1262.	26
2	47	11	1275.	1000.	1272.	27
2	47	12	1260.	0.2000E+05	1257.	28
2	48	12	1255.	0.1500E+05	1252.	29
2	49	13	1245.	0.2000E+05	1242.	30
2	50	13	1265.	0.1000E+05	1262.	31
2	51	14	1230.	0.2000E+05	1227.	32
2	52	14	1225.	0.2000E+05	1222.	33
2	52	15	1215.	1500.	1212.	34
2	52	16	1205.	1000.	1202.	35
2	53	15	1218.	425.0	1215.	36
2	53	16	1195.	2000.	1192.	37
2	54	15	1190.	1000.	1187.	38
2	54	16	1202.	425.0	1199.	39
2	55	16	1185.	0.2000E+05	1182.	40
2	55	17	1175.	0.1000E+05	1172.	41

MAXIMUM HEAD CHANGE FOR EACH ITERATION:

HEAD CHANGE	LAYER,ROW,COL	HEAD CHANGE	LAYER,ROW,COL	HEAD CHANGE	LAYER,ROW,COL	HEAD CHANGE	LAYER,ROW,COL	HEAD CHANGE	LAYER,ROW,COL
301.1	(2, 39, 26)	-283.5	(2, 39, 26)	65.91	(2, 36, 24)	-52.62	(2, 36, 24)	21.42	(2, 36, 24)
-14.60	(2, 36, 24)	7.486	(2, 36, 24)	-4.659	(2, 36, 24)	2.695	(2, 36, 24)	-1.600	(2, 36, 24)
0.9931	(2, 36, 24)	-0.6115	(2, 36, 24)	0.3409	(2, 36, 24)	-0.1905	(2, 36, 24)	0.1137	(2, 36, 24)
-0.6469E-01	(2, 36, 24)	0.3781E-01	(2, 36, 24)	-0.2231E-01	(2, 36, 24)	0.1334E-01	(2, 36, 24)	-0.7824E-02	(2, 36, 24)
0.4953E-02	(2, 36, 24)	-0.2943E-02	(2, 36, 24)	0.1570E-02	(2, 36, 24)	-0.8875E-03	(2, 36, 24)		

HEAD/DRAWDOWN PRINTOUT FLAG = 1 TOTAL BUDGET PRINTOUT FLAG = 1 CELL-BY-CELL FLOW TERM FLAG = 1

OUTPUT FLAGS FOR EACH LAYER:

LAYER	HEAD PRINTOUT	DRAWDOWN PRINTOUT	HEAD SAVE	DRAWDOWN SAVE
-------	------------------	----------------------	--------------	------------------

1	1	1	1	1
2	1	1	1	1
" CONSTANT HEAD" BUDGET VALUES WILL BE SAVED ON UNIT 77 AT END OF TIME STEP 1, STRESS PERIOD 1				
"FLOW RIGHT FACE " BUDGET VALUES WILL BE SAVED ON UNIT 77 AT END OF TIME STEP 1, STRESS PERIOD 1				
"FLOW FRONT FACE " BUDGET VALUES WILL BE SAVED ON UNIT 77 AT END OF TIME STEP 1, STRESS PERIOD 1				
"FLOW LOWER FACE " BUDGET VALUES WILL BE SAVED ON UNIT 77 AT END OF TIME STEP 1, STRESS PERIOD 1				
" DRAINS" BUDGET VALUES WILL BE SAVED ON UNIT 77 AT END OF TIME STEP 1, STRESS PERIOD 1				
" RECHARGE" BUDGET VALUES WILL BE SAVED ON UNIT 78 AT END OF TIME STEP 1, STRESS PERIOD 1				
" RIVER LEAKAGE" BUDGET VALUES WILL BE SAVED ON UNIT 77 AT END OF TIME STEP 1, STRESS PERIOD 1				

—

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

HEAD IN LAYER 2 AT END OF TIME STEP 1 IN STRESS PERIOD 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	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.
3	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.
5	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.
7	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.
9	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.
11	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.
13	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.
15	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. 1800.	1751.	
17	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0. 1814.	1815.	1810.	
18	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0. 1767.	1782.	1799.	1799.	
19	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0. 1702.	1741.	1729.	1758.	1773.	
20	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0. 1676.	1675.	1690.	1743.	1792.	
21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0. 1630.	1641.	1688.	1730.	1774.	1827.	
22	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0. 1616.	1658.	1708.	1744.	1779.	1822.	
23	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0. 1602.	1689.	1706.	1701.	1738.	1794.	
24	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0. 1572.	1648.	1711.	1667.	1643.	1710.	1759.	
25	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0. 1587.	1641.	1656.	1610.	1638.	1695.	1722.	
26	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0. 1533.	1547.	1591.	1571.	1571.	1622.	1692.	1707.	
27	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0. 1494.	1513.	1527.	1540.	1579.	1633.	1693.	1692.	
28	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0. 1493.	1510.	1548.	1606.	1654.	1678.	1661.		
29	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0. 1493.	1537.	1576.	1625.	1653.	1666.	1649.		
30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0. 1498.	1553.	1589.	1619.	1644.	1650.	1633.		

[illegible]

31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1448.	1538.	1565.	1605.	1644.	1646.	1625.						
32	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1435.	1466.	1528.	1566.	1637.	1660.	1644.	1626.					
33	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1429.	1480.	1547.	1580.	1643.	1648.	1632.	1618.					
34	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1450.	1460.	1513.	1562.	1611.	1654.	1637.	1601.	1572.				
35	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1434.	1449.	1489.	1540.	1568.	1605.	1635.	1643.	1611.	1595.			
36	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1391.	1429.	1471.	1513.	1544.	1559.	1567.	1580.	1614.	1616.	1610.		
37	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1381.	1427.	1480.	1517.	1533.	1535.	1536.	1587.	1605.	1612.	1618.		
38	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1370.	1439.	1481.	1512.	1518.	1505.	1484.	1547.	1571.	1598.	1618.		
39	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1388.	1447.	1475.	1502.	1495.	1469.	1494.	1520.	1484.	1568.	1605.		
40	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1388.	1405.	1438.	1472.	1490.	1468.	1440.	1469.	1466.	1493.	1564.	1553.	
41	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1352.	1415.	1460.	1481.	1461.	1410.	1403.	1474.	1501.	1499.	1482.		
42	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1329.	1338.	1349.	1421.	1454.	1464.	1449.	1403.	1406.	1446.	1444.	1435.	1538.
43	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1329.	1359.	1406.	1426.	1435.	1432.	1398.	1374.	1398.	1395.	1426.	1480.	1572.
44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1321.	1352.	1372.	1400.	1403.	1408.	1391.	1348.	1342.	1397.	1468.	1511.	1540.
45	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1303.	1305.	1360.	1387.	1411.	1408.	1360.	1351.	1406.	1450.	1484.	1498.	
46	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1304.	1285.	1308.	1287.	1389.	1406.	1360.	1349.	1383.	1409.	1475.	1477.	
47	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1315.	1296.	1266.	1348.	1393.	1348.	1375.	1408.	1452.	1470.	1464.		
48	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1318.	1298.	1261.	1345.	1378.	1309.	1381.	1419.	1467.	1452.	1405.		
49	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1328.	1300.	1251.	1332.	1293.	1376.	1414.	1430.	1355.	1373.			
50	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1314.	1270.	1287.	1282.	1349.	1417.	1419.	1386.	0.				
51	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1314.	1280.	1238.	1283.	1308.	1363.	1400.	1317.	0.				
52	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1335.	1294.	1230.	1256.	1289.	1326.	1375.	1314.	0.				
53	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1382.	1321.	1296.	1276.	1234.	1312.	1346.	0.	0.				
54	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1389.	1341.	1298.	1256.	1236.	1236.	1309.	0.	0.				
55	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1368.	1273.	1272.	1256.	1193.	1180.	0.	0.	0.				
56	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1324.	1341.	1332.	1280.	1227.	0.	0.	0.	0.				
57	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1313.	1349.	1339.	1254.	1283.	1264.	1203.	0.	0.				
58	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1356.	1363.	1361.	1336.	1306.	1246.	0.	0.	0.				
59	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1359.	1362.	1369.	1353.	1276.	1275.	1251.	1319.	0.				
60	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1345.	1341.	1369.	1373.	1342.	1324.	1287.	0.	0.				
61	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1309.	1318.	1282.	1352.	1382.	1377.	1337.	1298.	1254.	0.			
62	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1337.	1305.	1249.	1310.	1376.	1356.	1261.	1210.	1247.	0.			
63	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1305.	1294.	1235.	1260.	1305.	1307.	1252.	0.	0.	0.			

[illegible]

HEAD IN LAYER 2 AT END OF TIME STEP 1 IN STRESS PERIOD 1

	21	22	23	24	25	26	27	28	29	30	31	32	33	34
1	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.
3	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.
5	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.
7	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.
9	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.
11	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.
13	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
14	0.	0.	0.	0.	0.	1683.	1668.	1684.	0.	0.	0.	0.	0.	0.
15	0.	0.	0.	0.	1704.	1733.	1714.	1653.	0.	0.	0.	0.	0.	0.
16	1762.	1728.	1722.	1772.	1801.	1786.	1744.	1668.	0.	0.	0.	0.	0.	0.
17	1804.	1807.	1808.	1823.	1809.	1789.	1745.	1651.	0.	0.	0.	0.	0.	0.
18	1834.	1844.	1855.	1833.	1745.	1732.	1733.	1690.	0.	0.	0.	0.	0.	0.
19	1812.	1848.	1859.	1815.	1760.	1706.	0.	0.	0.	0.	0.	0.	0.	0.
20	1844.	1857.	1855.	1831.	1791.	1732.	0.	0.	0.	0.	0.	0.	0.	0.
21	1849.	1834.	1826.	1825.	1787.	1713.	0.	0.	0.	0.	0.	0.	0.	0.
22	1814.	1806.	1803.	1807.	1763.	1685.	0.	0.	0.	0.	0.	0.	0.	0.
23	1783.	1758.	1792.	1789.	1746.	1640.	0.	0.	0.	0.	0.	0.	0.	0.
24	1745.	1728.	1779.	1774.	1714.	1603.	0.	0.	0.	0.	0.	0.	0.	0.
25	1693.	1731.	1745.	1731.	1659.	1631.	0.	0.	0.	0.	0.	0.	0.	0.
26	1644.	1699.	1710.	1723.	1690.	1598.	0.	0.	0.	0.	0.	0.	0.	0.
27	1641.	1650.	1657.	1706.	1665.	1581.	0.	0.	0.	0.	0.	0.	0.	0.
28	1615.	1629.	1642.	1668.	1648.	1581.	0.	0.	0.	0.	0.	0.	0.	0.
29	1618.	1595.	1629.	1644.	1637.	1595.	0.	0.	0.	0.	0.	0.	0.	0.
30	1608.	1576.	1618.	1631.	1610.	1555.	0.	0.	0.	0.	0.	0.	0.	0.

[illegible]

64	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
66	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
67	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
68	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
69	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
70	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
72	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
73	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
74	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
76	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
77	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
78	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
81	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
82	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

HEAD WILL BE SAVED ON UNIT 79 AT END OF TIME STEP 1, STRESS PERIOD 1

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

DRAWDOWN IN LAYER 2 AT END OF TIME STEP 1 IN STRESS PERIOD 1

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	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.
3	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.
5	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.
7	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.
9	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.
11	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.
13	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.
15	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.	-16.	-7.
17	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	2.	-2.	10.
18	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	11.	4.	6.	3.
19	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	7.	-5.	-8.	-1.
20	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	9.	3.	2.	6.	8.
21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	9.	-4.	1.	16.	6.	6.
22	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-9.	1.	19.	16.	5.	0.
23	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	3.	2.	5.	-19.	-3.	2.
24	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	3.	2.	2.	9.	3.	-3.	-5.
25	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	2.	6.	0.	-8.	5.	3.	1.
26	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	10.	7.	9.	-1.	-9.	8.	-2.	-3.
27	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-6.	-11.	-20.	-18.	10.	2.	-4.	3.
28	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-8.	-8.	-11.	11.	13.	5.	5.
29	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.	-1.	13.	7.	2.	4.	5.
30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-4.	2.	11.	-20.	6.	3.	-3.

31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	20.	-3.	-20.	-4.	12.	2.	-9.
32	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-6.	6.	-10.	1.	10.	2.	6.	-6.
33	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-1.	7.	4.	5.	12.	3.	-4.	12.
34	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-18.	10.	16.	4.	7.	1.	-4.	-9.	-7.
35	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-24.	-28.	2.	-1.	2.	8.	15.	-1.	-12.	-20.
36	0.	0.	0.	0.	0.	0.	0.	0.	0.	2.	3.	6.	-7.	2.	2.	7.	-7.	7.	-3.	-2.
37	0.	0.	0.	0.	0.	0.	0.	0.	0.	-1.	-4.	10.	-5.	-3.	-8.	4.	18.	-14.	-7.	2.
38	0.	0.	0.	0.	0.	0.	0.	0.	0.	17.	-17.	-3.	-5.	1.	-2.	9.	3.	-2.	-38.	2.
39	0.	0.	0.	0.	0.	0.	0.	0.	0.	7.	-29.	-5.	5.	15.	6.	7.	27.	-3.	5.	11.
40	0.	0.	0.	0.	0.	0.	0.	0.	-5.	-4.	-13.	-4.	5.	3.	-14.	26.	-6.	8.	-2.	4.
41	0.	0.	0.	0.	0.	0.	0.	0.	0.	-6.	-7.	0.	-5.	7.	-14.	6.	31.	39.	3.	6.
42	0.	0.	0.	0.	0.	0.	0.	2.	5.	16.	-7.	-2.	-8.	6.	4.	1.	14.	1.	10.	-8.
43	0.	0.	0.	0.	0.	0.	0.	-3.	12.	1.	-10.	1.	8.	6.	-14.	20.	6.	7.	9.	8.
44	0.	0.	0.	0.	0.	0.	0.	-16.	-4.	-22.	10.	-7.	2.	1.	-6.	10.	6.	22.	16.	0.
45	0.	0.	0.	0.	0.	0.	0.	0.	-13.	15.	-4.	-8.	7.	5.	-16.	8.	19.	0.	-12.	-4.
46	0.	0.	0.	0.	0.	0.	0.	0.	-8.	7.	-10.	18.	10.	10.	-21.	7.	6.	-9.	5.	3.
47	0.	0.	0.	0.	0.	0.	0.	0.	0.	-12.	5.	-11.	14.	17.	-5.	-31.	2.	6.	-4.	-45.
48	0.	0.	0.	0.	0.	0.	0.	0.	0.	4.	6.	-9.	6.	19.	2.	-24.	-7.	-4.	-24.	2.
49	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-28.	-6.	2.	-2.	3.	-15.	-1.	3.	-6.	-7.
50	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-1.	-10.	8.	0.	7.	-3.	-7.	-36.	0.
51	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-9.	1.	8.	-15.	-12.	13.	-1.	-6.	0.
52	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-27.	0.	14.	-5.	-32.	-47.	-1.	1.	0.
53	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	5.	-2.	-15.	-22.	-4.	10.	6.	0.	0.
54	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-39.	2.	6.	-15.	-10.	-4.	-1.	0.	0.
55	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-8.	4.	-2.	-18.	0.	7.	0.	0.	0.
56	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	6.	16.	10.	10.	9.	0.	0.	0.	0.
57	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-10.	4.	-40.	2.	5.	-51.	-5.	0.	0.
58	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-9.	7.	-3.	-5.	3.	2.	0.	0.	0.
59	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-22.	-15.	2.	-6.	-6.	-1.	7.	-15.	0.
60	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-25.	-36.	7.	4.	3.	-14.	6.	0.	0.
61	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-7.	-9.	-6.	-1.	9.	11.	1.	-17.	-1.	0.
62	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	13.	8.	-2.	17.	-13.	4.	-10.	2.	-3.	0.
63	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	-18.	9.	8.	-13.	10.	-9.	-3.	0.	0.	0.

[illegible]

DRAWDOWN IN LAYER 2 AT END OF TIME STEP 1 IN STRESS PERIOD 1

	21	22	23	24	25	26	27	28	29	30	31	32	33	34
1	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.
3	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.
5	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.
7	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.
9	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.
11	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.
13	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
14	0.	0.	0.	0.	0.	-20.	-6.	3.	0.	0.	0.	0.	0.	0.
15	0.	0.	0.	0.	-9.	8.	-10.	-8.	0.	0.	0.	0.	0.	0.
16	-4.	-10.	7.	-1.	12.	10.	1.	6.	0.	0.	0.	0.	0.	0.
17	1.	-1.	2.	13.	14.	11.	8.	1.	0.	0.	0.	0.	0.	0.
18	6.	9.	2.	7.	8.	4.	4.	4.	0.	0.	0.	0.	0.	0.
19	-10.	11.	7.	-4.	5.	-3.	0.	0.	0.	0.	0.	0.	0.	0.
20	0.	-2.	-4.	-5.	-2.	10.	0.	0.	0.	0.	0.	0.	0.	0.
21	4.	0.	-7.	-8.	7.	-9.	0.	0.	0.	0.	0.	0.	0.	0.
22	3.	-26.	-12.	7.	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
23	6.	-5.	-19.	17.	-10.	5.	0.	0.	0.	0.	0.	0.	0.	0.
24	-3.	-19.	17.	22.	6.	5.	0.	0.	0.	0.	0.	0.	0.	0.
25	2.	16.	12.	13.	-6.	-21.	0.	0.	0.	0.	0.	0.	0.	0.
26	7.	11.	2.	-16.	8.	5.	0.	0.	0.	0.	0.	0.	0.	0.
27	8.	-8.	0.	-2.	6.	8.	0.	0.	0.	0.	0.	0.	0.	0.
28	-4.	-4.	2.	6.	4.	6.	0.	0.	0.	0.	0.	0.	0.	0.
29	-4.	-1.	-18.	9.	-1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
30	-17.	-5.	-14.	0.	-8.	9.	0.	0.	0.	0.	0.	0.	0.	0.

[illegible]

64	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
65	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
66	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
67	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
68	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
69	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
70	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
72	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
73	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
74	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
75	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
76	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
77	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
78	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
80	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
81	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
82	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

DRAWDOWN WILL BE SAVED ON UNIT 80 AT END OF TIME STEP 1, STRESS PERIOD 1

VOLUMETRIC BUDGET FOR ENTIRE MODEL AT END OF TIME STEP 1 IN STRESS PERIOD 1

CUMULATIVE VOLUMES L**3

RATES FOR THIS TIME STEP

L**3/T

IN:

 STORAGE = 0.00000E+00
 CONSTANT HEAD = 0.00000E+00
 DRAINS = 0.00000E+00
 RECHARGE = 0.20012E+08
 RIVER LEAKAGE = 0.00000E+00

TOTAL IN = 0.20012E+08

OUT:

 STORAGE = 0.00000E+00
 CONSTANT HEAD = 0.00000E+00
 DRAINS = 0.16467E+08
 RECHARGE = 0.00000E+00
 RIVER LEAKAGE = 0.35449E+07

IN:

 STORAGE = 0.00000E+00
 CONSTANT HEAD = 0.00000E+00
 DRAINS = 0.00000E+00
 RECHARGE = 0.20012E+08
 RIVER LEAKAGE = 0.00000E+00

TOTAL IN = 0.20012E+08

OUT:

 STORAGE = 0.00000E+00
 CONSTANT HEAD = 0.00000E+00
 DRAINS = 0.16467E+08
 RECHARGE = 0.00000E+00
 RIVER LEAKAGE = 0.35449E+07

TOTAL OUT = 0.20012E+08
 IN - OUT = 6.0000
 PERCENT DISCREPANCY = 0.00

TOTAL OUT = 0.20012E+08
 IN - OUT = 6.0000
 PERCENT DISCREPANCY = 0.00

TIME SUMMARY AT END OF TIME STEP 1 IN STRESS PERIOD 1	SECONDS	MINUTES	HOURS	DAYS	YEARS
TIME STEP LENGTH	86400.0	1440.00	24.0000	1.00000	0.273785E-02
STRESS PERIOD TIME	86400.0	1440.00	24.0000	1.00000	0.273785E-02
TOTAL SIMULATION TIME	86400.0	1440.00	24.0000	1.00000	0.273785E-02

Appendix B: Modular model post-processor results of a steady state simulation of ground-water flow in the rush springs aquifer, western Oklahoma

1

U.S. GEOLOGICAL SURVEY MODULAR FINITE-DIFFERENCE GROUND-WATER MODEL
STATISTICAL PRE- AND POST- PROCESSOR

Steady state model of Rush Springs Aquifer

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

LAYERS = 2 ROWS = 82 COLUMNS = 34 NODES = 5576 STRESS PERIODS = 1

I/O UNITS:

ELEMENT OF IUNIT: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
I/O UNIT: 8 0 9 11 0 0 0 18 16 0 0 19 0 0 0 0 0 0 0 0 0 0 0 0

LAYER AQUIFER TYPE

1	1
2	3

DYNAMIC STORAGE UTILIZATION

117221 ELEMENTS ALLOCATED
500000 ELEMENTS AVAILABLE

23.4% UTILIZED

382779 elements available for graphic storage

1Steady state model of Rush Springs Aquifer
Rush Springs aquifer
TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

Processing: READ CBCDRN 77 3 R 1 1 CELL BY CELL DRAIN DISCH

READING : CBCDRN - CELL BY CELL DRAIN DISC
ON UNIT: 77
STRESS PERIOD 1
TIME STEP 1

--> FAST-FORWARDING... found CONSTANT HEAD: stress period 1, time step 1
--> FAST-FORWARDING... found FLOW RIGHT FACE : stress period 1, time step 1
--> FAST-FORWARDING... found FLOW FRONT FACE : stress period 1, time step 1
--> FAST-FORWARDING... found FLOW LOWER FACE : stress period 1, time step 1

THREE-DIMENSIONAL STACK CONTENTS AFTER READ COMMAND

STACK POSITION	DATA SET NAME	STRESS PERIOD	TIME STEP	DESCRIPTION
4		0	0	
3		0	0	
2		0	0	
1	CBCDRN	1	1	CELL BY CELL DRAIN DISC

1Steady state model of Rush Springs Aquifer
Rush Springs aquifer

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Processing: READ UBOUND 61 3 I ./drnmask.dir/cobb.file

READING : UBOUND - ./drnmask.dir/cobb.file
ON UNIT: 61

./drnmask.dir/cobb.file FOR LAYER 1 WILL BE READ ON UNIT 61 USING FORMAT: (8I10)

./drnmask.dir/cobb.file FOR LAYER 2 WILL BE READ ON UNIT 61 USING FORMAT: (8I10)

1Steady state model of Rush Springs Aquifer
Rush Springs aquifer
TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

Processing: STAT CBCDRN 02 1

STATISTICS FOR : CBCDRN - CELL BY CELL DRAIN DISC
LAYER 2
STRESS PERIOD 1
TIME STEP 1

Beginning mask from layer 2

Masking was performed on CBCDRN

22 points remain out of 2788

2766 points excluded that were outside the user boundary

Zero or negative values present in matrix, therefore geometric and harmonic means were not computed

ARITHMETIC MEAN	ABSOLUTE VALUE MEAN	GEOMETRIC MEAN	HARMONIC MEAN	ROOT MEAN SQUARE	VARIANCE
-85468.8	85468.8	0.000000E+00	0.000000E+00	112511.	0.560864E+10
MINIMUM	MAXIMUM	SUM OF VALUES	STANDARD DEVIATION	MEAN DEVIATION	NUMBER OF VALUES
-247115.	0.000000E+00	-0.188031E+07	74890.9	56649.3	22
COEFFICIENT OF SKEWNESS	LOWER QUARTILE	MEDIAN	UPPER QUARTILE	NON-PARAMETRIC SKEWNESS	
-0.806289	-115180.	-82733.0	-8105.10	0.393945	

STATISTICS FOR : CBCDRN - CELL BY CELL DRAIN DISC
 LAYER 2
 STRESS PERIOD 1
 TIME STEP 1

Beginning mask from layer 2

Masking was performed on CBCDRN

2 points remain out of 2788

2786 points excluded that were outside the user boundary

Zero or negative values present in matrix, therefore geometric and harmonic means were not computed

Upper and lower quartiles equal, therefore non-parametric skewness was not computed

Number of observations < 3, therefore skewness was not computed

ARITHMETIC MEAN	ABSOLUTE VALUE MEAN	GEOMETRIC MEAN	HARMONIC MEAN	ROOT MEAN SQUARE	VARIANCE
-56203.8	56203.8	0.000000E+00	0.000000E+00	75605.0	0.511451E+10
MINIMUM	MAXIMUM	SUM OF VALUES	STANDARD DEVIATION	MEAN DEVIATION	NUMBER OF VALUES
-106773.	-5634.52	-112408.	71515.8	50569.3	2
COEFFICIENT OF SKEWNESS	LOWER QUARTILE	MEDIAN	UPPER QUARTILE	NON-PARAMETRIC SKEWNESS	
0.000000E+00	-56203.8	-56203.8	-56203.8	0.000000E+00	

STATISTIC	LOCATION		
	ROW	COLUMN	LAYER
MINIMUM	54	17	2
MAXIMUM	54	18	2
MEDIAN	54	18	2
MEDIAN	1	3	1

1Steady state model of Rush Springs Aquifer
 Rush Springs aquifer
 TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

Processing: READ CBCDRN 77 3 R 1 1 CELL BY CELL DRAIN DISCH

READING : CBCDRN - CELL BY CELL DRAIN DISC
 ON UNIT: 77
 STRESS PERIOD 1
 TIME STEP 1

Processing: READ CBCDRN 77 3 R 1 1 CELL BY CELL DRAIN DISCH

READING : CBCDRN - CELL BY CELL DRAIN DISC

ON UNIT: 77
STRESS PERIOD 1
TIME STEP 1

--> FAST-FORWARDING... found RIVER LEAKAGE: stress period 1, time step 1

--> REWINDING UNIT 77

--> FAST-FORWARDING... found CONSTANT HEAD: stress period 1, time step 1

--> FAST-FORWARDING... found FLOW RIGHT FACE : stress period 1, time step 1

--> FAST-FORWARDING... found FLOW FRONT FACE : stress period 1, time step 1

--> FAST-FORWARDING... found FLOW LOWER FACE : stress period 1, time step 1

THREE-DIMENSIONAL STACK CONTENTS AFTER READ COMMAND

STACK POSITION	DATA SET NAME	STRESS PERIOD	TIME STEP	DESCRIPTION
----------------	---------------	---------------	-----------	-------------

4		0	0	
3	CBCDRN	1	1	CELL BY CELL DRAIN DISC
2	CBCDRN	1	1	CELL BY CELL DRAIN DISC
1	CBCDRN	1	1	CELL BY CELL DRAIN DISC

1Steady state model of Rush Springs Aquifer

Rush Springs aquifer

TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

Processing: READ UBOUND 63 3 I ./drnmask.dir/hog.file

READING : UBOUND - ./drnmask.dir/hog.file
ON UNIT: 63

./drnmask.dir/hog.file FOR LAYER 1 WILL BE READ ON UNIT 63 USING FORMAT: (8I10)

./drnmask.dir/hog.file FOR LAYER 2 WILL BE READ ON UNIT 63 USING FORMAT: (8I10)

1Steady state model of Rush Springs Aquifer

Rush Springs aquifer

TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

Processing: STAT CBCDRN 02 1

STATISTIC	LOCATION		
	ROW	COLUMN	LAYER
MINIMUM	39	18	2
MAXIMUM	35	17	2
MEDIAN	50	15	2
MEDIAN	45	16	2

1Steady state model of Rush Springs Aquifer
 Rush Springs aquifer
 TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

Processing: READ CBCDRN 77 3 R 1 1 CELL BY CELL DRAIN DISCH

READING : CBCDRN - CELL BY CELL DRAIN DISC
 ON UNIT: 77
 STRESS PERIOD 1
 TIME STEP 1

--> FAST-FORWARDING... found RIVER LEAKAGE: stress period 1, time step 1
 --> REWINDING UNIT 77
 --> FAST-FORWARDING... found CONSTANT HEAD: stress period 1, time step 1
 --> FAST-FORWARDING... found FLOW RIGHT FACE : stress period 1, time step 1
 --> FAST-FORWARDING... found FLOW FRONT FACE : stress period 1, time step 1
 --> FAST-FORWARDING... found FLOW LOWER FACE : stress period 1, time step 1

THREE-DIMENSIONAL STACK CONTENTS AFTER READ COMMAND

STACK POSITION	DATA SET NAME	STRESS PERIOD	TIME STEP	DESCRIPTION
4		0	0	
3		0	0	
2	CBCDRN	1	1	CELL BY CELL DRAIN DISC
1	CBCDRN	1	1	CELL BY CELL DRAIN DISC

1Steady state model of Rush Springs Aquifer
 Rush Springs aquifer
 TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

Processing: READ UBOUND 62 3 I ./drnmask.dir/rush.file

READING : UBOUND - ./drnmask.dir/rush.file
 ON UNIT: 62

./drnmask.dir/rush.file FOR LAYER 1 WILL BE READ ON UNIT 62 USING FORMAT: (8I10)

./drnmask.dir/rush.file FOR LAYER 2 WILL BE READ ON UNIT 62 USING FORMAT: (8I10)

1Steady state model of Rush Springs Aquifer
Rush Springs aquifer
TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

Processing: STAT CBCDRN 02 1

STATISTICS FOR : CBCDRN - CELL BY CELL DRAIN DISC
LAYER 2
STRESS PERIOD 1
TIME STEP 1

Beginning mask from layer 2

Masking was performed on CBCDRN

4 points remain out of 2788

2784 points excluded that were outside the user boundary

Zero or negative values present in matrix, therefore geometric and harmonic means were not computed

ARITHMETIC MEAN -83826.5	ABSOLUTE VALUE MEAN 83826.5	GEOMETRIC MEAN 0.000000E+00	HARMONIC MEAN 0.000000E+00	ROOT MEAN SQUARE 91230.7	VARIANCE 0.172821E+10
MINIMUM -116140.	MAXIMUM -23871.9	SUM OF VALUES -335306.	STANDARD DEVIATION 41571.7	MEAN DEVIATION 29977.3	NUMBER OF VALUES 4
COEFFICIENT OF SKEWNESS 1.57464	LOWER QUARTILE -111420.	MEDIAN -97647.1	UPPER QUARTILE -56233.2	NON-PARAMETRIC SKEWNESS 0.500867	

STATISTIC	LOCATION		
	ROW	COLUMN	LAYER
MINIMUM	70	16	2
MAXIMUM	68	18	2
MEDIAN	70	13	2
MEDIAN	68	18	2

1Steady state model of Rush Springs Aquifer
Rush Springs aquifer
TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

```

--> FAST-FORWARDING... found RIVER LEAKAGE: stress period 1, time step 1
--> REWINDING UNIT 77
--> FAST-FORWARDING... found CONSTANT HEAD: stress period 1, time step 1
--> FAST-FORWARDING... found FLOW RIGHT FACE : stress period 1, time step 1
--> FAST-FORWARDING... found FLOW FRONT FACE : stress period 1, time step 1
--> FAST-FORWARDING... found FLOW LOWER FACE : stress period 1, time step 1

```

THREE-DIMENSIONAL STACK CONTENTS AFTER READ COMMAND

STACK POSITION	DATA SET NAME	STRESS PERIOD	TIME STEP	DESCRIPTION
4	CBCDRN	1	1	CELL BY CELL DRAIN DISC
3	CBCDRN	1	1	CELL BY CELL DRAIN DISC
2	CBCDRN	1	1	CELL BY CELL DRAIN DISC
1	CBCDRN	1	1	CELL BY CELL DRAIN DISC

1Steady state model of Rush Springs Aquifer
Rush Springs aquifer
TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

Processing: READ UBOUND 64 3 I ./drnmask.dir/sugar.file

READING : UBOUND - ./drnmask.dir/sugar.fil
ON UNIT: 64

./drnmask.dir/sugar.fil FOR LAYER 1 WILL BE READ ON UNIT 64 USING FORMAT: (8I10)

./drnmask.dir/sugar.fil FOR LAYER 2 WILL BE READ ON UNIT 64 USING FORMAT: (8I10)

1Steady state model of Rush Springs Aquifer
Rush Springs aquifer
TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

Processing: STAT CBCDRN 02 1

STATISTICS FOR : CBCDRN - CELL BY CELL DRAIN DISC
LAYER 2
STRESS PERIOD 1
TIME STEP 1

Beginning mask from layer 2

Masking was performed on CBCDRN

21 points remain out of 2788

2767 points excluded that were outside the user boundary

Zero or negative values present in matrix, therefore geometric and harmonic means were not computed

ARITHMETIC MEAN	ABSOLUTE VALUE MEAN	GEOMETRIC MEAN	HARMONIC MEAN	ROOT MEAN SQUARE	VARIANCE
-52174.5	52174.5	0.000000E+00	0.000000E+00	58585.6	0.745595E+09
MINIMUM	MAXIMUM	SUM OF VALUES	STANDARD DEVIATION	MEAN DEVIATION	NUMBER OF VALUES
-104727.	-12908.2	-0.109566E+07	27305.6	20706.4	21
COEFFICIENT OF SKEWNESS	LOWER QUANTILE	MEDIAN	UPPER QUANTILE	NON-PARAMETRIC SKEWNESS	
-0.590979	-63326.3	-46345.7	-37981.2	-0.339948	

STATISTIC	LOCATION		
	ROW	COLUMN	LAYER
MINIMUM	45	22	2
MAXIMUM	46	24	2
MEDIAN	48	20	2

1Steady state model of Rush Springs Aquifer
Rush Springs aquifer
TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

Processing: READ CBCDRN 77 3 R 1 1 CELL BY CELL DRAIN DISCH

READING : CBCDRN - CELL BY CELL DRAIN DISC
ON UNIT: 77
STRESS PERIOD 1
TIME STEP 1

--> FAST-FORWARDING... found RIVER LEAKAGE: stress period 1, time step 1
--> REWINDING UNIT 77
--> FAST-FORWARDING... found CONSTANT HEAD: stress period 1, time step 1
--> FAST-FORWARDING... found FLOW RIGHT FACE : stress period 1, time step 1
--> FAST-FORWARDING... found FLOW FRONT FACE : stress period 1, time step 1
--> FAST-FORWARDING... found FLOW LOWER FACE : stress period 1, time step 1

THREE-DIMENSIONAL STACK CONTENTS AFTER READ COMMAND

STACK DATA SET STRESS TIME

POSITION NAME PERIOD STEP DESCRIPTION

4	CBCDRN	1	1	CELL BY CELL DRAIN DISC
3	CBCDRN	1	1	CELL BY CELL DRAIN DISC
2	CBCDRN	1	1	CELL BY CELL DRAIN DISC
1	CBCDRN	1	1	CELL BY CELL DRAIN DISC

1Steady state model of Rush Springs Aquifer

Rush Springs aquifer

TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

Processing: READ UBOUND 65 3.1 ./drnmask.dir/deer.file

READING : UBOUND - ./drnmask.dir/deer.file
ON UNIT: 65

./drnmask.dir/deer.file FOR LAYER 1 WILL BE READ ON UNIT 65 USING FORMAT: (8I10)

./drnmask.dir/deer.file FOR LAYER 2 WILL BE READ ON UNIT 65 USING FORMAT: (8I10)

1Steady state model of Rush Springs Aquifer

Rush Springs aquifer

TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

Processing: STAT CBCDRN 02 1

STATISTICS FOR : CBCDRN - CELL BY CELL DRAIN DISC
LAYER 2
STRESS PERIOD 1
TIME STEP 1

Beginning mask from layer 2

Masking was performed on CBCDRN

30 points remain out of 2788

2758 points excluded that were outside the user boundary

Zero or negative values present in matrix, therefore geometric and harmonic means were not computed

ARITHMETIC MEAN	ABSOLUTE VALUE MEAN	GEOMETRIC MEAN	HARMONIC MEAN	ROOT MEAN SQUARE	VARIANCE
-89756.8	89756.8	0.000000E+00	0.000000E+00	103682.	0.278659E+10
		SUM OF	STANDARD	MEAN	NUMBER OF

MINIMUM -189988.	MAXIMUM 0.000000E+00	VALUES -0.269270E+07	DEVIATION 52788.1	DEVIATION 44876.6	VALUES 30
COEFFICIENT OF SKEWNESS 0.118470	LOWER QUARTILE -139074.	MEDIAN -83184.0	UPPER QUARTILE -50384.8	NON-PARAMETRIC SKEWNESS -0.260356	

STATISTIC	LOCATION		
	ROW	COLUMN	LAYER
MINIMUM	31	21	2
MAXIMUM	29	23	2
MEDIAN	22	23	2
MEDIAN	27	23	2

1Steady state model of Rush Springs Aquifer
Rush Springs aquifer
TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

Processing: READ CBCDRN 77 3 R 1 1 CELL BY CELL DRAIN DISCH

READING : CBCDRN - CELL BY CELL DRAIN DISC
ON UNIT: 77
STRESS PERIOD 1
TIME STEP 1

--> FAST-FORWARDING... found RIVER LEAKAGE: stress period 1, time step 1
--> REWINDING UNIT 77
--> FAST-FORWARDING... found CONSTANT HEAD: stress period 1, time step 1
--> FAST-FORWARDING... found FLOW RIGHT FACE : stress period 1, time step 1
--> FAST-FORWARDING... found FLOW FRONT FACE : stress period 1, time step 1
--> FAST-FORWARDING... found FLOW LOWER FACE : stress period 1, time step 1

THREE-DIMENSIONAL STACK CONTENTS AFTER READ COMMAND

STACK POSITION	DATA SET NAME	STRESS PERIOD	TIME STEP	DESCRIPTION
4	CBCDRN	1	1	CELL BY CELL DRAIN DISC
3	CBCDRN	1	1	CELL BY CELL DRAIN DISC
2	CBCDRN	1	1	CELL BY CELL DRAIN DISC
1	CBCDRN	1	1	CELL BY CELL DRAIN DISC

1Steady state model of Rush Springs Aquifer
Rush Springs aquifer
TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

Processing: READ UBOUND 67 3 I ./drnmask.dir/lwashita.file

READING : UBOUND - ./drnmask.dir/lwashita.
ON UNIT: 67

./drnmask.dir/lwashita. FOR LAYER 1 WILL BE READ ON UNIT 67 USING FORMAT: (8I10)

./drnmask.dir/lwashita. FOR LAYER 2 WILL BE READ ON UNIT 67 USING FORMAT: (8I10)

1Steady state model of Rush Springs Aquifer
Rush Springs aquifer
TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

Processing: STAT CBCDRN 02 1

STATISTICS FOR : CBCDRN - CELL BY CELL DRAIN DISC
LAYER 2
STRESS PERIOD 1
TIME STEP 1

Beginning mask from layer 2

Masking was performed on CBCDRN

6 points remain out of 2788

2782 points excluded that were outside the user boundary

Zero or negative values present in matrix, therefore geometric and harmonic means were not computed

ARITHMETIC MEAN	ABSOLUTE VALUE MEAN	GEOMETRIC MEAN	HARMONIC MEAN	ROOT MEAN SQUARE	VARIANCE
-102893.	102893.	0.000000E+00	0.000000E+00	110845.	0.203970E+10
MINIMUM	MAXIMUM	SUM OF VALUES	STANDARD DEVIATION	MEAN DEVIATION	NUMBER OF VALUES
-150701.	-48560.2	-617357.	45163.1	39750.3	6
COEFFICIENT OF SKEWNESS	LOWER QUARTILE	MEDIAN	UPPER QUARTILE	NON-PARAMETRIC SKEWNESS	
0.205558E-01	-150263.	-101425.	-56990.5	-0.472137E-01	

STATISTIC	LOCATION		
	ROW	COLUMN	LAYER
MINIMUM	59	16	2
MAXIMUM	61	11	2

MEDIAN 64 11 2
MEDIAN 62 17 2

1Steady state model of Rush Springs Aquifer
Rush Springs aquifer
TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

Processing:

Unknown command: refer to table 4

COMMAND ABORTED
1Steady state model of Rush Springs Aquifer
Rush Springs aquifer
TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

evaluate change in heads at the end of simulation

Processing: READ HEAD 79 1 1

READING : HEAD - COMPUTED HEADS
ON UNIT: 79
STRESS PERIOD 1
TIME STEP 1

THREE-DIMENSIONAL STACK CONTENTS AFTER READ COMMAND

STACK POSITION	DATA SET NAME	STRESS PERIOD	TIME STEP	DESCRIPTION
-------------------	------------------	------------------	--------------	-------------

4	CBCDRN	1	1	CELL BY CELL DRAIN DISC
3	CBCDRN	1	1	CELL BY CELL DRAIN DISC
2	CBCDRN	1	1	CELL BY CELL DRAIN DISC
1	HEAD	1	1	COMPUTED HEADS

1Steady state model of Rush Springs Aquifer
Rush Springs aquifer
TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

evaluate change in heads at the end of simulation

Processing: MATH STRT 01 - HEAD 01 CHNGE1 CHANGE IN HEAD-LAYER 1

COMPUTATION OF : CHNGE1 - CHANGE IN HEAD-LAYER 1

FROM : STRT - INITIAL HEADS
LAYER 1

MINUS : HEAD - COMPUTED HEADS
LAYER 1
STRESS PERIOD 1

TIME STEP 1

TWO-DIMENSIONAL STACK CONTENTS AFTER MATH COMMAND

STACK POSITION	DATA SET NAME	STRESS PERIOD	TIME STEP	DESCRIPTION
----------------	---------------	---------------	-----------	-------------

4		--	--	
3		--	--	
2		--	--	
1	CHNGE1	--	--	CHANGE IN HEAD-LAYER 1

1Steady state model of Rush Springs Aquifer

Rush Springs aquifer

TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

evaluate change in heads at the end of simulation

Processing: MATH STRT 02 - HEAD 02 CHNGE2 CHANGE IN HEAD-LAYER 2

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

COMPUTATION OF : CHNGE2 - CHANGE IN HEAD-LAYER 2

FROM : STRT - INITIAL HEADS
LAYER 2

MINUS : HEAD - COMPUTED HEADS
LAYER 2
STRESS PERIOD 1
TIME STEP 1

TWO-DIMENSIONAL STACK CONTENTS AFTER MATH COMMAND

STACK POSITION	DATA SET NAME	STRESS PERIOD	TIME STEP	DESCRIPTION
----------------	---------------	---------------	-----------	-------------

4		--	--	
3		--	--	
2	CHNGE1	--	--	CHANGE IN HEAD-LAYER 1
1	CHNGE2	--	--	CHANGE IN HEAD-LAYER 2

1Steady state model of Rush Springs Aquifer

Rush Springs aquifer

TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

evaluate change in heads at the end of simulation

Processing: READ UBOUND 14 3 I UBOUND.WELLS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

READING : UBOUND - UBOUND.WELLS
ON UNIT: 14

UBOUND.WELLS

FOR LAYER 1 WILL BE READ ON UNIT 14 USING FORMAT: (8I10)

UBOUND.WELLS

FOR LAYER 2 WILL BE READ ON UNIT 14 USING FORMAT: (8I10)

1Steady state model of Rush Springs Aquifer
Rush Springs aquifer
TITL SUM DRAIN DISCHARGES FOR SELECTED DRAINS

Compiled By Mark F. Becker, USGS WRD, Oklahoma C

evaluate change in heads at the end of simulation

Processing: STAT CHNGE2 02 1

Unable to find data set CHNGE2, layer 2 : two-dimensional; Retaining complete data set

STATISTICS FOR : CHNGE2 - CHANGE IN HEAD-LAYER 2
LAYER 2

Beginning mask from layer 2

Masking was performed on CHNGE2

170 points remain out of 2788

2618 points excluded that were outside the user boundary

Zero or negative values present in matrix, therefore geometric and harmonic means were not computed

ARITHMETIC MEAN -0.114357	ABSOLUTE VALUE MEAN 7.55956	GEOMETRIC MEAN 0.000000E+00	HARMONIC MEAN 0.000000E+00	ROOT MEAN SQUARE 10.1807	VARIANCE 104.247
MINIMUM -45.1886	MAXIMUM 22.3489	SUM OF VALUES -19.4407	STANDARD DEVIATION 10.2101	MEAN DEVIATION 7.58645	NUMBER OF VALUES 170
COEFFICIENT OF SKEWNESS -1.24127	LOWER QUARTILE -3.72906	MEDIAN 2.23035	UPPER QUARTILE 6.36469	NON-PARAMETRIC SKEWNESS -0.180812	

STATISTIC	LOCATION		
	ROW	COLUMN	LAYER
MINIMUM	47	20	1
MAXIMUM	44	18	1
MEDIAN	31	19	1
MEDIAN	35	15	1