SIMULATION OF WATER QUALITY AND THE EFFECTS OF WASTEWATER EFFLUENT ON THE SOUTH PLATTE RIVER FROM CHATFIELD RESERVOIR THROUGH DENVER, COLORADO

by James E. Paschal, Jr., and David K. Mueller

U.S. GEOLOGICAL SURVEY

Water-Resources Investigations Report 91-4016

Prepared in cooperation with the

DENVER REGIONAL COUNCIL OF GOVERNMENTS

Denver, Colorado
1991

U.S. DEPARTMENT OF THE INTERIOR

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CONVERSION FACTORS AND RELATED INFORMATION

Multiply	*By*	*To obtain*
cubic foot per second (ft^3/s)	0.028317	cubic meter per second
mile (mi)	1.609	kilometer
grams per square foot per day	0.0929	grams per square meter per day

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

$$°C = 5/9(°F-32)\ .$$

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

$$°F = 9/5(°C)+32\ .$$

The following term and abbreviation also is used in the report:

milligram per liter (mg/L)

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."

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ABSTRACT

Projected increases in population and discharges of wastewater effluent in the Denver metropolitan area makes compliance with water-quality standards increasingly difficult and necessitates controlling discharges of wastewater effluent to the South Platte River. In 1989, the State of Colorado adopted the U.S. Environmental Protection Agency's QUAL2E water-quality model as the preferred method for estimating effects of effluent on Colorado rivers. The Denver Regional Council of Governments entered into a cooperative agreement with the U.S. Geological Survey to use the QUAL2E model to evaluate the effects of wastewater effluent on the South Platte River from Chatfield Reservoir through Denver during low-streamflow conditions. Streamflow, dissolved-solids concentration, 5-day carbonaceous biochemical oxygen demand ($CBOD_5$), and concentrations of dissolved oxygen and nitrogen species were simulated for the river reach and for the Bear Creek and Cherry Creek tributaries.

The QUAL2E simulation model was compared to the previously verified U.S. Geological Survey water quality (USGS-QW) simulation model for a 14.5-river-mile reach of the South Platte River from the Littleton streamflow-gaging station to the streamflow-gaging station at 50th Avenue in Denver. Verification and simulation results for both models were similar for streamflow, dissolved-solids concentrations, and $CBOD_5$; however, concentrations of dissolved oxygen and nitrogen species were different. The QUAL2E program and reaction coefficients were modified to obtain a satisfactory fit to the measured values. The QUAL2E model data set then was revised to include a 4.5-river-mile reach that extended upstream from Littleton to the regulation dam at Chatfield Reservoir, the Bear Creek and Cherry Creek tributaries, and the Centennial and Glendale Wastewater Treatment Plants. The revised model then was recalibrated for the 19-river-mile reach.

Critically low-streamflow conditions were simulated for 1989 and 2010. The simulations for 2010 included wastewater-treatment-plant effluent volumes and constituent concentrations. Simulations indicated that predicted $CBOD_5$ was about 1.5 to about 15 milligrams per liter greater in the South Platte River for 2010 conditions than for 1989 conditions; predicted dissolved-oxygen concentrations were similar; predicted total ammonia (as nitrogen) concentrations were about 0.2 to about 1.1 milligrams per liter greater upstream from the Bi-City Wastewater Treatment Plant and were about 0.7 to about

10 milligrams per liter less downstream from the plant; and predicted total nitrate (as nitrogen) concentrations were about 0.7 to about 6 milligrams per liter greater for 2010 conditions.

INTRODUCTION

Projected increases in population and discharge of wastewater effluents in the Denver metropolitan area make compliance with water-quality standards increasingly difficult and necessitate controlling discharges of wastewater effluent to the South Platte River (fig. 1). Currently (1989), several wastewater-treatment plants (WWTP) in the study area discharge treated effluent into the river. The State of Colorado regulates the volume and concentration of effluents that the plants are allowed to discharge.

Because of projected increases in the discharge of wastewater effluent into the South Platte River, additional knowledge of the assimilative capacity of the river is needed to evaluate the current (1989) and projected (2010) effects of effluent on water quality of the South Platte River. In a previous U.S. Geological Survey (USGS) study, Spahr and Blakely (1985) described the effects of wastewater effluent on the assimilative capacity of the river. They used a water-quality model described by Bauer and others (1979) (hereinafter referred to as the USGS-QW model) to simulate the effects of effluent on the river during 1985 and during projected low-streamflow conditions. In 1989, the State of Colorado adopted the U.S. Environmental Protection Agency's (USEPA) QUAL2E model (Brown and Barnwell, 1987) as the preferred method for estimating effects of effluent volume on Colorado rivers. Subsequently, the Denver Regional Council of Governments (DRCOG) entered into a cooperative agreement with the USGS to evaluate the effects of current (1989) and projected (2010) effluent volumes and effluent quality on the South Platte River during specified critical low streamflow conditions. The DRCOG requested that the QUAL2E model be used for consistency of analysis.

Purpose and Scope

This report describes an application of the QUAL2E model that was used to evaluate the effects of wastewater effluent on the South Platte River during steady-state, low-streamflow conditions. Specific objectives of the report are to:

1. Describe the QUAL2E simulation model.
2. Compare the USGS-QW model to the QUAL2E model.
3. Summarize the assumptions, data collection, and calibration of the USGS-QW and QUAL2E models and compare calibration and verification results for the two models. Specifically, the QUAL2E model was calibrated and verified for the 14.5-river-mile reach of the South Platte River based on actual data used by the USGS-QW model for the same reach.
4. Describe revisions of the QUAL2E model data set, which included a 4.5-river-mile reach from the regulation dam at Chatfield Reservoir to the streamflow-gaging station at Littleton; the Bear Creek tributary from Bear Lake to the South Platte River; the Cherry Creek tributary from Cherry Creek Reservoir to the South Platte River; and the Centennial and Glendale WWTP's.

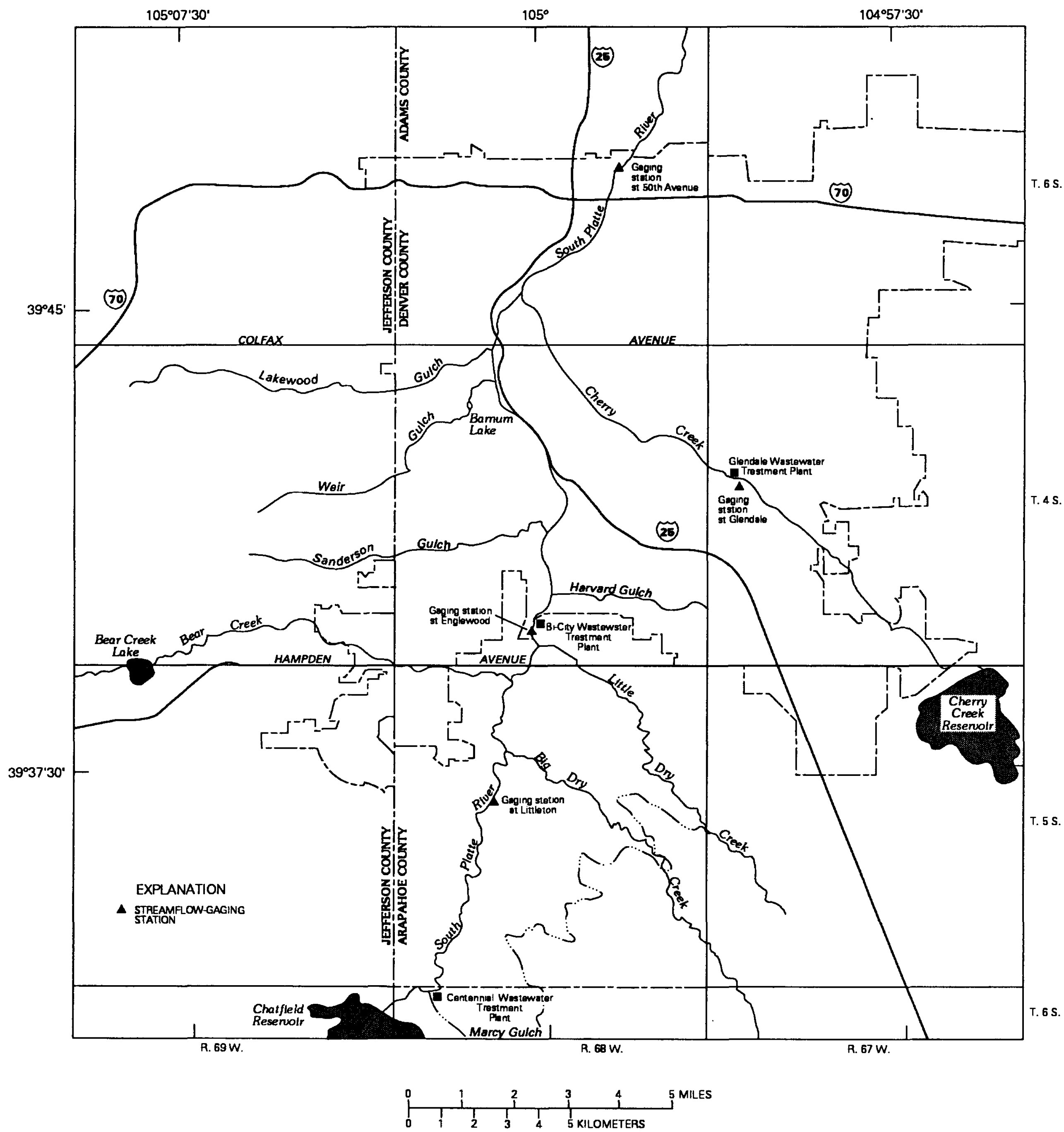

Figure 1.--South Platte River study area.

5. Present simulation results of current (1989) and projected (2010) effects of wastewater effluents in the study reach at critically low-streamflow conditions for 5-day carbonaceous biochemical oxygen demand ($CBOD_5$) and concentrations of dissolved oxygen and nitrogen species.

The revised QUAL2E model was calibrated and used to evaluate wastewater volumes in a 19-river-mile reach of the South Platte River from the regulation dam at Chatfield Reservoir near Littleton to the USGS streamflow-gaging station at 50th Avenue in Denver. Most of the data for the model calibration and verification were collected during the previous study by Spahr and others (1985). Data for tributaries, critically low streamflows, and projected quality and quantity of wastewater-treatment-plant effluents were provided by the DRCOG and the Colorado Department of Health (CDH), Water Quality Control Division (WQCD). No new data were collected during this study. The QUAL2E model has been thoroughly documented and tested (Brown and Barnwell, 1987); therefore, no additional analysis of the model was deemed necessary for this study. A sensitivity analysis of the applied model was considered beyond the scope of the study.

Acknowledgments

The authors thank the DRCOG Segment 14 Wasteload Allocation Study Steering Committee for providing guidance and data required for simulations. In particular, we acknowledge the assistance of Russell M. Clayshulte and Larry Mugler of DRCOG; Robert Owen of the CDH, WQCD; Dennis Stowe of the Bi-City WWTP; and Cynthia L. Paulson of Brown and Caldwell, Inc.

DESCRIPTION OF THE QUAL2E WATER-QUALITY SIMULATION MODEL

The QUAL2E model (Brown and Barnwell, 1987) was developed by the USEPA for waste-load allocations, discharge-permit determinations, and other pollution evaluations. The QUAL2E model is applicable to well-mixed dendritic streams where the major transport mechanisms of advection and dispersion are only significant along the longitudinal axis of flow for a stream or channel. Streamflow and input of waste loads are considered to be constant (steady state during the simulation period). In conjunction with onsite studies, the model can be used to study the assimilation of waste loads in receiving streams and to identify nonpoint waste loads.

A river or channel is represented in the QUAL2E model as a linked group of stream and tributary reaches that consist of headwaters (hereinafter indicating the beginning of a modeled stream reach) and sequential strings of completely mixed reactors, which are referred to as computational elements (fig. 2). Within each reach, all the computational elements have the same stream slope, channel cross section, and chemical and biological rate constants. Tributaries, inputs, and withdrawals are assumed to intersect at a particular computational element.

The QUAL2E model calculates a flow and a mass balance for each computational element (fig. 3). The model solves a one-dimensional, advection-dispersion, mass-transport equation of the following form:

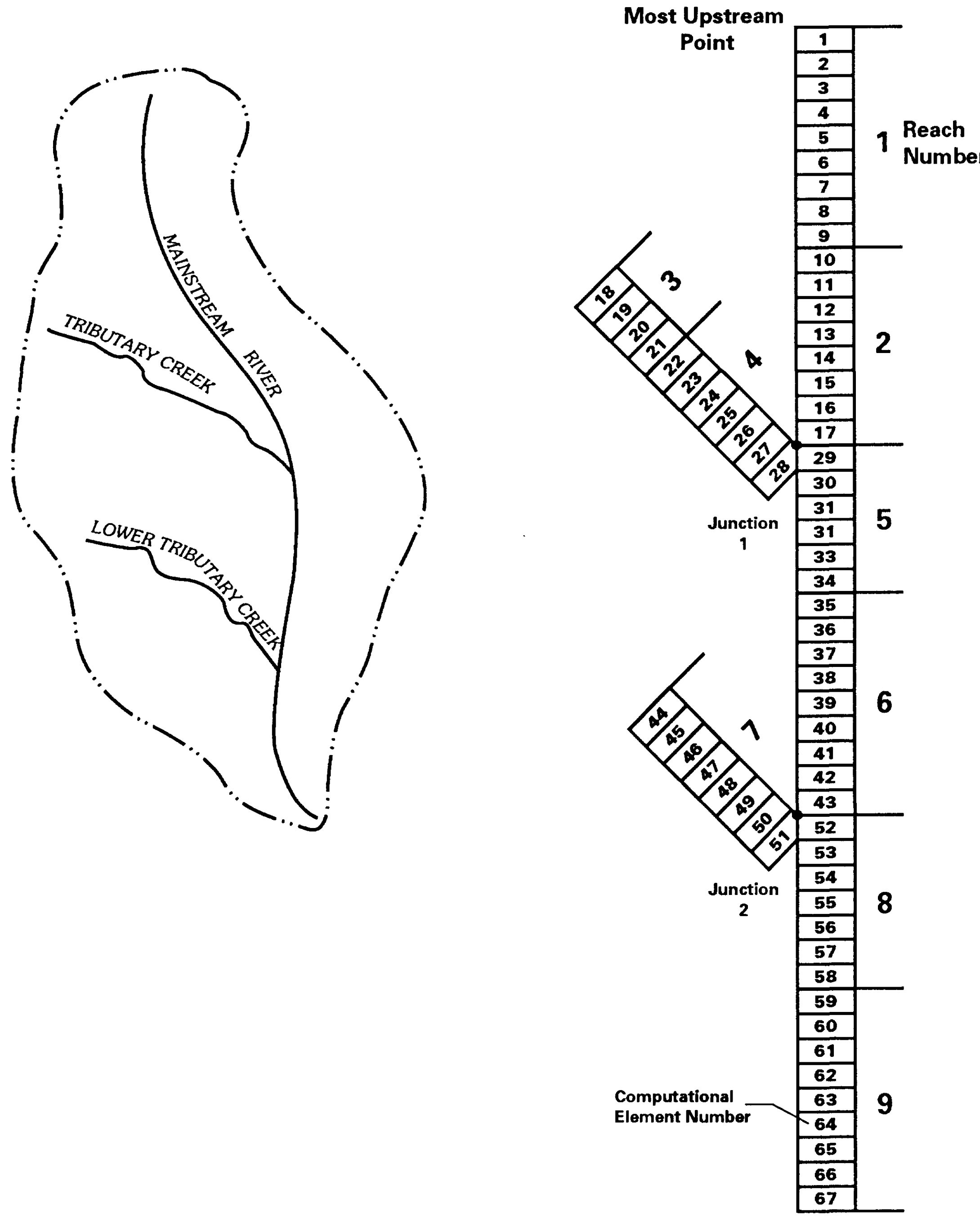

Figure 2.--Stream network of computational elements and reaches (from Brown and Barnwell, 1987, p. 13).

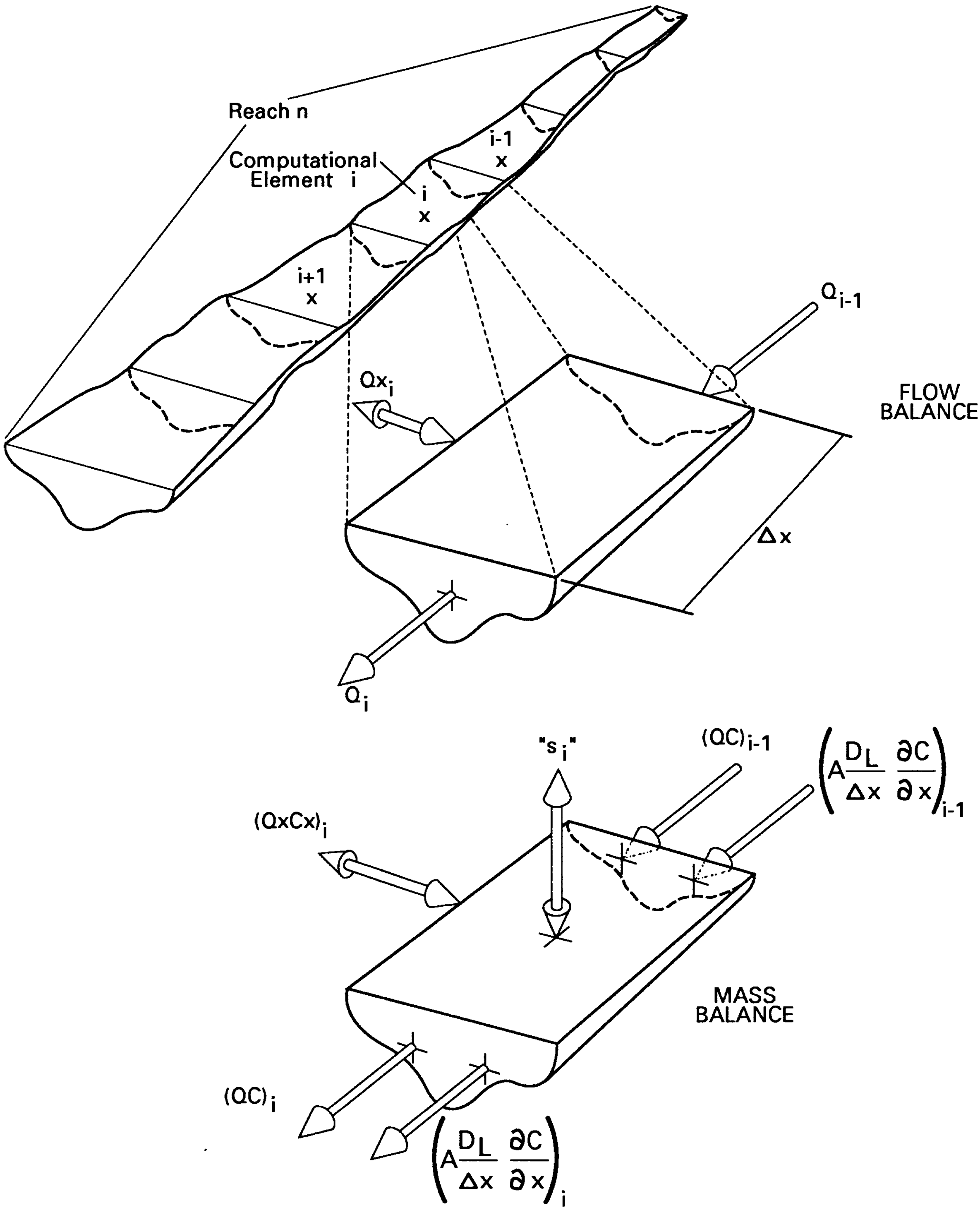

Figure 3.--Discretized stream system (from Brown and Barnwell, 1987, p. 12).

[$\frac{d\ (\text{constituent})}{dt}$ = the change of the constituent with a change in time]:

$$\frac{d\ \text{Mass}}{dt} = \text{Dispersion of constituent - advection of constituent + constituent reactions and interactions + sources of constituent - sinks of constituent.}$$

The model simulates streamflow and as many as 15 water-quality constituents in any combination desired by the user. Descriptive equations for the properties and constituents discussed in this report are (brackets represent concentration):

1. Streamflow, Q, in cubic feet per second:
   Q = sum of external inflows and withdrawals for a computational element.

2. Conservative constituent (dissolved solids), in milligrams per liter:
   $$\frac{d\ [\text{conservative constituent}]}{dt} = \text{flow-weighted sum of constituent inflows and withdrawals.}$$

In addition to flow-weighted inflows and withdrawals, the following constituents have within-reach reactions as shown.

3. $CBOD_5$, in milligrams per liter:
   $$\frac{d\ [\text{ultimate CBOD}]}{dt} = \text{deoxygenation of CBOD - settling of CBOD.}$$

   5-day CBOD = [ultimate CBOD] × (rate of exponential decay).

4. Dissolved oxygen (DO), in milligrams per liter:
   $$\frac{d\ [\text{DO}]}{dt} = \text{reaeration + photosynthesis - algal respiration - } CBOD_5 \text{ - sedimentation demand for DO - oxidation of nitrogen species.}$$

All species of nitrogen described in equations 5-8 are reported as total nitrogen in milligrams per liter.

5. Total organic nitrogen (org-N):
   $$\frac{d\ [\text{org-N}]}{dt} = \text{nitrogen in algal biomass - hydrolysis of org-N to total ammonia } (NH_3) \text{ - settling of org-N.}$$

6. Total ammonia (NH_3):
   $$\frac{d\ [NH_3]}{dt} = \text{hydrolysis of org-N to } NH_3 \text{ - oxidation of } NH_3 \text{ to total nitrite } (NO_2) \text{ + benthic source of } NH_3 \text{ - algal uptake of } NH_3 \text{ - low [DO] inhibition of } NH_3 \text{ as a nitrification rate correction factor.}$$

7. Total nitrite (NO_2):

$$\frac{d\,[NO_2]}{dt} = \text{oxidation of } NH_3 \text{ to } NO_2 - \text{oxidation of } NO_2 \text{ to total nitrate } (NO_3).$$

8. Total nitrate (NO_3):

$$\frac{d\,[NO_3]}{dt} = \text{oxidation of } NO_2 \text{ to } NO_3 - \text{algal uptake of } NO_3 - \text{low [DO] inhibition of } NO_3 \text{ as a nitrification rate correction factor.}$$

Coefficients for chemical and biological reactions can be constant, spatially variable, or temperature dependent. The model documentation by Brown and Barnwell (1987) describes ranges of coefficient values, units, and methods of analysis listed in the literature.

COMPARISON OF THE USGS-QW AND THE QUAL2E MODELS

Calculations of streamflow, concentrations of dissolved solids, and $CBOD_5$ are similar in the USGS-QW and QUAL2E models. Both models use similar one-dimensional, advection, mass-transport equations; the QUAL2E model also incorporates dispersion in the mass-transport equations.

Estimation of coefficients for calculating dissolved-oxygen concentrations is different in the two models. The QUAL2E model provides a choice of eight methods for computing reaeration coefficients, none of which is the method used in the USGS-QW model. However, both models allow direct input of reaeration coefficients. The USGS-QW model requires the user to input oxygen-saturation and oxygen-deficit values; the QUAL2E model calculates those values based on water temperature and atmospheric pressure. Water temperature can be simulated using climate data or can be specified by reach in the model input. Atmospheric pressure is assumed to be standard at sea level unless air and water temperatures are simulated, which allows climate data to be specified. The QUAL2E model also allows for simulation of reaeration over small dams.

Both the USGS-QW and QUAL2E models simulate changes of total organic nitrogen as nitrogen (referred to as total organic nitrogen), total ammonia as nitrogen (referred to as total ammonia), total nitrite as nitrogen (referred to as total nitrite), and total nitrate as nitrogen (referred to as total nitrate).

Calculations of the changes in concentrations of nitrogen species are different in the two models. The USGS-QW model provides for decay of total organic nitrogen, total ammonia, total nitrite, and total nitrate and can include nitrogen uptake by attached algae. The QUAL2E model only provides for decay of total organic nitrogen and for benthic sources of total ammonia; however, a benthic sink can be specified for total ammonia by giving the source a negative value.

MODEL DATA, CALIBRATION, AND VERIFICATION

A mathematical model has reaction-rate estimates, initial streamflow and water-quality input data, and simulated results for measured conditions. Prior to any simulation of nonmeasured conditions, a model must be calibrated and verified. The model then can be used to simulate conditions in or near the range of the calibrated or verified conditions. Model calibration is done by adjusting the reaction coefficients until the predicted values and measured data from the calibration period are within a preselected margin of error. Model verification is done using input data sets from periods other than the calibration period to determine if the predicted values and the measured data are within a preselected margin of error without additional modification of the reaction coefficients.

Summary of Assumptions, Data Collection, and Calibration of the USGS-QW and QUAL2E models

The study reach of the South Platte River met most of the assumptions of the USGS-QW and QUAL2E models:

1. Well-mixed dendritic stream.
2. Major transport mechanisms of advection and dispersion along the longitudinal axis of flow--the river is well mixed in cross sections.
3. Streamflow constant--low flow is controlled by an upstream reservoir.
4. Waste loads constant--except for the Bi-City WWTP, which may have diurnal changes.
5. Constant values of stream slope, channel cross section, chemical reaction rates, and biological reaction rates within computational elements--except for low-head dams, hydraulic changes are minimal; chemical and biological rates throughout the study area are highly variable on a daily basis and do not meet the assumption of constant values.

Spahr and Blakely (1985) collected data for model calibration and verification on October 7, 1982, September 22, 1983, and January 26, 1984. The details of data collection, preparation of data for model input, physical and water-quality data selection, and model calibration and verification of the USGS-QW model are described by Spahr and Blakely (1985). Data collected during the study and methods of laboratory analysis are reported by Spahr and others (1985).

Streamflow in the South Platte River was regulated during data collection to create steady-state conditions. At each sampling site, streamflow measurements usually were made at least twice during three 24-hour collection periods. Effluent volume from the Bi-City WWTP and the withdrawal volume for the Englewood water supply were provided by the cities of Englewood and Littleton. Variations in measured streamflow in the South Platte River primarily were due to the diurnal cycle in effluent volume from the Bi-City WWTP. Model-computed streamflows were less than measured streamflows at several sites, perhaps because nonpoint-source inflow was not included in the model. Mean velocity in each reach was computed using relations of streamflow to time of travel. Velocity, width, and streamflow then were used to compute the mean depth for each reach.

Onsite measurements of specific conductance, pH, water temperature, and dissolved oxygen were made when each water-quality sample was collected. Reaeration coefficients were measured in selected reaches to evaluate methods of estimating reaeration coefficients. Reaeration-coefficient estimates used in the model were calculated by an equation developed by Cadwallader and McDonnell (1969). The coefficients then were adjusted from 20 °C to corresponding values for the actual water temperatures. Water-quality samples for concentrations of dissolved solids, $CBOD_5$, and concentrations of nitrogen species were collected during the three 24-hour collection periods. Onsite and laboratory measurements of benthic-sediment oxygen demand (BSOD) were made at several sites throughout the study reach. BSOD is simulated as an oxygen sink in the dissolved oxygen part of the model.

Mean values of streamflow and minimum, mean, and maximum concentrations of water-quality constituents were used to calibrate and verify the USGS-QW model. The QUAL2E model was calibrated and verified using the same data used for the USGS-QW model. The QUAL2E model was calibrated using the September 22, 1983, data and modifying the reaction coefficients until the simulated results were similar to the mean of measured values. The QUAL2E model was verified by using the calibrated model and data sets for October 7, 1982, and January 26, 1984 (see "Supplemental Information" section at the back of this report). The final calibration coefficients for the two models are listed in table 1.

Table 1.--*Calibration coefficients for the USGS-QW and QUAL2E models*

[Reaction rates at 20 °Celsius are in units per day; benthic-sediment oxygen demand is in grams per square foot per day; --, not provided for in model]

Properties and constituents	USGS-QW model	QUAL2E model
5-day carbonaceous biochemical oxygen demand:		
Decay rate-------------------	0.50	0.50
Deoxygenation rate-----------	0.50	--
Settling rate----------------	--	0.0
Benthic-sediment oxygen demand---	0.094-0.257	0.094-0.257
Oxygen reaeration rate-----------	6.2-11.7	6.2-11.7
Total organic nitrogen as nitrogen:		
Forward-reaction rate--------	1.30	0.10-0.90
Decay rate-------------------	1.30	0.10-1.10
Total ammonia as nitrogen:		
Forward-reaction rate--------	0.50	0.50-1.0
Decay rate-------------------	1.00	[1]0.0-95
Total nitrite as nitrogen:		
Forward-reaction rate--------	8-45	8-45
Decay rate-------------------	8-45	--
Total nitrate as nitrogen:		
Decay rate-------------------	0.0	--

[1]Artificial decay rates in the QUAL2E model obtained by assigning negative values to benthic-source rates.

Comparison of USGS-QW and QUAL2E Model Results

Calibration and verification results for streamflow, dissolved-solids concentration, and $CBOD_5$ were similar for the USGS-QW and QUAL2E models (figs. 4-6; table 2). As indicated in table 2, the coefficients of variation of simulated streamflow, dissolved-solids concentration, and $CBOD_5$ were less than 5 percent. The slight differences between the pairs of simulated curves were due to differences in length of computational elements for the two models.

Table 2.--*Standard errors and coefficients of variation of the USGS-QW and the QUAL2E model results*

[SE, standard error[1]; CV, coefficient of variation[2]; ft^3/s, cubic feet per second; mg/L, milligrams per liter; <, less than]

Properties and constituents	Units	USGS-QW model SE	USGS-QW model CV (percent)	QUAL2E model SE	QUAL2E model CV (percent)
CALIBRATION DATA (SEPTEMBER 22, 1983)					
Streamflow	ft^3/s	4.21	3.77	4.32	3.87
Dissolved solids	mg/L	7.29	1.36	8.03	1.50
5-day carbonaceous biochemical oxygen demand	mg/L	0.24	4.40	0.25	4.51
Dissolved oxygen	mg/L	0.14	1.81	0.17	2.32
Total organic nitrogen as nitrogen	mg/L	0.08	7.47	0.06	5.63
Total ammonia as nitrogen	mg/L	0.06	1.65	0.04	1.00
Total nitrite as nitrogen	mg/L	0.01	6.74	0.01	9.54
Total nitrate as nitrogen	mg/L	0.03	1.84	0.02	1.36
Total nitrogen as nitrogen	mg/L	0.17	2.57	0.06	0.89
VERIFICATION DATA (OCTOBER 7, 1982)					
Streamflow	ft^3/s	4.49	3.07	4.32	2.96
Dissolved solids	mg/L	8.93	2.25	10.68	2.69
5-day carbonaceous biochemical oxygen demand	mg/L	0.16	3.44	0.16	3.47
Dissolved oxygen	mg/L	0.09	1.24	0.08	1.03
Total organic nitrogen as nitrogen	mg/L	0.13	6.32	0.13	6.54
Total ammonia as nitrogen	mg/L	0.17	7.40	0.10	4.42
Total nitrite as nitrogen	mg/L	0.01	6.27	<0.01	4.72
Total nitrate as nitrogen	mg/L	0.05	6.25	0.05	5.76
Total nitrogen as nitrogen	mg/L	0.18	3.41	0.11	2.14
VERIFICATION DATA (JANUARY 26, 1984)					
Streamflow	ft^3/s	2.99	3.29	2.71	2.98
Dissolved solids	mg/L	8.85	1.55	12.27	2.14
5-day carbonaceous biochemical oxygen demand	mg/L	0.33	4.19	0.33	4.21
Dissolved oxygen	mg/L	0.16	1.68	0.42	4.50
Total organic nitrogen as nitrogen	mg/L	0.07	7.24	0.08	7.66
Total ammonia as nitrogen	mg/L	0.19	5.11	0.17	4.68

Table 2.--*Standard errors and coefficients of variation of the USGS-QW and the QUAL2E model results*--Continued

Properties and constituents	Units	USGS-QW model SE	USGS-QW model CV (percent)	QUAL2E model SE	QUAL2E model CV (percent)
Total nitrite as nitrogen----------	mg/L	0.02	37.96	0.01	9.64
Total nitrate as nitrogen----------	mg/L	0.02	1.28	0.01	0.83
Total nitrogen as nitrogen---------	mg/L	0.13	2.01	0.22	3.44

[1]Standard error is defined as the root-mean-square error of measured mean values and predicted values.

[2]Coefficient of variation in percent is defined as the quotient of root-mean-square error and the mean of the measured values multiplied by 100.

To obtain satisfactory dissolved-oxygen results (fig. 7; table 2), the QUAL2E computer program was changed to account for atmospheric pressure at the elevation of the study area. In subroutine DOS, section D of the computer program (Brown and Barnwell, 1987), the variable ATMP (the fraction of sea-level atmospheric pressure) was assigned a value of 0.82, and the conditional statement used to branch around the calculation of atmospheric pressure when climate was not simulated [IF(MODOPT(2).LE.0) GO TO 95] was made inexecutable by making the statement a comment. Differences of simulated dissolved-oxygen concentrations between the QUAL2E model and the USGS-QW model are the result of the different ways of estimating dissolved-oxygen coefficients.

When the same reaction coefficients were used in the QUAL2E model as were used in the USGS-QW model, the simulated concentrations for total organic nitrogen were about 0.5 mg/L less in the QUAL2E model than in the USGS-QW model, and total ammonia was 1 to 2 mg/L greater. Forward-reaction-rate coefficients (hydrolysis and oxidation), source, and sink rates (table 1) were modified for the nitrogen species until the simulated values for the QUAL2E model were closer to the mean measured values (figs. 8-12). A decay rate for total ammonia, as provided for in the USGS-QW model, was provided for in the QUAL2E model by assigning a negative value to the benthic-source rate for several reaches downstream from the Bi-City WWTP (table 1).

When the calibration coefficients and the verification data sets for October 7, 1982, and January 26, 1984, were used with the final calibration coefficients, the QUAL2E model simulated streamflow and most of the water-quality constituents similarly to the USGS-QW model (figs. 4-12; table 2). Except for total nitrite on January 26, 1984, in the USGS-QW model (table 2), the coefficients of variation of simulated concentrations of dissolved oxygen and nitrogen species were less than 10 percent. The USGS-QW and QUAL2E models are not considered calibrated for total nitrite. Nitrite was considered a transitory form of nitrogen that was not purposely calibrated for in the model; reaction coefficients were adjusted to obtain calibrated values for total ammonia and total nitrate, with minimal concern for total nitrite. Also, concentrations of total nitrite were small (0.02 to 0.2 mg/L).

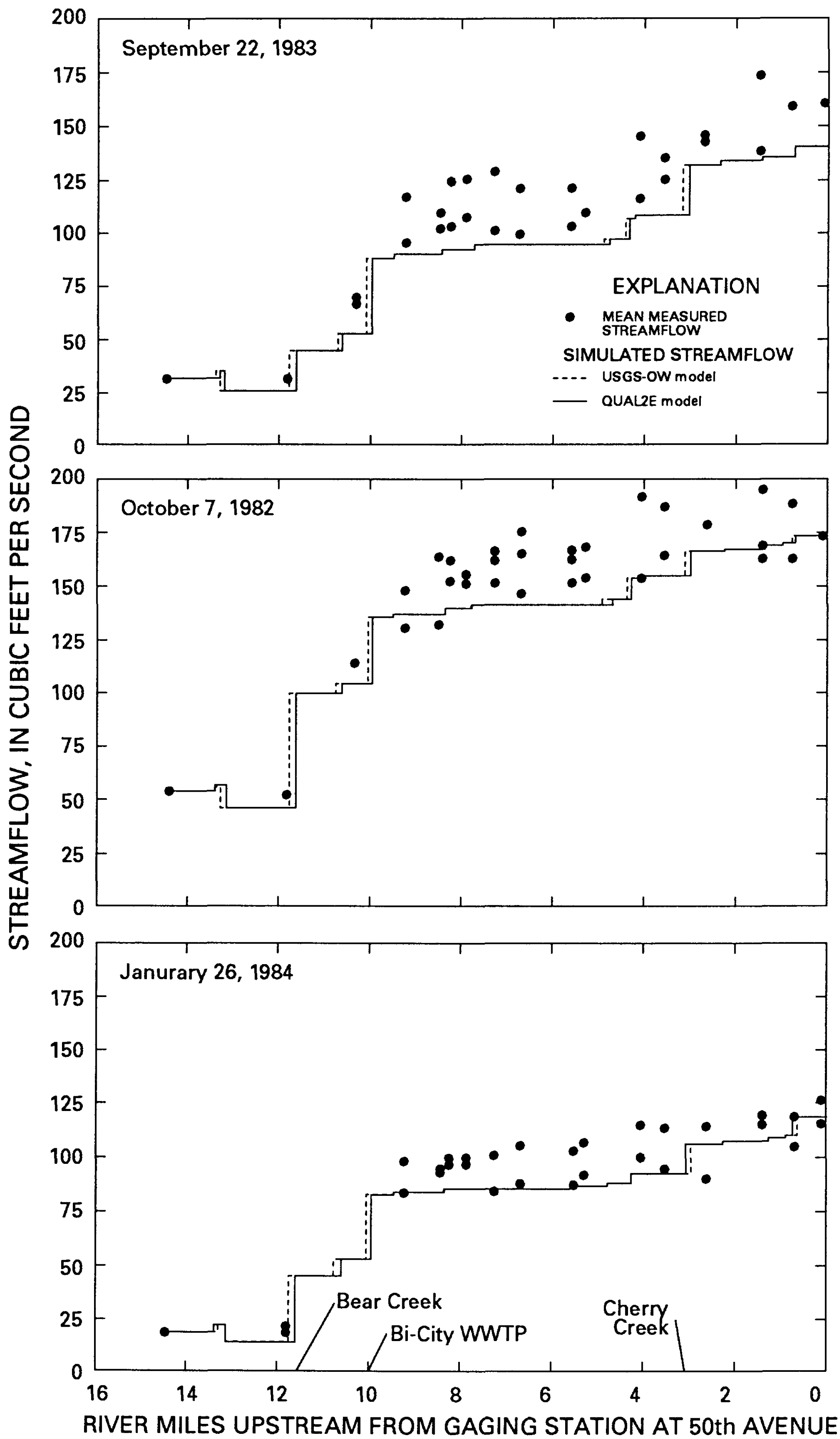

Figure 4.--Mean measured and simulated values of streamflow for the calibration period of September 22, 1983, and the verification periods of October 7, 1982, and January 26, 1984.

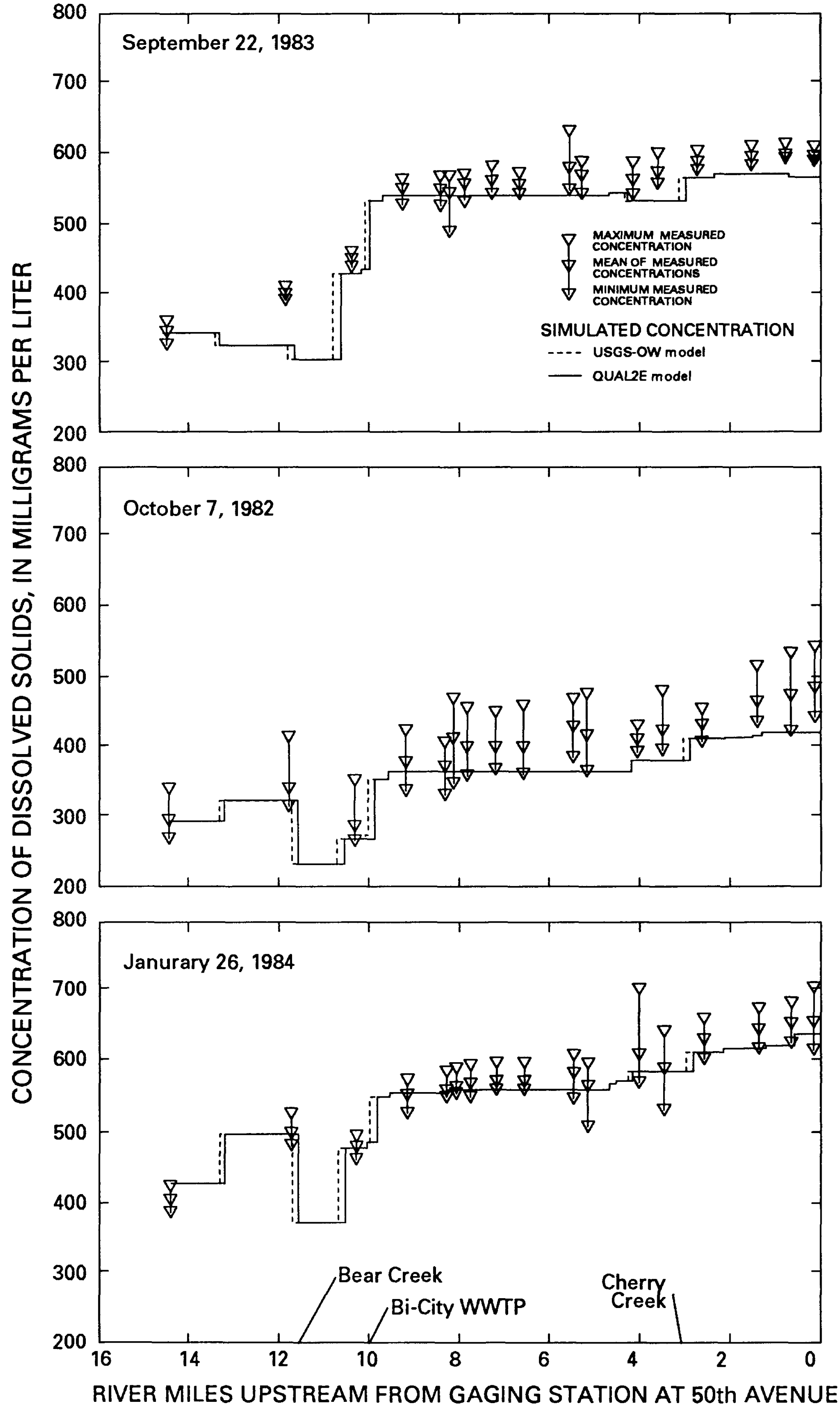

Figure 5.--Measured and simulated values of dissolved-solids concentrations for the calibration period of September 22, 1983, and the verification periods of October 7, 1982, and January 26, 1984.

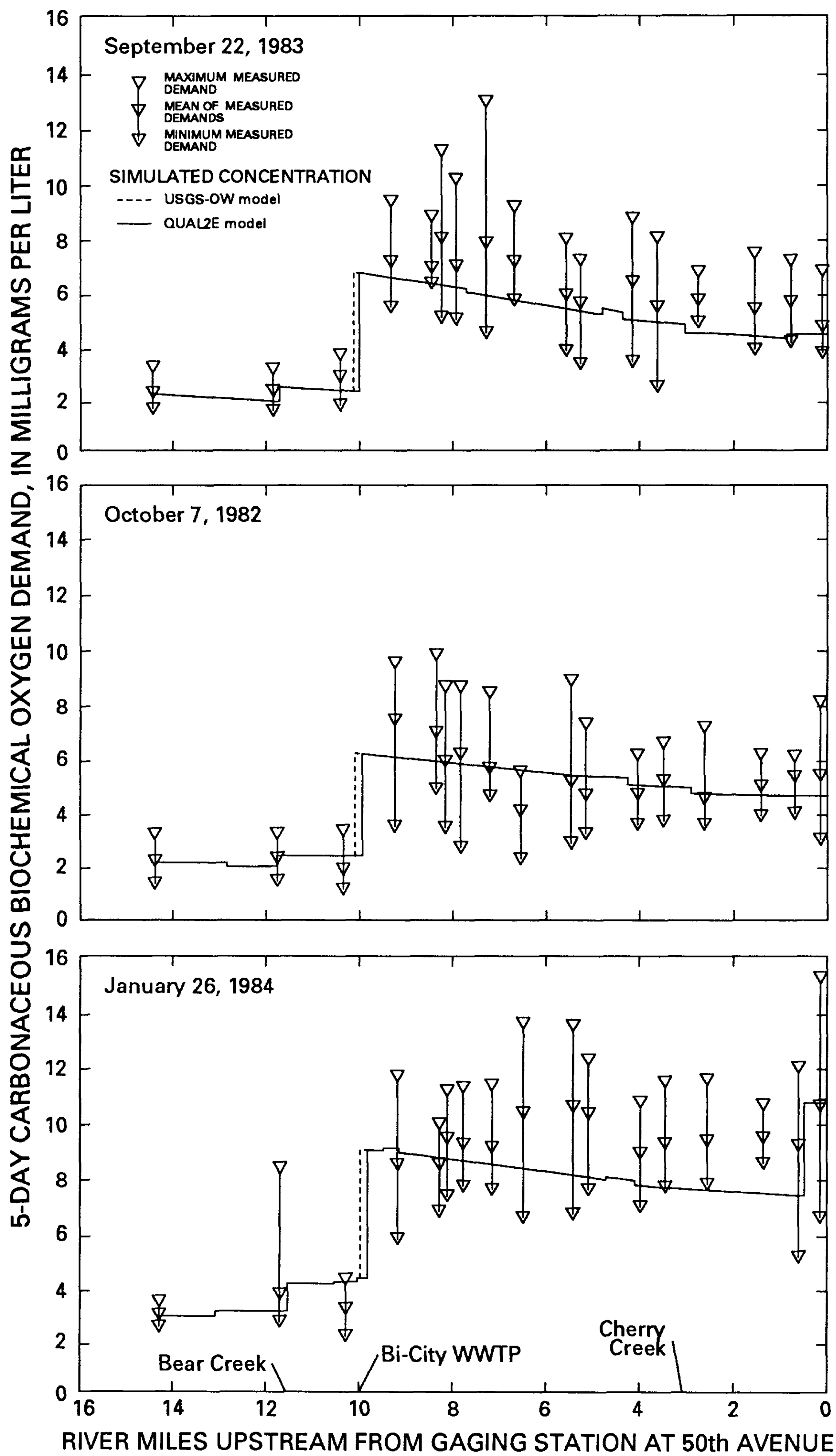

Figure 6.--Measured and simulated values of 5-day carbonaceous biochemical oxygen demands for the calibration period of September 22, 1983, and the verification periods of October 7, 1982, and January 26, 1984.

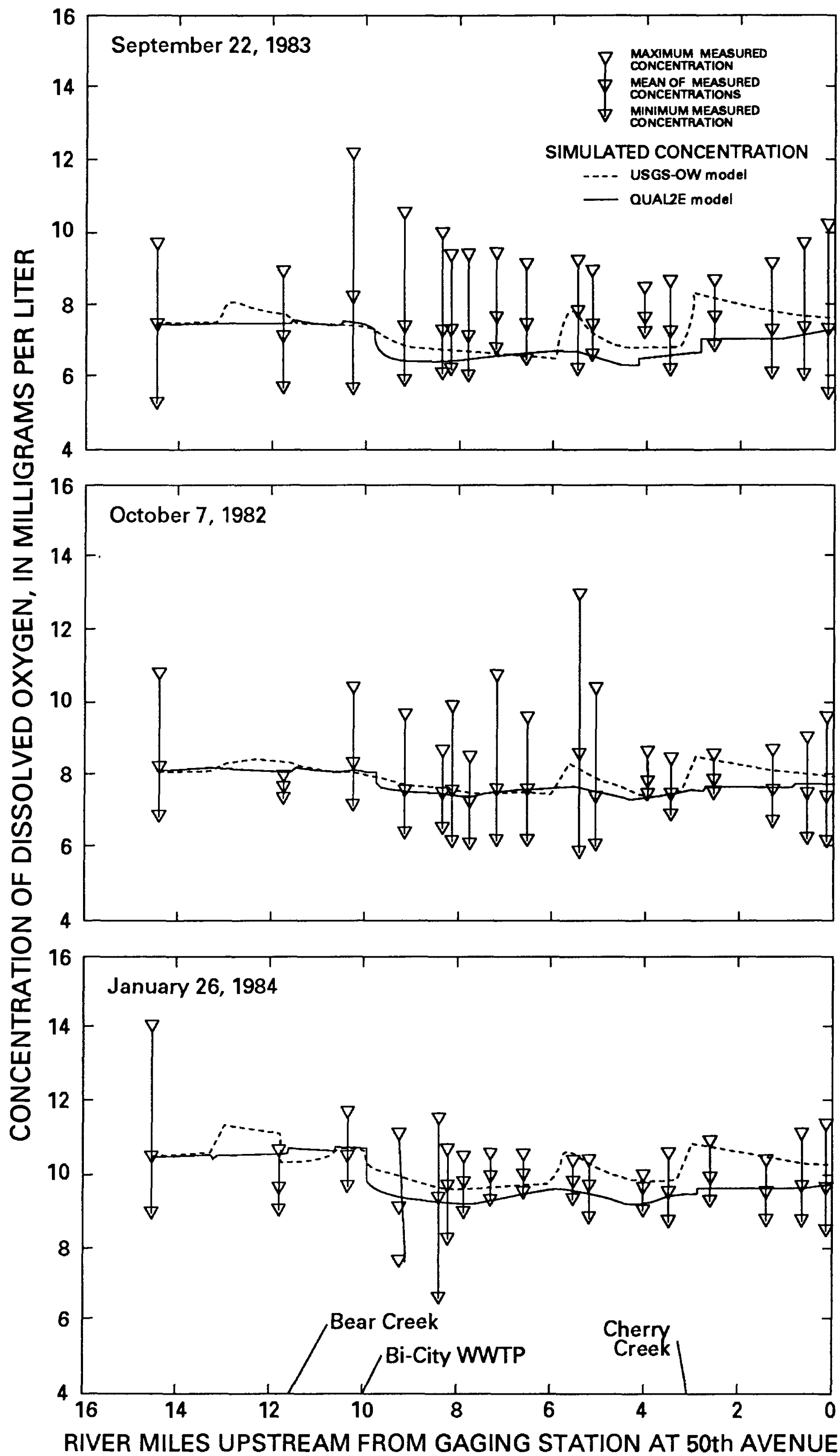

Figure 7.--Measured and simulated concentrations of dissolved oxygen for the calibration period of September 22, 1983, and the verification periods of October 7, 1982, and January 26, 1984.

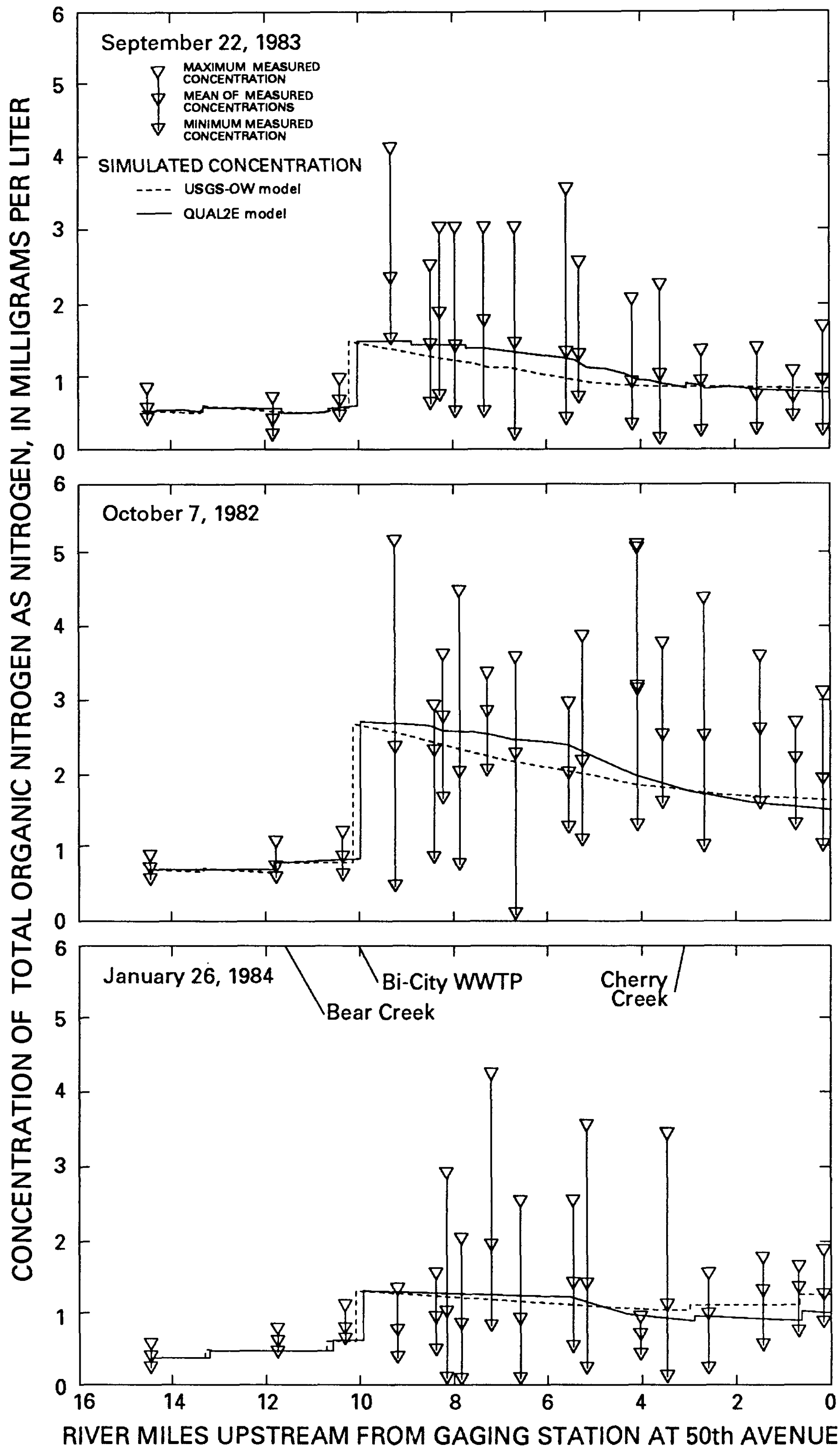

Figure 8.--Measured and simulated concentrations of total organic nitrogen as nitrogen for the calibration period of September 22, 1983, and the verification periods of October 7, 1982, and January 26, 1984.

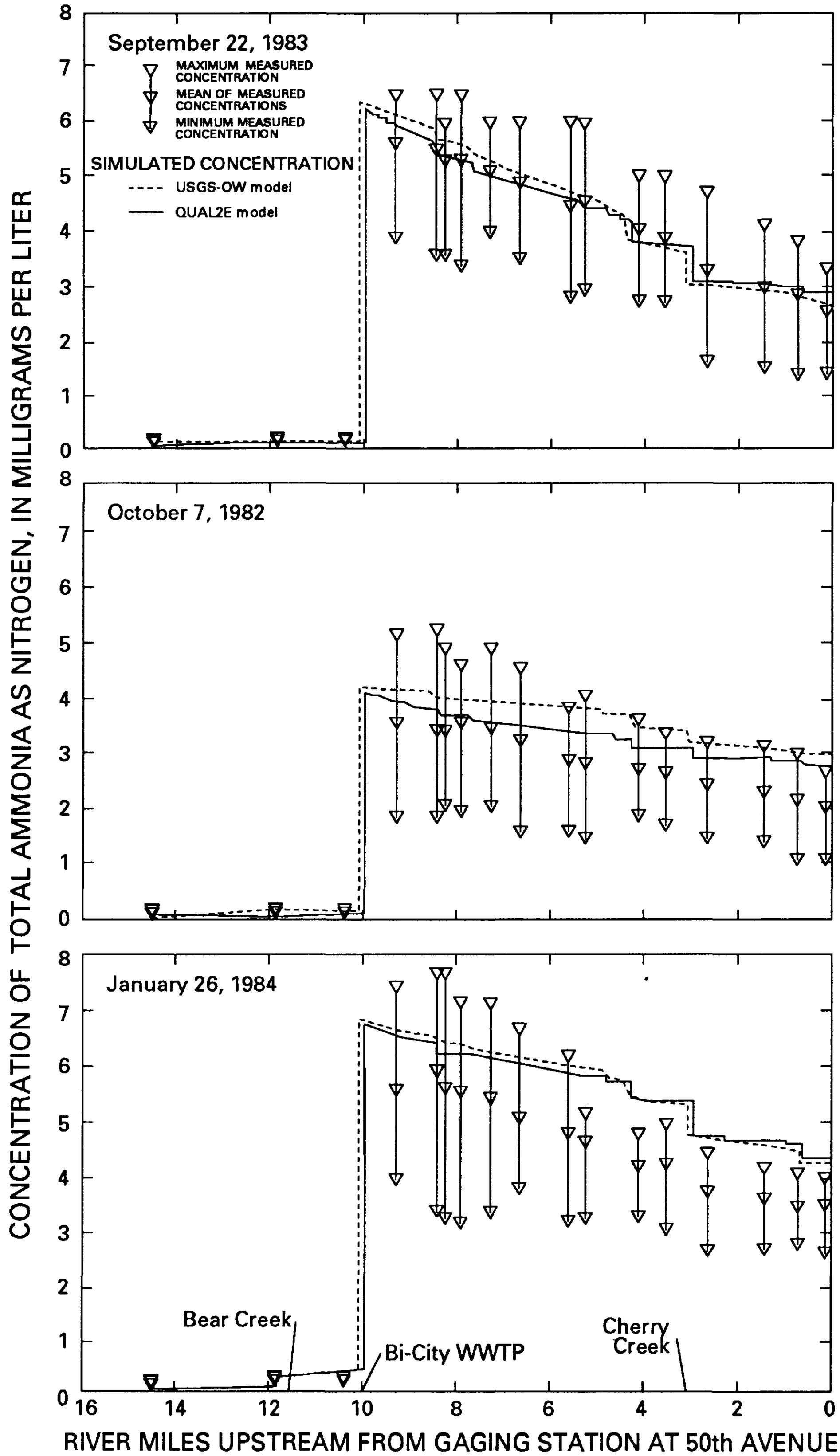

Figure 9.--Measured and simulated concentrations of total ammonia as nitrogen for the calibration period of September 22, 1983, and the verification periods of October 7, 1982, and January 26, 1984.

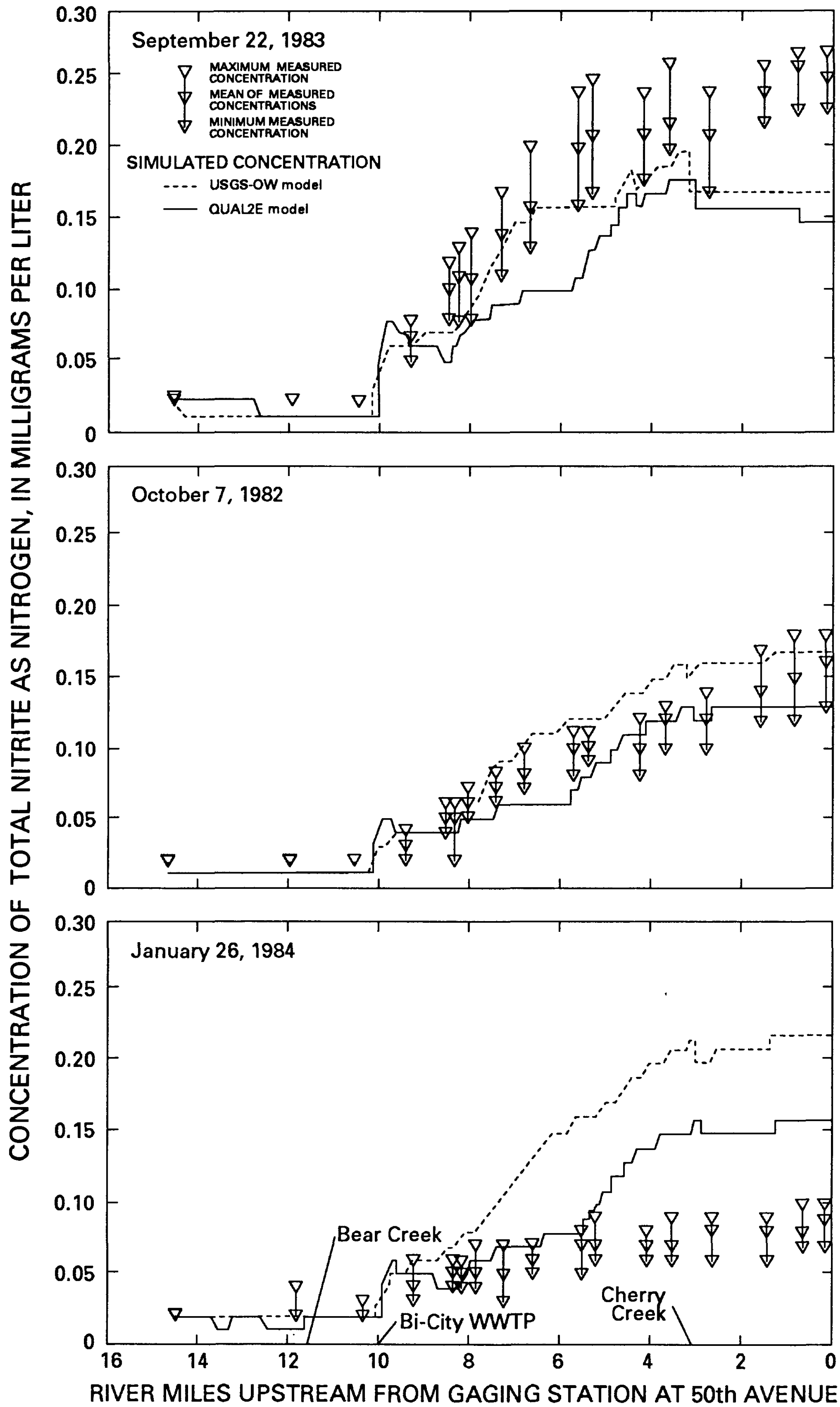

Figure 10.--Measured and simulated concentrations of total nitrite as nitrogen for the calibration period of September 22, 1983, and the verification periods of October 7, 1982, and January 26, 1984.

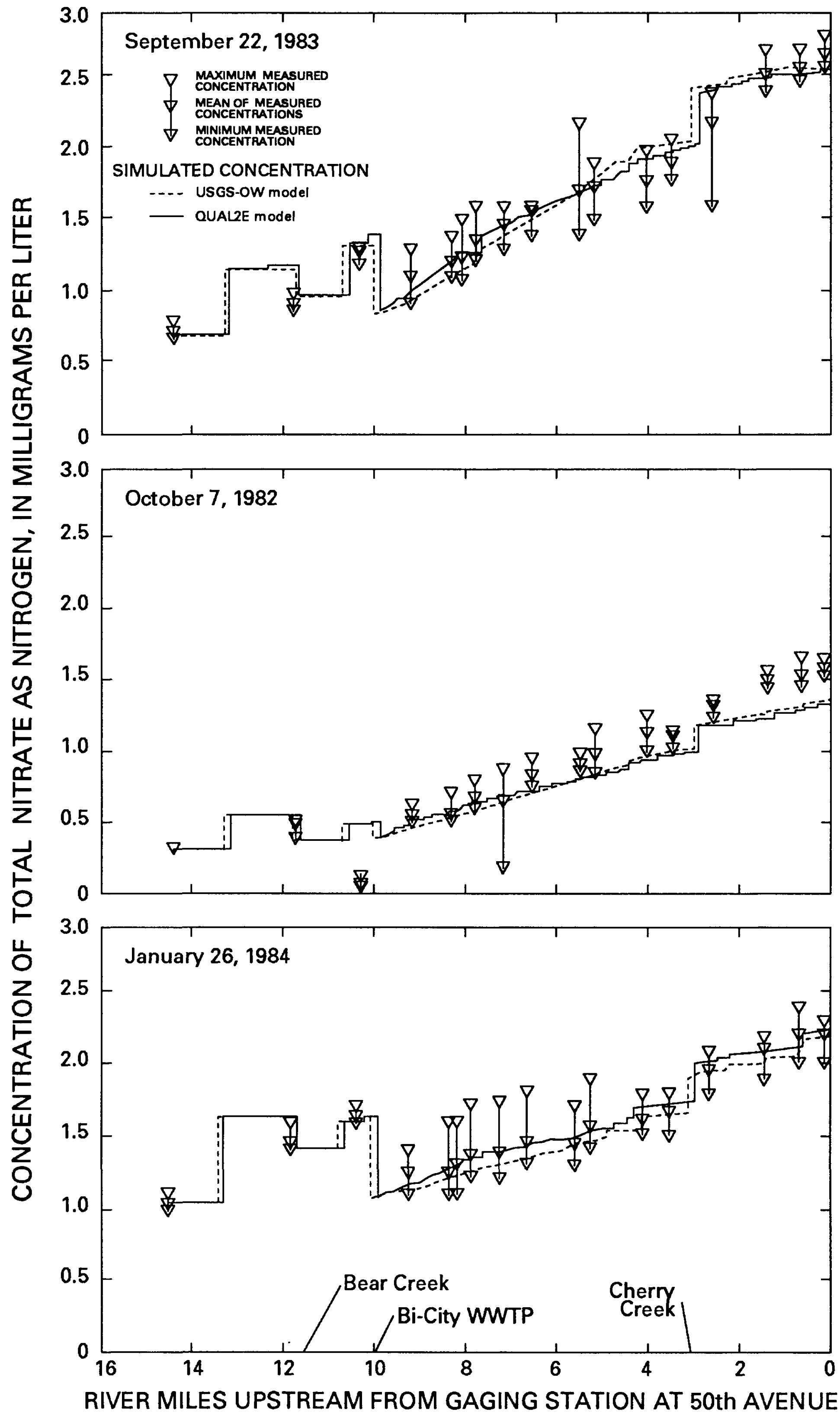

Figure 11.--Measured and simulated concentrations of total nitrate as nitrogen for the calibration period of September 22, 1983, and the verification periods of October 7, 1982, and January 26, 1984.

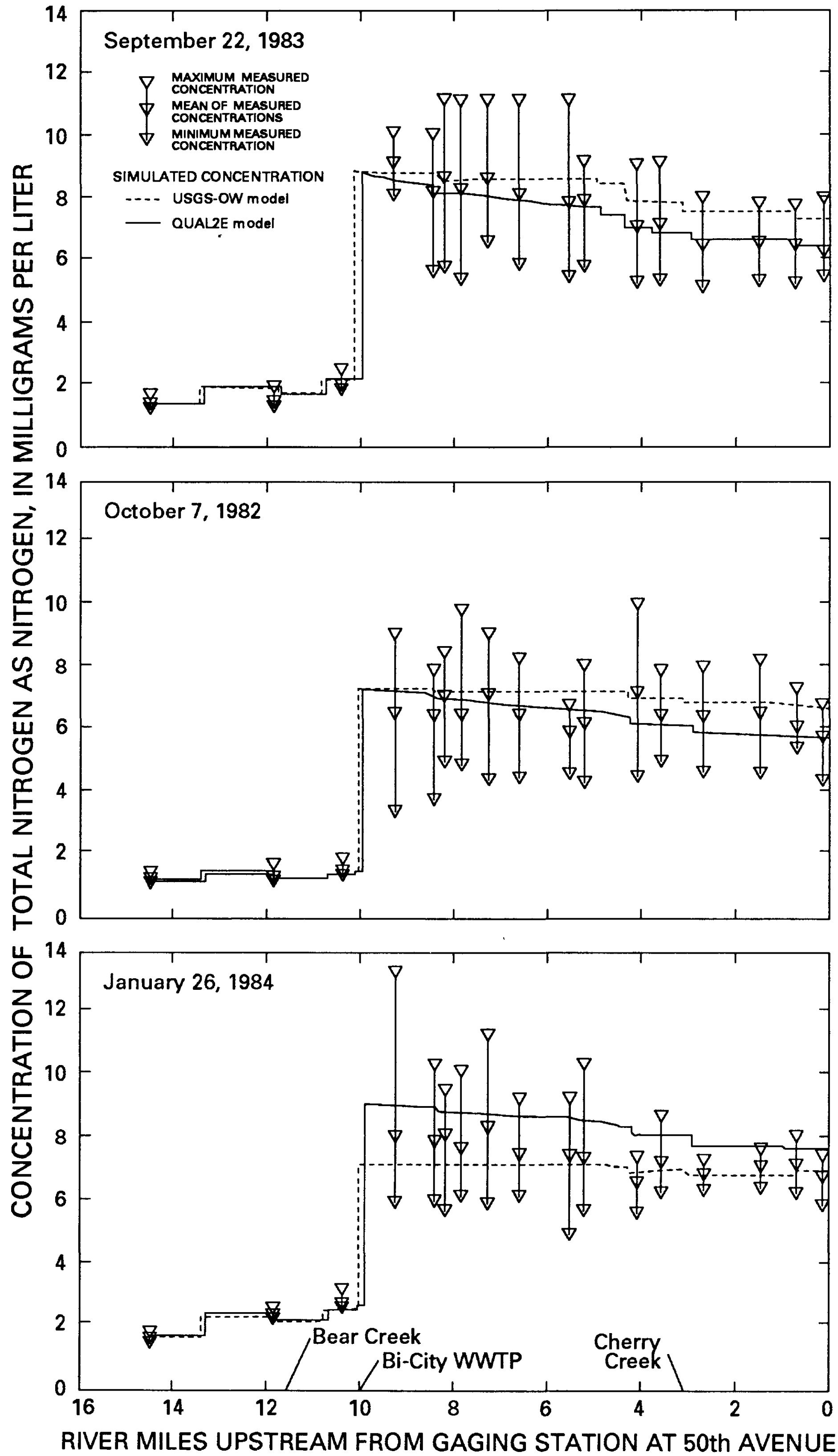

Figure 12.--Measured and simulated concentrations of total nitrogen as nitrogen for the calibration period of September 22, 1983, and the verification periods of October 7, 1982, and January 26, 1984.

REVISIONS OF THE QUAL2E MODEL DATA SET

The QUAL2E model data sets were revised to include streamflow and water-quality data for Bear Creek and Cherry Creek upstream to Bear Creek Lake and Cherry Creek reservoir, respectively, and for a reach of the South Platte River that extended 4.5 river miles upstream from the Littleton gaging station to the regulation dam at the Chatfield Reservoir (fig. 1). To allow the data sets to be used for other than the measured streamflow conditions during the calibration and verification periods, depth (d) and velocity (v) coefficients were estimated by relations with streamflow (Q) from 11 sites:

$$d = AQ^a$$

$$v = BQ^b$$

where A, B, a, and b are regression coefficients. Streamflow and water-quality data for the tributaries and the Centennial and Glendale WWTP's were provided by the DRCOG and the CDH, WQCD (see "Simulation Input Data" section). The data were not complete enough to enable calibration or verification of streamflows or water-quality concentrations in the tributaries, but were used to estimate the water quality of the tributaries at their mouths.

The model was recalibrated and reverified; the reaction coefficients remained unchanged except for streamflow coefficients discussed above (see "Supplemental Information" section at the back of this report). The results of the simulations using the revised data sets are shown in figures 13-21. As indicated in table 3, the coefficients of variation of simulated streamflows and all constituents, except total nitrite, were less than 10 percent. The revised QUAL2E model is considered calibrated and verified for streamflow and all constituents, except total nitrite.

SIMULATIONS OF CRITICAL LOW STREAMFLOW CONDITIONS AND WASTEWATER EFFLUENT USING THE REVISED QUAL2E MODEL

The effects of wastewater effluent on the South Platte River were simulated for critical low streamflow conditions during 1989 and 2010 using the revised QUAL2E model that included the 19-river-mile reach of the South Platte River and the Bear Creek and Cherry Creek tributaries. Summer-chronic conditions are based on the lowest 30-day average streamflow in August during a 3-year period. Acute conditions are based on the lowest 1-day, 3-year, June streamflows; and winter-chronic conditions are based on the lowest 30-day, 3-year, January streamflows. Model inputs for September 22, 1983, for calibration reaction coefficients, most initial conditions, and most point-source inflows were used for summer-chronic and acute conditions, and corresponding model inputs for January 26, 1984, were used for winter-chronic conditions. The model inputs of water temperatures for summer-chronic conditions were all assumed to be 68 °F, the inputs for acute conditions were assumed to be the same as for September 22, 1983, and the inputs for winter-chronic conditions were assumed to be the same as for January 26, 1984.

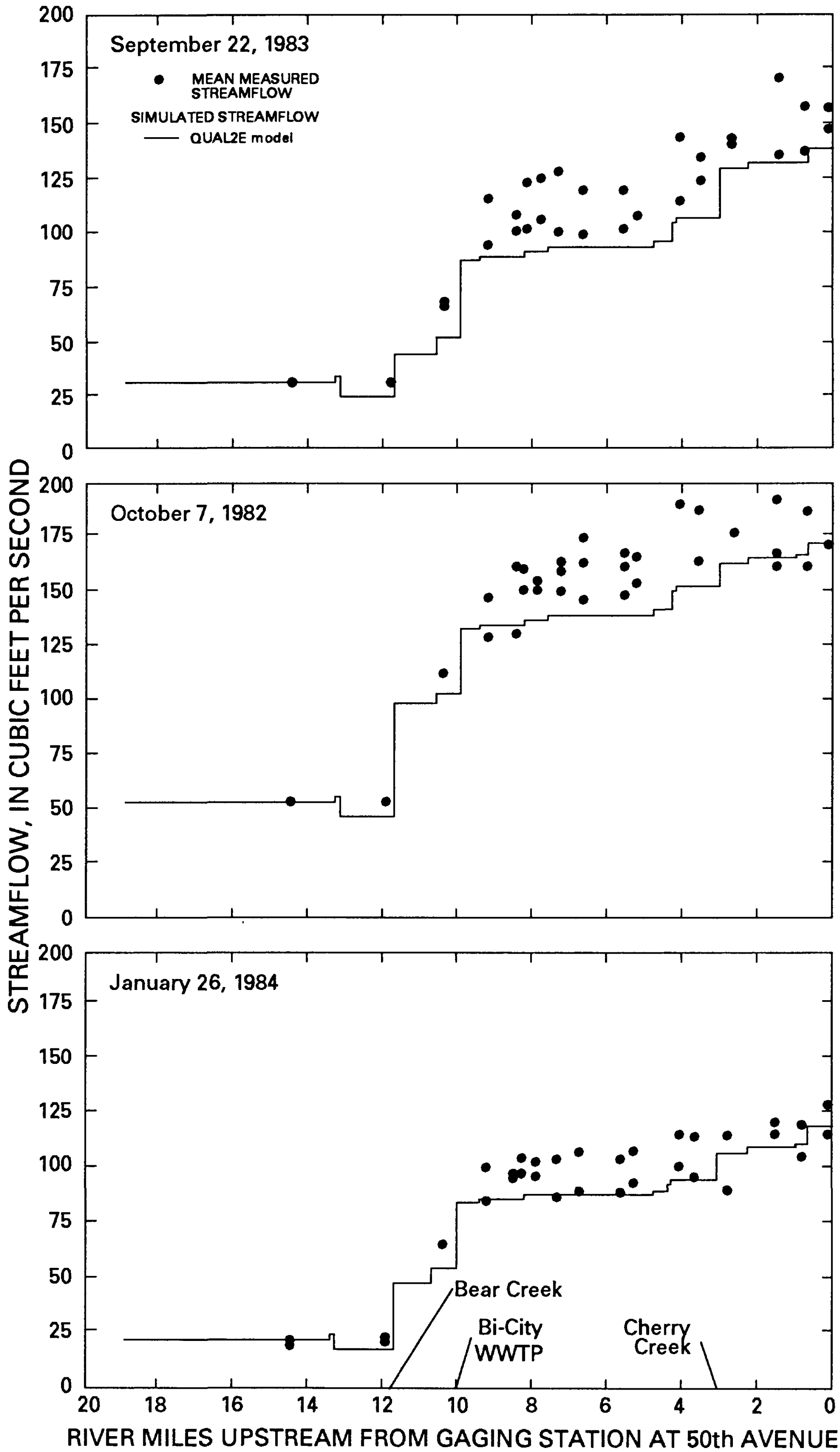

Figure 13.--Mean measured and revised QUAL2E simulated values of streamflow for the calibration period of September 22, 1983, and the verification periods of October 7, 1982, and January 26, 1984.

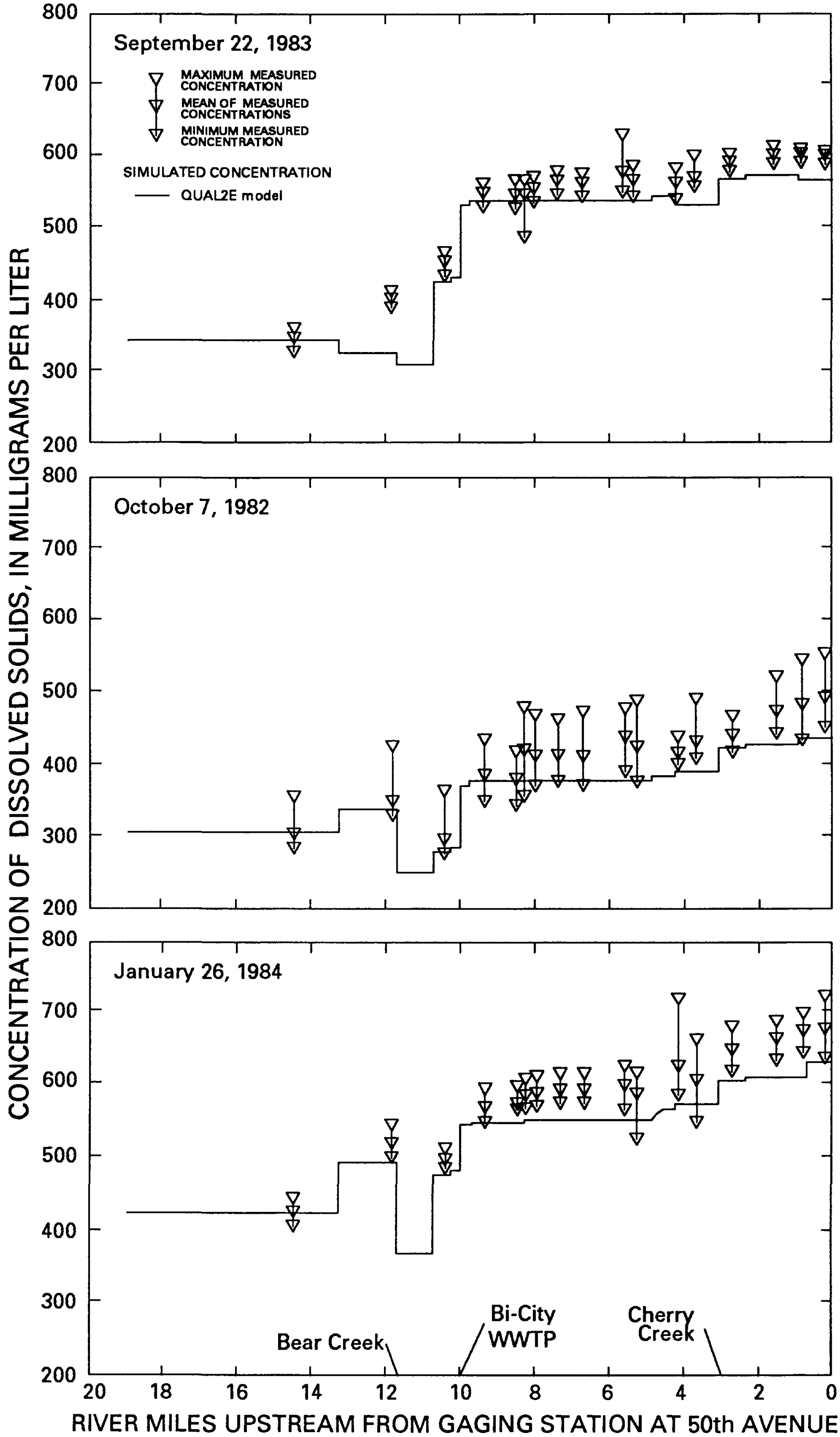

Figure 14.--Measured and revised QUAL2E simulated values of dissolved-solids concentrations for the calibration period of September 22, 1983, and the verification periods of October 7, 1982, and January 26, 1984.

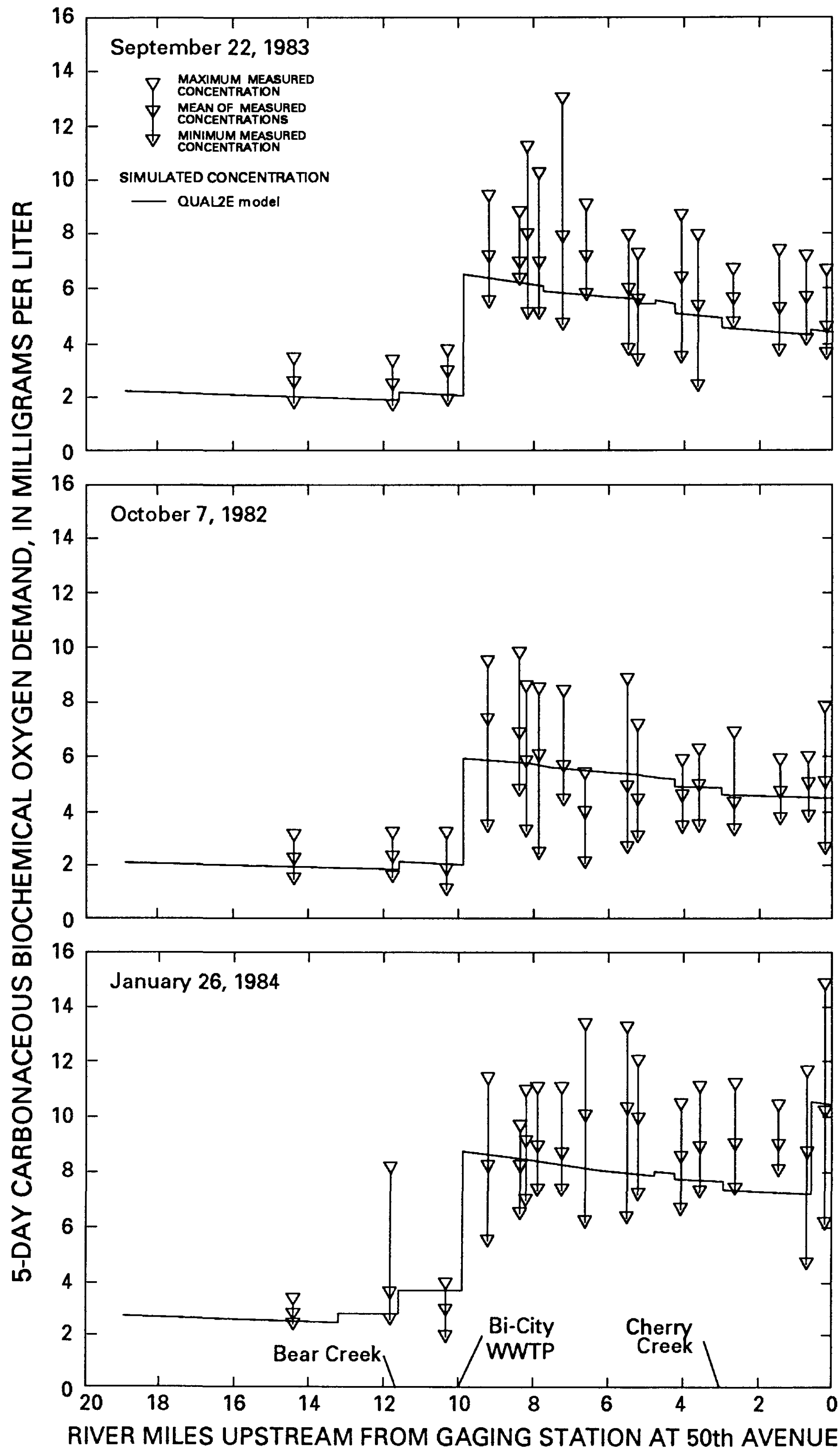

Figure 15.--Measured and revised QUAL2E simulated values of 5-day carbonaceous biochemical oxygen demands for the calibration period of September 22, 1983, and the verification periods of October 7, 1982, and January 26, 1984.

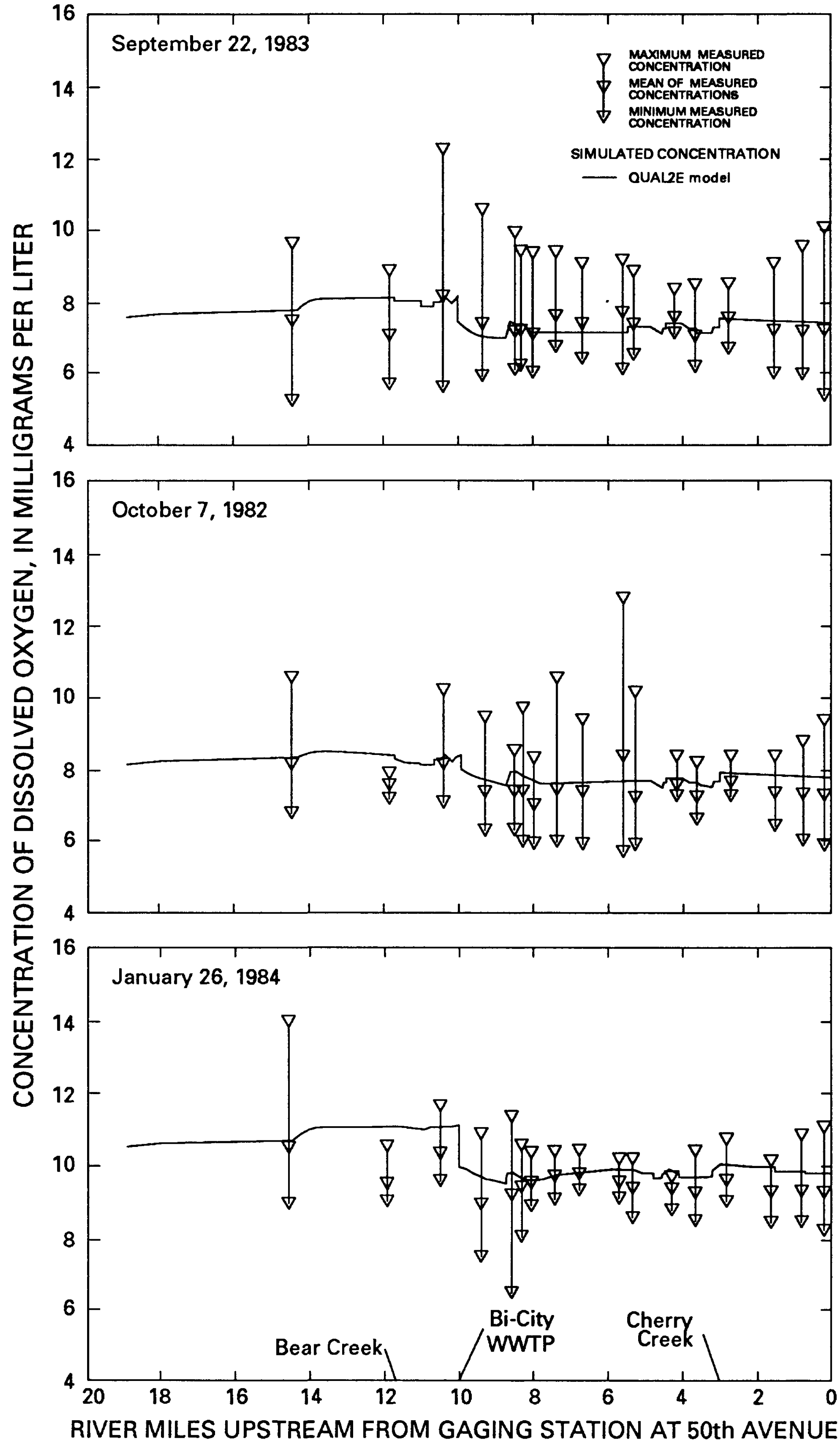

Figure 16.--Measured and revised QUAL2E simulated concentrations of dissolved oxygen for the calibration period of September 22, 1983, and the verification periods of October 7, 1982, and January 26, 1984.

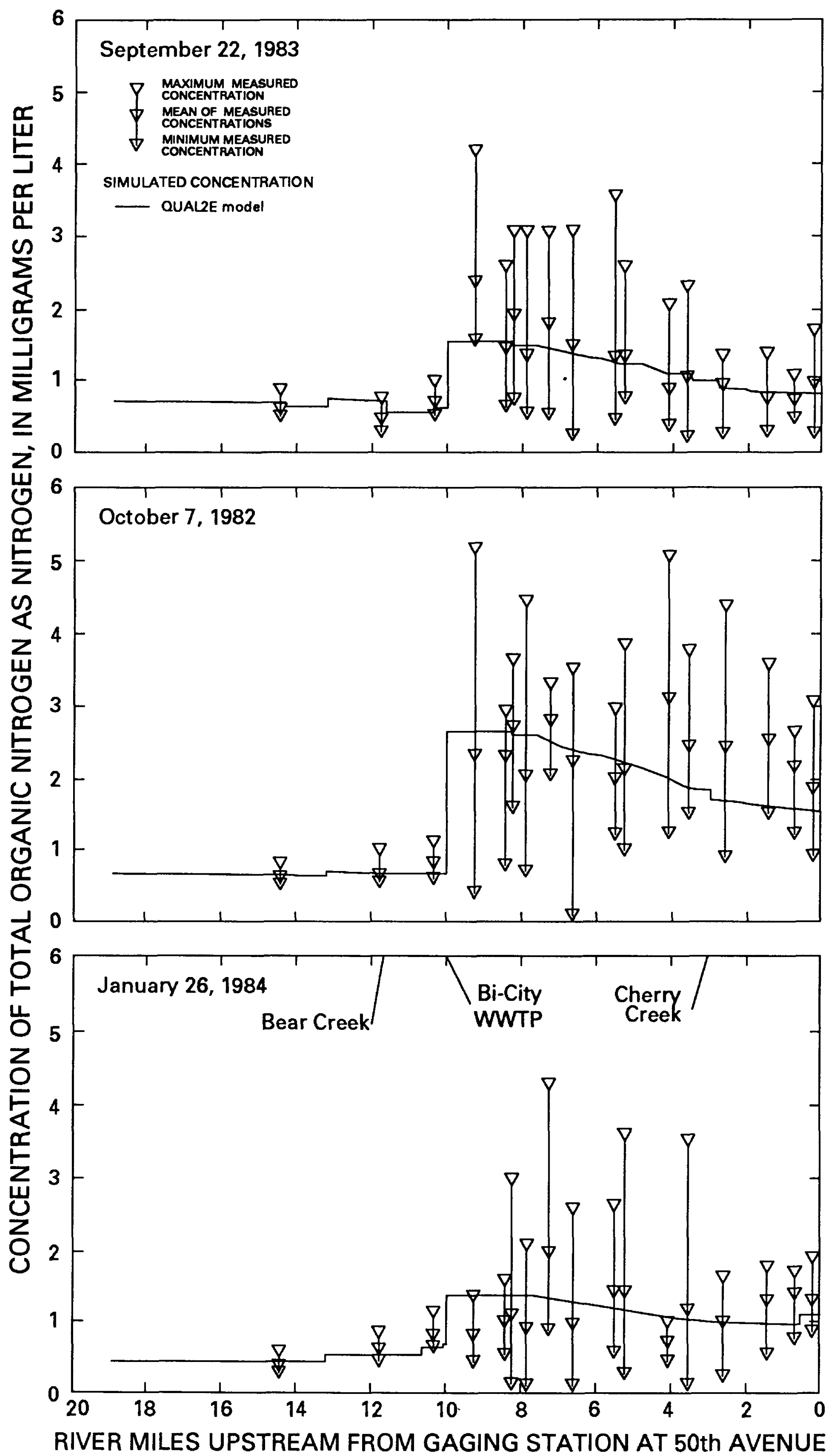

Figure 17.--Measured and revised QUAL2E simulated concentrations of total organic nitrogen as nitrogen for the calibration period of September 22, 1983, and the verification periods of October 7, 1982, and January 26, 1984.

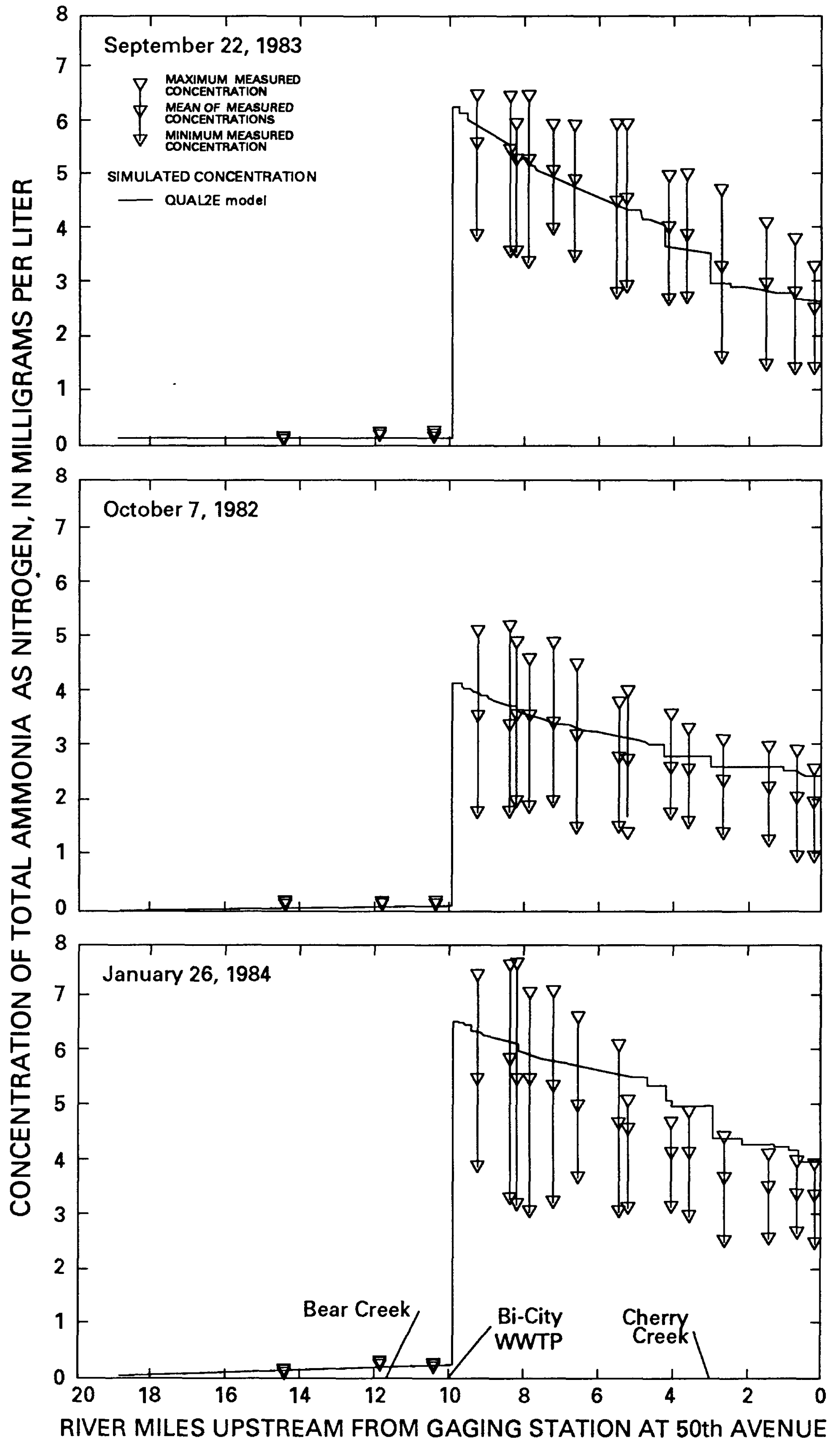

Figure 18.--Measured and revised QUAL2E simulated concentrations of total ammonia as nitrogen for the calibration period of September 22, 1983, and the verification periods of October 7, 1982, and January 26, 1984.

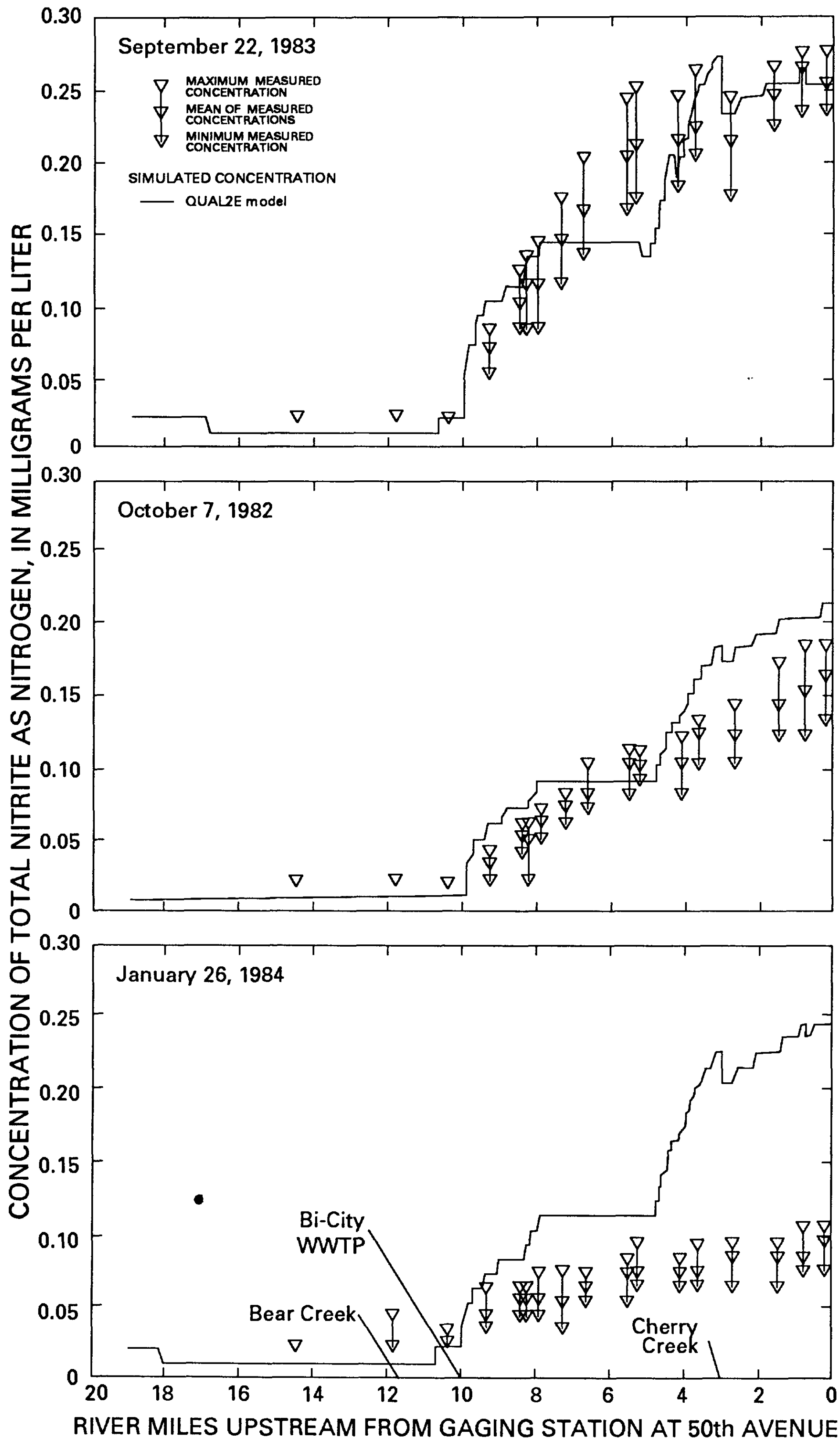

Figure 19.--Measured and revised QUAL2E simulated concentrations of total nitrite as nitrogen for the calibration period of September 22, 1983, and the verification periods of October 7, 1982, and January 26, 1984.

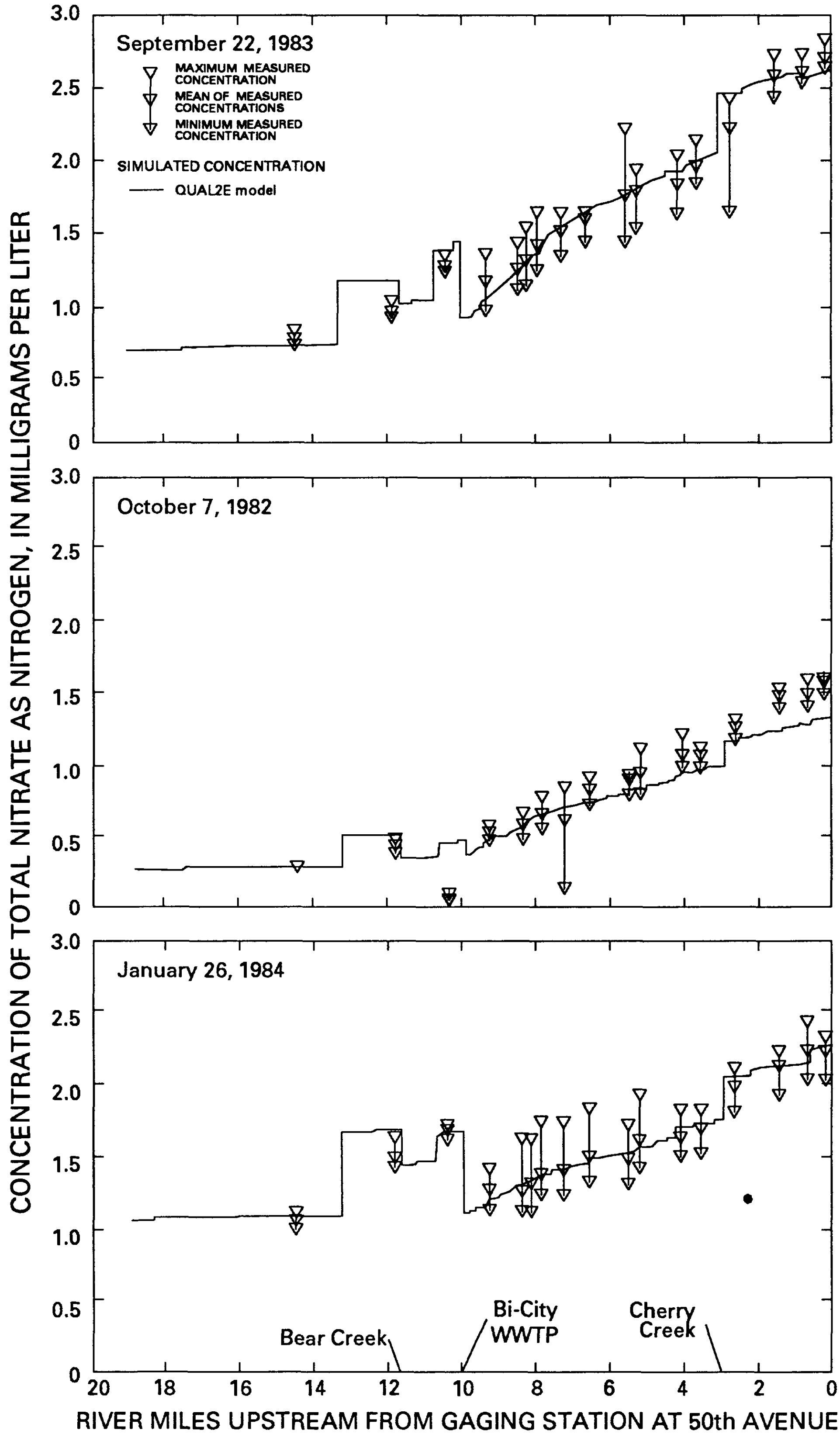

Figure 20.--Measured and revised QUAL2E simulated concentrations of total nitrate as nitrogen for the calibration period of September 22, 1983, and the verification periods of October 7, 1982, and January 26, 1984.

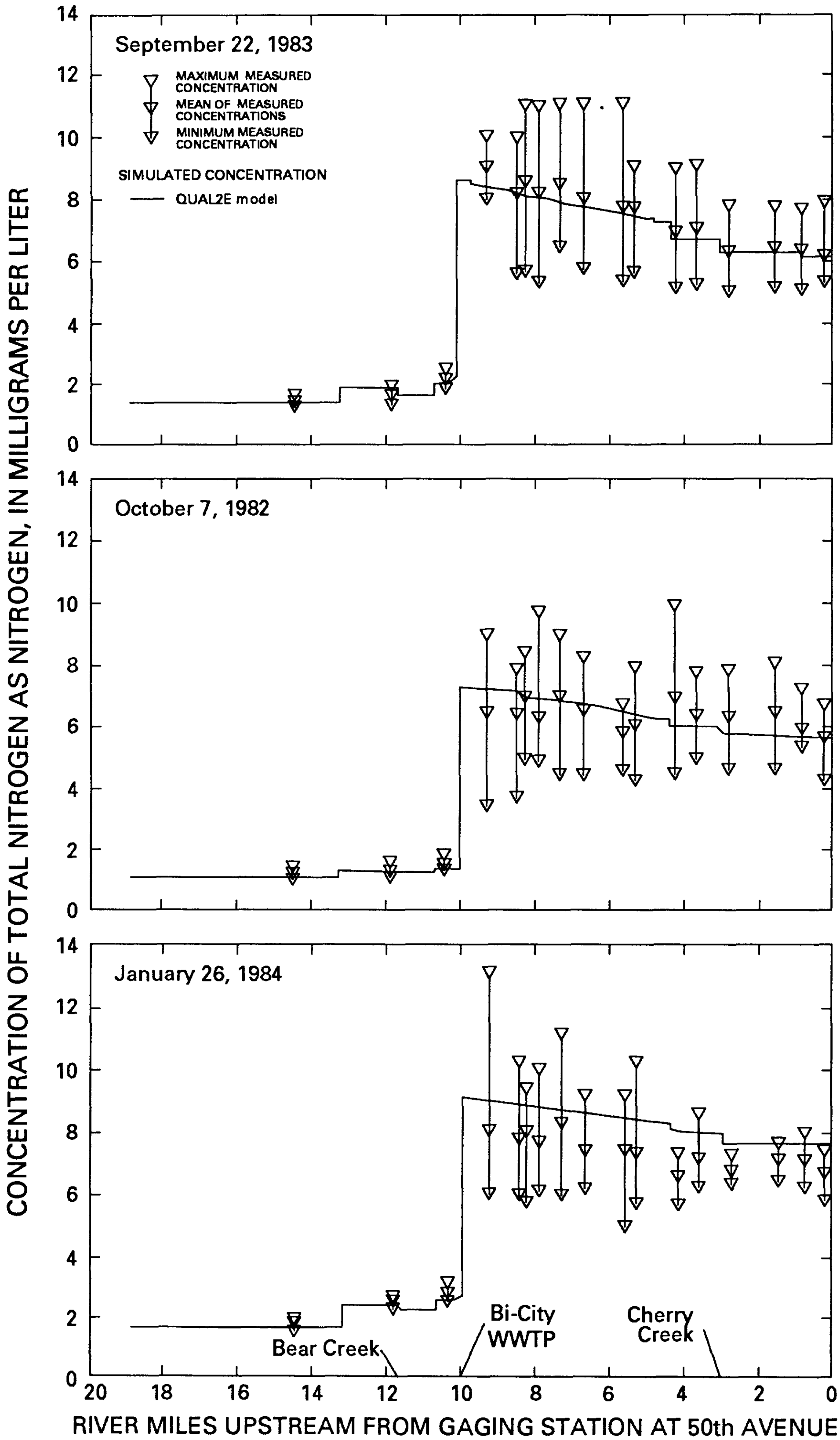

Figure 21.--Measured and revised QUAL2E simulated concentrations of total nitrogen as nitrogen for the calibration period of September 22, 1983, and the verification periods of October 7, 1982, and January 26, 1984.

Table 3.--*Standard errors and coefficients of variation of the revised QUAL2E model results*

[SE, standard error[1]; CV, coefficient of variation[2]; ft^3/s, cubic feet per second; mg/L, milligrams per liter; $CBOD_5$, 5-day carbonaceous biochemical oxygen demand]

Properties and constituents	Units	Calibration data Sept. 22, 1983		Verification data Oct. 7, 1982		Verification data Jan. 26, 1984	
		SE	CV (percent)	SE	CV (percent)	SE	CV (percent)
Streamflow--------	ft^3/s	4.32	3.87	4.44	3.04	2.71	2.98
Dissolved solids--	mg/L	7.98	1.49	10.32	2.60	12.20	2.13
$CBOD_5$------------	mg/L	0.22	4.06	0.17	3.56	0.30	3.77
Dissolved oxygen--	mg/L	0.08	1.10	0.11	1.43	0.14	1.51
Total organic nitrogen as nitrogen--------	mg/L	0.06	5.34	0.12	5.96	0.08	7.75
Total ammonia as nitrogen-----	mg/L	0.05	1.27	0.07	2.96	0.16	4.25
Total nitrite as nitrogen-----	mg/L	0.01	4.54	0.01	10.28	0.02	37.38
Total nitrate as nitrogen-----	mg/L	0.02	1.31	0.04	5.32	0.01	0.79
Total nitrogen as nitrogen-----	mg/L	0.05	0.81	0.12	2.23	0.21	3.41

[1]Standard error is defined as the root-mean-square error of measured mean values and predicted values.

[2]Coefficient of variation is defined as the quotient of root-mean-square error and the mean of the measured values multiplied by 100.

Simulation Input Data

The calculations of critical low streamflows and constituent concentrations at the headwaters and WWTP point sources were provided by Paulson and Sanders (1987). Model inputs of constituent concentrations for the river and tributary headwaters were determined from existing data collected during the selected low-flow months (Denver Regional Council of Governments, 1983; Chatfield Basin Water Quality Association, 1989; Cherry Creek Water Quality Authority, 1989; R.M. Clayshulte, Denver Regional Council of Governments, written commun., 1989). An artificial point source at the Glendale gaging station on Cherry Creek was created to provide model inputs of streamflow and constituent concentrations for acute and winter-chronic conditions when the Cherry Creek headwater flow was zero. Streamflow values were obtained for the Glendale gaging station (Robert Owen, Colorado Department of Health, Water Quality Control Division, written commun., 1989). Constituent concentrations at the headwaters of Cherry Creek were used for model inputs for the periods when there was no streamflow downstream from the headwaters (Cherry Creek Water Quality Authority, 1989). Data and projections for the three critical low streamflow conditions are listed in table 4, and the actual model inputs are shown in the data sets in the "Supplemental Information" section at the back of this report. During the simulations, missing $CBOD_5$ data in the headwaters were replaced with $CBOD_5$ calibration values, and missing nitrogen-compound data for the headwaters of the tributaries were replaced with zeros.

Table 4.--*Data for summer-chronic, acute, and winter-chronic conditions in the South Platte River and selected tributaries*

[The term headwaters indicates the first computational element of the first modeled stream reach; current data and projections are from Cherry Creek Water Quality Authority (1989), Chatfield Basin Water Quality Association (1989), Denver Regional Council of Governments (1983), and Robert Owen (Colorado Department of Health, Water Quality Control Division, written commun., 1989), which accounts for variance in the number of significant figures; summer-chronic conditions are based on the lowest 30-day, 3-year, August streamflows; acute conditions are based on the lowest 1-day, 3-year, June streamflows; and winter-chronic conditions are based on the lowest 30-day, 3-year, January streamflows; ft^3/s, cubic feet per second; °F, degrees Fahrenheit; mg/L, milligrams per liter; --, data not available]

Properties and constituents	South Platte River		Bear Creek		Cherry Creek	
	Headwaters	Englewood	Headwaters	Mouth	Headwaters	Mouth
Streamflow (ft^3/s)						
Summer chronic-----	65	68	0.60	5.0	7.9	15.9
Acute--------------	19	8.0	2.0	3.0	[1]8.7	15
Winter chronic-----	25	38	1.0	10	[1]4.2	15
Water temperature (°F)						
Summer chronic-----	68.0	66.6	--	68.0	--	74.7
Acute[2]-------------	60.3	57.2	57.2	59.0	60.8	59.0
Winter chronic[3]----	37.4	37.4	37.4	37.4	41.0	41.0
5-day carbonaceous biochemical oxygen demand (mg/L)						
Summer chronic-----	--	--	--	3.0	2.6	5.2
Acute--------------	--	--	--	2.0	--	4.4
Winter chronic-----	--	--	--	2.0	--	3.5
Dissolved oxygen (mg/L)						
Summer chronic-----	6.6	--	7.1	8.3	7.1	6.6
Acute--------------	6.2	--	7.3	8.4	8.3	7.1
Winter chronic-----	6.4	--	11.2	--	9.8	--
Total organic nitrogen as nitrogen (mg/L)						
Summer chronic-----	0.2	--	0.38	1.04	1.1	3.8
Acute--------------	0.47	--	0.29	0.74	--	2.7
Winter chronic-----	0.01	--	2.4	0.98	--	1.3
Total ammonia as nitrogen (mg/L)						
Summer chronic-----	0.14	--	0.06	0.78	0.19	0.19
Acute--------------	0.11	--	0.05	0.31	0.04	0.08
Winter chronic-----	0.08	--	0.01	2.2	0.16	0.08
Total nitrite as nitrogen (mg/L)						
Summer chronic-----	0.02	--	0.01	0.01	--	0.06
Acute--------------	0.00	--	--	0.01	0.02	0.04
Winter chronic-----	0.00	--	--	0.01	0.0	0.10

Table 4.--*Data for summer-chronic, acute, and winter-chronic conditions in the South Platte River and selected tributaries*--Continued

Properties and constituents	South Platte River		Bear Creek		Cherry Creek	
	Head-waters	Englewood	Head-waters	Mouth	Head-waters	Mouth
Total nitrate as nitrogen (mg/L)						
Summer chronic-----	0.20	--	0.01	0.83	0.02	2.6
Acute--------------	0.12	--	0.23	0.30	0.11	2.4
Winter chronic-----	0.32	--	0.57	2.2	0.18	3.6

[1]Streamflows measured at the Glendale gaging station (see figure 1).
[2]Assumed to be the same as temperatures on September 22, 1983.
[3]Assumed to be the same as temperatures on January 26, 1984.

Streamflows and constituent concentrations measured at the mouths of the Bear Creek and Cherry Creek tributaries (Denver Regional Council of Governments, 1983) generally were larger than the predicted values calculated from the model mass balances of headwater inputs and measured point sources. Unmeasured nonpoint sources probably provide water to the tributaries. Rather than estimate nonpoint inflows and concentrations in the tributaries, artificial point sources were created in the model to provide unmeasured inflow volumes and constituent concentrations to the tributaries near their confluences with the South Platte River. Concentrations in these artificial point sources were computed by mass balance, using the measured streamflow and constituent concentrations that were present upstream in the tributaries and at their mouths.

Current (1989) 1-year mean values of wastewater discharge and wastewater-effluent concentrations were used for the 1989 simulations. Projected wastewater discharges and wastewater-effluent concentrations that were based on 1989 permit limits established by the National Pollutant Discharge Elimination System (C.L. Paulson, Brown and Caldwell, Inc., written commun., 1988; Colorado Department of Health, Water Quality Control Division, 1989a,b,c) were used for the 2010 simulations. The data are in table 5, and the model inputs are shown in the data sets in the "Supplemental Information" section at the back of this report. The decrease in the concentration of total ammonia projected for the Bi-City WWTP between 1989 and permit maximum (table 5) limits is expected to result from implementation of a nitrification treatment process. This process also would cause the large increase projected for the concentration of total nitrate.

Simulation Results

The predicted effects of wastewater effluent on the South Platte River were evaluated by comparing the results of the simulations for 1989 conditions with the results of the simulations for projected 2010 conditions. Because of uncertainties in the model representation of the river system, the differences between simulations are a more appropriate measure of effect than the concentrations predicted by a single simulation. The simulated streamflows for 1989

Table 5.--*Data for effluent discharges and concentrations from selected wastewater-treatment plants to the South Platte River and Cherry Creek*

[Current data and projections are from C.L. Paulson (Brown and Caldwell, Inc., written commun., 1988) for the Denver Regional Council of Governments, and the Colorado Department of Health, Water Quality Control Division (1989a,b,c), which accounts for the variance in the number of significant figures; summer-chronic conditions are based on the lowest 30-day, 3-year, August streamflows; acute conditions are based on the lowest 1-day, 3-year, June streamflows; and winter-chronic conditions are based on the lowest 30-day, 3-year, January streamflows. Constituent concentrations are based on 1989 effluent-discharge permits, except for total organic nitrogen and total nitrate, which are estimated; ft^3/s, cubic feet per second; mg/L, milligrams per liter]

Properties and constituents	Wastewater-treatment plants		
	Centennial	Bi-City	Glendale
Effluent discharge (ft^3/s)			
Current (1989) 1-year mean-------	0.79	36.5	1.5
Projected (2010) estimate--------	6.46	47.21	2.05
5-day carbonaceous biochemical oxygen demand (mg/L)			
Current (1989) 1-year mean-------	5.3	9.3	1.94
Permit maximum limit			
Summer chronic (August)-----	30	20	30
Acute (June)----------------	45	30	30
Winter chronic (January)----	30	20	30
Dissolved oxygen (mg/L)			
Current (1989) 1-year mean-------	9.9	[1]8.8	6.5
Permit minimum limit-------------	5.0	6.0	6.0
Total organic nitrogen as nitrogen (mg/L)			
Current (1989) 1-year estimate---	0	2.87	0
Projected (2010) estimate--------	3	3	3
Total ammonia as nitrogen (mg/L)			
Current (1989) 1-year mean-------	0.7	18.9	0.93
Permit maximum limit			
Summer chronic (August)-----	2.4	4.3	4.2
Acute (June) (chronic limit used for Bi-City plant)---	4.9	6.0	8.2
Winter chronic (January)----	5.2	12.9	6.6
Total nitrate as nitrogen (mg/L)			
Current (1989) 1-year estimate---	13	6	14
Projected (2010) estimate--------	15	15	15

[1]Mean of concentrations from calibration and verification data sets.

and 2010 effluent-discharge conditions are shown in figure 22. Because of the higher South Platte headwater-flow and WWTP in flows predicted for 2010, as compared to flows measured in 1989, the simulated winter streamflows for effluent-discharge conditions generally are higher than the streamflows shown in figure 13. The only exception is between the Bear Creek inflow and the Bi-City WWTP inflow (about river mile 12 to river mile 10), because of the lower Bear Creek flow predicted for 2010.

Simulations indicated that predicted values of $CBOD_5$ were about 1.5 to about 15 mg/L greater for 2010 conditions than for 1989 conditions (fig. 23). However, because of high rates of reaeration in the South Platte River, predicted dissolved-oxygen concentrations were about the same for 2010 conditions as for 1989 conditions (fig. 24). There was a slight decrease in predicted dissolved-oxygen concentration in the South Platte River downstream from the Bi-City WWTP for 2010 conditions.

Upstream from the Bi-City WWTP, predicted concentrations of total ammonia were about 0.2 to about 1.1 mg/L greater for 2010 conditions than for 1989 conditions (fig. 25), and predicted concentrations of total nitrate were about 0.7 to about 2.8 mg/L greater for 2010 conditions than for 1989 conditions (fig. 26). This is a result of expected population increases in the area served by the Centennial WWTP and associated increases in effluent volume and nitrogen-species concentrations from the Centennial WWTP. Downstream from the Bi-City WWTP, predicted concentrations of total ammonia were about 0.7 to about 10 mg/L less for 2010 conditions than for 1989 conditions (fig. 25), and predicted concentrations of total nitrate were about 0.7 to about 6 mg/L greater for 2010 conditions than for 1989 conditions (fig. 26). The predicted decrease of total ammonia and the predicted increase of total nitrate downstream from the Bi-City WWTP is a result of the expected implementation of a nitrification treatment process at the Bi-City WWTP.

Concentrations of un-ionized ammonia as nitrogen (hereinafter referred to as un-ionized ammonia) (fig. 27) were calculated for each computational element from predicted concentrations of total ammonia using an equation developed by Thurston and others (1974) for water having no salinity:

$$[\text{un-ionized ammonia}] = [\text{total ammonia}] \,/\, \{1 + 10^{(pka\ -\ pH)}\}$$

where:

$$pka = 0.09018 + 2729.92/(273.18 + \text{water temperature, in degrees Celsius}).$$

Water-temperature values were obtained from the QUAL2E input data sets. Values of pH were assigned to computational elements based on data from Spahr and others (1985). Median pH was determined for each sampling site on each measurement date. The median pH value at a site generally was assumed to apply downstream to the next site (table 6). The sole exception was downstream from the Bi-City WWTP outfall. Because the discharge from the Bi-City WWTP causes pH in the South Platte River to decrease, the pH measurement upstream from the outfall was assumed to apply only downstream to the outfall point. At the outfall, pH was assumed to change to the value measured at the next downstream sampling site, at Evans Avenue (table 6). The uncertainties in water temperature and pH values can cause the calculated concentrations of

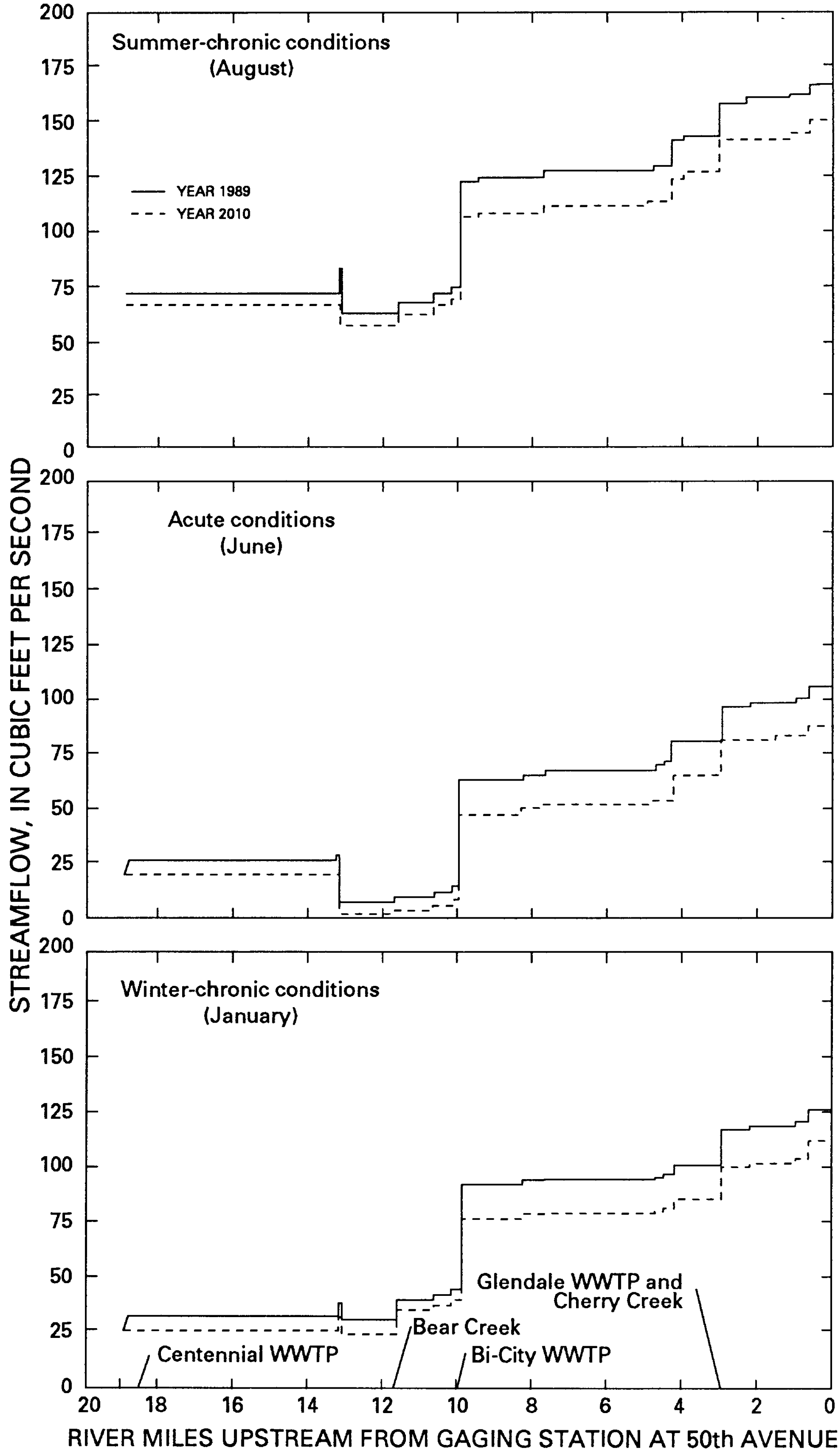

Figure 22.--QUAL2E simulated streamflows for current (1989) and projected (2010) wastewater-treatment effluents during summer-chronic, acute, and winter-chronic conditions.

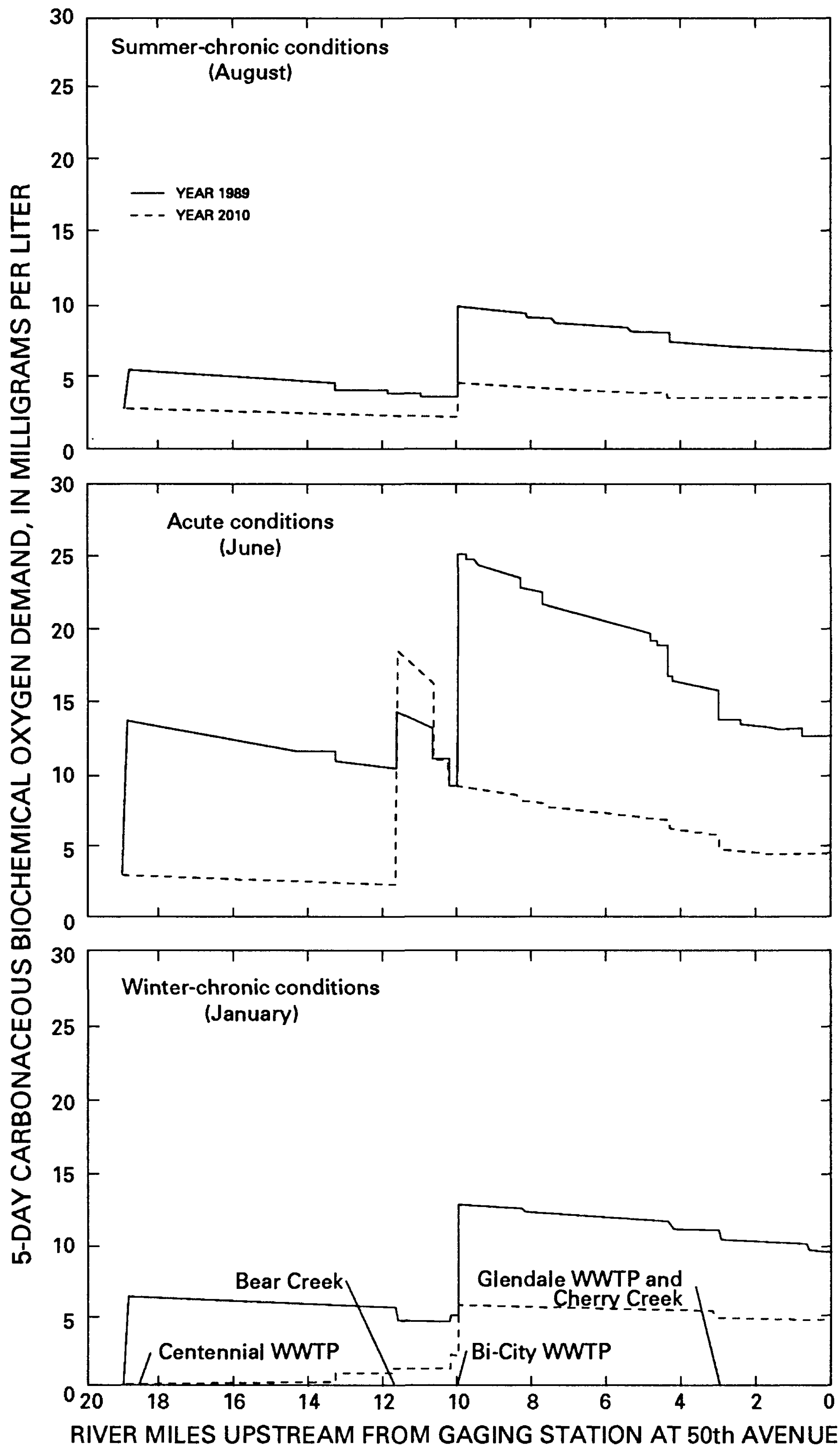

Figure 23.--QUAL2E simulated 5-day carbonaceous biochemical oxygen demands for current (1989) and projected (2010) wastewater-treatment effluents during summer-chronic, acute, and winter-chronic conditions.

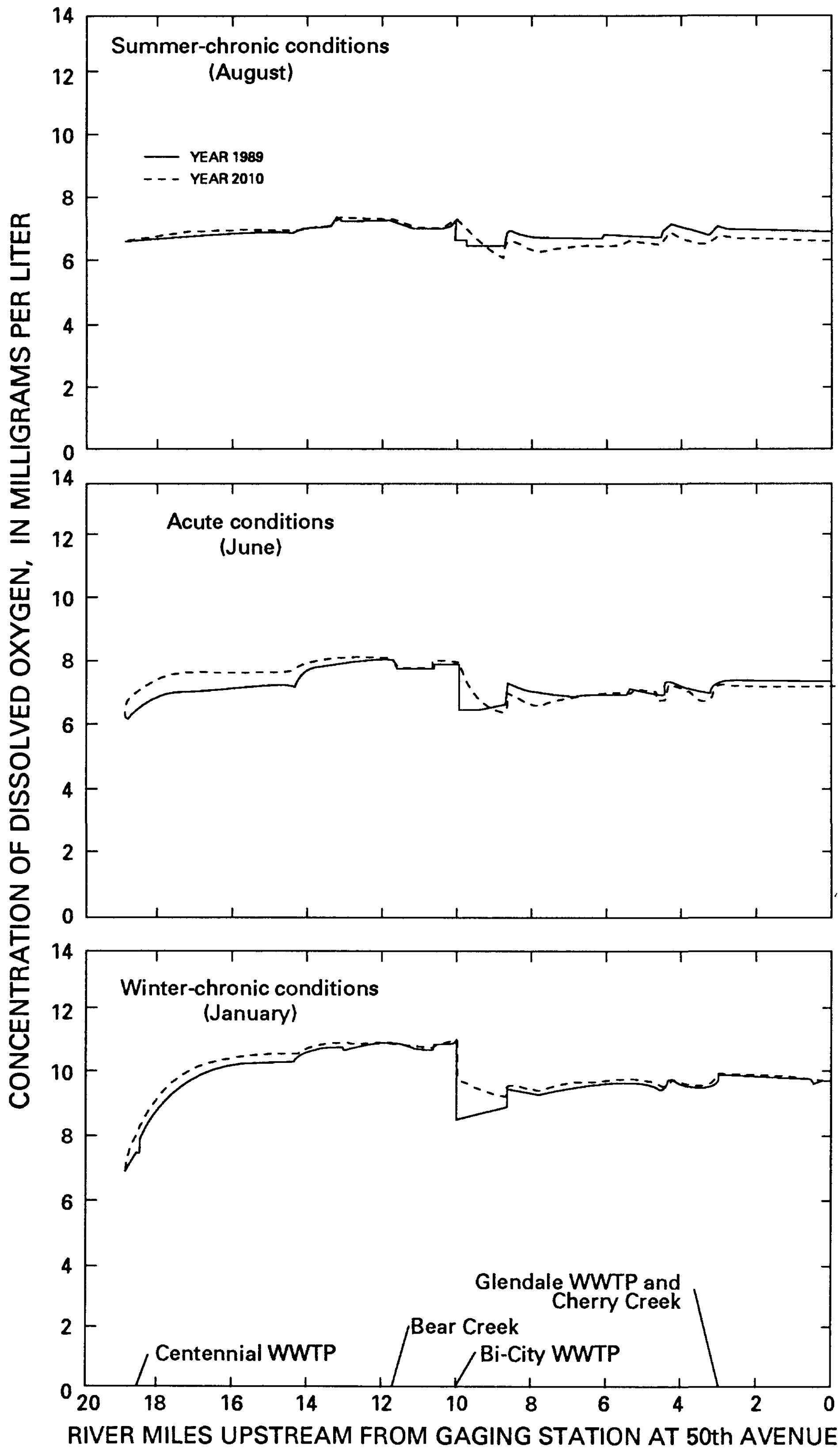

Figure 24.--QUAL2E simulated concentrations of dissolved oxygen for current (1989) and projected (2010) wastewater-treatment effluents during summer-chronic, acute, and winter-chronic conditions.

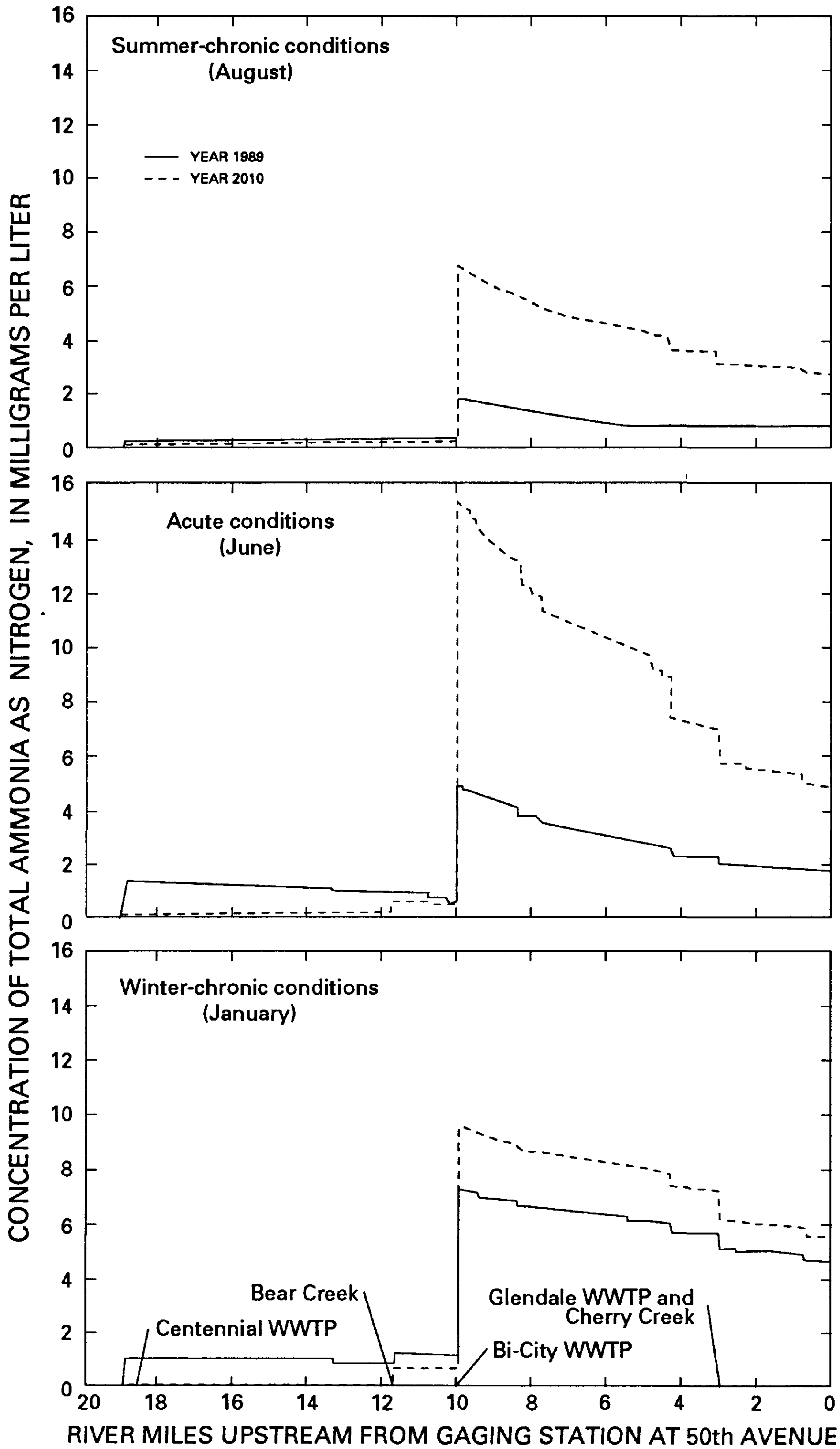

Figure 25.--QUAL2E simulated concentrations of total ammonia as nitrogen for current (1989) and projected (2010) wastewater-treatment effluents during summer-chronic, acute, and winter-chronic conditions.

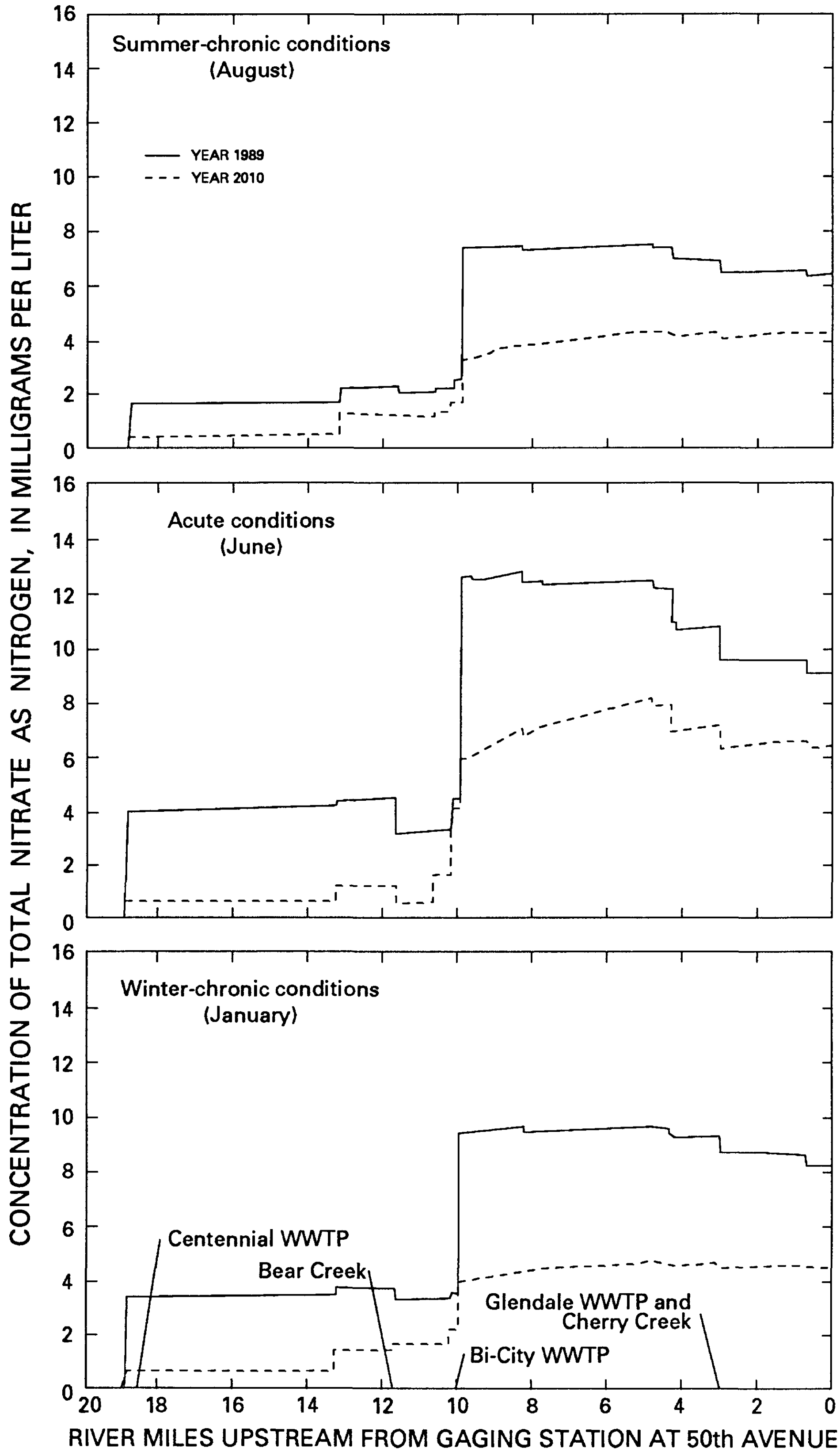

Figure 26.--QUAL2E simulated concentrations of total nitrate as nitrogen for current (1989) and projected (2010) wastewater-treatment effluents during summer-chronic, acute, and winter-chronic conditions.

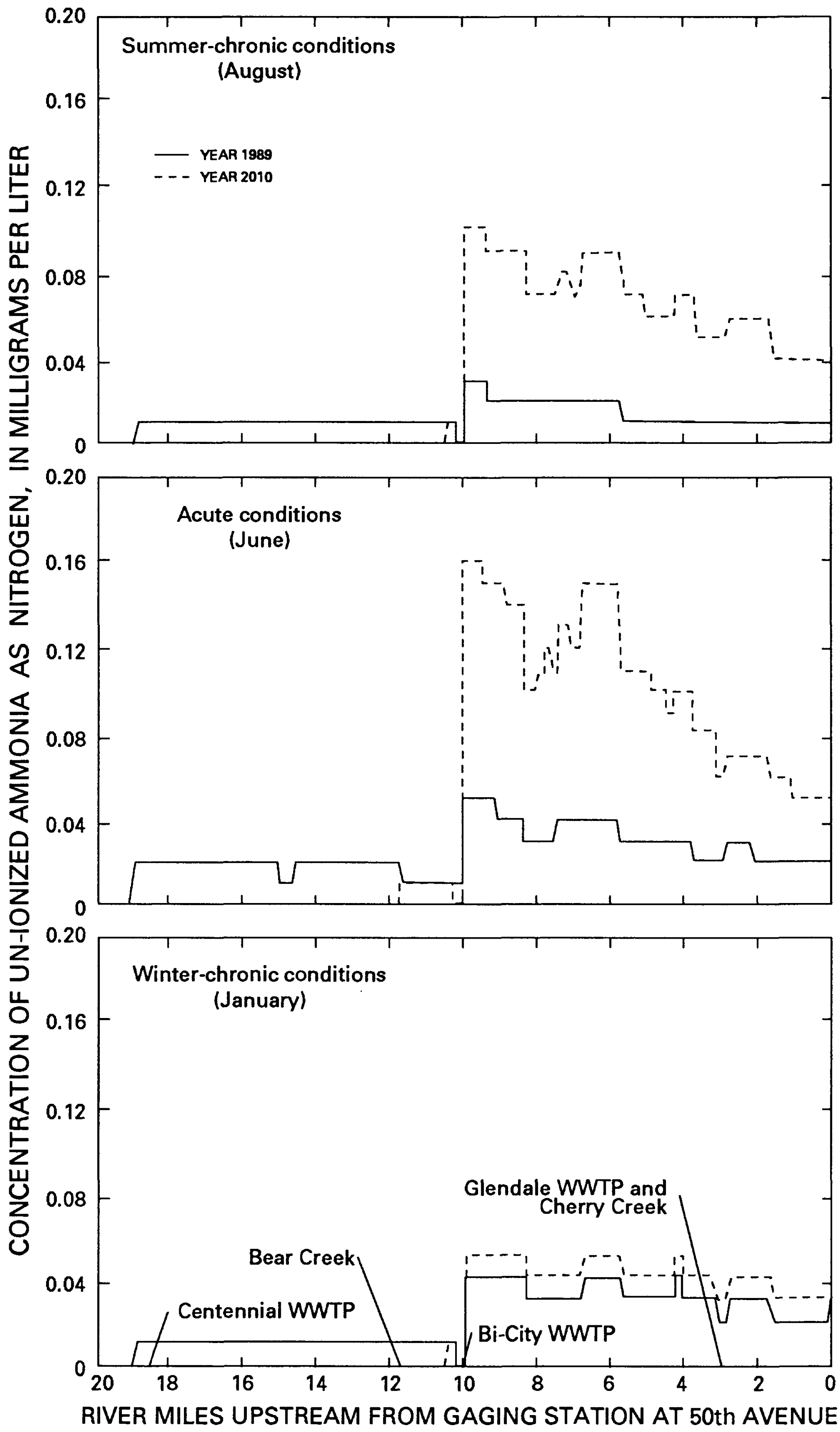

Figure 27.--QUAL2E calculated concentrations of un-ionized ammonia as nitrogen for current (1989) and projected (2010) wastewater-treatment effluents during summer-chronic, acute, and winter-chronic conditions.

Table 6.--*Median pH values at sampling sites along the South Platte River*

[Median pH values were calculated from data reported in Spahr and others (1985); pH is in standard units]

Location on river	River miles		Median pH		
	Measurement site	Computational-element interval	September 1983	October 1982	January 1984
Near Highway 470	18.7	19.0-14.6	7.9	8.0	7.7
Littleton	14.5	14.5-12.10	8.0	7.9	7.8
Upstream from Bear Creek	11.9	11.9-10.5	8.0	7.8	7.8
Englewood	10.4	10.4-10.1	8.15	7.9	7.9
Evans Avenue[1]	10.0	10.2-8.6	7.4	7.5	7.6
Florida Avenue	8.5	8.5-8.4	7.6	7.6	7.6
Below footbridge	8.3	8.3-8.0	7.5	7.7	7.5
Mississippi Avenue	7.9	7.9-7.4	7.6	7.5	7.55
Santa Fe overpass	7.3	7.3-6.8	7.8	7.6	7.6
Alameda Avenue	6.7	6.7-5.5	7.9	7.7	7.7
Vallejo Street	5.6	5.6-5.4	7.8	7.7	7.6
8th Avenue bridge	5.3	5.3-4.3	7.9	7.65	7.6
17th Avenue underpass	4.2	4.2-3.7	8.0	7.8	7.7
7th Street	3.6	3.6-2.8	7.9	7.8	7.6
Denver	2.7	2.7-1.6	7.9	7.9	7.7
31st Street bridge	1.5	1.5-0.9	7.9	7.85	7.6
38th Street bridge	0.8	0.8-0.1	7.9	8.15	7.6
50th Avenue	0.0	0.0	7.95	8.1	7.7

[1]pH value assigned at Bi-City Wastewater Treatment Plant instead of sampling site.

un-ionized ammonia to be inaccurate. For example, at 20 °C and at a pH of 7, 10 mg/L of total ammonia will produce about 0.04 mg/L of un-ionized ammonia; at 20 °C and at a pH of 8, 10 mg/L of total ammonia will produce about 0.4 mg/L of un-ionized ammonia. The pH values for September 1983 and assumed water temperatures of 68 °F were used for summer-chronic conditions; the pH and water-temperature values for September 1983 were used for acute conditions, and the pH and water-temperature values for January 1984 were used for winter-chronic conditions.

SUMMARY

Projected increases in population and discharges of wastewater effluent in the Denver metropolitan area makes compliance with water-quality standards increasingly important and necessitates controlling discharges of wastewater effluent to the South Platte River. The State of Colorado regulates the volume and concentration of effluents that wastewater-treatment plants are allowed to discharge. In order to evaluate discharge requirements, the State needs information on the assimilative capacity of the river under current and projected conditions.

In 1989, the State of Colorado adopted the U.S. Environmental Protection Agency's QUAL2E water-quality simulation model as the preferred method for estimating effects of effluent on Colorado rivers. For consistency of analysis, the QUAL2E model was used in this study to evaluate the effects of wastewater effluent on the South Platte River from Chatfield Reservoir through Denver during low-flow conditions.

The QUAL2E model was used to simulate streamflow, dissolved-solids concentrations, 5-day carbonaceous biochemical oxygen demand ($CBOD_5$), and concentrations of dissolved oxygen and dissolved nitrogen species in the South Platte River and the Bear Creek and Cherry Creek tributaries.

The QUAL2E model was compared to the previously verified USGS-QW simulation model for a 14.5-river-mile reach of the South Platte River from the Littleton gaging station to the gaging station at 50th Avenue in Denver. The simulation results of the two models were similar for streamflow, dissolved-solids concentrations, and $CBOD_5$; however, initial simulated concentrations of dissolved oxygen and nitrogen species were different. The QUAL2E program was changed to account for low atmospheric pressure in Denver, hydrolysis and oxidation coefficients for nitrogen species were modified, and a sink for total ammonia was added by assigning negative values to the benthic-source rate. Then, the concentrations of dissolved oxygen and nitrogen species fit the measured values satisfactorily.

The QUAL2E model data set then was revised to include streamflow and water-quality data for a 4.5-river-mile reach upstream to the regulation dam at Chatfield Reservoir, the Bear Creek and Cherry Creek tributaries, and the Centennial and Glendale WWTP's. Streamflow simulation was generalized by developing regression relations for river depth and velocity. The revised QUAL2E model then was calibrated for streamflows, water-quality concentrations, and tributary effects for the 19-river-mile reach. The data were not sufficient to calibrate tributary streamflows or constituent concentrations.

Critical low streamflows and constituent concentrations were simulated for 1989; critical low streamflows with projected effluent-discharge volumes and concentrations were simulated for 2010. Critical low streamflows were based on the lowest 1-day and 30-day average streamflows in August, June, and January during a 3-year period. Artificial point sources were created for the model input to produce mass-balanced streamflows and concentrations from the tributaries to the South Platte River and to provide modeled flow to Cherry Creek during periods when headwater flow was zero.

Simulations indicated that predicted values of $CBOD_5$ were about 1.5 to about 15 mg/L greater for 2010 conditions than for 1989 conditions; however, dissolved-oxygen concentrations were similar. For 2010 conditions, predicted concentrations of total ammonia (as nitrogen) were about 0.2 to about 1.1 mg/L greater upstream from the Bi-City WWTP as a result of increased discharge from the Centennial WWTP and were about 0.7 to about 10 mg/L less downstream from the Bi-City WWTP as a result of expected implementation of a nitrification treatment process. Predicted concentrations of total nitrate were about 0.7 to about 6 mg/L greater for 2010 conditions. Concentrations of total un-ionized ammonia were calculated from predicted concentrations of total ammonia.

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SUPPLEMENTAL INFORMATION

Complete Data Set for the Calibration of the Revised QUAL2E Model, with Initial Conditions, Headwater Date, and Point Source Data from September 22, 1983

This data set is the basis for all of the other data sets; the partial data sets only include the changes to this data set. Headings in italics are not part of data sets. BOD in these headings signifies 5-day carbonaceous biochemical oxygen demand.

Program Titles

```
TITLE01   Stream Quality Model--QUAL2E; South Platte River, CO
TITLE02   Calibration Data, Sept. 22, 1983, 19 Mi. w/ Bear Cr. and Cherry Cr.
TITLE03   YES         CONSERVATIVE MINERAL   I     DS IN MG/L
TITLE04   NO          CONSERVATIVE MINERAL  II
TITLE05   NO          CONSERVATIVE MINERAL III
TITLE06   NO          TEMPERATURE
TITLE07   YES         5-DAY BIOCHEMICAL OXYGEN DEMAND IN MG/L
TITLE08   NO          ALGAE AS CHL-A, IN UG/L
TITLE09   NO          PHOSPHORUS CYCLE AS P IN MG/L
TITLE10                 (ORGANIC-P; DISSOLVED-P)
TITLE11   YES         NITROGEN CYCLE AS N IN MG/L
TITLE12                 (ORGANIC-N; AMMONIA-N; NITRITE-N; NITRATE-N)
TITLE13   YES         DISSOLVED OXYGEN IN MG/L
TITLE14   NO          FECAL COLIFORM IN NO./100 ML
TITLE15   NO          ARBITRARY NON-CONSERVATIVE
ENDTITLE
```

Control Data

```
LIST DATA INPUT
NOWRITE OPTIONAL SUMMARY
NO FLOW AUGMENTATION
STEADY STATE
NO TRAPEZOIDAL X-SECTIONS
NO PRINT LCD/SOLAR DATA
NO PLOT DO AND BOD
FIXED DNSTM CONC (YES=1)=       0.       5D-ULT BOD CONV K COEF  =     0.25
INPUT METRIC (YES=1)    =       0.       OUTPUT METRIC           =       0.
NUMBER OF REACHES       =      39.       NUMBER OF JUNCTIONS     =       2.
NUM OF HEADWATERS       =       3.       NUMBER OF POINT LOADS   =      23.
TIME STEP (HOURS)       =                LNTH. COMP. ELEMENT (MI)=      0.1
MAXIMUM ITERATIONS      =      30.       TIME INC. FOR RPT2 (HRS)=
LATITUDE OF BASIN (DEG) =    39.75       LONGITUDE OF BASIN (DEG)=     105.
STANDARD MERIDIAN (DEG) =                DAY OF YEAR START TIME  =     244.
EVAP. COEF.,(AE)        = 0.00068        EVAP. COEF.,(BE)        =  0.00027
ELEV. OF BASIN (FEET)   =    5280.       DUST ATTENUATION COEF.  =     0.13
ENDATA1
```

Algae Production and Nitrogen Oxidation Constants

```
O UPTAKE BY NH3 OXID(MG O/MG N)= 3.0       O UPTAKE BY NO2 OXID(MG O/MG N)= 1.00
O PROD BY ALGAE (MG O/MG A)    = 1.6       O UPTAKE BY ALGAE (MG O/MG A)  = 2.0
N CONTENT OF ALGAE (MG N/MG A) = .085      P CONTENT OF ALGAE (MG P/MG A) = .012
ALG MAX SPEC GROWTH RATE(1/DAY)= 2.0       ALGAE RESPIRATION RATE (1/DAY) = 0.1
N HALF SATURATION CONST  (MG/L)= 0.3       P HALF SATURATION CONST  (MG/L)= 0.01
LIN ALG SHADE CO (1/H-UGCHA/L) =           NLIN SHADE (1/H-(UGCHA/L)**2/3 =
LIGHT FUNCTION OPTION (LFNOPT) = 1.        LIGHT SATURATION COEF (INT/MIN)= 1.
DAILY AVERAGING OPTION (LAVOPT)= 2.        LIGHT AVERAGING FACTOR (AFACT) = 2.
NUMBER OF DAYLIGHT HOURS (DLH) = 12.       TOTAL DAILY SOLAR RADTN (INT)  = 400.0
ALGY GROWTH CALC OPTION(LGROPT)= 1.        ALGAL PREF FOR NH3-N (PREFN)   = 0.5
ALG/TEMP SOLR RAD FACTOR(TFACT)= 0.45      NITRIFICATION INHIBITION COEF  = 0.7
ENDATA1A
```

Temperature Correction Constants for Rate Coefficients

```
ENDATA1B
```

Reach Identification

	Reach order and identification		River mile		River mile
stream reach	0.1 rch= Reregulation dam	from	38.0	to	37.6
stream reach	0.2 rch= Near highway 47	from	37.6	to	35.6
stream reach	0.3 rch= sp-100 #2	from	35.6	to	33.6
stream reach	0.4 rch= sp-100 #3	from	33.6	to	33.4
STREAM REACH	1. RCH= BPSR ST-BG DRY CR	FROM	33.4	TO	32.3
STREAM REACH	2. RCH= BDCR-NGLWDINTK	FROM	32.3	TO	32.2
STREAM REACH	3. RCH= BENGLWD IN-BEARCR	FROM	32.2	TO	30.7
STREAM REACH	4.0 RCH= BEAR CREEK TRIB	FROM	30.7	TO	28.7
STREAM REACH	4.1 RCH= BEAR CREEK #2	FROM	28.7	TO	26.7
STREAM REACH	4.2 RCH= BEAR CREEK #3	FROM	26.7	TO	24.7
STREAM REACH	4.3 RCH= BEAR CREEK #4	FROM	24.7	TO	23.3
STREAM REACH	5. RCH= BEARCR-LITTLE DRY	FROM	23.3	TO	22.3
STREAM REACH	6. RCH= LITTLE DRY-UNNAMD	FROM	22.3	TO	21.8
STREAM REACH	7. RCH= UNNAMED - BI CITY	FROM	21.8	TO	21.6
STREAM REACH	8. RCH= BI CITY-PSCO EFFL	FROM	21.6	TO	21.3
STREAM REACH	9. RCH= PSCO EFFL-HRVRDGL	FROM	21.3	TO	21.1
STREAM REACH	10. RCH= HRVRDGL-SANDERSON	FROM	21.1	TO	19.9
STREAM REACH	11. RCH= SANDERSON-MISS.SD	FROM	19.9	TO	19.3
STREAM REACH	12.0 RCH= MISS.SD-MISS #2	FROM	19.3	TO	17.3
STREAM REACH	12.1 RCH= MISS #2-VALLEJOSD	FROM	17.3	TO	17.1
STREAM REACH	13. RCH= VALLJOSD-LKWDWWTP	FROM	17.1	TO	16.5
STREAM REACH	14. RCH= LDWDWWTP-WEIRGULC	FROM	16.5	TO	16.4
STREAM REACH	15. RCH= WEIRG-ZUNI PP#1	FROM	16.4	TO	16.3
STREAM REACH	16. RCH= ZUNI PP#1-ZUNPP#3	FROM	16.3	TO	16.1
STREAM REACH	17. RCH= ZUNIPP#3-LKWDGULC	FROM	16.1	TO	15.9
STREAM REACH	18. RCH= LKWDGL-SLOANS LK	FROM	15.9	TO	15.8
STREAM REACH	19. RCH= SLOANSLK-ELISFOOD	FROM	15.8	TO	15.6
STREAM REACH	20. RCH= ELLISFD-CHERRY CR	FROM	15.6	TO	14.7
STREAM REACH	21.0 RCH= CHERRY CREEK TRIB	FROM	14.7	TO	12.7
STREAM REACH	21.1 RCH= CHERRY CREEK #2	FROM	12.7	TO	10.7
STREAM REACH	21.2 RCH= CHERRY CREEK #3	FROM	10.7	TO	8.7
STREAM REACH	21.3 RCH= CHERRY CREEK #4	FROM	8.7	TO	6.7
STREAM REACH	21.4 RCH= CHERRY CREEK #5	FROM	6.7	TO	4.7
STREAM REACH	21.5 RCH= CHERRY CREEK #6	FROM	4.7	TO	3.1
STREAM REACH	22. RCH= CHERRYCR-23D STSD	FROM	3.1	TO	2.4
STREAM REACH	23. RCH= 23DSTSD-ICEPL EFF	FROM	2.4	TO	1.5
STREAM REACH	24. RCH= ICEPLEFFL-36 STSD	FROM	1.5	TO	1.1
STREAM REACH	25. RCH= 36STSD-38TH STSD	FROM	1.1	TO	0.8
STREAM REACH	26. RCH= 38STSD-SPR END	FROM	0.8	TO	0.0

ENDATA2

Target Level Dissolved Oxygen and Flow Augmentation Sources

ENDATA3

Computational Reach Flag Fields

Reach	*Elements/reach*	*Computational flags*
flag field rch= 0.1	4.	1.6.2.2.
flag field rch= 0.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
flag field rch= 0.3	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
flag field rch= 0.4	2.	2.2.
FLAG FIELD RCH= 1.	11.	2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH= 2.	1.	6.
FLAG FIELD RCH= 3.	15.	7.2.2.2.2.2.2.2.2.2.2.2.2.2.3.
FLAG FIELD RCH= 4.0	20.	1.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH= 4.1	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH= 4.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH= 4.3	14.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH= 5.	10.	4.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH= 6.	5.	6.2.2.2.2.
FLAG FIELD RCH= 7.	2.	6.2.
FLAG FIELD RCH= 8.	3.	6.2.2.
FLAG FIELD RCH= 9.	2.	6.2.
FLAG FIELD RCH= 10.	12.	6.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH= 11.	6.	6.2.2.2.2.2.
FLAG FIELD RCH= 12.0	20.	6.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH= 12.1	2.	2.2.
FLAG FIELD RCH= 13.	6.	6.2.2.2.2.2.
FLAG FIELD RCH= 14.	1.	6.
FLAG FIELD RCH= 15.	1.	6.
FLAG FIELD RCH= 16.	2.	6.2.
FLAG FIELD RCH= 17.	2.	6.2.
FLAG FIELD RCH= 18.	1.	6.
FLAG FIELD RCH= 19.	2.	6.2.
FLAG FIELD RCH= 20.	10.	6.2.2.2.2.2.2.2.2.3.
FLAG FIELD RCH= 21.0	20.	1.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH= 21.1	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH= 21.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH= 21.3	20.	6.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH= 21.4	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH= 21.5	16.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH= 22.	7.	4.2.2.2.2.2.2.
FLAG FIELD RCH= 23.	9.	6.2.2.2.2.2.2.2.2.
FLAG FIELD RCH= 24.	4.	6.2.2.2.
FLAG FIELD RCH= 25.	3.	6.2.2.
FLAG FIELD RCH= 26.	8.	6.2.2.2.2.2.2.5.

ENDATA4

Hydraulic Data for Obtaining Velocity and Depth

	Reach	Coef.-dispers.	Coef.QV	Expo.QV	Coef.QH	Expo.QH	CMANN
hydraulics rch=	0.1	60.	0.20	0.37	0.38	0.26	0.025
hydraulics rch=	0.2	60.	.20	.37	.38	.26	.025
hydraulics rch=	0.3	60.	.22	.37	.38	.26	.025
hydraulics rch=	0.4	60.	.22	.37	.38	.26	.025
HYDRAULICS RCH=	1.	60.0	0.62	0.28	0.14	0.42	.025
HYDRAULICS RCH=	2.	60.0	.62	.28	.14	.42	0.025
HYDRAULICS RCH=	3.	60.0	.62	.28	.14	.42	0.025
HYDRAULICS RCH=	4.0	60.0	0.34	0.36	0.20	0.38	0.025
HYDRAULICS RCH=	4.1	60.	.34	.36	.20	.38	0.025
HYDRAULICS RCH=	4.2	60.	.34	.36	.20	.38	0.025
HYDRAULICS RCH=	4.3	60.	0.15	0.57	0.57	0.24	0.025
HYDRAULICS RCH=	5.	60.0	.10	.48	.14	.45	0.025
HYDRAULICS RCH=	6.	60.0	0.10	0.48	0.14	0.45	0.025
HYDRAULICS RCH=	7.	60.	.10	.48	.14	.45	0.025
HYDRAULICS RCH=	8.	60.	.10	.48	.14	.45	0.025
HYDRAULICS RCH=	9.	60.	.10	.48	.14	.45	0.025
HYDRAULICS RCH=	10.	60.	.10	.48	.14	.45	0.025
HYDRAULICS RCH=	11.	60.	.10	.48	.14	.45	0.025
HYDRAULICS RCH=	12.0	60.	.10	.48	.14	.45	0.025
HYDRAULICS RCH=	12.1	60.	.10	.48	.14	.45	0.025
HYDRAULICS RCH=	13.	60.	.10	.48	.14	.45	0.025
HYDRAULICS RCH=	14.	60.	.10	.48	.14	.45	0.025
HYDRAULICS RCH=	15.	60.	.10	.48	.14	.45	0.025
HYDRAULICS RCH=	16.	60.	.10	.48	.14	.45	0.025
HYDRAULICS RCH=	17.	60.	.10	.48	.14	.45	0.025
HYDRAULICS RCH=	18.	60.	.10	.48	.14	.45	0.025
HYDRAULICS RCH=	19.	60.	.10	.48	.14	.45	0.025
HYDRAULICS RCH=	20.	60.	.10	.48	.14	.45	0.025
HYDRAULICS RCH=	21.0	60.	0.96	0.17	0.10	0.42	0.025
HYDRAULICS RCH=	21.1	60.	.96	.17	.10	.42	0.025
HYDRAULICS RCH=	21.2	60.	.96	.17	.10	.42	0.025
HYDRAULICS RCH=	21.3	60.	.96	.17	.10	.42	0.025
HYDRAULICS RCH=	21.4	60.	.96	.17	.10	.42	0.025
HYDRAULICS RCH=	21.5	60.	0.47	0.38	0.11	0.48	0.025
HYDRAULICS RCH=	22.	60.	0.22	0.40	0.27	0.32	0.025
HYDRAULICS RCH=	23.	60.	.22	.40	.27	.32	0.025
HYDRAULICS RCH=	24.	60.	.22	.40	.27	.32	0.025
HYDRAULICS RCH=	25.	60.	.22	.40	.27	.32	0.025
HYDRAULICS RCH=	26.	60.	.22	.40	.27	.32	0.025

ENDATA5

Steady-State Temperature and Climatology Data

ENDATA5A

Reaction Coefficients for Deoxygenation and Reaeration

	Reach	K1	K3	SOD rate	K^2 OPT	K^2	OPT 8-1	OPT 8-2
react coef rch=	0.1	0.5	0.	0.163	4.	0.0		
react coef rch=	0.2	0.5	0.	0.163	4.	0.0		
react coef rch=	0.3	0.5	0.	0.163	4.	0.0		
react coef rch=	0.4	0.5	0.	0.163	4.	0.0		
REACT COEF RCH=	1.	0.5	0.000	0.163	4.	0.0	0.0000	0.0000
REACT COEF RCH=	2.	0.5		0.163	4.	0.0	0.0000	0.0000
REACT COEF RCH=	3.	0.5		0.163	4.	0.0	0.0000	0.0000
REACT COEF RCH=	4.0	0.5		.0	4.	0.0	0.0000	0.0000
REACH COEF RCH=	4.1	0.5		.0	4.	0.0		
REACH COEF RCH=	4.2	0.5		.0	4.	0.0		
REACH COEF RCH=	4.3	0.5		.0	4.	0.0		
REACT COEF RCH=	5.	0.5		0.163	4.	0.0	0.0000	0.0000
REACT COEF RCH=	6.	0.5		0.163	4.	0.0	0.0000	0.0000
REACT COEF RCH=	7.	0.5		0.257	4.	0.0		
REACT COEF RCH=	8.	0.5		0.257	4.	0.0		
REACT COEF RCH=	9.	0.5		0.257	4.	0.0		
REACT COEF RCH=	10.	0.5		0.094	4.	0.0		
REACT COEF RCH=	11.	0.5		0.094	4.	0.0		
REACT COEF RCH=	12.0	0.5		0.094	4.	0.0		
REACT COEF RCH=	12.1	0.5		0.094	4.	0.0		
REACT COEF RCH=	13.	0.5		0.163	4.	0.0		
REACT COEF RCH=	14.	0.5		0.094	4.	0.0		
REACT COEF RCH=	15.	0.5		0.094	4.	0.0		
REACT COEF RCH=	16.	0.5		0.257	4.	0.0		
REACT COEF RCH=	17.	0.5		0.094	4.	0.0		
REACT COEF RCH=	18.	0.5		0.094	4.	0.0		
REACT COEF RCH=	19.	0.5		0.094	4.	0.0		
REACT COEF RCH=	20.	0.5		0.163	4.	0.0		
REACT COEF RCH=	21.0	0.5		.0	4.	0.0		
REACT COEF RCH=	21.1	0.5		.0	4.	0.0		
REACT COEF RCH=	21.2	0.5		.0	4.	0.0		
REACT COEF RCH=	21.3	0.5		.0	4.	0.0		
REACT COEF RCH=	21.4	0.5		.0	4.	0.0		
REACT COEF RCH=	21.5	0.5		.0	4.	0.0		
REACT COEF RCH=	22.	0.5		0.094	4.	0.0		
REACT COEF RCH=	23.	0.5		0.094	4.	0.0		
REACT COEF RCH=	24.	0.5		0.094	4.	0.0		
REACT COEF RCH=	25.	0.5		0.094	4.	0.0		
REACT COEF RCH=	26.	0.5		0.094	4.	0.0		

ENDATA6

Nitrogen and Phosphorus Constants

	Reach	*CKNH2*	*SETNH2*	*CKNH3*	*SNH3*	*CKNO2*	*CKPORG*	*SET PORG*	*SPO4*
n and p coef rch=	0.1	0.1	0.10	1.0		8.00			
n and p coef rch=	0.2	0.1	0.10	1.0		8.00			
n and p coef rch=	0.3	0.1	0.10	1.0		8.00			
n and p coef rch=	0.4	0.1	0.10	1.0		8.00			
N AND P COEF RCH=	1.	0.50	0.10	1.0		8.00	0.70	0.05	0.05
N AND P COEF RCH=	2.	0.50	0.10	1.0		8.00			
N AND P COEF RCH=	3.	0.50	0.10	1.0		8.			
N AND P COEF RCH=	4.0	0.5	0.1	1.0		8.			
N AND P COEF RCH=	4.1	0.5	0.1	1.0		8.			
N AND P COEF RCH=	4.2	0.5	0.1	1.0		8.			
N AND P COEF RCH=	4.3	0.5	0.1	1.0		8.			
N AND P COEF RCH=	5.	0.5	0.1	1.0		8.00			
N AND P COEF RCH=	6.	0.3	0.1	1.0		8.00			
N AND P COEF RCH=	7.	0.2	0.1	1.0		8.00			
N AND P COEF RCH=	8.	0.0	0.1	1.0	-95.	45.00			
N AND P COEF RCH=	9.	0.0	0.1	1.0	-95.	45.00			
N AND P COEF RCH=	10.	0.0	0.1	1.0	-95.	45.00			
N AND P COEF RCH=	11.	0.0	0.1	1.0	-95.	25.00			
N AND P COEF RCH=	12.0	0.2	1.1	0.5	-95.	15.00			
N AND P COEF RCH=	12.1	0.2	1.1	0.5	-95	15.00			
N AND P COEF RCH=	13.	0.2	1.1	0.5	-95.	15.00			
N AND P COEF RCH=	14.	0.9	1.1	0.5	-95.	10.00			
N AND P COEF RCH=	15.	0.9	1.1	1.0		10.00			
N AND P COEF RCH=	16.	0.9	1.1	1.0		8.00			
N AND P COEF RCH=	17.	0.9	1.1	1.0		8.00			
N AND P COEF RCH=	18.	0.9	1.1	1.0		8.00			
N AND P COEF RCH=	19.	0.9	1.1	1.0		8.00			
N AND P COEF RCH=	20.	0.9	1.1	1.0		8.00			
N AND P COEF RCH=	21.0	0.9	1.1	1.0		8.00			
N AND P COEF RCH=	21.1	0.9	1.1	1.0		8.00			
N AND P COEF RCH=	21.2	0.9	1.1	1.0		8.00			
N AND P COEF RCH=	21.3	0.9	1.1	1.0		8.00			
N AND P COEF RCH=	21.4	0.9	1.1	1.0		8.00			
N AND P COEF RCH=	21.5	0.9	1.1	1.0		8.00			
N AND P COEF RCH=	22.	0.9	1.1	1.0		8.00			
N AND P COEF RCH=	23.	0.9	1.1	1.0		8.00			
N AND P COEF RCH=	24.	0.9	1.1	1.0		8.00			
N AND P COEF RCH=	25.	0.9	1.1	1.0		8.00			
N AND P COEF RCH=	26.	0.9	1.1	1.0		8.00			

ENDATA6A

Algae and Other Coefficients

	Reach	Alpha0	Algset	Ex coeff	CK5 CKCOLI	CKANC	SETANC	SRCANC
alg/other coef rch=	0.1	50.0						
alg/other coef rch=	0.2	50.0						
alg/other coef rch=	0.3	50.0						
alg/other coef rch=	0.4	50.0						
ALG/OTHER COEF RCH=	1.	50.0	0.15	0.38	1.50			
ALG/OTHER COEF RCH=	2.	50.0						
ALG/OTHER COEF RCH=	3.	50.0						
ALG/OTHER COEF RCH=	4.0	50.0						
ALG/OTHER COEF RCH=	4.1	50.0						
ALG/OTHER COEF RCH=	4.2	50.0						
ALG/OTHER COEF RCH=	4.3	50.0						
ALG/OTHER COEF RCH=	5.	50.0						
ALG/OTHER COEF RCH=	6.	50.0						
ALG/OTHER COEF RCH=	7.	50.0						
ALG/OTHER COEF RCH=	8.	50.0						
ALG/OTHER COEF RCH=	9.	50.0						
ALG/OTHER COEF RCH=	10.	50.0						
ALG/OTHER COEF RCH=	11.	50.0						
ALG/OTHER COEF RCH=	12.0	50.0						
ALG/OTHER COEF RCH=	12.1	50.0						
ALG/OTHER COEF RCH=	13.	50.0						
ALG/OTHER COEF RCH=	14.	50.0						
ALG/OTHER COEF RCH=	15.	50.0						
ALG/OTHER COEF RCH=	16.	50.0						
ALG/OTHER COEF RCH=	17.	50.0						
ALG/OTHER COEF RCH=	18.	50.0						
ALG/OTHER COEF RCH=	19.	50.0						
ALG/OTHER COEF RCH=	20.	50.0						
ALG/OTHER COEF RCH=	21.0	50.0						
ALG/OTHER COEF RCH=	21.1	50.0						
ALG/OTHER COEF RCH=	21.2	50.0						
ALG/OTHER COEF RCH=	21.3	50.0						
ALG/OTHER COEF RCH=	21.4	50.0						
ALG/OTHER COEF RCH=	21.5	50.0						
ALG/OTHER COEF RCH=	22.	50.0						
ALG/OTHER COEF RCH=	23.	50.0						
ALG/OTHER COEF RCH=	24.	50.0						
ALG/OTHER COEF RCH=	25.	50.0						
ALG/OTHER COEF RCH=	26.	50.0						

ENDATA6B

Initial Conditions

	Reach	Temp.	DO	BOD	DS	CM-2	CM-3	ANC	COLI
initial cond-1 rch=	0.1	60.3	6.6	2.9	244.				
initial cond-1 rch=	0.2	60.3	6.6	2.9	244.				
initial cond-1 rch=	0.3	60.3	6.6	2.9	244.				
initial cond-1 rch=	0.4	60.3	7.5	2.9	244.				
INITIAL COND-1 RCH=	1.	59.	7.5	2.3	341.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	2.	59.	8.5	2.1	142.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	3.	59.	0.0	0.	0.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	4.0	59.	0.	0.	0.	0.00	0.00	0.000	
INITIAL COND-1 RCH=	4.1	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	4.2	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	4.3	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	5.	59.	8.0	3.0	279.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	6.	57.2	8.2	2.0	1090.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	7.	57.2	7.9	2.6	1185.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	8.	59.	6.8	13.4	680.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	9.	59.	8.7	8.9	1803.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	10.	59.	6.9	4.6	853.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	11.	59.	8.2	4.4	439.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	12.0	60.8	7.6	2.4	585.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	12.1	60.8	7.6	2.4	585.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	13.	60.8	7.2	5.4	868.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	14.	60.8	0.0	0.	0.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	15.	60.8	8.1	8.3	543.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	16.	60.8	7.1	3.8	560.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	17.	60.8	6.0	1.4	1020.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	18.	60.8	8.9	2.1	403.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	19.	60.8	7.8	5.3	535.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	20.	60.8	5.6	1.2	150.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.0	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.1	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.2	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.3	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.4	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.5	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	22.	59.	8.6	3.	733.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	23.	59.	7.4	1.1	844.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	24.	59.	7.3	2.4	796.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	25.	59.	7.3	7.2	334.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	26.	59.	6.6	6.3	462.00	0.00	0.00	0.000	0.0

ENDATA7

Initial Conditions for Chlorophyll-a, Nitrogen, and Phosphorus

	Reach	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
initial cond-2 rch=	0.1	0.	0.45	0.12	0.02	0.64		
initial cond-2 rch=	0.2	0.	0.45	0.12	0.02	0.64		
initial cond-2 rch=	0.3	0.	0.45	0.12	0.02	0.64		
initial cond-2 rch=	0.4	0.	0.45	0.12	0.02	0.64		
INITIAL COND-2 RCH=	1.	0.	0.58	0.10	0.02	0.70	0.	0.
INITIAL COND-2 RCH=	2.	0.	1.52	0.12	0.02	5.68	0.	0.
INITIAL COND-2 RCH=	3.	0.	.0	.0	.0	.0	0.	0.
INITIAL COND-2 RCH=	4.0	0.	.0	.0	.0	.0	0.	0.
INITIAL COND-2 RCH=	4.1	0.	.0	.0	.0	.0	0.	0.
INITIAL COND-2 RCH=	4.2	0.	.0	.0	.0	.0	0.	0.
INITIAL COND-2 RCH=	4.3	0.	.0	.0	.0	.0	0.	0.
INITIAL COND-2 RCH=	5.	0.	0.50	0.10	0.01	0.75	0.	0.
INITIAL COND-2 RCH=	6.	0.	1.06	0.14	0.02	3.31	0.	0.
INITIAL COND-2 RCH=	7.	0.	1.66	0.09	0.03	8.71	0.	0.
INITIAL COND-2 RCH=	8.	0.	2.87	15.98	0.05	0.00	0.	0.
INITIAL COND-2 RCH=	9.	0.	1.36	0.14	0.02	0.58	0.	0.
INITIAL COND-2 RCH=	10.	0.	1.2	0.13	0.05	2.52	0.	0.
INITIAL COND-2 RCH=	11.	0.	1.07	0.12	0.03	1.47	0.	0.
INITIAL COND-2 RCH=	12.0	0.	1.38	0.12	0.02	5.92	0.	0.
INITIAL COND-2 RCH=	12.1	0.	1.38	0.12	0.02	5.92	0.	0.
INITIAL COND-2 RCH=	13.	0.	1.13	0.16	0.38	5.32	0.	0.
INITIAL COND-2 RCH=	14.	0.	0.	0.	0.	0.	0.	0.
INITIAL COND-2 RCH=	15.	0.	1.12	0.15	0.05	2.65	0.	0.
INITIAL COND-2 RCH=	16.	0.	0.80	2.9	0.46	1.59	0.	0.
INITIAL COND-2 RCH=	17.	0.	0.9	0.19	0.01	5.79	0.	0.
INITIAL COND-2 RCH=	18.	0.	0.91	0.09	0.02	1.95	0.	0.
INITIAL COND-2 RCH=	19.	0.	2.68	0.07	0.02	0.33	0.	0.
INITIAL COND-2 RCH=	20.	0.	0.49	0.31	0.02	0.03	0.	0.
INITIAL COND-2 RCH=	21.0	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.1	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.2	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.3	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.4	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.5	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	22.	0.	1.15	0.14	0.03	4.19	0.	0.
INITIAL COND-2 RCH=	23.	0.	1.39	0.20	0.02	5.23	0.	0.
INITIAL COND-2 RCH=	24.	0.	1.28	0.67	0.07	4.82	0.	0.
INITIAL COND-2 RCH=	25.	0.	1.56	0.79	0.14	2.15	0.	0.
INITIAL COND-2 RCH=	26.	0.	1.43	0.12	0.04	1.51	0.	0.

ENDATA7A

Incremental Inflow Conditions

	Reach	Flow	Temp.	DO	BOD	OS	CM-2	CM-3	ANC	COLI
incr inflow-1 rch=	0.1									
incr inflow-1 rch=	0.2									
incr inflow-1 rch=	0.3									
incr inflow-1 rch=	0.4									
INCR INFLOW-1 RCH=	1.	0.000	00.00	0.0	00.0	0.0	0.0	0.0	0.0	0.0
INCR INFLOW-1 RCH=	2.									
INCR INFLOW-1 RCH=	3.									
INCR INFLOW-1 RCH=	4.0									
INCR INFLOW-1 RCH=	4.1									
INCR INFLOW-1 RCH=	4.2									
INCR INFLOW-1 RCH=	4.3									
INCR INFLOW-1 RCH=	5.									
INCR INFLOW-1 RCH=	6.									
INCR INFLOW-1 RCH=	7.									
INCR INFLOW-1 RCH=	8.									
INCR INFLOW-1 RCH=	9.									
INCR INFLOW-1 RCH=	10.									
INCR INFLOW-1 RCH=	11.									
INCR INFLOW-1 RCH=	12.0									
INCR INFLOW-1 RCH=	12.1									
INCR INFLOW-1 RCH=	13.									
INCR INFLOW-1 RCH=	14.									
INCR INFLOW-1 RCH=	15.									
INCR INFLOW-1 RCH=	16.									
INCR INFLOW-1 RCH=	17.									
INCR INFLOW-1 RCH=	18.									
INCR INFLOW-1 RCH=	19.									
INCR INFLOW-1 RCH=	20.									
INCR INFLOW-1 RCH=	21.0									
INCR INFLOW-1 RCH=	21.1									
INCR INFLOW-1 RCH=	21.2									
INCR INFLOW-1 RCH=	21.3									
INCR INFLOW-1 RCH=	21.4									
INCR INFLOW-1 RCH=	21.5									
INCR INFLOW-1 RCH=	22.									
INCR INFLOW-1 RCH=	23.									
INCR INFLOW-1 RCH=	24.									
INCR INFLOW-1 RCH=	25.									
INCR INFLOW-1 RCH=	26.									

ENDATA8

Incremental Inflow Conditions for Chlorophyl-a, Nitrogen, and Phosphorus

	Reach	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
incr inflow-2 rch=	0.1							
incr inflow-2 rch=	0.2							
incr inflow-2 rch=	0.3							
incr inflow-2 rch=	0.4							
INCR INFLOW-2 RCH=	1.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
INCR INFLOW-2 RCH=	2.							
INCR INFLOW-2 RCH=	3.							
INCR INFLOW-2 RCH=	4.0							
INCR INFLOW-2 RCH=	4.1							
INCR INFLOW-2 RCH=	4.2							
INCR INFLOW-2 RCH=	4.3							
INCR INFLOW-2 RCH=	5.							
INCR INFLOW-2 RCH=	6.							
INCR INFLOW-2 RCH=	7.							
INCR INFLOW-2 RCH=	8.							
INCR INFLOW-2 RCH=	9.							
INCR INFLOW-2 RCH=	10.							
INCR INFLOW-2 RCH=	11.							
INCR INFLOW-2 RCH=	12.0							
INCR INFLOW-2 RCH=	12.1							
INCR INFLOW-2 RCH=	13.							
INCR INFLOW-2 RCH=	14.							
INCR INFLOW-2 RCH=	15.							
INCR INFLOW-2 RCH=	16.							
INCR INFLOW-2 RCH=	17.							
INCR INFLOW-2 RCH=	18.							
INCR INFLOW-2 RCH=	19.							
INCR INFLOW-2 RCH=	20.							
INCR INFLOW-2 RCH=	21.0							
INCR INFLOW-2 RCH=	21.1							
INCR INFLOW-2 RCH=	21.2							
INCR INFLOW-2 RCH=	21.3							
INCR INFLOW-2 RCH=	21.4							
INCR INFLOW-2 RCH=	21.5							
INCR INFLOW-2 RCH=	22.							
INCR INFLOW-2 RCH=	23.							
INCR INFLOW-2 RCH=	24.							
INCR INFLOW-2 RCH=	25.							
INCR INFLOW-2 RCH=	26.							

ENDATA8A

Stream Junctions

	Junction order and identification		Upstream	Junction	Tributary
STREAM JUNCTION	1.	JNC=BEAR CREEK	73.	148.	147.
STREAM JUNCTION	2.	JNC=CHERRY CREEK	234.	351.	350.

ENDATA9

Headwater Sources

	Order	Name	Flow	Temp.	DO	BOD	DS	CM-2	CM-3
HEADWTR-1 HDW=	1.	SOUTH PLATTE	32.5	60.3	7.5	2.3	341.0	0.0	0.0
HEADWTR-1 HDW=	2.	BEAR CREEK	19.8	57.2	8.0	3.0	279.0	0.0	0.0
HEADWTR-1 HDW=	3.	CHERRY CREEK	23.3	60.8	8.6	3.0	733.0	0.0	0.0

ENDATA10

Headwater Conditions for ANC, Coliform, Chlorophyll-a, Nitrogen, and Phosphorus

	Order	ANC	COLI	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
HEADWTR-2 HDW=	1.	0.00	0.00	0.00	0.70	0.12	0.02	0.64	0.00	0.00
HEADWTR-2 HDW=	2.	0.00	0.00	0.00	0.50	0.10	0.01	0.75		
HEADWTR-2 HDW=	3.	0.00	0.00	0.00	1.15	0.14	0.03	4.19		

ENDATA10A

Point Sources and Point-Source Characteristics

	Order and name	Effl.	Flow	Temp.	DO	BOD	DS	CM-2	CM-3
pointld-1 ptl=	1.Marcey Gulch	0.	0.	0.	0.	0.	0.	0.	0.
POINTLD-1 PTL=	2.BG DRY CR-M	0.00	3.2	59.0	8.5	2.1	142.0	0.0	0.0
POINTLD-1 PTL=	3.	0.00	-10.2	59.	0.0	0.0	0.0	0.0	0.0
POINTLD-1 PLT=	4.		8.1	57.2	8.2	2.0	1090.0		
POINTLD-1 PLT=	5.		0.4	57.2	7.9	2.6	1185.0		
POINTLD-1 PLT=	6.Bi-City WWTP		35.0	59.	6.8	13.4	680.0		
POINTLD-1 PLT=	7.		0.4	59.	8.7	8.9	1803.0		
POINTLD-1 PLT=	8.		0.6	59.	6.9	4.6	853.0		
POINTLD-1 PLT=	9.		2.4	59.	8.2	4.4	439.0		
POINTLD-1 PLT=	10.		2.0	60.8	7.6	2.4	585.0		
POINTLD-1 PLT=	11.		0.3	60.8	7.2	5.4	868.0		
POINTLD-1 PLT=	12.		0.0	60.8	0.0	0.	0.		
POINTLD-1 PLT=	13.		2.1	60.8	8.1	8.3	543.0		
POINTLD-1 PLT=	14.		0.2	60.8	7.1	3.8	560.0		
POINTLD-1 PLT=	15.		0.6	60.8	6.0	1.4	1020.0		
POINTLD-1 PLT=	16.		10.0	60.8	8.9	2.1	403.		
POINTLD-1 PLT=	17.		1.1	60.8	7.8	5.3	535.		
POINTLD-1 PLT=	18.		0.1	60.8	5.6	1.2	150.		
pointld-1 plt=	19.GlendaleWWTP		0.	0.	0.	0.	0.		
POINTLD-1 PLT=	20.		1.2	59.	7.4	1.1	844.		
POINTLD-1 PLT=	21.		0.8	59.	7.3	2.4	796.		
POINTLD-1 PLT=	22.		0.8	59.	7.3	7.2	334.		
POINTLD-1 PLT=	23.		5.2	59.	6.6	6.3	462.		

ENDATA11

Point-Source Characteristics for ANC, Coliform, Chlorophyll-a, Nitrogen, and Phosphorus

		Order	ANC	COLI	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
pointld-2	plt=	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
POINTLD-2	PLT=	2.	0.00	000.0	00.00	1.52	0.12	0.02	5.68	0.00	0.00
POINTLD-2	PLT=	3.				0.	0.	0.	0.		
POINTLD-2	PLT=	4.				1.06	0.14	0.02	3.31		
POINTLD-2	PLT=	5.				1.66	0.09	0.03	8.71		
POINTLD-2	PLT=	6.				2.87	15.98	0.05	0.		
POINTLD-2	PLT=	7.				1.36	0.14	0.02	0.58		
POINTLD-2	PLT=	8.				1.2	0.13	0.05	2.52		
POINTLD-2	PLT=	9.				1.07	0.12	0.03	1.47		
POINTLD-2	PLT=	10.				1.38	0.12	0.02	5.92		
POINTLD-2	PLT=	11.				1.13	0.16	0.38	5.32		
POINTLD-2	PLT=	12.				0.	0.	0.	0.		
POINTLD-2	PLT=	13.				1.12	0.15	0.05	2.65		
POINTLD-2	PLT=	14.				0.80	2.9	0.46	1.59		
POINTLD-2	PLT=	15.				0.9	0.19	0.01	5.79		
POINTLD-2	PLT=	16.				0.91	0.09	0.02	1.95		
POINTLD-2	PLT=	17.				2.68	0.07	0.02	0.33		
POINTLD-2	PLT=	18.				0.49	0.31	0.02	0.03		
pointld-2	plt=	19.				0.	0.	0.	0.		
POINTLD-2	PLT=	20.				1.39	0.20	0.02	5.19		
POINTLD-2	PLT=	21.				1.28	0.67	0.07	4.82		
POINTLD-2	PLT=	22.				1.56	0.79	0.14	2.15		
POINTLD-2	PLT=	23.				1.43	0.12	0.04	1.51		

ENDATA11A

Dam Characteristics

		Dam	Reach	Element	ADAM	BDAM	FDAM	HDAM
dam data	dam=	1	14	2	1.6	0.8	1.0	2.0
dam data	dam=	2	17	10	1.4	0.9	1.0	5.0
dam data	dam=	3	21	2	1.2	0.7	0.5	5.0
dam data	dam=	4	25	2	1.2	0.7	1.0	4.0
dam data	dam=	5	28	10	1.2	0.8	0.7	5.0

ENDATA12

Downstream Boundary Conditions

ENDATA13

Downstream Boundary Concentrations--Unconstrained

ENDATA13A

Partial Data Set for the Verification of the Revised QUAL2E Model, with Initial Conditions, Headwater Data, and Point Source Data from October 7, 1982

The flow and constituent concentrations for the initial conditions, headwaters, and point sources.

TITLE01 Stream Quality Model--QUAL2E; South Platte River, CO
TITLE02 Verification Data, Oct. 6, 1982, 19 Mi. w/ Bear Cr. and Cherry Cr.

Initial Conditions

	Reach	Temp.	DO	BOD	DS	CM-2	CM-3	ANC	COLI
initial cond-1 rch=	0.1	55.4	7.4	2.6	297.				
initial cond-1 rch=	0.2	55.4	7.4	2.6	297.				
initial cond-1 rch=	0.3	55.4	7.4	2.6	297.				
initial cond-1 rch=	0.4	55.4	7.4	2.6	297.				
INITIAL COND-1 RCH=	1.	55.	7.6	2.2	297.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	2.	55.	8.1	1.6	886.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	3.	57.	0.0	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	4.0	59.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	4.1	59.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	4.2	59.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	4.3	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	5.	57.	8.3	2.7	161.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	6.	55.	8.6	1.4	1127.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	7.	55.	7.6	2.1	989.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	8.	57.	7.4	19.2	626.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	9.	57.	9.2	1.8	2924.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	10.	57.	8.6	2.4	745.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	11.	59.	8.8	3.0	348.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	12.0	57	8.1	4.2	614.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	12.1	57	8.1	4.2	614.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	13.	59	7.8	2.1	920.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	14.	59	6.0	7.8	534.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	15.	59	7.6	5.5	490.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	16.	59	7.2	2.0	326.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	17.	59	6.6	1.8	941.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	18.	59	8.9	1.8	500.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	19.	59	7.9	6.0	631.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	20.	57	5.9	2.0	221.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.0	57.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.1	57.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.2	57.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.3	57.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.4	57.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.5	57.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	22.	57.	8.6	3.	826.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	23.	57.	8.1	2.0	823.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	24.	57.	5.9	2.1	825.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	25.	57.	7.6	6.6	294.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	26.	57.	7.1	5.9	611.	0.00	0.00	0.000	0.0

ENDATA7

Initial Conditions for Chlorophyll-a, Nitrogen, and Phosphorus

	Reach	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
initial cond-2 rch=	0.1	0.	1.1	0.06	0.02	0.18		
initial cond-2 rch=	0.2	0.	1.1	0.06	0.02	0.18		
initial cond-2 rch=	0.3	0.	1.1	0.06	0.02	0.18		
initial cond-2 rch=	0.4	0.	1.1	0.06	0.02	0.18		
INITIAL COND-2 RCH=	1.	0.	0.70	0.05	0.01	0.28	0.	0.
INITIAL COND-2 RCH=	2.	0.	1.66	0.04	0.02	4.72	0.	0.
INITIAL COND-2 RCH=	3.	0.	0.	0.	0.	0.	0.	0.
initial cond-2 RCH=	4.0	0.	0.	0.	0.	0.	0.	0.
initial cond-2 RCH=	4.1	0.	0.	0.	0.	0.	0.	0.
initial cond-2 RCH=	4.2	0.	0.	0.	0.	0.	0.	0.
initial cond-2 RCH=	4.3	0.	0.	0.	0.	0.	0.	0.
INITIAL COND-2 RCH=	5.	0.	0.88	0.04	0.01	0.19	0.	0.
INITIAL COND-2 RCH=	6.	0.	0.96	0.07	0.03	2.74	0.	0.
INITIAL COND-2 RCH=	7.	0.	1.87	0.09	0.19	6.18	0.	0.
INITIAL COND-2 RCH=	8.	0.	9.11	17.90	0.03	0.02	0.	0.
INITIAL COND-2 RCH=	9.	0.	4.31	0.15	0.06	5.10	0.	0.
INITIAL COND-2 RCH=	10.	0.	2.11	0.05	0.03	2.89	0.	0.
INITIAL COND-2 RCH=	11.	0.	1.45	0.05	0.02	1.01	0.	0.
INITIAL COND-2 RCH=	12.0	0.	2.11	0.04	0.01	4.89	0.	0.
INITIAL COND-2 RCH=	12.1	0.	2.11	0.04	0.01	4.89	0.	0.
INITIAL COND-2 RCH=	13.	0.	4.40	0.07	0.02	5.77	0.	0.
INITIAL COND-2 RCH=	14.	0.	5.00	12.33	0.21	0.05	0.	0.
INITIAL COND-2 RCH=	15.	0.	1.73	0.07	0.07	1.80	0.	0.
INITIAL COND-2 RCH=	16.	0.	3.27	0.53	0.12	1.08	0.	0.
INITIAL COND-2 RCH=	17.	0.	2.21	0.19	0.01	4.62	0.	0.
INITIAL COND-2 RCH=	18.	0.	1.18	0.09	0.02	1.58	0.	0.
INITIAL COND-2 RCH=	19.	0.	6.02	0.05	0.02	0.71	0.	0.
INITIAL COND-2 RCH=	20.	0.	7.24	0.39	0.06	0.04	0.	0.
initial cond-2 RCH=	21.0	0.	.0	.0	.00	0.	0.	0.
initial cond-2 RCH=	21.1	0.	.0	.0	.00	0.	0.	0.
initial cond-2 RCH=	21.2	0.	.0	.0	.00	0.	0.	0.
initial cond-2 RCH=	21.3	0.	.0	.0	.00	0.	0.	0.
initial cond-2 RCH=	21.4	0.	.0	.0	.00	0.	0.	0.
initial cond-2 RCH=	21.5	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	22.	0.	1.53	0.05	0.05	3.06	0.	0.
INITIAL COND-2 RCH=	23.	0.	4.35	0.08	0.01	2.82	0.	0.
INITIAL COND-2 RCH=	24.	0.	1.76	0.44	0.12	5.01	0.	0.
INITIAL COND-2 RCH=	25.	0.	3.38	0.19	0.07	1.40	0.	0.
INITIAL COND-2 RCH=	26.	0.	2.20	0.18	0.06	2.20	0.	0.

ENDATA7A

Stream Junctions

	Junction order and identification		Upstream	Junction	Tributary
STREAM JUNCTION	1.	JNC=BEAR CREEK	73.	148.	147.
STREAM JUNCTION	2.	JNC=CHERRY CREEK	234.	351.	350.

ENDATA9

Headwater Sources

	Order	Name	Flow	Temp.	DO	BOD	DS	CM-2	CM-3
headwtr-1 HDW=	1.	SOUTH PLATTE	52.5	55.	8.1	2.2	297.0	0.0	0.0
headwtr-1 HDW=	2.	BEAR CREEK	52.8	57.	8.3	2.7	161.0	0.0	0.0
headwtr-1 HDW=	3.	CHERRY CREEK	11.6	57.	8.6	3.0	826.0	0.0	0.0

ENDATA10

Headwater Conditions for ANC, Coliform, Chlorophyll-a, Nitrogen, and Phosphorus

	Order	ANC	COLI	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
headwtr-2 HDW=	1.	0.00	0.00	0.00	0.70	0.05	0.01	0.28	0.00	0.00
headwtr-2 HDW=	2.	0.00	0.00	0.00	0.88	0.04	0.01	0.19		
headwtr-2 HDW=	3.	0.00	0.00	0.00	1.53	0.05	0.05	3.06		

ENDATA10A

Point Sources and Point-Source Characteristics

		Order and name	Effl.	Flow	Temp.	DO	BOD	DS	CM-2	CM-3
pointld-1	ptl=	1.Marcey Gulch	0.	0.	0.	0.	0.	0.	0.	0.
POINTLD-1	PTL=	2.BG DRY CR-M	0.00	2.8	55.	8.1	1.6	886.	0.0	0.0
POINTLD-1	PTL=	3.	0.00	-10.1	57.	0.0	0.0	0.	0.0	0.0
POINTLD-1	PLT=	4.		4.1	55.	8.6	1.4	1127.		
POINTLD-1	PLT=	5.		0.3	55.	7.6	2.1	989.		
POINTLD-1	PLT=	6.Bi-City WWTP		30.7	57.	7.4	19.2	626.		
POINTLD-1	PLT=	7.		0.4	57.	9.2	1.8	2924.		
POINTLD-1	PLT=	8.		0.6	57.	8.6	2.4	745.		
POINTLD-1	PLT=	9.		3.3	59.	8.8	3.0	348.		
POINTLD-1	PLT=	10.		0.8	57.	8.1	4.2	614.		
POINTLD-1	PLT=	11.		0.2	59.	7.8	2.1	920.		
POINTLD-1	PLT=	12.		0.2	59.	6.0	7.8	534.		
POINTLD-1	PLT=	13.		1.5	59.	7.6	5.5	490.		
POINTLD-1	PLT=	14.		1.6	59.	7.2	2.0	326.		
POINTLD-1	PLT=	15.		0.3	59.	6.6	1.8	941.		
POINTLD-1	PLT=	16.		9.0	59.	8.9	1.8	500.		
POINTLD-1	PLT=	17.		0.4	59.	7.9	6.0	631.		
POINTLD-1	PLT=	18.		0.3	57.	5.9	2.0	221.		
pointld-1	plt=	19.GlendaleWWTP		0.	0.	0.	0.	0.		
POINTLD-1	PLT=	20.		1.0	57.	8.1	2.0	823.		
POINTLD-1	PLT=	21.		1.3	57.	5.9	2.1	825.		
POINTLD-1	PLT=	22.		1.1	57.	7.6	6.6	294.		
POINTLD-1	PLT=	23.		3.6	57.	7.1	5.9	611.		

ENDATA11

Point-Source Characteristics for ANC, Coliform, Chlorophyll-a, Nitrogen, and Phosphorus

		Order	ANC	COLI	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
pointld-2	plt=	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
POINTLD-2	PLT=	2.	0.00	000.0	00.00	1.66	0.04	0.02	4.72	0.00	0.00
POINTLD-2	PLT=	3.				0.	0.	0.	0.		
POINTLD-2	PLT=	4.				0.96	0.07	0.03	2.74		
POINTLD-2	PLT=	5.				1.87	0.09	0.19	6.18		
POINTLD-2	PLT=	6.				9.11	17.90	0.03	0.02		
POINTLD-2	PLT=	7.				4.31	0.15	0.06	5.10		
POINTLD-2	PLT=	8.				2.11	0.05	0.03	2.89		
POINTLD-2	PLT=	9.				1.45	0.05	0.02	1.01		
POINTLD-2	PLT=	10.				2.11	0.04	0.01	4.89		
POINTLD-2	PLT=	11.				4.40	0.07	0.02	5.77		
POINTLD-2	PLT=	12.				5.00	12.33	0.21	0.05		
POINTLD-2	PLT=	13.				1.73	0.07	0.07	1.80		
POINTLD-2	PLT=	14.				3.27	0.53	0.12	1.08		
POINTLD-2	PLT=	15.				2.21	0.19	0.01	4.62		
POINTLD-2	PLT=	16.				1.18	0.09	0.02	1.58		
POINTLD-2	PLT=	17.				6.02	0.05	0.02	0.71		
POINTLD-2	PLT=	18.				7.24	0.39	0.06	0.04		
pointld-2	plt=	19.				0.	0.	0.	0.		
POINTLD-2	PLT=	20.				4.35	0.08	0.01	2.82		
POINTLD-2	PLT=	21.				1.76	0.44	0.12	5.01		
POINTLD-2	PLT=	22.				3.38	0.19	0.07	1.40		
POINTLD-2	PLT=	23.				2.20	0.18	0.06	2.20		

ENDATA11A

Partial Data Set for the Verification of the Revised QUAL2E Model, with Initial Conditions, Headwater Data, and Point Source Data from January 26, 1984

The flow and constituent concentrations for the intitial conditions, headwaters, and point sources.

TITLE01 Stream Quality Model--QUAL2E; South Platte River, CO
TITLE02 Verification Data, Jan. 26, 1984, 19 Mi. w/ Bear Cr. and Cherry Cr.

Initial Conditions

	Reach	Temp.	DO	BOD	DS	CM-2	CM-3	ANC	COLI
initial cond-1 rch=	0.1	39.2	8.6	1.9	244.				
initial cond-1 rch=	0.2	39.2	8.6	1.9	244.				
initial cond-1 rch=	0.3	39.2	8.6	1.9	244.				
initial cond-1 rch=	0.4	39.2	8.6	1.9	244.				
INITIAL COND-1 RCH=	1.	37.4	10.3	2.7	410.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	2.	37.4	9.9	4.8	936.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	3.	37.4	0.0	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	4.0	37.4	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	4.1	37.4	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	4.2	37.4	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	4.3	37.4	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	5.	37.4	10.6	4.4	279.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	6.	35.6	11.0	4.5	1190.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	7.	35.6	9.3	12.0	1154.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	8.	42.8	8.2	17.6	646.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	9.	42.8	9.7	1.4	2613.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	10.	42.8	10.0	15.0	686.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	11.	42.8	11.4	3.8	738.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	12.0	41.	7.6	5.6	540.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	12.1	41.	7.6	5.6	540.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	13.	42.8	9.2	3.5	942.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	14.	42.8	0.0	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	15.	42.8	10.6	16.	971.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	16.	42.8	6.8	2.4	1625.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	17.	42.8	0.0	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	18.	42.8	11.7	5.6	815.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	19.	44.6	10.7	5.9	489.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	20.	41.	8.4	6.	213.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.0	41.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.1	41.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.2	41.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.3	41.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.4	41.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.5	41.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	22.	41.	10.4	7.	813.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	23.	41.	8.1	5.2	839.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	24.	41.	4.4	7.6	809.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	25.	41.	8.6	9.2	670.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	26.	41.	8.4	5.4	856.	0.00	0.00	0.000	0.0

ENDATA7

Initial Conditions for Chlorophyll-a, Nitrogen, and Phosphorus

	Reach	*CHL-A*	*ORG-N*	*NH3-N*	*NO2-N*	*NO3-N*	*ORG-P*	*DISS-P*
initial cond-2 rch=	0.1	0.	0.45	0.05	0.01	0.89		
initial cond-2 rch=	0.2	0.	0.45	0.05	0.01	0.89		
initial cond-2 rch=	0.3	0.	0.45	0.05	0.01	0.89		
initial cond-2 rch=	0.4	0.	0.45	0.05	0.01	0.89		
INITIAL COND-2 RCH=	1.	0.	0.43	0.05	0.02	1.05	0.	0.
INITIAL COND-2 RCH=	2.	0.	1.25	0.11	0.06	5.6	0.	0.
INITIAL COND-2 RCH=	3.	0.	0.	0.	0.	0.	0.	0.
initial cond-2 RCH=	4.0	0.	0.	0.	0.	0.	0.	0.
initial cond-2 RCH=	4.1	0.	0.	0.	0.	0.	0.	0.
initial cond-2 RCH=	4.2	0.	0.	0.	0.	0.	0.	0.
initial cond-2 RCH=	4.3	0.	0.	0.	0.	0.	0.	0.
INITIAL COND-2 RCH=	5.	0.	0.58	0.16	0.02	1.3	0.	0.
INITIAL COND-2 RCH=	6.	0.	1.3	0.12	0.05	2.8	0.	0.
INITIAL COND-2 RCH=	7.	0.	1.80	0.30	0.16	5.8	0.	0.
INITIAL COND-2 RCH=	8.	0.	2.5	18.	0.04	0.05	0.	0.
INITIAL COND-2 RCH=	9.	0.	1.4	0.18	0.17	5.4	0.	0.
INITIAL COND-2 RCH=	10.	0.	2.3	0.52	0.1	2.2	0.	0.
INITIAL COND-2 RCH=	11.	0.	2.2	0.4	0.13	2.2	0.	0.
INITIAL COND-2 RCH=	12.0	0.	1.1	0.16	0.05	5.0	0.	0.
INITIAL COND-2 RCH=	12.1	0.	1.1	.16	0.05	5.0	0.	0.
INITIAL COND-2 RCH=	13.	0.	1.6	0.3	0.24	3.5	0.	0.
INITIAL COND-2 RCH=	14.	0.	0.	0.	0.	0.	0.	0.
INITIAL COND-2 RCH=	15.	0.	1.6	0.28	0.22	3.8	0.	0.
INITIAL COND-2 RCH=	16.	0.	2.2	0.11	0.02	0.18	0.	0.
INITIAL COND-2 RCH=	17.	0.	0.0	0.0	0.00	0.0	0.	0.
INITIAL COND-2 RCH=	18.	0.	1.2	0.15	0.08	3.2	0.	0.
INITIAL COND-2 RCH=	19.	0.	1.5	1.1	0.04	0.13	0.	0.
INITIAL COND-2 RCH=	20.	0.	0.47	0.23	0.03	0.17	0.	0.
initial cond-2 RCH=	21.0	0.	.0	.0	.00	0.	0.	0.
initial cond-2 RCH=	21.1	0.	.0	.0	.00	0.	0.	0.
initial cond-2 RCH=	21.2	0.	.0	.0	.00	0.	0.	0.
initial cond-2 RCH=	21.3	0.	.0	.0	.00	0.	0.	0.
initial cond-2 RCH=	21.4	0.	.0	.0	.00	0.	0.	0.
initial cond-2 RCH=	21.5	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	22.	0.	1.8	0.26	0.1	3.9	0.	0.
INITIAL COND-2 RCH=	23.	0.	1.6	0.18	0.02	5.0	0.	0.
INITIAL COND-2 RCH=	24.	0.	2.4	1.6	0.63	6.4	0.	0.
INITIAL COND-2 RCH=	25.	0.	2.8	0.98	0.13	1.8	0.	0.
INITIAL COND-2 RCH=	26.	0.	3.2	0.89	0.18	3.4	0.	0.

ENDATA7A

Headwater Sources

	Order Name	Flow	Temp.	DO	BOD	DS	CM-2	CM-3
headwtr-1 HDW=	1.SOUTH PLATTE	21.0	37.4	10.3	2.7	410.0	0.0	0.0
headwtr-1 HDW=	2.BEAR CREEK	29.8	37.4	10.6	4.4	279.0	0.0	0.0
headwtr-1 HDW=	3.CHERRY CREEK	13.1	41.	10.4	7.0	813.0	0.0	0.0

ENDATA10

Headwater Conditions for ANC, Coliform, Chlorophyll-a, Nitrogen, and Phosphorus

	Order	ANC	COLI	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
headwtr-2 HDW=	1.	0.00	0.00	0.00	0.43	0.05	0.02	1.05	0.00	0.00
headwtr-2 HDW=	2.	0.00	0.00	0.00	0.58	0.16	0.02	1.30		
headwtr-2 HDW=	3.	0.00	0.00	0.00	1.80	0.26	0.10	3.90		

ENDATA10A

Point Sources and Point-Source Characteristics

	Order and name	Effl.	Flow	Temp.	DO	BOD	DS	CM-2	CM-3
pointld-1 ptl=	1.Marcey Gulch	0.	0.	0.	0.	0.	0.	0.	0.
POINTLD-1 PTL=	2.BG DRY CR-M	0.00	3.1	37.4	9.9	4.8	936.	0.0	0.0
POINTLD-1 PTL=	3.	0.00	- 7.5	37.4	0.0	0.0	0.	0.0	0.0
POINTLD-1 PLT=	4.		7.0	35.6	11.0	4.5	1190.		
POINTLD-1 PLT=	5.		0.4	35.6	9.3	12.0	1154.		
POINTLD-1 PLT=	6.Bi-City WWTP		29.9	42.8	8.2	17.6	646.		
POINTLD-1 PLT=	7.		0.2	42.8	9.7	1.4	2613.		
POINTLD-1 PLT=	8.		0.5	42.8	10.0	15.	686.		
POINTLD-1 PLT=	9.		1.3	42.8	11.4	3.8	738.		
POINTLD-1 PLT=	10.		.5	41.	7.6	5.6	540.		
POINTLD-1 PLT=	11.		0.2	42.8	9.2	3.5	942.		
POINTLD-1 PLT=	12.		0.0	42.8	0.0	0.	0.		
POINTLD-1 PLT=	13.		1.0	42.8	10.6	16.	971.		
POINTLD-1 PLT=	14.		0.3	42.8	6.8	2.4	1625.		
POINTLD-1 PLT=	15.		0.0	42.8	0.0	0.	0.		
POINTLD-1 PLT=	16.		4.2	42.8	11.7	5.6	815.		
POINTLD-1 PLT=	17.		1.	44.6	10.7	5.9	489.		
POINTLD-1 PLT=	18.		0.4	41.	8.4	6.0	213.		
pointld-1 plt=	19.GlendaleWWTP		0.	0.	0.	0.	0.		
POINTLD-1 PLT=	20.		1.2	41.	8.1	5.2	839.		
POINTLD-1 PLT=	21.		0.8	41.	4.4	7.6	809.		
POINTLD-1 PLT=	22.		1.1	41.	8.6	9.2	670.		
POINTLD-1 PLT=	23.		8.2	41.	8.4	54.	856.		

ENDATA11

Point-Source Characteristics for ANC, Coliform, Chlorophyll-a, Nitrogen, and Phosphorus

		Order	ANC	COLI	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
pointld-2	plt=	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
POINTLD-2	PLT=	2.	0.00	000.0	00.00	1.2	0.11	0.06	5.6	0.00	0.00
POINTLD-2	PLT=	3.				0.	0.	0.	0.		
POINTLD-2	PLT=	4.				1.3	0.12	0.05	2.8		
POINTLD-2	PLT=	5.				1.8	0.3	0.16	5.8		
POINTLD-2	PLT=	6.				2.5	18.	0.04	0.05		
POINTLD-2	PLT=	7.				1.4	0.18	0.17	5.4		
POINTLD-2	PLT=	8.				2.3	0.52	0.1	2.2		
POINTLD-2	PLT=	9.				2.2	0.4	0.13	2.2		
POINTLD-2	PLT=	10.				1.1	0.16	0.05	5.		
POINTLD-2	PLT=	11.				1.6	0.30	0.24	3.5		
POINTLD-2	PLT=	12.				0.	0.	0.	0.		
POINTLD-2	PLT=	13.				1.6	0.28	0.22	3.8		
POINTLD-2	PLT=	14.				2.2	0.11	0.02	0.18		
POINTLD-2	PLT=	15.				0.0	0.00	0.00	0.00		
POINTLD-2	PLT=	16.				1.2	0.15	0.08	3.2		
POINTLD-2	PLT=	17.				1.5	1.1	0.04	0.13		
POINTLD-2	PLT=	18.				0.47	0.23	0.03	0.17		
pointld-2	plt=	19.				0.	0.	0.	0.		
POINTLD-2	PLT=	20.				1.6	0.18	0.02	5.		
POINTLD-2	PLT=	21.				2.4	1.6	0.63	.64		
POINTLD-2	PLT=	22.				2.8	0.98	0.13	1.8		
POINTLD-2	PLT=	23.				3.2	0.89	0.18	3.4		
ENDATA11A											

Partial Data Set for the 1989 Summer-Chronic Conditions
of the Revised QUAL2E Model

The flag fields and point sources, and the flow and constituent concentrations for the initial conditions, headwaters, and point sources.

TITLE01 Stream Quality Model--QUAL2E; S.PlatteRr, CO, 19 mi, Based on 9/22/83
TITLE02 Summer-chronic low-flow, current(1989), w/ BearCr., CherryCr., WWTP's.

NUM OF HEADWATERS = 3. NUMBER OF POINT LOADS = 25.

Computational Reach Flag Fields

	Reach	*Elements/reach*	*Computational flags*
flag field rch=	0.1	4.	1.6.2.2.
flag field rch=	0.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
flag field rch=	0.3	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
flag field rch=	0.4	2.	2.2.
FLAG FIELD RCH=	1.	11.	2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	2.	1.	6.
FLAG FIELD RCH=	3.	15.	7.2.2.2.2.2.2.2.2.2.2.2.2.2.3.
FLAG FIELD RCH=	4.0	20.	1.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	4.1	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	4.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	4.3	14.	2.2.2.2.2.2.2.2.2.2.2.2.2.6.
FLAG FIELD RCH=	5.	10.	4.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	6.	5.	6.2.2.2.2.
FLAG FIELD RCH=	7.	2.	6.2.
FLAG FIELD RCH=	8.	3.	6.2.2.
FLAG FIELD RCH=	9.	2.	6.2.
FLAG FIELD RCH=	10.	12.	6.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	11.	6.	6.2.2.2.2.2.
FLAG FIELD RCH=	12.0	20.	6.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	12.1	2.	2.2.
FLAG FIELD RCH=	13.	6.	6.2.2.2.2.2.
FLAG FIELD RCH=	14.	1.	6.
FLAG FIELD RCH=	15.	1.	6.
FLAG FIELD RCH=	16.	2.	6.2.
FLAG FIELD RCH=	17.	2.	6.2.
FLAG FIELD RCH=	18.	1.	6.
FLAG FIELD RCH=	19.	2.	6.2.
FLAG FIELD RCH=	20.	10.	6.2.2.2.2.2.2.2.2.3.
FLAG FIELD RCH=	21.0	20.	1.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.1	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.3	20.	6.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.4	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.5	16.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.6.
FLAG FIELD RCH=	22.	7.	4.2.2.2.2.2.2.
FLAG FIELD RCH=	23.	9.	6.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	24.	4.	6.2.2.2.
FLAG FIELD RCH=	25.	3.	6.2.2.
FLAG FIELD RCH=	26.	8.	6.2.2.2.2.2.2.5.

ENDATA4

Initial Conditions

	Reach	Temp.	DO	BOD	DS	CM-2	CM-3	ANC	COLI
initial cond-1 rch=	0.1	68.	6.6	2.9	244.				
initial cond-1 rch=	0.2	68.	6.6	2.9	244.				
initial cond-1 rch=	0.3	68.	6.6	2.9	244.				
initial cond-1 rch=	0.4	68.	7.5	2.9	244.				
INITIAL COND-1 RCH=	1.	68.	7.5	2.3	341.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	2.	68.	8.5	2.1	142.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	3.	68.	0.0	0.	0.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	4.0	68.	0.	0.	0.	0.00	0.00	0.000	
INITIAL COND-1 RCH=	4.1	68.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	4.2	68.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	4.3	68.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	5.	68.	8.0	3.0	279.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	6.	68.	8.2	2.0	1090.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	7.	68.	7.9	2.6	1185.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	8.	68.	6.8	13.4	680.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	9.	68.	8.7	8.9	1803.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	10.	68.	6.9	4.6	853.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	11.	68.	8.2	4.4	439.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	12.0	68.	7.6	2.4	585.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	12.1	68.	7.6	2.4	585.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	13.	68.	7.2	5.4	868.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	14.	68.	0.0	0.	0.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	15.	68.	8.1	8.3	543.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	16.	68.	7.1	3.8	560.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	17.	68.	6.0	1.4	1020.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	18.	68.	8.9	2.1	403.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	19.	68.	7.8	5.3	535.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	20.	68.	5.6	1.2	150.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.0	68.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.1	68.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.2	68.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.3	68.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.4	68.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.5	68.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	22.	68.	8.6	3.	733.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	23.	68.	7.4	1.1	844.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	24.	68.	7.3	2.4	796.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	25.	68.	7.3	7.2	334.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	26.	68.	6.6	6.3	462.00	0.00	0.00	0.000	0.0

ENDATA7

Initial Conditions for Chlorophyll-a, Nitrogen, and Phosphorus

	Reach	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
initial cond-2 rch=	0.1	0.	0.45	0.12	0.02	0.64		
initial cond-2 rch=	0.2	0.	0.45	0.12	0.02	0.64		
initial cond-2 rch=	0.3	0.	0.45	0.12	0.02	0.64		
initial cond-2 rch=	0.4	0.	0.45	0.12	0.02	0.64		
INITIAL COND-2 RCH=	1.	0.	0.58	0.10	0.02	0.70	0.	0.
INITIAL COND-2 RCH=	2.	0.	1.52	0.12	0.02	5.68	0.	0.
INITIAL COND-2 RCH=	3.	0.	.0	.0	.0	.0	0.	0.
INITIAL COND-2 RCH=	4.0	0.	.0	.0	.0	.7	0.	0.
INITIAL COND-2 RCH=	4.1	0.	.0	.0	.0	.7	0.	0.
INITIAL COND-2 RCH=	4.2	0.	.0	.0	.0	.7	0.	0.
INITIAL COND-2 RCH=	4.3	0.	.0	.0	.0	.7	0.	0.
INITIAL COND-2 RCH=	5.	0.	0.50	0.10	0.01	0.75	0.	0.
INITIAL COND-2 RCH=	6.	0.	1.06	0.14	0.02	3.31	0.	0.
INITIAL COND-2 RCH=	7.	0.	1.66	0.09	0.03	8.71	0.	0.
INITIAL COND-2 RCH=	8.	0.	2.87	15.98	0.05	0.00	0.	0.
INITIAL COND-2 RCH=	9.	0.	1.36	0.14	0.02	0.58	0.	0.
INITIAL COND-2 RCH=	10.	0.	1.2	0.13	0.05	2.52	0.	0.
INITIAL COND-2 RCH=	11.	0.	1.07	0.12	0.03	1.47	0.	0.
INITIAL COND-2 RCH=	12.0	0.	1.38	0.12	0.02	5.92	0.	0.
INITIAL COND-2 RCH=	12.1	0.	1.38	0.12	0.02	5.92	0.	0.
INITIAL COND-2 RCH=	13.	0.	1.13	0.16	0.38	5.32	0.	0.
INITIAL COND-2 RCH=	14.	0.	0.	0.	0.	0.	0.	0.
INITIAL COND-2 RCH=	15.	0.	1.12	0.15	0.05	2.65	0.	0.
INITIAL COND-2 RCH=	16.	0.	0.80	2.9	0.46	1.59	0.	0.
INITIAL COND-2 RCH=	17.	0.	0.9	0.19	0.01	5.79	0.	0.
INITIAL COND-2 RCH=	18.	0.	0.91	0.09	0.02	1.95	0.	0.
INITIAL COND-2 RCH=	19.	0.	2.68	0.07	0.02	0.33	0.	0.
INITIAL COND-2 RCH=	20.	0.	0.49	0.31	0.02	0.03	0.	0.
INITIAL COND-2 RCH=	21.0	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.1	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.2	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.3	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.4	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.5	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	22.	0.	1.15	0.14	0.03	4.19	0.	0.
INITIAL COND-2 RCH=	23.	0.	1.39	0.20	0.02	5.23	0.	0.
INITIAL COND-2 RCH=	24.	0.	1.28	0.67	0.07	4.82	0.	0.
INITIAL COND-2 RCH=	25.	0.	1.56	0.79	0.14	2.15	0.	0.
INITIAL COND-2 RCH=	26.	0.	1.43	0.12	0.04	1.51	0.	0.

ENDATA7A

Stream Junctions

	Junction order and identification		Upstream	Junction	Tributary
STREAM JUNCTION	1.	JNC=BEAR CREEK	73.	148.	147.
STREAM JUNCTION	2.	JNC=CHERRY CREEK	234.	351.	350.

ENDATA9

Headwater Sources

	Order	Name	Flow	Temp.	DO	BOD	DS	CM-2	CM-3
HEADWTR-1 HDW=	1.	SOUTH PLATTE	65.	68.	6.6	2.9	341.0	0.0	0.0
HEADWTR-1 HDW=	2.	BEAR CREEK	0.6	68.	7.1	3.0	279.0	0.0	0.0
HEADWTR-1 HDW=	3.	CHERRY CREEK	7.9	68.	7.1	2.6	38.0	0.0	0.0

ENDATA10

Headwater Conditions for ANC, Coliform, Chlorophyll-a, Nitrogen, and Phosphorus

	Order	ANC	COLI	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
HEADWTR-2 HDW=	1.	0.00	0.00	0.00	0.2	0.14	0.02	0.2	0.00	0.00
HEADWTR-2 HDW=	2.	0.00	0.00	0.00	0.38	0.06	0.01	0.01		
HEADWTR-2 HDW=	3.	0.00	0.00	0.00	1.06	0.19	0.03	0.02		

ENDATA10A

Point Sources and Point-Source Characteristics

	Order and name	Effl.	Flow	Temp.	DO	BOD	DS	CM-2	CM-3
pointld-1 ptl=	1.Marcey Gulch	0.	0.79	68.	9.9	5.3	0.	0.	0.
POINTLD-1 PTL=	2.Big Dry Cr.	0.00	11.	68.0	8.5	2.1	142.0	0.0	0.0
POINTLD-1 PTL=	3.Englwd Intke	0.00	-20.	68.	0.0	0.0	0.0	0.0	0.0
Pointld-1 ptl=	4.BearCrBalnce		4.4	68.	8.5	3.0	337.		
POINTLD-1 PLT=	5.LittleDryCr		4.	68.	8.7	2.0	1090.0		
POINTLD-1 PLT=	6.Unnamed Trib		3.	68.	7.9	2.6	1185.0		
POINTLD-1 PLT=	7.Bi-City WWTP		36.5	68.	8.7	9.3	680.0		
POINTLD-1 PLT=	8.PSCO efluent		0.4	68.	8.7	8.9	1803.0		
POINTLD-1 PLT=	9.Harvard Glch		0.6	68.	6.9	4.6	853.0		
POINTLD-1 PLT=	10.Anderson Gch		2.4	68.	8.2	4.4	439.0		
POINTLD-1 PLT=	11.Miss.StormDr		2.0	68.	7.6	2.4	585.0		
POINTLD-1 PLT=	12.ValjoStDrain		0.3	68.	7.2	5.4	868.0		
POINTLD-1 PLT=	13.LakewoodWWTP		0.0	68.	0.0	0.	0.		
POINTLD-1 PLT=	14.EnWWTP-WeirG		2.1	68.	8.1	8.3	543.0		
POINTLD-1 PLT=	15.ZuniPPlant#1		0.2	68.	7.1	3.8	560.0		
POINTLD-1 PLT=	16.ZuniPowerP#2		0.6	68.	6.0	1.4	1020.0		
POINTLD-1 PLT=	17.LakeWdGulch		10.0	68.	8.9	2.1	403.		
POINTLD-1 PLT=	18.SloansLkOutF		1.1	68.	7.8	5.3	535.		
POINTLD-1 PLT=	19.EllisFoodsEf		0.1	68.	5.6	1.2	150.		
Pointld-1 plt=	20.GlendaleWWTP		1.5	68.	6.5	1.9	0.		
Pointld-1 plt=	21.CherryCrBlnc		6.5	68.	6.0	9.1	1551.		
POINTLD-1 PLT=	22.23rdStStrmDr		1.2	68.	7.4	1.1	844.		
POINTLD-1 PLT=	23.IcePlantEffl		0.8	68.	7.3	2.4	796.		
POINTLD-1 PLT=	24.36thStStrmDr		0.8	68.	7.3	7.2	334.		
POINTLD-1 PLT=	25.38thStStrmDr		5.2	68.	6.6	6.3	462.		

ENDATA11

Point-Source Characteristics for ANC, Coliform, Chlorophyll-a, Nitrogen, and Phosphorus

		Order	ANC	COLI	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
pointld-2	plt=	1.	0.	0.	0.	0.	0.7	0.	13.	0.	0.
POINTLD-2	PLT=	2.	0.00	000.0	00.00	1.52	0.12	0.02	5.68	0.00	0.00
POINTLD-2	PLT=	3.				0.	0.	0.	0.		
Pointld-2	plt=	4.				1.13	0.88	0.01	0.94		
POINTLD-2	PLT=	5.				1.06	0.14	0.02	3.31		
POINTLD-2	PLT=	6.				1.66	0.09	0.03	8.71		
POINTLD-2	PLT=	7.				2.87	18.9	0.05	6.1		
POINTLD-2	PLT=	8.				1.36	0.14	0.02	0.58		
POINTLD-2	PLT=	9.				1.2	0.13	0.05	2.52		
POINTLD-2	PLT=	10.				1.07	0.12	0.03	1.47		
POINTLD-2	PLT=	11.				1.38	0.12	0.02	5.92		
POINTLD-2	PLT=	12.				1.13	0.16	0.38	5.32		
POINTLD-2	PLT=	13.				0.	0.	0.	0.		
POINTLD-2	PLT=	14.				1.12	0.15	0.05	2.65		
POINTLD-2	PLT=	15.				0.80	2.9	0.46	1.59		
POINTLD-2	PLT=	16.				0.9	0.19	0.01	5.79		
POINTLD-2	PLT=	17.				0.91	0.09	0.02	1.95		
POINTLD-2	PLT=	18.				2.68	0.07	0.02	0.33		
POINTLD-2	PLT=	19.				0.49	0.31	0.02	0.03		
Pointld-2	plt=	20.				0.	0.93	0.	14.07		
Pointld-2	plt=	21.				8.1	0.02	0.11	3.2		
POINTLD-2	PLT=	22.				1.39	0.20	0.02	5.19		
POINTLD-2	PLT=	23.				1.28	0.67	0.07	4.82		
POINTLD-2	PLT=	24.				1.56	0.79	0.14	2.15		
POINTLD-2	PLT=	25.				1.43	0.12	0.04	1.51		

ENDATA11A

Partial Data Set for the 2010 Summer-Chronic Conditions
of the Revised QUAL2E Model

The flag fields and point sources, and the flow and constituent concentrations for the initial conditions, headwaters, and point sources

TITLE01 Stream Quality Model--QUAL2E; S.PlatteRr, CO, 19 mi, Based on 9/22/83
TITLE02 Summer-chronic low-flow, project(2010), w/ BearCr., CherryCr., WWTP's.

NUM OF HEADWATERS = 3. NUMBER OF POINT LOADS = 25.

Computational Reach Flag Fields

	Reach	*Elements/reach*	*Computational flags*
flag field rch=	0.1	4.	1.6.2.2.
flag field rch=	0.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
flag field rch=	0.3	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
flag field rch=	0.4	2.	2.2.
FLAG FIELD RCH=	1.	11.	2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	2.	1.	6.
FLAG FIELD RCH=	3.	15.	7.2.2.2.2.2.2.2.2.2.2.2.2.2.3.
FLAG FIELD RCH=	4.0	20.	1.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	4.1	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	4.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	4.3	14.	2.2.2.2.2.2.2.2.2.2.2.2.2.6.
FLAG FIELD RCH=	5.	10.	4.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	6.	5.	6.2.2.2.2.
FLAG FIELD RCH=	7.	2.	6.2.
FLAG FIELD RCH=	8.	3.	6.2.2.
FLAG FIELD RCH=	9.	2.	6.2.
FLAG FIELD RCH=	10.	12.	6.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	11.	6.	6.2.2.2.2.2.
FLAG FIELD RCH=	12.0	20.	6.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	12.1	2.	2.2.
FLAG FIELD RCH=	13.	6.	6.2.2.2.2.2.
FLAG FIELD RCH=	14.	1.	6.
FLAG FIELD RCH=	15.	1.	6.
FLAG FIELD RCH=	16.	2.	6.2.
FLAG FIELD RCH=	17.	2.	6.2.
FLAG FIELD RCH=	18.	1.	6.
FLAG FIELD RCH=	19.	2.	6.2.
FLAG FIELD RCH=	20.	10.	6.2.2.2.2.2.2.2.2.3.
FLAG FIELD RCH=	21.0	20.	1.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.1	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.3	20.	6.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.4	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.5	16.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.6.
FLAG FIELD RCH=	22.	7.	4.2.2.2.2.2.2.
FLAG FIELD RCH=	23.	9.	6.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	24.	4.	6.2.2.2.
FLAG FIELD RCH=	25.	3.	6.2.2.
FLAG FIELD RCH=	26.	8.	6.2.2.2.2.2.2.5.

ENDATA4

Initial Conditions

	Reach	Temp.	DO	BOD	DS	CM-2	CM-3	ANC	COLI
initial cond-1 rch=	0.1	68.	6.6	2.9	244.				
initial cond-1 rch=	0.2	68.	6.6	2.9	244.				
initial cond-1 rch=	0.3	68.	6.6	2.9	244.				
initial cond-1 rch=	0.4	68.	7.5	2.9	244.				
INITIAL COND-1 RCH=	1.	68.	7.5	2.3	341.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	2.	68.	8.5	2.1	142.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	3.	68.	0.0	0.	0.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	4.0	68.	0.	0.	0.	0.00	0.00	0.000	
INITIAL COND-1 RCH=	4.1	68.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	4.2	68.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	4.3	68.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	5.	68.	8.0	3.0	279.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	6.	68.	8.2	2.0	1090.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	7.	68.	7.9	2.6	1185.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	8.	68.	6.8	13.4	680.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	9.	68.	8.7	8.9	1803.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	10.	68.	6.9	4.6	853.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	11.	68.	8.2	4.4	439.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	12.0	68.	7.6	2.4	585.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	12.1	68.	7.6	2.4	585.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	13.	68.	7.2	5.4	868.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	14.	68.	0.0	0.	0.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	15.	68.	8.1	8.3	543.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	16.	68.	7.1	3.8	560.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	17.	68.	6.0	1.4	1020.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	18.	68.	8.9	2.1	403.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	19.	68.	7.8	5.3	535.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	20.	68.	5.6	1.2	150.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.0	68.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.1	68.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.2	68.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.3	68.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.4	68.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.5	68.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	22.	68.	8.6	3.	733.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	23.	68.	7.4	1.1	844.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	24.	68.	7.3	2.4	796.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	25.	68.	7.3	7.2	334.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	26.	68.	6.6	6.3	462.00	0.00	0.00	0.000	0.0

ENDATA7

Initial Conditions for Chlorophyll-a, Nitrogen, and Phosphorus

	Reach	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
initial cond-2 rch=	0.1	0.	0.45	0.12	0.02	0.64		
initial cond-2 rch=	0.2	0.	0.45	0.12	0.02	0.64		
initial cond-2 rch=	0.3	0.	0.45	0.12	0.02	0.64		
initial cond-2 rch=	0.4	0.	0.45	0.12	0.02	0.64		
INITIAL COND-2 RCH=	1.	0.	0.58	0.10	0.02	0.70	0.	0.
INITIAL COND-2 RCH=	2.	0.	1.52	0.12	0.02	5.68	0.	0.
INITIAL COND-2 RCH=	3.	0.	.0	.0	.0	.0	0.	0.
INITIAL COND-2 RCH=	4.0	0.	.0	.0	.0	.7	0.	0.
INITIAL COND-2 RCH=	4.1	0.	.0	.0	.0	.7	0.	0.
INITIAL COND-2 RCH=	4.2	0.	.0	.0	.0	.7	0.	0.
INITIAL COND-2 RCH=	4.3	0.	.0	.0	.0	.7	0.	0.
INITIAL COND-2 RCH=	5.	0.	0.50	0.10	0.01	0.75	0.	0.
INITIAL COND-2 RCH=	6.	0.	1.06	0.14	0.02	3.31	0.	0.
INITIAL COND-2 RCH=	7.	0.	1.66	0.09	0.03	8.71	0.	0.
INITIAL COND-2 RCH=	8.	0.	2.87	15.98	0.05	0.00	0.	0.
INITIAL COND-2 RCH=	9.	0.	1.36	0.14	0.02	0.58	0.	0.
INITIAL COND-2 RCH=	10.	0.	1.2	0.13	0.05	2.52	0.	0.
INITIAL COND-2 RCH=	11.	0.	1.07	0.12	0.03	1.47	0.	0.
INITIAL COND-2 RCH=	12.0	0.	1.38	0.12	0.02	5.92	0.	0.
INITIAL COND-2 RCH=	12.1	0.	1.38	0.12	0.02	5.92	0.	0.
INITIAL COND-2 RCH=	13.	0.	1.13	0.16	0.38	5.32	0.	0.
INITIAL COND-2 RCH=	14.	0.	0.	0.	0.	0.	0.	0.
INITIAL COND-2 RCH=	15.	0.	1.12	0.15	0.05	2.65	0.	0.
INITIAL COND-2 RCH=	16.	0.	0.80	2.9	0.46	1.59	0.	0.
INITIAL COND-2 RCH=	17.	0.	0.9	0.19	0.01	5.79	0.	0.
INITIAL COND-2 RCH=	18.	0.	0.91	0.09	0.02	1.95	0.	0.
INITIAL COND-2 RCH=	19.	0.	2.68	0.07	0.02	0.33	0.	0.
INITIAL COND-2 RCH=	20.	0.	0.49	0.31	0.02	0.03	0.	0.
INITIAL COND-2 RCH=	21.0	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.1	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.2	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.3	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.4	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.5	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	22.	0.	1.15	0.14	0.03	4.19	0.	0.
INITIAL COND-2 RCH=	23.	0.	1.39	0.20	0.02	5.23	0.	0.
INITIAL COND-2 RCH=	24.	0.	1.28	0.67	0.07	4.82	0.	0.
INITIAL COND-2 RCH=	25.	0.	1.56	0.79	0.14	2.15	0.	0.
INITIAL COND-2 RCH=	26.	0.	1.43	0.12	0.04	1.51	0.	0.

ENDATA7A

Stream Junctions

	Junction order and identification		Upstream	Junction	Tributary
STREAM JUNCTION	1.	JNC=BEAR CREEK	73.	148.	147.
STREAM JUNCTION	2.	JNC=CHERRY CREEK	234.	351.	350.

ENDATA9

Headwater Sources

	Order	*Name*	*Flow*	*Temp.*	*DO*	*BOD*	*DS*	*CM-2*	*CM-3*
HEADWTR-1 HDW=	1.	SOUTH PLATTE	65.	68.	6.6	2.9	341.0	0.0	0.0
HEADWTR-1 HDW=	2.	BEAR CREEK	0.6	68.	7.1	3.0	279.0	0.0	0.0
HEADWTR-1 HDW=	3.	CHERRY CREEK	7.9	68.	7.1	2.6	38.0	0.0	0.0

ENDATA10

Headwater Conditions for ANC, Coliform, Chlorophyll-a, Nitrogen, and Phosphorus

	Order	*ANC*	*COLI*	*CHL-A*	*ORG-N*	*NH3-N*	*NO2-N*	*NO3-N*	*ORG-P*	*DISS-P*
HEADWTR-2 HDW=	1.	0.00	0.00	0.00	0.2	0.14	0.02	0.2	0.00	0.00
HEADWTR-2 HDW=	2.	0.00	0.00	0.00	0.38	0.06	0.01	0.01		
HEADWTR-2 HDW=	3.	0.00	0.00	0.00	1.06	0.19	0.03	0.02		

ENDATA10A

Point Sources and Point-Source Characteristics

	Order and name	*Effl.*	*Flow*	*Temp.*	*DO*	*BOD*	*DS*	*CM-2*	*CM-3*
pointld-1 ptl=	1.Marcey Gulch	0.	6.46	68.	5.	30.	30.	0.	0.
POINTLD-1 PTL=	2.Big Dry Cr.	0.00	11.	68.0	8.5	2.1	142.0	0.0	0.0
POINTLD-1 PTL=	3.Englwd Intke	0.00	-20.	68.	0.0	0.0	0.0	0.0	0.0
Pointld-1 ptl=	4.BearCrBalnce		4.4	68.	8.5	3.0	337.		
POINTLD-1 PLT=	5.LittleDryCr		4.	68.	8.2	2.0	1090.0		
POINTLD-1 PLT=	6.Unnamed Trib		3.	68.	7.9	2.6	1185.0		
POINTLD-1 PLT=	7.Bi-City WWTP		47.2	68.	6.	20.	30.0		
POINTLD-1 PLT=	8.PSCO efluent		0.4	68.	8.7	8.9	1803.0		
POINTLD-1 PLT=	9.Harvard Glch		0.6	68.	6.9	4.6	853.0		
POINTLD-1 PLT=	10.Anderson Gch		2.4	68.	8.2	4.4	439.0		
POINTLD-1 PLT=	11.Miss.StormDr		2.0	68.	7.6	2.4	585.0		
POINTLD-1 PLT=	12.ValjoStDrain		0.3	68.	7.2	5.4	868.0		
POINTLD-1 PLT=	13.LakewoodWWTP		0.0	68.	0.0	0.	0.		
POINTLD-1 PLT=	14.EnWWTP-WeirG		2.1	68.	8.1	8.3	543.0		
POINTLD-1 PLT=	15.ZuniPPlant#1		0.2	68.	7.1	3.8	560.0		
POINTLD-1 PLT=	16.ZuniPowerP#2		0.6	68.	6.0	1.4	1020.0		
POINTLD-1 PLT=	17.LakeWdGulch		10.0	68.	8.9	2.1	403.		
POINTLD-1 PLT=	18.SloansLkOutF		1.1	68.	7.8	5.3	535.		
POINTLD-1 PLT=	19.EllisFoodsEf		0.1	68.	5.6	1.2	150.		
Pointld-1 plt=	20.GlendaleWWTP		2.1	68.	6.	30.	30.		
Pointld-1 plt=	21.CherryCrBlnc		6.5	68.	6.0	9.1	1551.		
POINTLD-1 PLT=	22.23rdStStrmDr		1.2	68.	7.4	1.1	844.		
POINTLD-1 PLT=	23.IcePlantEffl		0.8	68.	7.3	2.4	796.		
POINTLD-1 PLT=	24.36thStStrmDr		0.8	68.	7.3	7.2	334.		
POINTLD-1 PLT=	25.38thStStrmDr		5.2	68.	6.6	6.3	462.		

ENDATA11

Point-Source Characteristics for ANC, Coliform, Chlorophyll-a, Nitrogen, and Phosphorus

		Order	ANC	COLI	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
pointld-2	plt=	1.	0.	0.	0.	3.	2.4	0.	15.	0.	0.
POINTLD-2	PLT=	2.	0.00	000.0	00.00	1.52	0.12	0.02	5.68	0.00	0.00
POINTLD-2	PLT=	3.				0.	0.	0.	0.		
Pointld-2	plt=	4.				1.13	0.88	0.01	0.94		
POINTLD-2	PLT=	5.				1.06	0.14	0.02	3.31		
POINTLD-2	PLT=	6.				1.66	0.09	0.03	8.71		
POINTLD-2	PLT=	7.				3.	4.3	0.0	15.		
POINTLD-2	PLT=	8.				1.36	0.14	0.02	0.58		
POINTLD-2	PLT=	9.				1.2	0.13	0.05	2.52		
POINTLD-2	PLT=	10.				1.07	0.12	0.03	1.47		
POINTLD-2	PLT=	11.				1.38	0.12	0.02	5.92		
POINTLD-2	PLT=	12.				1.13	0.16	0.38	5.32		
POINTLD-2	PLT=	13.				0.	0.	0.	0.		
POINTLD-2	PLT=	14.				1.12	0.15	0.05	2.65		
POINTLD-2	PLT=	15.				0.80	2.9	0.46	1.59		
POINTLD-2	PLT=	16.				0.9	0.19	0.01	5.79		
POINTLD-2	PLT=	17.				0.91	0.09	0.02	1.95		
POINTLD-2	PLT=	18.				2.68	0.07	0.02	0.33		
POINTLD-2	PLT=	19.				0.49	0.31	0.02	0.03		
Pointld-2	plt=	20.				3.	4.2	0.	15.		
Pointld-2	plt=	21.				8.1	0.02	0.11	3.2		
POINTLD-2	PLT=	22.				1.39	0.20	0.02	5.19		
POINTLD-2	PLT=	23.				1.28	0.67	0.07	4.82		
POINTLD-2	PLT=	24.				1.56	0.79	0.14	2.15		
POINTLD-2	PLT=	25.				1.43	0.12	0.04	1.51		

ENDATA11A

Partial Data Set for the 1989 Acute Conditions of the Revised QUAL2E Model

The flag fields and point sources, and the flow and constituent concentrations for the initial conditions, headwaters, and point sources.

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TITLE01   Stream Quality Model--QUAL2E; S.PlatteRr, CO, 19 mi, Based on 9/22/83
TITLE02   Acute low-flow, current(1989), w/ BearCr., CherryCr., WWTP's.

NUM OF HEADWATERS       =       3.          NUMBER OF POINT LOADS   =       26.
```

Computational Reach Flag Fields

	Reach	*Elements/reach*	*Computational flags*
flag field rch=	0.1	4.	1.6.2.2.
flag field rch=	0.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
flag field rch=	0.3	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
flag field rch=	0.4	2.	2.2.
FLAG FIELD RCH=	1.	11.	2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	2.	1.	6.
FLAG FIELD RCH=	3.	15.	7.2.2.2.2.2.2.2.2.2.2.2.2.2.3.
FLAG FIELD RCH=	4.0	20.	1.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	4.1	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	4.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	4.3	14.	2.2.2.2.2.2.2.2.2.2.2.2.2.6.
FLAG FIELD RCH=	5.	10.	4.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	6.	5.	6.2.2.2.2.
FLAG FIELD RCH=	7.	2.	6.2.
FLAG FIELD RCH=	8.	3.	6.2.2.
FLAG FIELD RCH=	9.	2.	6.2.
FLAG FIELD RCH=	10.	12.	6.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	11.	6.	6.2.2.2.2.2.
FLAG FIELD RCH=	12.0	20.	6.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	12.1	2.	2.2.
FLAG FIELD RCH=	13.	6.	6.2.2.2.2.2.
FLAG FIELD RCH=	14.	1.	6.
FLAG FIELD RCH=	15.	1.	6.
FLAG FIELD RCH=	16.	2.	6.2.
FLAG FIELD RCH=	17.	2.	6.2.
FLAG FIELD RCH=	18.	1.	6.
FLAG FIELD RCH=	19.	2.	6.2.
FLAG FIELD RCH=	20.	10.	6.2.2.2.2.2.2.2.2.3.
FLAG FIELD RCH=	21.0	20.	1.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.1	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.3	20.	6.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.4	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.5	16.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.6.
FLAG FIELD RCH=	22.	7.	4.2.2.2.2.2.2.
FLAG FIELD RCH=	23.	9.	6.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	24.	4.	6.2.2.2.
FLAG FIELD RCH=	25.	3.	6.2.2.
FLAG FIELD RCH=	26.	8.	6.2.2.2.2.2.2.5.

ENDATA4

Initial Conditions

	Reach	*Temp.*	*DO*	*BOD*	*DS*	*CM-2*	*CM-3*	*ANC*	*COLI*
initial cond-1 rch=	0.1	60.3	6.6	2.9	244.				
initial cond-1 rch=	0.2	60.3	6.6	2.9	244.				
initial cond-1 rch=	0.3	60.3	6.6	2.9	244.				
initial cond-1 rch=	0.4	60.3	7.5	2.9	244.				
INITIAL COND-1 RCH=	1.	59.	7.5	2.3	341.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	2.	59.	8.5	2.1	142.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	3.	59.	0.0	0.	0.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	4.0	59.	0.	0.	0.	0.00	0.00	0.000	
INITIAL COND-1 RCH=	4.1	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	4.2	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	4.3	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	5.	59.	8.0	3.0	279.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	6.	57.2	8.2	2.0	1090.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	7.	57.2	7.9	2.6	1185.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	8.	59.	6.8	13.4	680.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	9.	59.	8.7	8.9	1803.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	10.	59.	6.9	4.6	853.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	11.	59.	8.2	4.4	439.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	12.0	60.8	7.6	2.4	585.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	12.1	60.8	7.6	2.4	585.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	13.	60.8	7.2	5.4	868.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	14.	60.8	0.0	0.	0.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	15.	60.8	8.1	8.3	543.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	16.	60.8	7.1	3.8	560.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	17.	60.8	6.0	1.4	1020.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	18.	60.8	8.9	2.1	403.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	19.	60.8	7.8	5.3	535.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	20.	60.8	5.6	1.2	150.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.0	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.1	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.2	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.3	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.4	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.5	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	22.	59.	8.6	3.	733.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	23.	59.	7.4	1.1	844.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	24.	59.	7.3	2.4	796.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	25.	59.	7.3	7.2	334.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	26.	59.	6.6	6.3	462.00	0.00	0.00	0.000	0.0

ENDATA7

Initial Conditions for Chlorophyll-a, Nitrogen, and Phosphorus

	Reach	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
initial cond-2 rch=	0.1	0.	0.45	0.12	0.02	0.64		
initial cond-2 rch=	0.2	0.	0.45	0.12	0.02	0.64		
initial cond-2 rch=	0.3	0.	0.45	0.12	0.02	0.64		
initial cond-2 rch=	0.4	0.	0.45	0.12	0.02	0.64		
INITIAL COND-2 RCH=	1.	0.	0.58	0.10	0.02	0.70	0.	0.
INITIAL COND-2 RCH=	2.	0.	1.52	0.12	0.02	5.68	0.	0.
INITIAL COND-2 RCH=	3.	0.	.0	.0	.0	.0	0.	0.
INITIAL COND-2 RCH=	4.0	0.	.0	.0	.0	.7	0.	0.
INITIAL COND-2 RCH=	4.1	0.	.0	.0	.0	.7	0.	0.
INITIAL COND-2 RCH=	4.2	0.	.0	.0	.0	.7	0.	0.
INITIAL COND-2 RCH=	4.3	0.	.0	.0	.0	.7	0.	0.
INITIAL COND-2 RCH=	5.	0.	0.50	0.10	0.01	0.75	0.	0.
INITIAL COND-2 RCH=	6.	0.	1.06	0.14	0.02	3.31	0.	0.
INITIAL COND-2 RCH=	7.	0.	1.66	0.09	0.03	8.71	0.	0.
INITIAL COND-2 RCH=	8.	0.	2.87	15.98	0.05	0.00	0.	0.
INITIAL COND-2 RCH=	9.	0.	1.36	0.14	0.02	0.58	0.	0.
INITIAL COND-2 RCH=	10.	0.	1.2	0.13	0.05	2.52	0.	0.
INITIAL COND-2 RCH=	11.	0.	1.07	0.12	0.03	1.47	0.	0.
INITIAL COND-2 RCH=	12.0	0.	1.38	0.12	0.02	5.92	0.	0.
INITIAL COND-2 RCH=	12.1	0.	1.38	0.12	0.02	5.92	0.	0.
INITIAL COND-2 RCH=	13.	0.	1.13	0.16	0.38	5.32	0.	0.
INITIAL COND-2 RCH=	14.	0.	0.	0.	0.	0.	0.	0.
INITIAL COND-2 RCH=	15.	0.	1.12	0.15	0.05	2.65	0.	0.
INITIAL COND-2 RCH=	16.	0.	0.80	2.9	0.46	1.59	0.	0.
INITIAL COND-2 RCH=	17.	0.	0.9	0.19	0.01	5.79	0.	0.
INITIAL COND-2 RCH=	18.	0.	0.91	0.09	0.02	1.95	0.	0.
INITIAL COND-2 RCH=	19.	0.	2.68	0.07	0.02	0.33	0.	0.
INITIAL COND-2 RCH=	20.	0.	0.49	0.31	0.02	0.03	0.	0.
INITIAL COND-2 RCH=	21.0	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.1	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.2	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.3	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.4	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.5	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	22.	0.	1.15	0.14	0.03	4.19	0.	0.
INITIAL COND-2 RCH=	23.	0.	1.39	0.20	0.02	5.23	0.	0.
INITIAL COND-2 RCH=	24.	0.	1.28	0.67	0.07	4.82	0.	0.
INITIAL COND-2 RCH=	25.	0.	1.56	0.79	0.14	2.15	0.	0.
INITIAL COND-2 RCH=	26.	0.	1.43	0.12	0.04	1.51	0.	0.

ENDATA7A

Stream Junctions

	Junction order and identification		Upstream	Junction	Tributary
STREAM JUNCTION	1.	JNC=BEAR CREEK	73.	148.	147.
STREAM JUNCTION	2.	JNC=CHERRY CREEK	234.	351.	350.

ENDATA9

Headwater Sources

	Order	Name	Flow	Temp.	DO	BOD	DS	CM-2	CM-3
HEADWTR-1 HDW=	1.	SOUTH PLATTE	19.	60.3	6.2	2.9	341.0	0.0	0.0
HEADWTR-1 HDW=	2.	BEAR CREEK	2.	57.2	7.35	0.	279.0	0.0	0.0
HEADWTR-1 HDW=	3.	CHERRY CREEK	0.1	60.8	8.3	0.	38.0	0.0	0.0

ENDATA10

Headwater Conditions for ANC, Coliform, Chlorophyll-a, Nitrogen, and Phosphorus

	Order	ANC	COLI	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
HEADWTR-2 HDW=	1.	0.00	0.00	0.00	0.47	0.11	0.	0.12	0.00	0.00
HEADWTR-2 HDW=	2.	0.00	0.00	0.00	0.29	0.05	0.	0.23		
HEADWTR-2 HDW=	3.	0.00	0.00	0.00	0.	0.04	0.02	0.11		

ENDATA10A

Point Sources and Point-Source Characteristics

	Order and name	Effl.	Flow	Temp.	DO	BOD	DS	CM-2	CM-3
pointld-1 ptl=	1.Marcey Gulch	0.	0.79	60.3	9.9	5.3	5.7	0.	0.
POINTLD-1 PTL=	2.Big Dry Cr.	0.00	2.	59.0	8.5	2.1	142.0	0.0	0.0
POINTLD-1 PTL=	3.Englwd Intke	0.00	-21.	59.	0.0	0.0	0.0	0.0	0.0
Pointld-1 ptl=	4.BearCrBalnce		1.	59.	10.5	6.0	532.		
POINTLD-1 PLT=	5.LittleDryCr		2.	57.2	8.2	2.0	1090.0		
POINTLD-1 PLT=	6.Unnamed Trib		3.	59.	7.9	2.6	1185.0		
POINTLD-1 PLT=	7.Bi-City WWTP		36.5	59.	8.7	9.3	680.0		
POINTLD-1 PLT=	8.PSCO efluent		0.4	59.	8.7	8.9	1803.0		
POINTLD-1 PLT=	9.Harvard Glch		0.6	59.	6.9	4.6	853.0		
POINTLD-1 PLT=	10.Anderson Gch		2.4	59.	8.2	4.4	439.0		
POINTLD-1 PLT=	11.Miss.StormDr		2.0	60.8	7.6	2.4	585.0		
POINTLD-1 PLT=	12.ValjoStDrain		0.3	60.8	7.2	5.4	868.0		
POINTLD-1 PLT=	13.LakewoodWWTP		0.0	60.8	0.0	0.	0.		
POINTLD-1 PLT=	14.EnWWTP-WeirG		2.1	60.8	8.1	8.3	543.0		
POINTLD-1 PLT=	15.ZuniPPlant#1		0.2	60.8	7.1	3.8	560.0		
POINTLD-1 PLT=	16.ZuniPowerP#2		0.6	60.8	6.0	1.4	1020.0		
POINTLD-1 PLT=	17.LakeWdGulch		10.0	60.8	8.9	2.1	403.		
POINTLD-1 PLT=	18.SloansLkOutF		1.1	60.8	7.8	5.3	535.		
POINTLD-1 PLT=	19.EllisFoodsEf		0.1	60.8	5.6	1.2	150.		
pointld-1 plt=	20.GlendaleGage		8.7	60.8	8.3	0.	38.		
Pointld-1 plt=	21.GlendaleWWTP		1.5	59.	6.5	1.9	7.4		
Pointld-1 plt=	22.CherryCrBlnc		4.8	59.	5.1	0.	1972.		
POINTLD-1 PLT=	23.23rdStStrmDr		1.2	59.	7.4	1.1	844.		
POINTLD-1 PLT=	24.IcePlantEffl		0.8	59.	7.3	2.4	796.		
POINTLD-1 PLT=	25.36thStStrmDr		0.8	59.	7.3	7.2	334.		
POINTLD-1 PLT=	26.38thStStrmDr		5.2	59.	6.6	6.3	462.		

ENDATA11

Point-Source Characteristics for ANC, Coliform, Chlorophyll-a, Nitrogen, and Phosphorus

		Order	*ANC*	*COLI*	*CHL-A*	*ORG-N*	*NH3-N*	*NO2-N*	*NO3-N*	*ORG-P*	*DISS-P*
pointld-2	plt=	1.	0.	0.	0.	0.	0.7	0.	13.	0.	0.
POINTLD-2	PLT=	2.	0.00	000.0	00.00	1.52	0.12	0.02	5.68	0.00	0.00
POINTLD-2	PLT=	3.				0.	0.	0.	0.		
Pointld-2	plt=	4.				1.64	2.22	0.03	0.44		
POINTLD-2	PLT=	5.				1.06	0.14	0.02	3.31		
POINTLD-2	PLT=	6.				1.66	0.09	0.03	8.71		
POINTLD-2	PLT=	7.				2.87	18.9	0.05	6.1		
POINTLD-2	PLT=	8.				1.36	0.14	0.02	0.58		
POINTLD-2	PLT=	9.				1.2	0.13	0.05	2.52		
POINTLD-2	PLT=	10.				1.07	0.12	0.03	1.47		
POINTLD-2	PLT=	11.				1.38	0.12	0.02	5.92		
POINTLD-2	PLT=	12.				1.13	0.16	0.38	5.32		
POINTLD-2	PLT=	13.				0.	0.	0.	0.		
POINTLD-2	PLT=	14.				1.12	0.15	0.05	2.65		
POINTLD-2	PLT=	15.				0.80	2.9	0.46	1.59		
POINTLD-2	PLT=	16.				0.9	0.19	0.01	5.79		
POINTLD-2	PLT=	17.				0.91	0.09	0.02	1.95		
POINTLD-2	PLT=	18.				2.68	0.07	0.02	0.33		
POINTLD-2	PLT=	19.				0.49	0.31	0.02	0.03		
pointld-2	plt=	20.				0.	0.04	0.02	0.11		
Pointld-2	plt=	21.				0.	0.93	0.	14.		
Pointld-2	plt=	22.				8.5	0.	0.09	2.89		
POINTLD-2	PLT=	23.				1.39	0.20	0.02	5.19		
POINTLD-2	PLT=	24.				1.28	0.67	0.07	4.82		
POINTLD-2	PLT=	25.				1.56	0.79	0.14	2.15		
POINTLD-2	PLT=	26.				1.43	0.12	0.04	1.51		

ENDATA11A

Partial Data Set for the 2010 Acute Conditions of the Revised QUAL2E Model

The flag fields and point sources, and the flow and constituent concentrations for the initial conditions, headwaters, and point sources.

TITLE01 Stream Quality Model--QUAL2E; S.PlatteRr, CO, 19 mi, Based on 9/22/83
TITLE02 Acute low-flow, projected (2010), w/ BearCr., CherryCr., WWTP's.

NUM OF HEADWATERS = 3. NUMBER OF POINT LOADS = 26.

Computational Reach Flag Fields

	Reach	*Elements/reach*	*Computational flags*
flag field rch=	0.1	4.	1.6.2.2.
flag field rch=	0.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
flag field rch=	0.3	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
flag field rch=	0.4	2.	2.2.
FLAG FIELD RCH=	1.	11.	2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	2.	1.	6.
FLAG FIELD RCH=	3.	15.	7.2.2.2.2.2.2.2.2.2.2.2.2.2.3.
FLAG FIELD RCH=	4.0	20.	1.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	4.1	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	4.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	4.3	14.	2.2.2.2.2.2.2.2.2.2.2.2.2.6.
FLAG FIELD RCH=	5.	10.	4.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	6.	5.	6.2.2.2.2.
FLAG FIELD RCH=	7.	2.	6.2.
FLAG FIELD RCH=	8.	3.	6.2.2.
FLAG FIELD RCH=	9.	2.	6.2.
FLAG FIELD RCH=	10.	12.	6.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	11.	6.	6.2.2.2.2.2.
FLAG FIELD RCH=	12.0	20.	6.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	12.1	2.	2.2.
FLAG FIELD RCH=	13.	6.	6.2.2.2.2.2.
FLAG FIELD RCH=	14.	1.	6.
FLAG FIELD RCH=	15.	1.	6.
FLAG FIELD RCH=	16.	2.	6.2.
FLAG FIELD RCH=	17.	2.	6.2.
FLAG FIELD RCH=	18.	1.	6.
FLAG FIELD RCH=	19.	2.	6.2.
FLAG FIELD RCH=	20.	10.	6.2.2.2.2.2.2.2.2.3.
FLAG FIELD RCH=	21.0	20.	1.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.1	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.3	20.	6.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.4	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.5	16.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.6.
FLAG FIELD RCH=	22.	7.	4.2.2.2.2.2.2.
FLAG FIELD RCH=	23.	9.	6.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	24.	4.	6.2.2.2.
FLAG FIELD RCH=	25.	3.	6.2.2.
FLAG FIELD RCH=	26.	8.	6.2.2.2.2.2.2.5.

ENDATA4

Initial Conditions

	Reach	*Temp.*	*DO*	*BOD*	*DS*	*CM-2*	*CM-3*	*ANC*	*COLI*
initial cond-1 rch=	0.1	60.3	6.6	2.9	244.				
initial cond-1 rch=	0.2	60.3	6.6	2.9	244.				
initial cond-1 rch=	0.3	60.3	6.6	2.9	244.				
initial cond-1 rch=	0.4	60.3	7.5	2.9	244.				
INITIAL COND-1 RCH=	1.	59.	7.5	2.3	341.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	2.	59.	8.5	2.1	142.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	3.	59.	0.0	0.	0.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	4.0	59.	0.	0.	0.	0.00	0.00	0.000	
INITIAL COND-1 RCH=	4.1	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	4.2	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	4.3	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	5.	59.	8.0	3.0	279.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	6.	57.2	8.2	2.0	1090.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	7.	57.2	7.9	2.6	1185.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	8.	59.	6.8	13.4	680.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	9.	59.	8.7	8.9	1803.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	10.	59.	6.9	4.6	853.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	11.	59.	8.2	4.4	439.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	12.0	60.8	7.6	2.4	585.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	12.1	60.8	7.6	2.4	585.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	13.	60.8	7.2	5.4	868.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	14.	60.8	0.0	0.	0.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	15.	60.8	8.1	8.3	543.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	16.	60.8	7.1	3.8	560.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	17.	60.8	6.0	1.4	1020.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	18.	60.8	8.9	2.1	403.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	19.	60.8	7.8	5.3	535.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	20.	60.8	5.6	1.2	150.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.0	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.1	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.2	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.3	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.4	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	21.5	59.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	22.	59.	8.6	3.	733.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	23.	59.	7.4	1.1	844.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	24.	59.	7.3	2.4	796.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	25.	59.	7.3	7.2	334.00	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	26.	59.	6.6	6.3	462.00	0.00	0.00	0.000	0.0

ENDATA7

Initial Conditions for Chlorophyll-a, Nitrogen, and Phosphorus

	Reach	*CHL-A*	*ORG-N*	*NH3-N*	*NO2-N*	*NO3-N*	*ORG-P*	*DISS-P*
initial cond-2 rch=	0.1	0.	0.45	0.12	0.02	0.64		
initial cond-2 rch=	0.2	0.	0.45	0.12	0.02	0.64		
initial cond-2 rch=	0.3	0.	0.45	0.12	0.02	0.64		
initial cond-2 rch=	0.4	0.	0.45	0.12	0.02	0.64		
INITIAL COND-2 RCH=	1.	0.	0.58	0.10	0.02	0.70	0.	0.
INITIAL COND-2 RCH=	2.	0.	1.52	0.12	0.02	5.68	0.	0.
INITIAL COND-2 RCH=	3.	0.	.0	.0	.0	.0	0.	0.
INITIAL COND-2 RCH=	4.0	0.	.0	.0	.0	.7	0.	0.
INITIAL COND-2 RCH=	4.1	0.	.0	.0	.0	.7	0.	0.
INITIAL COND-2 RCH=	4.2	0.	.0	.0	.0	.7	0.	0.
INITIAL COND-2 RCH=	4.3	0.	.0	.0	.0	.7	0.	0.
INITIAL COND-2 RCH=	5.	0.	0.50	0.10	0.01	0.75	0.	0.
INITIAL COND-2 RCH=	6.	0.	1.06	0.14	0.02	3.31	0.	0.
INITIAL COND-2 RCH=	7.	0.	1.66	0.09	0.03	8.71	0.	0.
INITIAL COND-2 RCH=	8.	0.	2.87	15.98	0.05	0.00	0.	0.
INITIAL COND-2 RCH=	9.	0.	1.36	0.14	0.02	0.58	0.	0.
INITIAL COND-2 RCH=	10.	0.	1.2	0.13	0.05	2.52	0.	0.
INITIAL COND-2 RCH=	11.	0.	1.07	0.12	0.03	1.47	0.	0.
INITIAL COND-2 RCH=	12.0	0.	1.38	0.12	0.02	5.92	0.	0.
INITIAL COND-2 RCH=	12.1	0.	1.38	0.12	0.02	5.92	0.	0.
INITIAL COND-2 RCH=	13.	0.	1.13	0.16	0.38	5.32	0.	0.
INITIAL COND-2 RCH=	14.	0.	0.	0.	0.	0.	0.	0.
INITIAL COND-2 RCH=	15.	0.	1.12	0.15	0.05	2.65	0.	0.
INITIAL COND-2 RCH=	16.	0.	0.80	2.9	0.46	1.59	0.	0.
INITIAL COND-2 RCH=	17.	0.	0.9	0.19	0.01	5.79	0.	0.
INITIAL COND-2 RCH=	18.	0.	0.91	0.09	0.02	1.95	0.	0.
INITIAL COND-2 RCH=	19.	0.	2.68	0.07	0.02	0.33	0.	0.
INITIAL COND-2 RCH=	20.	0.	0.49	0.31	0.02	0.03	0.	0.
INITIAL COND-2 RCH=	21.0	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.1	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.2	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.3	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.4	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	21.5	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	22.	0.	1.15	0.14	0.03	4.19	0.	0.
INITIAL COND-2 RCH=	23.	0.	1.39	0.20	0.02	5.23	0.	0.
INITIAL COND-2 RCH=	24.	0.	1.28	0.67	0.07	4.82	0.	0.
INITIAL COND-2 RCH=	25.	0.	1.56	0.79	0.14	2.15	0.	0.
INITIAL COND-2 RCH=	26.	0.	1.43	0.12	0.04	1.51	0.	0.

ENDATA7A

Stream Junctions

	Junction order and identification		*Upstream*	*Junction*	*Tributary*
STREAM JUNCTION	1.	JNC=BEAR CREEK	73.	148.	147.
STREAM JUNCTION	2.	JNC=CHERRY CREEK	234.	351.	350.

ENDATA9

Headwater Sources

	Order	Name	Flow	Temp.	DO	BOD	DS	CM-2	CM-3
HEADWTR-1 HDW=	1.	SOUTH PLATTE	19.	60.3	6.2	2.9	341.0	0.0	0.0
HEADWTR-1 HDW=	2.	BEAR CREEK	2.	57.2	7.35	0.	279.0	0.0	0.0
HEADWTR-1 HDW=	3.	CHERRY CREEK	0.1	60.8	8.3	0.	38.0	0.0	0.0

ENDATA10

Headwater Conditions for ANC, Coliform, Chlorophyll-a, Nitrogen, and Phosphorus

	Order	ANC	COLI	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
HEADWTR-2 HDW=	1.	0.00	0.00	0.00	0.47	0.11	0.	0.12	0.00	0.00
HEADWTR-2 HDW=	2.	0.00	0.00	0.00	0.29	0.05	0.	0.23		
HEADWTR-2 HDW=	3.	0.00	0.00	0.00	0.	0.04	0.02	0.11		

ENDATA10A

Point Sources and Point-Source Characteristics

	Order and name	Effl.	Flow	Temp.	DO	BOD	DS	CM-2	CM-3
pointld-1 ptl=	1.Marcey Gulch	0.	6.46	60.3	5.	45.	45.	0.	0.
POINTLD-1 PTL=	2.Big Dry Cr.	0.00	2.	59.0	8.5	2.1	142.0	0.0	0.0
POINTLD-1 PTL=	3.Englwd Intke	0.00	-21.	59.	0.0	0.0	0.0	0.0	0.0
Pointld-1 ptl=	4.BearCrBalnce		1.	59.	10.5	6.0	532.		
POINTLD-1 PLT=	5.LittleDryCr		2.	57.2	8.2	2.0	1090.0		
POINTLD-1 PLT=	6.Unnamed Trib		3.	59.	7.9	2.6	1185.0		
POINTLD-1 PLT=	7.Bi-City WWTP		47.2	59.	6.	30.	45.0		
POINTLD-1 PLT=	8.PSCO efluent		0.4	59.	8.7	8.9	1803.0		
POINTLD-1 PLT=	9.Harvard Glch		0.6	59.	6.9	4.6	853.0		
POINTLD-1 PLT=	10.Anderson Gch		2.4	59.	8.2	4.4	439.0		
POINTLD-1 PLT=	11.Miss.StormDr		2.0	60.8	7.6	2.4	585.0		
POINTLD-1 PLT=	12.ValjoStDrain		0.3	60.8	7.2	5.4	868.0		
POINTLD-1 PLT=	13.LakewoodWWTP		0.0	60.8	0.0	0.	0.		
POINTLD-1 PLT=	14.EnWWTP-WeirG		2.1	60.8	8.1	8.3	543.0		
POINTLD-1 PLT=	15.ZuniPPlant#1		0.2	60.8	7.1	3.8	560.0		
POINTLD-1 PLT=	16.ZuniPowerP#2		0.6	60.8	6.0	1.4	1020.0		
POINTLD-1 PLT=	17.LakeWdGulch		10.0	60.8	8.9	2.1	403.		
POINTLD-1 PLT=	18.SloansLkOutF		1.1	60.8	7.8	5.3	535.		
POINTLD-1 PLT=	19.EllisFoodsEf		0.1	60.8	5.6	1.2	150.		
pointld-1 plt=	20.GlendaleGage		8.7	60.8	8.3	0.	38.		
Pointld-1 plt=	21.GlendaleWWTP		1.5	59.	6.	30.	30.		
Pointld-1 plt=	22.CherryCrBlnc		4.8	59.	5.1	0.	1972.		
POINTLD-1 PLT=	23.23rdStStrmDr		1.2	59.	7.4	1.1	844.		
POINTLD-1 PLT=	24.IcePlantEffl		0.8	59.	7.3	2.4	796.		
POINTLD-1 PLT=	25.36thStStrmDr		0.8	59.	7.3	7.2	334.		
POINTLD-1 PLT=	26.38thStStrmDr		5.2	59.	6.6	6.3	462.		

ENDATA11

Point-Source Characteristics for ANC, Coliform, Chlorophyll-a, Nitrogen, and Phosphorus

		Order	*ANC*	*COLI*	*CHL-A*	*ORG-N*	*NH3-N*	*NO2-N*	*NO3-N*	*ORG-P*	*DISS-P*
pointld-2	plt=	1.	0.	0.	0.	3.	4.9	0.	15.	0.	0.
POINTLD-2	PLT=	2.	0.00	000.0	00.00	1.52	0.12	0.02	5.68	0.00	0.00
POINTLD-2	PLT=	3.				0.	0.	0.	0.		
Pointld-2	plt=	4.				1.64	2.22	0.03	0.44		
POINTLD-2	PLT=	5.				1.06	0.14	0.02	3.31		
POINTLD-2	PLT=	6.				1.66	0.09	0.03	8.71		
POINTLD-2	PLT=	7.				3.	6.0	0.	15.		
POINTLD-2	PLT=	8.				1.36	0.14	0.02	0.58		
POINTLD-2	PLT=	9.				1.2	0.13	0.05	2.52		
POINTLD-2	PLT=	10.				1.07	0.12	0.03	1.47		
POINTLD-2	PLT=	11.				1.38	0.12	0.02	5.92		
POINTLD-2	PLT=	12.				1.13	0.16	0.38	5.32		
POINTLD-2	PLT=	13.				0.	0.	0.	0.		
POINTLD-2	PLT=	14.				1.12	0.15	0.05	2.65		
POINTLD-2	PLT=	15.				0.80	2.9	0.46	1.59		
POINTLD-2	PLT=	16.				0.9	0.19	0.01	5.79		
POINTLD-2	PLT=	17.				0.91	0.09	0.02	1.95		
POINTLD-2	PLT=	18.				2.68	0.07	0.02	0.33		
POINTLD-2	PLT=	19.				0.49	0.31	0.02	0.03		
pointld-2	plt=	20.				0.	0.04	0.02	0.11		
Pointld-2	plt=	21.				3.	8.2	0.	15.		
Pointld-2	plt=	22.				8.5	0.	0.09	2.89		
POINTLD-2	PLT=	23.				1.39	0.20	0.02	5.19		
POINTLD-2	PLT=	24.				1.28	0.67	0.07	4.82		
POINTLD-2	PLT=	25.				1.56	0.79	0.14	2.15		
POINTLD-2	PLT=	26.				1.43	0.12	0.04	1.51		

ENDATA11A

Partial Data Set for the 1989 Winter-Chronic Conditions of the Revised QUAL2E Model

The flag fields and point sources, and the flow and constituent concentrations for the initial conditions, headwaters, and point sources.

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TITLE01   Stream Quality Model--QUAL2E; S.PlatteRr, CO, 19 mi, Based on 1/26/84
TITLE02   Winter-chronic low-flow, current(1989), w/ BearCr., CherryCr., WWTP's.

NUM OF HEADWATERS        =        3.        NUMBER OF POINT LOADS   =      26.
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Computational Reach Flag Fields

	Reach	*Elements/reach*	*Computational flags*
flag field rch=	0.1	4.	1.6.2.2.
flag field rch=	0.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
flag field rch=	0.3	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
flag field rch=	0.4	2.	2.2.
FLAG FIELD RCH=	1.	11.	2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	2.	1.	6.
FLAG FIELD RCH=	3.	15.	7.2.2.2.2.2.2.2.2.2.2.2.2.2.3.
FLAG FIELD RCH=	4.0	20.	1.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	4.1	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	4.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	4.3	14.	2.2.2.2.2.2.2.2.2.2.2.2.2.6.
FLAG FIELD RCH=	5.	10.	4.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	6.	5.	6.2.2.2.2.
FLAG FIELD RCH=	7.	2.	6.2.
FLAG FIELD RCH=	8.	3.	6.2.2.
FLAG FIELD RCH=	9.	2.	6.2.
FLAG FIELD RCH=	10.	12.	6.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	11.	6.	6.2.2.2.2.2.
FLAG FIELD RCH=	12.0	20.	6.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	12.1	2.	2.2.
FLAG FIELD RCH=	13.	6.	6.2.2.2.2.2.
FLAG FIELD RCH=	14.	1.	6.
FLAG FIELD RCH=	15.	1.	6.
FLAG FIELD RCH=	16.	2.	6.2.
FLAG FIELD RCH=	17.	2.	6.2.
FLAG FIELD RCH=	18.	1.	6.
FLAG FIELD RCH=	19.	2.	6.2.
FLAG FIELD RCH=	20.	10.	6.2.2.2.2.2.2.2.2.3.
FLAG FIELD RCH=	21.0	20.	1.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.1	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.6.
FLAG FIELD RCH=	21.3	20.	6.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.4	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.5	16.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.6.
FLAG FIELD RCH=	22.	7.	4.2.2.2.2.2.2.
FLAG FIELD RCH=	23.	9.	6.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	24.	4.	6.2.2.2.
FLAG FIELD RCH=	25.	3.	6.2.2.
FLAG FIELD RCH=	26.	8.	6.2.2.2.2.2.2.5.

ENDATA4

Initial Conditions

	Reach	Temp.	DO	BOD	DS	CM-2	CM-3	ANC	COLI
initial cond-1 rch=	0.1	39.2	8.6	1.9	244.				
initial cond-1 rch=	0.2	39.2	8.6	1.9	244.				
initial cond-1 rch=	0.3	39.2	8.6	1.9	244.				
initial cond-1 rch=	0.4	39.2	8.6	1.9	244.				
INITIAL COND-1 RCH=	1.	37.4	10.3	2.7	410.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	2.	37.4	9.9	4.8	936.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	3.	37.4	0.0	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	4.0	37.4	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	4.1	37.4	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	4.2	37.4	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	4.3	37.4	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	5.	37.4	10.6	4.4	279.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	6.	35.6	11.0	4.5	1190.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	7.	35.6	9.3	12.0	1154.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	8.	42.8	8.2	17.6	646.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	9.	42.8	9.7	1.4	2613.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	10.	42.8	10.0	15.0	686.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	11.	42.8	11.4	3.8	738.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	12.0	41.	7.6	5.6	540.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	12.1	41.	7.6	5.6	540.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	13.	42.8	9.2	3.5	942.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	14.	42.8	0.0	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	15.	42.8	10.6	16.	971.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	16.	42.8	6.8	2.4	1625.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	17.	42.8	0.0	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	18.	42.8	11.7	5.6	815.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	19.	44.6	10.7	5.9	489.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	20.	41.	8.4	6.	213.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.0	41.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.1	41.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.2	41.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.3	41.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.4	41.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.5	41.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	22.	41.	10.4	7.	813.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	23.	41.	8.1	5.2	839.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	24.	41.	4.4	7.6	809.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	25.	41.	8.6	9.2	670.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	26.	41.	8.4	5.4	856.	0.00	0.00	0.000	0.0

ENDATA7

Initial Conditions for Chlorophyll-a, Nitrogen, and Phosphorus

	Reach	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
initial cond-2 rch=	0.1	0.	0.45	0.05	0.01	0.89		
initial cond-2 rch=	0.2	0.	0.45	0.05	0.01	0.89		
initial cond-2 rch=	0.3	0.	0.45	0.05	0.01	0.89		
initial cond-2 rch=	0.4	0.	0.45	0.05	0.01	0.89		
INITIAL COND-2 RCH=	1.	0.	0.43	0.05	0.02	1.05	0.	0.
INITIAL COND-2 RCH=	2.	0.	1.25	0.11	0.06	5.6	0.	0.
INITIAL COND-2 RCH=	3.	0.	0.	0.	0.	0.	0.	0.
initial cond-2 RCH=	4.0	0.	0.	0.	0.	0.	0.	0.
initial cond-2 RCH=	4.1	0.	0.	0.	0.	0.	0.	0.
initial cond-2 RCH=	4.2	0.	0.	0.	0.	0.	0.	0.
initial cond-2 RCH=	4.3	0.	0.	0.	0.	0.	0.	0.
INITIAL COND-2 RCH=	5.	0.	0.58	0.16	0.02	1.3	0.	0.
INITIAL COND-2 RCH=	6.	0.	1.3	0.12	0.05	2.8	0.	0.
INITIAL COND-2 RCH=	7.	0.	1.80	0.30	0.16	5.8	0.	0.
INITIAL COND-2 RCH=	8.	0.	2.5	18.	0.04	0.05	0.	0.
INITIAL COND-2 RCH=	9.	0.	1.4	0.18	0.17	5.4	0.	0.
INITIAL COND-2 RCH=	10.	0.	2.3	0.52	0.1	2.2	0.	0.
INITIAL COND-2 RCH=	11.	0.	2.2	0.4	0.13	2.2	0.	0.
INITIAL COND-2 RCH=	12.0	0.	1.1	0.16	0.05	5.0	0.	0.
INITIAL COND-2 RCH=	12.1	0.	1.1	.16	0.05	5.0	0.	0.
INITIAL COND-2 RCH=	13.	0.	1.6	0.3	0.24	3.5	0.	0.
INITIAL COND-2 RCH=	14.	0.	0.	0.	0.	0.	0.	0.
INITIAL COND-2 RCH=	15.	0.	1.6	0.28	0.22	3.8	0.	0.
INITIAL COND-2 RCH=	16.	0.	2.2	0.11	0.02	0.18	0.	0.
INITIAL COND-2 RCH=	17.	0.	0.0	0.0	0.00	0.0	0.	0.
INITIAL COND-2 RCH=	18.	0.	1.2	0.15	0.08	3.2	0.	0.
INITIAL COND-2 RCH=	19.	0.	1.5	1.1	0.04	0.13	0.	0.
INITIAL COND-2 RCH=	20.	0.	0.47	0.23	0.03	0.17	0.	0.
initial cond-2 RCH=	21.0	0.	.0	.0	.00	0.	0.	0.
initial cond-2 RCH=	21.1	0.	.0	.0	.00	0.	0.	0.
initial cond-2 RCH=	21.2	0.	.0	.0	.00	0.	0.	0.
initial cond-2 RCH=	21.3	0.	.0	.0	.00	0.	0.	0.
initial cond-2 RCH=	21.4	0.	.0	.0	.00	0.	0.	0.
initial cond-2 RCH=	21.5	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	22.	0.	1.8	0.26	0.1	3.9	0.	0.
INITIAL COND-2 RCH=	23.	0.	1.6	0.18	0.02	5.0	0.	0.
INITIAL COND-2 RCH=	24.	0.	2.4	1.6	0.63	6.4	0.	0.
INITIAL COND-2 RCH=	25.	0.	2.8	0.98	0.13	1.8	0.	0.
INITIAL COND-2 RCH=	26.	0.	3.2	0.89	0.18	3.4	0.	0.

ENDATA7A

Stream Junctions

	Junction order and identification		Upstream	Junction	Tributary
STREAM JUNCTION	1.	JNC=BEAR CREEK	73.	148.	147.
STREAM JUNCTION	2.	JNC=CHERRY CREEK	234.	351.	350.

ENDATA9

Headwater Sources

	Order	*Name*	*Flow*	*Temp.*	*DO*	*BOD*	*DS*	*CM-2*	*CM-3*
headwtr-1 HDW=	1.	SOUTH PLATTE	25.0	37.4	6.4	0.	410.0	0.0	0.0
headwtr-1 HDW=	2.	BEAR CREEK	1.	37.4	11.2	0.	279.0	0.0	0.0
headwtr-1 HDW=	3.	CHERRY CREEK	0.1	41.	9.8	0.	38.0	0.0	0.0

ENDATA10

Headwater Conditions for ANC, Coliform, Chlorophyll-a, Nitrogen, and Phosphorus

	Order	*ANC*	*COLI*	*CHL-A*	*ORG-N*	*NH3-N*	*NO2-N*	*NO3-N*	*ORG-P*	*DISS-P*
headwtr-2 HDW=	1.	0.00	0.00	0.00	0.01	0.08	0.	0.32	0.00	0.00
headwtr-2 HDW=	2.	0.00	0.00	0.00	2.36	0.01	0.	0.57		
headwtr-2 HDW=	3.	0.00	0.00	0.00	0.	0.16	0.	0.18		

ENDATA10A

Point Sources and Point-Source Characteristics

	Order and name	*Effl.*	*Flow*	*Temp.*	*DO*	*BOD*	*DS*	*CM-2*	*CM-3*
pointld-1 ptl=	1.Marcey Gulch	0.	0.79	37.4	9.9	5.3	5.7	0.	0.
POINTLD-1 PTL=	2.Big DryCreek	0.00	5.	37.4	9.9	4.8	936.	0.0	0.0
POINTLD-1 PTL=	3.EnglwdIntake	0.00	-7.0	37.4	0.0	0.0	0.	0.0	0.0
Pointld-1 plt=	4.BearCrBalnce		9.3	37.4	11.	2.2	365.		
POINTLD-1 PLT=	5.LittleDryCrk		2.0	35.6	11.0	4.5	1190.		
POINTLD-1 PLT=	6.Unnamed Trib		3.0	35.6	9.3	12.0	1154.		
POINTLD-1 PLT=	7.Bi-City WWTP		36.5	42.8	8.7	9.3	646.		
POINTLD-1 PLT=	8.PSCOEffluent		0.2	42.8	9.7	1.4	2613.		
POINTLD-1 PLT=	9.HarvardGulch		0.5	42.8	10.0	15.	686.		
POINTLD-1 PLT=	10.AndersonGlch		1.3	42.8	11.4	3.8	738.		
POINTLD-1 PLT=	11.Miss.StormDr		.5	41.	7.6	5.6	540.		
POINTLD-1 PLT=	12.ValjoStDrain		0.2	42.8	9.2	3.5	942.		
POINTLD-1 PLT=	13.LakewoodWWTP		0.0	42.8	0.0	0.	0.		
POINTLD-1 PLT=	14.EnWWTP-WeirG		1.0	42.8	10.6	16.	971.		
POINTLD-1 PLT=	15.ZuniPPlant#1		0.3	42.8	6.8	2.4	1625.		
POINTLD-1 PLT=	16.ZuniPowerP#2		0.0	42.8	0.0	0.	0.		
POINTLD-1 PLT=	17.LakewdGulch		4.2	42.8	11.7	5.6	815.		
POINTLD-1 PLT=	18.SloansLkOutF		1.	44.6	10.7	5.9	489.		
POINTLD-1 PLT=	19.EllisFoodsEf		0.4	41.	8.4	6.0	213.		
pointld-1 plt=	20.GlendaleGage		4.2	41.	9.8	0.	279.		
pointld-1 plt=	21.GlendaleWWTP		1.5	41.	6.5	1.9	7.4		
Pointld-1 plt=	22.CherryCrBlnc		9.3	41.	11.1	5.3	1035.		
POINTLD-1 PLT=	23.23rdStStrmDr		1.2	41.	8.1	5.2	839.		
POINTLD-1 PLT=	24.IcePlantEffl		0.8	41.	4.4	7.6	809.		
POINTLD-1 PLT=	25.36thStStrmDr		1.1	41.	8.6	9.2	670.		
POINTLD-1 PLT=	26.38thStStrmDr		8.2	41.	8.4	5.4	856.		

ENDATA11

Point-Source Characteristics for ANC, Coliform, Chlorophyll-a, Nitrogen, and Phosphorus

		Order	ANC	COLI	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
pointld-2	plt=	1.	0.	0.	0.	0.	0.7	0.	13.	0.	0.
POINTLD-2	PLT=	2.	0.00	000.0	00.00	1.2	0.11	0.06	5.6	0.00	0.00
POINTLD-2	PLT=	3.				0.	0.	0.	0.		
Pointld-2	plt=	4.				0.83	2.4	0.01	2.4		
POINTLD-2	PLT=	5.				1.3	0.12	0.05	2.8		
POINTLD-2	PLT=	6.				1.8	0.3	0.16	5.8		
POINTLD-2	PLT=	7.				2.87	18.9	0.	6.		
POINTLD-2	PLT=	8.				1.4	0.18	0.17	5.4		
POINTLD-2	PLT=	9.				2.3	0.52	0.1	2.2		
POINTLD-2	PLT=	10.				2.2	0.4	0.13	2.2		
POINTLD-2	PLT=	11.				1.1	0.16	0.05	5.		
POINTLD-2	PLT=	12.				1.6	0.30	0.24	3.5		
POINTLD-2	PLT=	13.				0.	0.	0.	0.		
POINTLD-2	PLT=	14.				1.6	0.28	0.22	3.8		
POINTLD-2	PLT=	15.				2.2	0.11	0.02	0.18		
POINTLD-2	PLT=	16.				0.0	0.00	0.00	0.00		
POINTLD-2	PLT=	17.				1.2	0.15	0.08	3.2		
POINTLD-2	PLT=	18.				1.5	1.1	0.04	0.13		
POINTLD-2	PLT=	19.				0.47	0.23	0.03	0.17		
pointld-2	plt=	20.				0.	0.16	0.	0.18		
pointld-2	plt=	21.				0.	0.93	0.	14.		
Pointld-2	plt=	22.				2.1	0.	0.16	3.4		
POINTLD-2	PLT=	23.				1.6	0.18	0.02	5.		
POINTLD-2	PLT=	24.				2.4	1.6	0.63	0.64		
POINTLD-2	PLT=	25.				2.8	0.98	0.13	1.8		
POINTLD-2	PLT=	26.				3.2	0.89	0.18	3.4		

ENDATA11A

Partial Data Set for the 2010 Winter-Chronic Conditions of the Revised QUAL2E Model

The flag fields and point sources, and the flow and constituent concentrations for the initial conditions, headwaters, and point sources.

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TITLE01   Stream Quality Model--QUAL2E; S.PlatteRr, CO, 19 mi, Based on 1/26/84
TITLE02   Winter-chronic low-flow, project(2010), w/ BearCr., CherryCr., WWTP's.

NUM OF HEADWATERS        =        3.         NUMBER OF POINT LOADS   =       26.
```

Computational Reach Flag Fields

	Reach	Elements/reach	Computational flags
flag field rch=	0.1	4.	1.6.2.2.
flag field rch=	0.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
flag field rch=	0.3	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
flag field rch=	0.4	2.	2.2.
FLAG FIELD RCH=	1.	11.	2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	2.	1.	6.
FLAG FIELD RCH=	3.	15.	7.2.2.2.2.2.2.2.2.2.2.2.2.2.3.
FLAG FIELD RCH=	4.0	20.	1.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	4.1	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	4.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	4.3	14.	2.2.2.2.2.2.2.2.2.2.2.2.2.6.
FLAG FIELD RCH=	5.	10.	4.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	6.	5.	6.2.2.2.2.
FLAG FIELD RCH=	7.	2.	6.2.
FLAG FIELD RCH=	8.	3.	6.2.2.
FLAG FIELD RCH=	9.	2.	6.2.
FLAG FIELD RCH=	10.	12.	6.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	11.	6.	6.2.2.2.2.2.
FLAG FIELD RCH=	12.0	20.	6.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	12.1	2.	2.2.
FLAG FIELD RCH=	13.	6.	6.2.2.2.2.2.
FLAG FIELD RCH=	14.	1.	6.
FLAG FIELD RCH=	15.	1.	6.
FLAG FIELD RCH=	16.	2.	6.2.
FLAG FIELD RCH=	17.	2.	6.2.
FLAG FIELD RCH=	18.	1.	6.
FLAG FIELD RCH=	19.	2.	6.2.
FLAG FIELD RCH=	20.	10.	6.2.2.2.2.2.2.2.2.3.
FLAG FIELD RCH=	21.0	20.	1.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.1	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.2	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.6.
FLAG FIELD RCH=	21.3	20.	6.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.4	20.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	21.5	16.	2.2.2.2.2.2.2.2.2.2.2.2.2.2.2.6.
FLAG FIELD RCH=	22.	7.	4.2.2.2.2.2.2.
FLAG FIELD RCH=	23.	9.	6.2.2.2.2.2.2.2.2.
FLAG FIELD RCH=	24.	4.	6.2.2.2.
FLAG FIELD RCH=	25.	3.	6.2.2.
FLAG FIELD RCH=	26.	8.	6.2.2.2.2.2.2.5.

ENDATA4

Initial Conditions

	Reach	Temp.	DO	BOD	DS	CM-2	CM-3	ANC	COLI
initial cond-1 rch=	0.1	39.2	8.6	1.9	244.				
initial cond-1 rch=	0.2	39.2	8.6	1.9	244.				
initial cond-1 rch=	0.3	39.2	8.6	1.9	244.				
initial cond-1 rch=	0.4	39.2	8.6	1.9	244.				
INITIAL COND-1 RCH=	1.	37.4	10.3	2.7	410.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	2.	37.4	9.9	4.8	936.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	3.	37.4	0.0	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	4.0	37.4	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	4.1	37.4	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	4.2	37.4	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	4.3	37.4	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	5.	37.4	10.6	4.4	279.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	6.	35.6	11.0	4.5	1190.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	7.	35.6	9.3	12.0	1154.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	8.	42.8	8.2	17.6	646.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	9.	42.8	9.7	1.4	2613.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	10.	42.8	10.0	15.0	686.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	11.	42.8	11.4	3.8	738.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	12.0	41.	7.6	5.6	540.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	12.1	41.	7.6	5.6	540.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	13.	42.8	9.2	3.5	942.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	14.	42.8	0.0	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	15.	42.8	10.6	16.	971.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	16.	42.8	6.8	2.4	1625.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	17.	42.8	0.0	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	18.	42.8	11.7	5.6	815.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	19.	44.6	10.7	5.9	489.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	20.	41.	8.4	6.	213.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.0	41.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.1	41.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.2	41.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.3	41.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.4	41.	0.	0.	0.	0.00	0.00	0.000	0.0
initial cond-1 RCH=	21.5	41.	0.	0.	0.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	22.	41.	10.4	7.	813.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	23.	41.	8.1	5.2	839.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	24.	41.	4.4	7.6	809.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	25.	41.	8.6	9.2	670.	0.00	0.00	0.000	0.0
INITIAL COND-1 RCH=	26.	41.	8.4	5.4	856.	0.00	0.00	0.000	0.0

ENDATA7

Initial Conditions for Chlorophyll-a, Nitrogen, and Phosphorus

	Reach	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
initial cond-2 rch=	0.1	0.	0.45	0.05	0.01	0.89		
initial cond-2 rch=	0.2	0.	0.45	0.05	0.01	0.89		
initial cond-2 rch=	0.3	0.	0.45	0.05	0.01	0.89		
initial cond-2 rch=	0.4	0.	0.45	0.05	0.01	0.89		
INITIAL COND-2 RCH=	1.	0.	0.43	0.05	0.02	1.05	0.	0.
INITIAL COND-2 RCH=	2.	0.	1.25	0.11	0.06	5.6	0.	0.
INITIAL COND-2 RCH=	3.	0.	0.	0.	0.	0.	0.	0.
initial cond-2 RCH=	4.0	0.	0.	0.	0.	0.	0.	0.
initial cond-2 RCH=	4.1	0.	0.	0.	0.	0.	0.	0.
initial cond-2 RCH=	4.2	0.	0.	0.	0.	0.	0.	0.
initial cond-2 RCH=	4.3	0.	0.	0.	0.	0.	0.	0.
INITIAL COND-2 RCH=	5.	0.	0.58	0.16	0.02	1.3	0.	0.
INITIAL COND-2 RCH=	6.	0.	1.3	0.12	0.05	2.8	0.	0.
INITIAL COND-2 RCH=	7.	0.	1.80	0.30	0.16	5.8	0.	0.
INITIAL COND-2 RCH=	8.	0.	2.5	18.	0.04	0.05	0.	0.
INITIAL COND-2 RCH=	9.	0.	1.4	0.18	0.17	5.4	0.	0.
INITIAL COND-2 RCH=	10.	0.	2.3	0.52	0.1	2.2	0.	0.
INITIAL COND-2 RCH=	11.	0.	2.2	0.4	0.13	2.2	0.	0.
INITIAL COND-2 RCH=	12.0	0.	1.1	0.16	0.05	5.0	0.	0.
INITIAL COND-2 RCH=	12.1	0.	1.1	.16	0.05	5.0	0.	0.
INITIAL COND-2 RCH=	13.	0.	1.6	0.3	0.24	3.5	0.	0.
INITIAL COND-2 RCH=	14.	0.	0.	0.	0.	0.	0.	0.
INITIAL COND-2 RCH=	15.	0.	1.6	0.28	0.22	3.8	0.	0.
INITIAL COND-2 RCH=	16.	0.	2.2	0.11	0.02	0.18	0.	0.
INITIAL COND-2 RCH=	17.	0.	0.0	0.0	0.00	0.0	0.	0.
INITIAL COND-2 RCH=	18.	0.	1.2	0.15	0.08	3.2	0.	0.
INITIAL COND-2 RCH=	19.	0.	1.5	1.1	0.04	0.13	0.	0.
INITIAL COND-2 RCH=	20.	0.	0.47	0.23	0.03	0.17	0.	0.
initial cond-2 RCH=	21.0	0.	.0	.0	.00	0.	0.	0.
initial cond-2 RCH=	21.1	0.	.0	.0	.00	0.	0.	0.
initial cond-2 RCH=	21.2	0.	.0	.0	.00	0.	0.	0.
initial cond-2 RCH=	21.3	0.	.0	.0	.00	0.	0.	0.
initial cond-2 RCH=	21.4	0.	.0	.0	.00	0.	0.	0.
initial cond-2 RCH=	21.5	0.	.0	.0	.00	0.	0.	0.
INITIAL COND-2 RCH=	22.	0.	1.8	0.26	0.1	3.9	0.	0.
INITIAL COND-2 RCH=	23.	0.	1.6	0.18	0.02	5.0	0.	0.
INITIAL COND-2 RCH=	24.	0.	2.4	1.6	0.63	6.4	0.	0.
INITIAL COND-2 RCH=	25.	0.	2.8	0.98	0.13	1.8	0.	0.
INITIAL COND-2 RCH=	26.	0.	3.2	0.89	0.18	3.4	0.	0.

ENDATA7A

Stream Junctions

	Junction order and identification		Upstream	Junction	Tributary
STREAM JUNCTION	1.	JNC=BEAR CREEK	73.	148.	147.
STREAM JUNCTION	2.	JNC=CHERRY CREEK	234.	351.	350.

ENDATA9

Headwater Sources

	Order Name	Flow	Temp.	DO	BOD	DS	CM-2	CM-3
headwtr-1 HDW=	1.SOUTH PLATTE	25.0	37.4	6.4	0.	410.0	0.0	0.0
headwtr-1 HDW=	2.BEAR CREEK	1.	37.4	11.2	0.	279.0	0.0	0.0
headwtr-1 HDW=	3.CHERRY CREEK	0.1	41.	9.8	0.	38.0	0.0	0.0

ENDATA10

Headwater Conditions for ANC, Coliform, Chlorophyll-a, Nitrogen, and Phosphorus

	Order	ANC	COLI	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
headwtr-2 HDW=	1.	0.00	0.00	0.00	0.01	0.08	0.	0.32	0.00	0.00
headwtr-2 HDW=	2.	0.00	0.00	0.00	2.36	0.01	0.	0.57		
headwtr-2 HDW=	3.	0.00	0.00	0.00	0.	0.16	0.	0.18		

ENDATA10A

Point Sources and Point-Source Characteristics

	Order and name	Effl.	Flow	Temp.	DO	BOD	DS	CM-2	CM-3
pointld-1 ptl=	1.Marcey Gulch	0.	6.46	37.4	5.0	30.	30.	0.	0.
POINTLD-1 PTL=	2.Big DryCreek	0.00	5.	37.4	9.9	4.8	936.	0.0	0.0
POINTLD-1 PTL=	3.EnglwdIntake	0.00	-7.0	37.4	0.0	0.0	0.	0.0	0.0
Pointld-1 plt=	4.BearCrBalnce		9.3	37.4	11.	2.2	365.		
POINTLD-1 PLT=	5.LittleDryCrk		2.0	35.6	11.0	4.5	1190.		
POINTLD-1 PLT=	6.Unnamed Trib		3.0	35.6	9.3	12.0	1154.		
POINTLD-1 PLT=	7.Bi-City WWTP		47.2	42.8	6.0	20.	30.		
POINTLD-1 PLT=	8.PSCOEffluent		0.2	42.8	9.7	1.4	2613.		
POINTLD-1 PLT=	9.HarvardGulch		0.5	42.8	10.0	15.	686.		
POINTLD-1 PLT=	10.AndersonGlch		1.3	42.8	11.4	3.8	738.		
POINTLD-1 PLT=	11.Miss.StormDr		.5	41.	7.6	5.6	540.		
POINTLD-1 PLT=	12.ValjoStDrain		0.2	42.8	9.2	3.5	942.		
POINTLD-1 PLT=	13.LakewoodWWTP		0.0	42.8	0.0	0.	0.		
POINTLD-1 PLT=	14.EnWWTP-WeirG		1.0	42.8	10.6	16.	971.		
POINTLD-1 PLT=	15.ZuniPPlant#1		0.3	42.8	6.8	2.4	1625.		
POINTLD-1 PLT=	16.ZuniPowerP#2		0.0	42.8	0.0	0.	0.		
POINTLD-1 PLT=	17.LakewdGulch		4.2	42.8	11.7	5.6	815.		
POINTLD-1 PLT=	18.SloansLkOutF		1.	44.6	10.7	5.9	489.		
POINTLD-1 PLT=	19.EllisFoodsEf		0.4	41.	8.4	6.0	213.		
pointld-1 plt=	20.GlendaleGage		4.2	41.	9.8	0.	279.		
pointld-1 plt=	21.GlendaleWWTP		2.1	41.	6.0	30.	30.		
Pointld-1 plt=	22.CherryCrBlnc		9.3	41.	11.1	5.3	1035.		
POINTLD-1 PLT=	23.23rdStStrmDr		1.2	41.	8.1	5.2	839.		
POINTLD-1 PLT=	24.IcePlantEffl		0.8	41.	4.4	7.6	809.		
POINTLD-1 PLT=	25.36thStStrmDr		1.1	41.	8.6	9.2	670.		
POINTLD-1 PLT=	26.38thStStrmDr		8.2	41.	8.4	5.4	856.		

ENDATA11

Point-Source Characteristics for ANC, Coliform, Chlorophyll-a, Nitrogen, and Phosphorus

		Order	ANC	COLI	CHL-A	ORG-N	NH3-N	NO2-N	NO3-N	ORG-P	DISS-P
pointld-2	plt=	1.	0.	0.	0.	3.	5.2	0.	15.	0.	0.
POINTLD-2	PLT=	2.	0.00	000.0	00.00	1.2	0.11	0.06	5.6	0.00	0.00
POINTLD-2	PLT=	3.				0.	0.	0.	0.		
Pointld-2	plt=	4.				0.83	2.4	0.01	2.4		
POINTLD-2	PLT=	5.				1.3	0.12	0.05	2.8		
POINTLD-2	PLT=	6.				1.8	0.3	0.16	5.8		
POINTLD-2	PLT=	7.				3.	12.9	0.	15.		
POINTLD-2	PLT=	8.				1.4	0.18	0.17	5.4		
POINTLD-2	PLT=	9.				2.3	0.52	0.1	2.2		
POINTLD-2	PLT=	10.				2.2	0.4	0.13	2.2		
POINTLD-2	PLT=	11.				1.1	0.16	0.05	5.		
POINTLD-2	PLT=	12.				1.6	0.30	0.24	3.5		
POINTLD-2	PLT=	13.				0.	0.	0.	0.		
POINTLD-2	PLT=	14.				1.6	0.28	0.22	3.8		
POINTLD-2	PLT=	15.				2.2	0.11	0.02	0.18		
POINTLD-2	PLT=	16.				0.0	0.00	0.00	0.00		
POINTLD-2	PLT=	17.				1.2	0.15	0.08	3.2		
POINTLD-2	PLT=	18.				1.5	1.1	0.04	0.13		
POINTLD-2	PLT=	19.				0.47	0.23	0.03	0.17		
pointld-2	plt=	20.				0.	0.16	0.	0.18		
pointld-2	plt=	21.				3.	6.6	0.	15.		
Pointld-2	plt=	22.				2.1	0.	0.16	3.4		
POINTLD-2	PLT=	23.				1.6	0.18	0.02	5.		
POINTLD-2	PLT=	24.				2.4	1.6	0.63	.64		
POINTLD-2	PLT=	25.				2.8	0.98	0.13	1.8		
POINTLD-2	PLT=	26.				3.2	0.89	0.18	3.4		

ENDATA11A

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