Third Creek (Downstream of DIA)
Outfall Systems Planning Study Update

Preliminary Design Report

September 2005

Prepared by:

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Sponsored by:

Adams County

Commerce City

City of Brighton

Urban Drainage and Flood Control District

THIRD CREEK (DOWNSTREAM OF DIA)
OUTFALL SYSTEMS PLANNING STUDY UPDATE

PRELIMINARY DESIGN REPORT

Prepared for:

City of Brighton
City of Commerce City
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and
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September, 2005

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September 13, 2005

John Doerfer
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RE: Third Creek Watershed Outfall Systems Planning Study Update
(Kiowa Project No. 03059)

In compliance with Agreement No. 03-04.01 between Urban Drainage and Flood Control District and Kiowa Engineering Corporation, we have completed this report titled "Third Creek Outfall Systems Planning Study Update: Preliminary Design Report". Included in the report are details of the alternative analysis and preliminary design for improvements found in text description and the plan and profile sheets at the back of the report. Transmitted herewith are 80 copies of the final report as specified by the agreement.

Sincerely,
KIOWA ENGINEERNG CORPORATION

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Principal

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Project Engineer

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Executive Summary

This report is the Preliminary Design phase of the Outfall Systems Planning Study Update for *Third Creek (Downstream of DIA)*. This portion of *Third Creek* watershed is located in Adams County, Commerce City, and the City of Brighton and is an east-bank tributary to the *South Platte River*. Figure ES-1 shows the study area portion of the watershed. The sponsors of the study are the City of Brighton, Commerce City, Adams County, and the Urban Drainage and Flood Control District. he purpose of this phase of the study is to present a preliminary level of design for improvements established in the selected plan from the Alternatives Development and Evaluation Report (reference 28). The preliminary design investigated the design feasibility of the proposed improvements and provide a more detailed cost estimate.

This watershed is projected to rapidly urbanize with a mix of commercial and residential developments. The E-470 extension has been completed through the study area. High-density development is expected to follow along this major transportation corridor. Much of the area that is currently undeveloped is being planned for development in the near future.

In 1990, an Outfall System Planning Study was completed for the entire *Third Creek* watershed (Reference 1). This study defined hydrology and hydraulics and established a master plan for the watershed. At the time of the 1990 study, E-470 and DIA were in the planning stages, earlier versions of CUHP-SWMM were used, average subbasin sizes exceeded 130 acres, existing and future land uses were different, and USGS contour mapping was used for model definition. The hydrology was updated in 2003 (reference 22) to account for the construction of E-470, Denver International Airport (DIA), and recent residential developments including Buffalo Run Tributary. The current study focused on the lower half of the *Third Creek* Watershed (downstream of DIA). Detailed 2-foot contour mapping is now available for more accurate model definition, existing and future land uses estimates have been revised, and the latest version of CUHP-SWMM are used (references 9 and 26).

Hydrologic analysis was performed for the 2-, 5-, 10-, 50-, and 100-year return periods for existing and future conditions. Analysis of the 85th percentile storm (0.4-inch) rainfall event was also conducted. The CUHP computer model was used to compute runoff hydrographs at key locations throughout the study area. The UDSWMM computer model was used to route and combine the hydrographs along the drainageways. Since the study area includes the *Third Creek* watershed downstream of DIA, inflow hydrographs of upper *Third Creek* were imported into the SWMM model for both existing future, and master plan models. A comparison of peak flow rates from the various studies is shown in Table ES-1.

Results of the hydrology models were used to determine the hydraulic capacity of existing structures and indicate necessary channel and crossing improvements. Flood potential was reviewed and determined not to be a significant problem in the *Third Creek* watershed under current watershed conditions. Flood potential greatly increases with anticipated future development. In 1976, a Flood Hazard Area Delineation (FHAD) report was published(Reference 14). This report anticipated moderate future development and established the 100-year regulatory floodplain to eliminate future structural flood damages. Use of this floodplain as a regulatory guide kept subsequent development out of the 100-year floodplain and should continue to be used to guide future development near the major drainageways. Comparing results from this study with the 1976 FHAD found that flood magnitudes predicted at that time were significantly higher. Implementing flood detention, as recommended by this study, will reduce flows to well below those predicted by the FHAD.

Table ES-1: Summary of 100-Year Peak Flows (cfs)
Third Creek at South Platte Outfall

Hydrology Model	0.4in	2-Year	5-Year	10-Year	50-Year	100-Year
FHAD				3370	5710	**11770
1990 Existing	--	15	221	772	--	6767
1990 Future	--	1969	2866	3778	--	9721
1990 Master Plan	--	964	1439	2084	--	4628
2003 Existing	--	8	139	274	2190	3573
2003 Future	--	861	1384	2006	3687	4676
*2005 Existing	21	48	223	341	2077	3358
*2005 Future Unimproved	227	688	1349	1874	4195	5359
*2005 Master Plan	200	525	797	1269	2782	3578

*Current Study

**Includes flow diverted from Second Creek

As seen from Table ES-1, peak flows from the existing conditions model of this study are very close to that of the 2003 study (reference 22). The future conditions flows also similar for most storm frequencies; however the 100-year storm is approximately 15 percent higher for the current study. Improvements recommended in this study reduce the flows to slightly below those of the 1990 master plan model (reference 1).

The selected plan was developed during twelve progress meetings held with the project sponsors and other interested parties. Two meetings were also held to present the project to the public and gather input from local residents. Information gathered from the meetings helped identify specific problem areas and highlight current development plans that will impact hydrology and improvement designs.

Alternative development focused on solutions to drainage problems including potential increased runoff from future development, decreased water quality from urban runoff, frequent road overtopping, frequent ditch overtopping and potential failure, lack of an adequate outfall path to the *South Platte River*, and increased erosion and sediment transport.

Alternative development considered improvements to channel and crossings along the main stem and tributaries of *Third Creek*. The hydraulic analysis inventoried and analyzed the various road, irrigation ditch, and railroad crossings. Many of the major roads in the study area are currently gravel roads that will be improved to serve as major arterials for future development. The selected plan calls for increasing the capacity of all current and future arterial roads to a 100-year capacity to comply with standard criteria. Analysis of current development, such as Buffalo Run Tributary and the Reunion development on Tributary 3306, indicates that adequate conveyance structures are generally being implemented. A previous study (reference 17) focused on the hydrology and improvement plans for Buffalo Run (Tributary 3305.5) and was not restudied for this report. Updated hydrology in this study will serve as a guide for future development of the remaining watershed.

Due to the infrequent occurrence of existing flows downstream of the canals, there is little sign of a conveyance channel to the *South Platte River*. Adding low-flow crossing structures to separate storm runoff from irrigation water will require an adequate downstream channel to carry the flows and prevent erosion. Crossings and channels for all storm frequencies were analyzed for size and cost as a means of choosing the ideal alternative. A 5-year capacity channel was recommended in the lower reaches to separate and pass frequent flows past the agricultural ditches to an outfall at the South Platte River. This capacity approximately matches the existing channel for the relocated portion of *Third Creek* along the east side of E-470. Channel improvement was not considered necessary for the reach upstream of E-470. A policy of maintaining the existing channel and floodplain was recommended since the area is undeveloped and poses no major or nuisance flood problems under future conditions. Channels for the major tributaries were sized for 100-year storm events.

Adding crossing structures at the four irrigation canals (McCann Ditch, Fulton Ditch, Burlington Ditch, O'Brian Canal) is also included in the preliminary design improvements. Historically, the four canals have captured all low flows and carried them out of the watershed. The increase in frequency and magnitude of flows due to development will create problems for ditch operations. Therefore 5-year capacity crossings were designed for the Fulton and Burlington ditches and the O'Brian Canal.

The two regional detention facilities recommended for Tributaries 3309 and Grass Valley Gulch are a key part of the preliminary design plan. A variety of regional detention alternatives were identified and evaluated as a means of mitigating increased flows under future conditions. Detention options on the main stem of *Third Creek* were explored and rejected; hydrologic analysis indicated that additional facilities were not effective at reducing peak flows. Cost estimates for various detention options on tributaries were compared to the associated savings in downstream crossing and channel improvements as a means of evaluating alternatives. The recommended detention options were located on the tributaries to *Third Creek* since the facilities can be designed for a practical size and will reduce peak flows in the main stem. In addition to regional detention, water quality basins were recommended to capture the initial flush of runoff and settle out the sediments and pollutants. Water quality can further be improved by requiring developers to adhere to Best Management Practices as described in Volume III of the Urban Storm Drainage Criteria Manual (Reference 8).

Table ES-2 and Figure ES-2 list the recommended improvements by reach and the associated cost estimates. A detailed cost estimate is presented on the improvement plan and profile sheets in Appendix D. The total construction cost for the improvements to address drainage problems is estimated at $51.8 million. Approximately $9.2 million of the total consists of land value, $8.3 million is for crossing improvements, and $10.6 million is for channel improvement. Much of the cost can be deferred to developers through regulatory guidelines used to mitigate the drainage impacts of the developments. Cooperation between the City of Brighton, Commerce City, Adams County, and UDFCD will be essential to implementing improvements. Since a majority of the watershed is currently undeveloped most of the specific master plan improvements can be implemented as the areas around the proposed structures are developed.

Table ES-2: Preliminary Design Summary and Cost Description

	Description	Size
	Reach 1 :South Platte River to Old Brighton Road ($3,315,272)	
	Length= 3983 ft *Area=0.52 sq. mi.*	
❒	2-year wetland channel	2085', 70' Top Width
❒	5-year trapezoidal grass-lined channel	3432', 54' Top Width
❒	100-year capacity at Old Brighton Road	115 LF Twin 10x16 CBC
❒	McCann Ditch crossing of proposed channel	60 LF 2x5 CBC
❒	Engineering and Contingencies	35% of Cost
❒	Land Value	6.9 acres
	Reach 2: Old Brighton Road to Fulton Ditch ($6,826,294)	
	Length= 5506 ft *Area=0.90 sq. mi.*	
❒	100 year capacity crossing for144th Avenue	115 LF Twin 10x16 CBC
❒	100 year capacity crossing at US-85	100 LF 10x10 CBC
❒	100-year capacity at Union Pacific RR	70 LF Twin 10x16 CBC
❒	100-yr capacity at 136th Avenue	115 LF Twin 10x16 CBC
❒	5 yr capacity crossing under Fulton Ditch	Twin 4x8 CBC
❒	100-year overflow weir and riprap protection at Fulton Ditch	35% of Cost
❒	5-Year Capacity trapezoidal grass-lined channel	5506', 49' Top Width
❒	Engineering and Contingencies	35% of Cost
❒	Land Value	11.2 acres
	Reach 3: Fulton Ditch to O'Brian Canal ($6,816,265)	
	Length= 10,408 ft *Area=1.80 sq. mi.*	
❒	100 year capacity crossing at 132nd Avenue	115 LF Twin 10x16 CBC
❒	100 year capacity crossing at Sable Road	115 LF Twin 10x16 CBC
❒	5-Year capacity trapezoidal grass-lined channel	5514', 50' Top Width
❒	100-year capacity trapezoidal channel on Tribs 3303 and 3304	2600', 25' Top Width
❒	Utilize relocated Third Creek channel along E-470	NA
❒	5-Year Crossing at Cameron Drive	Twin 5x10 CBC
❒	5-year crossing under Burlington Ditch	Twin 5x10 CBC
❒	100-Year weir overflow and riprap at Burlington Ditch	Weir
❒	100-year capacity at Buckley Road	115 LF Twin 10x16 CBC
❒	100-year capacity wetland channel downstream of O'Brian Canal	2640 feet, 200' Top Width
❒	Institute on-site or regional water quality basins	NA
❒	Engineering and Contingencies	35% of Cost
❒	Land Value	18.7 acres

	Description	Size
	Reach 4:O'Brian Canal to Tower Road and E-470 ($3,266,597)	
	Length= 11,369 ft *Area=7.0 sq. mi.*	
❒	5-year capacity crossing under O'Brian Canal	(2) 5x12 CBC
❒	100-year capacity trapezoidal channel	1461 feet, 200' Top Width
❒	100-year capacity at Tower Road	10x16 CBC
❒	Institute on-site or regional water quality basins	NA
❒	Engineering and Contingencies	35% of Cost
❒	Land Value	4.7 acres
	Reach 5 Tower Road and E-470 to DIA ($1,448,495)	
	Length= 16,066 ft *Area=4.15sq. mi.*	
❒	100-year capacity at 112th Avenue	115 LF Twin 10x12 CBC
❒	Institute on-site or regional water quality basins	NA
❒	Engineering and Contingencies	35% of Cost
❒	Preserve the floodplain through local regulations	NA
	Reach 5 Tributary 3309: ($15,920,061)	
	Length= 8,400 ft *Area=1.80 sq. mi.*	
❒	100-Year channel downstream of detention facility	628', 28' Top Width
❒	Regional detention facility	171 Acre-ft
❒	100-Year channel upstream of detention facility	5590', 90' Top Width
❒	Drop Structures	7
❒	Institute on-site or regional water quality basins	NA
❒	Engineering and Contingencies	35% of Cost
❒	Land Value	92.2 acres
	Reach 5 Grass Valley Gulch ($14,418,822)	
	Length= 8,200 ft *Area=2.16 sq. mi.*	
❒	100-Year channel downstream of detention facility	2182', 29' Top Width
❒	Drop Structures	5
❒	Regional detention facility	230 Acre-ft
❒	100-Year channel upstream of detention facility	230 Acre-ft
❒	100-Yr Crossing at 96th Avenue	3750', 131' Top Width
❒	Institute on-site or regional water quality basins	Twin 8x12 CBC
❒	Engineering and Contingencies	35% of Cost
❒	Land Value	73.3 acres
	Total Cost	**$51,837,297**

The proposed detention and water quality basins need to be implemented as the upstream areas develop. Grade control structures can be implemented as development occurs along a particular section of channel. In general, drainage improvements should be constructed downstream to upstream if feasible. However, improvements will be constructed at the time of development and upstream improvements may be constructed first. The outfall to the *South Platte River* should be constructed prior to significant changes to the upstream hydrology. The difficulty in this watershed is that development is occurring from upstream to downstream. Generally, the improvements need to be constructed from downstream to upstream. The canal crossings should only be installed after the 5-year channel is in place downstream. A large part of the master plan requires enlarging road crossings to 100-year capacity. This is a significant expense. Enlarging road crossings can be staged to parallel development. Most of the master plan road crossings require multiple box culverts. To spread the cost of implementation, the boxes may be installed piecemeal. For example on a three-barrel box culvert, one box may be installed now, with the other two boxes to be installed with increased development.

Interim improvements to existing drainage problems in the lower reach of *Third Creek* should also be addressed. Replacement and maintenance of existing culvert crossings was recommended in a previous study regarding interim improvements (reference 21). A summary of these improvements is presented and discussed in Section 6.1 of this report.

The priority for the *Third Creek* watershed is to offset the impacts of extensive future development. Maintaining flood magnitudes at existing levels, removing urban pollutants from the creek's waters, stabilizing the channel against more frequent flood flows, and providing outfalls to the *South Platte River* are all critical aspects of the recommended plan. The preliminary design improvements accomplish this with specific improvements designed to detain and slowly release floodwaters, settle urban pollutants from floodwaters, stabilize the channel slope, and excavate a channel for frequent flows to the South Platte River.

BASE MAPPING AND HORIZONTAL & VERTICAL CONTROL PREPARED BY: *LANDMARK MAPPING, LTD.* *7500 W. Mississippi Ave, 21* *Lakewood, CO 80232*	Kiowa Engineering Corporation 7175 W. Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303)–692–0369	*CITY OF BRIGHTON* *COMMERCE CITY* *ADAMS COUNTY* *URBAN DRAINAGE & FLOOD CONTROL DISTRICT*	THIRD CREEK D/S OF DIA OUTFALL SYSTEMS PLANNING STUDY UPDATE	*VICINITY MAP*	FIGURE ES–1

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BASE MAPPING AND HORIZONTAL & VERTICAL CONTROL PREPARED BY: *LANDMARK MAPPING, LTD. 7500 W. Mississippi Ave, 21 Lakewood, CO 80232*	Kiowa Engineering Corporation 7175 W. Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303) 692-0369 KIOWA PROJECT NO. 03059	ADAMS COUNTY COMMERCE CITY CITY OF BRIGHTON URBAN DRAINAGE & FLOOD CONTROL DISTRICT	THIRD CREEK D/S OF DIA OUTFALL SYSTEMS PLANNING STUDY UPDATE	SELECTED PLAN	FIGURE ES-2

1 INTRODUCTION

1.1 Authorization, Purpose and Scope

The Urban Drainage and Flood Control District (UDFCD) authorized the *Third Creek (Downstream of DIA) Watershed Outfall Systems Planning Study* under joint sponsorship with the City of Brighton, City of Commerce City and Adams County. The specific tasks were performed in accordance with the terms of Agreement Number 03-04.01, dated July 30, 2003.

The purpose of this study is to update the existing master plan completed in 1990 (reference 1), namely, analyzing revised existing and future drainage conditions of the watershed, applying updated mapping, developing alternative drainageway planning concepts, and preparing a preliminary design of facilities with a focus on implementation.

Tasks for analyzing the existing and future drainage conditions, and developing and evaluating drainage improvement concepts:

1. Meet regularly with the sponsors to obtain information, present study findings, and discuss results of the planning tasks.
2. Contact agencies and/or individuals that have knowledge or specific interest in the study area.
3. Inventory and compile the existing drainage system.
4. Prepare hydrologic analysis for the existing and future development watershed conditions.
5. Conduct hydraulic analysis along the major drainageways to ascertain capacities of existing structures, determine location of flooding problems, and analyze hydraulic impacts of future peak discharges.
6. Develop drainageway improvement alternatives that address future drainage impacts while maintaining an emphasis on implementation.
7. Evaluate alternatives based on criteria, estimated construction costs, potential flooding, planning constraints and/or other issues.
8. Prepare a written alternatives development and evaluation report, including a recommended alternative for each reach of the drainageway.
9. Prepare a preliminary design report which further evaluates the feasibility of the selected improvements.
10. Prepare a detailed cost estimate of preliminary design improvements .

1.2 Mapping

Landmark Mapping Ltd. provided project mapping under a separate agreement with the UDFCD. The downstream portion of the project mapping was developed from aerial photography dated 1995, and prepared at a contour interval of two-feet. The upstream portion was provided by Commerce City and is dated 2003. Mapping from the recently completed E-470 was also incorporated into the project mapping. The vertical and horizontal controls are NAVD 1988 and NAD 1983-92 modified, respectively. The mapping is based on State Plane Zone, Colorado Central Zone (502) and covers the entire study area.

1.3 Acknowledgements

Kiowa Engineering Corporation wishes to acknowledge the various individuals who assisted in the preparation of the study. A Technical Advisory Committee made up of the project sponsors and other interested individuals and agencies provided guidance during the study process. The Technical Advisory Committee met regularly during the course of the project study. Additional agencies and individuals were involved during the planning process. The members of the Technical Advisory Committee are:

Name	Representing
Mr. John Doerfer	Urban Drainage and Flood Control District
Mr. Andy Walsh, PE	City of Brighton
Ms. Shonnie Cline	City of Brighton
Ms. Chris Sveum	City of Commerce City
Mr. Tom Acre	City of Commerce City
Ms. Tiffany Ewing	City of Commerce City
Mr. Eric Weis, PE	Adams County
Ms. Melissa van der Poel	Adams County
Mr. Besharrah Najjar, PE	Adams County

The following members of Kiowa's project team contributed to the preparation of this report:

Mr. Tom Fairley, PE	Principal-in-Charge
Mr. Brian Wozniak, PE	Project Manager
Mr. Steve Brown	Project Engineer
Mr. Damian Daszuta	Engineering Technician
Ms. Holly Lake	Engineering Technician
Ms. Elizabeth Klein	Environmental Scientist

1.4 References

The following reports were reviewed during the course of preparing this report:

(1) "Third Creek and Barr Lake Drainage Outfall Planning Study, Preliminary Design", prepared by Kiowa Engineering Corporation for the UDFCD, Adams County, City of Brighton, Commerce City, City of Aurora, City and County of Denver, July 1990.

(2) "Adams County Storm Drainage Design and Technical Criteria", prepared by WRC Engineering Inc. for Adams County and UDFCD, February 1989.

(3) "Adams County Comprehensive Plan", prepared by Balloffet and Associates, Inc. for Adams County, adopted January, 1999.

(4) "City of Brighton 2020 Comprehensive Plan", prepared by the City of Brighton, February 2001.

(5) "New Lands Comprehensive Plan, Commerce City, Colorado", prepared by BRW, Inc. for Commerce City, April 1992.

(6) "1998 Comprehensive Plan, City of Aurora, Colorado", prepared by the City of Aurora, adopted January 1998.

(7) "Soils Survey of Adams County, Colorado", USDA Soil Conservation Service, October 1974.

(8) "Urban Storm Drainage Criteria Manual, Volumes I, II and III", Urban Drainage and Flood Control District, prepared by Wright Water Engineers for UDFCD, June 2001.

(9) "Colorado Urban Hydrograph Procedure Computer Program" – CUHP-2000 Version, prepared by Boyle Engineering Consultants for UDFCD, 1985 (updated by UDFCD in 2000).

(10) "Urban Drainage Storm Water Management Model" – SWMM-2000 Version, prepared by Boyle Engineering Consultants for UDFCD, 1985 (updated by UDFCD in 2000).

(11) "HY8 Culvert Sizing Program", Federal Highway Administration and Pennsylvania State University, Version 3.2.

(12) "Colorado Department of Transportation 2002 Cost Data", prepared by Engineering Estimates and Market Analysis Unit, Colorado Department of Transportation, January 1, 2003.

(13) "Flood Insurance Study, Adams County, Colorado, and Incorporated Areas", prepared by Federal Emergency Management Agency, August 16, 1995.

(14) "Flood Hazard Area Delineation: Second Creek and Third Creek", prepared by Gingery Associates, Inc. for the UDFCD and Adams County, February 1976.

(15) "Pond 229 (Model 852) Design/Construction Information and Modeling Data", prepared by The City and County of Denver for the City and County of Denver, January 2002.

(16) "Adams County Transportation Plan", prepared by Felsburg Holt & Ullevig for Adams County, April 1996.

(17) "City of Commerce City Buffalo Run Outfall of Third Creek Preliminary Design Report", prepared by Knight Piesold and Company for the City of Commerce City, November 7, 2002.

(18) "Conceptual Drainage Report for Buckley Crossing Overall Development Plan", prepared by MMC Engineering, Inc. for Business Center Investors, April 2, 2002.

(19) "The Villages at Buffalo Run East – Drainage Improvements", prepared by Paragon Engineering Consultants, Inc. for Northwood Village Associates, Ltd., May 2003.

(20) "Cutler Property Preliminary Design Report", prepared by Calibre Engineering, Inc. for Southwestern Investment Group, LLC, July 2003.

(21) "Third Creek Interim Implementation Plan", prepared by HDR Engineering, Inc. for UDFCD, October 2000.

(22) Third Creek Hydrology Report", Boyle Engineering Corporation , prepared for UDFCD, July 2003.

(23) "DIA DRAINAGE: 3rd Creek Full Buildout Condition", CUHP and UDSWMM models prepared by Martin/Martin Consulting Engineers, November 18, 2003. Updated June 2004.

(24) "Third Creek Drainage Analysis A: Preliminary Grading Plan", prepared by JR Engineering, February 2004.

(25) "Open Channel Design" Excel spreadsheet developed by UDFCD June 2001.

(26) "Urban Drainage Storm Water Management Model", computer model version 1.4.6, Urban Drainage and Flood Control District, June 2003.

(27) "Bid Tabulation Program", computer model version 3.0, Urban Drainage and Flood Control District, January 2000.

(28) "Third Creek (Downstream of DIA) Outfall Systems Planning Study Update: Alternatives Design and Evaluation Report", Kiowa Engineering Corporation, prepared for Urban Drainage and Flood Control District, August 2004.

(3) (29) "Flood Insurance Rate Map: Adams County, Colorado and Incorporated Areas", Map 08001C0075 G, Panel 75. Federal Emergency Management Agency, August 1995.

2 STUDY AREA DESCRIPTION

2.1 Watershed Description

The study area consists of the *Third Creek* watershed downstream of Denver International Airport (DIA) that is located in the City of Brighton, Commerce City and unincorporated Adams County (see Figure 2-1). The total study area has a drainage area of 14.5 square miles and is an east bank tributary to the *South Platte River*. The study limits extend from just north of 144th Avenue, south to 88th Avenue, and east from the DIA boundary property line to the *South Platte River* on the west. Existing development within the study area includes five distinct areas: the rural residential development, agricultural land found throughout the study area, gravel mining operations along the *South Platte River*, light industrial land along Highway 85, and new residential subdivisions.

The residential development within the watershed is mostly rural with low-density and low impervious values near 15%. There are several residential areas planned or under construction. These subdivisions are expected to have higher densities with approximately 50% imperviousness.

Four irrigation canals cross the watershed. The McCann Ditch is close to the mouth of *Third Creek*; the Fulton Ditch crosses *Third Creek* near 136th Avenue; the Burlington Ditch is near Buckley Road; and the O'Brian Canal is downstream of 120th Avenue.

The topography of the watershed is sloped from the high ground near E-470 and 88th Avenue west to northwest toward the *South Platte River*. The highest point has an elevation of 5366 feet above sea level. The lowest point is at the downstream outfall to the *South Platte* and has an elevation of 4978 feet. The entire watershed is fairly flat except for the highest reaches south of 96th Avenue and along the upper reaches of the contributing tributaries.

Third Creek outfalls to the *South Platte River* approximately 1½ miles southwest of Brighton, Colorado. The *Third Creek* watershed has a total drainage area of 31 square miles at the *South Platte River*. This includes approximately 16 square miles of drainage area from the City of Aurora and DIA. Within the downstream study limits, the main channel extends upstream in a south-easterly direction, approximately 10 miles to the DIA property line. Slopes along the main drainageway average 0.4 percent, while the upper tributary watershed slopes vary from 1 to 3 percent. Existing vegetation along the drainageway consists of native rangeland grasses with little woody vegetation.

The channel has an irregular, natural section upstream of the O'Brian Canal. Historically, nearly all flows have entered the canal with only irrigation returns being passed downstream. Due to this, the channel section downstream of the O'Brian is nearly nonexistent. Large flood flows overtop the O'Brian and travel downstream to the South Platte via a very wide and shallow floodplain. Additional irrigation ditches downstream have also contributed to the lack of a significant low-flow channel. These include the Burlington Ditch, the Fulton Ditch, and the McCann Ditch.

Historically small flow rates have also led to the undersizing of road crossings downstream of the O'Brian Canal. Increases in future runoff will decrease conveyance capacities of many road crossings to less than 2-year frequencies.

A total of 14 tributaries to Third Creek were identified in the study area. Due to the very narrow nature of the watershed, most tributaries drain small areas with only one or two subwatersheds. The major tributaries are located in the upstream portion of the study area and include 3305.5 (Buffalo Run), 3306, 3309, and Grass Valley Gulch (3313).

The watershed also experienced residential development recently and new development is planned or ongoing. Buffalo Run is a residential development and golf course located on Tributary 3305.5. A 270 acre-ft detention facility was established at the downstream portion of the tributary to reduce peak flows. Figure ES-2 also shows two developments, Reunion and Buckley Crossing, that are planned for the west side of the watershed near 112th Avenue.

2.2 Soil

Soil information was obtained from the Soils Survey of Adams County, Colorado (Reference 7). The significance of soil type for hydrologic analysis is in the infiltration rate. Soils are classified into four hydrologic classifications; namely, Types A, B, C, and D. Infiltration rates range from 5.0 inches per hour for Type A soils to 3.0 inches per hour for Type C and D soils. Soils in the study area are mainly Type B and C soils that can be characterized as loamy to clayey. Mapping of the soil groups found in this watershed is shown on Figure 2-2.

2.3 Wetlands Inventory

A detailed field investigation for wetlands, vegetative conditions, and wildlife habitat was conducted by Kiowa's environmental scientist. The investigation details the types of vegetation throughout the watershed and areas of existing wetlands, as well as areas where there is potential for wetlands to establish. A detailed report of the wetlands investigation is given in Appendix C. Specific vegetation species and wetland location mapping is included.

2.4 Previous Studies

The earliest study performed on *Third Creek* was the 1976 FHAD study that also included Second Creek (reference 14). The FEMA Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM) are similar and based on the FHAD (Reference 13). These earlier reports do not include either DIA or E-470. A preliminary design report published in 1990 (reference 1) did include both projects, however they were still in planning stages. A hydrology update was published in 2003 (reference 22) to revise the previous hydrology and include DIA, E-470, and a more detailed development estimation. In late 2003, an interim implementation plan (reference 21) was published for the reach of *Third Creek* between 120th Avenue and the South Platte outfall. The purpose of this report was to examine detention and conveyance improvements and recommend interim improvements.

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\\Dnserver\company\Active Projects\2003\03059 Third Creek Outfall Plan\Drawings\Vicinity Map.dwg 02/17/2004 11:04:55 AM MST

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3 HYDROLOGIC ANALYSIS

3.1 Summary of Previous Master Plan Hydrology

At the time of the previous Master Plan study (reference 1) both DIA and E-470 were in the planning stages. The following discussion summarizes the hydrologic effort and assumptions that were used at that time and compares them to the present master plan update.

Third Creek drains a total of approximately 31 square miles to the *South Platte River*. In the late 1980's, existing development consisted of agricultural lands and low-density residential areas. The channel section was natural and irregular above the O'Brian Canal, and small and poorly defined downstream to the South Platte. Flows from minor storms were diverted to Barr Lake via the O'Brian Canal and Burlington Ditch. In addition, the Fulton Ditch diverted minor storm flows towards the City of Brighton. Major flood flows overtopped the irrigation canals and entered the *South Platte River*. These descriptions still apply to the present watershed conditions.

In 1990 existing land use consisted mostly of 2% and some areas of 5% impervious area. The present existing condition average imperviousness is 7%. Future projected land use in 1990 was summarized into four categories: Open Space 2%, Residential 40%, Commercial 70%, and Non-residential 75%. All lands south of DIA were designated as commercial. The area within DIA property ranged from 2% to 99% with a composite of 27%. Along E-470, a generalized one mile wide corridor was dedicated to Commercial uses along the length of the highway. All of the area between E-470 and DIA was designated as Non-residential, and all remaining land was shown as Residential. The average future percent imperviousness for the study area was near 60%. The current study assumes a future condition average imperviousness of 49%. The main difference is more residential and less commercial development under today's projections.

For the 1990 study subcatchments were delineated using USGS quadrangle maps with a scale of 1" = 2000' and 10-foot contour interval. A total of 126 subbasins (averaging 157 acres per basin) were used to describe *Third Creek*. The 2003 study's lower *Third Creek* model uses 2-foot contour mapping and has 98 subbasins averaging 95 acres each. CUHP is recommended for basin areas greater than 90 acres. A time of concentration value is required for basins smaller than 90 acres for use in Rational Method computations. Impervious area surface storage and pervious area surface storage were estimated to be 0.1 and 0.35 inch, respectively.

1990 existing SWMM channel routing elements were modeled as a low-flow channel with an overflow section. Slopes were measured from USGS maps. Lengths were measured from USGS maps neglecting small bends in the low-flow channel. Typical cross sections for the low-flow channel and overbanks were developed based on surveyed sections, field inspections, FHAD mapping, and USGS maps. Roughness coefficients were estimated based on Equation 2 in the UDSWM2-PC manual (reference 9). Mainstem channels were expected to remain in their natural (but degraded) condition in the future, so no other adjustments were made to the channel section.

Currently, the existing land use has changed only slightly. DIA and E-470 have been constructed. Most of the study area remains open with agriculture comprising the primary land use. The irrigation canals still capture the minor flood flows. Soils conditions have not changed. The CUHP and SWMM models have evolved over several versions since the late 1980's. The most recent versions, CUHP-2000 and SWMM-2000, are being used in the current study. Design rainfall has also been revised slightly in the 2001 version of the Urban Storm Drainage Criteria Manual (USDCM).

3.2 General

Hydrologic analysis was conducted to determine the 2-, 5-, 10-, 50- and 100-year peak flows for three separate development conditions. The "baseline" conditions are existing conditions without any improved detention facilities. Existing conditions are those that are found in the watershed today, with existing detention in place including 120th Avenue and Buffalo Run. Future conditions are projected future, fully-developed conditions assuming ultimate build-out as projected at the present time (2003) with information provided by the project sponsors. The *Colorado Urban Hydrograph Procedure* (version 2000) was used to develop runoff hydrographs from individual sub-watersheds, and *Urban Drainage Storm Water Management Model* (version 2000) was used to route the individual hydrographs through a model of the drainageways.

This study update focuses on the lower 14.5 square miles of *Third Creek*. The upper 16.5 square miles are read into the hydrology models as an input hydrograph generated by the most recent hydrology study effort (reference 21). The existing condition model reads the inflow hydrograph from the DIA boundary at Picadilly Road as defined in the 2003 study. The future conditions inflow hydrographs were taken from the most recent hydrology model for DIA under full build-out conditions (reference 23). Thee subbasins in this model were altered to match downstream future imperviousness values for subwatersheds outside the DIA property. Subwatersheds 4, 92, and 93 were changed to an impervious value of 65%. Detention pond T-239, located at the DIA outflow of *Third Creek* at Picadilly Road, was added to the future conditions hydrology provided by Martin/Martin. Inclusion of the facility reduces the 100-year future conditions outflow.

Third Creek downstream of DIA is a fairly narrow watershed downstream of I-76 with few sizeable tributaries contributing. This configuration impacts the hydrology and shapes the hydrograph. The runoff from the lower (narrow) drainage area arrives quickly to the main channel due to the short travel distance. The main peak of *Third Creek* is generated by drainage from the upper part of the watershed. This peak arrives to the *South Platte River* significantly later than drainage from the lower part due to the longer travel distance. The result is a peak flow rate that does not increase downstream of I-76.

The input data for CUHP includes rainfall depth, imperviousness, watershed area, length of the flow path, distance to watershed centroid, longitudinal slope, time of concentration, soil infiltration rate, and surface storage losses. Input data was prepared using guidelines and values recommended in the Urban Storm Drainage Criteria Manual (USDCM) and the CUHP users manual (references 8 and 10). Watershed area, length, existing impervious area, and watershed slope were measured from the two-foot contour interval project mapping provided by the UDFCD. Discussions of specific input parameters follow.

3.3 Design Rainfall

The design rainfall for the study area was determined from the latest UDFCD Rainfall Spreadsheet. Six-hour and two-hour rainfall depth adjustments have already been incorporated into the standard distributions in this table. In *Third Creek*, the total rainfall depths for the 2-, 5-, 10-, 50-, and 100-year recurrence interval storms are 1.36", 1.82", 2.09", 2.94" and 3.31", respectively. Table III-1 lists the detailed 5-minute

rainfall distributions and totals used in this study for the *Third Creek* main stem. Tributaries were modeled using the 2-hour rainfall distribution.

Table III-1
Rainfall Distributions (inches)

Time	6-hour between 20 and 30 sq.mi. (*Third Creek*)				
(minutes)	100-year	50-year	10-year	5-year	2-year
0	0.000	0.000	0.000	0.000	0.000
5	0.026	0.030	0.032	0.027	0.018
10	0.078	0.081	0.060	0.050	0.036
15	0.120	0.115	0.132	0.117	0.076
20	0.209	0.184	0.196	0.166	0.118
25	0.296	0.279	0.326	0.271	0.184
30	0.529	0.466	0.156	0.141	0.103
35	0.296	0.224	0.090	0.078	0.057
40	0.209	0.184	0.069	0.059	0.046
45	0.162	0.115	0.061	0.048	0.027
50	0.131	0.115	0.052	0.048	0.027
55	0.104	0.074	0.052	0.040	0.027
60	0.104	0.074	0.052	0.040	0.027
65	0.104	0.074	0.052	0.040	0.027
70	0.052	0.055	0.052	0.040	0.018
75	0.052	0.055	0.052	0.034	0.018
80	0.031	0.041	0.040	0.029	0.018
85	0.031	0.041	0.031	0.029	0.018
90	0.031	0.032	0.031	0.029	0.018
95	0.031	0.032	0.031	0.029	0.018
100	0.031	0.032	0.031	0.020	0.018
105	0.031	0.032	0.031	0.020	0.018
110	0.031	0.032	0.031	0.020	0.018
115	0.031	0.032	0.027	0.020	0.009
120	0.031	0.032	0.021	0.017	0.009
125-180	0.143	0.137	0.114	0.143	0.172
185-360	0.412	0.371	0.273	0.260	0.227
Total	3.31	2.94	2.09	1.82	1.36

3.4 Watershed Imperviousness

Hydrologic impervious information for each sub-watershed was developed for input into the CUHP hydrology model. The amount of impervious area within each sub-watershed was estimated for existing (2003) development and anticipated maximum future development. Figures 3-1 and 3-2 show the percent imperviousness values used in the hydrological models for these two conditions, respectively. Table III-2 describes the percent imperviousness for each of the different land uses. The upper portion of the study area is mainly undeveloped with large lot rural land, ranging from 5% to 15% imperviousness. The lower watershed areas are mixed rural residential and commercial, ranging from 15% to 80% imperviousness.

Impervious areas for existing conditions were compiled by examining aerial photography dated October 2001 and by field inspections in the area. Watersheds were delineated into various land-use categories to which the imperviousness values in Table III-2 were applied. An area-weighted percent imperviousness was then computed for each sub-watershed and used as input for the CUHP model. The future impervious cover was estimated by reviewing land use planning studies from the City of Brighton, Commerce City, Adams County, and recent development submittals (references 3, 4, 5, 6, 16, 17, 18, 19, 20, 23).

Table III-2
Uniform Impervious Values

Land Use Category	Imperviousness (percent)
Undeveloped, agricultural	5
Golf Course, parks	10
5-acre Rural Residential	15
2-acre Rural Residential	20
1-acre Rural Estate	25
1/2 –acre Fringe Residential	30
1/3-acre Fringe Residential	35
Low-density Residential	40
Medium-density Residential, school	50
Mixed Use	65
Light Industrial	80
Industrial	90
Water	100

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THIRD CREEK D/S OF DIA
OUTFALL SYSTEMS PLANNING STUDY UPDATE

EXISTING IMPERVIOUSNESS

FIGURE 3-1

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THIRD CREEK D/S OF DIA
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FUTURE IMPERVIOUSNESS

FIGURE 3-2

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3.5 Sub-Watersheds

Sub-watersheds were defined using the digital two-foot contour mapping provided for the project. Major watershed and sub-watershed boundaries were established based on topographic and physical drainage boundaries, such as major roadways (e.g., E-470, US-85, 104th Avenue). Watershed boundaries were verified in the field. The watershed was divided into sub-watersheds with an average area less than 100 acres per sub-watershed to convey each design storm. Larger sub-watersheds were used in the less developed upper reaches with no single watershed exceeding 130 acres in size, and smaller sub-watersheds were necessary to evaluate the more complicated drainage of the more developed reaches. Figure 3-3 shows the subwatershed delineation for the study area.

Area, length, length to centroid, and the slopes of each sub-watershed were measured from the project mapping. Data was entered into spreadsheets to calculate weighted slope per equation RO-9 in the USDCM. All slopes greater than four percent were first adjusted per Figure RO-10 in the Runoff Chapter of the USDCM before the weighted slope was calculated. CUHP input parameters are included in Appendix A.

3.6 Time of Concentration

Time of Concentration (T_c) was calculated for each sub-watershed with an area less than 90 acres as recommended in the Runoff Chapter of the USDCM. The UDFCD has determined that the use of the Rational Method (using the calculated T_c value) tends to overestimate runoff in urban areas for areas greater than 90 acres. Therefore, the criteria was adjusted to calculate T_c only for those sub-watersheds with areas less than 50 acres in urban areas. Urban areas are defined as those areas with an impervious value of 20% or greater. In non-urban areas the 90-acre criteria was applied.

3.7 Depression Losses/Retention Storage

Depression losses/retention storage for impervious areas was estimated to be 0.1 inches in accordance with Table RO-6 in the Runoff Chapter of the USDCM. This value was used for all sub-watersheds in the study area. For pervious areas surface depression/retention losses of 0.40 inches were applied throughout the study area. This value is also in accordance with the USDCM.

3.8 SWMM-2000 Channel Routing

Hydrographs from individual sub-watersheds were routed through the drainageway system using the SWMM-2000 computer model (reference 10). The drainage system was modeled using a system of channels, overflow sections, and direct flow elements. The conveyance element input parameters include length, slope, roughness coefficient, and cross-sectional geometry. The cross-sections were input to a spreadsheet that was used to calculate the roughness coefficient (Manning's 'n' value) for each channel segment based on Equation 2 in the SWMM manual. Slope was adjusted where necessary for non-uniform segments according to the SWMM manual. Schematics of the SWMM model are shown in Figures 3-4 and 3-5. A table of SWMM input parameters is included in Appendix A.

Existing channel elements were modeled using data from the 1990 study and verified with the digital project mapping. Length, change in elevation, and cross-sections were measured on the two-foot interval topographic mapping for each routing reach.

Future channel element cross-section, slope, and roughness were not modified from existing conditions for the purposes of determining the design hydrology. Specific alternatives may suggest significant changes to channel geometry. The hydraulic impact of those alternatives was maintained as a separate modeling effort included in the Alternatives chapters of the Alternatives Development and Evaluation report.

Although subwatersheds 92 and 93 are shown on Figure 3-5, the subwatersheds and channel elements are included in the DIA SWMM model (Reference 23) as part of Grass Gulch Tributary. The hydrograph for the upstream portion of *Third Creek* including the DIA property and subwatersheds 92 and 93 were input to the lower *Third Creek* SWMM model associated with this study.

3.9 Detention Storage

The existing model incorporates two regional detention facilities at 120th Avenue and Buffalo Run Tributary. Inadvertent detention behind roadway embankments and in low depression areas occurs at several locations, but future development will likely eliminate these by adding culverts and increasing capacity under the roads; therefore, this detention was not included in the models. However the inadvertent detention locations were considered as potential sites for formal regional detention in the Alternatives chapter of this report. Detention is also modeled for DIA and is represented in the inflow hydrograph for the lower *Third Creek* models in this study. SWMM-2000 model existing and future output results are provided in Appendix A.

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SUBWATERSHED DELINEATION

FIGURE 3-3

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3.10 Results of Hydrologic Analysis

Table III-3 shows comparisons between the current hydrologic model and previous studies for existing conditions. As seen from the table, the 100-year flow rates predicted by the 2003 Boyle (reference 22) model and the current model are very close for existing conditions. The flow rates at the boundary with DIA are identical since the updated study reads the inflow hydrograph at this location from the 2003 Boyle model. Flows for the 1990 and FHAD studies are significantly higher than the more recent studies primarily due to the absence of detention modeling on DIA.

Table III-4 shows a comparison between future conditions models. The inflow hydrograph for the future condition model in this study was taken from the most recent DIA model in 2004 (reference 23) with full development on Grass Gulch Tributary. This model was updated since the Alternatives Development and Evaluation Report. Detention originally modeled on Grass Gulch Tributary was removed in the upstream model for future conditions. This model estimated hydrology for full build-out of the airport and includes detention at pond T-239 at the downstream boundary of DIA on *Third Creek* and on Grassy Gulch Tributary. The model in this study shows an increase compared to the 2003 Boyle model (reference 22) for 100-year flows. The 1990 study has significantly higher peak flows due to higher impervious value assumptions and a lack of detention modeling for DIA.

Table III-3: Summary of 100-Year Peak Flows (cfs)
Third Creek Existing Condition Models

Design Point	FHAD (1976) (Reference 13)	Kiowa Master Plan (1990) (Reference 1)	Boyle Hydrology Update (2003) (Reference 22)	Kiowa Preliminary Master Plan [2] (Current Study)
Outfall at South Platte	11570 [1]	6767	3573	3558
U.S. 85	11490 [1]	6865	3581	3564
I-76	6000	7262	3573	3559
120th Avenue	5103	6945	3984	3244
Tower Road	5650	6874	3888	3236
DIA Western Boundary (Picadilly Road)	4500	6394	3086	3071

[1] Combined Second and Third Creek

[2] Includes Detention at Buffalo Run and 120th

Table III-4: Summary of 100-Year Peak Flows (cfs)
Third Creek Future Condition Models

Design Point	FHAD (1976) (Reference 13)	Kiowa Master Plan (1990) (Reference 1)	Boyle Hydrology Update (2003) (Reference 22)	Kiowa Preliminary Master Plan [2][3] (Current Study)
Outfall at South Platte	11570 [1]	9721	4676	5379
U.S. 85	11490 [1]	9740	4694	5388
I-76	6000	9997	4790	5414
120th Avenue	5103	9611	4621	5232
Tower Road	5650	9565	6329	6152
DIA Western Boundary (Picadilly Road)	4500	9366	3441	5489

[1] Combined Second and Third Creek

[2] Includes Detention at Buffalo Run and 120th

[3] Includes existing detention at Buffalo Run, 120th Avenue, and proposed facility at E-470 and 112th Avenue

Table III-5 is a comparison between recent models for the Buffalo Run residential development located south of I-76 and west of E-470. The present study includes a detention facility in the hydrologic model as designed for the Buffalo Run Development. As seen from Table III-5, peak 100-year flows for this study closely match that of the Knight-Piesold study for Buffalo Run (Reference 17).

Table III-5: Summary of 100-Year Peak Flows (cfs) at Buffalo Run
Third Creek Existing and Future Condition Models

Model	Design Point	Existing (no det)	Existing (w/ det)	Future (no det)	Future (w/det)
Current Study	302	871	123	1770	149
Buffalo Run (Reference 17)	301	792	-	2105	152

Figure 3-6 on the following page shows discharge profiles along *Third Creek* from the study limit at Picadilly Road to the *South Platte River*. Flow rates generally increase between Picadilly Road and I-76, and flatten out along the remaining length to the *South Platte River*. The steadiness of peak flows may be explained by the timing of flows contributing from the narrow drainage area in the downstream portion.

Figure 3-6 : Third Creek Comparison of Existing and Future Conditions Discharge Profile

Figures 3-7 to 3-9 show the hydrographs of flows at the South Platte outfall of *Third Creek*. To understand the influence of the DIA inflow, subwatersheds from the downstream portion of the watershed were eliminated from the SWMM model (labeled as DIA flow). A second SWMM test model was run without the DIA inflow to determine the influence of the lower portion on the outfall (labeled Lower 3rd Ck). The combined flow is labeled as Full Flow in the figures. As seen from the figures, the 100-year DIA outflow increases the eventual peak flow at the South Platte outfall. However, more frequent storm flows are largely detained by Pond T-239 at the DIA boundary and the outflow only slightly increases the 2-year to 10-year peak flows at the South Platte River.

Figure 3-7
100 Year Hydrograph at South Platte Outfall

Figure 3-8
10-Year Hydrograph at South Platte Outfall

Figure 3-9
2-Year Hydrograph at South Platte Outfall

4 HYDRAULIC ANALYSIS

4.1 Introduction

The lower *Third Creek* Watershed was divided into the 5 reaches shown in Figure 4-1. Reach delineation was determined by similar hydrology/hydraulic characteristics, jurisdiction, and physical features. Major and minor tributaries are noted as Tributaries 3301 to 3313 and Buffalo Run Tributary (3305.5).

4.2 Floodplain Description

The main stem of *Third Creek* is characterized by a narrow, meandering, and incised natural channel with a very mild slope ranging from 0.1% to 0.5%. The overbank area that would convey the bulk of a 100-year flood is generally very flat with a typical side slope of approximately 20:1. The natural channel is poorly defined in the lower reaches downstream of I-76 due to the interception of frequent flows by the upstream irrigation canals and farming practices.

The *Third Creek* FHAD floodplain (reference14) co-mingles with that of Second Creek at U.S. Highway 85. The construction of E-470 has altered the channel for approximately 14,000 feet along the west side of E-470. A formal detention facility of approximately 300 acre-ft was created by the embankment of 120th Avenue at E-470. Most of the tributaries shown on Figure 4-1 do not have well established and incised natural channel alignments. The alignments shown on the figure represent a very subtle depression in the topography which creates a path of shallow flow.

The 100-year floodplain for *Third Creek* was determined in the 1976 Flood Hazard Area Delineation (FHAD) report (reference 14). The FHAD hydrology was based upon a fully-developed condition projected from 1975 comprehensive land use planning maps. This included some high density development but did not include the E-470 corridor. The average percent impervious value used in the FHAD is 79% compared to the current projected value of 49%. Excluding the lower reach of *Third Creek* where the FHAD combines with Second Creek, the peak discharges used in the current unimproved future conditions model are approximately 70% of those found in the FHAD (Table III-4).

FEMA published Flood Insurance Rate Maps dated August 16, 1995 (reference 29). The *Third Creek* floodplain is labeled as Zone A, which indicates no base flood elevations were determined. In comparing the shape of the floodplains between the FHAD and the FIRM, they appear similar, implying that the FHAD is the basis for the FIRM. The Flood Insurance Study for *Third Creek* only references approximate methods. For the purpose of this study and future regulation of the floodplain, it is recommended that the FHAD be used in identifying the floodplain limits for *Third Creek*.

Significant increases in runoff have yet to be verified compared to the descriptions provided by landowners within the watershed. The bulk of the development and urbanization impacts to the watershed are expected to occur over the next several years. E-470 has been completed through the watershed and urban development is already under construction. The timeliness of this study is crucial to establish drainage criteria prior to development. It is the goal of this master plan to create a drainage plan that most effectively reduces the impacts from impending development and that allows the sponsors a viable means for implementation.

4.3 Drainage Structure Inventory

Table IV-1 provides a summary of crossing structures along E-470 that connect tributary flows on the west portion of the watershed to the main stem of *Third Creek*. Figures 4-2 and 4-3 show the locations of the crossings in the *Third Creek* watershed. The first two crossings listed in the table near 128th Avenue will function together since flows in excess of the two 42" CMP will pond and eventually continue through the two 6'x6' CBC to the South. The combined capacity of these two conduits are approximately sufficient to convey the combined 100-year future flows. The table also identifies the remaining crossings along E-470 north and south of Tower Road which do not have a 100-year capacity. The potential for construction of a detention facility is determined by the presence of sufficient embankment at the conduit and available upstream area to the west. Detention facilities at these locations are discussed in the alternatives analysis section of this report.

Table IV-1: E-470 Crossing Structure Capacities

Third Creek Future Condition Models-Unadjusted Flows

					Hydrology Model Flows (cfs)					
Location	DP	Trib	Structure	Capacity (cfs)	100 Year	50-year	10 Year	5 Year	2 Year	Detention Potential
E-470 and 128th Av.	130	NA	(2)-42" CMP	142	571	485	261	**194**	99	Yes
SE of E-470 and 128th Av.	131	NA	(2)- 6' x 6' CBC	504	**127**	99	40	25	3	No
1200' East of I-76 on E-470	233	Buffalo Run	60" RCP	185	**142**	132	14	89	63	No
E-470 Between 120th and Tower Rd.	140	D	8' x 8' CBC	880	1152	**923**	447	327	196	Yes
500' West of Tower Rd on E-470	136	E	8' x 6' CBC	336	837	575	**216**	170	100	Yes
400' South of 112th Av on E-470	143	F	(2) - 8' x 6' CBC	672	1194	893	**316**	227	114	Yes

Bold indicates existing structure has capacity up to flow in Bold

Main Stem *Third Creek* Crossings

Road crossings along the main stem of *Third Creek* were inventoried from Old Brighton Road to the O'Brian Canal as part of the 2000 Interim Implementation Plan (reference 21). Crossings further upstream were taken from E-470 improvement plans and field inspection. Most existing crossings have capacity for only the most frequent storms. Table IV-2 shows that only a few locations such as I-76 have sufficient capacity to convey major storm events.

Table IV-1: E-470 Crossing Structure Capacities

				Future Condition Flows (cfs)				
Location	DP	Structure	Capacity (cfs)	100-Year	50-year	10-Year	5-Year	2-Year
Old Brighton Road	103	24" & 72" CMP *	105	5353	2821	1866	1352	682
144th Avenue	204	72" CMP *	60	5349	2817	1864	1349	682
US-85	104	11' x14' x11' x 5' CBC	920	5367	2820	1871	1357	**682**
Union Pac. Railroad	105	50' Span Bridge	100	5341	2800	1868	1357	682
136th Avenue	106	60" CMP *	85	5366	2795	1882	1369	683
Fulton Canal	207	36" CMP	45	5353	2793	1881	1369	682
132nd Avenue	108	60" CMP *	65	5365	2790	1883	1369	679
Sable Road (Co-2)	209	27" CMP	30	5347	2784	1879	1365	675
I-76	110	200' Bridges	>6000	**5385**	2778	1895	1379	672
BNSF Railroad	110	8-span, 150' Bridge	>6000	**5385**	2778	1895	1379	672
E-470 off Ramp to I-76	211	100' Span Bridge	>6000	5328	2741	1871	1362	660
Cameron Drive	211	Twin 48" RCP	200	5328	2741	1871	1362	660
Burlington Ditch	112	24" Inverted Siphon for Ditch	22	5182	2616	1771	1275	590
Buckley Road	213	24" CMP	10	5170	2616	1771	1275	590
O'Brian Canal	114	12' x 6' Upstream Inlet to Ditch	0	5187	2620	1778	1279	591
120th Avenue	115	(1)8'x8', (7) 10'x7' CBCs	5520	**5183**	2615	1775	1276	587
Tower Road	116	6'H x 38' Span Bridge	2000	6008	2669	**1872**	1310	551
Himalaya Street	147	no through road	0	5133	2176	1617	1111	426
112th Avenue	120	Small Culvert	<200	4551	1934	1345	919	329
Quency Street (formerly Picadilly Road)	904	Triple 10x 12 CBC	> 5000	**5489**	2224	1695	1033	327

* Partial Blockage observed

Bold indicates existing structure has capacity up to flow in Bold

BASE MAPPING AND HORIZONTAL & VERTICAL CONTROL PREPARED BY:	Kiowa Engineering Corporation	ADAMS COUNTY COMMERCE CITY CITY OF BRIGHTON URBAN DRAINAGE & FLOOD CONTROL DISTRICT	THIRD CREEK D/S OF DIA OUTFALL SYSTEMS PLANNING STUDY UPDATE	REACH DELINEATION MAP	FIGURE 4-1
LANDMARK MAPPING, LTD. *7500 W. Mississippi Ave, 21* *Lakewood, CO 80232*	7175 W. Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303) 692-0369 KIOWA PROJECT NO. 03059				

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BASE MAPPING AND HORIZONTAL & VERTICAL CONTROL PREPARED BY: *LANDMARK MAPPING, LTD.* *7500 W. Mississippi Ave, 21* *Lakewood, CO 80232*	Kiowa Engineering Corporation 7175 W. Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303) 692-0369 KIOWA PROJECT NO. 03059	ADAMS COUNTY COMMERCE CITY CITY OF BRIGHTON URBAN DRAINAGE & FLOOD CONTROL DISTRICT	THIRD CREEK D/S OF DIA OUTFALL SYSTEMS PLANNING STUDY UPDATE	EXISTING CROSSING STRUCTURES MAP 1 OF 2	FIGURE 4-2

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BASE MAPPING AND HORIZONTAL & VERTICAL CONTROL PREPARED BY: *LANDMARK MAPPING, LTD.* *7500 W. Mississippi Ave, 21* *Lakewood, CO 80232*	Kiowa Engineering Corporation 7175 W. Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303) 692-0369 KIOWA PROJECT NO. 03059	ADAMS COUNTY COMMERCE CITY CITY OF BRIGHTON URBAN DRAINAGE & FLOOD CONTROL DISTRICT	THIRD CREEK D/S OF DIA OUTFALL SYSTEMS PLANNING STUDY UPDATE	EXISTING CROSSING STRUCTURES MAP 2 OF 2	FIGURE 4-3

5 ALTERNATIVES DEVELOPMENT AND EVALUATION

5.1 Introduction

Historically, development within the study area has been agricultural in nature. However, much of the existing agricultural land within the study area is either under construction or being planned for development.

In the future it is anticipated that the City of Brighton and Commerce City will encompass nearly all of the unincorporated Adams County area remaining within the study area. Development plans and construction activities are already underway throughout the study area (References 17, 18, and 19). As much information as could be collected was used to project future land development densities. Most of this information was derived from the latest Comprehensive Plans for the City of Brighton, Adams County, and Commerce City (References 3, 4, 5, and 6) provided by the sponsors and verified by their individual planning departments. Generally, land uses are projected to increase from an average imperviousness of 7% up to 49%.

The impact of future development on the watershed without mitigation will nearly double 100-year flows and increase more frequent flood magnitudes by 10 to 30 times existing levels. This increase in runoff will not only provide an increased threat of flooding and structural damages in the future, but also have significant negative impacts on water quality and stream stability. Alternatives have been developed to offset the impacts of future development by focusing on reducing flood magnitudes, increasing conveyance capacities, removing pollutants from the runoff, and stabilizing the stream against erosion. Alternatives to reduce the extent of the existing 100-year floodplain were also examined.

5.2 Criteria

Drainageway alternatives that mitigate existing and future problems were developed for *Third Creek*. The Urban Storm Drainage Criteria Manual (Reference 8), as well as local criteria (Reference 2), was used to guide the development of the alternative drainageway plans. In addition, the floodplain regulations of Adams County, Commerce City, and the City of Brighton also apply for the administration of the *Third Creek* watershed. Development within the floodplain is currently controlled through existing floodplain regulations and the 100-year floodplain as defined by the 1976 FHAD study (Reference 14). Floodplain regulation is common to all alternatives and will continue as part of all improvement plans.

5.3 Evaluation Parameters

Coordination meetings were held during the study to address overall goals and specific concerns of those agencies and individuals participating in the study. This effort identified the following list of factors for consideration when evaluating each of the alternatives:

- Flood Control
- Implementation
- Construction Cost
- Constructability
- Operation and Maintenance
- Water Quality
- Open Space/ Wildlife Habitat
- Recreation/ Trails/ Wetlands
- Erosion Control
- Transportation
- Aesthetics
- Land Use

5.4 Problem Areas

The major problems identified in this watershed are due to the significant increase in flows under future conditions. Future land use planning (references 3, 4, 5) includes a wide open space floodplain along *Third Creek* intended to approximately maintain the existing FHAD floodplain or floodway delineation. Therefore the need to contain *Third Creek* in a large conveyance structure such as an open channel is not warranted in most areas. Few structures are located in the FHAD floodplain or floodway in reaches 4 and 5; maintenance of the floodplain in these reaches is the most likely option. Several structures are located within the FHAD floodplain in the downstream reaches. Proposed alternatives will compare reducing the existing floodplain with a policy of floodplain maintenance, flood insurance, and local protection measures.

The most immediate flooding problem in the lower portion of the watershed occurs at Old Brighton Road. The existing 72" and 24" CMPs are often silted and unable to convey more than the low flow condition. The backwater upstream of the road embankment will flood a nearby residence during a 5-year existing condition storm and a 2-year future condition storm. The undersized channel capacity downstream will flood nearby structures during 50-year existing and 10-year future conditions storms.

Most of the major road and highway crossings in the lower portion of the watershed are significantly undersized for a 100-year existing conditions event. Since the O'Brian Canal in Reach 4 intercepts most of the low flows for *Third Creek*, existing crossings consist of small culverts sized to convey a relatively small and intermittent overflow. The crossing at US-85 has a capacity to pass the 10-year existing and 5-year future conditions flow. Only the bridge and off-ramp at I-76 is sized to pass the 100-year flow under existing and future conditions. During the construction of E-470, *Third Creek* crossings at 128th Avenue, 120th Avenue, and Tower Road were increased to convey 100-year flows. In Reach 5 located upstream of E-470, typical crossings revert to small culverts designed to convey low and intermittent flows. Alternatives discussed in this chapter are focused on increasing the capacity of both the channel and road crossings for *Third Creek* and tributaries.

At the time that the O'Brian Canal, Burlington Ditch, Fulton Ditch and McCann Ditch were constructed inflows from *Third Creek* were relatively rare and small in magnitude. Crossing structures consist primarily of small culverts. However, as *Third Creek* flows become greater and more common the ditch companies will encounter more frequent overtopping, erosion, and bank failure.

In *Third Creek* the O'Brian Canal intercepts most of the watershed low flows. Since there is no crossing structure on the downstream bank of the canal, all low flows enter the canal and are conveyed to Barr Lake. The Farmers Reservoir and Irrigation Company (FRICO) owns water rights for the first 200 cfs of flows in *Third Creek*. For existing conditions there is little if any base flow; a crossing structure to convey flows in excess of 200cfs under the O'Brian Canal is not needed for storms of less than a 10-year frequency. However, future conditions flows would exceed 200 cfs for storms larger than the 2-year return period. A spillway or conveyance for major storm events is needed to accommodate the higher flows.

5.5 Preliminary Screening of Improvement Alternatives

Potential conveyance, detention and regulatory alternatives were identified and judged based on the evaluation parameters and feasibility. Table V-1 shows an alternative matrix used to compare the various options.

Table V-1
Third Creek Outfall Systems Plan Update
Preliminary Alternative Screening Matrix

		Future Conditions Flows			Alternatives					
Channel Reach	**Location**	**Q_{100} (cfs)**	**Q_{10} (cfs)**	**Q_2 (cfs)**	**Detention**	**Storm Sewer**	**Diversion/ Channelization & Drops**	**Floodplain Management/ Preservation**	**Water Quality**	**Crossing Improvements**
1	South Platte to upstream of Old Brighton Road	4195	1273	628	Too far downstream to effectively reduce flows.	Flows too high to be practical.	Channelization/Diversion possible into or around gravel pits	Possible	Consider for Tributary areas draining less than 1 square mile	100 Year capacity for Tribs, 10- to 100-year capacity for Mainstem Third Creek
2	Upstream Old Brighton Road to Fulton Ditch	4197	1272	627	Too far downstream to effectively reduce flows.	Flows too high to be practical.	Channelization possible. No practical location for diversion.	Possible	Consider for Tributary areas draining less than 1 square mile	100 Year capacity for Tribs, 10- to 100-year capacity for Mainstem Third Creek
3	Fulton Ditch to I-76	4182	1278	628	Too far downstream to effectively reduce flows.	Flows too high to be practical.	Channelization possible. No practical location for diversion.	Possible	Consider for Tributary areas draining less than 1 square mile	100 Year capacity for Tribs, 10- to 100-year capacity for Mainstem Third Creek
4	I-76 to Tower Road	4160	1268	617	Regional Detention: Mainstem at Fulton Ditch; Tributary D (see Table Y)	Flows too high to be practical.	Channelization possible. No practical location for diversion.	Possible	Consider for Tributary areas draining less than 1 square mile	100 Year capacity for Tribs, 10- to 100-year capacity for Mainstem Third Creek
5	Tower Road to DIA	4493	1152	516	Regional Detention: Tributaries F, L (See Table Y)	Flows too high to be practical.	Channelization possible. No practical location for diversion.	Possible	Consider for Tributary areas draining less than 1 square mile	100 Year capacity for Tribs, 10- to 100-year capacity for Mainstem Third Creek

Shaded cells indicate options eliminated from Screening Matrix

Storm Sewers

Table V-1 indicates that storm sewers were eliminated from consideration due to the magnitude of the flows in *Third Creek*. Individual developments will likely utilize storm sewers to convey local runoff, however regional drainage issues will be addressed with other alternatives capable of handling relatively large flow volumes. Urban Drainage and Flood Control District policy is to utilize underground conduits for major drainageways only in special circumstances.

Detention

Table V-1 also shows that regional detention in the lower reaches was eliminated from consideration due to their limited effectiveness at this location within the watershed. The implementation of regional detention facilities in the upper reaches was considered as a means of reducing the cumulative peak flows during various storm events. Such a reduction may eliminate or downsize the need for downstream conveyance structures such as formalized channels, culverts, and bridges. Analysis of the effect of detention was studied on a range of storm frequencies including the 100-, 10-, and 2-year storm events. Since regional detention is designed to impact the watershed as a whole, a reach-by-reach analysis was not performed.

Sensitivity analysis using the SWMM model was conducted to identify the best locations for regional detention. Since future conditions flows for the mainstem baseline are relatively high and sustained, the analysis focused on detaining tributary flows. The method consisted of eliminating the SWMM routing elements connecting the tributaries to the *Third Creek* mainstem as a means of simulating detention. Actual detention facilities were later modeled for locations suggested by the analysis.

Table V-2: Effects of Tributaries on Main Stem Flows
Third Creek OSP

			Future Conditions Flows					
Tributary	DP	Trib Area (sq. mi.)	100 Year	Reduction %	10 Year	Reduction %	2 Year	Reduction %
Baseline Flows			5359		1874		688	
Trib A	285	0.23	5358	0.0%	1873	0.1%	688	0.0%
Buffalo Run	233	2.40	5204	2.9%	1873	0.1%	617	10.3%
Trib B	225	0.31	5341	0.3%	1764	5.9%	688	0.0%
Trib C	224	0.28	5345	0.3%	1873	0.1%	686	0.3%
Trib D*	140	2.60	5181	3.3%	1786	4.7%	612	11.0%
Trib E	48	0.17	5324	0.7%	1857	0.9%	674	2.0%
Trib G	254	1.80	4578	**14.6%**	1530	**18.4%**	541	**21.4%**
Trib H	268	0.17	5305	1.0%	1848	1.4%	670	2.6%
Trib I	264	0.21	5315	0.8%	1872	0.1%	688	0.0%
Trib J	226	0.21	5350	0.2%	1868	0.3%	683	0.7%
Trib K	228	0.21	5351	0.1%	1869	0.3%	684	0.6%
Trib L (DIA)	1094	2.20	4492	**16.2%**	1596	**14.8%**	525	**23.7%**
No DIA Inflow	904	16.42	3143	41.4%	1869	0.3%	628	8.7%

*Trib D is diverted into Trib F for future conditions model; Trib F is not listed separately.

As seen from Table V-2, detention on Tributaries D, G and L have the most significant effect on the peak flow along the *Third Creek* mainstem. Therefore all three tributaries were considered for potential detention facilities. The future conditions model included a diversion channel and 104 acre-ft detention facility on Tributary 3306 that is currently being planned (Reference 24). Formalization of an existing 227 acre-feet of inadvertent detention at DP 304 located near the intersection of 104th Avenue and Tower Road would reduce 100-year peak flows by 3.3% to 5181 cfs. However the proposed residential development plan for the location was not conducive to the location; detention options on Tributary 3306 were confined to the 104 acre-ft facility currently being planned.

Further SWMM modeling of a detention on Tributary 3309 indicated that a 171 acre-foot facility located at the intersection of Himalaya Road and 112th Avenue would reduce 100-year peak flows on the mainstem by 15% to 4578 cfs. The reduction of more frequent flows is similar to that of the 100-year flows. This detention facility was developed further as an alternative.

The final location studied for detention is on Grass Valley Gulch (originally included in the DIA hydrology model). The design in this study diverted the flow from the outfall to Pond T-239 on DIA to a location downstream of the pond outlet. Further SWMM modeling of a 230 acre-ft detention facility on Grass Valley Gulch reduced the 100-year peak at the South Platte outfall from 5359 cfs to 4492 cfs (16%). Reductions in more frequent flows are similar. A regional detention facility on Grass Valley Gulch was therefore developed as an alternative.

Channelization

As seen from Table V-1, channelization was considered as a practical improvement alternative for each reach. Since the majority of the watershed is undeveloped, maintenance of the existing floodplain along the main stem of *Third Creek* was the preferred approach to convey the 100-year flow. The increase in flows due to future development is best mitigated with the regional detention alternatives previously discussed. The goal of channelization of the mainstem of *Third Creek* is to contain more frequent flows. Crossings at the major road arterials considered conveyance of 100-year flows, or 10-year flows with 100-year overtopping. Since the flows on the tributaries are significantly lower than the main stem, channel alternatives were sized based on the 100-year peak flow. Alternatives to convey the flows from different storm frequencies were considered for comparison. Storm frequencies include the 2-, 5-, 10- and 100-year as well as a low-flow channel sized to convey runoff from the 0.4 inch storm. The 0.4 inch storm represents about 85% of all storms.

Channel alternatives were designed based on peak flow rates for each reach from the hydrologic models. The open channel spreadsheet developed by UDFCD was used to determine channel size and geometry (Reference 8). Drop structures were added to the channel design to maintain channel slopes relative to the natural grade. All defined channels, both natural and constructed, will require access for periodic maintenance.

Riprap-lined channels provide reduced right-of-way, relatively high velocity criteria, and allow for deep cross-sections. Higher roughness of the riprap allows for a steeper channel that still maintains a sub-critical flow regime. A steeper channel requires fewer drop structures. However the need for riprap channel is not apparent since the natural grade of the watershed is relatively flat. For this study, the practical channel alternatives are grass lined, wetland, or stabilized natural vegetation channels.

Grass-lined channels have the benefit of not requiring expensive riprap lining material along the entire length of the channel. However, the criteria for grass-lined channels requires that the velocities are kept below 5 feet per second for sandy soils, the depth at full flow remains below 5', and side slopes must be 4:1 or flatter. To meet these requirements, grass-lined channels require a relatively wide right-of-way and frequent drop structures in steep areas. Multi-frequency channels generally have a low-flow channel, stabilized banks and a grass-lined overflow area that contains the 100-year peak flows. Grass-lined channels in areas where a significant base flow exists must include some provision for erosion control.

Wetland channels are shallow, slow-flowing channels that are intended to provide an area for wetland vegetation to thrive, as well as providing an adequate conveyance for flood flows. In mature conditions the wetland vegetation should fill the channel, except for a meandering low-flow section, which can be allowed to form naturally. Perennial base flow is generally required in order to keep the wetland species alive. Wetland channels must be designed to be stable for both the initial condition where the vegetation has not yet been established, and the mature condition where the vegetation significantly affects the channel roughness and capacity. In order to maintain slow velocities, the longitudinal slope of wetland channels must be flat, which requires more grade-control structures than other channel types. In general, wetland channels are more expensive, but provide excellent flood and water quality mitigation opportunities.

The topography near the *South Platte River* is very flat. All channels were designed with a minimum slope of 0.4-percent to reduce sediment deposition. Due to the flatness of this area, the need for erosion control and bank protection is reduced. Project sponsors have a strong interest in this corridor and would like to see channels designed as natural in appearance as possible. Grass-lined and wetland channels were analyzed in the alternatives.

Drop and Check Structures

Both drop and check structures were considered as a means of reducing channel slopes in excess of one percent and the associated flow velocity to a less erosive rate of less than seven feet per second. For the purpose of alternative evaluation, drop structures were assumed to be grouted sloping boulder drops extending across the entire width of the channel. The purpose of the drop structure is to reduce the grade in channels designed for major flows. The grouted sloping boulder drop structure is appropriate for use with channel types including riprap-lined, grass-lined or multi-frequency channels, and as a selective structural improvement. Check structures consist of a concrete or grouted vertical wall designed to stop head cutting in the channel bottom due to low flows.

Water Quality

Improvement of urban stormwater quality is an important issue in watershed planning. Many pollutants are associated with sediments present in stormwater runoff. Airborne pollutants contribute to these by deposition onto the urban landscape. Other sources of pollutants include lawn chemicals, oil and grease, pet feces, lawn clippings, and other items often found on urban land surfaces. Some of these pollutants can be limited by programs such as erosion control at construction sites, educational programs to inform the public as to proper use of lawn chemicals, oil recycling programs, and seasonal collection of leaf litter and debris as part of normal street sweeping programs. Even with these programs in place, normal erosion along drainageways can generate sediment that can settle out along downstream channel reaches. The UDFCD, in cooperation with many cities and counties in the Denver region, has developed a manual of Best Management Practices (BMPs) (see Reference 8, Vol. 3). It is recommended that all involved municipalities adopt the BMPs and, if possible, include water-quality features in any future detention-facility designs.

The implementation of water quality basins is recommended with each of the proposed detention facilities. On-site and regional water quality facilities have been sized at various locations throughout the watersheds. The required size of each facility is directly proportional to upstream drainage area. A maximum tributary area of one-half to one square mile is recommended for water quality basins. A summary of the required water quality capture volume for each sub-basin based on various optional detention times applicable to different BMPs is presented in Table V-3.

Re-vegetation

Criteria for "bioengineered" vegetation should be in the form of performance specifications. This requires that vegetation be designed to withstand specific velocity, depth and roughness criteria. All disturbed areas should be re-vegetated with plant species recommended by the UDFCD or local government in whose jurisdiction the proposed improvements are to be located. Areas in the bottoms of wetland channels should be planted with wetland-type vegetation and upland areas planted with dry-land grass species according to UDFCD or local sponsor practices. Detention basin areas should be planted with dry land species except for the permanent pool fringe area where wetland/riparian vegetation could be used. Existing trees and desirable vegetation should be saved wherever possible. Large cottonwoods and/or willow trees should be protected during construction activities.

Maintenance

All drainageways and other stormwater facilities will require periodic maintenance to ensure operation as designed. Routine mowing, debris pick up, and repair of minor erosion are the commonly needed maintenance measures. Use of native grasses helps reduce mowing requirements and is encouraged. Signs and educational programs can help reduce debris dumping in drainageways. Routine inspection of drop structures, rip-rapped areas, crossing structures, and detention facilities is required to detect deficiencies prior to flood events. All facilities are to be designed to current UDFCD criteria to be considered eligible for UDFCD maintenance assistance.

5.6 Viable Alternatives

Figures 5-1 to 5-5 show improvement alternatives on a reach-by-reach basis. Regional detention facilities are proposed at locations indicated by hydrologic analysis. Channel capacities were sized for various storm frequencies and are compared in the preceding evaluation chapter. Water quality basins were placed at locations that drain less than a square mile and are outside of the FHAD floodplain.

Table V-3

Third Creek Water Quality Capture Volumes (ac-ft)

Basin #	I (imp.value)	6-hour WQCV (in)	12- hour WQCV (in)	24-hour WQCV (in)	40-hour WQCV (in)	Area (sq. mi.)	Area (acres)	6-hour Required Storage (acre-feet)	12-hour Required Storage (acre-feet)	24-hour Required Storage (acre-feet)	40-hour Required Storage (acre-feet)
1	0.836	0.246	0.282	0.317	0.352	0.19	120.4	2.473	2.826	3.179	3.533
2	0.222	0.087	0.100	0.112	0.124	0.12	77.6	0.563	0.644	0.724	0.805
3	0.229	0.089	0.102	0.115	0.127	0.11	37.7	0.280	0.320	0.360	0.400
4	0.419	0.129	0.148	0.166	0.185	0.11	77.1	0.832	0.950	1.069	1.188
5	0.369	0.120	0.137	0.154	0.172	0.16	62.2	0.622	0.711	0.800	0.889
6	0.060	0.030	0.034	0.038	0.043	0.18	68.0	0.170	0.194	0.218	0.242
7	0.100	0.047	0.054	0.060	0.067	0.13	59.4	0.232	0.265	0.298	0.332
8	0.050	0.025	0.029	0.033	0.036	0.13	81.1	0.171	0.195	0.220	0.244
9	0.050	0.025	0.029	0.032	0.036	0.17	30.4	0.064	0.073	0.082	0.092
10	0.050	0.025	0.029	0.033	0.036	0.13	104.9	0.221	0.253	0.284	0.316
11	0.050	0.025	0.029	0.033	0.036	0.16	63.3	0.133	0.153	0.172	0.191
12	0.085	0.041	0.046	0.052	0.058	0.14	78.9	0.267	0.306	0.344	0.382
13	0.127	0.057	0.065	0.073	0.081	0.15	117.9	0.561	0.641	0.721	0.801
14	0.105	0.049	0.056	0.063	0.070	0.15	46.5	0.190	0.217	0.244	0.271
15	0.204	0.082	0.094	0.106	0.117	0.18	67.3	0.460	0.526	0.591	0.657
16	0.081	0.039	0.045	0.050	0.056	0.16	82.1	0.267	0.306	0.344	0.382
17	0.204	0.082	0.094	0.106	0.117	0.10	47.8	0.327	0.374	0.421	0.467
18	0.550	0.154	0.176	0.198	0.220	0.17	31.8	0.409	0.467	0.525	0.584
19	0.701	0.193	0.221	0.248	0.276	0.11	85.7	1.377	1.574	1.771	1.968
20	0.473	0.139	0.159	0.179	0.199	0.24	62.4	0.725	0.828	0.932	1.035
21	0.050	0.025	0.029	0.033	0.036	0.13	51.8	0.109	0.125	0.140	0.156
22	0.050	0.025	0.029	0.033	0.036	0.12	128.4	0.271	0.309	0.348	0.387
23	0.358	0.118	0.135	0.152	0.169	0.06	45.5	0.448	0.512	0.576	0.640
24	0.050	0.025	0.029	0.033	0.036	0.06	32.3	0.068	0.078	0.088	0.097
25	0.207	0.083	0.095	0.107	0.119	0.19	28.8	0.200	0.228	0.257	0.285
26	0.313	0.109	0.124	0.140	0.155	0.22	113.5	1.029	1.176	1.323	1.470
27	0.587	0.162	0.185	0.209	0.232	0.21	67.3	0.910	1.040	1.170	1.300
28	0.124	0.056	0.064	0.072	0.080	0.16	97.7	0.456	0.521	0.586	0.652
29	0.450	0.135	0.154	0.174	0.193	0.14	33.0	0.372	0.425	0.478	0.531
30	0.319	0.110	0.126	0.142	0.157	0.14	43.1	0.396	0.452	0.509	0.566
31	0.525	0.149	0.170	0.192	0.213	0.17	70.3	0.874	0.999	1.123	1.248
32	0.682	0.187	0.214	0.240	0.267	0.14	123.7	1.928	2.204	2.479	2.755
33	0.365	0.119	0.136	0.153	0.170	0.15	119.8	1.190	1.360	1.530	1.700
34	0.728	0.202	0.230	0.259	0.288	0.15	46.0	0.773	0.883	0.994	1.104
35	0.307	0.107	0.123	0.138	0.154	0.18	79.4	0.711	0.813	0.914	1.016
36	0.777	0.220	0.252	0.283	0.315	0.12	59.4	1.089	1.245	1.401	1.556
37	0.638	0.175	0.200	0.225	0.249	0.14	80.5	1.171	1.338	1.505	1.672
38	0.897	0.279	0.319	0.359	0.399	0.06	47.2	1.099	1.256	1.413	1.570
39	0.753	0.211	0.241	0.271	0.301	0.10	68.8	1.210	1.382	1.555	1.728
40	0.101	0.047	0.054	0.061	0.068	0.21	116.0	0.459	0.524	0.590	0.655
41	0.650	0.178	0.203	0.229	0.254	0.11	123.5	1.831	2.092	2.354	2.615
42	0.356	0.118	0.134	0.151	0.168	0.15	123.8	1.212	1.386	1.559	1.732
43	0.380	0.122	0.140	0.157	0.174	0.16	89.0	0.906	1.035	1.165	1.294
44	0.313	0.109	0.124	0.140	0.155	0.17	87.2	0.790	0.903	1.016	1.129
45	0.450	0.135	0.154	0.174	0.193	0.08	46.2	0.520	0.595	0.669	0.744
46	0.477	0.140	0.160	0.180	0.200	0.21	118.0	1.377	1.573	1.770	1.967
47	0.050	0.025	0.029	0.033	0.036	0.16	93.0	0.196	0.224	0.252	0.280
48	0.650	0.178	0.203	0.229	0.254	0.17	114.1	1.692	1.934	2.175	2.417
49	0.406	0.127	0.145	0.163	0.181	0.19	121.6	1.287	1.470	1.654	1.838
50	0.619	0.170	0.194	0.219	0.243	0.17	128.4	1.818	2.078	2.338	2.598
51	0.758	0.213	0.243	0.273	0.304	0.13	101.5	1.798	2.055	2.312	2.569
52	0.499	0.144	0.165	0.185	0.206	0.15	78.7	0.946	1.081	1.217	1.352
53	0.828	0.243	0.278	0.312	0.347	0.09	78.7	1.593	1.820	2.048	2.275
54	0.650	0.178	0.203	0.229	0.254	0.17	78.7	1.167	1.334	1.500	1.667
55	0.412	0.128	0.146	0.165	0.183	0.08	78.7	0.840	0.960	1.080	1.200

Basin #	I (imp.value)	6-hour WQCV (in)	12- hour WQCV (in)	24-hour WQCV (in)	40-hour WQCV (in)	Area (sq. mi.)	Area (acres)	6-hour Required Storage (acre-feet)	12-hour Required Storage (acre-feet)	24-hour Required Storage (acre-feet)	40-hour Required Storage (acre-feet)
55	0.412	0.128	0.146	0.165	0.183	0.08	98.3	1.050	1.200	1.349	1.499
56	0.262	0.097	0.111	0.125	0.139	0.16	82.5	0.669	0.765	0.860	0.956
57	0.301	0.106	0.121	0.137	0.152	0.06	101.7	0.900	1.029	1.157	1.286
58	0.278	0.101	0.116	0.130	0.144	0.15	112.1	0.945	1.080	1.215	1.349
59	0.477	0.140	0.160	0.180	0.200	0.09	56.9	0.664	0.759	0.854	0.948
60	0.702	0.193	0.221	0.248	0.276	0.14	53.7	0.864	0.988	1.111	1.234
61	0.730	0.203	0.232	0.260	0.289	0.08	61.8	1.043	1.192	1.341	1.490
62	0.950	0.313	0.358	0.403	0.447	0.12	122.7	3.202	3.659	4.117	4.574
64	0.837	0.247	0.282	0.317	0.353	0.19	42.9	0.882	1.008	1.134	1.260
65	0.911	0.287	0.329	0.370	0.411	0.14	31.3	0.749	0.856	0.963	1.070
66	0.799	0.229	0.262	0.295	0.328	0.19	70.9	1.355	1.549	1.742	1.936
67	0.650	0.178	0.203	0.229	0.254	0.09	120.8	1.791	2.047	2.303	2.559
68	0.650	0.178	0.203	0.229	0.254	0.08	126.2	1.871	2.139	2.406	2.673
69	0.493	0.143	0.163	0.184	0.204	0.16	112.7	1.342	1.534	1.726	1.918
70	0.150	0.065	0.074	0.084	0.093	0.10	75.3	0.409	0.467	0.526	0.584
71	0.725	0.201	0.229	0.258	0.287	0.18	69.7	1.166	1.333	1.500	1.666
72	0.050	0.025	0.029	0.033	0.036	0.21	129.8	0.274	0.313	0.352	0.391
73	0.050	0.025	0.029	0.033	0.036	0.13	130.1	0.274	0.313	0.353	0.392
74	0.537	0.152	0.173	0.195	0.217	0.17	73.7	0.931	1.065	1.198	1.331
75	0.331	0.113	0.129	0.145	0.161	0.13	57.3	0.538	0.615	0.692	0.768
76	0.450	0.135	0.154	0.174	0.193	0.16	54.9	0.618	0.706	0.794	0.882
77	0.318	0.110	0.126	0.141	0.157	0.19	74.1	0.679	0.775	0.872	0.969
78	0.776	0.220	0.251	0.283	0.314	0.21	92.2	1.689	1.931	2.172	2.413
79	0.736	0.205	0.234	0.263	0.292	0.19	133.9	2.284	2.610	2.936	3.262
80	0.857	0.257	0.294	0.331	0.367	0.07	48.0	1.029	1.176	1.323	1.471
81	0.737	0.205	0.234	0.264	0.293	0.15	75.2	1.285	1.469	1.652	1.836
82	0.650	0.178	0.203	0.229	0.254	0.16	129.7	1.923	2.198	2.473	2.748
83	0.760	0.213	0.244	0.274	0.305	0.20	103.0	1.832	2.093	2.355	2.617
84	0.650	0.178	0.203	0.229	0.254	0.14	43.9	0.651	0.744	0.837	0.930
85	0.907	0.285	0.326	0.367	0.408	0.21	74.4	1.769	2.021	2.274	2.527
86	0.915	0.290	0.332	0.373	0.414	0.20	119.8	2.896	3.310	3.723	4.137
87	0.650	0.178	0.203	0.229	0.254	0.20	85.4	1.266	1.447	1.627	1.808
88	0.650	0.178	0.203	0.229	0.254	0.17	24.4	0.362	0.414	0.466	0.517
89	0.481	0.141	0.161	0.181	0.201	0.19	33.6	0.394	0.450	0.506	0.563
90	0.950	0.313	0.358	0.402	0.447	0.11	43.5	1.135	1.297	1.459	1.621
91	0.950	0.313	0.358	0.402	0.447	0.11	77.6	2.025	2.315	2.604	2.893
92	0.950	0.313	0.358	0.403	0.447	0.20	40.5	1.057	1.208	1.359	1.510
93	0.876	0.267	0.305	0.343	0.382	0.16	66.9	1.488	1.701	1.913	2.126
94	0.650	0.178	0.203	0.229	0.254	0.11	46.7	0.692	0.791	0.890	0.989
95	0.650	0.178	0.203	0.229	0.254	0.19	129.1	1.914	2.188	2.461	2.735
96	0.647	0.177	0.202	0.228	0.253	0.14	54.7	0.808	0.923	1.039	1.154
97	0.650	0.178	0.203	0.229	0.254	0.20	68.2	1.011	1.156	1.300	1.445
98	0.650	0.178	0.203	0.229	0.254	0.12	112.2	1.663	1.901	2.138	2.376
99	0.437	0.133	0.152	0.171	0.190	0.13	67.1	0.742	0.848	0.954	1.060
992	0.650	0.178	0.203	0.229	0.254	0.72	461.0	6.834	7.810	8.787	9.763
993	0.650	0.178	0.203	0.229	0.254	1.44	922.0	13.668	15.621	17.573	19.526

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KIOWA PROJECT NO. 03059

ADAMS COUNTY
COMMERCE CITY
CITY OF BRIGHTON
URBAN DRAINAGE & FLOOD CONTROL DISTRICT

THIRD CREEK D/S OF DIA
OUTFALL SYSTEMS PLANNING STUDY UPDATE

REACH 1
ALTERNATIVES

FIGURE 5-1

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REACH 2
ALTERNATIVES

FIGURE 5-2

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LEGEND

0 1000' 2000'
SCALE: 1"=2000'

WATERSHED BOUNDARY

APPROXIMATE FHAD 100-YEAR FLOODPLAIN

THIRD CREEK EXISTING FLOW PATH

IMPROVEMENT CHANNEL

WATER QUALITY BASIN

CHECK/DROP STRUCTURE

TRIBUTARY

DIVERSION

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REACH 5
ALTERNATIVES

FIGURE 5-5

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Cost estimates for each of the plans were prepared. The list of alternative plans and associated costs are presented in the Alternatives Evaluation chapter to allow the project sponsors to objectively evaluate the desirability of each concept.

The sections below summarize the existing conditions and viable alternatives considered for each reach. A major consideration in the lower reaches is increasing the capacity of relatively small ditch and road crossings of lower *Third Creek*. Since the ditch inverts must be maintained, channelization alternatives involve lowering the entire channel invert of *Third Creek* from at least the Fulton Ditch downstream to the South Platte outfall. Therefore all channel alternatives discussed in the following sections for Reach 1-3 involve lowering the channel invert by approximately five feet depending on the goal for conveyance capacity. Specific sizing of crossing and channel improvements are presented and compared in the preceding Hydraulics Analysis chapter. The proposed alternatives represent the minimum improvements necessary to address future drainage problems.

The three alternatives for the crossings of the Fulton Ditch, Burlington Ditch, and O'Brian Canal were a frequent flow conveyance (2- or 5-year) with 100-year overflow structure, a 100-year conveyance structure, and a no improvement. Any recommended alternative should match improvements at these locations with the necessary channel capacity.

Reach 1: South Platte River to Old Brighton Road (Figure 5-1)
The flow path to the South Platte is poorly defined in Reach 1 due to the interception of low flows by the upstream canals and ditches. Alternatives include channels sized for the 0.4 in storm as well as 2-, 5-, 10-, and 100-year storm frequencies. Channels with less than the 100-year capacity would require maintenance and management of the floodplain. Two alignments were studied. Alignment A crosses 144th Avenue and outfalls into the proposed water storage facility. The facility would then serve as water quality detention before surcharging into the South Platte. Alignment B conveys flows south of 144th Avenue between the two proposed water storage facilities and outfalls into the South Platte. The McCann Ditch would be conveyed in a flume over the *Third Creek* channel for both alignments.

The existing 72" and 24" CMP crossings under Old Brighton Road would be replaced with larger culverts for frequent flows or a bridge to pass the 100-year event. These options would eliminate the existing flooding potential for nearby structures that would flood during 2-year future conditions flows due to the existing backwater condition upstream of the road.

Reach 2: Old Brighton Road to Fulton Ditch (Figure 5-2)
Channels sized for the 0.4 in storm as well as 2-, 5-, 10-, and 100-year storm frequencies were considered upstream and downstream of US-85. Channels with less than the 100-year capacity would require maintenance and management of the floodplain.

Major crossings are located at 144th Avenue, US-85, the Union Pacific Railroad, and 136th Avenue. The existing crossing at 144th Avenue consists of 72" CMP that is prone to clogging. Addition of box culverts for the 10-year flow and a bridge for 100-year flows were considered for alternatives.

The existing crossing at US-85 consists of three box culverts with a capacity for the 10-year existing and 5-year future conditions flow. Improvement alternatives to the crossing include adding a box culvert to accommodate future 10-year flows or replacement with a bridge for 100-year flows.

The Union Pacific Railroad crossing is a 50-foot span bridge with a very shallow opening for *Third Creek* flows. Under current conditions the opening is only able to convey about 100 cfs. Erosion from the earthen railroad embankment is common and though not structurally unstable, causes a reduction in the opening. Lowering the channel invert for *Third Creek* is the only viable alternative at this location. This would allow for either box culverts or a bridge opening to convey various flow frequencies considered in this study. A grade separated trail crossing is also desirable.

Two channel alignments were considered for the Union Pacific Railroad crossing of *Third Creek*. Alternative A would maintain the existing location with a lowered channel and increased capacity. Alternative B would divert flow approximately 1700 feet to the Northeast along the south side of the railroad to a new crossing location.

Reach 3: Fulton Ditch to O'Brian Canal (Figure 5-3)
Channels sized for the 0.4 in storm as well as 2-, 5-, 10-, and 100-year storm frequencies were also considered for this reach. Channels with less than the 100-year capacity would require maintenance and management of the floodplain.

Crossings include a 36" culvert under the Fulton Ditch that currently conveys low flows from *Third Creek*. The crossing capacity of 136th Avenue, located immediately downstream, consists of a 60" CMP that is prone to clogging. Lowering of the channel invert is a key to enlarging the capacity of these crossings.

The mainstem of *Third Creek* upstream of Sable Boulevard has been relocated and improved during the construction of E-470. The improved channel has a capacity for approximately 540 cfs and would contain flows during for 2-year storm event under future unimproved conditions and for 10-year existing conditions. The channel downstream of Sable Boulevard is undersized for most flow events. Both segments were considered for channel improvement to accommodate larger storm frequencies. The 27" CMP crossing at Sable Boulevard was recently replaced with a 4x8 box culvert. Alternatives for improving the remaining upstream section to I-76 include enlarging the existing channel. However there is no need to lower the channel invert for this section.

Reach 4: *Third Creek* Mainstem from O'Brian Canal to E-470 and Tower Road (Figure 5-4)
As with portions of Reach 3, the *Third Creek* channel in Reach 4 was relocated and improved during the construction of E-470. The improved channel has a capacity for approximately 540 cfs and would contain flows during for 2-year storm event under future unimproved conditions and for 10-year existing conditions. Alternatives considered for this channel include increasing capacity to 10-year and 100-year flow conditions or no improvement.

Major crossings of *Third Creek* in Reach 4 include I-76, the BNSF Railroad, Cameron Drive, the E-470 off-ramp, the Burlington Ditch, the O'Brian Canal, Buckley Road and 120th Avenue. All but the ditch crossings and Buckley Road are sized to convey 100-year flows under future conditions. No additional improvement is necessary.

Under existing conditions, a single 8'x8' box culvert at 120th Avenue detention facility outlet directs frequent flows to a side channel north along E-470 and into the O'Brian Canal. This conveyance is in place to maintain 200cfs of water rights from *Third Creek* into the canal. Major flows from *Third creek* exit the remaining seven box culverts at 120th Avenue and would overtop the canal to continue downstream. For

future flows, storms greater than a 5-year frequency will overtop and continue downstream. Three alternatives were investigated for the canal crossing. One option investigated the creation of a detention facility capable of reducing 5-year flows to the 2-year (similar to one proposed in the 1990 master plan). A 2-year outlet culvert and a 100-year overflow structure would convey flows past the O'Brian Canal. Hydrologic analysis indicated a 300 acre-ft facility would be necessary. The depth of the facility would be limited to four feet due the invert of the existing 120th Avenue detention facility immediately upstream and the presence of shallow ground water. A significant amount of soil, approximately one million cubic yards, would need to be excavated from the east side of the facility in order to provide the necessary volume. Any improvement design would have to convey the first 200 cfs of *Third Creek* flow into the O'Brian Canal to preserve the existing water rights. Preliminary design of an outlet culvert indicated that a four-foot high box culvert would be necessary. An open channel downstream of the culvert would extend approximately 3500 feet downstream to match the existing channel grade. A culvert sized for the 2-year flow would be a 4'x5'CBC. A 100-year overflow weir and riprap spillway would be constructed on the downstream bank of the canal. The remaining options include a 2- to 5-year capacity siphon crossing or providing a full 100-year culvert.

Reach 4: Tributary 3305.5 (Buffalo Run) to *Third Creek* (Figure 5-4)

Channels along the lower reaches of Buffalo Run are either constructed or planned for construction to accommodate residential development. Twin 6'H x 8'W CBC are to convey flows from upstream Buffalo Tributary and adjacent residential developments across 120th Avenue and into the recently established detention facility adjacent to the O'Brian Canal. The culverts would convey approximately 720 cfs and correspond to the 50-year storm runoff based on hydrology in this study. Shallow overtopping of 120th Avenue would be expected during a 100-year event. The Buffalo Run Golf Course has been built and extends upstream for nearly the entire tributary. Future residential development to be incorporated with the golf course will match the existing conveyance structures. Therefore no additional improvements were considered for Buffalo Run Tributary.

Reach 4: Tributary 3306 to *Third Creek* (Figure 5-4)

Original improvement plans for Tributary 3306 include formalizing 227 acre-ft of existing inadvertent detention on either side of 104th Avenue. However the alternative was superceded by recent preliminary plans associated with the Reunion residential development. A diversion channel and detention facility immediately east of E-470 (reference 24) is currently under design that would accept runoff from residential development, divert flows north along the west side of E-470, and discharge into a 103 acre-ft detention facility (a plan for two detention facilities of equivalent size was also presented). Therefore no additional detention alternative was considered for Tributary 3306. The proposed channel capacity is well in excess of flows for the 100-year future conditions storm predicted by the hydrology in this study.

Channel improvement for Tributary 3306 upstream of the proposed channel and detention will match the proposed drainage plan and were not included in further alternative evaluation. Downstream of the detention facility (north of 112th Avenue) the previous master plan recommended at least two drainage channels and/or large storm sewers to contain future flows (T-58 and t-60). The Buckley Crossing development currently under development has also superceded the need for improvement alternatives. A storm sewer and curb/gutter design has now been approved to convey the flows on Tributary 3306 not intercepted by the detention pond. The remaining runoff will outfall to the existing 8x8 CBC on the west side of E-470. With the planned diversion from the upper portion of Tributary 3306, this structure would have the capacity to convey 100-year future conditions flows under e-470 and to the outfall with the *Third Creek* mainstem.

Reach 5: *Third Creek* Mainstem from E-470 to DIA (Figure 5-5)

This uppermost reach of the study area is completely undeveloped. Although channels were sized for various storm frequencies, the most likely alternative is to maintain the existing floodplain and natural channel. The key arterial road crossings at Tower Road, 112th Avenue, and Picadilly Road were sized for 10-year and 100-year crossings as alternative options. Although Himalaya Street does not currently continue across *Third Creek*, future development would likely extend the road and require an appropriate crossing.

Reach 5: Tributary 3309 (Figure 5-5)

Alternatives for 10-year and 100-year channels were included for much of Trib 3309. A 171 acre-ft regional detention facility was also considered near the confluence with *Third Creek*. This alternative would reduce 100-year flows at the *Third Creek* outfall from 5359 cfs to 4578 (16%). Greater reductions are seen in the more frequent storm events as seen from Table V-2.

Reach 5: Grass Valley Gulch (DIA) (Figure 5-5)

Grass Valley Gulch drains subwatersheds immediately west of the DIA property line and has a confluence with *Third Creek* on DIA Property just upstream of Pond T-239. Improvement alternatives include channels sized for various storm frequencies and a 230 acre-ft regional detention facility. The detention facility would divert the existing outfall into Pond T-239 to a location downstream of the pond outlet. Of all the detention options, the Grass Valley Gulch facility would result in the greatest reduction of 100-year flows at the South Platte outfall (see Table V-2).

5.7 Alternatives Evaluation

Improvement alternatives that were identified as viable and addressed the specific drainage, erosion, and water quality problems in each reach were developed and described in the previous sections. For each of these alternatives, structures were sized for the detained future conditions hydrological analysis. Cost estimates were completed for each alternative, and were used to develop the recommended alternative for each reach.

5.8 Alternatives Hydrology

Alternatives hydrology reflects anticipated future (fully-developed) impervious conditions. Detention alternatives discussed in the following section reduced the unimproved future conditions hydrology to approximately existing-condition flows for large flood events. The more frequent runoff events (i.e., 2-year) will increase significantly compared to existing conditions. Alternatives based on hydrology models with individual and a combination of detention alternatives will be compared for evaluation.

5.9 Cost Estimates

Conceptual cost estimates were prepared for each of the improvement alternatives, and compiled by reach for alternative evaluation. The cost of each improvement was developed by estimating the quantity of materials required and applying the unit cost as presented in Table VI-2 of next chapter. The unit costs were developed from current published cost values (CDOT, 2002) and from the Urban Drainage Bid Tabulation program and database (reference 27). An additional 35 percent was added for administration, engineering and contingencies. Detailed cost estimate for the Selected Plan is presented with plan and profile sheets in Appendix D. Estimated costs in this section are used to allow clear comparisons between alternates and provide a relative order of magnitude to projected implementation costs.

5.10 Discussion of Alternatives

The project sponsors expressed the desire to preserve an open space corridor along *Third Creek* with a minimum width of 300-400 feet. However, lowering the channel will be required to construct low-flow crossings of the three irrigation canals and increase the capacity of road crossings. A channel invert similar to the one shown in the 1990 master plan will be required as the same constraints apply; namely, the upstream elevation required to cross under the Fulton Ditch, and the downstream elevation at the *South Platte River*. Lowering the invert by 4-5 feet for all existing structures would facilitate 100-year capacity at several of the larger crossings, (i.e.,US-85, 136th Avenue, and UPRR). Channel lowering would also enable the construction of a pedestrian trail along *Third Creek* with adequate clearance at crossings. However, since the structural details of the existing road crossing structures are not known, it cannot be assumed that existing structures can be safely modified to accommodate a drop in channel invert elevations. In the Phase A part of the study, all existing structures are assumed to have solid bottoms incapable of having the inverts lowered. Some existing structures may be salvaged in their existing form as overflow structures with new structures placed adjacently to increase capacity. The structural integrity of the older structures is unknown and may further dictate that existing structures be replaced. Due to this uncertainty, where increased road crossing capacity is required, it is assumed that all existing structures will be completely replaced. Most of the roads in the study area will become major collector or arterial roads in the future and the 100-year capacity is required.

Based on the cost estimates prepared for the alternatives and the comments received throughout the coordination meetings with the project sponsors, a plan for each reach is recommended for preliminary design. This recommended plan is meant to serve as a guideline to the project sponsors in choosing alternatives for preliminary design. Alternatives chosen for preliminary design will be designed in the subsequent portion of this study. Results of this study will be presented in a preliminary design report that will include more specific cost estimates, analysis of the hydrology and hydraulics of the proposed structures, and phasing of implementation.

Flood detention, water quality improvement, grade control for longitudinal slope stabilization, provision of a defined flow path, and increased roadway capacity are the key structural elements in the recommended plan. Key non-structural elements of the recommended plan are preserving right-of-way for flood-carrying capacity, wildlife corridors, and future trails in the watershed.

5.11 Detention Alternatives

Detention alternatives were evaluated for the hydrologic effectiveness of reducing future flows to existing conditions during various storm frequencies. Further analysis explored the preliminary design issues associated with each detention alternative.

Main Stem of *Third Creek*

Alternatives for detention on the main stem focused on the O'Brian Canal facility recommended in the 1990 master plan (Reference 1). The main objective of detention is to reduce future flows to existing conditions and thus reduce downstream channel and crossing costs. Analysis using UDSWMM indicated that significant reduction of 100-year flows would require a volume of approximately 600 acre-ft. The effectiveness of additional detention is limited by the existing 342 acre-ft facility located immediately upstream at 120th Avenue. Ponds in series are less efficient because the stored water is passed to the downstream pond which must store the runoff again.

Practical alternatives for detention at the O'Brian Canal site focused on reducing the future 5-year flows to a 2-year level. Analysis of the UDSWMM model indicated that a 300 acre-ft facility would be required. The presence of shallow groundwater limited the depth of the detention basin to approximately four feet. Excavation would encompass of an area of approximately 75 acres and require the removal of over one million cubic yards of fill from the eastern portion of the site. Based on these limitations, the O'Brian Canal detention site was eliminated from further consideration. Alternative sites on the main stem of *Third Creek* would encounter similar issues due to the placement of ponds in series.

Tributary Detention

Hydrologic analysis presented in the previous chapter indicated that detention options on Tributaries 3306, 3309 and Grass Valley Gulch presented the most effective options for reducing future peak flows on the main stem of *Third Creek*. Preliminary plans for 103 acre-ft of detention were recently presented (Reference 24) as part of a residential development in the vicinity of 104th Avenue and Tower Road. The improvements would divert flows from the upstream half of Trib 3306 into a detention facility located on the west side of E-470. This pond will provide regional detention for a large portion of the Trib 3306 watershed. An alternative for additional detention was therefore not considered on Trib 3306.

Evaluation of the remaining detention alternatives on Tributaries 3309 and Grass Valley Gulch focused on comparing cost and benefits to downstream crossings and channel improvements with construction of the facilities. The future conditions SWMM model was used to determine the ideal detention volume. A preliminary design was then conducted to estimate excavation volumes and material quantities. Design of

both sites took advantage of existing road embankments and land features to form a detention basin and minimize cost. An outlet and emergency overflow structure was included in both designs.

The construction cost of both detention alternatives were compared to the cost savings of smaller downstream improvement structures due to reduced flows. Improvements including trapezoidal grass-lined channels and crossing structures sized for various storm frequencies under four hydrology scenarios: (1) no additional detention; (2) Trib 3309 detention; (3) Grass Valley Gulch detention; and (4) detention on both Trib 3309 and Grass Valley Gulch. For the 100-year estimate, a 10-year channel was used since the 100-year capacity channel was considered unnecessary and impractical for the main stem of *Third Creek*. Table V-4 shows the results of the cost analysis.

Table V-4
Channel and Crossing Improvement Cost Estimates for Reach 1-5

	0.4in Storm	2-year	5-year	10-year	100-year
No Detention	$6,167,767	$10,341,123	$14,726,653	$21,000,416	$28,704,804
Tributary 3309 Detention	$5,711,603	$10,492,487	$15,217,542	$18,443,547	$23,088,383
Savings	**$456,164**	**-$151,365**	**-$490,889**	**$2,556,869**	**$5,616,420**
Grass Valley Gulch Detention	$6,807,109	$10,277,448	$12,738,999	$18,364,754	$22,184,051
(GVG) **Savings**	**-$639,342**	**$63,675**	**$1,987,654**	**$2,635,662**	**$6,520,753**
Trib 3309 & GVG Detention	$6,544,623	$9,973,675	$11,691,532	$14,616,816	$16,388,559
Savings	**-$376,856**	**$367,448**	**$3,035,122**	**$6,383,600**	**$12,316,244**

* 100-Year cost estimates include channels sized for 10-year frequency (100-Year Channels not considered necessary)

As seen from the table, detention on Grass Valley Gulch offers the greatest single option savings for downstream improvement structures. Savings for channels and crossings due to detention on both tributaries are minimal for the more frequent storms but significant when considering larger storm events.

Existing and planned detention on DIA is focused on maintaining the outflows to Lower *Third Creek* at existing levels. Future flows from Grass Valley Gulch will overwhelm Pond T-239, located downstream on DIA, and result in the release of excess flows at the property line with Adams County. The DIA design hydrology does not account for future flow increases from areas outside of DIA such as Grass Valley Gulch. While Detention on Grass Valley Gulch is not readily justified based cost savings for lower *Third Creek* improvements, the need to maintain the design hydrology for DIA is vital.

Recommended Detention

Based on cost estimates the detention alternative on Tributary 3309 and Grass Valley Gulch are justified due to savings in downstream improvement structures sized for 100-year storms flows. The combination of both detention facilities will reduce future flows to approximately existing condition levels.

5.12 Channel and Crossing Improvements

The following sections present improvements based on implementation of regional detention facilities on Tributary 3309 and Grass Valley Gulch. All improvements were sized to accommodate the improved hydrology. Crossing structures, with the exception of ditch crossings, were sized to accommodate a future pedestrian trail system along *Third Creek* with minimum height of eight feet (ten feet preferred). Ditch crossings were sized with more shallow structures (five foot RCP or box culverts) to reduce the depth of channel lowering. In addition, a concrete weir and riprap overflow apron were designed to convey 100-year flows over the downstream bank of the ditch crossings (see Appendix D). Right-of-way cost was included in all channel estimates for comparison purposes; actual cost will be determined at the time of development. Improved channels consist of a composite design based on UDFCD criteria (Reference 8). Channels include a low flow channel with riprap toe protection within a larger trapezoidal grass-lined channel capable of conveying the design flow. Unimproved over-banks convey the residual 100-year flow. The channel maintains the existing slope of approximately 0.4% for the *Third Creek* main stem. Since peak flows are relatively consistent, channel size and characteristics are similar for all reaches to those shown in Table V-5.

Table V-5
Third Creek Channel Design Characteristics

	0.4in Storm	2-year	5-year	10-year	100-year
Master Plan Flows	200	525	797	1,269	3578
Bottomwidth (ft)	0	6	20	45	167
Topwidth (ft)	27	42	55	79	200
Velocity (fps)	4.4	5	4.9	4.8	4.6
Depth (ft)	3.4	4.4	4.3	4.3	4.2

Reach 1 *Third Creek* (Figure 5-1)

This is the lower reach of *Third Creek* covering approximately 5700 feet from the *South Platte River* to Old Brighton Road. Adding a lowered conveyance channel in this reach is necessary due to the crossings of the three upstream irrigation ditches. The minimum capacity sizing of the channel was matched to the capacity of the upstream ditch crossing structures. Although several structures are located in the floodplain, for the most part the floodplain has been preserved. The need to reduce the 100-year floodplain by constructing a 100-year channel was not considered necessary due to the desire to preserve a floodplain corridor along *Third Creek*. All channel and crossing designs assume that the channel bottom for *Third Creek* will be lowered to accommodate increased capacities and a future trail system. Table V-6 summarizes the cost estimates for the various design capacities in Reach 1.

Table V-6
Third Creek Channel and Crossing Cost Estimate
Reach 1

	0.4in Storm	2-year	5-year	10-year	100-year
Channel Cost	$1,153,126	$1,715,941	$1,958,896	$2,458,985	$3,516,089
Crossing Cost	$23,022	$70,529	$110,165	$158,800	$340,391
35%	$411,652	$625,264	$724,171	$916,225	$1,349,768
Total Cost	**$1,587,800**	**$2,411,734**	**$2,793,232**	**$3,534,010**	**$5,206,248**

As seen from the table, the cost of improvements sized for the various storm frequencies increase steadily. Crossing structures considered for Old Brighton Road include a 60" RCP for the 0.4 in storm, 8x8 CBC for the 2-year, 6x10 CBC for the 5-year, 10x10 CBC for the 10-year, and a twin 10x16 CBC for 100-year capacity. A flume or buried culvert will be needed to cross the McCann Ditch over the proposed trapezoidal

grass-lined channel. Two channel alignments were considered to either route flows into the future Bromley water storage facility or detour around to an outfall at the South Platte. A channel alignment that routes frequent flows around the facilities was favored in order to avoid water quality issues. Water quality improvement for *Third Creek* runoff is best achieved through on-site or regional water quality basins and stream stabilization. No improvements are recommended for Tributary 3301 since the Bromley water storage facilities are planned in that location.

Reach 2 *Third Creek* (Figure 5-2)
Reach 2 consists of approximately 8200 feet of channel between Old Brighton Road and the Fulton Ditch. Existing crossing structures at 144th Avenue, the Union Pacific Railroad, 136th Avenue, and the Fulton Ditch are all undersized for all but the most frequent flows. The existing triple culvert crossing at US-85 has a 10-year capacity of 920 cfs. As with Reach 1, the channel and crossing design assumes that the invert of *Third Creek* will be lowered. Table V-7 summarizes the channel and crossing improvements cost estimates for the various storm frequencies.

Table V-7
Third Creek Channel and Crossing Cost Estimate
Reach 2

	0.4in Storm	2-year	5-year	10-year	100-year
Channel Cost	$1,450,207	$2,192,948	$2,541,733	$3,248,756	$5,297,444
Crossing Cost	$81,600	$291,045	$426,915	$745,747	$1,926,907
35%	$536,133	$869,398	$1,039,027	$1,398,076	$2,528,523
Total Cost	**$2,067,940**	**$3,353,391**	**$4,007,675**	**$5,392,578**	**$9,752,874**

The Fulton Ditch crossing structure is limited in height to five feet. A triple 5x16 CBC would convey a 5-year storm. The channel should match the crossing and the downstream channel tie-in to Reach 1 with a 5-year capacity. An additional twin 10x10 CBC at US-85 would increase the capacity to the 100-year storm. Due to the close proximity of the Union Pacific Railroad, a twin 10x18 CBC should be added to match the 100-year capacity of US-85. A 100-year crossing at both locations would eliminate the potential for considerable ponding upstream of the Union Pacific Railroad during major floods.

Reach 3 *Third Creek* (Figure 5-3)
Reach 3 consists of 10,910 feet of channel from the Fulton Ditch to I-76 and the Burlington Northern Railroad crossings. *Third Creek* channel was relocated and improved upstream of Sable Road during the construction of E-470. The relocated channel is trapezoidal grass-lined with riprap toe protection and has an approximate capacity for the 5-year storm (669 cfs). Therefore the downstream channel improvement should match this channel and the channel recommended for Reach 2. Crossings include 132nd Avenue and Sable Boulevard which will be improved to collector or arterial roads with future development. A single 10x10 CBC would need to be added to these locations to increase the capacity to a 10-year flow. The 100-year capacity crossing would require a twin 10x16 CBC. Tributary 3303 and Tributary 3304 will convey 100-year future flows of 226 cfs and 315 cfs respectively. Since both tributaries collect runoff from more than 160 acres, an open channel with 100-year conveyance is recommended by UDFCD criteria. Table VI-8 summarizes the channel and crossing improvements cost estimates for the various storm frequencies.

Table V-8
Third Creek Channel and Crossing Cost Estimate
Reach 3

	0.4in Storm	2-year	5-year	10-year	100-year
Channel Cost	$957,890	$1,677,381	$1,873,475	$2,288,894	$4,326,178
Crossing Cost	$40,800	$70,529	$110,165	$158,800	$340,391
35%	$349,541	$611,769	$694,274	$856,693	$1,633,299
Total Cost	**$1,348,231**	**$2,359,679**	**$2,677,914**	**$3,304,387**	**$6,299,868**

The recommended plan will continue the 5-year capacity trapezoidal grass-lined channel from Reach 2 and add 100-year capacity crossing improvements at the major road arterials.

Reach 4 *Third Creek* (Figure 5-4)
Reach 4 consists of 11,800 feet of channel that was relocated and improved during the construction of E-470. A regional detention facility was proposed in the 1990 master plan (Reference 1) for the upstream bank of the O'Brian Canal. Evaluation of this alternative revealed the diminished effectiveness of adding new detention in series with the 120th Avenue facility located immediately upstream. In addition, shallow groundwater and the invert from the 120th Avenue culverts limited the depth and feasibility of the proposed detention pond.

The crossings at I-76, the Burlington Northern Railroad, E-470 off ramp, and 120th Avenue are adequate for the 100-year future conditions flow. Both the Burlington Ditch and the O'Brian Canal have little or no conveyance capacity for *Third Creek* flows other than overtopping. Existing low flows are intercepted by the O'Brian Canal via a 6 x 12 CBC inlet structure that routes 200 cfs of water rights from *Third Creek* to the canal. Due to the need to preserve the channel inverts, the ditch crossings were limited to box culverts of four to five feet in height. Alternatives include 4x6 CBC for the 0.4-inch storm, twin 4x8 CBC for the 2-year, twin 5x10 CBC for the 5-year, twin 5x12 CBC for the 10-year, and (9) 5x12 for 100-year storm flows. A 100-year overflow weir and riprap apron was designed to convey major flows past the Burlington Ditch and O'Brian Canal.

The existing road crossings are a 24" CMP at Buckley Road and 6' high, 38' span bridge at Tower Road. Options for crossing structures at Buckley Road include an 10x10 CBC for 10-year and twin 10x14 CBC for the 100-year storm. The Tower Road bridge is adequate for 10-year flow and would require an additional 10x16 CBC for a 100-year capacity.

Since the proposed culvert crossing under the O'Brian Canal exits at least five feet below the existing grade, several channel alternatives were considered to match grade downstream. One option consists of a 5-year open channel at a 0.3% slope that would match existing grade 4750 feet downstream. The second alternative considered was a wetland channel with a .07% grade that would require only 1300 feet of length to match existing grade downstream. Cost estimates for all channel types are shown in Table V-9.

Table V-9
Third Creek Channel and Crossing Cost Estimate
Reach 4

	0.4in Storm	2-year	5-year	5-Yr Wetland*	10-year	100-year
Channel Cost	$888,778	$1,341,083	$1,664,611	$3,438,154	$1,911,435	$3,842,222
Crossing Cost	$574,505	$202,576	$281,389	$281,389	$546,889	$1,049,660
35%	$512,149	$540,281	$681,100	$1,301,840	$860,413	$1,712,159
Total Cost	**$1,975,431**	**$2,083,940**	**$2,627,101**	**$5,021,383**	**$3,318,738**	**$6,604,041**

The recommended plan includes the 5-year wetland channel, 5-year ditch crossings with weir and riprap overflow structures, and 100-year crossings for the major road arterials.

Reach 4 Buffalo Run and Tributary 3306 to *Third Creek* (Figure 5-4)
Tributaries 3306 and Buffalo Run (3305.5) are located on the east side of E-470 in Reach 4. Recent development in the Buffalo Run Tributary include major channels and crossing structures in the lower drainage on either side of 120th Avenue and a regional detention facility at the O'Brian Canal. The golf course extends upstream for most of the drainage, and future development will match downstream structures with channels and crossings. No additional improvements are recommended for Buffalo Run.

In Tributary 3306, preliminary plans for a major channel and detention facility downstream of 112th Avenue will divert flows upstream of 112th Avenue to an existing 8x8 CBC under E-470 (Reference 24). No additional improvements are recommended for the upstream portion of the drainage. Downstream of 112th Avenue, the Buckley Crossing development is currently under design. The preliminary drainage plan includes a combination of storm sewer and curb/gutter conveyance of flows to the 8x8 CBC at E-470. These plans supercede the open channel conveyances labeled T-58 and T-60 in the 1990 drainage master plan (reference 1). Therefore no additional improvements are recommended. The existing 8x8 CBC at the confluence of Tributary 3306 and E-470 and has sufficient capacity to pass 100-year future flows of 563 cfs.

Reach 5 *Third Creek* (Figure 5-5)
The upper portion of *Third Creek* in this study consists of 17,150 feet of natural channel in Reach 5. The majority of the channel is highly meandering with occasional sections of deep incision. In place of extensive channel improvements, the maintenance of the existing floodplain with selected road crossing improvements is recommended. Existing road crossings include 112th Avenue and Quency Street (formerly Picadilly Road). Although Himalaya Street currently ends at 112th Avenue, a future crossing extending north was assumed for future development. The Quency Street crossing represents the outlet to Pond T-239 in DIA and will not require additional capacity to accommodate master plan flows. The 112th Avenue crossing will require twin 10x12 CBC to convey 100-year master plan flows.

Reach 5 Tributary 3308 to *Third Creek* (Figure 5-5)
Tributary 3308 conveys flow from the twin 8x6 CBC just south of 112th Avenue at E-470 to *Third Creek*. Under recent preliminary plans (reference 24), the flows originate from upper Tributary 3306 and are released from a detention facility via culverts to the east side of E-470 and into Tributary 3308. The existing channel and crossing at 112th Avenue has sufficient capacity to convey detained 100-year flows under 112th Avenue to *Third Creek*. The only additional improvement recommended is an on-site or regional water quality facility.

Reach 5 Tributary 3309 to *Third Creek* (Figure 5-5)
Tributary 3309 to *Third Creek* is approximately 10,900 feet long and joins *Third Creek* just north of 112th Avenue. As with all tributaries to Third Creek, improvements were considered for 100-year future flows only. Flows steadily increase along the drainage from 405 cfs to 1730 cfs. Design for a trapezoidal grass-lined channel was therefore split into two segments: the channel upstream of 104th Avenue was sized for 412 cfs flows and the downstream channel was sized for 1726 cfs. A 171 acre-ft regional detention facility is proposed for the southeast corner of 112th Avenue and Himalaya Street. Drop structures were included in the design to maintain a channel slope of approximately 0.5%.

Grass Valley Gulch (DIA) (Figure 5-5)
Grass Valley Gulch consists of 6963 feet of channel that drains subwatersheds immediately west of the DIA property line to a confluence with *Third Creek* on DIA. The proposed channel will divert flows to combine with Third Creek downstream of DIA. As discussed previously, approximately 230 acre-ft of detention is required on Grass Valley Gulch to reduce future flows to existing levels. A single detention facility or equivalent on-site detention is recommended. As with other tributaries to *Third Creek*, channel and road crossing improvements focused on 100-year capacity improvements. There is no natural floodplain and a residual floodplain will be very wide. The recommended improvements are for a 100-year capacity channel with a twin 8x12 CBC crossing at 96th Avenue. At least five check or drop structures will be required to reduce the runoff velocity to an acceptable rate.

6 PRELIMINARY DESIGN

6.1 Introduction

The preliminary design improvements are based on the Selected Plan provided by the project sponsors. Previously, the Alternatives Development and Evaluation Report (reference 28) presented various alternatives and narrowed improvements down to a recommended plan. Project sponsors then refined the recommended plan into the final Selected Plan which is presented in this section. The preliminary design for improvements represents a more detailed analysis of design structures and cost estimate. A copy of the sponsor's Selected Plan has been provided in Appendix B. An overview of the Selected Plan is shown in Figure VI-1.

6.2 Master Plan Hydrology

Master Plan hydrology reflects anticipated future (fully-developed) impervious conditions. It is assumed that the detention facilities on DIA will be constructed per the full-build hydrology model (see schematic and SWMM model in Appendix A). It should be noted that a correction in the detention modeling on Grass Valley Gulch as presented in the Alternatives Development and Evaluation report resulted in a thirty three percent increase in the master plan hydrology flows for major storms. However the corrected flows still accomplish the goal of reducing future flows to approximately existing conditions levels. Table VI-1 is a comparison of flow rates for the existing, future and master plan hydrology.

Table VI-1: Summary of 100-Year Peak Flows (cfs)

Third Creek at South Platte Outfall

Hydrology Model	100-Year	10-Year	5-Year	2-Year
Existing	3358	341	223	48
Future Unimproved	5359	1874	1349	688
Master Plan	3578	1269	797	525

The final master plan improvements and hydrology models were developed by analyzing the final Selected Plan. As seen from the table, the master plan model including upstream detention greatly reduces the future conditions flows to approximately existing conditions rates for major storms. However the more frequent storms will increase dramatically despite master plan improvements. Proposed detention facilities were analyzed in more detail and included in the master plan hydrology models.

6.3 Public Meeting

A public meeting was held on March 31, 2005 at the Adams County Fairgrounds. The purpose of the meeting was to present master plan improvements to the public and collect comments and concerns regarding flooding issues. Most people in attendance were residents or business owners from the lower portion of the *Third Creek* Watershed. Most of the issues raised by those in attendance concerned specific and localized drainage problems. The project sponsors agreed to add interim improvements and maintenance to the master plan improvement recommendations. The interim recommendations concur with a previous study (reference 21).

6.4 Preliminary Design

Plan and profile sheets for the preliminary design of the master plan improvements are presented in Appendix D. Sheet 1 is an index map that allows for quick location of specific master plan drainage improvements. Drainageway improvements have been designed to fit their locations and anticipated peak flow rates according to the master plan hydrology model. Specific description and detailed cost estimates for each improvement are provided on the commentary page opposite each plan and profile sheet.

As part of creating additional conveyance capacity and separating storm runoff from ditch flow, the 1990 master plan called for lowering the existing channel by an average of 8' downstream of the O'Brian Canal. Lowering the channel will also be required as part of this updated study in order to construct low-flow crossings of the three irrigation canals. In general the existing invert will be lowered by 4 to 5 feet to accommodate a 5-year capacity grass-lined channel. The channel will provide a defined conveyance for frequent storm runoff and alleviate many of the existing flooding problems in the lower reach of Third Creek. Crossings of Third Creek at major road arterials were sized to pass the 100-year master plan flow and accommodate a 10' high clearance for a future trail system. In many cases, the elevation of the existing road grade will need to be increased significantly to achieve the necessary clearance.

Flood detention, water quality improvement, grade control for longitudinal slope stabilization, provision of a defined flow path, and increased roadway capacity are the key structural elements in the master plan. Key non-structural elements of the master plan are preserving right-of-way for flood-carrying capacity, wildlife corridors, and future trails in the watershed. The total cost, including land value, is estimated at $47.0 million for the improvements in all of the reaches.

The following section includes a description of the improvement structures and associated cost estimates for the master plan components in the watershed. Total project costs will include five percent of the structure cost for utility re-location, and 35 percent of the structure cost and utility relocation for administration, engineering and contingencies.

Detention and Water Quality

The key improvements to the Third Creek watershed involve two detention facilities on Tributary 3309 and Grass Valley Gulch. The facilities were designed to reduce major storm flows on the mainstem of Third Creek to approximately existing condition rates. The sizes of the facilities were optimized by trial and error in the SWMM model. Since both detention facilities would drain a tributary area greater than one square mine, water quality enhancement was not included in the facilities per UDFCD criteria. Multiple water quality storage facilities are recommended at locations upstream of the facilities and sized per Table V-3 to cover all the subwatersheds in the tributaries. Water quality storage volumes total 22.88 acre-feet for Tributary 3309 and 29.27 acre-feet for 3313 (Grass Valley Gulch). Volumes and general locations for water quality storage on the smaller tributaries are also noted on the improvement plans.

Tributary 3309. The location of the 171 acre-foot facility on Tributary 3309 was chosen near the confluence with Third Creek to maximize the volume of runoff collected. The cross streets of 112th Avenue and Himalaya Street are to be used as the embankment of the facility. The basin was designed to exclude the existing FHAD floodplain on the north. The outlet structure includes a 42" RCP outlet pipe and emergency

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THIRD CREEK D/S OF DIA
OUTFALL SYSTEMS PLANNING STUDY UPDATE

SELECTED PLAN

FIGURE 6-1

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overflow structure. A 24 acre-foot extended detention basin was designed near the outlet to provide water quality improvement.

Grass Valley Gulch. The detention facility designed for Grass Valley Gulch is similar to that of Tributary 3309. The location of the 230 acre-foot facility was chosen to take advantage of 104th Avenue and Quency Street as embankment. The outlet structure includes a 42" RCP outlet pipe and emergency overflow structure. A 29.27 acre-feet of water quality storage is recommended at multiple facilities upstream of the detention.

CHANNEL IMPROVEMENT

Due to the many obstacles to drainage in the watershed the mainstem of *Third Creek* is often poorly defined in the lower reach. Currently, most of the frequent flows are diverted by the irrigation canals that intersect Third Creek. Increased runoff associated with future development will exceed the capacities of the current system and result in roadway overtopping and bank failures. While the regional detention facilities will mitigate the increased flows during major storms, channel improvement was designed in the lower reach to address the increased flows during frequent storm events.

Much of the mainstem channel of *Third Creek* along E-470 was relocated and improved during recent construction. The improved channel is grass lined with the approximate capacity of the 5-year master plan flow. The recommended improvements for this study continue the five-year capacity channel downstream of E-470 to the South Platte outfall. Segments of wetland channel are currently being designed for the O'Brian Canal Crossing and the Ready Mixed property (future City of Brighton water storage facilities). The typical design includes 4:1 side slopes, a maximum depth of 5 feet and a maximum velocity of 7 feet per second. The channel was modeled after the composite design; the main channel has a 5-year capacity while overbanks will remain unimproved and convey the residual 100-year floodplain. The proposed channel matches the existing channel slope of 0.4% for the entire length.

The selected plan also included channel improvements for tributaries where the contributing area exceeds 160 acres (major drainageway). Channel improvements were designed for two short tributaries, 3303 and 3304, as well as longer tributaries 3306 and Grass Valley Gulch. All tributary channel improvements were trapezoidal grass-lined channels sized to convey 100-year flows under master plan conditions. Numerous check structures were required to maintain a stable channel slope as determined from Urban Drainage criteria.

THIRD CREEK IRRIGATION CROSSINGS

All canal and ditch crossings, including McCann Ditch, Fulton Ditch and Burlington Ditch, and O'Brian Canal, have been designed with 5-year conveyance capacities. Larger flows will overtop and enter the canal. A separation structure was included in the design to limit the canal flow to that defined by each canal company. Larger flows will be forced over the downstream embankment through a controlled armored weir section. Typical details are shown on sheets 17 to 19 in Appendix D.

6.5 Cost Estimates

Cost estimates were prepared by sizing the master plan improvements using criteria presented in the Urban Storm Drainage Criteria Manual (UDFCD, 2001). Cost estimates were developed for all structural improvements by estimating the quantity and installation cost of required materials and applying unit costs as presented in Table VI-2. Unit costs have been updated to reflect the most current available published values.

Table VI-2: Unit Costs

CBC	Cost/LF	cfs	CBC	Cost/LF	cfs
Single 4x5	$700	200	Twin 8x6	$2,152	1168
Single 4x6	$812	225	Twin 8x8	$2,853	1468
Single 4x8	$1,036	250	Twin 8x10	$3,613	1768
Twin 4x4	$1,146	400	Twin 8x12	$4,013	2068
Twin 4x5	$1,210	425	Twin 8x14	$4,959	2368
Twin 4x6	$1,373	450	Twin 8x16	$5,274	2668
Single 5x5	$762	250	Twin 8x18	$5,790	2968
Single 5x6	$870	280	Twin 8x20	$6,205	3270
Single 5x7	$927	310	Triple 8x8	$3,950	2202
Single 5x8	$1,035	340	Triple 8x10	$4,664	2652
Twin 5x5	$1,224	500	Triple 8x12	$5,171	3102
Twin 5x6	$1,289	560	Triple 8x14	$5,214	3552
Twin 5x7	$1,504	620	Triple 8x16	$6,588	4002
Twin 5x8	$1,719	680	Triple 8x18	$7,111	4452
Twin 5x10	$1,979	720	Triple 8x20	$8,635	4905
Triple 5x6	$3,044	840	Single 10x10	$3,133	1243
Triple 5x7	$3,301	930	Single 10x12	$3,669	1437
Triple 5x8	$3,459	1020	Single 10x14	$4,218	1631
Single 6x8	$1,477	434	Single 10x16	$4,413	1825
Single 6x10	$1,821	567	Single 10x18	$4,888	2019
Single 6x12	$2,112	700	Single 10x20	$5,598	2213
Twin 6x8	$1,953	868	Twin 10x10	$4,698	2446
Twin 6x10	$2,336	1134	Twin 10x12	$5,129	2926
Twin 6x12	$3,195	1400	Twin 10x14	$6,015	3406
Triple 6x8	$4,000	1302	Twin 10x16	$7,009	3887
Triple 6x10	$4,418	1701	Twin 10x18	$8,376	4366
Triple 6x12	$4,805	2100	Twin 10x20	$9,113	4847
Single 8x8	$1,643	734	Triple 10x10	$7,777	3758
Single 8x10	$2,015	884	Triple 10x12	$8,676	3071
Single 8x12	$2,521	1034	Triple 10x14	$9,499	4617
Single 8x14	$2,659	1184	Triple 10x16	$11,046	5475
Single 8x16	$2,867	1334	Triple 10x18	$13,667	6334
Single 8x18	$3,224	1484	Triple 10x20	$14,943	7192
Single 8x20	$3,582	1635			

Size	Cost/L.F.	cfs @ .4%
42"	$130	64
48"	$140	91
54"	$150	124
60"	$170	165
66"	$180	212
72"	$190	268

Other Material Costs

Item	Cost	Unit
Outlet Structure	$30,000	Each
Trickle Channel	$45	L.F.
Excavation	$10	CY
4'High Berm	$20	LF
Right-of-Way	$1	Sq. Ft.
Riprap	$55	CY
WQ Basin	$25,000	Ac-Ft
8' Rec. Trail	$25	L.F.
Ditch Separation Structure =		$50,000
*Yearly Channel -		
Maintenance Cost	$0.90	L.F.

*5 times a year, $100/acre mowing, $0.05 LF debris clearing, assumes 55- foot wide channel

Note: costs to not include utility relocation, engineering and contingencies.

Unit costs of each element were developed from the 2002 Colorado Department of Transportation Cost Data (CDOT, 2003) and from the Urban Drainage Bid Tabulation program and data (reference 27). Drainage improvement costs include channels, culverts, detention facilities, water quality basins, and stream stabilization. Right-of-way acquisition costs were determined separately. In addition to cost estimates for construction activities, 5% has been added to account for utility relocation, and 35% has been added to account for administration, contingencies, legal review and engineering. These additional costs apply to the drainage improvement costs, but were not applied to the right-of-way acquisition costs.

Details of the detention facility and water quality basin cost estimates are provided in Appendix D. The surface area for each facility was determined from the project mapping. Clear and grub, excavation, topsoil, and seed and mulch were estimated based on the required disturbed area. Low flow channel lengths were measured for each facility and specific outlet structure sizes were determined to achieve desired release rates. Riprap quantities were applied to each facility for erosion protection. Utility relocation, administration, contingencies, and engineering, and right-of-way were also added to the construction subtotals to arrive at the total estimated cost for the detention facilities. Water quality basin costs were estimated in a similar manner. However, rather than utilizing the project mapping for each specific location, an average depth of 3 feet was used to determine surface area.

The total cost estimate for all preliminary design improvements is $51.8 million. Right-of-way land value is $8.3 million, channel improvement is $10.5 million, and crossing improvements total $7.0 million. The largest single expense is associated with excavation of two regional detention facilities on Tributary 3309 and Grass Valley Gulch which total $11.4 million and $10.4 million respectively. Individual reach cost estimates are shown in Table ES-1 and detailed costs of each improvement is found on the commentary sheets of Appendix D.

6.6 Implementation

The list of recommended alternatives was compiled using cost estimates and determining an acceptable frequency level of protection. Acquiring right-of-way along the major drainageways is important for preserving the flood-carrying capacity of the floodplain and preventing damage to future building assets. The right-of way will also provide a trail system for recreational use and channel maintenance. Funding for land acquisition and structural improvements may be staged over several years or incorporated into local regulatory requirements. In the areas that have already developed, the sponsors will need to provide funding for construction of the selected improvements. In the areas that have not yet developed, criteria have been established that will require implementation during future development as it occurs.

Since a majority of the watershed is currently undeveloped, most of the specific master plan improvements can be implemented as the areas around the proposed structures are developed. Proposed detention and water quality basins need to be implemented as the upstream areas develop. Grade control structures, particularly on the tributaries, can be implemented as development occurs along a particular section of channel. The channel to the *South Platte River* should be constructed prior to road crossing improvements and low-flow crossings to the irrigation canals.

The difficulty in this watershed is that development is occurring from upstream to downstream. Generally, the improvements need to be constructed from downstream to upstream. The canal crossing at the Fulton and Fulton Ditch should only be installed after the 5-year channel is in place downstream in order to maintain the proper channel grade downstream. Due to recent channel lowering and improvement associated with E-470 construction, the crossings at the Burlington Ditch and O'Brian Canal can be lowered prior to channel improvements further downstream and maintain sufficient grade to match the existing channel.

A large part of the master plan requires enlarging road crossings to 100-year capacity. This is a significant expense. Enlarging road crossings can be staged to parallel development. Most of the master plan road crossings require multiple box culverts. To spread the cost of implementation, the boxes may be installed piecemeal. For example on a three-barrel box culvert, one box may be installed now, while the other two boxes would be delayed until future development occurs.

Interim improvements to existing drainage problems in the lower reach of *Third Creek* should also be addressed. Table VI-3 shows a summary of recommendations from the Interim Implementation Plan published by Urban Drainage in 2000 (reference 21).

Table VI-3: Summary of 2000 *Interim Implementation Plan
Lower Third Creek

Location	Existing Condition	Recommendation
Old Brighton Road	72", 24" CMP (silted)	100-Yr Bridge
144th Ave	72" CMP (silted)	Clean Existing, Add (2) 72" CMP
US 85		None
UPRR	Shallow Bridge	None
136th Ave	30" CMP (Silted)	Clean Existing, Add 60" CMP
Fulton Ditch	36" CMP	None
132nd Avenue	60: CMP (silted)	Clean Existing, Add 60" CMP
Sable Road	27" RCP	100-Yr Bridge
Buckley Road	24" CMP (silted)	Replace with 36" culvert
O'Brian Canal	No existing crossing	Install 36" culvert

*(Reference 21)

As seen from VI-3, basic maintenance of the crossings is in need before the master plan improvements can be implemented. Most recommendations consist of maintenance and/or replacement of existing culvert crossings. Old Brighton Road and Sable Road should also be considered for temporary culvert improvement since the construction of a 100-year capacity bridge would not occur for several years. Since crossings such as Old Brighton Road are on the jurisdictional boundary between the City of Brighton and Adams County, the maintenance responsibility may be ambiguous. The ideal solution would be for local governments to secure drainage easements and establish the entire reach under the Urban Drainage and Flood Control District maintenance program. The easements would also facilitate the eventual implementation of the master plan channel improvements.

6.2 Conclusions

The pressing drainage issue in the lower *Third Creek* Watershed is the mitigation of increased flows due to future development. Maintaining flood magnitudes at existing levels, removing urban pollutants from the creek's waters, stabilizing the channel against more frequent flood flows, and providing an outfall to the *South Platte River* are the critical aspects of the recommended plan.

The preliminary design improvements will accomplish these goals with detention, water quality facilities, and channel improvements. In order to maximize the effectiveness of the recommendations, future developers should be encouraged to implement open space, minimizing directly connected impervious areas, grass-lined swales and the other best management practices as recommended in the USDCM Volume III.

The recommended detention facilities on Tributary 3309 and Grass Valley Gulch will reduce future flows to approximately existing levels. In general, a 5-year capacity channel was recommended along the main stem of *Third Creek* to control frequent runoff events and match recent improvements associated with the construction of E-470. The existing floodplain has been preserved for development; the need for costly improvement projects capable of reducing the floodplain was not warranted. However, the major arterial road crossings were sized for 100-year capacity for public safety and to avoid flood damages due to the potential for backwater upstream of the crossings. Improvements for the undeveloped tributaries to *Third Creek* presented a more practical use of 100-year capacity channels and crossings due to significantly lower flows and associated improvement costs.

A water storage facility is currently being designed by the City of Brighton for the location currently under use by Ready Mixed. A series of water storage cells will replace the areas after gravel mining operations have been discontinued. The wetland channel shown in the preliminary design reflects the current design as of the publication of this report. The channel will convey 2-year flows from Third Creek to the South Platte River outfall and allow 5-year flows to overflow into the water storage facility. This will ensure that the water quality of the storage cells are not adversely affected by Third Creek runoff during frequent storm events. The design also anticipates major flows from the South Platte River that will overflow individual water storage cells and the wetland channel.

Water quality was analyzed as a system throughout the watershed. Regional water quality basins are proposed at regional flood control facilities to capture pollutants from upstream areas. Downstream water quality basins are placed off line from the main channel of *Third Creek.* Small water quality basins placed at the tributary outfalls remove pollutants from all incoming areas. This allows water quality throughout the watershed to be enhanced rather than re-treating the entire watershed at the outfall. Grade control is another water quality feature. By limiting erosion in the channel, the sediments are reduced and water quality is improved.

Cooperation between the City of Brighton, Commerce City, Adams County, and UDFCD will be essential to implementing improvements. Cost sharing agreements should be examined to assure that upstream jurisdictions do not create future drainage problems downstream. Much of the cost can be deferred to developers through regulatory guidelines used to mitigate the drainage impacts of the developments.

Appendix A: Hydrologic Model Input and Output Files

CUHP and UDSWM Technical Appendices

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CUHP Input Values – Existing Conditions

Third Creek Alternatives Development and Evaluation

Kiowa Engineering Corporation

Subwatershed	Area (Sq. Miles)	Length (miles)	Centroid (miles)	Percent Imperviousness	Slope	Time of concetration	Depression Storage (Pervious)	Depression Storage (Impervious)	Initial Infiltration	Decay Rate Coef	Final Infiltration Rate
1	0.186	0.666	0.289	5	0.002	50.5	0.4	0.1	3.13	0.0018	0.508
2	0.122	0.857	0.206	42.4	0.006	45.2	0.4	0.1	3.53	0.0018	0.535
3	0.108	0.399	0.178	5	0.013	69.9	0.4	0.1	4	0.0018	0.567
4	0.11	0.388	0.149	71.3	0.009	31.4	0.4	0.1	3.91	0.0018	0.561
5	0.157	0.559	0.175	7.7	0.004	146.2	0.4	0.1	4.34	0.0018	0.589
6	0.184	0.686	0.346	16.5	0.004	167.3	0.4	0.1	3.67	0.0018	0.545
7	0.13	0.836	0.377	5	0.004	207.2	0.4	0.1	3.01	0.0018	0.501
8	0.131	0.818	0.35	5	0.005	178	0.4	0.1	4.27	0.0018	0.585
9	0.166	0.68	0.456	4.99	0.004	169	0.4	0.1	3.02	0.0018	0.501
10	0.131	0.738	0.465	7.2	0.004	187.5	0.4	0.1	3	0.0018	0.5
11	0.162	0.485	0.162	7.67	0.008	96	0.4	0.1	3.7	0.0015	0.655
12	0.139	0.527	0.266	9.46	0.007	105.6	0.4	0.1	3.19	0.0017	0.545
13	0.152	0.647	0.229	12.73	0.006	137.2	0.4	0.1	4.2	0.0017	0.61
14	0.149	0.545	0.157	5	0.004	141.7	0.4	0.1	4.2	0.0017	0.61
15	0.184	0.652	0.349	15.56	0.011	103.1	0.4	0.1	4.5	0.0018	0.602
16	0.163	1.254	0.286	5	0.005	261.5	0.4	0.1	4.46	0.0017	0.627
17	0.104	0.575	0.261	5	0.004	146.6	0.4	0.1	3.33	0.0017	0.546
18	0.17	1.021	0.53	5	0.005	129.8	0.4	0.1	4.5	0.0018	0.61
19	0.114	0.368	0.188	5	0.009	77.1	0.4	0.1	3.85	0.0018	0.566
20	0.241	0.442	0.292	5	0.005	111.4	0.4	0.1	4.35	0.0018	0.59
21	0.131	0.347	0.203	8.36	0.015	57.9	0.4	0.1	3.67	0.0018	0.545
22	0.117	0.686	0.407	5	0.004	170.7	0.4	0.1	3.12	0.0018	0.508
23	0.056	0.27	0.113	5	0.01	62.7	0.4	0.1	3.81	0.0018	0.554
24	0.061	0.307	0.123	5	0.01	67.5	0.4	0.1	4.5	0.0018	0.6
25	0.186	0.642	0.312	5	0.005	140.4	0.4	0.1	3.32	0.0018	0.522
26	0.221	0.585	0.278	5	0.007	118.4	0.4	0.1	4.09	0.0018	0.573
27	0.213	1.759	0.278	7	0.004	398.4	0.4	0.1	3.18	0.0018	0.516
28	0.159	0.657	0.34	5	0.003	173.2	0.4	0.1	3.4	0.0018	0.527
29	0.142	0.828	0.353	5	0.005	188.8	0.4	0.1	4.36	0.0018	0.591
30	0.137	0.761	0.332	5	0.001	293	0.4	0.1	4.44	0.0018	0.596
31	0.165	0.451	0.296	5	0.007	100.7	0.4	0.1	4.5	0.0018	0.6
32	0.143	0.577	0.341	9.67	0.008	73.8	0.4	0.1	4.5	0.0017	0.647
33	0.149	0.63	0.266	5	0.007	71.9	0.4	0.1	4.12	0.0018	0.575
34	0.146	0.199	0.353	4.99	0.009	54.4	0.4	0.1	4.49	0.0018	0.598
35	0.182	0.798	0.343	5	0.014	111.7	0.4	0.1	4.5	0.0018	0.6
36	0.116	0.588	0.258	8.42	0.014	86.7	0.4	0.1	4.5	0.0018	0.6
37	0.142	0.602	0.337	5	0.011	71.4	0.4	0.1	4.85	0.001	0.883
38	0.061	0.415	0.264	5	0.018	46.9	0.4	0.1	4.73	0.0013	0.782

Subwatershed	Area (Sq. Miles)	Length (miles)	Centroid (miles)	Percent Imperviousness	Slope	Time of concetration	Depression Storage (Pervious)	Depression Storage (Impervious)	Initial Infiltration	Decay Rate Coef	Final Infiltration Rate
39	0.095	0.275	0.233	5	0.023	47.6	0.4	0.1	4.92	0.0009	0.937
40	0.213	0.733	0.334	5	0.013	107.8	0.4	0.1	3.89	0.0017	0.602
41	0.108	0.643	0.208	6.8	0.015	90.7	0.4	0.1	4.73	0.0013	0.781
42	0.153	0.721	0.239	5.24	0.011	114.2	0.4	0.1	4.5	0.0018	0.6
43	0.161	0.673	0.319	11.3	0.017	55.5	0.4	0.1	4.69	0.0014	0.75
44	0.169	0.484	0.168	9.7	0.02	62.7	0.4	0.1	4.5	0.0018	0.6
45	0.082	0.386	0.037	13.7	0.004	106	0.4	0.1	4.6	0.0016	0.682
46	0.213	0.385	0.253	5.3	0.011	74.4	0.4	0.1	4.69	0.0014	0.755
47	0.161	0.561	0.268	5	0.017	79	0.4	0.1	4.56	0.0017	0.652
48	0.173	0.58	0.192	5	0.021	72.8	0.4	0.1	4.5	0.0018	0.6
49	0.189	1.01	0.404	5	0.008	169.2	0.4	0.1	4.14	0.0016	0.636
50	0.17	0.895	0.386	8.1	0.01	141.7	0.4	0.1	4.73	0.0011	0.833
51	0.131	1.08	0.464	5	0.025	107	0.4	0.1	4.72	0.0013	0.777
52	0.15	0.72	0.405	5	0.023	83	0.4	0.1	4.72	0.0013	0.777
53	0.089	0.807	0.323	6.06	0.019	98	0.4	0.1	4.58	0.0016	0.66
54	0.171	0.656	0.307	9.61	0.011	104.9	0.4	0.1	4.66	0.0014	0.729
55	0.078	1.28	0.312	5	0.009	195.3	0.4	0.1	4.57	0.0017	0.654
56	0.156	0.797	0.34	5	0.002	273	0.4	0.1	4	0.0018	0.58
57	0.062	0.369	0.125	5	0.008	80.3	0.4	0.1	4.66	0.0014	0.729
58	0.149	0.749	0.311	6.22	0.007	143.2	0.4	0.1	4.58	0.0016	0.663
59	0.089	0.585	0.151	6.71	0.015	86	0.4	0.1	4.5	0.0018	0.6
60	0.136	0.68	0.343	5	0.014	98.6	0.4	0.1	4.62	0.0015	0.695
61	0.075	0.318	0.135	4.99	0.015	57.4	0.4	0.1	4.49	0.0018	0.599
62	0.122	0.596	0.207	5	0.022	51.2	0.4	0.1	4.5	0.0018	0.599
63	0.185	0.596	0.207	5	0.014	68.9	0.4	0.1	4.5	0.0018	0.599
64	0.139	0.753	0.301	4.99	0.017	64.1	0.4	0.1	4.5	0.0018	0.6
65	0.187	0.702	0.381	5	0.021	84.1	0.4	0.1	4.5	0.0018	0.6
66	0.089	0.381	0.292	8.13	0.035	45.9	0.4	0.1	4.5	0.0018	0.6
67	0.082	0.596	0.211	15	0.018	78.2	0.4	0.1	4.42	0.0018	0.595
68	0.162	0.523	0.315	5	0.009	96.6	0.4	0.1	3.86	0.0018	0.557
69	0.102	1.02	0.355	5	0.007	183.8	0.4	0.1	3.73	0.0018	0.548
70	0.178	1.31	0.432	5	0.016	152.8	0.4	0.1	4.57	0.0016	0.66
71	0.206	0.746	0.35	5	0.008	138.1	0.4	0.1	4.66	0.0014	0.729
72	0.127	0.559	0.225	5	0.014	86.6	0.4	0.1	4.54	0.0017	0.633
73	0.175	0.519	0.192	5	0.024	64.5	0.4	0.1	4.49	0.0018	0.6
74	0.135	0.634	0.158	5	0.011	102.5	0.4	0.1	4.5	0.0018	0.6
75	0.16	0.612	0.424	5	0.02	77.3	0.4	0.1	4.5	0.0018	0.6
76	0.194	0.651	0.344	5	0.015	92.1	0.4	0.1	4.51	0.0018	0.605
77	0.212	0.411	0.212	5	0.011	76.8	0.4	0.1	4.52	0.0018	0.617
78	0.185	0.432	0.24	5	0.008	91.4	0.4	0.1	4.5	0.0018	0.6
79	0.074	0.822	0.25	5	0.01	131.1	0.4	0.1	4.46	0.0018	0.597
80	0.149	0.401	0.159	5	0.008	88.7	0.4	0.1	3.96	0.0018	0.564
81	0.165	0.428	0.218	5.22	0.021	60.1	0.4	0.1	4.5	0.0018	0.6

Subwatershed	Area (Sq. Miles)	Length (miles)	Centroid (miles)	Percent Imperviousness	Slope	Time of concetration	Depression Storage (Pervious)	Depression Storage (Impervious)	Initial Infiltration	Decay Rate Coef	Final Infiltration Rate
82	0.201	0.755	0.4	5	0.013	109.7	0.4	0.1	4.47	0.0018	0.598
83	0.141	0.585	0.228	5	0.008	110	0.4	0.1	4.5	0.0018	0.6
84	0.206	0.55	0.218	5	0.008	106.1	0.4	0.1	4.5	0.0018	0.6
85	0.201	0.923	0.4	5	0.009	148.4	0.4	0.1	4.13	0.0018	0.576
86	0.203	0.656	0.379	5	0.012	104.2	0.4	0.1	4.16	0.0018	0.577
87	0.169	0.573	0.247	5	0.02	73.9	0.4	0.1	4.5	0.0018	0.6
88	0.195	0.721	0.205	4.98	0.007	141.2	0.4	0.1	3.84	0.0018	0.555
89	0.113	0.5	0.124	5.03	0.008	102.8	0.4	0.1	4.21	0.0018	0.582
90	0.11	0.403	0.073	5	0.013	70.6	0.4	0.1	3.94	0.0018	0.563
91	0.201	0.672	0.382	5	0.01	109.1	0.4	0.1	3.74	0.0018	0.549
92	0.165	0.716	0.418	5	0.01	118.3	0.4	0.1	4.17	0.0018	0.578
93	0.113	0.74	0.393	5	0.011	117.8	0.4	0.1	4.05	0.0018	0.57
94	0.189	0.529	0.331	4.98	0.009	101.4	0.4	0.1	3.92	0.0018	0.56
95	0.14	0.749	0.343	5	0.006	149.5	0.4	0.1	3.15	0.0018	0.51
96	0.201	0.776	0.368	5	0.018	95.4	0.4	0.1	3.68	0.0018	0.546
97	0.123	1.05	0.422	5	0.01	156.4	0.4	0.1	3.81	0.0018	0.554
98	0.131	1.04	0.413	5	0.012	142.1	0.4	0.1	3.4	0.0018	0.527

CUHP Input Values – Future Conditions

Third Creek Alternatives Development and Evaluation
Kiowa Engineering Corporation

Subwatershed	Area (Sq. Miles)	Length (miles)	Centroid (miles)	Percent Imperviousness	Slope	Time of concetration	Depression Storage (Pervious)	Depression Storage (Impervious)	Initial Infiltration	Decay Rate Coef	Final Infiltration Rate
1	0.186	0.666	0.289	83.6	0.002	39.55	0.4	0.1	3.13	0.0018	0.508
2	0.122	0.857	0.206	22.2	0.006	45.14	0.4	0.1	3.53	0.0018	0.535
3	0.108	0.399	0.178	22.94	0.013	31.7	0.4	0.1	4	0.0018	0.567
4	0.11	0.388	0.149	41.89	0.009	31.37	0.4	0.1	3.91	0.0018	0.561
5	0.157	0.559	0.175	36.9	0.004	36.4	0.4	0.1	4.34	0.0018	0.589
6	0.184	0.686	0.346	6.01	0.004	170.3	0.4	0.1	3.67	0.0018	0.545
7	0.13	0.836	0.377	10	0.004	206.7	0.4	0.1	3.01	0.0018	0.501
8	0.131	0.818	0.35	5	0.005	177.6	0.4	0.1	4.27	0.0018	0.585
9	0.166	0.68	0.456	4.99	0.004	168.6	0.4	0.1	3.02	0.0018	0.501
10	0.131	0.738	0.465	5	0.004	187.1	0.4	0.1	3	0.0018	0.5
11	0.162	0.485	0.162	5	0.004	134.8	0.4	0.1	3.7	0.0015	0.655
12	0.139	0.527	0.266	8.47	0.007	104	0.4	0.1	3.19	0.0017	0.545
13	0.152	0.647	0.229	12.65	0.006	136.9	0.4	0.1	4.2	0.0017	0.61
14	0.149	0.545	0.157	10.51	0.004	139.2	0.4	0.1	4.5	0.0018	0.602
15	0.184	0.652	0.349	20.38	0.008	39.13	0.4	0.1	4.46	0.0017	0.627
16	0.163	1.254	0.286	8.1	0.005	255.3	0.4	0.1	3.33	0.0017	0.546
17	0.104	0.575	0.261	20.4	0.004	36.85	0.4	0.1	4.5	0.0018	0.61
18	0.17	1.02	0.53	54.98	0.005	49.95	0.4	0.1	3.85	0.0018	0.566
19	0.114	0.368	0.188	70.13	0.009	30.79	0.4	0.1	4.34	0.0018	0.589
20	0.241	0.442	0.292	47.29	0.005	32.98	0.4	0.1	4.35	0.0018	0.59
21	0.131	0.347	0.203	5	0.015	55.03	0.4	0.1	3.67	0.0018	0.545
22	0.117	0.686	0.407	5	0.004	168.7	0.4	0.1	3.12	0.0018	0.508
23	0.056	0.27	0.113	35.83	0.01	27.9	0.4	0.1	3.81	0.0018	0.554
24	0.061	0.307	0.123	5	0.01	67.38	0.4	0.1	4.5	0.0018	0.6
25	0.186	0.642	0.312	20.73	0.005	38.83	0.4	0.1	3.32	0.0018	0.522
26	0.221	0.585	0.278	31.3	0.007	37.17	0.4	0.1	4.09	0.0018	0.573
27	0.213	1.75	9.278	58.66	0.004	71.6	0.4	0.1	3.18	0.0018	0.516
28	0.159	0.657	0.34	12.38	0.003	158.5	0.4	0.1	3.4	0.0018	0.527
29	0.142	0.828	0.353	45	0.005	44.28	0.4	0.1	4.36	0.0018	0.591
30	0.137	0.761	0.332	31.91	0.001	42.31	0.4	0.1	4.44	0.0018	0.596
31	0.165	0.451	0.296	52.46	0.007	33.22	0.4	0.1	4.5	0.0018	0.6
32	0.143	0.577	0.341	68.2	0.004	36.92	0.4	0.1	4.5	0.0017	0.647
33	0.149	0.63	0.266	36.48	0.005	38.49	0.4	0.1	4.12	0.0018	0.575
34	0.146	0.199	0.353	72.76	0.01	25.83	0.4	0.1	4.49	0.0018	0.598
35	0.182	0.798	0.343	30.67	0.014	43.4	0.4	0.1	4.5	0.0018	0.6
36	0.116	0.588	0.258	77.72	0.014	37.26	0.4	0.1	4.5	0.0018	0.6
37	0.142	0.602	0.337	63.77	0.011	37.67	0.4	0.1	4.85	0.001	0.883
38	0.061	0.415	0.264	89.72	0.018	32.14	0.4	0.1	4.73	0.0013	0.782

Subwatershed	Area	(Sq. Miles)	Length (miles)	Centroid (miles)	Percent Imperviousness	Slope	Time of concetration	Depression Storage (Pervious)	Depression Storage (Impervious)	Initial Infiltration	Decay Rate Coef	Final Infiltration Rate
39		0.095	0.275	0.233	75.35	0.023	24.58	0.4	0.1	4.92	0.0009	0.937
40		0.213	0.733	0.334	10.14	0.013	98.38	0.4	0.1	3.89	0.0017	0.602
41		0.108	0.643	0.208	65	0.015	38.86	0.4	0.1	4.73	0.0013	0.781
42		0.153	0.721	0.239	35.61	0.011	41.16	0.4	0.1	4.5	0.0018	0.6
43		0.161	0.673	0.319	37.98	0.017	39.74	0.4	0.1	4.69	0.0014	0.75
44		0.169	0.484	0.168	31.26	0.02	34.2	0.4	0.1	4.5	0.0018	0.6
45		0.082	0.386	0.037	45	0.004	31.33	0.4	0.1	4.6	0.0016	0.682
46		0.213	0.385	0.253	47.67	0.011	31.3	0.4	0.1	4.69	0.0014	0.755
47		0.161	0.561	0.268	5	0.017	68.38	0.4	0.1	4.56	0.0017	0.652
48		0.173	0.58	0.192	65	0.022	36.6	0.4	0.1	4.5	0.0018	0.6
49		0.189	1.01	0.404	40.57	0.007	49.53	0.4	0.1	4.14	0.0016	0.636
50		0.17	0.895	0.386	61.94	0.005	46.25	0.4	0.1	4.73	0.0011	0.833
51		0.131	1.07	5.464	75.76	0.025	51.54	0.4	0.1	4.72	0.0013	0.777
52		0.15	0.72	0.405	49.94	0.019	41.12	0.4	0.1	4.72	0.0013	0.777
53		0.089	0.807	0.323	82.85	0.019	43.66	0.4	0.1	4.58	0.0016	0.66
54		0.171	0.656	0.307	65	0.011	39.23	0.4	0.1	4.66	0.0014	0.729
55		0.078	1.28	4.312	41.18	0.009	57.68	0.4	0.1	4.57	0.0017	0.654
56		0.156	0.797	0.34	26.2	0.002	43.37	0.4	0.1	4	0.0018	0.58
57		0.062	0.369	0.125	30.1	0.008	30.82	0.4	0.1	4.66	0.0014	0.729
58		0.149	0.749	0.311	27.81	0.007	41.98	0.4	0.1	4.58	0.0016	0.663
59		0.089	0.585	0.151	47.73	0.015	37.17	0.4	0.1	4.5	0.0018	0.6
60		0.136	0.68	0.343	70.21	0.014	39.95	0.4	0.1	4.62	0.0015	0.695
61		0.075	0.318	0.135	73.03	0.015	29.32	0.4	0.1	4.49	0.0018	0.599
62		0.122	0.596	0.207	95	0.022	37.19	0.4	0.1	4.5	0.0018	0.599
63		0.185	0.768	0.364	83.67	0.014	42.54	0.4	0.1	4.5	0.0018	0.6
64		0.139	0.753	0.301	91.07	0.017	42.09	0.4	0.1	4.5	0.0018	0.6
65		0.187	0.702	0.381	79.92	0.021	40.58	0.4	0.1	4.5	0.0018	0.6
66		0.089	0.381	0.292	65	0.035	23.58	0.4	0.1	4.5	0.0018	0.6
67		0.082	0.596	0.211	65	0.018	37.47	0.4	0.1	4.42	0.0018	0.595
68		0.162	0.523	0.315	49.26	0.009	35.33	0.4	0.1	3.86	0.0018	0.557
69		0.102	1.01	5.355	14.96	0.007	180.7	0.4	0.1	3.73	0.0018	0.548
70		0.178	1.3	6.432	72.51	0.013	58.32	0.4	0.1	4.57	0.0016	0.66
71		0.206	0.746	0.35	5	0.008	134.8	0.4	0.1	4.66	0.0014	0.729
72		0.127	0.559	0.225	5	0.014	82.82	0.4	0.1	4.54	0.0017	0.633
73		0.175	0.519	0.192	53.74	0.005	35.22	0.4	0.1	4.49	0.0018	0.6
74		0.135	0.634	0.158	33.13	0.011	38.61	0.4	0.1	4.5	0.0018	0.6
75		0.16	0.612	0.424	45	0.02	37.95	0.4	0.1	4.5	0.0018	0.6
76		0.194	0.651	0.344	31.82	0.015	39.09	0.4	0.1	4.51	0.0018	0.605
77		0.212	0.411	0.212	77.64	0.011	32.05	0.4	0.1	4.52	0.0018	0.617
78		0.185	0.432	0.24	73.62	0.008	32.67	0.4	0.1	4.5	0.0018	0.6
79		0.074	0.822	0.25	85.71	0.01	44.12	0.4	0.1	4.46	0.0018	0.597
80		0.149	0.401	0.159	73.72	0.005	31.77	0.4	0.1	3.96	0.0018	0.564
81		0.165	0.428	0.218	65	0.021	30.68	0.4	0.1	4.5	0.0018	0.6

Subwatershed	Area	(Sq. Miles)	Length (miles)	Centroid (miles)	Percent Imperviousness	Slope	Time of concetration	Depression Storage (Pervious)	Depression Storage (Impervious)	Initial Infiltration	Decay Rate Coef	Final Infiltration Rate
82		0.201	0.755	0.4	75.99	0.013	42.15	0.4	0.1	4.47	0.0018	0.598
83		0.141	0.585	0.228	65	0.008	37.16	0.4	0.1	4.5	0.0018	0.6
84		0.206	0.55	0.218	90.7	0.008	36.15	0.4	0.1	4.5	0.0018	0.6
85		0.201	0.923	0.4	91.49	0.009	47.06	0.4	0.1	4.1	0.0018	0.576
86		0.203	0.656	0.379	65	0.01	39.25	0.4	0.1	4.16	0.0018	0.577
87		0.169	0.573	0.247	65	0.02	36.82	0.4	0.1	4.5	0.0018	0.6
88		0.195	0.721	0.205	48.09	0.007	41.15	0.4	0.1	3.84	0.0018	0.555
89		0.113	0.5	0.124	95	0.007	34.66	0.4	0.1	4.21	0.0018	0.582
90		0.11	0.403	0.073	95	0.013	31.82	0.4	0.1	3.94	0.0018	0.563
91		0.201	0.672	0.382	95	0.01	39.71	0.4	0.1	3.74	0.0018	0.549
92		0.165	0.716	0.418	87.57	0.01	41.01	0.4	0.1	4.17	0.0018	0.578
93		0.113	0.74	0.393	65	0.011	41.71	0.4	0.1	4.05	0.0018	0.57
94		0.189	0.529	0.331	65	0.009	35.52	0.4	0.1	3.92	0.0018	0.56
95		0.14	0.749	0.343	64.7	0.016	41.96	0.4	0.1	3.15	0.0018	0.51
96		0.201	0.776	0.368	65	0.015	42.76	0.4	0.1	3.68	0.0018	0.546
97		0.123	1.04	5.422	65	0.011	50.65	0.4	0.1	3.81	0.0018	0.554
98		0.131	1.04	4.413	43.74	0.008	50.61	0.4	0.1	3.4	0.0018	0.527

BASE MAPPING AND HORIZONTAL & VERTICAL CONTROL PREPARED BY: LANDMARK MAPPING, LTD. 7500 W. Mississippi Ave, 21 Lakewood, CO 80232	Kiowa Engineering Corporation 7175 W. Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303) 692-0369 KIOWA PROJECT NO. 03059	ADAMS COUNTY COMMERCE CITY CITY OF BRIGHTON URBAN DRAINAGE & FLOOD CONTROL DISTRICT	THIRD CREEK D/S OF DIA OUTFALL SYSTEMS PLANNING STUDY UPDATE	SWMM SCHEMATIC	FIGURE III-6

SWMM Schematic.dwg/Aug 09, 2005

Third Creek OSP
Existing Conditions Model

Element #	DS Element	Element Type	Diameter/ Bottom Width(ft)	Length(ft)	Slope(ft/ft)	Left Side Slope	Right Side Slope	Mannings N	Full Depth(ft)
100	0	3 = Direct flow	10	1	0.1	0	0	0.01	1
101	285	3 = Direct flow	10	1	0.1	0	0	0.01	1
102	273	3 = Direct flow	10	1	0.1	0	0	0.01	1
103	203	3 = Direct flow	10	1	0.1	0	0	0.01	1
104	204	3 = Direct flow	10	1	0.1	0	0	0.01	1
105	205	3 = Direct flow	10	1	0.1	0	0	0.01	1
106	206	3 = Direct flow	10	1	0.1	0	0	0.01	1
107	207	3 = Direct flow	10	1	0.1	0	0	0.01	1
108	208	3 = Direct flow	10	1	0.1	0	0	0.01	1
109	209	3 = Direct flow	10	1	0.1	0	0	0.01	1
110	210	3 = Direct flow	10	1	0.1	0	0	0.01	1
111	211	3 = Direct flow	10	1	0.1	0	0	0.01	1
112	212	3 = Direct flow	10	1	0.1	0	0	0.01	1
113	213	3 = Direct flow	10	1	0.1	0	0	0.01	1
114	214	3 = Direct flow	10	1	0.1	0	0	0.01	1
115	215	3 = Direct flow	10	1	0.1	0	0	0.01	1
116	311	3 = Direct flow	10	1	0.1	0	0	0.01	1
117	217	3 = Direct flow	10	1	0.1	0	0	0.01	1
118	218	3 = Direct flow	10	1	0.1	0	0	0.01	1
119	280	3 = Direct flow	10	1	0.1	0	0	0.01	1
120	220	3 = Direct flow	10	1	0.1	0	0	0.01	1
121	221	3 = Direct flow	10	1	0.1	0	0	0.01	1
122	222	3 = Direct flow	10	1	0.1	0	0	0.01	1
123	278	3 = Direct flow	10	1	0.1	0	0	0.01	1
124	223	3 = Direct flow	10	1	0.1	0	0	0.01	1
125	274	3 = Direct flow	10	1	0.1	0	0	0.01	1
126	226	3 = Direct flow	10	1	0.1	0	0	0.01	1
127	228	3 = Direct flow	10	1	0.1	0	0	0.01	1
128	229	3 = Direct flow	10	1	0.1	0	0	0.01	1
129	227	3 = Direct flow	10	1	0.1	0	0	0.01	1
130	287	3 = Direct flow	10	1	0.1	0	0	0.01	1
132	304	3 = Direct flow	10	1	0.1	0	0	0.01	1
133	232	3 = Direct flow	10	1	0.1	0	0	0.01	1
134	281	3 = Direct flow	10	1	0.1	0	0	0.01	1
135	202	3 = Direct flow	10	1	0.1	0	0	0.01	1
136	288	3 = Direct flow	10	1	0.1	0	0	0.01	1
137	219	3 = Direct flow	10	1	0.1	0	0	0.01	1
138	236	3 = Direct flow	10	1	0.1	0	0	0.01	1
139	307	3 = Direct flow	10	1	0.1	0	0	0.01	1
141	200	3 = Direct flow	10	1	0.1	0	0	0.01	1
142	240	3 = Direct flow	10	1	0.1	0	0	0.01	1
143	237	3 = Direct flow	10	1	0.1	0	0	0.01	1
144	276	3 = Direct flow	10	1	0.1	0	0	0.01	1
145	266	3 = Direct flow	10	1	0.1	0	0	0.01	1
146	267	3 = Direct flow	10	1	0.1	0	0	0.01	1
147	230	3 = Direct flow	10	1	0.1	0	0	0.01	1
148	254	3 = Direct flow	10	1	0.1	0	0	0.01	1
149	255	3 = Direct flow	10	1	0.1	0	0	0.01	1
150	256	3 = Direct flow	10	1	0.1	0	0	0.01	1
151	257	3 = Direct flow	10	1	0.1	0	0	0.01	1
152	259	3 = Direct flow	10	1	0.1	0	0	0.01	1
153	264	3 = Direct flow	10	1	0.1	0	0	0.01	1
154	268	3 = Direct flow	10	1	0.1	0	0	0.01	1
155	269	3 = Direct flow	10	1	0.1	0	0	0.01	1
156	265	3 = Direct flow	10	1	0.1	0	0	0.01	1
157	275	3 = Direct flow	10	1	0.1	0	0	0.01	1
158	302	3 = Direct flow	10	1	0.1	0	0	0.01	1
159	309	3 = Direct flow	10	1	0.1	0	0	0.01	1
160	282	3 = Direct flow	10	1	0.1	0	0	0.01	1
161	310	3 = Direct flow	10	1	0.1	0	0	0.01	1
162	299	3 = Direct flow	10	1	0.1	0	0	0.01	1
163	244	3 = Direct flow	10	1	0.1	0	0	0.01	1
164	279	3 = Direct flow	10	1	0.1	0	0	0.01	1
165	245	3 = Direct flow	10	1	0.1	0	0	0.01	1
166	246	3 = Direct flow	10	1	0.1	0	0	0.01	1

Third Creek OSP
Existing Conditions Model

Element #	DS Element	Element Type	Diameter/ Bottom Width(ft)	Length(ft)	Slope(ft/ft)	Left Side Slope	Right Side Slope	Mannings N	Full Depth(ft)
167	250	3 = Direct flow	10	1	0.1	0	0	0.01	1
168	243	3 = Direct flow	10	1	0.1	0	0	0.01	1
169	242	3 = Direct flow	10	1	0.1	0	0	0.01	1
170	241	3 = Direct flow	10	1	0.1	0	0	0.01	1
171	248	3 = Direct flow	10	1	0.1	0	0	0.01	1
172	249	3 = Direct flow	10	1	0.1	0	0	0.01	1
173	270	3 = Direct flow	10	1	0.1	0	0	0.01	1
174	305	3 = Direct flow	10	1	0.1	0	0	0.01	1
175	258	3 = Direct flow	10	1	0.1	0	0	0.01	1
176	252	3 = Direct flow	10	1	0.1	0	0	0.01	1
177	263	3 = Direct flow	10	1	0.1	0	0	0.01	1
178	262	3 = Direct flow	10	1	0.1	0	0	0.01	1
179	261	3 = Direct flow	10	1	0.1	0	0	0.01	1
180	260	3 = Direct flow	10	1	0.1	0	0	0.01	1
181	159	3 = Direct flow	10	1	0.1	0	0	0.01	1
182	283	3 = Direct flow	10	1	0.1	0	0	0.01	1
183	239	3 = Direct flow	10	1	0.1	0	0	0.01	1
184	277	3 = Direct flow	10	1	0.1	0	0	0.01	1
185	284	3 = Direct flow	10	1	0.1	0	0	0.01	1
186	225	3 = Direct flow	10	1	0.1	0	0	0.01	1
187	301	3 = Direct flow	10	1	0.1	0	0	0.01	1
188	247	3 = Direct flow	10	1	0.1	0	0	0.01	1
200	136	4 = Channel with overflow channel	10	964	0.004	10	10	0.047	2
			50	964	0.004	50	50	0.033	20
202	101	4 = Channel with overflow channel	20	2327	0.003	20	20	0.04	3
			120	2327	0.003	50	50	0.03	20
203	102	4 = Channel with overflow channel	20	1902	0.004	20	20	0.044	3
			120	1902	0.004	50	50	0.033	20
204	103	4 = Channel with overflow channel	20	2673	0.004	20	20	0.044	3
			120	2673	0.004	50	50	0.033	20
205	104	4 = Channel with overflow channel	60	1621	0.003	4	4	0.037	3
			160	1621	0.003	50	50	0.03	20
206	105	4 = Channel with overflow channel	50	4148	0.0034	4	4	0.039	3
			150	4148	0.0034	50	50	0.031	20
207	106	4 = Channel with overflow channel	15	717	0.003	4	4	0.037	4
			115	717	0.003	20	20	0.029	20
208	107	4 = Channel with overflow channel	20	2763	0.003	10	10	0.039	3
			120	2763	0.003	40	40	0.03	20
209	108	4 = Channel with overflow channel	20	3945	0.003	4	4	0.036	5
			120	3945	0.003	40	40	0.03	20
210	109	4 = Channel with overflow channel	20	3217	0.007	4	4	0.053	3
			120	3217	0.007	50	50	0.041	20
211	110	4 = Channel with overflow channel	20	1323	0.008	4	4	0.056	3
			120	1323	0.008	50	50	0.043	20
212	111	4 = Channel with overflow channel	50	2426	0.003	4	4	0.037	3
			150	2426	0.003	50	50	0.03	20
213	112	4 = Channel with overflow channel	20	2473	0.005	4	4	0.046	3
			120	2473	0.005	50	50	0.036	20
214	113	4 = Channel with overflow channel	20	443	0.003	10	10	0.039	3
			120	443	0.003	25	25	0.029	20
215	308	4 = Channel with overflow channel	20	1622	0.003	10	10	0.039	3
			120	1622	0.003	25	25	0.028	25
216	164	4 = Channel with overflow channel	20	1324	0.003	10	10	0.039	3
			120	1324	0.003	25	25	0.029	20
217	116	4 = Channel with overflow channel	20	3243	0.005	10	10	0.047	3
			120	3243	0.005	25	25	0.036	20
218	117	4 = Channel with overflow channel	20	282	0.003	10	10	0.039	3
			120	282	0.003	25	25	0.029	20
219	118	4 = Channel with overflow channel	20	2003	0.003	10	10	0.039	3
			120	2003	0.003	20	20	0.029	20
220	147	4 = Channel with overflow channel	20	2196	0.003	4	4	0.037	4
			120	2196	0.003	20	20	0.029	20
221	120	4 = Channel with overflow channel	20	5356	0.001	4	4	0.024	5
			120	5356	0.001	20	20	0.046	20
222	121	4 = Channel with overflow channel	8	4084	0.012	4	4	0.066	3

Third Creek OSP
Existing Conditions Model

Element #	DS Element	Element Type	Diameter/ Bottom Width(ft)	Length(ft)	Slope(ft/ft)	Left Side Slope	Right Side Slope	Mannings N	Full Depth(ft)
			32	4084	0.012	20	20	0.071	20
224	110	4 = Channel with overflow channel	20	2002	0.003	4	4	0.04	2
			120	2002	0.003	50	50	0.03	20
223	105	4 = Channel with overflow channel	20	1141	0.002	10	10	0.035	2
			120	1141	0.002	50	50	0.025	20
225	106	4 = Channel with overflow channel	20	2475	0.001	10	10	0.027	2
			120	2475	0.001	50	50	0.02	20
226	107	4 = Channel with overflow channel	10	2015	0.006	4	4	0.054	2
			110	2015	0.006	50	50	0.039	20
227	126	4 = Channel with overflow channel	20	2686	0.0052	10	10	0.056	1
			120	2686	0.0052	50	50	0.037	20
228	108	4 = Channel with overflow channel	10	645	0.016	4	4	0.078	2
			110	645	0.016	50	50	0.056	20
229	127	4 = Channel with overflow channel	10	838	0.003	4	4	0.041	2
			110	838	0.003	50	50	0.03	20
230	119	4 = Channel with overflow channel	20	302	0.003	4	4	0.037	4
			120	302	0.003	20	20	0.029	20
231	130	4 = Channel with overflow channel	20	2856	0.004	10	10	0.046	2
			120	2856	0.004	50	50	0.033	20
232	111	4 = Channel with overflow channel	20	1120	0.005	10	10	0.05	2
			120	1120	0.005	50	50	0.036	20
233	297	4 = Channel with overflow channel	20	2070	0.008	10	10	0.06	2
			120	2070	0.008	50	50	0.043	20
234	173	4 = Channel with overflow channel	20	3316	0.013	10	10	0.072	2
			120	3316	0.013	50	50	0.052	20
235	140	4 = Channel with overflow channel	40	1047	0.019	10	10	0.09	1
			120	1047	0.019	50	50	0.06	20
236	116	4 = Channel with overflow channel	50	2857	0.0035	10	10	0.047	1
			200	2857	0.0035	50	50	0.031	20
237	184	5 = Pipe with overflow channel	6	183	0.035	0	0	0.013	6
			100	1400	0.005	50	50	0.051	20
239	143	4 = Channel with overflow channel	40	1430	0.003	10	10	0.041	2
			120	1430	0.003	50	50	0.03	20
240	140	4 = Channel with overflow channel	20	2733	0.015	5	5	0.082	1
			120	2733	0.015	50	50	0.055	20
241	139	4 = Channel with overflow channel	20	2126	0.009	10	10	0.069	1
			120	2126	0.009	50	50	0.045	20
242	168	4 = Channel with overflow channel	20	927	0.013	5	5	0.071	2
			120	927	0.013	50	50	0.052	20
243	161	4 = Channel with overflow channel	20	1224	0.002	10	10	0.035	2
			120	1224	0.002	50	50	0.025	20
244	160	4 = Channel with overflow channel	20	1747	0.007	10	10	0.057	2
			120	1747	0.007	50	50	0.041	20
245	163	4 = Channel with overflow channel	20	2060	0.006	10	10	0.054	2
			120	2060	0.006	50	50	0.039	20
246	165	4 = Channel with overflow channel	20	3293	0.007	10	10	0.057	2
			120	3293	0.007	50	50	0.041	20
247	168	4 = Channel with overflow channel	40	1278	0.02	10	10	0.083	2
			120	1278	0.02	50	50	0.061	20
248	170	4 = Channel with overflow channel	100	1834	0.013	10	10	0.077	1
			200	1834	0.013	50	50	0.051	20
249	171	4 = Channel with overflow channel	100	3800	0.008	10	10	0.064	1
			200	3800	0.008	50	50	0.043	20
250	132	4 = Channel with overflow channel	100	2986	0.008	10	10	0.064	1
			200	2986	0.008	50	50	0.043	20
251	167	4 = Channel with overflow channel	20	1081	0.004	10	10	0.051	1
			120	1081	0.004	50	50	0.033	20
252	174	4 = Channel with overflow channel	20	2585	0.005	5	5	0.049	2
			120	2585	0.005	50	50	0.036	20
254	147	4 = Channel with overflow channel	20	637	0.003	10	10	0.045	1
			120	637	0.003	50	50	0.03	20
255	150	4 = Channel with overflow channel	70	1579	0.004	5	5	0.049	1
			200	1579	0.004	50	50	0.033	20
256	145	4 = Channel with overflow channel	100	2710	0.013	10	10	0.077	1
			200	2710	0.013	50	50	0.051	20

Third Creek OSP
Existing Conditions Model

Element #	DS Element	Element Type	Diameter/ Bottom Width(ft)	Length(ft)	Slope(ft/ft)	Left Side Slope	Right Side Slope	Mannings N	Full Depth(ft)
257	149	4 = Channel with overflow channel	100	1831	0.014	10	10	0.079	1
			200	1831	0.014	50	50	0.053	20
258	151	4 = Channel with overflow channel	100	3598	0.01	10	10	0.069	1
			200	3598	0.01	50	50	0.047	20
259	149	4 = Channel with overflow channel	100	1401	0.012	10	10	0.074	1
			200	1401	0.012	50	50	0.05	20
260	150	4 = Channel with overflow channel	100	2084	0.007	10	10	0.06	1
			200	2084	0.007	50	50	0.041	20
261	176	4 = Channel with overflow channel	20	1626	0.009	10	10	0.063	2
			120	1626	0.009	50	50	0.045	20
262	179	4 = Channel with overflow channel	100	1461	0.006	10	10	0.057	1
			200	1461	0.006	50	50	0.038	20
263	179	4 = Channel with overflow channel	100	1278	0.007	10	10	0.06	1
			200	1278	0.007	50	50	0.041	20
264	121	4 = Channel with overflow channel	100	2606	0.019	5	5	0.063	2
			400	2606	0.019	50	50	0.045	20
265	122	4 = Channel with overflow channel	20	1802	0.024	4	4	0.089	2
			120	1802	0.024	50	50	0.065	20
266	148	4 = Channel with overflow channel	20	3270	0.007	5	5	0.056	2
			120	3270	0.007	50	50	0.041	20
267	145	4 = Channel with overflow channel	100	972	0.002	10	10	0.038	1
			200	972	0.002	50	50	0.025	20
268	120	4 = Channel with overflow channel	100	1610	0.031	10	10	0.089	1
			400	1610	0.031	50	50	0.065	20
269	119	4 = Channel with overflow channel	10	730	0.025	10	10	0.103	1
			100	730	0.025	50	50	0.066	20
270	181	4 = Channel with overflow channel	20	1456	0.006	5	5	0.053	2
			120	1456	0.006	50	50	0.039	20
271	164	4 = Channel with overflow channel	50	1908	0.002	10	10	0.035	2
			150	1908	0.002	50	50	0.025	20
273	100	4 = Channel with overflow channel	20	703	0.002	10	10	0.041	2
			120	703	0.002	50	50	0.03	20
274	186	4 = Channel with overflow channel	20	1045	0.001	10	10	0.027	2
			120	1045	0.001	50	50	0.02	20
275	186	4 = Channel with overflow channel	20	1420	0.011	10	10	0.068	2
			120	1420	0.011	50	50	0.049	20
276	137	4 = Channel with overflow channel	20	2158	0.006	4	4	0.047	5
			120	2158	0.006	50	50	0.043	10
277	144	4 = Channel with overflow channel	17	262	0.008	3	3	0.044	1
			120	262	0.008	50	50	0.048	10
278	103	4 = Channel with overflow channel	20	708	0.007	4	4	0.056	2
			120	708	0.007	50	50	0.041	20
279	315	4 = Channel with overflow channel	20	2452	0.003	10	10	0.039	3
			120	2452	0.003	25	25	0.029	20
280	137	4 = Channel with overflow channel	20	1804	0.003	10	10	0.039	3
			120	1804	0.003	50	50	0.03	20
281	133	4 = Channel with overflow channel	20	3622	0.004	10	10	0.046	2
			120	3622	0.004	50	50	0.033	20
282	182	4 = Channel with overflow channel	20	2352	0.006	10	10	0.054	2
			120	2352	0.006	50	50	0.039	20
283	159	4 = Channel with overflow channel	20	1995	0.004	10	10	0.046	2
			120	1995	0.004	50	50	0.033	20
284	132	4 = Channel with overflow channel	20	3155	0.006	10	10	0.054	2
			120	3155	0.006	50	50	0.039	20
285	102	4 = Channel with overflow channel	35	502	0.001	10	10	0.027	2
			135	502	0.001	50	50	0.02	20
286	158	4 = Channel with overflow channel	20	1328	0.004	10	10	0.06	2
			120	1328	0.008	50	50	0.043	20
287	109	5 = Pipe with overflow channel	5	344	0.005	1	1	0.017	5
			120	344	0.004	20	20	0.037	20
288	271	5 = Pipe with overflow channel	5.5	250	0.011	0	0	0.013	5.5
			120	250	0.011	20	20	0.037	20
296	172	4 = Channel with overflow channel	20	1613	0.008	10	10	0.05	2
			120	1613	0.008	50	50	0.04	20
297	298	2 = Pipe	5	350	0.005	0	0	0.013	5

Third Creek OSP
Existing Conditions Model

Element #	DS Element	Element Type	Diameter/ Bottom Width(ft)	Length(ft)	Slope(ft/ft)	Left Side Slope	Right Side Slope	Mannings N	Full Depth(ft)
298	211	4 = Channel with overflow channel	20	440	0.008	10	10	0.05	2
			120	440	0.008	50	50	0.04	20
299	302	4 = Channel with overflow channel	20	2854	0.008	10	10	0.046	2
			120	2854	0.004	50	50	0.033	20
301	224	3 = Direct flow	10	1	0.1	0	0	0.01	1
302	233	Detention	0.1	500	0.001	0	0	0.035	0.1
303	247	3 = Direct flow	10	1	0.1	0	0	0.01	1
304	296	3 = Direct flow	10	1	0.1	0	0	0.01	1
305	251	3 = Direct flow	10	1	0.1	0	0	0.01	1
306	140	3 = Direct flow	10	1	0.1	0	0	0.01	1
307	235	3 = Direct flow	10	1	0.1	0	0	0.01	1
308	114	3 = Direct flow	10	1	0.1	0	0	0.01	1
309	286	3 = Direct flow	10	1	0.1	0	0	0.01	1
310	234	3 = Direct flow	10	1	0.1	0	0	0.01	1
311	216	3 = Direct flow	10	1	0.1	0	0	0.01	1
315	115	Detention	0.1	10	0.1	0	0	0	0.1
131	231	3 = Direct flow	0	1					
401	402	3 = Direct flow	0	1					
402	210	2 = Pipe	6.5	196	0.013	0	0	0.015	6.5
140	200	3 = Direct flow	0	1	0	0	0	0	0
403	238	3 = Direct flow	0	1	0	0	0	0	0
238	164	2 = Pipe	7.6	245	0.005	0	0	0.013	8
949	122	Inflow Hydrograph	10	1	0.1	0	0	0.01	10

Third Creek OSP
Future Conditions Model

Element #	DS Element	Element Type	Diameter/ Bottom Width(ft)	Length(ft)	Slope(ft/ft)	Left Side Slope	Right Side Slope	Mannings N	Full Depth(ft)
100	0	3 = Direct flow	10	1	0.1	0	0	0.01	1
101	285	3 = Direct flow	10	1	0.1	0	0	0.01	1
102	273	3 = Direct flow	10	1	0.1	0	0	0.01	1
103	203	3 = Direct flow	10	1	0.1	0	0	0.01	1
104	204	3 = Direct flow	10	1	0.1	0	0	0.01	1
105	205	3 = Direct flow	10	1	0.1	0	0	0.01	1
106	206	3 = Direct flow	10	1	0.1	0	0	0.01	1
107	207	3 = Direct flow	10	1	0.1	0	0	0.01	1
108	208	3 = Direct flow	10	1	0.1	0	0	0.01	1
109	209	3 = Direct flow	10	1	0.1	0	0	0.01	1
110	210	3 = Direct flow	10	1	0.1	0	0	0.01	1
111	211	3 = Direct flow	10	1	0.1	0	0	0.01	1
112	212	3 = Direct flow	10	1	0.1	0	0	0.01	1
113	213	3 = Direct flow	10	1	0.1	0	0	0.01	1
114	214	3 = Direct flow	10	1	0.1	0	0	0.01	1
115	215	3 = Direct flow	10	1	0.1	0	0	0.01	1
116	311	3 = Direct flow	10	1	0.1	0	0	0.01	1
117	217	3 = Direct flow	10	1	0.1	0	0	0.01	1
118	218	3 = Direct flow	10	1	0.1	0	0	0.01	1
119	280	3 = Direct flow	10	1	0.1	0	0	0.01	1
120	220	3 = Direct flow	10	1	0.1	0	0	0.01	1
121	221	3 = Direct flow	10	1	0.1	0	0	0.01	1
122	222	3 = Direct flow	10	1	0.1	0	0	0.01	1
123	278	3 = Direct flow	10	1	0.1	0	0	0.01	1
124	223	3 = Direct flow	10	1	0.1	0	0	0.01	1
125	274	3 = Direct flow	10	1	0.1	0	0	0.01	1
126	226	3 = Direct flow	10	1	0.1	0	0	0.01	1
127	228	3 = Direct flow	10	1	0.1	0	0	0.01	1
128	229	3 = Direct flow	10	1	0.1	0	0	0.01	1
129	227	3 = Direct flow	10	1	0.1	0	0	0.01	1
130	287	3 = Direct flow	10	1	0.1	0	0	0.01	1
132	304	3 = Direct flow	10	1	0.1	0	0	0.01	1
133	232	3 = Direct flow	10	1	0.1	0	0	0.01	1
134	281	3 = Direct flow	10	1	0.1	0	0	0.01	1
135	202	3 = Direct flow	10	1	0.1	0	0	0.01	1
136	288	3 = Direct flow	10	1	0.1	0	0	0.01	1
137	219	3 = Direct flow	10	1	0.1	0	0	0.01	1
138	236	3 = Direct flow	10	1	0.1	0	0	0.01	1
139	307	3 = Direct flow	10	1	0.1	0	0	0.01	1
141	200	3 = Direct flow	10	1	0.1	0	0	0.01	1
142	240	3 = Direct flow	10	1	0.1	0	0	0.01	1
143	237	3 = Direct flow	10	1	0.1	0	0	0.01	1
144	276	3 = Direct flow	10	1	0.1	0	0	0.01	1
145	266	3 = Direct flow	10	1	0.1	0	0	0.01	1
146	267	3 = Direct flow	10	1	0.1	0	0	0.01	1
147	230	3 = Direct flow	10	1	0.1	0	0	0.01	1
148	254	3 = Direct flow	10	1	0.1	0	0	0.01	1
149	255	3 = Direct flow	10	1	0.1	0	0	0.01	1
150	256	3 = Direct flow	10	1	0.1	0	0	0.01	1
151	257	3 = Direct flow	10	1	0.1	0	0	0.01	1
152	259	3 = Direct flow	10	1	0.1	0	0	0.01	1
153	264	3 = Direct flow	10	1	0.1	0	0	0.01	1
154	268	3 = Direct flow	10	1	0.1	0	0	0.01	1
155	269	3 = Direct flow	10	1	0.1	0	0	0.01	1
156	265	3 = Direct flow	10	1	0.1	0	0	0.01	1
157	275	3 = Direct flow	10	1	0.1	0	0	0.01	1
158	302	3 = Direct flow	10	1	0.1	0	0	0.01	1
159	309	3 = Direct flow	10	1	0.1	0	0	0.01	1
160	282	3 = Direct flow	10	1	0.1	0	0	0.01	1
161	310	3 = Direct flow	10	1	0.1	0	0	0.01	1
162	299	3 = Direct flow	10	1	0.1	0	0	0.01	1
163	244	3 = Direct flow	10	1	0.1	0	0	0.01	1
164	279	3 = Direct flow	10	1	0.1	0	0	0.01	1
165	245	3 = Direct flow	10	1	0.1	0	0	0.01	1
166	246	3 = Direct flow	10	1	0.1	0	0	0.01	1

Third Creek OSP
Future Conditions Model

Element #	DS Element	Element Type	Diameter/ Bottom Width(ft)	Length(ft)	Slope(ft/ft)	Left Side Slope	Right Side Slope	Mannings N	Full Depth(ft)
167	250	3 = Direct flow	10	1	0.1	0	0	0.01	1
168	243	3 = Direct flow	10	1	0.1	0	0	0.01	1
169	242	3 = Direct flow	10	1	0.1	0	0	0.01	1
170	241	3 = Direct flow	10	1	0.1	0	0	0.01	1
171	248	3 = Direct flow	10	1	0.1	0	0	0.01	1
173	270	3 = Direct flow	10	1	0.1	0	0	0.01	1
174	305	3 = Direct flow	10	1	0.1	0	0	0.01	1
175	258	3 = Direct flow	10	1	0.1	0	0	0.01	1
176	252	3 = Direct flow	10	1	0.1	0	0	0.01	1
177	263	3 = Direct flow	10	1	0.1	0	0	0.01	1
178	262	3 = Direct flow	10	1	0.1	0	0	0.01	1
179	261	3 = Direct flow	10	1	0.1	0	0	0.01	1
180	260	3 = Direct flow	10	1	0.1	0	0	0.01	1
181	159	3 = Direct flow	10	1	0.1	0	0	0.01	1
182	283	3 = Direct flow	10	1	0.1	0	0	0.01	1
183	239	3 = Direct flow	10	1	0.1	0	0	0.01	1
184	277	3 = Direct flow	10	1	0.1	0	0	0.01	1
185	284	3 = Direct flow	10	1	0.1	0	0	0.01	1
186	225	3 = Direct flow	10	1	0.1	0	0	0.01	1
187	301	3 = Direct flow	10	1	0.1	0	0	0.01	1
188	247	3 = Direct flow	10	1	0.1	0	0	0.01	1
200	136	4 = Channel with overflow channel	10	964	0.004	10	10	0.047	2
			50	964	0.004	50	50	0.033	20
202	101	4 = Channel with overflow channel	20	2327	0.003	20	20	0.04	3
			120	2327	0.003	50	50	0.03	20
203	102	4 = Channel with overflow channel	20	1902	0.004	20	20	0.044	3
			120	1902	0.004	50	50	0.033	20
204	103	4 = Channel with overflow channel	20	2673	0.004	20	20	0.044	3
			120	2673	0.004	50	50	0.033	20
205	104	4 = Channel with overflow channel	60	1621	0.003	4	4	0.037	3
			160	1621	0.003	50	50	0.03	20
206	105	4 = Channel with overflow channel	50	4148	0.0034	4	4	0.039	3
			150	4148	0.0034	50	50	0.031	20
207	106	4 = Channel with overflow channel	15	717	0.003	4	4	0.037	4
			115	717	0.003	20	20	0.029	20
208	107	4 = Channel with overflow channel	20	2763	0.003	10	10	0.039	3
			120	2763	0.003	40	40	0.03	20
209	108	4 = Channel with overflow channel	20	3945	0.003	4	4	0.036	5
			120	3945	0.003	40	40	0.03	20
210	109	4 = Channel with overflow channel	20	3217	0.007	4	4	0.053	3
			120	3217	0.007	50	50	0.041	20
211	110	4 = Channel with overflow channel	20	1323	0.008	4	4	0.056	3
			120	1323	0.008	50	50	0.043	20
212	111	4 = Channel with overflow channel	50	2426	0.003	4	4	0.037	3
			150	2426	0.003	50	50	0.03	20
213	112	4 = Channel with overflow channel	20	2473	0.005	4	4	0.046	3
			120	2473	0.005	50	50	0.036	20
214	113	4 = Channel with overflow channel	20	443	0.003	10	10	0.039	3
			120	443	0.003	25	25	0.029	20
215	308	4 = Channel with overflow channel	20	1622	0.003	10	10	0.039	3
			120	1622	0.003	25	25	0.028	25
216	164	4 = Channel with overflow channel	20	1324	0.003	10	10	0.039	3
			120	1324	0.003	25	25	0.029	20
217	116	4 = Channel with overflow channel	20	3243	0.005	10	10	0.047	3
			120	3243	0.005	25	25	0.036	20
218	117	4 = Channel with overflow channel	20	282	0.003	10	10	0.039	3
			120	282	0.003	25	25	0.029	20
219	118	4 = Channel with overflow channel	20	2003	0.003	10	10	0.039	3
			120	2003	0.003	20	20	0.029	20
220	147	4 = Channel with overflow channel	20	2196	0.003	4	4	0.037	4
			120	2196	0.003	20	20	0.029	20
221	120	4 = Channel with overflow channel	20	5356	0.001	4	4	0.024	5
			120	5356	0.001	20	20	0.046	20
222	121	4 = Channel with overflow channel	8	4084	0.012	4	4	0.066	3
			32	4084	0.012	20	20	0.071	20

Third Creek OSP
Future Conditions Model

Element #	DS Element	Element Type	Diameter/ Bottom Width(ft)	Length(ft)	Slope(ft/ft)	Left Side Slope	Right Side Slope	Mannings N	Full Depth(ft)
224	110	4 = Channel with overflow channel	20	2002	0.003	4	4	0.04	2
			120	2002	0.003	50	50	0.03	20
223	105	4 = Channel with overflow channel	20	1141	0.002	10	10	0.035	2
			120	1141	0.002	50	50	0.025	20
225	106	4 = Channel with overflow channel	20	2475	0.001	10	10	0.027	2
			120	2475	0.001	50	50	0.02	20
226	107	4 = Channel with overflow channel	10	2015	0.006	4	4	0.054	2
			110	2015	0.006	50	50	0.039	20
227	126	4 = Channel with overflow channel	20	2686	0.0052	10	10	0.056	1
			120	2686	0.0052	50	50	0.037	20
228	108	4 = Channel with overflow channel	10	645	0.016	4	4	0.078	2
			110	645	0.016	50	50	0.056	20
229	127	4 = Channel with overflow channel	10	838	0.003	4	4	0.041	2
			110	838	0.003	50	50	0.03	20
230	119	4 = Channel with overflow channel	20	302	0.003	4	4	0.037	4
			120	302	0.003	20	20	0.029	20
231	130	4 = Channel with overflow channel	20	2856	0.004	10	10	0.046	2
			120	2856	0.004	50	50	0.033	20
232	111	4 = Channel with overflow channel	20	1120	0.005	10	10	0.05	2
			120	1120	0.005	50	50	0.036	20
233	297	4 = Channel with overflow channel	20	2070	0.008	10	10	0.06	2
			120	2070	0.008	50	50	0.043	20
234	173	4 = Channel with overflow channel	20	3316	0.013	10	10	0.072	2
			120	3316	0.013	50	50	0.052	20
235	140	4 = Channel with overflow channel	40	1047	0.019	10	10	0.09	1
			120	1047	0.019	50	50	0.06	20
236	116	4 = Channel with overflow channel	50	2857	0.0035	10	10	0.047	1
			200	2857	0.0035	50	50	0.031	20
237	184	5 = Pipe with overflow channel	6	183	0.035	0	0	0.013	6
			100	1400	0.005	50	50	0.051	20
239	141	4 = Channel with overflow channel	40	2088	0.003	10	10	0.041	2
			120	2088	0.003	50	50	0.03	20
240	140	4 = Channel with overflow channel	20	2733	0.015	5	5	0.082	1
			120	2733	0.015	50	50	0.055	20
241	139	4 = Channel with overflow channel	20	2126	0.009	10	10	0.069	1
			120	2126	0.009	50	50	0.045	20
242	168	4 = Channel with overflow channel	20	927	0.013	5	5	0.071	2
			120	927	0.013	50	50	0.052	20
243	161	4 = Channel with overflow channel	20	1224	0.002	10	10	0.035	2
			120	1224	0.002	50	50	0.025	20
244	160	4 = Channel with overflow channel	20	1747	0.007	10	10	0.057	2
			120	1747	0.007	50	50	0.041	20
245	163	4 = Channel with overflow channel	20	2060	0.006	10	10	0.054	2
			120	2060	0.006	50	50	0.039	20
246	165	4 = Channel with overflow channel	20	3293	0.007	10	10	0.057	2
			120	3293	0.007	50	50	0.041	20
247	168	4 = Channel with overflow channel	40	1278	0.02	10	10	0.083	2
			120	1278	0.02	50	50	0.061	20
248	170	4 = Channel with overflow channel	100	1834	0.013	10	10	0.077	1
			200	1834	0.013	50	50	0.051	20
250	132	4 = Channel with overflow channel	100	2986	0.008	10	10	0.064	1
			200	2986	0.008	50	50	0.043	20
251	167	4 = Channel with overflow channel	20	1081	0.004	10	10	0.051	1
			120	1081	0.004	50	50	0.033	20
252	174	4 = Channel with overflow channel	20	2585	0.005	5	5	0.049	2
			120	2585	0.005	50	50	0.036	20
254	147	4 = Channel with overflow channel	20	637	0.003	10	10	0.045	1
			120	637	0.003	50	50	0.03	20
255	150	4 = Channel with overflow channel	70	1579	0.004	5	5	0.049	1
			200	1579	0.004	50	50	0.033	20
256	145	4 = Channel with overflow channel	100	2710	0.013	10	10	0.077	1
			200	2710	0.013	50	50	0.051	20
257	149	4 = Channel with overflow channel	100	1831	0.014	10	10	0.079	1
			200	1831	0.014	50	50	0.053	20
258	151	4 = Channel with overflow channel	100	3598	0.01	10	10	0.069	1

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Future Conditions Model

Element #	DS Element	Element Type	Diameter/ Bottom Width(ft)	Length(ft)	Slope(ft/ft)	Left Side Slope	Right Side Slope	Mannings N	Full Depth(ft)
			200	3598	0.01	50	50	0.047	20
259	149	4 = Channel with overflow channel	100	1401	0.012	10	10	0.074	1
			200	1401	0.012	50	50	0.05	20
260	150	4 = Channel with overflow channel	100	2084	0.007	10	10	0.06	1
			200	2084	0.007	50	50	0.041	20
261	176	4 = Channel with overflow channel	20	1626	0.009	10	10	0.063	2
			120	1626	0.009	50	50	0.045	20
262	179	4 = Channel with overflow channel	100	1461	0.006	10	10	0.057	1
			200	1461	0.006	50	50	0.038	20
263	179	4 = Channel with overflow channel	100	1278	0.007	10	10	0.06	1
			200	1278	0.007	50	50	0.041	20
264	121	4 = Channel with overflow channel	100	2606	0.019	5	5	0.063	2
			400	2606	0.019	50	50	0.045	20
265	122	4 = Channel with overflow channel	20	1802	0.024	4	4	0.089	2
			120	1802	0.024	50	50	0.065	20
266	148	4 = Channel with overflow channel	20	3270	0.007	5	5	0.056	2
			120	3270	0.007	50	50	0.041	20
267	145	4 = Channel with overflow channel	100	972	0.002	10	10	0.038	1
			200	972	0.002	50	50	0.025	20
268	120	4 = Channel with overflow channel	100	1610	0.031	10	10	0.089	1
			400	1610	0.031	50	50	0.065	20
269	119	4 = Channel with overflow channel	10	730	0.025	10	10	0.103	1
			100	730	0.025	50	50	0.066	20
270	181	4 = Channel with overflow channel	20	1456	0.006	5	5	0.053	2
			120	1456	0.006	50	50	0.039	20
271	164	4 = Channel with overflow channel	50	1908	0.002	10	10	0.035	2
			150	1908	0.002	50	50	0.025	20
273	100	4 = Channel with overflow channel	20	703	0.002	10	10	0.041	2
			120	703	0.002	50	50	0.03	20
274	186	4 = Channel with overflow channel	20	1045	0.001	10	10	0.027	2
			120	1045	0.001	50	50	0.02	20
275	186	4 = Channel with overflow channel	20	1420	0.011	10	10	0.068	2
			120	1420	0.011	50	50	0.049	20
276	137	4 = Channel with overflow channel	20	2158	0.006	4	4	0.047	5
			120	2158	0.006	50	50	0.043	10
277	144	4 = Channel with overflow channel	17	262	0.008	3	3	0.044	1
			120	262	0.008	50	50	0.048	10
278	103	4 = Channel with overflow channel	20	708	0.007	4	4	0.056	2
			120	708	0.007	50	50	0.041	20
279	315	4 = Channel with overflow channel	20	2452	0.003	10	10	0.039	3
			120	2452	0.003	25	25	0.029	20
280	137	4 = Channel with overflow channel	20	1804	0.003	10	10	0.039	3
			120	1804	0.003	50	50	0.03	20
281	133	4 = Channel with overflow channel	20	3622	0.004	10	10	0.046	2
			120	3622	0.004	50	50	0.033	20
282	182	4 = Channel with overflow channel	20	2352	0.006	10	10	0.054	2
			120	2352	0.006	50	50	0.039	20
283	159	4 = Channel with overflow channel	20	1995	0.004	10	10	0.046	2
			120	1995	0.004	50	50	0.033	20
284	132	4 = Channel with overflow channel	20	3155	0.006	10	10	0.054	2
			120	3155	0.006	50	50	0.039	20
285	102	4 = Channel with overflow channel	35	502	0.001	10	10	0.027	2
			135	502	0.001	50	50	0.02	20
286	158	4 = Channel with overflow channel	20	1328	0.004	10	10	0.06	2
			120	1328	0.008	50	50	0.043	20
287	109	5 = Pipe with overflow channel	5	344	0.005	1	1	0.017	5
			120	344	0.004	20	20	0.037	20
288	271	5 = Pipe with overflow channel	5.5	250	0.011	0	0	0.013	5.5
			120	250	0.011	20	20	0.037	20
296	316	4 = Channel with overflow channel	80	3500	0.002	4	4	0.03	8.5
			120	3500	0.002	50	50	0.028	10
297	298	2 = Pipe	5	350	0.005	0	0	0.013	5
298	211	4 = Channel with overflow channel	20	440	0.008	10	10	0.05	2
			120	440	0.008	50	50	0.04	20
299	302	4 = Channel with overflow channel	20	2854	0.008	10	10	0.046	2

Third Creek OSP
Future Conditions Model

Element #	DS Element	Element Type	Diameter/ Bottom Width(ft)	Length(ft)	Slope(ft/ft)	Left Side Slope	Right Side Slope	Mannings N	Full Depth(ft)
			120	2854	0.004	50	50	0.033	20
301	224	3 = Direct flow	10	1	0.1	0	0	0.01	1
302	233	Detention	0.1	500	0.001	0	0	0.035	0.1
303	188	3 = Direct flow	10	1	0.1	0	0	0.01	1
304	296	3 = Direct flow	10	1	0.1	0	0	0.01	1
305	251	3 = Direct flow	10	1	0.1	0	0	0.01	1
306	140	3 = Direct flow	10	1	0.1	0	0	0.01	1
307	235	3 = Direct flow	10	1	0.1	0	0	0.01	1
308	114	3 = Direct flow	10	1	0.1	0	0	0.01	1
309	286	3 = Direct flow	10	1	0.1	0	0	0.01	1
310	234	3 = Direct flow	10	1	0.1	0	0	0.01	1
311	216	3 = Direct flow	10	1	0.1	0	0	0.01	1
315	115	Detention	0.1	10	0.1	0	0	0	0.1
316	143	Detention	0.1	10	0.1	0	0	0	0.1
131	231	3 = Direct flow	0	1					
401	402	3 = Direct flow	0	1					
402	210	2 = Pipe	6.5	196	0.013	0	0	0.015	6.5
140	200	3 = Direct flow	0	1	0	0	0	0	0
403	238	3 = Direct flow	0	1	0	0	0	0	0
238	164	2 = Pipe	7.6	245	0.005	0	0	0.013	8
904	122	Inflow	10	1	0.1	0	0	0.01	10

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Element #	DS Element	Element Type	Diameter/ Bottom Width(ft)	Length(ft)	Slope(ft/ft)	Left Side Slope	Right Side Slope	Mannings N	Full Depth(ft)
100	0	3 = Direct flow	10	1	0.1	0	0	0.01	1
101	285	3 = Direct flow	10	1	0.1	0	0	0.01	1
102	273	3 = Direct flow	10	1	0.1	0	0	0.01	1
103	203	3 = Direct flow	10	1	0.1	0	0	0.01	1
104	204	3 = Direct flow	10	1	0.1	0	0	0.01	1
105	205	3 = Direct flow	10	1	0.1	0	0	0.01	1
106	206	3 = Direct flow	10	1	0.1	0	0	0.01	1
107	207	3 = Direct flow	10	1	0.1	0	0	0.01	1
108	208	3 = Direct flow	10	1	0.1	0	0	0.01	1
109	209	3 = Direct flow	10	1	0.1	0	0	0.01	1
110	210	3 = Direct flow	10	1	0.1	0	0	0.01	1
111	211	3 = Direct flow	10	1	0.1	0	0	0.01	1
112	212	3 = Direct flow	10	1	0.1	0	0	0.01	1
113	213	3 = Direct flow	10	1	0.1	0	0	0.01	1
114	214	3 = Direct flow	10	1	0.1	0	0	0.01	1
115	215	3 = Direct flow	10	1	0.1	0	0	0.01	1
116	311	3 = Direct flow	10	1	0.1	0	0	0.01	1
117	217	3 = Direct flow	10	1	0.1	0	0	0.01	1
118	218	3 = Direct flow	10	1	0.1	0	0	0.01	1
119	280	3 = Direct flow	10	1	0.1	0	0	0.01	1
120	220	3 = Direct flow	10	1	0.1	0	0	0.01	1
121	221	3 = Direct flow	10	1	0.1	0	0	0.01	1
122	222	3 = Direct flow	10	1	0.1	0	0	0.01	1
123	278	3 = Direct flow	10	1	0.1	0	0	0.01	1
124	223	3 = Direct flow	10	1	0.1	0	0	0.01	1
125	274	3 = Direct flow	10	1	0.1	0	0	0.01	1
126	226	3 = Direct flow	10	1	0.1	0	0	0.01	1
127	228	3 = Direct flow	10	1	0.1	0	0	0.01	1
128	229	3 = Direct flow	10	1	0.1	0	0	0.01	1
129	227	3 = Direct flow	10	1	0.1	0	0	0.01	1
130	287	3 = Direct flow	10	1	0.1	0	0	0.01	1
132	304	3 = Direct flow	10	1	0.1	0	0	0.01	1
133	232	3 = Direct flow	10	1	0.1	0	0	0.01	1
134	281	3 = Direct flow	10	1	0.1	0	0	0.01	1
135	202	3 = Direct flow	10	1	0.1	0	0	0.01	1
136	288	3 = Direct flow	10	1	0.1	0	0	0.01	1
137	219	3 = Direct flow	10	1	0.1	0	0	0.01	1
138	236	3 = Direct flow	10	1	0.1	0	0	0.01	1
139	307	3 = Direct flow	10	1	0.1	0	0	0.01	1
141	200	3 = Direct flow	10	1	0.1	0	0	0.01	1
142	240	3 = Direct flow	10	1	0.1	0	0	0.01	1
143	237	3 = Direct flow	10	1	0.1	0	0	0.01	1
144	276	3 = Direct flow	10	1	0.1	0	0	0.01	1
145	266	3 = Direct flow	10	1	0.1	0	0	0.01	1
146	267	3 = Direct flow	10	1	0.1	0	0	0.01	1
147	230	3 = Direct flow	10	1	0.1	0	0	0.01	1
148	254	3 = Direct flow	10	1	0.1	0	0	0.01	1
149	255	3 = Direct flow	10	1	0.1	0	0	0.01	1
150	256	3 = Direct flow	10	1	0.1	0	0	0.01	1
151	257	3 = Direct flow	10	1	0.1	0	0	0.01	1
152	259	3 = Direct flow	10	1	0.1	0	0	0.01	1
153	264	3 = Direct flow	10	1	0.1	0	0	0.01	1
154	268	3 = Direct flow	10	1	0.1	0	0	0.01	1
155	269	3 = Direct flow	10	1	0.1	0	0	0.01	1
156	265	3 = Direct flow	10	1	0.1	0	0	0.01	1
157	275	3 = Direct flow	10	1	0.1	0	0	0.01	1
158	302	3 = Direct flow	10	1	0.1	0	0	0.01	1
159	309	3 = Direct flow	10	1	0.1	0	0	0.01	1
160	282	3 = Direct flow	10	1	0.1	0	0	0.01	1
161	310	3 = Direct flow	10	1	0.1	0	0	0.01	1
162	299	3 = Direct flow	10	1	0.1	0	0	0.01	1
163	244	3 = Direct flow	10	1	0.1	0	0	0.01	1
164	279	3 = Direct flow	10	1	0.1	0	0	0.01	1
165	245	3 = Direct flow	10	1	0.1	0	0	0.01	1
166	246	3 = Direct flow	10	1	0.1	0	0	0.01	1

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Master Plan Conditions Model

Element #	DS Element	Element Type	Diameter/ Bottom Width(ft)	Length(ft)	Slope(ft/ft)	Left Side Slope	Right Side Slope	Mannings N	Full Depth(ft)
167	250	3 = Direct flow	10	1	0.1	0	0	0.01	1
168	243	3 = Direct flow	10	1	0.1	0	0	0.01	1
169	242	3 = Direct flow	10	1	0.1	0	0	0.01	1
170	241	3 = Direct flow	10	1	0.1	0	0	0.01	1
171	248	3 = Direct flow	10	1	0.1	0	0	0.01	1
173	270	3 = Direct flow	10	1	0.1	0	0	0.01	1
174	305	3 = Direct flow	10	1	0.1	0	0	0.01	1
175	258	3 = Direct flow	10	1	0.1	0	0	0.01	1
176	252	3 = Direct flow	10	1	0.1	0	0	0.01	1
177	263	3 = Direct flow	10	1	0.1	0	0	0.01	1
178	262	3 = Direct flow	10	1	0.1	0	0	0.01	1
179	261	3 = Direct flow	10	1	0.1	0	0	0.01	1
180	260	3 = Direct flow	10	1	0.1	0	0	0.01	1
181	159	3 = Direct flow	10	1	0.1	0	0	0.01	1
182	283	3 = Direct flow	10	1	0.1	0	0	0.01	1
183	239	3 = Direct flow	10	1	0.1	0	0	0.01	1
184	277	3 = Direct flow	10	1	0.1	0	0	0.01	1
185	284	3 = Direct flow	10	1	0.1	0	0	0.01	1
186	225	3 = Direct flow	10	1	0.1	0	0	0.01	1
187	301	3 = Direct flow	10	1	0.1	0	0	0.01	1
190	289	3 = Direct flow	10	1	0.1	0	0	0.01	1
188	247	3 = Direct flow	10	1	0.1	0	0	0.01	1
200	136	4 = Channel with overflow channel	10	964	0.004	10	10	0.047	2
			50	964	0.004	50	50	0.033	20
202	101	4 = Channel with overflow channel	20	2327	0.003	20	20	0.04	3
			120	2327	0.003	50	50	0.03	20
203	102	4 = Channel with overflow channel	20	1902	0.004	20	20	0.044	3
			120	1902	0.004	50	50	0.033	20
204	103	4 = Channel with overflow channel	20	2673	0.004	20	20	0.044	3
			120	2673	0.004	50	50	0.033	20
205	104	4 = Channel with overflow channel	60	1621	0.003	4	4	0.037	3
			160	1621	0.003	50	50	0.03	20
206	105	4 = Channel with overflow channel	50	4148	0.0034	4	4	0.039	3
			150	4148	0.0034	50	50	0.031	20
207	106	4 = Channel with overflow channel	15	717	0.003	4	4	0.037	4
			115	717	0.003	20	20	0.029	20
208	107	4 = Channel with overflow channel	20	2763	0.003	10	10	0.039	3
			120	2763	0.003	40	40	0.03	20
209	108	4 = Channel with overflow channel	20	3945	0.003	4	4	0.036	5
			120	3945	0.003	40	40	0.03	20
210	109	4 = Channel with overflow channel	20	3217	0.007	4	4	0.053	3
			120	3217	0.007	50	50	0.041	20
211	110	4 = Channel with overflow channel	20	1323	0.008	4	4	0.056	3
			120	1323	0.008	50	50	0.043	20
212	111	4 = Channel with overflow channel	50	2426	0.003	4	4	0.037	3
			150	2426	0.003	50	50	0.03	20
213	112	4 = Channel with overflow channel	20	2473	0.005	4	4	0.046	3
			120	2473	0.005	50	50	0.036	20
214	113	4 = Channel with overflow channel	20	443	0.003	10	10	0.039	3
			120	443	0.003	25	25	0.029	20
215	308	4 = Channel with overflow channel	20	1622	0.003	10	10	0.039	3
			120	1622	0.003	25	25	0.028	25
216	164	4 = Channel with overflow channel	20	1324	0.003	10	10	0.039	3
			120	1324	0.003	25	25	0.029	20
217	116	4 = Channel with overflow channel	20	3243	0.005	10	10	0.047	3
			120	3243	0.005	25	25	0.036	20
218	117	4 = Channel with overflow channel	20	282	0.003	10	10	0.039	3
			120	282	0.003	25	25	0.029	20
219	118	4 = Channel with overflow channel	20	2003	0.003	10	10	0.039	3
			120	2003	0.003	20	20	0.029	20
220	147	4 = Channel with overflow channel	20	2196	0.003	4	4	0.037	4
			120	2196	0.003	20	20	0.029	20
221	120	4 = Channel with overflow channel	20	5356	0.001	4	4	0.024	5
			120	5356	0.001	20	20	0.046	20
222	121	4 = Channel with overflow channel	8	4084	0.012	4	4	0.066	3

Third Creek OSP
Master Plan Conditions Model

Element #	DS Element	Element Type	Diameter/ Bottom Width(ft)	Length(ft)	Slope(ft/ft)	Left Side Slope	Right Side Slope	Mannings N	Full Depth(ft)
			32	4084	0.012	20	20	0.071	20
224	110	4 = Channel with overflow channel	20	2002	0.003	4	4	0.04	2
			120	2002	0.003	50	50	0.03	20
223	105	4 = Channel with overflow channel	20	1141	0.002	10	10	0.035	2
			120	1141	0.002	50	50	0.025	20
225	106	4 = Channel with overflow channel	20	2475	0.001	10	10	0.027	2
			120	2475	0.001	50	50	0.02	20
226	107	4 = Channel with overflow channel	10	2015	0.006	4	4	0.054	2
			110	2015	0.006	50	50	0.039	20
227	126	4 = Channel with overflow channel	20	2686	0.0052	10	10	0.056	1
			120	2686	0.0052	50	50	0.037	20
228	108	4 = Channel with overflow channel	10	645	0.016	4	4	0.078	2
			110	645	0.016	50	50	0.056	20
229	127	4 = Channel with overflow channel	10	838	0.003	4	4	0.041	2
			110	838	0.003	50	50	0.03	20
230	119	4 = Channel with overflow channel	20	302	0.003	4	4	0.037	4
			120	302	0.003	20	20	0.029	20
231	130	4 = Channel with overflow channel	20	2856	0.004	10	10	0.046	2
			120	2856	0.004	50	50	0.033	20
232	111	4 = Channel with overflow channel	20	1120	0.005	10	10	0.05	2
			120	1120	0.005	50	50	0.036	20
233	297	4 = Channel with overflow channel	20	2070	0.008	10	10	0.06	2
			120	2070	0.008	50	50	0.043	20
234	173	4 = Channel with overflow channel	20	3316	0.013	10	10	0.072	2
			120	3316	0.013	50	50	0.052	20
235	140	4 = Channel with overflow channel	40	1047	0.019	10	10	0.09	1
			120	1047	0.019	50	50	0.06	20
236	116	4 = Channel with overflow channel	50	2857	0.0035	10	10	0.047	1
			200	2857	0.0035	50	50	0.031	20
237	184	5 = Pipe with overflow channel	6	183	0.035	0	0	0.013	6
			100	1400	0.005	50	50	0.051	20
239	141	4 = Channel with overflow channel	40	2088	0.003	10	10	0.041	2
			120	2088	0.003	50	50	0.03	20
240	140	4 = Channel with overflow channel	20	2733	0.015	5	5	0.082	1
			120	2733	0.015	50	50	0.055	20
241	139	4 = Channel with overflow channel	20	2126	0.009	10	10	0.069	1
			120	2126	0.009	50	50	0.045	20
242	168	4 = Channel with overflow channel	20	927	0.013	5	5	0.071	2
			120	927	0.013	50	50	0.052	20
243	161	4 = Channel with overflow channel	20	1224	0.002	10	10	0.035	2
			120	1224	0.002	50	50	0.025	20
244	160	4 = Channel with overflow channel	20	1747	0.007	10	10	0.057	2
			120	1747	0.007	50	50	0.041	20
245	163	4 = Channel with overflow channel	20	2060	0.006	10	10	0.054	2
			120	2060	0.006	50	50	0.039	20
246	165	4 = Channel with overflow channel	20	3293	0.007	10	10	0.057	2
			120	3293	0.007	50	50	0.041	20
247	168	4 = Channel with overflow channel	40	1278	0.02	10	10	0.083	2
			120	1278	0.02	50	50	0.061	20
248	170	4 = Channel with overflow channel	100	1834	0.013	10	10	0.077	1
			200	1834	0.013	50	50	0.051	20
250	132	4 = Channel with overflow channel	100	2986	0.008	10	10	0.064	1
			200	2986	0.008	50	50	0.043	20
251	167	4 = Channel with overflow channel	20	1081	0.004	10	10	0.051	1
			120	1081	0.004	50	50	0.033	20
252	174	4 = Channel with overflow channel	20	2585	0.005	5	5	0.049	2
			120	2585	0.005	50	50	0.036	20
254	147	4 = Channel with overflow channel	20	637	0.003	10	10	0.045	1
			120	637	0.003	50	50	0.03	20
255	150	4 = Channel with overflow channel	70	1579	0.004	5	5	0.049	1
			200	1579	0.004	50	50	0.033	20
256	145	4 = Channel with overflow channel	100	2710	0.013	10	10	0.077	1
			200	2710	0.013	50	50	0.051	20
257	149	4 = Channel with overflow channel	100	1831	0.014	10	10	0.079	1
			200	1831	0.014	50	50	0.053	20

Third Creek OSP
Master Plan Conditions Model

Element #	DS Element	Element Type	Diameter/ Bottom Width(ft)	Length(ft)	Slope(ft/ft)	Left Side Slope	Right Side Slope	Mannings N	Full Depth(ft)
258	151	4 = Channel with overflow channel	100	3598	0.01	10	10	0.069	1
			200	3598	0.01	50	50	0.047	20
259	149	4 = Channel with overflow channel	100	1401	0.012	10	10	0.074	1
			200	1401	0.012	50	50	0.05	20
260	150	4 = Channel with overflow channel	100	2084	0.007	10	10	0.06	1
			200	2084	0.007	50	50	0.041	20
261	176	4 = Channel with overflow channel	20	1626	0.009	10	10	0.063	2
			120	1626	0.009	50	50	0.045	20
262	179	4 = Channel with overflow channel	100	1461	0.006	10	10	0.057	1
			200	1461	0.006	50	50	0.038	20
263	179	4 = Channel with overflow channel	100	1278	0.007	10	10	0.06	1
			200	1278	0.007	50	50	0.041	20
264	121	4 = Channel with overflow channel	100	2606	0.019	5	5	0.063	2
			400	2606	0.019	50	50	0.045	20
265	122	4 = Channel with overflow channel	20	1802	0.024	4	4	0.089	2
			120	1802	0.024	50	50	0.065	20
266	312	4 = Channel with overflow channel	20	3270	0.007	5	5	0.056	2
			120	3270	0.007	50	50	0.041	20
267	145	4 = Channel with overflow channel	100	972	0.002	10	10	0.038	1
			200	972	0.002	50	50	0.025	20
268	120	4 = Channel with overflow channel	100	1610	0.031	10	10	0.089	1
			400	1610	0.031	50	50	0.065	20
269	119	4 = Channel with overflow channel	10	730	0.025	10	10	0.103	1
			100	730	0.025	50	50	0.066	20
270	181	4 = Channel with overflow channel	20	1456	0.006	5	5	0.053	2
			120	1456	0.006	50	50	0.039	20
271	164	4 = Channel with overflow channel	50	1908	0.002	10	10	0.035	2
			150	1908	0.002	50	50	0.025	20
273	100	4 = Channel with overflow channel	20	703	0.002	10	10	0.041	2
			120	703	0.002	50	50	0.03	20
274	186	4 = Channel with overflow channel	20	1045	0.001	10	10	0.027	2
			120	1045	0.001	50	50	0.02	20
275	186	4 = Channel with overflow channel	20	1420	0.011	10	10	0.068	2
			120	1420	0.011	50	50	0.049	20
276	137	4 = Channel with overflow channel	20	2158	0.006	4	4	0.047	5
			120	2158	0.006	50	50	0.043	10
277	144	4 = Channel with overflow channel	17	262	0.008	3	3	0.044	1
			120	262	0.008	50	50	0.048	10
278	103	4 = Channel with overflow channel	20	708	0.007	4	4	0.056	2
			120	708	0.007	50	50	0.041	20
279	315	4 = Channel with overflow channel	20	2452	0.003	10	10	0.039	3
			120	2452	0.003	25	25	0.029	20
280	137	4 = Channel with overflow channel	20	1804	0.003	10	10	0.039	3
			120	1804	0.003	50	50	0.03	20
281	133	4 = Channel with overflow channel	20	3622	0.004	10	10	0.046	2
			120	3622	0.004	50	50	0.033	20
282	182	4 = Channel with overflow channel	20	2352	0.006	10	10	0.054	2
			120	2352	0.006	50	50	0.039	20
283	159	4 = Channel with overflow channel	20	1995	0.004	10	10	0.046	2
			120	1995	0.004	50	50	0.033	20
284	132	4 = Channel with overflow channel	20	3155	0.006	10	10	0.054	2
			120	3155	0.006	50	50	0.039	20
285	102	4 = Channel with overflow channel	35	502	0.001	10	10	0.027	2
			135	502	0.001	50	50	0.02	20
286	158	4 = Channel with overflow channel	20	1328	0.004	10	10	0.06	2
			120	1328	0.008	50	50	0.043	20
287	109	5 = Pipe with overflow channel	5	344	0.005	1	1	0.017	5
			120	344	0.004	20	20	0.037	20
288	271	5 = Pipe with overflow channel	5.5	250	0.011	0	0	0.013	5.5
			120	250	0.011	20	20	0.037	20
289	162	5 = Pipe with overflow channel	5.5	2700	0.011	0	0	0.013	3.5
			120	2700	0.011	20	20	0.037	20
296	316	4 = Channel with overflow channel	80	3500	0.002	4	4	0.03	8.5
			120	3500	0.002	50	50	0.028	10
297	298	2 = Pipe	5	350	0.005	0	0	0.013	5

Third Creek OSP
Master Plan Conditions Model

Element #	DS Element	Element Type	Diameter/ Bottom Width(ft)	Length(ft)	Slope(ft/ft)	Left Side Slope	Right Side Slope	Mannings N	Full Depth(ft)
298	211	4 = Channel with overflow channel	20	440	0.008	10	10	0.05	2
			120	440	0.008	50	50	0.04	20
299	302	4 = Channel with overflow channel	20	2854	0.008	10	10	0.046	2
			120	2854	0.004	50	50	0.033	20
301	224	3 = Direct flow	10	1	0.1	0	0	0.01	1
302	233	Detention	0.1	500	0.001	0	0	0.035	0.1
303	188	3 = Direct flow	10	1	0.1	0	0	0.01	1
304	296	3 = Direct flow	10	1	0.1	0	0	0.01	1
305	251	3 = Direct flow	10	1	0.1	0	0	0.01	1
306	140	3 = Direct flow	10	1	0.1	0	0	0.01	1
307	235	3 = Direct flow	10	1	0.1	0	0	0.01	1
308	114	3 = Direct flow	10	1	0.1	0	0	0.01	1
309	286	3 = Direct flow	10	1	0.1	0	0	0.01	1
310	234	3 = Direct flow	10	1	0.1	0	0	0.01	1
311	216	3 = Direct flow	10	1	0.1	0	0	0.01	1
312	148	Detention	0.1	10	0.1	0	0	0	0.1
315	115	Detention	0.1	10	0.1	0	0	0	0.1
316	143	Detention	0.1	10	0.1	0	0	0	0.1
993	1093	3 = Direct flow	0	1					
1093	992	4 = Channel with overflow channel	10	5109	0.008	4	4	0.04	1
			18	5109	0.008	50	50	0.04	10
992	892	3 = Direct flow	0	1					
892	1092	Detention	0.1	1	0.001	0	0	0.015	0.1
1092	1192	4 = Channel with overflow channel	10	2100	0.006	4	4	0.04	1
			18	2100	0.006	50	50	0.04	10
1192	122	5 = Pipe with overflow channel	12.4	60	0.005	0	0	0.013	10
			400	60	0.005	50	50	0.015	14
131	231	3 = Direct flow	0	1					
401	402	3 = Direct flow	0	1					
402	210	2 = Pipe	6.5	196	0.013	0	0	0.015	6.5
140	200	3 = Direct flow	0	1	0	0	0	0	0
403	238	3 = Direct flow	0	1	0	0	0	0	0
238	164	2 = Pipe	7.6	245	0.005	0	0	0.013	8
904	122	Inflow Hydrograph	10	1	0.1	0	0	0.01	10

Input Files

CUHP 100yr Existing Condition

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1 LOWER THIRD CREEK  100 -YEAR Existing BASELINE  11/03
1 100-YEAR .026.078.120.209.296.529.296.209.162.131.104.104.052.052.031.031
1 100-YEAR .031.031.031.031.031.031.031.012.012.012.012.012.012.012.012.012.012
1 100-YEAR .012.012.011.011.011.011.011.011.011.011.011.011.011.011.011.011.011
1 100-YEAR .011.011.011.011.011.011.011.011.011.011.011.011.011

70 1 1 5.   1  1
.186 .666 .289       5.0 .002 50.5   .4   .1 3.13.0018 .508
71 1 1 5.   2  2
.122 .857 .206 42.4 .006 45.2   .4   .1 3.53.0018 .535
71 1 1 5.   3  3
.108 .399 .178       5.0 .013 69.9   .4   .1 4.00.0018 .567
71 1 1 5.   4  4
.110 .388 .149      71.3 .009 31.4   .4   .1 3.91.0018 .561
70 1 1 5.   5  5
.157 .559 .175       7.7 .004146.2   .4   .1 4.34.0018 .589
70 1 1 5.   6  6
.184 .686 .346      16.5 .004167.3   .4   .1 3.67.0018 .545
71 1 1 5.   7  7
.130 .836 .377       5.0 .004207.2   .4   .1 3.01.0018 .501
71 1 1 5.   8  8
.131 .818 .350       5.0 .005178.0   .4   .1 4.27.0018 .585
70 1 1 5.   9  9
.166 .680 .456      4.99 .004169.0   .4   .1 3.02.0018 .501
71 1 1 5.  10  10
.131 .738 .465       7.2 .004187.5   .4   .1 3.00.0018 .500
70 1 1 5.  11  11
.162 .485 .162      7.67 .008 96.0   .4   .1 3.70.0015 .655
71 1 1 5.  12  12
.139 .527 .266      9.46 .007105.6   .4   .1 3.19.0017 .545
70 1 1 5.  13  13
.152 .647 .22912.73 .006137.2   .4   .1 4.20.0017 .610
70 1 1 5.  14  14
.149 .545 .157  5.0 .004141.7   .4   .1 4.20.0017 .610
70 1 1 5.  15  15
.184 .652 .34915.56 .011103.1   .4   .1 4.50.0018 .602
70 1 1 5.  16  16
.1631.254 .286  5.0 .005261.5   .4   .1 4.46.0017 .627
71 1 1 5.  17  17
.104 .575 .261  5.0 .004146.6   .4   .1 3.33.0017 .546
70 1 1 5.  18  18
.1701.021 .530  5.0 .005129.8   .4   .1 4.50.0018 .610
71 1 1 5.  19  19
.114 .368 .188  5.0 .009 77.1   .4   .1 3.85.0018 .566
70 1 1 5.  20  20
.241 .442 .292  5.0 .005111.4   .4   .1 4.35.0018 .590
71 1 1 5.  21  21
.131 .347 .203 8.36 .015 57.9   .4   .1 3.67.0018 .545
71 1 1 5.  22  22
.117 .686 .407  5.0 .004170.7   .4   .1 3.12.0018 .508
71 1 1 5.  23  23
.056 .270 .113  5.0 .010 62.7   .4   .1 3.81.0018 .554
71 1 1 5.  24  24
.061 .307 .123  5.0 .010 67.5   .4   .1 4.50.0018 .600
70 1 1 5.  25  25
.186 .642 .312  5.0 .005140.4   .4   .1 3.32.0018 .522
70 1 1 5.  26  26
.221 .585 .278  5.0 .007118.4   .4   .1 4.09.0018 .573
70 1 1 5.  27  27
.2131.759 .278  7.0 .004398.4   .4   .1 3.18.0018 .516
70 1 1 5.  28  28
.159 .657 .340  5.0 .003173.2   .4   .1 3.40.0018 .527
70 1 1 5.  29  29
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71 1 1 5.  30  30
.137 .761 .332  5.0 .001293.0   .4   .1 4.44.0018 .596
70 1 1 5.  31  31
.165 .451 .296  5.0 .007100.7   .4   .1 4.50.0018 .600
70 1 1 5.  32  32
.143 .577 .341 9.67 .008 73.8   .4   .1 4.50.0017 .647
70 1 1 5.  33  33
.149 .630 .266  5.0 .007 71.9   .4   .1 4.12.0018 .575
70 1 1 5.  34  34
.146 .199 .353 4.99 .009 54.4   .4   .1 4.49.0018 .598
70 1 1 5.  35  35
.182 .798 .343  5.0 .014111.7   .4   .1 4.50.0018 .600
71 1 1 5.  36  36
.116 .588 .258 8.42 .014 86.7   .4   .1 4.50.0018 .600
70 1 1 5.  37  37
.142 .602 .337  5.0 .011 71.4   .4   .1 4.85.0010 .883
71 1 1 5.  38  38
.061 .415 .264  5.0 .018 46.9   .4   .1 4.73.0013 .782
71 1 1 5.  39  39
.095 .275 .233  5.0 .023 47.6   .4   .1 4.92.0009 .937
70 1 1 5.  40  40
.213 .733 .334  5.0 .013107.8   .4   .1 3.89.0017 .602
71 1 1 5.  41  41
.108 .643 .208  6.8 .015 90.7   .4   .1 4.73.0013 .781
70 1 1 5.  42  42
.153 .721 .239 5.24 .011114.2   .4   .1 4.50.0018 .600
70 1 1 5.  43  43
.161 .673 .319 11.3 .017 55.5   .4   .1 4.69.0014 .750
70 1 1 5.  44  44
.169 .484 .168 9.70 .020 62.7   .4   .1 4.50.0018 .600
71 1 1 5.  45  45
.082 .386 .037 13.7 .004106.0   .4   .1 4.60.0016 .682
70 1 1 5.  46  46
.213 .385 .253  5.3 .011 74.4   .4   .1 4.69.0014 .755
70 1 1 5.  47  47
.161 .561 .268  5.0 .017 79.0   .4   .1 4.56.0017 .652
70 1 1 5.  48  48
.173 .580 .192  5.0 .021 72.8   .4   .1 4.50.0018 .600
70 1 1 5.  49  49
.189 1.01 .404  5.0 .008169.2   .4   .1 4.14.0016 .636
70 1 1 5.  50  50
.170 .895 .386  8.1 .010141.7   .4   .1 4.73.0011 .833
71 1 1 5.  51  51
.131 1.08 .464  5.0 .025107.0   .4   .1 4.72.0013 .777
70 1 1 5.  52  52
.150 .720 .405  5.0 .023 83.0   .4   .1 4.72.0013 .777
71 1 1 5.  53  53
.089 .807 .323 6.06 .019 98.0   .4   .1 4.58.0016 .660
70 1 1 5.  54  54
.171 .656 .307 9.61 .011104.9   .4   .1 4.66.0014 .729
71 1 1 5.  55  55
```

```
.078 1.28 .312  5.0 .009195.3   .4   .1 4.57.0017 .654
70 1 1 5.   56  56
.156 .797 .340  5.0 .002273.0   .4   .1 4.00.0018 .580
71 1 1 5.   57  57
.062 .369 .125  5.0 .008 80.3   .4   .1 4.66.0014 .729
70 1 1 5.   58  58
.149 .749 .311 6.22 .007143.2   .4   .1 4.58.0016 .663
71 1 1 5.   59  59
.089 .585 .151 6.71 .015 86.0   .4   .1 4.50.0018 .600
70 1 1 5.   60  60
.136 .680 .343  5.0 .014 98.6   .4   .1 4.62.0015 .695
71 1 1 5.   61  61
.075 .318 .135 4.99 .015 57.4   .4   .1 4.49.0018 .599
71 1 1 5.   62  62
.122 .596 .207  5.0 .022 51.2   .4   .1 4.50.0018 .599
71 1 1 5.   63  63
.185 .596 .207  5.0 .014 68.9   .4   .1 4.50.0018 .599
71 1 1 5.   64  64
.139 .753 .301 4.99 .017 64.1   .4   .1 4.50.0018 .600
70 1 1 5.   65  65
.187 .702 .381  5.0 .021 84.1   .4   .1 4.50.0018 .600
71 1 1 5.   66  66
.089 .381 .292 8.13 .035 45.9   .4   .1 4.50.0018 .600
71 1 1 5.   67  67
.082 .596 .211 15.0 .018 78.2   .4   .1 4.42.0018 .595
70 1 1 5.   68  68
.162 .523 .315  5.0 .009 96.6   .4   .1 3.86.0018 .557
71 1 1 5.   69  69
.102 1.02 .355  5.0 .007183.8   .4   .1 3.73.0018 .548
70 1 1 5.   70  70
.178 1.31 .432  5.0 .016152.8   .4   .1 4.57.0016 .660
70 1 1 5.   71  71
.206 .746 .350  5.0 .008138.1   .4   .1 4.66.0014 .729
71 1 1 5.   72  72
.127 .559 .225  5.0 .014 86.6   .4   .1 4.54.0017 .633
70 1 1 5.   73  73
.175 .519 .192  5.0 .024 64.5   .4   .1 4.49.0018 .600
71 1 1 5.   74  74
.135 .634 .158  5.0 .011102.5   .4   .1 4.50.0018 .600
70 1 1 5.   75  75
.160 .612 .424  5.0 .020 77.3   .4   .1 4.50.0018 .600
70 1 1 5.   76  76
.194 .651 .344  5.0 .015 92.1   .4   .1 4.51.0018 .605
70 1 1 5.   77  77
.212 .411 .212  5.0 .011 76.8   .4   .1 4.52.0018 .617
70 1 1 5.   78  78
.185 .432 .240  5.0 .008 91.4   .4   .1 4.50.0018 .600
71 1 1 5.   79  79
.074 .822 .250  5.0 .010131.1   .4   .1 4.46.0018 .597
70 1 1 5.   80  80
.149 .401 .159  5.0 .008 88.7   .4   .1 3.96.0018 .564
70 1 1 5.   81  81
.165 .428 .218 5.22 .021 60.1   .4   .1 4.50.0018 .600
70 1 1 5.   82  82
.201 .755 .400  5.0 .013109.7   .4   .1 4.47.0018 .598
70 1 1 5.   83  83
.141 .585 .228  5.0 .008110.0   .4   .1 4.50.0018 .600
70 1 1 5.   84  84
.206 .550 .218  5.0 .008106.1   .4   .1 4.50.0018 .600
70 1 1 5.   85  85
.201 .923 .400  5.0 .009148.4   .4   .1 4.13.0018 .576
70 1 1 5.   86  86
.203 .656 .379  5.0 .012104.2   .4   .1 4.16.0018 .577
70 1 1 5.   87  87
.169 .573 .247  5.0 .020 73.9   .4   .1 4.50.0018 .600
70 1 1 5.   88  88
.195 .721 .205 4.98 .007141.2   .4   .1 3.84.0018 .555
71 1 1 5.   89  89
.113 .500 .124 5.03 .008102.8   .4   .1 4.21.0018 .582
71 1 1 5.   90  90
.110 .403 .073  5.0 .013 70.6   .4   .1 3.94.0018 .563
70 1 1 5.   91  91
.201 .672 .382  5.0 .010109.1   .4   .1 3.74.0018 .549
70 1 1 5.   92  92
.165 .716 .418  5.0 .010118.3   .4   .1 4.17.0018 .578
71 1 1 5.   93  93
.113 .740 .393  5.0 .011117.8   .4   .1 4.05.0018 .570
70 1 1 5.   94  94
.189 .529 .331 4.98 .009101.4   .4   .1 3.92.0018 .560
71 1 1 5.   95  95
.140 .749 .343  5.0 .006149.5   .4   .1 3.15.0018 .510
70 1 1 5.   96  96
.201 .776 .368  5.0 .018 95.4   .4   .1 3.68.0018 .546
71 1 1 5.   97  97
.123 1.05 .422  5.0 .010156.4   .4   .1 3.81.0018 .554
71 1 1 5.   98  98
.131 1.04 .413  5.0 .012142.1   .4   .1 3.40.0018 .527
E
```

CUHP 50YR EXISTING CONDITION

```
1 LOWER THIRD CREEK  50 -YEAR Existing BASELINE  11/03
1  50-YEAR .030.081.115.184.279.466.224.184.115.115.074.074.074.055.055.041.041
1  50-YEAR .032.032.032.032.032.032.032.011.011.011.011.011.011.011.011.011.011
1  50-YEAR .011.011.010.010.010.010.010.010.010.010.010.010.010.010.010.010.010
1  50-YEAR .010.010.010.010.010.010.010.010.010.010.010.010.010

70 1 1 5.   1  1
.186 .666 .289       5.0 .002 50.5   .4   .1 3.13.0018 .508
71 1 1 5.   2  2
.122 .857 .206 42.4 .006 45.2   .4   .1 3.53.0018 .535
71 1 1 5.   3  3
.108 .399 .178       5.0 .013 69.9   .4   .1 4.00.0018 .567
71 1 1 5.   4  4
.110 .388 .149      71.3 .009 31.4   .4   .1 3.91.0018 .561
70 1 1 5.   5  5
.157 .559 .175       7.7 .004146.2   .4   .1 4.34.0018 .589
70 1 1 5.   6  6
.184 .686 .346      16.5 .004167.3   .4   .1 3.67.0018 .545
71 1 1 5.   7  7
.130 .836 .377       5.0 .004207.2   .4   .1 3.01.0018 .501
71 1 1 5.   8  8
.131 .818 .350       5.0 .005178.0   .4   .1 4.27.0018 .585
70 1 1 5.   9  9
.166 .680 .456       4.99 .004169.0   .4   .1 3.02.0018 .501
71 1 1 5.   10  10
.131 .738 .465       7.2 .004187.5   .4   .1 3.00.0018 .500
70 1 1 5.   11  11
.162 .485 .162       7.67 .008 96.0   .4   .1 3.70.0015 .655
```

```
71 1 1 5.  12  12
.139 .527 .266      9.46 .007105.6  .4  .1 3.19.0017 .545
70 1 1 5.  13  13
.152 .647 .22912.73 .006137.2  .4  .1 4.20.0017 .610
70 1 1 5.  14  14
.149 .545 .157  5.0 .004141.7  .4  .1 4.20.0017 .610
70 1 1 5.  15  15
.184 .652 .34915.56 .011103.1  .4  .1 4.50.0018 .602
70 1 1 5.  16  16
.1631.254 .286  5.0 .005261.5  .4  .1 4.46.0017 .627
71 1 1 5.  17  17
.104 .575 .261  5.0 .004146.6  .4  .1 3.33.0017 .546
70 1 1 5.  18  18
.1701.021 .530  5.0 .005129.8  .4  .1 4.50.0018 .610
71 1 1 5.  19  19
.114 .368 .188  5.0 .009 77.1  .4  .1 3.85.0018 .566
70 1 1 5.  20  20
.241 .442 .292  5.0 .005111.4  .4  .1 4.35.0018 .590
71 1 1 5.  21  21
.131 .347 .203 8.36 .015 57.9  .4  .1 3.67.0018 .545
71 1 1 5.  22  22
.117 .686 .407  5.0 .004170.7  .4  .1 3.12.0018 .508
71 1 1 5.  23  23
.056 .270 .113  5.0 .010 62.7  .4  .1 3.81.0018 .554
71 1 1 5.  24  24
.061 .307 .123  5.0 .010 67.5  .4  .1 4.50.0018 .600
70 1 1 5.  25  25
.186 .642 .312  5.0 .005140.4  .4  .1 3.32.0018 .522
70 1 1 5.  26  26
.221 .585 .278  5.0 .007118.4  .4  .1 4.09.0018 .573
70 1 1 5.  27  27
.2131.759 .278  7.0 .004398.4  .4  .1 3.18.0018 .516
70 1 1 5.  28  28
.159 .657 .340  5.0 .003173.2  .4  .1 3.40.0018 .527
70 1 1 5.  29  29
.142 .828 .353  5.0 .005188.8  .4  .1 4.36.0018 .591
71 1 1 5.  30  30
.137 .761 .332  5.0 .001293.0  .4  .1 4.44.0018 .596
70 1 1 5.  31  31
.165 .451 .296  5.0 .007100.7  .4  .1 4.50.0018 .600
70 1 1 5.  32  32
.143 .577 .341 9.67 .008 73.8  .4  .1 4.50.0017 .647
70 1 1 5.  33  33
.149 .630 .266  5.0 .007 71.9  .4  .1 4.12.0018 .575
70 1 1 5.  34  34
.146 .199 .353 4.99 .009 54.4  .4  .1 4.49.0018 .598
70 1 1 5.  35  35
.182 .798 .343  5.0 .014111.7  .4  .1 4.50.0018 .600
71 1 1 5.  36  36
.116 .588 .258 8.42 .014 86.7  .4  .1 4.50.0018 .600
70 1 1 5.  37  37
.142 .602 .337  5.0 .011 71.4  .4  .1 4.85.0010 .883
71 1 1 5.  38  38
.061 .415 .264  5.0 .018 46.9  .4  .1 4.73.0013 .782
71 1 1 5.  39  39
.095 .275 .233  5.0 .023 47.6  .4  .1 4.92.0009 .937
70 1 1 5.  40  40
.213 .733 .334  5.0 .013107.8  .4  .1 3.89.0017 .602
71 1 1 5.  41  41
.108 .643 .208  6.8 .015 90.7  .4  .1 4.73.0013 .781
70 1 1 5.  42  42
.153 .721 .239 5.24 .011114.2  .4  .1 4.50.0018 .600
70 1 1 5.  43  43
.161 .673 .319 11.3 .017 55.5  .4  .1 4.69.0014 .750
70 1 1 5.  44  44
.169 .484 .168 9.70 .020 62.7  .4  .1 4.50.0018 .600
71 1 1 5.  45  45
.082 .386 .037 13.7 .004106.0  .4  .1 4.60.0016 .682
70 1 1 5.  46  46
.213 .385 .253  5.3 .011 74.4  .4  .1 4.69.0014 .755
70 1 1 5.  47  47
.161 .561 .268  5.0 .017 79.0  .4  .1 4.56.0017 .652
70 1 1 5.  48  48
.173 .580 .192  5.0 .021 72.8  .4  .1 4.50.0018 .600
70 1 1 5.  49  49
.189 1.01 .404  5.0 .008169.2  .4  .1 4.14.0016 .636
70 1 1 5.  50  50
.170 .895 .386  8.1 .010141.7  .4  .1 4.73.0011 .833
71 1 1 5.  51  51
.131 1.08 .464  5.0 .025107.0  .4  .1 4.72.0013 .777
70 1 1 5.  52  52
.150 .720 .405  5.0 .023 83.0  .4  .1 4.72.0013 .777
71 1 1 5.  53  53
.089 .807 .323 6.06 .019 98.0  .4  .1 4.58.0016 .660
70 1 1 5.  54  54
.171 .656 .307 9.61 .011104.9  .4  .1 4.66.0014 .729
71 1 1 5.  55  55
.078 1.28 .312  5.0 .009195.3  .4  .1 4.57.0017 .654
70 1 1 5.  56  56
.156 .797 .340  5.0 .002273.0  .4  .1 4.00.0018 .580
71 1 1 5.  57  57
.062 .369 .125  5.0 .008 80.3  .4  .1 4.66.0014 .729
70 1 1 5.  58  58
.149 .749 .311 6.22 .007143.2  .4  .1 4.58.0016 .663
71 1 1 5.  59  59
.089 .585 .151 6.71 .015 86.0  .4  .1 4.50.0018 .600
70 1 1 5.  60  60
.136 .680 .343  5.0 .014 98.6  .4  .1 4.62.0015 .695
71 1 1 5.  61  61
.075 .318 .135 4.99 .015 57.4  .4  .1 4.49.0018 .599
71 1 1 5.  62  62
.122 .596 .207  5.0 .022 51.2  .4  .1 4.50.0018 .599
71 1 1 5.  63  63
.185 .596 .207  5.0 .014 68.9  .4  .1 4.50.0018 .599
71 1 1 5.  64  64
.139 .753 .301 4.99 .017 64.1  .4  .1 4.50.0018 .600
70 1 1 5.  65  65
.187 .702 .381  5.0 .021 84.1  .4  .1 4.50.0018 .600
71 1 1 5.  66  66
.089 .381 .292 8.13 .035 45.9  .4  .1 4.50.0018 .600
71 1 1 5.  67  67
.082 .596 .211 15.0 .018 78.2  .4  .1 4.42.0018 .595
70 1 1 5.  68  68
.162 .523 .315  5.0 .009 96.6  .4  .1 3.86.0018 .557
71 1 1 5.  69  69
.102 1.02 .355  5.0 .007183.8  .4  .1 3.73.0018 .548
70 1 1 5.  70  70
.178 1.31 .432  5.0 .016152.8  .4  .1 4.57.0016 .660
70 1 1 5.  71  71
.206 .746 .350  5.0 .008138.1  .4  .1 4.66.0014 .729
```

```
71 1 1 5.  72  72
.127 .559 .225  5.0 .014 86.6  .4  .1 4.54.0017 .633
70 1 1 5.  73  73
.175 .519 .192  5.0 .024 64.5  .4  .1 4.49.0018 .600
71 1 1 5.  74  74
.135 .634 .158  5.0 .011102.5  .4  .1 4.50.0018 .600
70 1 1 5.  75  75
.160 .612 .424  5.0 .020 77.3  .4  .1 4.50.0018 .600
70 1 1 5.  76  76
.194 .651 .344  5.0 .015 92.1  .4  .1 4.51.0018 .605
70 1 1 5.  77  77
.212 .411 .212  5.0 .011 76.8  .4  .1 4.52.0018 .617
70 1 1 5.  78  78
.185 .432 .240  5.0 .008 91.4  .4  .1 4.50.0018 .600
71 1 1 5.  79  79
.074 .822 .250  5.0 .010131.1  .4  .1 4.46.0018 .597
70 1 1 5.  80  80
.149 .401 .159  5.0 .008 88.7  .4  .1 3.96.0018 .564
70 1 1 5.  81  81
.165 .428 .218 5.22 .021 60.1  .4  .1 4.50.0018 .600
70 1 1 5.  82  82
.201 .755 .400  5.0 .013109.7  .4  .1 4.47.0018 .598
70 1 1 5.  83  83
.141 .585 .228  5.0 .008110.0  .4  .1 4.50.0018 .600
70 1 1 5.  84  84
.206 .550 .218  5.0 .008106.1  .4  .1 4.50.0018 .600
70 1 1 5.  85  85
.201 .923 .400  5.0 .009148.4  .4  .1 4.13.0018 .576
70 1 1 5.  86  86
.203 .656 .379  5.0 .012104.2  .4  .1 4.16.0018 .577
70 1 1 5.  87  87
.169 .573 .247  5.0 .020 73.9  .4  .1 4.50.0018 .600
70 1 1 5.  88  88
.195 .721 .205 4.98 .007141.2  .4  .1 3.84.0018 .555
71 1 1 5.  89  89
.113 .500 .124 5.03 .008102.8  .4  .1 4.21.0018 .582
71 1 1 5.  90  90
.110 .403 .073  5.0 .013 70.6  .4  .1 3.94.0018 .563
70 1 1 5.  91  91
.201 .672 .382  5.0 .010109.1  .4  .1 3.74.0018 .549
70 1 1 5.  92  92
.165 .716 .418  5.0 .010118.3  .4  .1 4.17.0018 .578
71 1 1 5.  93  93
.113 .740 .393  5.0 .011117.8  .4  .1 4.05.0018 .570
70 1 1 5.  94  94
.189 .529 .331 4.98 .009101.4  .4  .1 3.92.0018 .560
71 1 1 5.  95  95
.140 .749 .343  5.0 .006149.5  .4  .1 3.15.0018 .510
70 1 1 5.  96  96
.201 .776 .368  5.0 .018 95.4  .4  .1 3.68.0018 .546
71 1 1 5.  97  97
.123 1.05 .422  5.0 .010156.4  .4  .1 3.81.0018 .554
71 1 1 5.  98  98
.131 1.04 .413  5.0 .012142.1  .4  .1 3.40.0018 .527
E
```

CUHP 10YR EXISTING CONDITION

```
1 LOWER THIRD CREEK  10 -YEAR Existing BASELINE   11/03
1  10-YEAR .032.060.132.196.326.156.090.069.061.052.052.052.052.052.052.040.031
1  10-YEAR .031.031.031.031.031.011.011.011.011.011.011.011.011.011.011.011
1  10-YEAR .008.008.008.008.008.008.008.008.008.008.008.008.008.008.008.008
1  10-YEAR .008.008.008.008.008.008.008.008.008.008.008.008

70 1 1 5.  1  1
.186 .666 .289      5.0 .002 50.5  .4  .1 3.13.0018 .508
71 1 1 5.  2  2
.122 .857 .206 42.4 .006 45.2  .4  .1 3.53.0018 .535
71 1 1 5.  3  3
.108 .399 .178      5.0 .013 69.9  .4  .1 4.00.0018 .567
71 1 1 5.  4  4
.110 .388 .149     71.3 .009 31.4  .4  .1 3.91.0018 .561
70 1 1 5.  5  5
.157 .559 .175      7.7 .004146.2  .4  .1 4.34.0018 .589
70 1 1 5.  6  6
.184 .686 .346     16.5 .004167.3  .4  .1 3.67.0018 .545
71 1 1 5.  7  7
.130 .836 .377      5.0 .004207.2  .4  .1 3.01.0018 .501
71 1 1 5.  8  8
.131 .818 .350      5.0 .005178.0  .4  .1 4.27.0018 .585
70 1 1 5.  9  9
.166 .680 .456     4.99 .004169.0  .4  .1 3.02.0018 .501
71 1 1 5.  10  10
.131 .738 .465      7.2 .004187.5  .4  .1 3.00.0018 .500
70 1 1 5.  11  11
.162 .485 .162     7.67 .008 96.0  .4  .1 3.70.0015 .655
71 1 1 5.  12  12
.139 .527 .266     9.46 .007105.6  .4  .1 3.19.0017 .545
70 1 1 5.  13  13
.152 .647 .22912.73 .006137.2  .4  .1 4.20.0017 .610
70 1 1 5.  14  14
.149 .545 .157  5.0 .004141.7  .4  .1 4.20.0017 .610
70 1 1 5.  15  15
.184 .652 .34915.56 .011103.1  .4  .1 4.50.0018 .602
70 1 1 5.  16  16
.1631.254 .286  5.0 .005261.5  .4  .1 4.46.0017 .627
71 1 1 5.  17  17
.104 .575 .261  5.0 .004146.6  .4  .1 3.33.0017 .546
70 1 1 5.  18  18
.1701.021 .530  5.0 .005129.8  .4  .1 4.50.0018 .610
71 1 1 5.  19  19
.114 .368 .188  5.0 .009 77.1  .4  .1 3.85.0018 .566
70 1 1 5.  20  20
.241 .442 .292  5.0 .005111.4  .4  .1 4.35.0018 .590
71 1 1 5.  21  21
.131 .347 .203 8.36 .015 57.9  .4  .1 3.67.0018 .545
71 1 1 5.  22  22
.117 .686 .407  5.0 .004170.7  .4  .1 3.12.0018 .508
71 1 1 5.  23  23
.056 .270 .113  5.0 .010 62.7  .4  .1 3.81.0018 .554
71 1 1 5.  24  24
.061 .307 .123  5.0 .010 67.5  .4  .1 4.50.0018 .600
70 1 1 5.  25  25
.186 .642 .312  5.0 .005140.4  .4  .1 3.32.0018 .522
70 1 1 5.  26  26
.221 .585 .278  5.0 .007118.4  .4  .1 4.09.0018 .573
70 1 1 5.  27  27
.2131.759 .278  7.0 .004398.4  .4  .1 3.18.0018 .516
```

```
70 1 1 5.  28  28
.159 .657 .340  5.0 .003173.2  .4  .1 3.40.0018 .527
70 1 1 5.  29  29
.142 .828 .353  5.0 .005188.8  .4  .1 4.36.0018 .591
71 1 1 5.  30  30
.137 .761 .332  5.0 .001293.0  .4  .1 4.44.0018 .596
70 1 1 5.  31  31
.165 .451 .296  5.0 .007100.7  .4  .1 4.50.0018 .600
70 1 1 5.  32  32
.143 .577 .341 9.67 .008 73.8  .4  .1 4.50.0017 .647
70 1 1 5.  33  33
.149 .630 .266  5.0 .007 71.9  .4  .1 4.12.0018 .575
70 1 1 5.  34  34
.146 .199 .353 4.99 .009 54.4  .4  .1 4.49.0018 .598
70 1 1 5.  35  35
.182 .798 .343  5.0 .014111.7  .4  .1 4.50.0018 .600
71 1 1 5.  36  36
.116 .588 .258 8.42 .014 86.7  .4  .1 4.50.0018 .600
70 1 1 5.  37  37
.142 .602 .337  5.0 .011 71.4  .4  .1 4.85.0010 .883
71 1 1 5.  38  38
.061 .415 .264  5.0 .018 46.9  .4  .1 4.73.0013 .782
71 1 1 5.  39  39
.095 .275 .233  5.0 .023 47.6  .4  .1 4.92.0009 .937
70 1 1 5.  40  40
.213 .733 .334  5.0 .013107.8  .4  .1 3.89.0017 .602
71 1 1 5.  41  41
.108 .643 .208  6.8 .015 90.7  .4  .1 4.73.0013 .781
70 1 1 5.  42  42
.153 .721 .239 5.24 .011114.2  .4  .1 4.50.0018 .600
70 1 1 5.  43  43
.161 .673 .319 11.3 .017 55.5  .4  .1 4.69.0014 .750
70 1 1 5.  44  44
.169 .484 .168 9.70 .020 62.7  .4  .1 4.50.0018 .600
71 1 1 5.  45  45
.082 .386 .037 13.7 .004106.0  .4  .1 4.60.0016 .682
70 1 1 5.  46  46
.213 .385 .253  5.3 .011 74.4  .4  .1 4.69.0014 .755
70 1 1 5.  47  47
.161 .561 .268  5.0 .017 79.0  .4  .1 4.56.0017 .652
70 1 1 5.  48  48
.173 .580 .192  5.0 .021 72.8  .4  .1 4.50.0018 .600
70 1 1 5.  49  49
.189 1.01 .404  5.0 .008169.2  .4  .1 4.14.0016 .636
70 1 1 5.  50  50
.170 .895 .386  8.1 .010141.7  .4  .1 4.73.0011 .833
71 1 1 5.  51  51
.131 1.08 .464  5.0 .025107.0  .4  .1 4.72.0013 .777
70 1 1 5.  52  52
.150 .720 .405  5.0 .023 83.0  .4  .1 4.72.0013 .777
71 1 1 5.  53  53
.089 .807 .323 6.06 .019 98.0  .4  .1 4.58.0016 .660
70 1 1 5.  54  54
.171 .656 .307 9.61 .011104.9  .4  .1 4.66.0014 .729
71 1 1 5.  55  55
.078 1.28 .312  5.0 .009195.3  .4  .1 4.57.0017 .654
70 1 1 5.  56  56
.156 .797 .340  5.0 .002273.0  .4  .1 4.00.0018 .580
71 1 1 5.  57  57
.062 .369 .125  5.0 .008 80.3  .4  .1 4.66.0014 .729
70 1 1 5.  58  58
.149 .749 .311 6.22 .007143.2  .4  .1 4.58.0016 .663
71 1 1 5.  59  59
.089 .585 .151 6.71 .015 86.0  .4  .1 4.50.0018 .600
70 1 1 5.  60  60
.136 .680 .343  5.0 .014 98.6  .4  .1 4.62.0015 .695
71 1 1 5.  61  61
.075 .318 .135 4.99 .015 57.4  .4  .1 4.49.0018 .599
71 1 1 5.  62  62
.122 .596 .207  5.0 .022 51.2  .4  .1 4.50.0018 .599
71 1 1 5.  63  63
.185 .596 .207  5.0 .014 68.9  .4  .1 4.50.0018 .599
71 1 1 5.  64  64
.139 .753 .301 4.99 .017 64.1  .4  .1 4.50.0018 .600
70 1 1 5.  65  65
.187 .702 .381  5.0 .021 84.1  .4  .1 4.50.0018 .600
71 1 1 5.  66  66
.089 .381 .292 8.13 .035 45.9  .4  .1 4.50.0018 .600
71 1 1 5.  67  67
.082 .596 .211 15.0 .018 78.2  .4  .1 4.42.0018 .595
70 1 1 5.  68  68
.162 .523 .315  5.0 .009 96.6  .4  .1 3.86.0018 .557
71 1 1 5.  69  69
.102 1.02 .355  5.0 .007183.8  .4  .1 3.73.0018 .548
70 1 1 5.  70  70
.178 1.31 .432  5.0 .016152.8  .4  .1 4.57.0016 .660
70 1 1 5.  71  71
.206 .746 .350  5.0 .008138.1  .4  .1 4.66.0014 .729
71 1 1 5.  72  72
.127 .559 .225  5.0 .014 86.6  .4  .1 4.54.0017 .633
70 1 1 5.  73  73
.175 .519 .192  5.0 .024 64.5  .4  .1 4.49.0018 .600
71 1 1 5.  74  74
.135 .634 .158  5.0 .011102.5  .4  .1 4.50.0018 .600
70 1 1 5.  75  75
.160 .612 .424  5.0 .020 77.3  .4  .1 4.50.0018 .600
70 1 1 5.  76  76
.194 .651 .344  5.0 .015 92.1  .4  .1 4.51.0018 .605
70 1 1 5.  77  77
.212 .411 .212  5.0 .011 76.8  .4  .1 4.52.0018 .617
70 1 1 5.  78  78
.185 .432 .240  5.0 .008 91.4  .4  .1 4.50.0018 .600
71 1 1 5.  79  79
.074 .822 .250  5.0 .010131.1  .4  .1 4.46.0018 .597
70 1 1 5.  80  80
.149 .401 .159  5.0 .008 88.7  .4  .1 3.96.0018 .564
70 1 1 5.  81  81
.165 .428 .218 5.22 .021 60.1  .4  .1 4.50.0018 .600
70 1 1 5.  82  82
.201 .755 .400  5.0 .013109.7  .4  .1 4.47.0018 .598
70 1 1 5.  83  83
.141 .585 .228  5.0 .008110.0  .4  .1 4.50.0018 .600
70 1 1 5.  84  84
.206 .550 .218  5.0 .008106.1  .4  .1 4.50.0018 .600
70 1 1 5.  85  85
.201 .923 .400  5.0 .009148.4  .4  .1 4.13.0018 .576
70 1 1 5.  86  86
.203 .656 .379  5.0 .012104.2  .4  .1 4.16.0018 .577
70 1 1 5.  87  87
.169 .573 .247  5.0 .020 73.9  .4  .1 4.50.0018 .600
```

```
70 1 1 5.  88  88
.195 .721 .205 4.98 .007141.2  .4  .1 3.84.0018 .555
71 1 1 5.  89  89
.113 .500 .124 5.03 .008102.8  .4  .1 4.21.0018 .582
71 1 1 5.  90  90
.110 .403 .073  5.0 .013 70.6  .4  .1 3.94.0018 .563
70 1 1 5.  91  91
.201 .672 .382  5.0 .010109.1  .4  .1 3.74.0018 .549
70 1 1 5.  92  92
.165 .716 .418  5.0 .010118.3  .4  .1 4.17.0018 .578
71 1 1 5.  93  93
.113 .740 .393  5.0 .011117.8  .4  .1 4.05.0018 .570
70 1 1 5.  94  94
.189 .529 .331 4.98 .009101.4  .4  .1 3.92.0018 .560
71 1 1 5.  95  95
.140 .749 .343  5.0 .006149.5  .4  .1 3.15.0018 .510
70 1 1 5.  96  96
.201 .776 .368  5.0 .018 95.4  .4  .1 3.68.0018 .546
71 1 1 5.  97  97
.123 1.05 .422  5.0 .010156.4  .4  .1 3.81.0018 .554
71 1 1 5.  98  98
.131 1.04 .413  5.0 .012142.1  .4  .1 3.40.0018 .527
E
```

CUHP 5YR EXISTING CONDITION

```
1 LOWER THIRD CREEK  5 -YEAR Existing BASELINE   11/03
 1  5 -YEAR .027.050.117.166.271.141.078.059.048.048.040.040.040.040.034.029.029
 1  5 -YEAR .029.029.020.020.020.020.017.012.012.012.012.012.012.012.012.012.012
 1  5 -YEAR .012.012.007.007.007.007.007.007.007.007.007.007.007.007.007.007.007
 1  5 -YEAR .007.007.007.007.007.007.007.007.007.007.007.007.007

70 1 1 5.   1   1
.186 .666 .289       5.0 .002 50.5   .4   .1 3.13.0018 .508
71 1 1 5.   2   2
.122 .857 .206 42.4 .006 45.2   .4   .1 3.53.0018 .535
71 1 1 5.   3   3
.108 .399 .178       5.0 .013 69.9   .4   .1 4.00.0018 .567
71 1 1 5.   4   4
.110 .388 .149      71.3 .009 31.4   .4   .1 3.91.0018 .561
70 1 1 5.   5   5
.157 .559 .175       7.7 .004146.2   .4   .1 4.34.0018 .589
70 1 1 5.   6   6
.184 .686 .346      16.5 .004167.3   .4   .1 3.67.0018 .545
71 1 1 5.   7   7
.130 .836 .377       5.0 .004207.2   .4   .1 3.01.0018 .501
71 1 1 5.   8   8
.131 .818 .350       5.0 .005178.0   .4   .1 4.27.0018 .585
70 1 1 5.   9   9
.166 .680 .456      4.99 .004169.0   .4   .1 3.02.0018 .501
71 1 1 5.  10  10
.131 .738 .465       7.2 .004187.5   .4   .1 3.00.0018 .500
70 1 1 5.  11  11
.162 .485 .162      7.67 .008 96.0   .4   .1 3.70.0015 .655
71 1 1 5.  12  12
.139 .527 .266      9.46 .007105.6   .4   .1 3.19.0017 .545
70 1 1 5.  13  13
.152 .647 .22912.73 .006137.2   .4   .1 4.20.0017 .610
70 1 1 5.  14  14
.149 .545 .157  5.0 .004141.7   .4   .1 4.20.0017 .610
70 1 1 5.  15  15
.184 .652 .34915.56 .011103.1   .4   .1 4.50.0018 .602
70 1 1 5.  16  16
.1631.254 .286  5.0 .005261.5   .4   .1 4.46.0017 .627
71 1 1 5.  17  17
.104 .575 .261  5.0 .004146.6   .4   .1 3.33.0017 .546
70 1 1 5.  18  18
.1701.021 .530  5.0 .005129.8   .4   .1 4.50.0018 .610
71 1 1 5.  19  19
.114 .368 .188  5.0 .009 77.1   .4   .1 3.85.0018 .566
70 1 1 5.  20  20
.241 .442 .292  5.0 .005111.4   .4   .1 4.35.0018 .590
71 1 1 5.  21  21
.131 .347 .203 8.36 .015 57.9   .4   .1 3.67.0018 .545
71 1 1 5.  22  22
.117 .686 .407  5.0 .004170.7   .4   .1 3.12.0018 .508
71 1 1 5.  23  23
.056 .270 .113  5.0 .010 62.7   .4   .1 3.81.0018 .554
71 1 1 5.  24  24
.061 .307 .123  5.0 .010 67.5   .4   .1 4.50.0018 .600
70 1 1 5.  25  25
.186 .642 .312  5.0 .005140.4   .4   .1 3.32.0018 .522
70 1 1 5.  26  26
.221 .585 .278  5.0 .007118.4   .4   .1 4.09.0018 .573
70 1 1 5.  27  27
.2131.759 .278  7.0 .004398.4   .4   .1 3.18.0018 .516
70 1 1 5.  28  28
.159 .657 .340  5.0 .003173.2   .4   .1 3.40.0018 .527
70 1 1 5.  29  29
.142 .828 .353  5.0 .005188.8   .4   .1 4.36.0018 .591
71 1 1 5.  30  30
.137 .761 .332  5.0 .001293.0   .4   .1 4.44.0018 .596
70 1 1 5.  31  31
.165 .451 .296  5.0 .007100.7   .4   .1 4.50.0018 .600
70 1 1 5.  32  32
.143 .577 .341 9.67 .008 73.8   .4   .1 4.50.0017 .647
70 1 1 5.  33  33
.149 .630 .266  5.0 .007 71.9   .4   .1 4.12.0018 .575
70 1 1 5.  34  34
.146 .199 .353 4.99 .009 54.4   .4   .1 4.49.0018 .598
70 1 1 5.  35  35
.182 .798 .343  5.0 .014111.7   .4   .1 4.50.0018 .600
71 1 1 5.  36  36
.116 .588 .258 8.42 .014 86.7   .4   .1 4.50.0018 .600
70 1 1 5.  37  37
.142 .602 .337  5.0 .011 71.4   .4   .1 4.85.0010 .883
71 1 1 5.  38  38
.061 .415 .264  5.0 .018 46.9   .4   .1 4.73.0013 .782
71 1 1 5.  39  39
.095 .275 .233  5.0 .023 47.6   .4   .1 4.92.0009 .937
70 1 1 5.  40  40
.213 .733 .334  5.0 .013107.8   .4   .1 3.89.0017 .602
71 1 1 5.  41  41
.108 .643 .208  6.8 .015 90.7   .4   .1 4.73.0013 .781
70 1 1 5.  42  42
.153 .721 .239 5.24 .011114.2   .4   .1 4.50.0018 .600
70 1 1 5.  43  43
.161 .673 .319 11.3 .017 55.5   .4   .1 4.69.0014 .750
70 1 1 5.  44  44
.169 .484 .168 9.70 .020 62.7   .4   .1 4.50.0018 .600
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```
71 1 1 5.  45  45
.082 .386 .037 13.7 .004106.0   .4   .1 4.60.0016 .682
70 1 1 5.  46  46
.213 .385 .253  5.3 .011 74.4   .4   .1 4.69.0014 .755
70 1 1 5.  47  47
.161 .561 .268  5.0 .017 79.0   .4   .1 4.56.0017 .652
70 1 1 5.  48  48
.173 .580 .192  5.0 .021 72.8   .4   .1 4.50.0018 .600
70 1 1 5.  49  49
.189 1.01 .404  5.0 .008169.2   .4   .1 4.14.0016 .636
70 1 1 5.  50  50
.170 .895 .386  8.1 .010141.7   .4   .1 4.73.0011 .833
71 1 1 5.  51  51
.131 1.08 .464  5.0 .025107.0   .4   .1 4.72.0013 .777
70 1 1 5.  52  52
.150 .720 .405  5.0 .023 83.0   .4   .1 4.72.0013 .777
71 1 1 5.  53  53
.089 .807 .323 6.06 .019 98.0   .4   .1 4.58.0016 .660
70 1 1 5.  54  54
.171 .656 .307 9.61 .011104.9   .4   .1 4.66.0014 .729
71 1 1 5.  55  55
.078 1.28 .312  5.0 .009195.3   .4   .1 4.57.0017 .654
70 1 1 5.  56  56
.156 .797 .340  5.0 .002273.0   .4   .1 4.00.0018 .580
71 1 1 5.  57  57
.062 .369 .125  5.0 .008 80.3   .4   .1 4.66.0014 .729
70 1 1 5.  58  58
.149 .749 .311 6.22 .007143.2   .4   .1 4.58.0016 .663
71 1 1 5.  59  59
.089 .585 .151 6.71 .015 86.0   .4   .1 4.50.0018 .600
70 1 1 5.  60  60
.136 .680 .343  5.0 .014 98.6   .4   .1 4.62.0015 .695
71 1 1 5.  61  61
.075 .318 .135 4.99 .015 57.4   .4   .1 4.49.0018 .599
71 1 1 5.  62  62
.122 .596 .207  5.0 .022 51.2   .4   .1 4.50.0018 .599
71 1 1 5.  63  63
.185 .596 .207  5.0 .014 68.9   .4   .1 4.50.0018 .599
71 1 1 5.  64  64
.139 .753 .301 4.99 .017 64.1   .4   .1 4.50.0018 .600
70 1 1 5.  65  65
.187 .702 .381  5.0 .021 84.1   .4   .1 4.50.0018 .600
71 1 1 5.  66  66
.089 .381 .292 8.13 .035 45.9   .4   .1 4.50.0018 .600
71 1 1 5.  67  67
.082 .596 .211 15.0 .018 78.2   .4   .1 4.42.0018 .595
70 1 1 5.  68  68
.162 .523 .315  5.0 .009 96.6   .4   .1 3.86.0018 .557
71 1 1 5.  69  69
.102 1.02 .355  5.0 .007183.8   .4   .1 3.73.0018 .548
70 1 1 5.  70  70
.178 1.31 .432  5.0 .016152.8   .4   .1 4.57.0016 .660
70 1 1 5.  71  71
.206 .746 .350  5.0 .008138.1   .4   .1 4.66.0014 .729
71 1 1 5.  72  72
.127 .559 .225  5.0 .014 86.6   .4   .1 4.54.0017 .633
70 1 1 5.  73  73
.175 .519 .192  5.0 .024 64.5   .4   .1 4.49.0018 .600
71 1 1 5.  74  74
.135 .634 .158  5.0 .011102.5   .4   .1 4.50.0018 .600
70 1 1 5.  75  75
.160 .612 .424  5.0 .020 77.3   .4   .1 4.50.0018 .600
70 1 1 5.  76  76
.194 .651 .344  5.0 .015 92.1   .4   .1 4.51.0018 .605
70 1 1 5.  77  77
.212 .411 .212  5.0 .011 76.8   .4   .1 4.52.0018 .617
70 1 1 5.  78  78
.185 .432 .240  5.0 .008 91.4   .4   .1 4.50.0018 .600
71 1 1 5.  79  79
.074 .822 .250  5.0 .010131.1   .4   .1 4.46.0018 .597
70 1 1 5.  80  80
.149 .401 .159  5.0 .008 88.7   .4   .1 3.96.0018 .564
70 1 1 5.  81  81
.165 .428 .218 5.22 .021 60.1   .4   .1 4.50.0018 .600
70 1 1 5.  82  82
.201 .755 .400  5.0 .013109.7   .4   .1 4.47.0018 .598
70 1 1 5.  83  83
.141 .585 .228  5.0 .008110.0   .4   .1 4.50.0018 .600
70 1 1 5.  84  84
.206 .550 .218  5.0 .008106.1   .4   .1 4.50.0018 .600
70 1 1 5.  85  85
.201 .923 .400  5.0 .009148.4   .4   .1 4.13.0018 .576
70 1 1 5.  86  86
.203 .656 .379  5.0 .012104.2   .4   .1 4.16.0018 .577
70 1 1 5.  87  87
.169 .573 .247  5.0 .020 73.9   .4   .1 4.50.0018 .600
70 1 1 5.  88  88
.195 .721 .205 4.98 .007141.2   .4   .1 3.84.0018 .555
71 1 1 5.  89  89
.113 .500 .124 5.03 .008102.8   .4   .1 4.21.0018 .582
71 1 1 5.  90  90
.110 .403 .073  5.0 .013 70.6   .4   .1 3.94.0018 .563
70 1 1 5.  91  91
.201 .672 .382  5.0 .010109.1   .4   .1 3.74.0018 .549
70 1 1 5.  92  92
.165 .716 .418  5.0 .010118.3   .4   .1 4.17.0018 .578
71 1 1 5.  93  93
.113 .740 .393  5.0 .011117.8   .4   .1 4.05.0018 .570
70 1 1 5.  94  94
.189 .529 .331 4.98 .009101.4   .4   .1 3.92.0018 .560
71 1 1 5.  95  95
.140 .749 .343  5.0 .006149.5   .4   .1 3.15.0018 .510
70 1 1 5.  96  96
.201 .776 .368  5.0 .018 95.4   .4   .1 3.68.0018 .546
71 1 1 5.  97  97
.123 1.05 .422  5.0 .010156.4   .4   .1 3.81.0018 .554
71 1 1 5.  98  98
.131 1.04 .413  5.0 .012142.1   .4   .1 3.40.0018 .527
E
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CUHP 2YR EXISTING CONDITION

```
1 LOWER THIRD CREEK  2 -YEAR Existing BASELINE   11/03
 1 002-YEAR .018.036.076.118.184.103.057.046.027.027.027.027.027.018.018.018.018
 1 002-YEAR .018.018.018.018.018.009.009.014.014.014.014.014.014.014.014.014.014
 1 002-YEAR .014.014.006.006.006.006.006.006.006.006.006.006.006.006.006.006.006
 1 002-YEAR .006.006.006.006.006.006.006.006.006.006.006.006.006

 70 1 1 5.   1   1
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.186 .666 .289       5.0 .002 50.5   .4   .1 3.13.0018 .508
71 1 1 5.   2  2
.122 .857 .206 42.4 .006 45.2   .4   .1 3.53.0018 .535
71 1 1 5.   3  3
.108 .399 .178       5.0 .013 69.9   .4   .1 4.00.0018 .567
71 1 1 5.   4  4
.110 .388 .149      71.3 .009 31.4   .4   .1 3.91.0018 .561
70 1 1 5.   5  5
.157 .559 .175       7.7 .004146.2   .4   .1 4.34.0018 .589
70 1 1 5.   6  6
.184 .686 .346      16.5 .004167.3   .4   .1 3.67.0018 .545
71 1 1 5.   7  7
.130 .836 .377       5.0 .004207.2   .4   .1 3.01.0018 .501
71 1 1 5.   8  8
.131 .818 .350       5.0 .005178.0   .4   .1 4.27.0018 .585
70 1 1 5.   9  9
.166 .680 .456      4.99 .004169.0   .4   .1 3.02.0018 .501
71 1 1 5.  10  10
.131 .738 .465       7.2 .004187.5   .4   .1 3.00.0018 .500
70 1 1 5.  11  11
.162 .485 .162      7.67 .008 96.0   .4   .1 3.70.0015 .655
71 1 1 5.  12  12
.139 .527 .266      9.46 .007105.6   .4   .1 3.19.0017 .545
70 1 1 5.  13  13
.152 .647 .22912.73 .006137.2   .4   .1 4.20.0017 .610
70 1 1 5.  14  14
.149 .545 .157  5.0 .004141.7   .4   .1 4.20.0017 .610
70 1 1 5.  15  15
.184 .652 .34915.56 .011103.1   .4   .1 4.50.0018 .602
70 1 1 5.  16  16
.1631.254 .286  5.0 .005261.5   .4   .1 4.46.0017 .627
71 1 1 5.  17  17
.104 .575 .261  5.0 .004146.6   .4   .1 3.33.0017 .546
70 1 1 5.  18  18
.1701.021 .530  5.0 .005129.8   .4   .1 4.50.0018 .610
71 1 1 5.  19  19
.114 .368 .188  5.0 .009 77.1   .4   .1 3.85.0018 .566
70 1 1 5.  20  20
.241 .442 .292  5.0 .005111.4   .4   .1 4.35.0018 .590
71 1 1 5.  21  21
.131 .347 .203 8.36 .015 57.9   .4   .1 3.67.0018 .545
71 1 1 5.  22  22
.117 .686 .407  5.0 .004170.7   .4   .1 3.12.0018 .508
71 1 1 5.  23  23
.056 .270 .113  5.0 .010 62.7   .4   .1 3.81.0018 .554
71 1 1 5.  24  24
.061 .307 .123  5.0 .010 67.5   .4   .1 4.50.0018 .600
70 1 1 5.  25  25
.186 .642 .312  5.0 .005140.4   .4   .1 3.32.0018 .522
70 1 1 5.  26  26
.221 .585 .278  5.0 .007118.4   .4   .1 4.09.0018 .573
70 1 1 5.  27  27
.2131.759 .278  7.0 .004398.4   .4   .1 3.18.0018 .516
70 1 1 5.  28  28
.159 .657 .340  5.0 .003173.2   .4   .1 3.40.0018 .527
70 1 1 5.  29  29
.142 .828 .353  5.0 .005188.8   .4   .1 4.36.0018 .591
71 1 1 5.  30  30
.137 .761 .332  5.0 .001293.0   .4   .1 4.44.0018 .596
70 1 1 5.  31  31
.165 .451 .296  5.0 .007100.7   .4   .1 4.50.0018 .600
70 1 1 5.  32  32
.143 .577 .341 9.67 .008 73.8   .4   .1 4.50.0017 .647
70 1 1 5.  33  33
.149 .630 .266  5.0 .007 71.9   .4   .1 4.12.0018 .575
70 1 1 5.  34  34
.146 .199 .353 4.99 .009 54.4   .4   .1 4.49.0018 .598
70 1 1 5.  35  35
.182 .798 .343  5.0 .014111.7   .4   .1 4.50.0018 .600
71 1 1 5.  36  36
.116 .588 .258 8.42 .014 86.7   .4   .1 4.50.0018 .600
70 1 1 5.  37  37
.142 .602 .337  5.0 .011 71.4   .4   .1 4.85.0010 .883
71 1 1 5.  38  38
.061 .415 .264  5.0 .018 46.9   .4   .1 4.73.0013 .782
71 1 1 5.  39  39
.095 .275 .233  5.0 .023 47.6   .4   .1 4.92.0009 .937
70 1 1 5.  40  40
.213 .733 .334  5.0 .013107.8   .4   .1 3.89.0017 .602
71 1 1 5.  41  41
.108 .643 .208  6.8 .015 90.7   .4   .1 4.73.0013 .781
70 1 1 5.  42  42
.153 .721 .239 5.24 .011114.2   .4   .1 4.50.0018 .600
70 1 1 5.  43  43
.161 .673 .319 11.3 .017 55.5   .4   .1 4.69.0014 .750
70 1 1 5.  44  44
.169 .484 .168 9.70 .020 62.7   .4   .1 4.50.0018 .600
71 1 1 5.  45  45
.082 .386 .037 13.7 .004106.0   .4   .1 4.60.0016 .682
70 1 1 5.  46  46
.213 .385 .253  5.3 .011 74.4   .4   .1 4.69.0014 .755
70 1 1 5.  47  47
.161 .561 .268  5.0 .017 79.0   .4   .1 4.56.0017 .652
70 1 1 5.  48  48
.173 .580 .192  5.0 .021 72.8   .4   .1 4.50.0018 .600
70 1 1 5.  49  49
.189 1.01 .404  5.0 .008169.2   .4   .1 4.14.0016 .636
70 1 1 5.  50  50
.170 .895 .386  8.1 .010141.7   .4   .1 4.73.0011 .833
71 1 1 5.  51  51
.131 1.08 .464  5.0 .025107.0   .4   .1 4.72.0013 .777
70 1 1 5.  52  52
.150 .720 .405  5.0 .023 83.0   .4   .1 4.72.0013 .777
71 1 1 5.  53  53
.089 .807 .323 6.06 .019 98.0   .4   .1 4.58.0016 .660
70 1 1 5.  54  54
.171 .656 .307 9.61 .011104.9   .4   .1 4.66.0014 .729
71 1 1 5.  55  55
.078 1.28 .312  5.0 .009195.3   .4   .1 4.57.0017 .654
70 1 1 5.  56  56
.156 .797 .340  5.0 .002273.0   .4   .1 4.00.0018 .580
71 1 1 5.  57  57
.062 .369 .125  5.0 .008 80.3   .4   .1 4.66.0014 .729
70 1 1 5.  58  58
.149 .749 .311 6.22 .007143.2   .4   .1 4.58.0016 .663
71 1 1 5.  59  59
.089 .585 .151 6.71 .015 86.0   .4   .1 4.50.0018 .600
70 1 1 5.  60  60
.136 .680 .343  5.0 .014 98.6   .4   .1 4.62.0015 .695
71 1 1 5.  61  61
```

```
.075 .318 .135 4.99 .015 57.4   .4   .1 4.49.0018 .599
71 1 1 5.   62  62
.122 .596 .207  5.0 .022 51.2   .4   .1 4.50.0018 .599
71 1 1 5.   63  63
.185 .596 .207  5.0 .014 68.9   .4   .1 4.50.0018 .599
71 1 1 5.   64  64
.139 .753 .301 4.99 .017 64.1   .4   .1 4.50.0018 .600
70 1 1 5.   65  65
.187 .702 .381  5.0 .021 84.1   .4   .1 4.50.0018 .600
71 1 1 5.   66  66
.089 .381 .292 8.13 .035 45.9   .4   .1 4.50.0018 .600
71 1 1 5.   67  67
.082 .596 .211 15.0 .018 78.2   .4   .1 4.42.0018 .595
70 1 1 5.   68  68
.162 .523 .315  5.0 .009 96.6   .4   .1 3.86.0018 .557
71 1 1 5.   69  69
.102 1.02 .355  5.0 .007183.8   .4   .1 3.73.0018 .548
70 1 1 5.   70  70
.178 1.31 .432  5.0 .016152.8   .4   .1 4.57.0016 .660
70 1 1 5.   71  71
.206 .746 .350  5.0 .008138.1   .4   .1 4.66.0014 .729
71 1 1 5.   72  72
.127 .559 .225  5.0 .014 86.6   .4   .1 4.54.0017 .633
70 1 1 5.   73  73
.175 .519 .192  5.0 .024 64.5   .4   .1 4.49.0018 .600
71 1 1 5.   74  74
.135 .634 .158  5.0 .011102.5   .4   .1 4.50.0018 .600
70 1 1 5.   75  75
.160 .612 .424  5.0 .020 77.3   .4   .1 4.50.0018 .600
70 1 1 5.   76  76
.194 .651 .344  5.0 .015 92.1   .4   .1 4.51.0018 .605
70 1 1 5.   77  77
.212 .411 .212  5.0 .011 76.8   .4   .1 4.52.0018 .617
70 1 1 5.   78  78
.185 .432 .240  5.0 .008 91.4   .4   .1 4.50.0018 .600
71 1 1 5.   79  79
.074 .822 .250  5.0 .010131.1   .4   .1 4.46.0018 .597
70 1 1 5.   80  80
.149 .401 .159  5.0 .008 88.7   .4   .1 3.96.0018 .564
70 1 1 5.   81  81
.165 .428 .218 5.22 .021 60.1   .4   .1 4.50.0018 .600
70 1 1 5.   82  82
.201 .755 .400  5.0 .013109.7   .4   .1 4.47.0018 .598
70 1 1 5.   83  83
.141 .585 .228  5.0 .008110.0   .4   .1 4.50.0018 .600
70 1 1 5.   84  84
.206 .550 .218  5.0 .008106.1   .4   .1 4.50.0018 .600
70 1 1 5.   85  85
.201 .923 .400  5.0 .009148.4   .4   .1 4.13.0018 .576
70 1 1 5.   86  86
.203 .656 .379  5.0 .012104.2   .4   .1 4.16.0018 .577
70 1 1 5.   87  87
.169 .573 .247  5.0 .020 73.9   .4   .1 4.50.0018 .600
70 1 1 5.   88  88
.195 .721 .205 4.98 .007141.2   .4   .1 3.84.0018 .555
71 1 1 5.   89  89
.113 .500 .124 5.03 .008102.8   .4   .1 4.21.0018 .582
71 1 1 5.   90  90
.110 .403 .073  5.0 .013 70.6   .4   .1 3.94.0018 .563
70 1 1 5.   91  91
.201 .672 .382  5.0 .010109.1   .4   .1 3.74.0018 .549
70 1 1 5.   92  92
.165 .716 .418  5.0 .010118.3   .4   .1 4.17.0018 .578
71 1 1 5.   93  93
.113 .740 .393  5.0 .011117.8   .4   .1 4.05.0018 .570
70 1 1 5.   94  94
.189 .529 .331 4.98 .009101.4   .4   .1 3.92.0018 .560
71 1 1 5.   95  95
.140 .749 .343  5.0 .006149.5   .4   .1 3.15.0018 .510
70 1 1 5.   96  96
.201 .776 .368  5.0 .018 95.4   .4   .1 3.68.0018 .546
71 1 1 5.   97  97
.123 1.05 .422  5.0 .010156.4   .4   .1 3.81.0018 .554
71 1 1 5.   98  98
.131 1.04 .413  5.0 .012142.1   .4   .1 3.40.0018 .527
E
```

CUHP 0.4 in EXISTING CONDITION

```
2     THIRD CREEK (EXISITNG IMP.) 0.4-INCHES
01     AVG 2  .4

70 1 1 5.   1  1
.186 .666 .289       5.0 .002 50.5   .4   .1 3.13.0018 .508
71 1 1 5.   2  2
.122 .857 .206 42.4 .006 45.2   .4   .1 3.53.0018 .535
71 1 1 5.   3  3
.108 .399 .178       5.0 .013 69.9   .4   .1 4.00.0018 .567
71 1 1 5.   4  4
.110 .388 .149      71.3 .009 31.4   .4   .1 3.91.0018 .561
70 1 1 5.   5  5
.157 .559 .175       7.7 .004146.2   .4   .1 4.34.0018 .589
70 1 1 5.   6  6
.184 .686 .346      16.5 .004167.3   .4   .1 3.67.0018 .545
71 1 1 5.   7  7
.130 .836 .377       5.0 .004207.2   .4   .1 3.01.0018 .501
71 1 1 5.   8  8
.131 .818 .350       5.0 .005178.0   .4   .1 4.27.0018 .585
70 1 1 5.   9  9
.166 .680 .456       4.99 .004169.0   .4   .1 3.02.0018 .501
71 1 1 5.   10  10
.131 .738 .465       7.2 .004187.5   .4   .1 3.00.0018 .500
70 1 1 5.   11  11
.162 .485 .162       7.67 .008 96.0   .4   .1 3.70.0015 .655
71 1 1 5.   12  12
.139 .527 .266       9.46 .007105.6   .4   .1 3.19.0017 .545
70 1 1 5.   13  13
.152 .647 .22912.73 .006137.2   .4   .1 4.20.0017 .610
70 1 1 5.   14  14
.149 .545 .157  5.0 .004141.7   .4   .1 4.20.0017 .610
70 1 1 5.   15  15
.184 .652 .34915.56 .011103.1   .4   .1 4.50.0018 .602
70 1 1 5.   16  16
.1631.254 .286  5.0 .005261.5   .4   .1 4.46.0017 .627
71 1 1 5.   17  17
.104 .575 .261  5.0 .004146.6   .4   .1 3.33.0017 .546
70 1 1 5.   18  18
.1701.021 .530  5.0 .005129.8   .4   .1 4.50.0018 .610
71 1 1 5.   19  19
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.114 .368 .188  5.0 .009 77.1   .4   .1 3.85.0018 .566
70 1 1 5.  20  20
.241 .442 .292  5.0 .005111.4   .4   .1 4.35.0018 .590
71 1 1 5.  21  21
.131 .347 .203 8.36 .015 57.9   .4   .1 3.67.0018 .545
71 1 1 5.  22  22
.117 .686 .407  5.0 .004170.7   .4   .1 3.12.0018 .508
71 1 1 5.  23  23
.056 .270 .113  5.0 .010 62.7   .4   .1 3.81.0018 .554
71 1 1 5.  24  24
.061 .307 .123  5.0 .010 67.5   .4   .1 4.50.0018 .600
70 1 1 5.  25  25
.186 .642 .312  5.0 .005140.4   .4   .1 3.32.0018 .522
70 1 1 5.  26  26
.221 .585 .278  5.0 .007118.4   .4   .1 4.09.0018 .573
70 1 1 5.  27  27
.2131.759 .278  7.0 .004398.4   .4   .1 3.18.0018 .516
70 1 1 5.  28  28
.159 .657 .340  5.0 .003173.2   .4   .1 3.40.0018 .527
70 1 1 5.  29  29
.142 .828 .353  5.0 .005188.8   .4   .1 4.36.0018 .591
71 1 1 5.  30  30
.137 .761 .332  5.0 .001293.0   .4   .1 4.44.0018 .596
70 1 1 5.  31  31
.165 .451 .296  5.0 .007100.7   .4   .1 4.50.0018 .600
70 1 1 5.  32  32
.143 .577 .341 9.67 .008 73.8   .4   .1 4.50.0017 .647
70 1 1 5.  33  33
.149 .630 .266  5.0 .007 71.9   .4   .1 4.12.0018 .575
70 1 1 5.  34  34
.146 .199 .353 4.99 .009 54.4   .4   .1 4.49.0018 .598
70 1 1 5.  35  35
.182 .798 .343  5.0 .014111.7   .4   .1 4.50.0018 .600
71 1 1 5.  36  36
.116 .588 .258 8.42 .014 86.7   .4   .1 4.50.0018 .600
70 1 1 5.  37  37
.142 .602 .337  5.0 .011 71.4   .4   .1 4.85.0010 .883
71 1 1 5.  38  38
.061 .415 .264  5.0 .018 46.9   .4   .1 4.73.0013 .782
71 1 1 5.  39  39
.095 .275 .233  5.0 .023 47.6   .4   .1 4.92.0009 .937
70 1 1 5.  40  40
.213 .733 .334  5.0 .013107.8   .4   .1 3.89.0017 .602
71 1 1 5.  41  41
.108 .643 .208  6.8 .015 90.7   .4   .1 4.73.0013 .781
70 1 1 5.  42  42
.153 .721 .239 5.24 .011114.2   .4   .1 4.50.0018 .600
70 1 1 5.  43  43
.161 .673 .319 11.3 .017 55.5   .4   .1 4.69.0014 .750
70 1 1 5.  44  44
.169 .484 .168 9.70 .020 62.7   .4   .1 4.50.0018 .600
71 1 1 5.  45  45
.082 .386 .037 13.7 .004106.0   .4   .1 4.60.0016 .682
70 1 1 5.  46  46
.213 .385 .253  5.3 .011 74.4   .4   .1 4.69.0014 .755
70 1 1 5.  47  47
.161 .561 .268  5.0 .017 79.0   .4   .1 4.56.0017 .652
70 1 1 5.  48  48
.173 .580 .192  5.0 .021 72.8   .4   .1 4.50.0018 .600
70 1 1 5.  49  49
.189 1.01 .404  5.0 .008169.2   .4   .1 4.14.0016 .636
70 1 1 5.  50  50
.170 .895 .386  8.1 .010141.7   .4   .1 4.73.0011 .833
71 1 1 5.  51  51
.131 1.08 .464  5.0 .025107.0   .4   .1 4.72.0013 .777
70 1 1 5.  52  52
.150 .720 .405  5.0 .023 83.0   .4   .1 4.72.0013 .777
71 1 1 5.  53  53
.089 .807 .323 6.06 .019 98.0   .4   .1 4.58.0016 .660
70 1 1 5.  54  54
.171 .656 .307 9.61 .011104.9   .4   .1 4.66.0014 .729
71 1 1 5.  55  55
.078 1.28 .312  5.0 .009195.3   .4   .1 4.57.0017 .654
70 1 1 5.  56  56
.156 .797 .340  5.0 .002273.0   .4   .1 4.00.0018 .580
71 1 1 5.  57  57
.062 .369 .125  5.0 .008 80.3   .4   .1 4.66.0014 .729
70 1 1 5.  58  58
.149 .749 .311 6.22 .007143.2   .4   .1 4.58.0016 .663
71 1 1 5.  59  59
.089 .585 .151 6.71 .015 86.0   .4   .1 4.50.0018 .600
70 1 1 5.  60  60
.136 .680 .343  5.0 .014 98.6   .4   .1 4.62.0015 .695
71 1 1 5.  61  61
.075 .318 .135 4.99 .015 57.4   .4   .1 4.49.0018 .599
71 1 1 5.  62  62
.122 .596 .207  5.0 .022 51.2   .4   .1 4.50.0018 .599
71 1 1 5.  63  63
.185 .596 .207  5.0 .014 68.9   .4   .1 4.50.0018 .599
71 1 1 5.  64  64
.139 .753 .301 4.99 .017 64.1   .4   .1 4.50.0018 .600
70 1 1 5.  65  65
.187 .702 .381  5.0 .021 84.1   .4   .1 4.50.0018 .600
71 1 1 5.  66  66
.089 .381 .292 8.13 .035 45.9   .4   .1 4.50.0018 .600
71 1 1 5.  67  67
.082 .596 .211 15.0 .018 78.2   .4   .1 4.42.0018 .595
70 1 1 5.  68  68
.162 .523 .315  5.0 .009 96.6   .4   .1 3.86.0018 .557
71 1 1 5.  69  69
.102 1.02 .355  5.0 .007183.8   .4   .1 3.73.0018 .548
70 1 1 5.  70  70
.178 1.31 .432  5.0 .016152.8   .4   .1 4.57.0016 .660
70 1 1 5.  71  71
.206 .746 .350  5.0 .008138.1   .4   .1 4.66.0014 .729
71 1 1 5.  72  72
.127 .559 .225  5.0 .014 86.6   .4   .1 4.54.0017 .633
70 1 1 5.  73  73
.175 .519 .192  5.0 .024 64.5   .4   .1 4.49.0018 .600
71 1 1 5.  74  74
.135 .634 .158  5.0 .011102.5   .4   .1 4.50.0018 .600
70 1 1 5.  75  75
.160 .612 .424  5.0 .020 77.3   .4   .1 4.50.0018 .600
70 1 1 5.  76  76
.194 .651 .344  5.0 .015 92.1   .4   .1 4.51.0018 .605
70 1 1 5.  77  77
.212 .411 .212  5.0 .011 76.8   .4   .1 4.52.0018 .617
70 1 1 5.  78  78
.185 .432 .240  5.0 .008 91.4   .4   .1 4.50.0018 .600
71 1 1 5.  79  79
```

```
.074 .822 .250  5.0 .010131.1   .4   .1 4.46.0018 .597
70 1 1 5.   80  80
.149 .401 .159  5.0 .008 88.7   .4   .1 3.96.0018 .564
70 1 1 5.   81  81
.165 .428 .218 5.22 .021 60.1   .4   .1 4.50.0018 .600
70 1 1 5.   82  82
.201 .755 .400  5.0 .013109.7   .4   .1 4.47.0018 .598
70 1 1 5.   83  83
.141 .585 .228  5.0 .008110.0   .4   .1 4.50.0018 .600
70 1 1 5.   84  84
.206 .550 .218  5.0 .008106.1   .4   .1 4.50.0018 .600
70 1 1 5.   85  85
.201 .923 .400  5.0 .009148.4   .4   .1 4.13.0018 .576
70 1 1 5.   86  86
.203 .656 .379  5.0 .012104.2   .4   .1 4.16.0018 .577
70 1 1 5.   87  87
.169 .573 .247  5.0 .020 73.9   .4   .1 4.50.0018 .600
70 1 1 5.   88  88
.195 .721 .205 4.98 .007141.2   .4   .1 3.84.0018 .555
71 1 1 5.   89  89
.113 .500 .124 5.03 .008102.8   .4   .1 4.21.0018 .582
71 1 1 5.   90  90
.110 .403 .073  5.0 .013 70.6   .4   .1 3.94.0018 .563
70 1 1 5.   91  91
.201 .672 .382  5.0 .010109.1   .4   .1 3.74.0018 .549
70 1 1 5.   92  92
.165 .716 .418  5.0 .010118.3   .4   .1 4.17.0018 .578
71 1 1 5.   93  93
.113 .740 .393  5.0 .011117.8   .4   .1 4.05.0018 .570
70 1 1 5.   94  94
.189 .529 .331 4.98 .009101.4   .4   .1 3.92.0018 .560
71 1 1 5.   95  95
.140 .749 .343  5.0 .006149.5   .4   .1 3.15.0018 .510
70 1 1 5.   96  96
.201 .776 .368  5.0 .018 95.4   .4   .1 3.68.0018 .546
71 1 1 5.   97  97
.123 1.05 .422  5.0 .010156.4   .4   .1 3.81.0018 .554
71 1 1 5.   98  98
.131 1.04 .413  5.0 .012142.1   .4   .1 3.40.0018 .527
E
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CUHP 100yr Future Condition

```
1 LOWER THIRD CREEK  100-YEAR Future BASELINE  KIOWA ENGINEERING 11/03
 1 100-YEAR .026.078.120.209.296.529.296.209.162.131.104.104.104.052.052.031.031
 1 100-YEAR .031.031.031.031.031.031.031.012.012.012.012.012.012.012.012.012.012
 1 100-YEAR .012.012.011.011.011.011.011.011.011.011.011.011.011.011.011.011.011
 1 100-YEAR .011.011.011.011.011.011.011.011.011.011.011.011.011

 70 1 1 5.   1  1
 .186 .666 .289 83.6 .00239.55   .4   .1 3.13.0018 .508
 71 1 1 5.   2  2
 .122 .857 .206 22.2 .00645.14   .4   .1 3.53.0018 .535
 71 1 1 5.   3  3
 .108 .399 .17822.94 .013 31.7   .4   .1   4..0018 .567
 71 1 1 5.   4  4
  .11 .388 .14941.89 .00931.37   .4   .1 3.91.0018 .561
 70 1 1 5.   5  5
 .157 .559 .175 36.9 .004 36.4   .4   .1 4.34.0018 .589
 70 1 1 5.   6  6
 .184 .686 .346 6.01 .004170.3   .4   .1 3.67.0018 .545
 71 1 1 5.   7  7
  .13 .836 .377  10. .004206.7   .4   .1 3.01.0018 .501
 71 1 1 5.   8  8
 .131 .818  .35   5. .005177.6   .4   .1 4.27.0018 .585
 70 1 1 5.   9  9
 .166  .68 .456 4.99 .004168.6   .4   .1 3.02.0018 .501
 71 1 1 5.   10  10
 .131 .738 .465   5. .004187.1   .4   .1   3..0018   .5
 70 1 1 5.   11  11
 .162 .485 .162   5. .004134.8   .4   .1  3.7.0015 .655
 71 1 1 5.   12  12
 .139 .527 .266 8.47 .007 104.   .4   .1 3.19.0017 .545
 70 1 1 5.   13  13
 .152 .647 .22912.65 .006136.9   .4   .1  4.2.0017  .61
 70 1 1 5.   14  14
 .149 .545 .15710.51 .004139.2   .4   .1  4.5.0018 .602
 70 1 1 5.   15  15
 .184 .652 .34920.38 .00839.13   .4   .1 4.46.0017 .627
 70 1 1 5.   16  16
 .1631.254 .286  8.1 .005255.3   .4   .1 3.33.0017 .546
 71 1 1 5.   17  17
 .104 .575 .261 20.4 .00436.85   .4   .1  4.5.0018  .61
 70 1 1 5.   18  18
  .17 1.02  .5354.98 .00549.95   .4   .1 3.85.0018 .566
 71 1 1 5.   19  19
 .114 .368 .18870.13 .00930.79   .4   .1 4.34.0018 .589
 70 1 1 5.   20  20
 .241 .442 .29247.29 .00532.98   .4   .1 4.35.0018  .59
 71 1 1 5.   21  21
 .131 .347 .203   5. .01555.03   .4   .1 3.67.0018 .545
 71 1 1 5.   22  22
 .117 .686 .407   5. .004168.7   .4   .1 3.12.0018 .508
 71 1 1 5.   23  23
 .056  .27 .11335.83  .01 27.9   .4   .1 3.81.0018 .554
 71 1 1 5.   24  24
 .061 .307 .123   5.  .0167.38   .4   .1  4.5.0018   .6
 70 1 1 5.   25  25
 .186 .642 .31220.73 .00538.83   .4   .1 3.32.0018 .522
 70 1 1 5.   26  26
 .221 .585 .278 31.3 .00737.17   .4   .1 4.09.0018 .573
 70 1 1 5.   27  27
 .213 1.759.27858.66 .004 71.6   .4   .1 3.18.0018 .516
 70 1 1 5.   28  28
 .159 .657  .3412.38 .003158.5   .4   .1  3.4.0018 .527
 70 1 1 5.   29  29
 .142 .828 .353  45. .00544.28   .4   .1 4.36.0018 .591
 71 1 1 5.   30  30
 .137 .761 .33231.91 .00142.31   .4   .1 4.44.0018 .596
 70 1 1 5.   31  31
 .165 .451 .29652.46 .00733.22   .4   .1  4.5.0018   .6
 70 1 1 5.   32  32
 .143 .577 .341 68.2 .00436.92   .4   .1  4.5.0017 .647
 70 1 1 5.   33  33
 .149  .63 .26636.48 .00538.49   .4   .1 4.12.0018 .575
 70 1 1 5.   34  34
 .146 .199 .35372.76  .0125.83   .4   .1 4.49.0018 .598
 70 1 1 5.   35  35
 .182 .798 .34330.67 .014 43.4   .4   .1  4.5.0018   .6
 71 1 1 5.   36  36
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70 1 1 5.  37 37
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71 1 1 5.  38 38
.061 .415 .26489.72 .01832.14  .4  .1 4.73.0013 .782
71 1 1 5.  39 39
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70 1 1 5.  40 40
.213 .733 .33410.14 .01398.38  .4  .1 3.89.0017 .602
71 1 1 5.  41 41
.108 .643 .208  65. .01538.86  .4  .1 4.73.0013 .781
70 1 1 5.  42 42
.153 .721 .23935.61 .01141.16  .4  .1  4.5.0018  .6
70 1 1 5.  43 43
.161 .673 .31937.98 .01739.74  .4  .1 4.69.0014  .75
70 1 1 5.  44 44
.169 .484 .16831.26  .02 34.2  .4  .1  4.5.0018  .6
71 1 1 5.  45 45
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70 1 1 5.  46 46
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70 1 1 5.  47 47
.161 .561 .268   5. .01768.38  .4  .1 4.56.0017 .652
70 1 1 5.  48 48
.173  .58 .192  65. .022 36.6  .4  .1  4.5.0018  .6
70 1 1 5.  49 49
.189 1.01 .40440.57 .00749.53  .4  .1 4.14.0016 .636
70 1 1 5.  50 50
 .17 .895 .38661.94 .00546.25  .4  .1 4.73.0011 .833
71 1 1 5.  51 51
.131 1.075.46475.76 .02551.54  .4  .1 4.72.0013 .777
70 1 1 5.  52 52
 .15  .72 .40549.94 .01941.12  .4  .1 4.72.0013 .777
71 1 1 5.  53 53
.089 .807 .32382.85 .01943.66  .4  .1 4.58.0016  .66
70 1 1 5.  54 54
.171 .656 .307  65. .01139.23  .4  .1 4.66.0014 .729
71 1 1 5.  55 55
.078 1.284.31241.18 .00957.68  .4  .1 4.57.0017 .654
70 1 1 5.  56 56
.156 .797  .34 26.2 .00243.37  .4  .1  4..0018  .58
71 1 1 5.  57 57
.062 .369 .125 30.1 .00830.82  .4  .1 4.66.0014 .729
70 1 1 5.  58 58
.149 .749 .31127.81 .00741.98  .4  .1 4.58.0016 .663
71 1 1 5.  59 59
.089 .585 .15147.73 .01537.17  .4  .1  4.5.0018  .6
70 1 1 5.  60 60
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71 1 1 5.  61 61
.075 .318 .13573.03 .01529.32  .4  .1 4.49.0018 .599
71 1 1 5.  62 62
.122 .596 .207  95. .02237.19  .4  .1  4.5.0018 .599
71 1 1 5.  63 63
.185 .768 .36483.67 .01442.54  .4  .1  4.5.0018  .6
71 1 1 5.  64 64
.139 .753 .30191.07 .01742.09  .4  .1  4.5.0018  .6
70 1 1 5.  65 65
.187 .702 .38179.92 .02140.58  .4  .1  4.5.0018  .6
71 1 1 5.  66 66
.089 .381 .292  65. .03523.58  .4  .1  4.5.0018  .6
71 1 1 5.  67 67
.082 .596 .211  65. .01837.47  .4  .1 4.42.0018 .595
70 1 1 5.  68 68
.162 .523 .31549.26 .00935.33  .4  .1 3.86.0018 .557
71 1 1 5.  69 69
.102 1.015.35514.96 .007180.7  .4  .1 3.73.0018 .548
70 1 1 5.  70 70
.178  1.36.43272.51 .01358.32  .4  .1 4.57.0016  .66
70 1 1 5.  71 71
.206 .746  .35   5. .008134.8  .4  .1 4.66.0014 .729
71 1 1 5.  72 72
.127 .559 .225   5. .01482.82  .4  .1 4.54.0017 .633
70 1 1 5.  73 73
.175 .519 .19253.74 .00535.22  .4  .1 4.49.0018  .6
71 1 1 5.  74 74
.135 .634 .15833.13 .01138.61  .4  .1  4.5.0018  .6
70 1 1 5.  75 75
 .16 .612 .424  45.  .0237.95  .4  .1  4.5.0018  .6
70 1 1 5.  76 76
.194 .651 .34431.82 .01539.09  .4  .1 4.51.0018 .605
70 1 1 5.  77 77
.212 .411 .21277.64 .01132.05  .4  .1 4.52.0018 .617
70 1 1 5.  78 78
.185 .432  .2473.62 .00832.67  .4  .1  4.5.0018  .6
71 1 1 5.  79 79
.074 .822  .2585.71  .0144.12  .4  .1 4.46.0018 .597
70 1 1 5.  80 80
.149 .401 .15973.72 .00531.77  .4  .1 3.96.0018 .564
70 1 1 5.  81 81
.165 .428 .218  65. .02130.68  .4  .1  4.5.0018  .6
70 1 1 5.  82 82
.201 .755  .475.99 .01342.15  .4  .1 4.47.0018 .598
70 1 1 5.  83 83
.141 .585 .228  65. .00837.16  .4  .1  4.5.0018  .6
70 1 1 5.  84 84
.206  .55 .218 90.7 .00836.15  .4  .1  4.5.0018  .6
70 1 1 5.  85 85
.201 .923  .491.49 .00947.06  .4  .1  4.1.0018 .576
70 1 1 5.  86 86
.203 .656 .379  65.  .0139.25  .4  .1 4.16.0018 .577
70 1 1 5.  87 87
.169 .573 .247  65.  .0236.82  .4  .1  4.5.0018  .6
70 1 1 5.  88 88
.195 .721 .20548.09 .00741.15  .4  .1 3.84.0018 .555
71 1 1 5.  89 89
.113  .5 .124  95. .00734.66  .4  .1 4.21.0018 .582
71 1 1 5.  90 90
 .11 .403 .073  95. .01331.82  .4  .1 3.94.0018 .563
70 1 1 5.  91 91
.201 .672 .382  95.  .0139.71  .4  .1 3.74.0018 .549
70 1 1 5.  92 92
.165 .716 .41887.57  .0141.01  .4  .1 4.17.0018 .578
71 1 1 5.  93 93
.113  .74 .393  65. .01141.71  .4  .1 4.05.0018  .57
70 1 1 5.  94 94
.189 .529 .331  65. .00935.52  .4  .1 3.92.0018  .56
71 1 1 5.  95 95
 .14 .749 .343 64.7 .01641.96  .4  .1 3.15.0018  .51
70 1 1 5.  96 96
```

```
.201 .776 .368  65. .01542.76   .4   .1 3.68.0018 .546
71 1 1 5.   97  97
.123 1.045.422  65. .01150.65   .4   .1 3.81.0018 .554
71 1 1 5.   98  98
.131 1.044.41343.74 .00850.61   .4   .1  3.4.0018 .527
E
```

CUHP 50yr Future Condition

```
1 LOWER THIRD CREEK  50-YEAR Future BASELINE  KIOWA ENGINEERING 11/03
 1  50-YEAR .030.081.115.184.279.466.224.184.115.115.074.074.074.055.055.041.041
 1  50-YEAR .032.032.032.032.032.032.032.011.011.011.011.011.011.011.011.011.011
 1  50-YEAR .011.011.010.010.010.010.010.010.010.010.010.010.010.010.010.010.010
 1  50-YEAR .010.010.010.010.010.010.010.010.010.010.010.010.010

 70 1 1 5.    1   1
.186 .666 .289 83.6 .00239.55   .4   .1 3.13.0018 .508
71 1 1 5.    2   2
.122 .857 .206 22.2 .00645.14   .4   .1 3.53.0018 .535
71 1 1 5.    3   3
.108 .399 .17822.94 .013 31.7   .4   .1   4..0018 .567
71 1 1 5.    4   4
 .11 .388 .14941.89 .00931.37   .4   .1 3.91.0018 .561
70 1 1 5.    5   5
.157 .559 .175 36.9 .004 36.4   .4   .1 4.34.0018 .589
70 1 1 5.    6   6
.184 .686 .346 6.01 .004170.3   .4   .1 3.67.0018 .545
71 1 1 5.    7   7
 .13 .836 .377  10. .004206.7   .4   .1 3.01.0018 .501
71 1 1 5.    8   8
.131 .818  .35   5. .005177.6   .4   .1 4.27.0018 .585
70 1 1 5.    9   9
.166  .68 .456 4.99 .004168.6   .4   .1 3.02.0018 .501
71 1 1 5.   10  10
.131 .738 .465   5. .004187.1   .4   .1   3..0018   .5
70 1 1 5.   11  11
.162 .485 .162   5. .004134.8   .4   .1  3.7.0015 .655
71 1 1 5.   12  12
.139 .527 .266 8.47 .007 104.   .4   .1 3.19.0017 .545
70 1 1 5.   13  13
.152 .647 .22912.65 .006136.9   .4   .1  4.2.0017  .61
70 1 1 5.   14  14
.149 .545 .15710.51 .004139.2   .4   .1  4.5.0018 .602
70 1 1 5.   15  15
.184 .652 .34920.38 .00839.13   .4   .1 4.46.0017 .627
70 1 1 5.   16  16
.1631.254 .286  8.1 .005255.3   .4   .1 3.33.0017 .546
71 1 1 5.   17  17
.104 .575 .261 20.4 .00436.85   .4   .1  4.5.0018  .61
70 1 1 5.   18  18
 .17 1.02  .5354.98 .00549.95   .4   .1 3.85.0018 .566
71 1 1 5.   19  19
.114 .368 .18870.13 .00930.79   .4   .1 4.34.0018 .589
70 1 1 5.   20  20
.241 .442 .29247.29 .00532.98   .4   .1 4.35.0018  .59
71 1 1 5.   21  21
.131 .347 .203   5. .01555.03   .4   .1 3.67.0018 .545
71 1 1 5.   22  22
.117 .686 .407   5. .004168.7   .4   .1 3.12.0018 .508
71 1 1 5.   23  23
.056  .27 .11335.83  .01 27.9   .4   .1 3.81.0018 .554
71 1 1 5.   24  24
.061 .307 .123   5. .0167.38   .4   .1  4.5.0018   .6
70 1 1 5.   25  25
.186 .642 .31220.73 .00538.83   .4   .1 3.32.0018 .522
70 1 1 5.   26  26
.221 .585 .278 31.3 .00737.17   .4   .1 4.09.0018 .573
70 1 1 5.   27  27
.213 1.759.27858.66 .004 71.6   .4   .1 3.18.0018 .516
70 1 1 5.   28  28
.159 .657  .3412.38 .003158.5   .4   .1  3.4.0018 .527
70 1 1 5.   29  29
.142 .828 .353  45. .00544.28   .4   .1 4.36.0018 .591
71 1 1 5.   30  30
.137 .761 .33231.91 .00142.31   .4   .1 4.44.0018 .596
70 1 1 5.   31  31
.165 .451 .29652.46 .00733.22   .4   .1  4.5.0018   .6
70 1 1 5.   32  32
.143 .577 .341 68.2 .00436.92   .4   .1  4.5.0017 .647
70 1 1 5.   33  33
.149  .63 .26636.48 .00538.49   .4   .1 4.12.0018 .575
70 1 1 5.   34  34
.146 .199 .35372.76  .0125.83   .4   .1 4.49.0018 .598
70 1 1 5.   35  35
.182 .798 .34330.67 .014 43.4   .4   .1  4.5.0018   .6
71 1 1 5.   36  36
.116 .588 .25877.72 .01437.26   .4   .1  4.5.0018   .6
70 1 1 5.   37  37
.142 .602 .33763.77 .01137.67   .4   .1 4.85 .001 .883
71 1 1 5.   38  38
.061 .415 .26489.72 .01832.14   .4   .1 4.73.0013 .782
71 1 1 5.   39  39
.095 .275 .23375.35 .02324.58   .4   .1 4.92.0009 .937
70 1 1 5.   40  40
.213 .733 .33410.14 .01398.38   .4   .1 3.89.0017 .602
71 1 1 5.   41  41
.108 .643 .208  65. .01538.86   .4   .1 4.73.0013 .781
70 1 1 5.   42  42
.153 .721 .23935.61 .01141.16   .4   .1  4.5.0018   .6
70 1 1 5.   43  43
.161 .673 .31937.98 .01739.74   .4   .1 4.69.0014  .75
70 1 1 5.   44  44
.169 .484 .16831.26  .02 34.2   .4   .1  4.5.0018   .6
71 1 1 5.   45  45
.082 .386 .037  45. .00431.33   .4   .1  4.6.0016 .682
70 1 1 5.   46  46
.213 .385 .25347.67 .011 31.3   .4   .1 4.69.0014 .755
70 1 1 5.   47  47
.161 .561 .268   5. .01768.38   .4   .1 4.56.0017 .652
70 1 1 5.   48  48
.173  .58 .192  65. .022 36.6   .4   .1  4.5.0018   .6
70 1 1 5.   49  49
.189 1.01 .40440.57 .00749.53   .4   .1 4.14.0016 .636
70 1 1 5.   50  50
 .17 .895 .38661.94 .00546.25   .4   .1 4.73.0011 .833
71 1 1 5.   51  51
.131 1.075.46475.76 .02551.54   .4   .1 4.72.0013 .777
70 1 1 5.   52  52
 .15  .72 .40549.94 .01941.12   .4   .1 4.72.0013 .777
```

```
71 1 1 5.  53  53
.089 .807 .32382.85 .01943.66  .4  .1 4.58.0016 .66
70 1 1 5.  54  54
.171 .656 .307  65. .01139.23  .4  .1 4.66.0014 .729
71 1 1 5.  55  55
.078 1.284.31241.18 .00957.68  .4  .1 4.57.0017 .654
70 1 1 5.  56  56
.156 .797  .34 26.2 .00243.37  .4  .1  4..0018  .58
71 1 1 5.  57  57
.062 .369 .125 30.1 .00830.82  .4  .1 4.66.0014 .729
70 1 1 5.  58  58
.149 .749 .31127.81 .00741.98  .4  .1 4.58.0016 .663
71 1 1 5.  59  59
.089 .585 .15147.73 .01537.17  .4  .1  4.5.0018  .6
70 1 1 5.  60  60
.136  .68 .34370.21 .01439.95  .4  .1 4.62.0015 .695
71 1 1 5.  61  61
.075 .318 .13573.03 .01529.32  .4  .1 4.49.0018 .599
71 1 1 5.  62  62
.122 .596 .207  95. .02237.19  .4  .1  4.5.0018 .599
71 1 1 5.  63  63
.185 .768 .36483.67 .01442.54  .4  .1  4.5.0018  .6
71 1 1 5.  64  64
.139 .753 .30191.07 .01742.09  .4  .1  4.5.0018  .6
70 1 1 5.  65  65
.187 .702 .38179.92 .02140.58  .4  .1  4.5.0018  .6
71 1 1 5.  66  66
.089 .381 .292  65. .03523.58  .4  .1  4.5.0018  .6
71 1 1 5.  67  67
.082 .596 .211  65. .01837.47  .4  .1 4.42.0018 .595
70 1 1 5.  68  68
.162 .523 .31549.26 .00935.33  .4  .1 3.86.0018 .557
71 1 1 5.  69  69
.102 1.015.35514.96 .007180.7  .4  .1 3.73.0018 .548
70 1 1 5.  70  70
.178  1.36.43272.51 .01358.32  .4  .1 4.57.0016  .66
70 1 1 5.  71  71
.206 .746  .35  5. .008134.8  .4  .1 4.66.0014 .729
71 1 1 5.  72  72
.127 .559 .225  5. .01482.82  .4  .1 4.54.0017 .633
70 1 1 5.  73  73
.175 .519 .19253.74 .00535.22  .4  .1 4.49.0018  .6
71 1 1 5.  74  74
.135 .634 .15833.13 .01138.61  .4  .1  4.5.0018  .6
70 1 1 5.  75  75
 .16 .612 .424  45. .0237.95  .4  .1  4.5.0018  .6
70 1 1 5.  76  76
.194 .651 .34431.82 .01539.09  .4  .1 4.51.0018 .605
70 1 1 5.  77  77
.212 .411 .21277.64 .01132.05  .4  .1 4.52.0018 .617
70 1 1 5.  78  78
.185 .432  .2473.62 .00832.67  .4  .1  4.5.0018  .6
71 1 1 5.  79  79
.074 .822  .2585.71  .0144.12  .4  .1 4.46.0018 .597
70 1 1 5.  80  80
.149 .401 .15973.72 .00531.77  .4  .1 3.96.0018 .564
70 1 1 5.  81  81
.165 .428 .218  65. .02130.68  .4  .1  4.5.0018  .6
70 1 1 5.  82  82
.201 .755  .475.99 .01342.15  .4  .1 4.47.0018 .598
70 1 1 5.  83  83
.141 .585 .228  65. .00837.16  .4  .1  4.5.0018  .6
70 1 1 5.  84  84
.206  .55 .218 90.7 .00836.15  .4  .1  4.5.0018  .6
70 1 1 5.  85  85
.201 .923  .491.49 .00947.06  .4  .1  4.1.0018 .576
70 1 1 5.  86  86
.203 .656 .379  65. .0139.25  .4  .1 4.16.0018 .577
70 1 1 5.  87  87
.169 .573 .247  65. .0236.82  .4  .1  4.5.0018  .6
70 1 1 5.  88  88
.195 .721 .20548.09 .00741.15  .4  .1 3.84.0018 .555
71 1 1 5.  89  89
.113  .5 .124  95. .00734.66  .4  .1 4.21.0018 .582
71 1 1 5.  90  90
 .11 .403 .073  95. .01331.82  .4  .1 3.94.0018 .563
70 1 1 5.  91  91
.201 .672 .382  95. .0139.71  .4  .1 3.74.0018 .549
70 1 1 5.  92  92
.165 .716 .41887.57  .0141.01  .4  .1 4.17.0018 .578
71 1 1 5.  93  93
.113  .74 .393  65. .01141.71  .4  .1 4.05.0018  .57
70 1 1 5.  94  94
.189 .529 .331  65. .00935.52  .4  .1 3.92.0018  .56
71 1 1 5.  95  95
 .14 .749 .343 64.7 .01641.96  .4  .1 3.15.0018  .51
70 1 1 5.  96  96
.201 .776 .368  65. .01542.76  .4  .1 3.68.0018 .546
71 1 1 5.  97  97
.123 1.045.422  65. .01150.65  .4  .1 3.81.0018 .554
71 1 1 5.  98  98
.131 1.044.41343.74 .00850.61  .4  .1  3.4.0018 .527
E
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CUHP 10yr Future Condition

```
1 LOWER THIRD CREEK  10-YEAR Future BASELINE  KIOWA ENGINEERING 11/03
1  10-YEAR .032.060.132.196.326.156.090.069.061.052.052.052.052.052.052.040.031
1  10-YEAR .031.031.031.031.031.011.011.011.011.011.011.011.011.011.011.011.011
1  10-YEAR .008.008.008.008.008.008.008.008.008.008.008.008.008.008.008.008.008
1  10-YEAR .008.008.008.008.008.008.008.008.008.008.008.008.008

70 1 1 5.  1  1
.186 .666 .289 83.6 .00239.55  .4  .1 3.13.0018 .508
71 1 1 5.  2  2
.122 .857 .206 22.2 .00645.14  .4  .1 3.53.0018 .535
71 1 1 5.  3  3
.108 .399 .17822.94 .013 31.7  .4  .1  4..0018 .567
71 1 1 5.  4  4
 .11 .388 .14941.89 .00931.37  .4  .1 3.91.0018 .561
70 1 1 5.  5  5
.157 .559 .175 36.9 .004 36.4  .4  .1 4.34.0018 .589
70 1 1 5.  6  6
.184 .686 .346 6.01 .004170.3  .4  .1 3.67.0018 .545
71 1 1 5.  7  7
 .13 .836 .377  10. .004206.7  .4  .1 3.01.0018 .501
71 1 1 5.  8  8
.131 .818  .35  5. .005177.6  .4  .1 4.27.0018 .585
70 1 1 5.  9  9
```

```
.166 .68 .456 4.99 .004168.6  .4  .1 3.02.0018 .501
71 1 1 5.  10  10
.131 .738 .465  5. .004187.1  .4  .1  3..0018  .5
70 1 1 5.  11  11
.162 .485 .162  5. .004134.8  .4  .1  3.7.0015 .655
71 1 1 5.  12  12
.139 .527 .266 8.47 .007 104.  .4  .1 3.19.0017 .545
70 1 1 5.  13  13
.152 .647 .22912.65 .006136.9  .4  .1  4.2.0017  .61
70 1 1 5.  14  14
.149 .545 .15710.51 .004139.2  .4  .1  4.5.0018 .602
70 1 1 5.  15  15
.184 .652 .34920.38 .00839.13  .4  .1 4.46.0017 .627
70 1 1 5.  16  16
.1631.254 .286  8.1 .005255.3  .4  .1 3.33.0017 .546
71 1 1 5.  17  17
.104 .575 .261 20.4 .00436.85  .4  .1  4.5.0018  .61
70 1 1 5.  18  18
 .17 1.02  .5354.98 .00549.95  .4  .1 3.85.0018 .566
71 1 1 5.  19  19
.114 .368 .18870.13 .00930.79  .4  .1 4.34.0018 .589
70 1 1 5.  20  20
.241 .442 .29247.29 .00532.98  .4  .1 4.35.0018  .59
71 1 1 5.  21  21
.131 .347 .203  5. .01555.03  .4  .1 3.67.0018 .545
71 1 1 5.  22  22
.117 .686 .407  5. .004168.7  .4  .1 3.12.0018 .508
71 1 1 5.  23  23
.056  .27 .11335.83  .01 27.9  .4  .1 3.81.0018 .554
71 1 1 5.  24  24
.061 .307 .123  5. .0167.38  .4  .1  4.5.0018  .6
70 1 1 5.  25  25
.186 .642 .31220.73 .00538.83  .4  .1 3.32.0018 .522
70 1 1 5.  26  26
.221 .585 .278 31.3 .00737.17  .4  .1 4.09.0018 .573
70 1 1 5.  27  27
.213 1.759.27858.66 .004 71.6  .4  .1 3.18.0018 .516
70 1 1 5.  28  28
.159 .657  .3412.38 .003158.5  .4  .1  3.4.0018 .527
70 1 1 5.  29  29
.142 .828 .353  45. .00544.28  .4  .1 4.36.0018 .591
71 1 1 5.  30  30
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70 1 1 5.  31  31
.165 .451 .29652.46 .00733.22  .4  .1  4.5.0018  .6
70 1 1 5.  32  32
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70 1 1 5.  33  33
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70 1 1 5.  34  34
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71 1 1 5.  36  36
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70 1 1 5.  37  37
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71 1 1 5.  38  38
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71 1 1 5.  39  39
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70 1 1 5.  40  40
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71 1 1 5.  41  41
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70 1 1 5.  42  42
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70 1 1 5.  43  43
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70 1 1 5.  44  44
.169 .484 .16831.26  .02 34.2  .4  .1  4.5.0018  .6
71 1 1 5.  45  45
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70 1 1 5.  46  46
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70 1 1 5.  47  47
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70 1 1 5.  48  48
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70 1 1 5.  49  49
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70 1 1 5.  50  50
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71 1 1 5.  51  51
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70 1 1 5.  52  52
 .15  .72 .40549.94 .01941.12  .4  .1 4.72.0013 .777
71 1 1 5.  53  53
.089 .807 .32382.85 .01943.66  .4  .1 4.58.0016  .66
70 1 1 5.  54  54
.171 .656 .307  65. .01139.23  .4  .1 4.66.0014 .729
71 1 1 5.  55  55
.078 1.284.31241.18 .00957.68  .4  .1 4.57.0017 .654
70 1 1 5.  56  56
.156 .797  .34 26.2 .00243.37  .4  .1  4..0018  .58
71 1 1 5.  57  57
.062 .369 .125 30.1 .00830.82  .4  .1 4.66.0014 .729
70 1 1 5.  58  58
.149 .749 .31127.81 .00741.98  .4  .1 4.58.0016 .663
71 1 1 5.  59  59
.089 .585 .15147.73 .01537.17  .4  .1  4.5.0018  .6
70 1 1 5.  60  60
.136  .68 .34370.21 .01439.95  .4  .1 4.62.0015 .695
71 1 1 5.  61  61
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71 1 1 5.  62  62
.122 .596 .207  95. .02237.19  .4  .1  4.5.0018 .599
71 1 1 5.  63  63
.185 .768 .36483.67 .01442.54  .4  .1  4.5.0018  .6
71 1 1 5.  64  64
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70 1 1 5.  65  65
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71 1 1 5.  66  66
.089 .381 .292  65. .03523.58  .4  .1  4.5.0018  .6
71 1 1 5.  67  67
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70 1 1 5.  68  68
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71 1 1 5.  69  69
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70 1 1 5.  70  70
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70 1 1 5.  71  71
.206 .746  .35  5. .008134.8  .4  .1 4.66.0014 .729
71 1 1 5.  72  72
.127 .559 .225  5. .01482.82  .4  .1 4.54.0017 .633
70 1 1 5.  73  73
.175 .519 .19253.74 .00535.22  .4  .1 4.49.0018  .6
71 1 1 5.  74  74
.135 .634 .15833.13 .01138.61  .4  .1  4.5.0018  .6
70 1 1 5.  75  75
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70 1 1 5.  76  76
.194 .651 .34431.82 .01539.09  .4  .1 4.51.0018 .605
70 1 1 5.  77  77
.212 .411 .21277.64 .01132.05  .4  .1 4.52.0018 .617
70 1 1 5.  78  78
.185 .432  .2473.62 .00832.67  .4  .1  4.5.0018  .6
71 1 1 5.  79  79
.074 .822  .2585.71  .0144.12  .4  .1 4.46.0018 .597
70 1 1 5.  80  80
.149 .401 .15973.72 .00531.77  .4  .1 3.96.0018 .564
70 1 1 5.  81  81
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70 1 1 5.  82  82
.201 .755  .475.99 .01342.15  .4  .1 4.47.0018 .598
70 1 1 5.  83  83
.141 .585 .228  65. .00837.16  .4  .1  4.5.0018  .6
70 1 1 5.  84  84
.206  .55 .218 90.7 .00836.15  .4  .1  4.5.0018  .6
70 1 1 5.  85  85
.201 .923  .491.49 .00947.06  .4  .1  4.1.0018 .576
70 1 1 5.  86  86
.203 .656 .379  65.  .0139.25  .4  .1 4.16.0018 .577
70 1 1 5.  87  87
.169 .573 .247  65.  .0236.82  .4  .1  4.5.0018  .6
70 1 1 5.  88  88
.195 .721 .20548.09 .00741.15  .4  .1 3.84.0018 .555
71 1 1 5.  89  89
.113  .5 .124  95. .00734.66  .4  .1 4.21.0018 .582
71 1 1 5.  90  90
 .11 .403 .073  95. .01331.82  .4  .1 3.94.0018 .563
70 1 1 5.  91  91
.201 .672 .382  95.  .0139.71  .4  .1 3.74.0018 .549
70 1 1 5.  92  92
.165 .716 .41887.57  .0141.01  .4  .1 4.17.0018 .578
71 1 1 5.  93  93
.113  .74 .393  65. .01141.71  .4  .1 4.05.0018  .57
70 1 1 5.  94  94
.189 .529 .331  65. .00935.52  .4  .1 3.92.0018  .56
71 1 1 5.  95  95
 .14 .749 .343 64.7 .01641.96  .4  .1 3.15.0018  .51
70 1 1 5.  96  96
.201 .776 .368  65. .01542.76  .4  .1 3.68.0018 .546
71 1 1 5.  97  97
.123 1.045.422  65. .01150.65  .4  .1 3.81.0018 .554
71 1 1 5.  98  98
.131 1.044.41343.74 .00850.61  .4  .1  3.4.0018 .527
E
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CUHP 5yr Future Condition

```
1 LOWER THIRD CREEK  5-YEAR Future BASELINE  KIOWA ENGINEERING 11/03
1  5 -YEAR .027.050.117.166.271.141.078.059.048.048.040.040.040.040.034.029.029
1  5 -YEAR .029.029.020.020.020.020.017.012.012.012.012.012.012.012.012.012.012
1  5 -YEAR .012.012.007.007.007.007.007.007.007.007.007.007.007.007.007.007.007
1  5 -YEAR .007.007.007.007.007.007.007.007.007.007.007.007

70 1 1 5.   1   1
.186 .666 .289 83.6 .00239.55  .4  .1 3.13.0018 .508
71 1 1 5.   2   2
.122 .857 .206 22.2 .00645.14  .4  .1 3.53.0018 .535
71 1 1 5.   3   3
.108 .399 .17822.94 .013 31.7  .4  .1  4..0018 .567
71 1 1 5.   4   4
 .11 .388 .14941.89 .00931.37  .4  .1 3.91.0018 .561
70 1 1 5.   5   5
.157 .559 .175 36.9 .004 36.4  .4  .1 4.34.0018 .589
70 1 1 5.   6   6
.184 .686 .346 6.01 .004170.3  .4  .1 3.67.0018 .545
71 1 1 5.   7   7
 .13 .836 .377  10. .004206.7  .4  .1 3.01.0018 .501
71 1 1 5.   8   8
.131 .818  .35  5. .005177.6  .4  .1 4.27.0018 .585
70 1 1 5.   9   9
.166  .68 .456 4.99 .004168.6  .4  .1 3.02.0018 .501
71 1 1 5.  10  10
.131 .738 .465  5. .004187.1  .4  .1  3..0018  .5
70 1 1 5.  11  11
.162 .485 .162  5. .004134.8  .4  .1  3.7.0015 .655
71 1 1 5.  12  12
.139 .527 .266 8.47 .007 104.  .4  .1 3.19.0017 .545
70 1 1 5.  13  13
.152 .647 .22912.65 .006136.9  .4  .1  4.2.0017  .61
70 1 1 5.  14  14
.149 .545 .15710.51 .004139.2  .4  .1  4.5.0018 .602
70 1 1 5.  15  15
.184 .652 .34920.38 .00839.13  .4  .1 4.46.0017 .627
70 1 1 5.  16  16
.1631.254 .286  8.1 .005255.3  .4  .1 3.33.0017 .546
71 1 1 5.  17  17
.104 .575 .261 20.4 .00436.85  .4  .1  4.5.0018  .61
70 1 1 5.  18  18
 .17 1.02  .5354.98 .00549.95  .4  .1 3.85.0018 .566
71 1 1 5.  19  19
.114 .368 .18870.13 .00930.79  .4  .1 4.34.0018 .589
70 1 1 5.  20  20
.241 .442 .29247.29 .00532.98  .4  .1 4.35.0018  .59
71 1 1 5.  21  21
.131 .347 .203  5. .01555.03  .4  .1 3.67.0018 .545
71 1 1 5.  22  22
.117 .686 .407  5. .004168.7  .4  .1 3.12.0018 .508
71 1 1 5.  23  23
.056  .27 .11335.83  .01 27.9  .4  .1 3.81.0018 .554
71 1 1 5.  24  24
.061 .307 .123  5.  .0167.38  .4  .1  4.5.0018  .6
70 1 1 5.  25  25
.186 .642 .31220.73 .00538.83  .4  .1 3.32.0018 .522
70 1 1 5.  26  26
```

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.221 .585 .278 31.3 .00737.17  .4  .1 4.09.0018 .573
70 1 1 5.  27  27
.213 1.759.27858.66 .004 71.6  .4  .1 3.18.0018 .516
70 1 1 5.  28  28
.159 .657  .3412.38 .003158.5  .4  .1  3.4.0018 .527
70 1 1 5.  29  29
.142 .828 .353  45. .00544.28  .4  .1 4.36.0018 .591
71 1 1 5.  30  30
.137 .761 .33231.91 .00142.31  .4  .1 4.44.0018 .596
70 1 1 5.  31  31
.165 .451 .29652.46 .00733.22  .4  .1  4.5.0018  .6
70 1 1 5.  32  32
.143 .577 .341 68.2 .00436.92  .4  .1  4.5.0017 .647
70 1 1 5.  33  33
.149  .63 .26636.48 .00538.49  .4  .1 4.12.0018 .575
70 1 1 5.  34  34
.146 .199 .35372.76  .0125.83  .4  .1 4.49.0018 .598
70 1 1 5.  35  35
.182 .798 .34330.67 .014 43.4  .4  .1  4.5.0018  .6
71 1 1 5.  36  36
.116 .588 .25877.72 .01437.26  .4  .1  4.5.0018  .6
70 1 1 5.  37  37
.142 .602 .33763.77 .01137.67  .4  .1 4.85 .001 .883
71 1 1 5.  38  38
.061 .415 .26489.72 .01832.14  .4  .1 4.73.0013 .782
71 1 1 5.  39  39
.095 .275 .23375.35 .02324.58  .4  .1 4.92.0009 .937
70 1 1 5.  40  40
.213 .733 .33410.14 .01398.38  .4  .1 3.89.0017 .602
71 1 1 5.  41  41
.108 .643 .208  65. .01538.86  .4  .1 4.73.0013 .781
70 1 1 5.  42  42
.153 .721 .23935.61 .01141.16  .4  .1  4.5.0018  .6
70 1 1 5.  43  43
.161 .673 .31937.98 .01739.74  .4  .1 4.69.0014  .75
70 1 1 5.  44  44
.169 .484 .16831.26  .02 34.2  .4  .1  4.5.0018  .6
71 1 1 5.  45  45
.082 .386 .037  45. .00431.33  .4  .1  4.6.0016 .682
70 1 1 5.  46  46
.213 .385 .25347.67 .011 31.3  .4  .1 4.69.0014 .755
70 1 1 5.  47  47
.161 .561 .268   5. .01768.38  .4  .1 4.56.0017 .652
70 1 1 5.  48  48
.173  .58 .192  65. .022 36.6  .4  .1  4.5.0018  .6
70 1 1 5.  49  49
.189 1.01 .40440.57 .00749.53  .4  .1 4.14.0016 .636
70 1 1 5.  50  50
 .17 .895 .38661.94 .00546.25  .4  .1 4.73.0011 .833
71 1 1 5.  51  51
.131 1.075.46475.76 .02551.54  .4  .1 4.72.0013 .777
70 1 1 5.  52  52
 .15  .72 .40549.94 .01941.12  .4  .1 4.72.0013 .777
71 1 1 5.  53  53
.089 .807 .32382.85 .01943.66  .4  .1 4.58.0016  .66
70 1 1 5.  54  54
.171 .656 .307  65. .01139.23  .4  .1 4.66.0014 .729
71 1 1 5.  55  55
.078 1.284.31241.18 .00957.68  .4  .1 4.57.0017 .654
70 1 1 5.  56  56
.156 .797  .34 26.2 .00243.37  .4  .1   4..0018  .58
71 1 1 5.  57  57
.062 .369 .125 30.1 .00830.82  .4  .1 4.66.0014 .729
70 1 1 5.  58  58
.149 .749 .31127.81 .00741.98  .4  .1 4.58.0016 .663
71 1 1 5.  59  59
.089 .585 .15147.73 .01537.17  .4  .1  4.5.0018  .6
70 1 1 5.  60  60
.136  .68 .34370.21 .01439.95  .4  .1 4.62.0015 .695
71 1 1 5.  61  61
.075 .318 .13573.03 .01529.32  .4  .1 4.49.0018 .599
71 1 1 5.  62  62
.122 .596 .207  95. .02237.19  .4  .1  4.5.0018 .599
71 1 1 5.  63  63
.185 .768 .36483.67 .01442.54  .4  .1  4.5.0018  .6
71 1 1 5.  64  64
.139 .753 .30191.07 .01742.09  .4  .1  4.5.0018  .6
70 1 1 5.  65  65
.187 .702 .38179.92 .02140.58  .4  .1  4.5.0018  .6
71 1 1 5.  66  66
.089 .381 .292  65. .03523.58  .4  .1  4.5.0018  .6
71 1 1 5.  67  67
.082 .596 .211  65. .01837.47  .4  .1 4.42.0018 .595
70 1 1 5.  68  68
.162 .523 .31549.26 .00935.33  .4  .1 3.86.0018 .557
71 1 1 5.  69  69
.102 1.015.35514.96 .007180.7  .4  .1 3.73.0018 .548
70 1 1 5.  70  70
.178  1.36.43272.51 .01358.32  .4  .1 4.57.0016  .66
70 1 1 5.  71  71
.206 .746  .35   5. .008134.8  .4  .1 4.66.0014 .729
71 1 1 5.  72  72
.127 .559 .225   5. .01482.82  .4  .1 4.54.0017 .633
70 1 1 5.  73  73
.175 .519 .19253.74 .00535.22  .4  .1 4.49.0018  .6
71 1 1 5.  74  74
.135 .634 .15833.13 .01138.61  .4  .1  4.5.0018  .6
70 1 1 5.  75  75
 .16 .612 .424  45. .0237.95  .4  .1  4.5.0018  .6
70 1 1 5.  76  76
.194 .651 .34431.82 .01539.09  .4  .1 4.51.0018 .605
70 1 1 5.  77  77
.212 .411 .21277.64 .01132.05  .4  .1 4.52.0018 .617
70 1 1 5.  78  78
.185 .432  .2473.62 .00832.67  .4  .1  4.5.0018  .6
71 1 1 5.  79  79
.074 .822  .2585.71  .0144.12  .4  .1 4.46.0018 .597
70 1 1 5.  80  80
.149 .401 .15973.72 .00531.77  .4  .1 3.96.0018 .564
70 1 1 5.  81  81
.165 .428 .218  65. .02130.68  .4  .1  4.5.0018  .6
70 1 1 5.  82  82
.201 .755  .475.99 .01342.15  .4  .1 4.47.0018 .598
70 1 1 5.  83  83
.141 .585 .228  65. .00837.16  .4  .1  4.5.0018  .6
70 1 1 5.  84  84
.206  .55 .218 90.7 .00836.15  .4  .1  4.5.0018  .6
70 1 1 5.  85  85
.201 .923  .491.49 .00947.06  .4  .1  4.1.0018 .576
70 1 1 5.  86  86
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.203 .656 .379  65.  .0139.25   .4   .1 4.16.0018 .577
70 1 1 5.   87  87
.169 .573 .247  65.  .0236.82   .4   .1  4.5.0018   .6
70 1 1 5.   88  88
.195 .721 .20548.09 .00741.15   .4   .1 3.84.0018 .555
71 1 1 5.   89  89
.113   .5 .124  95. .00734.66   .4   .1 4.21.0018 .582
71 1 1 5.   90  90
 .11 .403 .073  95. .01331.82   .4   .1 3.94.0018 .563
70 1 1 5.   91  91
.201 .672 .382  95.  .0139.71   .4   .1 3.74.0018 .549
70 1 1 5.   92  92
.165 .716 .41887.57  .0141.01   .4   .1 4.17.0018 .578
71 1 1 5.   93  93
.113  .74 .393  65. .01141.71   .4   .1 4.05.0018  .57
70 1 1 5.   94  94
.189 .529 .331  65. .00935.52   .4   .1 3.92.0018  .56
71 1 1 5.   95  95
 .14 .749 .343 64.7 .01641.96   .4   .1 3.15.0018  .51
70 1 1 5.   96  96
.201 .776 .368  65. .01542.76   .4   .1 3.68.0018 .546
71 1 1 5.   97  97
.123 1.045.422  65. .01150.65   .4   .1 3.81.0018 .554
71 1 1 5.   98  98
.131 1.044.41343.74 .00850.61   .4   .1  3.4.0018 .527
E
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CUHP 2yr Future Condition

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1 LOWER THIRD CREEK  2-YEAR Future BASELINE  KIOWA ENGINEERING 11/03
 1 002-YEAR .018.036.076.118.184.103.057.046.027.027.027.027.027.018.018.018.018
 1 002-YEAR .018.018.018.018.018.009.009.014.014.014.014.014.014.014.014.014.014
 1 002-YEAR .014.014.006.006.006.006.006.006.006.006.006.006.006.006.006.006.006
 1 002-YEAR .006.006.006.006.006.006.006.006.006.006.006.006.006

 70 1 1 5.    1   1
 .186 .666 .289 83.6 .00239.55   .4   .1 3.13.0018 .508
 71 1 1 5.    2   2
 .122 .857 .206 22.2 .00645.14   .4   .1 3.53.0018 .535
 71 1 1 5.    3   3
 .108 .399 .17822.94 .013 31.7   .4   .1   4..0018 .567
 71 1 1 5.    4   4
  .11 .388 .14941.89 .00931.37   .4   .1 3.91.0018 .561
 70 1 1 5.    5   5
 .157 .559 .175 36.9 .004 36.4   .4   .1 4.34.0018 .589
 70 1 1 5.    6   6
 .184 .686 .346 6.01 .004170.3   .4   .1 3.67.0018 .545
 71 1 1 5.    7   7
  .13 .836 .377  10. .004206.7   .4   .1 3.01.0018 .501
 71 1 1 5.    8   8
 .131 .818  .35   5. .005177.6   .4   .1 4.27.0018 .585
 70 1 1 5.    9   9
 .166  .68 .456 4.99 .004168.6   .4   .1 3.02.0018 .501
 71 1 1 5.   10  10
 .131 .738 .465   5. .004187.1   .4   .1   3..0018   .5
 70 1 1 5.   11  11
 .162 .485 .162   5. .004134.8   .4   .1  3.7.0015 .655
 71 1 1 5.   12  12
 .139 .527 .266 8.47 .007 104.   .4   .1 3.19.0017 .545
 70 1 1 5.   13  13
 .152 .647 .22912.65 .006136.9   .4   .1  4.2.0017  .61
 70 1 1 5.   14  14
 .149 .545 .15710.51 .004139.2   .4   .1  4.5.0018 .602
 70 1 1 5.   15  15
 .184 .652 .34920.38 .00839.13   .4   .1 4.46.0017 .627
 70 1 1 5.   16  16
 .1631.254 .286  8.1 .005255.3   .4   .1 3.33.0017 .546
 71 1 1 5.   17  17
 .104 .575 .261 20.4 .00436.85   .4   .1  4.5.0018  .61
 70 1 1 5.   18  18
  .17 1.02  .5354.98 .00549.95   .4   .1 3.85.0018 .566
 71 1 1 5.   19  19
 .114 .368 .18870.13 .00930.79   .4   .1 4.34.0018 .589
 70 1 1 5.   20  20
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 71 1 1 5.   21  21
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 71 1 1 5.   22  22
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 71 1 1 5.   23  23
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 71 1 1 5.   24  24
 .061 .307 .123   5.  .0167.38   .4   .1  4.5.0018   .6
 70 1 1 5.   25  25
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 70 1 1 5.   26  26
 .221 .585 .278 31.3 .00737.17   .4   .1 4.09.0018 .573
 70 1 1 5.   27  27
 .213 1.759.27858.66 .004 71.6   .4   .1 3.18.0018 .516
 70 1 1 5.   28  28
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 70 1 1 5.   29  29
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 71 1 1 5.   30  30
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 70 1 1 5.   31  31
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 70 1 1 5.   33  33
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 70 1 1 5.   35  35
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 71 1 1 5.   36  36
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 70 1 1 5.   37  37
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 71 1 1 5.   38  38
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 71 1 1 5.   39  39
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 70 1 1 5.   40  40
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 71 1 1 5.   41  41
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 70 1 1 5.   42  42
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 70 1 1 5.   43  43
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70 1 1 5.  46  46
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70 1 1 5.  47  47
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.173  .58 .192  65. .022 36.6   .4   .1  4.5.0018   .6
70 1 1 5.  49  49
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71 1 1 5.  53  53
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70 1 1 5.  54  54
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71 1 1 5.  57  57
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70 1 1 5.  58  58
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71 1 1 5.  59  59
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71 1 1 5.  67  67
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71 1 1 5.  69  69
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70 1 1 5.  70  70
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70 1 1 5.  71  71
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71 1 1 5.  72  72
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71 1 1 5.  93  93
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70 1 1 5.  94  94
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71 1 1 5.  95  95
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70 1 1 5.  96  96
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71 1 1 5.  97  97
.123 1.045.422  65. .01150.65   .4   .1 3.81.0018 .554
71 1 1 5.  98  98
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E
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CUHP 0.4in Future Condition

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2     THIRD CREEK (FUTURE IMP.) 0.4-INCHES
01     AVG 2  .4

70 1 1 5.   1   1
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71 1 1 5.   2   2
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70 1 1 5.   5  5
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70 1 1 5.   6  6
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71 1 1 5.   7  7
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71 1 1 5.   8  8
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70 1 1 5.   9  9
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71 1 1 5.  10  10
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71 1 1 5.  12  12
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71 1 1 5.  17  17
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70 1 1 5.  18  18
 .17 1.02  .5354.98 .00549.95   .4   .1 3.85.0018 .566
71 1 1 5.  19  19
.114 .368 .18870.13 .00930.79   .4   .1 4.34.0018 .589
70 1 1 5.  20  20
.241 .442 .29247.29 .00532.98   .4   .1 4.35.0018  .59
71 1 1 5.  21  21
.131 .347 .203   5. .01555.03   .4   .1 3.67.0018 .545
71 1 1 5.  22  22
.117 .686 .407   5. .004168.7   .4   .1 3.12.0018 .508
71 1 1 5.  23  23
.056  .27 .11335.83  .01 27.9   .4   .1 3.81.0018 .554
71 1 1 5.  24  24
.061 .307 .123   5. .0167.38   .4   .1  4.5.0018   .6
70 1 1 5.  25  25
.186 .642 .31220.73 .00538.83   .4   .1 3.32.0018 .522
70 1 1 5.  26  26
.221 .585 .278 31.3 .00737.17   .4   .1 4.09.0018 .573
70 1 1 5.  27  27
.213 1.759.27858.66 .004 71.6   .4   .1 3.18.0018 .516
70 1 1 5.  28  28
.159 .657  .3412.38 .003158.5   .4   .1  3.4.0018 .527
70 1 1 5.  29  29
.142 .828 .353  45. .00544.28   .4   .1 4.36.0018 .591
71 1 1 5.  30  30
.137 .761 .33231.91 .00142.31   .4   .1 4.44.0018 .596
70 1 1 5.  31  31
.165 .451 .29652.46 .00733.22   .4   .1  4.5.0018   .6
70 1 1 5.  32  32
.143 .577 .341 68.2 .00436.92   .4   .1  4.5.0017 .647
70 1 1 5.  33  33
.149  .63 .26636.48 .00538.49   .4   .1 4.12.0018 .575
70 1 1 5.  34  34
.146 .199 .35372.76  .0125.83   .4   .1 4.49.0018 .598
70 1 1 5.  35  35
.182 .798 .34330.67 .014 43.4   .4   .1  4.5.0018   .6
71 1 1 5.  36  36
.116 .588 .25877.72 .01437.26   .4   .1  4.5.0018   .6
70 1 1 5.  37  37
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71 1 1 5.  38  38
.061 .415 .26489.72 .01832.14   .4   .1 4.73.0013 .782
71 1 1 5.  39  39
.095 .275 .23375.35 .02324.58   .4   .1 4.92.0009 .937
70 1 1 5.  40  40
.213 .733 .33410.14 .01398.38   .4   .1 3.89.0017 .602
71 1 1 5.  41  41
.108 .643 .208  65. .01538.86   .4   .1 4.73.0013 .781
70 1 1 5.  42  42
.153 .721 .23935.61 .01141.16   .4   .1  4.5.0018   .6
70 1 1 5.  43  43
.161 .673 .31937.98 .01739.74   .4   .1 4.69.0014  .75
70 1 1 5.  44  44
.169 .484 .16831.26  .02 34.2   .4   .1  4.5.0018   .6
71 1 1 5.  45  45
.082 .386 .037  45. .00431.33   .4   .1  4.6.0016 .682
70 1 1 5.  46  46
.213 .385 .25347.67 .011 31.3   .4   .1 4.69.0014 .755
70 1 1 5.  47  47
.161 .561 .268   5. .01768.38   .4   .1 4.56.0017 .652
70 1 1 5.  48  48
.173  .58 .192  65. .022 36.6   .4   .1  4.5.0018   .6
70 1 1 5.  49  49
.189 1.01 .40440.57 .00749.53   .4   .1 4.14.0016 .636
70 1 1 5.  50  50
 .17 .895 .38661.94 .00546.25   .4   .1 4.73.0011 .833
71 1 1 5.  51  51
.131 1.075.46475.76 .02551.54   .4   .1 4.72.0013 .777
70 1 1 5.  52  52
 .15  .72 .40549.94 .01941.12   .4   .1 4.72.0013 .777
71 1 1 5.  53  53
.089 .807 .32382.85 .01943.66   .4   .1 4.58.0016  .66
70 1 1 5.  54  54
.171 .656 .307  65. .01139.23   .4   .1 4.66.0014 .729
71 1 1 5.  55  55
.078 1.284.31241.18 .00957.68   .4   .1 4.57.0017 .654
70 1 1 5.  56  56
.156 .797  .34 26.2 .00243.37   .4   .1   4..0018  .58
71 1 1 5.  57  57
.062 .369 .125 30.1 .00830.82   .4   .1 4.66.0014 .729
70 1 1 5.  58  58
.149 .749 .31127.81 .00741.98   .4   .1 4.58.0016 .663
71 1 1 5.  59  59
.089 .585 .15147.73 .01537.17   .4   .1  4.5.0018   .6
70 1 1 5.  60  60
.136  .68 .34370.21 .01439.95   .4   .1 4.62.0015 .695
71 1 1 5.  61  61
.075 .318 .13573.03 .01529.32   .4   .1 4.49.0018 .599
71 1 1 5.  62  62
.122 .596 .207  95. .02237.19   .4   .1  4.5.0018 .599
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71 1 1 5.  63  63
.185 .768 .36483.67 .01442.54  .4  .1  4.5.0018  .6
71 1 1 5.  64  64
.139 .753 .30191.07 .01742.09  .4  .1  4.5.0018  .6
70 1 1 5.  65  65
.187 .702 .38179.92 .02140.58  .4  .1  4.5.0018  .6
71 1 1 5.  66  66
.089 .381 .292  65. .03523.58  .4  .1  4.5.0018  .6
71 1 1 5.  67  67
.082 .596 .211  65. .01837.47  .4  .1 4.42.0018 .595
70 1 1 5.  68  68
.162 .523 .31549.26 .00935.33  .4  .1 3.86.0018 .557
71 1 1 5.  69  69
.102 1.015.35514.96 .007180.7  .4  .1 3.73.0018 .548
70 1 1 5.  70  70
.178  1.36.43272.51 .01358.32  .4  .1 4.57.0016  .66
70 1 1 5.  71  71
.206 .746  .35  5. .008134.8  .4  .1 4.66.0014 .729
71 1 1 5.  72  72
.127 .559 .225  5. .01482.82  .4  .1 4.54.0017 .633
70 1 1 5.  73  73
.175 .519 .19253.74 .00535.22  .4  .1 4.49.0018  .6
71 1 1 5.  74  74
.135 .634 .15833.13 .01138.61  .4  .1  4.5.0018  .6
70 1 1 5.  75  75
 .16 .612 .424  45. .0237.95  .4  .1  4.5.0018  .6
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.194 .651 .34431.82 .01539.09  .4  .1 4.51.0018 .605
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.212 .411 .21277.64 .01132.05  .4  .1 4.52.0018 .617
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.185 .432  .2473.62 .00832.67  .4  .1  4.5.0018  .6
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.074 .822  .2585.71  .0144.12  .4  .1 4.46.0018 .597
70 1 1 5.  80  80
.149 .401 .15973.72 .00531.77  .4  .1 3.96.0018 .564
70 1 1 5.  81  81
.165 .428 .218  65. .02130.68  .4  .1  4.5.0018  .6
70 1 1 5.  82  82
.201 .755  .475.99 .01342.15  .4  .1 4.47.0018 .598
70 1 1 5.  83  83
.141 .585 .228  65. .00837.16  .4  .1  4.5.0018  .6
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.206  .55 .218 90.7 .00836.15  .4  .1  4.5.0018  .6
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.201 .923  .491.49 .00947.06  .4  .1  4.1.0018 .576
70 1 1 5.  86  86
.203 .656 .379  65.  .0139.25  .4  .1 4.16.0018 .577
70 1 1 5.  87  87
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71 1 1 5.  89  89
.113  .5 .124  95. .00734.66  .4  .1 4.21.0018 .582
71 1 1 5.  90  90
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70 1 1 5.  91  91
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70 1 1 5.  92  92
.165 .716 .41887.57  .0141.01  .4  .1 4.17.0018 .578
71 1 1 5.  93  93
.113  .74 .393  65. .01141.71  .4  .1 4.05.0018  .57
70 1 1 5.  94  94
.189 .529 .331  65. .00935.52  .4  .1 3.92.0018  .56
71 1 1 5.  95  95
 .14 .749 .343 64.7 .01641.96  .4  .1 3.15.0018  .51
70 1 1 5.  96  96
.201 .776 .368  65. .01542.76  .4  .1 3.68.0018 .546
71 1 1 5.  97  97
.123 1.045.422  65. .01150.65  .4  .1 3.81.0018 .554
71 1 1 5.  98  98
.131 1.044.41343.74 .00850.61  .4  .1  3.4.0018 .527
E
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SWMM 100YR EXISTING CONDITION

```
  2  1  1  2
  3  4
WATERSHED  1
LOWER THIRD CREEK, 100YR EXISTING CONDITION
KIOWA ENGINEERING CORPORATION 11/03
     192      5.0                                        1
       1  100
       2  135
       3  101
       4  100
       5  103
       6  123
       7  104
       8  104
       9  105
      10  124
      11  125
      12  106
      13  106
      14  157
      15  126
      16  108
      17  127
      18  128
      19  129
      20  130
      21  131
      22  109
      23  187
      24  134
      25  111
      26  133
      27  110
      28  112
      29  308
      30  158
      31  158
      32  158
      33  308
      34  159
      35  181
      36  159
      37  162
      38  162
      39  306
```

40	115
41	138
42	182
43	183
44	160
45	161
46	139
47	140
48	141
49	116
50	116
51	117
52	118
53	155
54	154
55	119
56	118
57	163
58	163
59	168
60	169
61	170
62	142
63	183
64	143
65	184
66	144
67	148
68	148
69	120
70	120
71	153
72	156
73	121
74	165
75	166
76	303
77	171
78	172
79	180
80	150
81	145
82	145
83	132
84	132
85	150
86	150
87	146
88	174
89	174
90	174
91	185
92	151
93	152
94	176
95	177
96	178
97	175
98	121

0	100	0	3	10.	1.	0.1	0.01	1.
0	101	285	3	10.	1.	0.1	0.01	1.
0	102	273	3	10.	1.	0.1	0.01	1.
0	103	203	3	10.	1.	0.1	0.01	1.
0	104	204	3	10.	1.	0.1	0.01	1.
0	105	205	3	10.	1.	0.1	0.01	1.
0	106	206	3	10.	1.	0.1	0.01	1.
0	107	207	3	10.	1.	0.1	0.01	1.
0	108	208	3	10.	1.	0.1	0.01	1.
0	109	209	3	10.	1.	0.1	0.01	1.
0	110	210	3	10.	1.	0.1	0.01	1.
0	111	211	3	10.	1.	0.1	0.01	1.
0	112	212	3	10.	1.	0.1	0.01	1.
0	113	213	3	10.	1.	0.1	0.01	1.
0	114	214	3	10.	1.	0.1	0.01	1.
0	115	215	3	10.	1.	0.1	0.01	1.
0	116	311	3	10.	1.	0.1	0.01	1.
0	117	217	3	10.	1.	0.1	0.01	1.
0	118	218	3	10.	1.	0.1	0.01	1.
0	119	280	3	10.	1.	0.1	0.01	1.
0	120	220	3	10.	1.	0.1	0.01	1.
0	121	221	3	10.	1.	0.1	0.01	1.
0	122	222	3	10.	1.	0.1	0.01	1.
0	123	278	3	10.	1.	0.1	0.01	1.
0	124	223	3	10.	1.	0.1	0.01	1.
0	125	274	3	10.	1.	0.1	0.01	1.
0	126	226	3	10.	1.	0.1	0.01	1.
0	127	228	3	10.	1.	0.1	0.01	1.
0	128	229	3	10.	1.	0.1	0.01	1.
0	129	227	3	10.	1.	0.1	0.01	1.
0	130	287	3	10.	1.	0.1	0.01	1.
0	132	304	3	10.	1.	0.1	0.01	1.
0	133	232	3	10.	1.	0.1	0.01	1.
0	134	281	3	10.	1.	0.1	0.01	1.
0	135	202	3	10.	1.	0.1	0.01	1.
0	136	288	3	10.	1.	0.1	0.01	1.
0	137	219	3	10.	1.	0.1	0.01	1.
0	138	236	3	10.	1.	0.1	0.01	1.
0	139	307	3	10.	1.	0.1	0.01	1.
0	141	200	3	10.	1.	0.1	0.01	1.
0	142	240	3	10.	1.	0.1	0.01	1.
0	143	237	3	10.	1.	0.1	0.01	1.
0	144	276	3	10.	1.	0.1	0.01	1.
0	145	266	3	10.	1.	0.1	0.01	1.
0	146	267	3	10.	1.	0.1	0.01	1.
0	147	230	3	10.	1.	0.1	0.01	1.
0	148	254	3	10.	1.	0.1	0.01	1.
0	149	255	3	10.	1.	0.1	0.01	1.
0	150	256	3	10.	1.	0.1	0.01	1.
0	151	257	3	10.	1.	0.1	0.01	1.
0	152	259	3	10.	1.	0.1	0.01	1.
0	153	264	3	10.	1.	0.1	0.01	1.
0	154	268	3	10.	1.	0.1	0.01	1.
0	155	269	3	10.	1.	0.1	0.01	1.
0	156	265	3	10.	1.	0.1	0.01	1.
0	157	275	3	10.	1.	0.1	0.01	1.
0	158	302	3	10.	1.	0.1	0.01	1.
0	159	309	3	10.	1.	0.1	0.01	1.
0	160	282	3	10.	1.	0.1	0.01	1.
0	161	310	3	10.	1.	0.1	0.01	1.

```
0 162 299  3   10.   1.   0.1          0.01   1.
0 163 244  3   10.   1.   0.1          0.01   1.
0 164 279  3   10.   1.   0.1          0.01   1.
0 165 245  3   10.   1.   0.1          0.01   1.
0 166 246  3   10.   1.   0.1          0.01   1.
0 167 250  3   10.   1.   0.1          0.01   1.
0 168 243  3   10.   1.   0.1          0.01   1.
0 169 242  3   10.   1.   0.1          0.01   1.
0 170 241  3   10.   1.   0.1          0.01   1.
0 171 248  3   10.   1.   0.1          0.01   1.
0 172 249  3   10.   1.   0.1          0.01   1.
0 173 270  3   10.   1.   0.1          0.01   1.
0 174 305  3   10.   1.   0.1          0.01   1.
0 175 258  3   10.   1.   0.1          0.01   1.
0 176 252  3   10.   1.   0.1          0.01   1.
0 177 263  3   10.   1.   0.1          0.01   1.
0 178 262  3   10.   1.   0.1          0.01   1.
0 179 261  3   10.   1.   0.1          0.01   1.
0 180 260  3   10.   1.   0.1          0.01   1.
0 181 159  3   10.   1.   0.1          0.01   1.
0 182 283  3   10.   1.   0.1          0.01   1.
0 183 239  3   10.   1.   0.1          0.01   1.
0 184 277  3   10.   1.   0.1          0.01   1.
0 185 284  3   10.   1.   0.1          0.01   1.
0 186 225  3   10.   1.   0.1          0.01   1.
0 187 301  3   10.   1.   0.1          0.01   1.
0 188 247  3   10.   1.   0.1          0.01   1.
0 200 136  4   10.  964.  0.004   10.   10.  0.047   2.
           50.  964.  0.004   50.   50.  0.033  20.
0 202 101  4   20. 2327.  0.003   20.   20.  0.04   3.
           120. 2327.  0.003   50.   50.  0.03   20.
0 203 102  4   20. 1902.  0.004   20.   20.  0.044  3.
           120. 1902.  0.004   50.   50.  0.033  20.
0 204 103  4   20. 2673.  0.004   20.   20.  0.044  3.
           120. 2673.  0.004   50.   50.  0.033  20.
0 205 104  4   60. 1621.  0.003    4.    4.  0.037  3.
           160. 1621.  0.003   50.   50.  0.03   20.
0 206 105  4   50. 4148.  0.0034   4.    4.  0.039  3.
           150. 4148.  0.0034  50.   50.  0.031  20.
0 207 106  4   15.  717.  0.003    4.    4.  0.037  4.
           115.  717.  0.003   20.   20.  0.029  20.
0 208 107  4   20. 2763.  0.003   10.   10.  0.039  3.
           120. 2763.  0.003   40.   40.  0.03   20.
0 209 108  4   20. 3945.  0.003    4.    4.  0.036  5.
           120. 3945.  0.003   40.   40.  0.03   20.
0 210 109  4   20. 3217.  0.007    4.    4.  0.053  3.
           120. 3217.  0.007   50.   50.  0.041  20.
0 211 110  4   20. 1323.  0.008    4.    4.  0.056  3.
           120. 1323.  0.008   50.   50.  0.043  20.
0 212 111  4   50. 2426.  0.003    4.    4.  0.037  3.
           150. 2426.  0.003   50.   50.  0.03   20.
0 213 112  4   20. 2473.  0.005    4.    4.  0.046  3.
           120. 2473.  0.005   50.   50.  0.036  20.
0 214 113  4   20.  443.  0.003   10.   10.  0.039  3.
           120.  443.  0.003   25.   25.  0.029  20.
0 215 308  4   20. 1622.  0.003   10.   10.  0.039  3.
           120. 1622.  0.003   25.   25.  0.028  25.
0 216 164  4   20. 1324.  0.003   10.   10.  0.039  3.
           120. 1324.  0.003   25.   25.  0.029  20.
0 217 116  4   20. 3243.  0.005   10.   10.  0.047  3.
           120. 3243.  0.005   25.   25.  0.036  20.
0 218 117  4   20.  282.  0.003   10.   10.  0.039  3.
           120.  282.  0.003   25.   25.  0.029  20.
0 219 118  4   20. 2003.  0.003   10.   10.  0.039  3.
           120. 2003.  0.003   20.   20.  0.029  20.
0 220 147  4   20. 2196.  0.003    4.    4.  0.037  4.
           120. 2196.  0.003   20.   20.  0.029  20.
0 221 120  4   20. 5356.  0.001    4.    4.  0.024  5.
           120. 5356.  0.001   20.   20.  0.046  20.
0 222 121  4    8. 4084.  0.012    4.    4.  0.066  3.
            32. 4084.  0.012   20.   20.  0.071  20.
0 224 110  4   20. 2002.  0.003    4.    4.  0.04   2.
           120. 2002.  0.003   50.   50.  0.03   20.
0 223 105  4   20. 1141.  0.002   10.   10.  0.035  2.
           120. 1141.  0.002   50.   50.  0.025  20.
0 225 106  4   20. 2475.  0.001   10.   10.  0.027  2.
           120. 2475.  0.001   50.   50.  0.02   20.
0 226 107  4   10. 2015.  0.006    4.    4.  0.054  2.
           110. 2015.  0.006   50.   50.  0.039  20.
0 227 126  4   20. 2686.  0.0052  10.   10.  0.056  1.
           120. 2686.  0.0052  50.   50.  0.037  20.
0 228 108  4   10.  645.  0.016    4.    4.  0.078  2.
           110.  645.  0.016   50.   50.  0.056  20.
0 229 127  4   10.  838.  0.003    4.    4.  0.041  2.
           110.  838.  0.003   50.   50.  0.03   20.
0 230 119  4   20.  302.  0.003    4.    4.  0.037  4.
           120.  302.  0.003   20.   20.  0.029  20.
0 231 130  4   20. 2856.  0.004   10.   10.  0.046  2.
           120. 2856.  0.004   50.   50.  0.033  20.
0 232 111  4   20. 1120.  0.005   10.   10.  0.05   2.
           120. 1120.  0.005   50.   50.  0.036  20.
0 233 297  4   20. 2070.  0.008   10.   10.  0.060  2.
           120. 2070.  0.008   50.   50.  0.043  20.
0 234 173  4   20. 3316.  0.013   10.   10.  0.072  2.
           120. 3316.  0.013   50.   50.  0.052  20.
0 235 140  4   40. 1047.  0.019   10.   10.  0.09   1.
           120. 1047.  0.019   50.   50.  0.06   20.
0 236 116  4   50. 2857.  0.0035  10.   10.  0.047  1.
           200. 2857.  0.0035  50.   50.  0.031  20.
0 237 184  5    6.  183.  0.035    0.    0.  0.013  6.
           100. 1400.  0.005   50.   50.  0.051  20.
0 239 143  4   40. 1430.  0.0030  10.   10.  0.041  2.
           120. 1430.  0.0030  50.   50.  0.030  20.
0 240 140  4   20. 2733.  0.015    5.    5.  0.082  1.
           120. 2733.  0.015   50.   50.  0.055  20.
0 241 139  4   20. 2126.  0.009   10.   10.  0.069  1.
           120. 2126.  0.009   50.   50.  0.045  20.
0 242 168  4   20.  927.  0.013    5.    5.  0.071  2.
           120.  927.  0.013   50.   50.  0.052  20.
0 243 161  4   20. 1224.  0.002   10.   10.  0.035  2.
           120. 1224.  0.002   50.   50.  0.025  20.
0 244 160  4   20. 1747.  0.007   10.   10.  0.057  2.
           120. 1747.  0.007   50.   50.  0.041  20.
0 245 163  4   20. 2060.  0.006   10.   10.  0.054  2.
           120. 2060.  0.006   50.   50.  0.039  20.
0 246 165  4   20. 3293.  0.007   10.   10.  0.057  2.
           120. 3293.  0.007   50.   50.  0.041  20.
0 247 168  4   40. 1278.  0.02    10.   10.  0.083  2.
           120. 1278.  0.02    50.   50.  0.061  20.
0 248 170  4  100. 1834.  0.013   10.   10.  0.077  1.
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          200.  1834.  0.013    50.    50.  0.051    20.
0 249 171   4   100.  3800.  0.008    10.    10.  0.064     1.
          200.  3800.  0.008    50.    50.  0.043    20.
0 250 132   4   100.  2986.  0.008    10.    10.  0.064     1.
          200.  2986.  0.008    50.    50.  0.043    20.
0 251 167   4    20.  1081.  0.004    10.    10.  0.051     1.
          120.  1081.  0.004    50.    50.  0.033    20.
0 252 174   4    20.  2585.  0.005     5.     5.  0.049     2.
          120.  2585.  0.005    50.    50.  0.036    20.
0 254 147   4    20.   637.  0.003    10.    10.  0.045     1.
          120.   637.  0.003    50.    50.  0.03     20.
0 255 150   4    70.  1579.  0.004     5.     5.  0.049     1.
          200.  1579.  0.004    50.    50.  0.033    20.
0 256 145   4   100.  2710.  0.013    10.    10.  0.077     1.
          200.  2710.  0.013    50.    50.  0.051    20.
0 257 149   4   100.  1831.  0.014    10.    10.  0.079     1.
          200.  1831.  0.014    50.    50.  0.053    20.
0 258 151   4   100.  3598.   0.01    10.    10.  0.069     1.
          200.  3598.   0.01    50.    50.  0.047    20.
0 259 149   4   100.  1401.  0.012    10.    10.  0.074     1.
          200.  1401.  0.012    50.    50.   0.05    20.
0 260 150   4   100.  2084.  0.007    10.    10.  0.06     1.
          200.  2084.  0.007    50.    50.  0.041    20.
0 261 176   4    20.  1626.  0.009    10.    10.  0.063     2.
          120.  1626.  0.009    50.    50.  0.045    20.
0 262 179   4   100.  1461.  0.006    10.    10.  0.057     1.
          200.  1461.  0.006    50.    50.  0.038    20.
0 263 179   4   100.  1278.  0.007    10.    10.  0.06     1.
          200.  1278.  0.007    50.    50.  0.041    20.
0 264 121   4   100.  2606.  0.019     5.     5.  0.063     2.
          400.  2606.  0.019    50.    50.  0.045    20.
0 265 122   4    20.  1802.  0.024     4.     4.  0.089     2.
          120.  1802.  0.024    50.    50.  0.065    20.
0 266 148   4    20.  3270.  0.007     5.     5.  0.056     2.
          120.  3270.  0.007    50.    50.  0.041    20.
0 267 145   4   100.   972.  0.002    10.    10.  0.038     1.
          200.   972.  0.002    50.    50.  0.025    20.
0 268 120   4   100.  1610.  0.031    10.    10.  0.089     1.
          400.  1610.  0.031    50.    50.  0.065    20.
0 269 119   4    10.   730.  0.025    10.    10.  0.103     1.
          100.   730.  0.025    50.    50.  0.066    20.
0 270 181   4    20.  1456.  0.006     5.     5.  0.053     2.
          120.  1456.  0.006    50.    50.  0.039    20.
0 271 164   4    50.  1908.  0.002    10.    10.  0.035     2.
          150.  1908.  0.002    50.    50.  0.025    20.
0 273 100   4    20.   703.  0.002    10.    10.  0.041     2.
          120.   703.  0.002    50.    50.  0.03     20.
0 274 186   4    20.  1045.  0.001    10.    10.  0.027     2.
          120.  1045.  0.001    50.    50.   0.02    20.
0 275 186   4    20.  1420.  0.011    10.    10.  0.068     2.
          120.  1420.  0.011    50.    50.  0.049    20.
0 276 137   4    20.  2158.  0.006     4.     4.  0.047     5.
          120.  2158.  0.006    50.    50.  0.043    10.
0 277 144   4    17.   262.  0.008     3.     3.  0.044     1.
          120.   262.  0.008    50.    50.  0.048    10.
0 278 103   4    20.   708.  0.007     4.     4.  0.056     2.
          120.   708.  0.007    50.    50.  0.041    20.
0 279 315   4    20.  2452.  0.003    10.    10.  0.039     3.
          120.  2452.  0.003    25.    25.  0.029    20.
0 280 137   4    20.  1804.  0.003    10.    10.  0.039     3.
          120.  1804.  0.003    50.    50.   0.03    20.
0 281 133   4    20.  3622.  0.004    10.    10.  0.046     2.
          120.  3622.  0.004    50.    50.  0.033    20.
0 282 182   4    20.  2352.  0.006    10.    10.  0.054     2.
          120.  2352.  0.006    50.    50.  0.039    20.
0 283 159   4    20.  1995.  0.004    10.    10.  0.046     2.
          120.  1995.  0.004    50.    50.  0.033    20.
0 284 132   4    20.  3155.  0.006    10.    10.  0.054     2.
          120.  3155.  0.006    50.    50.  0.039    20.
0 285 102   4    35.   502.  0.001    10.    10.  0.027     2.
          135.   502.  0.001    50.    50.   0.02    20.
0 286 158   4    20.  1328.  0.004    10.    10.  0.060     2.
          120.  1328.  0.008    50.    50.  0.043    20.
0 287 109   5   5.0   344.  0.005     1.     1.  0.017   5.0
          120.   344.  0.004    20.    20.  0.037    20.
0 288 271   5   5.5   250.  0.011     0.     0.  0.013   5.5
          120.   250.  0.011    20.    20.  0.037    20.
0 296 172   4    20.  1613.  0.008    10.    10.  0.050     2.
          120.  1613.  0.008    50.    50.  0.040    20.
0 297 298   2     5.   350.  0.005     0.     0.  0.013     5.
0 298 211   4    20.   440.  0.008    10.    10.  0.050     2.
          120.   440.  0.008    50.    50.  0.040    20.
0 299 302   4    20.  2854.  0.008    10.    10.  0.046     2.
          120.  2854.  0.004    50.    50.  0.033    20.
0 301 224   3    10.     1.    0.1              0.01     1.
0 302 233 11 2    0.1   500.  0.001              0.035    0.1
    0     0    0.21     5.   3.05    19.   12.65    40.
 30.14    66.    56.    92.  90.45   115.  131.74   131.
176.83   145.  223.32   158.  270.77   171.
0 303 247   3    10.     1.    0.1              0.01     1.
0 304 296   3    10.     1.    0.1              0.01     1.
0 305 251   3    10.     1.    0.1              0.01     1.
0 306 140   3    10.     1.    0.1              0.01     1.
0 307 235   3    10.     1.    0.1              0.01     1.
0 308 114   3    10.     1.    0.1              0.01     1.
0 309 286   3    10.     1.    0.1              0.01     1.
0 310 234   3    10.     1.    0.1              0.01     1.
0 311 216   3    10.     1.    0.1              0.01     1.
0 315 115 12 2    0.1    10.    0.1                       0.1
    0.     0.    1.4    22.     9.   150.    25.1    402.
   50.2   822.   83.7  1393.  125.3  2079.   173.4   2853.
  226.4  3712.  272.1  4499.  283.8  4640.    342.   5520.
401 131 231 3 3          1.
    0     0    528    528    900    528
   401 402   3          1.
   402 210   2    6.5   196  0.013     0     0  0.015    6.5
403 140 200 3 3          1.
    0     0    560.   560.   900.   560.     0.     0.
  0 403 238   3          1.
  0 238 164   2    7.6   245.  0.005              0.013     8.
 -1 949 122 10 3    10.     1.    0.1              0.01    10.
    0     0   1.00     1.   2.00  3032.    2.17   3072.
   2.33  3057.   3.00  2791.   6.00   551.     7.0    318.
   9.33   210.   16.0   193

  0
  0
ENDPROGRAM
```

50 YR EXISTING CONDITION

```
  2  1  1  2
  3  4
WATERSHED   1
LOWER THIRD CREEK, 50 YR EXISTING CONDITION
KIOWA ENGINEERING CORPORATION 12/03
     192      5.0                                   1
       1  100
       2  135
       3  101
       4  100
       5  103
       6  123
       7  104
       8  104
       9  105
      10  124
      11  125
      12  106
      13  106
      14  157
      15  126
      16  108
      17  127
      18  128
      19  129
      20  130
      21  131
      22  109
      23  187
      24  134
      25  111
      26  133
      27  110
      28  112
      29  308
      30  158
      31  158
      32  158
      33  308
      34  159
      35  181
      36  159
      37  162
      38  162
      39  306
      40  115
      41  138
      42  182
      43  183
      44  160
      45  161
      46  139
      47  140
      48  141
      49  116
      50  116
      51  117
      52  118
      53  155
      54  154
      55  119
      56  118
      57  163
      58  163
      59  168
      60  169
      61  170
      62  142
      63  183
      64  143
      65  184
      66  144
      67  148
      68  148
      69  120
      70  120
      71  153
      72  156
      73  121
      74  165
      75  166
      76  303
      77  171
      78  172
      79  180
      80  150
      81  145
      82  145
      83  132
      84  132
      85  150
      86  150
      87  146
      88  174
      89  174
      90  174
      91  185
      92  151
      93  152
      94  176
      95  177
      96  178
      97  175
      98  121

  0 100   0  3   10.   1.   0.1          0.01   1.
  0 101 285  3   10.   1.   0.1          0.01   1.
  0 102 273  3   10.   1.   0.1          0.01   1.
  0 103 203  3   10.   1.   0.1          0.01   1.
  0 104 204  3   10.   1.   0.1          0.01   1.
  0 105 205  3   10.   1.   0.1          0.01   1.
  0 106 206  3   10.   1.   0.1          0.01   1.
  0 107 207  3   10.   1.   0.1          0.01   1.
  0 108 208  3   10.   1.   0.1          0.01   1.
  0 109 209  3   10.   1.   0.1          0.01   1.
  0 110 210  3   10.   1.   0.1          0.01   1.
  0 111 211  3   10.   1.   0.1          0.01   1.
  0 112 212  3   10.   1.   0.1          0.01   1.
  0 113 213  3   10.   1.   0.1          0.01   1.
  0 114 214  3   10.   1.   0.1          0.01   1.
```

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0 115 215  3   10.   1.   0.1          0.01   1.
0 116 311  3   10.   1.   0.1          0.01   1.
0 117 217  3   10.   1.   0.1          0.01   1.
0 118 218  3   10.   1.   0.1          0.01   1.
0 119 280  3   10.   1.   0.1          0.01   1.
0 120 220  3   10.   1.   0.1          0.01   1.
0 121 221  3   10.   1.   0.1          0.01   1.
0 122 222  3   10.   1.   0.1          0.01   1.
0 123 278  3   10.   1.   0.1          0.01   1.
0 124 223  3   10.   1.   0.1          0.01   1.
0 125 274  3   10.   1.   0.1          0.01   1.
0 126 226  3   10.   1.   0.1          0.01   1.
0 127 228  3   10.   1.   0.1          0.01   1.
0 128 229  3   10.   1.   0.1          0.01   1.
0 129 227  3   10.   1.   0.1          0.01   1.
0 130 287  3   10.   1.   0.1          0.01   1.
0 132 304  3   10.   1.   0.1          0.01   1.
0 133 232  3   10.   1.   0.1          0.01   1.
0 134 281  3   10.   1.   0.1          0.01   1.
0 135 202  3   10.   1.   0.1          0.01   1.
0 136 288  3   10.   1.   0.1          0.01   1.
0 137 219  3   10.   1.   0.1          0.01   1.
0 138 236  3   10.   1.   0.1          0.01   1.
0 139 307  3   10.   1.   0.1          0.01   1.
0 141 200  3   10.   1.   0.1          0.01   1.
0 142 240  3   10.   1.   0.1          0.01   1.
0 143 237  3   10.   1.   0.1          0.01   1.
0 144 276  3   10.   1.   0.1          0.01   1.
0 145 266  3   10.   1.   0.1          0.01   1.
0 146 267  3   10.   1.   0.1          0.01   1.
0 147 230  3   10.   1.   0.1          0.01   1.
0 148 254  3   10.   1.   0.1          0.01   1.
0 149 255  3   10.   1.   0.1          0.01   1.
0 150 256  3   10.   1.   0.1          0.01   1.
0 151 257  3   10.   1.   0.1          0.01   1.
0 152 259  3   10.   1.   0.1          0.01   1.
0 153 264  3   10.   1.   0.1          0.01   1.
0 154 268  3   10.   1.   0.1          0.01   1.
0 155 269  3   10.   1.   0.1          0.01   1.
0 156 265  3   10.   1.   0.1          0.01   1.
0 157 275  3   10.   1.   0.1          0.01   1.
0 158 302  3   10.   1.   0.1          0.01   1.
0 159 309  3   10.   1.   0.1          0.01   1.
0 160 282  3   10.   1.   0.1          0.01   1.
0 161 310  3   10.   1.   0.1          0.01   1.
0 162 299  3   10.   1.   0.1          0.01   1.
0 163 244  3   10.   1.   0.1          0.01   1.
0 164 279  3   10.   1.   0.1          0.01   1.
0 165 245  3   10.   1.   0.1          0.01   1.
0 166 246  3   10.   1.   0.1          0.01   1.
0 167 250  3   10.   1.   0.1          0.01   1.
0 168 243  3   10.   1.   0.1          0.01   1.
0 169 242  3   10.   1.   0.1          0.01   1.
0 170 241  3   10.   1.   0.1          0.01   1.
0 171 248  3   10.   1.   0.1          0.01   1.
0 172 249  3   10.   1.   0.1          0.01   1.
0 173 270  3   10.   1.   0.1          0.01   1.
0 174 305  3   10.   1.   0.1          0.01   1.
0 175 258  3   10.   1.   0.1          0.01   1.
0 176 252  3   10.   1.   0.1          0.01   1.
0 177 263  3   10.   1.   0.1          0.01   1.
0 178 262  3   10.   1.   0.1          0.01   1.
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0 181 159  3   10.   1.   0.1          0.01   1.
0 182 283  3   10.   1.   0.1          0.01   1.
0 183 239  3   10.   1.   0.1          0.01   1.
0 184 277  3   10.   1.   0.1          0.01   1.
0 185 284  3   10.   1.   0.1          0.01   1.
0 186 225  3   10.   1.   0.1          0.01   1.
0 187 301  3   10.   1.   0.1          0.01   1.
0 188 247  3   10.   1.   0.1          0.01   1.
0 200 136  4   10.  964.  0.004   10.   10.  0.047   2.
             50.  964.  0.004   50.   50.  0.033  20.
0 202 101  4   20. 2327.  0.003   20.   20.  0.04    3.
            120. 2327.  0.003   50.   50.  0.03   20.
0 203 102  4   20. 1902.  0.004   20.   20.  0.044   3.
            120. 1902.  0.004   50.   50.  0.033  20.
0 204 103  4   20. 2673.  0.004   20.   20.  0.044   3.
            120. 2673.  0.004   50.   50.  0.033  20.
0 205 104  4   60. 1621.  0.003    4.    4.  0.037   3.
            160. 1621.  0.003   50.   50.  0.03   20.
0 206 105  4   50. 4148.  0.0034   4.    4.  0.039   3.
            150. 4148.  0.0034  50.   50.  0.031  20.
0 207 106  4   15.  717.  0.003    4.    4.  0.037   4.
            115.  717.  0.003   20.   20.  0.029  20.
0 208 107  4   20. 2763.  0.003   10.   10.  0.039   3.
            120. 2763.  0.003   40.   40.  0.03   20.
0 209 108  4   20. 3945.  0.003    4.    4.  0.036   5.
            120. 3945.  0.003   40.   40.  0.03   20.
0 210 109  4   20. 3217.  0.007    4.    4.  0.053   3.
            120. 3217.  0.007   50.   50.  0.041  20.
0 211 110  4   20. 1323.  0.008    4.    4.  0.056   3.
            120. 1323.  0.008   50.   50.  0.043  20.
0 212 111  4   50. 2426.  0.003    4.    4.  0.037   3.
            150. 2426.  0.003   50.   50.  0.03   20.
0 213 112  4   20. 2473.  0.005    4.    4.  0.046   3.
            120. 2473.  0.005   50.   50.  0.036  20.
0 214 113  4   20.  443.  0.003   10.   10.  0.039   3.
            120.  443.  0.003   25.   25.  0.029  20.
0 215 308  4   20. 1622.  0.003   10.   10.  0.039   3.
            120. 1622.  0.003   25.   25.  0.028  25.
0 216 164  4   20. 1324.  0.003   10.   10.  0.039   3.
            120. 1324.  0.003   25.   25.  0.029  20.
0 217 116  4   20. 3243.  0.005   10.   10.  0.047   3.
            120. 3243.  0.005   25.   25.  0.036  20.
0 218 117  4   20.  282.  0.003   10.   10.  0.039   3.
            120.  282.  0.003   25.   25.  0.029  20.
0 219 118  4   20. 2003.  0.003   10.   10.  0.039   3.
            120. 2003.  0.003   20.   20.  0.029  20.
0 220 147  4   20. 2196.  0.003    4.    4.  0.037   4.
            120. 2196.  0.003   20.   20.  0.029  20.
0 221 120  4   20. 5356.  0.001    4.    4.  0.024   5.
            120. 5356.  0.001   20.   20.  0.046  20.
0 222 121  4    8. 4084.  0.012    4.    4.  0.066   3.
             32. 4084.  0.012   20.   20.  0.071  20.
0 224 110  4   20. 2002.  0.003    4.    4.  0.04    2.
            120. 2002.  0.003   50.   50.  0.03   20.
0 223 105  4   20. 1141.  0.002   10.   10.  0.035   2.
            120. 1141.  0.002   50.   50.  0.025  20.
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0 225 106  4   20.  2475.  0.001   10.   10.  0.027   2.
           120.  2475.  0.001   50.   50.  0.02   20.
0 226 107  4   10.  2015.  0.006    4.    4.  0.054   2.
           110.  2015.  0.006   50.   50.  0.039   20.
0 227 126  4   20.  2686. 0.0052   10.   10.  0.056   1.
           120.  2686. 0.0052   50.   50.  0.037   20.
0 228 108  4   10.   645.  0.016    4.    4.  0.078   2.
           110.   645.  0.016   50.   50.  0.056   20.
0 229 127  4   10.   838.  0.003    4.    4.  0.041   2.
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0 230 119  4   20.   302.  0.003    4.    4.  0.037   4.
           120.   302.  0.003   20.   20.  0.029   20.
0 231 130  4   20.  2856.  0.004   10.   10.  0.046   2.
           120.  2856.  0.004   50.   50.  0.033   20.
0 232 111  4   20.  1120.  0.005   10.   10.  0.05   2.
           120.  1120.  0.005   50.   50.  0.036   20.
0 233 297  4   20.  2070.  0.008   10.   10.  0.060   2.
           120.  2070.  0.008   50.   50.  0.043   20.
0 234 173  4   20.  3316.  0.013   10.   10.  0.072   2.
           120.  3316.  0.013   50.   50.  0.052   20.
0 235 140  4   40.  1047.  0.019   10.   10.  0.09   1.
           120.  1047.  0.019   50.   50.  0.06   20.
0 236 116  4   50.  2857. 0.0035   10.   10.  0.047   1.
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0 237 184  5    6.   183.  0.035    0.    0.  0.013   6.
           100.  1400.  0.005   50.   50.  0.051   20.
0 239 143  4   40.  1430. 0.0030   10.   10.  0.041   2.
           120.  1430. 0.0030   50.   50.  0.030   20.
0 240 140  4   20.  2733.  0.015    5.    5.  0.082   1.
           120.  2733.  0.015   50.   50.  0.055   20.
0 241 139  4   20.  2126.  0.009   10.   10.  0.069   1.
           120.  2126.  0.009   50.   50.  0.045   20.
0 242 168  4   20.   927.  0.013    5.    5.  0.071   2.
           120.   927.  0.013   50.   50.  0.052   20.
0 243 161  4   20.  1224.  0.002   10.   10.  0.035   2.
           120.  1224.  0.002   50.   50.  0.025   20.
0 244 160  4   20.  1747.  0.007   10.   10.  0.057   2.
           120.  1747.  0.007   50.   50.  0.041   20.
0 245 163  4   20.  2060.  0.006   10.   10.  0.054   2.
           120.  2060.  0.006   50.   50.  0.039   20.
0 246 165  4   20.  3293.  0.007   10.   10.  0.057   2.
           120.  3293.  0.007   50.   50.  0.041   20.
0 247 168  4   40.  1278.   0.02   10.   10.  0.083   2.
           120.  1278.   0.02   50.   50.  0.061   20.
0 248 170  4  100.  1834.  0.013   10.   10.  0.077   1.
           200.  1834.  0.013   50.   50.  0.051   20.
0 249 171  4  100.  3800.  0.008   10.   10.  0.064   1.
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0 250 132  4  100.  2986.  0.008   10.   10.  0.064   1.
           200.  2986.  0.008   50.   50.  0.043   20.
0 251 167  4   20.  1081.  0.004   10.   10.  0.051   1.
           120.  1081.  0.004   50.   50.  0.033   20.
0 252 174  4   20.  2585.  0.005    5.    5.  0.049   2.
           120.  2585.  0.005   50.   50.  0.036   20.
0 254 147  4   20.   637.  0.003   10.   10.  0.045   1.
           120.   637.  0.003   50.   50.  0.03   20.
0 255 150  4   70.  1579.  0.004    5.    5.  0.049   1.
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0 256 145  4  100.  2710.  0.013   10.   10.  0.077   1.
           200.  2710.  0.013   50.   50.  0.051   20.
0 257 149  4  100.  1831.  0.014   10.   10.  0.079   1.
           200.  1831.  0.014   50.   50.  0.053   20.
0 258 151  4  100.  3598.   0.01   10.   10.  0.069   1.
           200.  3598.   0.01   50.   50.  0.047   20.
0 259 149  4  100.  1401.  0.012   10.   10.  0.074   1.
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0 260 150  4  100.  2084.  0.007   10.   10.  0.06   1.
           200.  2084.  0.007   50.   50.  0.041   20.
0 261 176  4   20.  1626.  0.009   10.   10.  0.063   2.
           120.  1626.  0.009   50.   50.  0.045   20.
0 262 179  4  100.  1461.  0.006   10.   10.  0.057   1.
           200.  1461.  0.006   50.   50.  0.038   20.
0 263 179  4  100.  1278.  0.007   10.   10.  0.06   1.
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0 264 121  4  100.  2606.  0.019    5.    5.  0.063   2.
           400.  2606.  0.019   50.   50.  0.045   20.
0 265 122  4   20.  1802.  0.024    4.    4.  0.089   2.
           120.  1802.  0.024   50.   50.  0.065   20.
0 266 148  4   20.  3270.  0.007    5.    5.  0.056   2.
           120.  3270.  0.007   50.   50.  0.041   20.
0 267 145  4  100.   972.  0.002   10.   10.  0.038   1.
           200.   972.  0.002   50.   50.  0.025   20.
0 268 120  4  100.  1610.  0.031   10.   10.  0.089   1.
           400.  1610.  0.031   50.   50.  0.065   20.
0 269 119  4   10.   730.  0.025   10.   10.  0.103   1.
           100.   730.  0.025   50.   50.  0.066   20.
0 270 181  4   20.  1456.  0.006    5.    5.  0.053   2.
           120.  1456.  0.006   50.   50.  0.039   20.
0 271 164  4   50.  1908.  0.002   10.   10.  0.035   2.
           150.  1908.  0.002   50.   50.  0.025   20.
0 273 100  4   20.   703.  0.002   10.   10.  0.041   2.
           120.   703.  0.002   50.   50.  0.03   20.
0 274 186  4   20.  1045.  0.001   10.   10.  0.027   2.
           120.  1045.  0.001   50.   50.  0.02   20.
0 275 186  4   20.  1420.  0.011   10.   10.  0.068   2.
           120.  1420.  0.011   50.   50.  0.049   20.
0 276 137  4   20.  2158.  0.006    4.    4.  0.047   5.
           120.  2158.  0.006   50.   50.  0.043   10.
0 277 144  4   17.   262.  0.008    3.    3.  0.044   1.
           120.   262.  0.008   50.   50.  0.048   10.
0 278 103  4   20.   708.  0.007    4.    4.  0.056   2.
           120.   708.  0.007   50.   50.  0.041   20.
0 279 315  4   20.  2452.  0.003   10.   10.  0.039   3.
           120.  2452.  0.003   25.   25.  0.029   20.
0 280 137  4   20.  1804.  0.003   10.   10.  0.039   3.
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0 281 133  4   20.  3622.  0.004   10.   10.  0.046   2.
           120.  3622.  0.004   50.   50.  0.033   20.
0 282 182  4   20.  2352.  0.006   10.   10.  0.054   2.
           120.  2352.  0.006   50.   50.  0.039   20.
0 283 159  4   20.  1995.  0.004   10.   10.  0.046   2.
           120.  1995.  0.004   50.   50.  0.033   20.
0 284 132  4   20.  3155.  0.006   10.   10.  0.054   2.
           120.  3155.  0.006   50.   50.  0.039   20.
0 285 102  4   35.   502.  0.001   10.   10.  0.027   2.
           135.   502.  0.001   50.   50.  0.02   20.
0 286 158  4   20.  1328.  0.004   10.   10.  0.060   2.
           120.  1328.  0.008   50.   50.  0.043   20.
0 287 109  5  5.0   344.  0.005    1.    1.  0.017  5.0
           120.   344.  0.004   20.   20.  0.037   20.
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 0 288 271   5    5.5   250.  0.011     0.     0.  0.013    5.5
             120.   250.  0.011    20.    20.  0.037    20.
 0 296 172   4    20.  1613.  0.008    10.    10.  0.050     2.
             120.  1613.  0.008    50.    50.  0.040    20.
 0 297 298   2     5.   350.  0.005     0.     0.  0.013     5.
 0 298 211   4    20.   440.  0.008    10.    10.  0.050     2.
             120.   440.  0.008    50.    50.  0.040    20.
 0 299 302   4    20.  2854.  0.008    10.    10.  0.046     2.
             120.  2854.  0.004    50.    50.  0.033    20.
 0 301 224   3    10.     1.    0.1              0.01     1.
 0 302 233 11 2    0.1   500.  0.001              0.035    0.1
    0      0    0.21      5.    3.05     19.   12.65     40.
 30.14     66.     56.     92.   90.45    115.  131.74    131.
 176.83    145.  223.32    158.  270.77    171.
 0 303 247   3    10.     1.    0.1              0.01     1.
 0 304 296   3    10.     1.    0.1              0.01     1.
 0 305 251   3    10.     1.    0.1              0.01     1.
 0 306 140   3    10.     1.    0.1              0.01     1.
 0 307 235   3    10.     1.    0.1              0.01     1.
 0 308 114   3    10.     1.    0.1              0.01     1.
 0 309 286   3    10.     1.    0.1              0.01     1.
 0 310 234   3    10.     1.    0.1              0.01     1.
 0 311 216   3    10.     1.    0.1              0.01     1.
 0 315 115 12 2    0.1    10.    0.1                       0.1
   0.      0.     1.4     22.     9.    150.     25.1    402.
  50.2    822.    83.7   1393.   125.3   2079.   173.4   2853.
 226.4   3712.   272.1   4499.   283.8   4640.    342.   5520.
401  131  231  3 3          1.
   0      0     528     528     900     528
  401 402   3          1.
  402 210   2    6.5   196   0.013      0      0  0.015    6.5
 403  140  200  3 3          1.
     0.      0.    560.    560.    900.    560.      0.      0.
  0 403 238   3          1.
  0 238 164   2    7.6   245.  0.005              0.013     8.
 -1 949 122 12 3    10.     1.    0.1              0.01    10.
     0.      0.    1.00      0.    1.33     54.     2.0   1962.
   1.17   2015.    2.33   1983.    3.00   1642.     4.0   1355.
   5.0     553.    5.67    385.    8.33    215.    16.0    190.

  0
  0   0   0   0   0   0   0   0   0   0
ENDPROGRAM
```

10YR EXISTING CONDITION

```
  2  1  1  2
  3  4
WATERSHED  1
LOWER THIRD CREEK, 10 YR FUTURE Master Plan CONDITION
KIOWA ENGINEERING CORPORATION 2/04
     192      5.0                                   1
      1  100
      2  135
      3  101
      4  100
      5  103
      6  123
      7  104
      8  104
      9  105
     10  124
     11  125
     12  106
     13  106
     14  157
     15  126
     16  108
     17  127
     18  128
     19  129
     20  130
     21  131
     22  109
     23  187
     24  134
     25  111
     26  133
     27  110
     28  112
     29  308
     30  158
     31  158
     32  158
     33  308
     34  159
     35  181
     36  159
     37  162
     38  162
     39  306
     40  115
     41  138
     42  182
     43  173
     44  160
     45  161
     46  139
     47  140
     48  141
     49  116
     50  116
     51  117
     52  118
     53  155
     54  154
     55  119
     56  118
     57  163
     58  163
     59  168
     60  169
     61  170
     62  142
     63  316
     64  316
     65  184
     66  144
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67 148
68 148
69 120
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76 303
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98 121

0 100  0  3   10.   1.   0.1        0.01   1.
0 101 285  3   10.   1.   0.1        0.01   1.
0 102 273  3   10.   1.   0.1        0.01   1.
0 103 203  3   10.   1.   0.1        0.01   1.
0 104 204  3   10.   1.   0.1        0.01   1.
0 105 205  3   10.   1.   0.1        0.01   1.
0 106 206  3   10.   1.   0.1        0.01   1.
0 107 207  3   10.   1.   0.1        0.01   1.
0 108 208  3   10.   1.   0.1        0.01   1.
0 109 209  3   10.   1.   0.1        0.01   1.
0 110 210  3   10.   1.   0.1        0.01   1.
0 111 211  3   10.   1.   0.1        0.01   1.
0 112 212  3   10.   1.   0.1        0.01   1.
0 113 213  3   10.   1.   0.1        0.01   1.
0 114 214  3   10.   1.   0.1        0.01   1.
0 115 215  3   10.   1.   0.1        0.01   1.
0 116 311  3   10.   1.   0.1        0.01   1.
0 117 217  3   10.   1.   0.1        0.01   1.
0 118 218  3   10.   1.   0.1        0.01   1.
0 119 280  3   10.   1.   0.1        0.01   1.
0 120 220  3   10.   1.   0.1        0.01   1.
0 121 221  3   10.   1.   0.1        0.01   1.
0 122 222  3   10.   1.   0.1        0.01   1.
0 123 278  3   10.   1.   0.1        0.01   1.
0 124 223  3   10.   1.   0.1        0.01   1.
0 125 274  3   10.   1.   0.1        0.01   1.
0 126 226  3   10.   1.   0.1        0.01   1.
0 127 228  3   10.   1.   0.1        0.01   1.
0 128 229  3   10.   1.   0.1        0.01   1.
0 129 227  3   10.   1.   0.1        0.01   1.
0 130 287  3   10.   1.   0.1        0.01   1.
0 132 304  3   10.   1.   0.1        0.01   1.
0 133 232  3   10.   1.   0.1        0.01   1.
0 134 281  3   10.   1.   0.1        0.01   1.
0 135 202  3   10.   1.   0.1        0.01   1.
0 136 288  3   10.   1.   0.1        0.01   1.
0 137 219  3   10.   1.   0.1        0.01   1.
0 138 236  3   10.   1.   0.1        0.01   1.
0 139 307  3   10.   1.   0.1        0.01   1.
0 141 200  3   10.   1.   0.1        0.01   1.
0 142 240  3   10.   1.   0.1        0.01   1.
0 143 237  3   10.   1.   0.1        0.01   1.
0 144 276  3   10.   1.   0.1        0.01   1.
0 145 266  3   10.   1.   0.1        0.01   1.
0 146 267  3   10.   1.   0.1        0.01   1.
0 147 230  3   10.   1.   0.1        0.01   1.
0 148      3   10.   1.   0.1        0.01   1.
0 149 255  3   10.   1.   0.1        0.01   1.
0 150 256  3   10.   1.   0.1        0.01   1.
0 151 257  3   10.   1.   0.1        0.01   1.
0 152 259  3   10.   1.   0.1        0.01   1.
0 153 264  3   10.   1.   0.1        0.01   1.
0 154 268  3   10.   1.   0.1        0.01   1.
0 155 269  3   10.   1.   0.1        0.01   1.
0 156 265  3   10.   1.   0.1        0.01   1.
0 157 275  3   10.   1.   0.1        0.01   1.
0 158 302  3   10.   1.   0.1        0.01   1.
0 159 309  3   10.   1.   0.1        0.01   1.
0 160 282  3   10.   1.   0.1        0.01   1.
0 161 310  3   10.   1.   0.1        0.01   1.
0 162 299  3   10.   1.   0.1        0.01   1.
0 163 244  3   10.   1.   0.1        0.01   1.
0 164 279  3   10.   1.   0.1        0.01   1.
0 165 245  3   10.   1.   0.1        0.01   1.
0 166 246  3   10.   1.   0.1        0.01   1.
0 167 250  3   10.   1.   0.1        0.01   1.
0 168 243  3   10.   1.   0.1        0.01   1.
0 169 242  3   10.   1.   0.1        0.01   1.
0 170 241  3   10.   1.   0.1        0.01   1.
0 171 248  3   10.   1.   0.1        0.01   1.
0 173 270  3   10.   1.   0.1        0.01   1.
0 174 305  3   10.   1.   0.1        0.01   1.
0 175 258  3   10.   1.   0.1        0.01   1.
0 176 252  3   10.   1.   0.1        0.01   1.
0 177 263  3   10.   1.   0.1        0.01   1.
0 178 262  3   10.   1.   0.1        0.01   1.
0 179 261  3   10.   1.   0.1        0.01   1.
0 180 260  3   10.   1.   0.1        0.01   1.
0 181 159  3   10.   1.   0.1        0.01   1.
0 184 277  3   10.   1.   0.1        0.01   1.
0 185 284  3   10.   1.   0.1        0.01   1.
0 186 225  3   10.   1.   0.1        0.01   1.
0 187 301  3   10.   1.   0.1        0.01   1.
0 188 247  3   10.   1.   0.1        0.01   1.
0 200 136  4   10.  964.  0.004   10.   10.  0.047   2.
           50.  964.  0.004   50.   50.  0.033  20.
0 202 101  4   20. 2327.  0.003   20.   20.  0.04   3.
```

```
          120.  2327.  0.003    50.    50.   0.03    20.
0 203 102   4    20.  1902.  0.004    20.    20.  0.044     3.
          120.  1902.  0.004    50.    50.  0.033    20.
0 204 103   4    20.  2673.  0.004    20.    20.  0.044     3.
          120.  2673.  0.004    50.    50.  0.033    20.
0 205 104   4    60.  1621.  0.003     4.     4.  0.037     3.
          160.  1621.  0.003    50.    50.   0.03    20.
0 206 105   4    50.  4148. 0.0034     4.     4.  0.039     3.
          150.  4148. 0.0034    50.    50.  0.031    20.
0 207 106   4    15.   717.  0.003     4.     4.  0.037     4.
          115.   717.  0.003    20.    20.  0.029    20.
0 208 107   4    20.  2763.  0.003    10.    10.  0.039     3.
          120.  2763.  0.003    40.    40.   0.03    20.
0 209 108   4    20.  3945.  0.003     4.     4.  0.036     5.
          120.  3945.  0.003    40.    40.   0.03    20.
0 210 109   4    20.  3217.  0.007     4.     4.  0.053     3.
          120.  3217.  0.007    50.    50.  0.041    20.
0 211 110   4    20.  1323.  0.008     4.     4.  0.056     3.
          120.  1323.  0.008    50.    50.  0.043    20.
0 212 111   4    50.  2426.  0.003     4.     4.  0.037     3.
          150.  2426.  0.003    50.    50.   0.03    20.
0 213 112   4    20.  2473.  0.005     4.     4.  0.046     3.
          120.  2473.  0.005    50.    50.  0.036    20.
0 214 113   4    20.   443.  0.003    10.    10.  0.039     3.
          120.   443.  0.003    25.    25.  0.029    20.
0 215 308   4    20.  1622.  0.003    10.    10.  0.039     3.
          120.  1622.  0.003    25.    25.  0.028    25.
0 216 164   4    20.  1324.  0.003    10.    10.  0.039     3.
          120.  1324.  0.003    25.    25.  0.029    20.
0 217 116   4    20.  3243.  0.005    10.    10.  0.047     3.
          120.  3243.  0.005    25.    25.  0.036    20.
0 218 117   4    20.   282.  0.003    10.    10.  0.039     3.
          120.   282.  0.003    25.    25.  0.029    20.
0 219 118   4    20.  2003.  0.003    10.    10.  0.039     3.
          120.  2003.  0.003    20.    20.  0.029    20.
0 220 147   4    20.  2196.  0.003     4.     4.  0.037     4.
          120.  2196.  0.003    20.    20.  0.029    20.
0 221 120   4    20.  5356.  0.001     4.     4.  0.024     5.
          120.  5356.  0.001    20.    20.  0.046    20.
0 222 121   4     8.  4084.  0.012     4.     4.  0.066     3.
           32.  4084.  0.012    20.    20.  0.071    20.
0 224 110   4    20.  2002.  0.003     4.     4.   0.04     2.
          120.  2002.  0.003    50.    50.   0.03    20.
0 223 105   4    20.  1141.  0.002    10.    10.  0.035     2.
          120.  1141.  0.002    50.    50.  0.025    20.
0 225 106   4    20.  2475.  0.001    10.    10.  0.027     2.
          120.  2475.  0.001    50.    50.   0.02    20.
0 226 107   4    10.  2015.  0.006     4.     4.  0.054     2.
          110.  2015.  0.006    50.    50.  0.039    20.
0 227 126   4    20.  2686. 0.0052    10.    10.  0.056     1.
          120.  2686. 0.0052    50.    50.  0.037    20.
0 228 108   4    10.   645.  0.016     4.     4.  0.078     2.
          110.   645.  0.016    50.    50.  0.056    20.
0 229 127   4    10.   838.  0.003     4.     4.  0.041     2.
          110.   838.  0.003    50.    50.   0.03    20.
0 230 119   4    20.   302.  0.003     4.     4.  0.037     4.
          120.   302.  0.003    20.    20.  0.029    20.
0 231 130   4    20.  2856.  0.004    10.    10.  0.046     2.
          120.  2856.  0.004    50.    50.  0.033    20.
0 232 111   4    20.  1120.  0.005    10.    10.   0.05     2.
          120.  1120.  0.005    50.    50.  0.036    20.
0 233 297   4    20.  2070.  0.008    10.    10.  0.060     2.
          120.  2070.  0.008    50.    50.  0.043    20.
0 234 173   4    20.  3316.  0.013    10.    10.  0.072     2.
          120.  3316.  0.013    50.    50.  0.052    20.
0 235 140   4    40.  1047.  0.019    10.    10.   0.09     1.
          120.  1047.  0.019    50.    50.   0.06    20.
0 236 116   4    50.  2857. 0.0035    10.    10.  0.047     1.
          200.  2857. 0.0035    50.    50.  0.031    20.
0 237 184   5     6.   183.  0.035     0.     0.  0.013     6.
          100.  1400.  0.005    50.    50.  0.051    20.
0 240 140   4    20.  2733.  0.015     5.     5.  0.082     1.
          120.  2733.  0.015    50.    50.  0.055    20.
0 241 139   4    20.  2126.  0.009    10.    10.  0.069     1.
          120.  2126.  0.009    50.    50.  0.045    20.
0 242 168   4    20.   927.  0.013     5.     5.  0.071     2.
          120.   927.  0.013    50.    50.  0.052    20.
0 243 161   4    20.  1224.  0.002    10.    10.  0.035     2.
          120.  1224.  0.002    50.    50.  0.025    20.
0 244 160   4    20.  1747.  0.007    10.    10.  0.057     2.
          120.  1747.  0.007    50.    50.  0.041    20.
0 245 163   4    20.  2060.  0.006    10.    10.  0.054     2.
          120.  2060.  0.006    50.    50.  0.039    20.
0 246 165   4    20.  3293.  0.007    10.    10.  0.057     2.
          120.  3293.  0.007    50.    50.  0.041    20.
0 247 168   4    40.  1278.   0.02    10.    10.  0.083     2.
          120.  1278.   0.02    50.    50.  0.061    20.
0 248 170   4   100.  1834.  0.013    10.    10.  0.077     1.
          200.  1834.  0.013    50.    50.  0.051    20.
0 250 132   4   100.  2986.  0.008    10.    10.  0.064     1.
          200.  2986.  0.008    50.    50.  0.043    20.
0 251 167   4    20.  1081.  0.004    10.    10.  0.051     1.
          120.  1081.  0.004    50.    50.  0.033    20.
0 252 174   4    20.  2585.  0.005     5.     5.  0.049     2.
          120.  2585.  0.005    50.    50.  0.036    20.
0 254 147   4    20.   637.  0.003    10.    10.  0.045     1.
          120.   637.  0.003    50.    50.   0.03    20.
0 255 150   4    70.  1579.  0.004     5.     5.  0.049     1.
          200.  1579.  0.004    50.    50.  0.033    20.
0 256 145   4   100.  2710.  0.013    10.    10.  0.077     1.
          200.  2710.  0.013    50.    50.  0.051    20.
0 257 149   4   100.  1831.  0.014    10.    10.  0.079     1.
          200.  1831.  0.014    50.    50.  0.053    20.
0 258 151   4   100.  3598.   0.01    10.    10.  0.069     1.
          200.  3598.   0.01    50.    50.  0.047    20.
0 259 149   4   100.  1401.  0.012    10.    10.  0.074     1.
          200.  1401.  0.012    50.    50.   0.05    20.
0 260 150   4   100.  2084.  0.007    10.    10.   0.06     1.
          200.  2084.  0.007    50.    50.  0.041    20.
0 261 176   4    20.  1626.  0.009    10.    10.  0.063     2.
          120.  1626.  0.009    50.    50.  0.045    20.
0 262 179   4   100.  1461.  0.006    10.    10.  0.057     1.
          200.  1461.  0.006    50.    50.  0.038    20.
0 263 179   4   100.  1278.  0.007    10.    10.   0.06     1.
          200.  1278.  0.007    50.    50.  0.041    20.
0 264 121   4   100.  2606.  0.019     5.     5.  0.063     2.
          400.  2606.  0.019    50.    50.  0.045    20.
0 265 122   4    20.  1802.  0.024     4.     4.  0.089     2.
          120.  1802.  0.024    50.    50.  0.065    20.
0 266 148   4    20.  3270.  0.007     5.     5.  0.056     2.
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            120.  3270.  0.007    50.    50.  0.041    20.
0 267 145   4   100.   972.  0.002    10.    10.  0.038     1.
            200.   972.  0.002    50.    50.  0.025    20.
0 268 120   4   100.  1610.  0.031    10.    10.  0.089     1.
            400.  1610.  0.031    50.    50.  0.065    20.
0 269 119   4    10.   730.  0.025    10.    10.  0.103     1.
            100.   730.  0.025    50.    50.  0.066    20.
0 270 181   4    20.  1456.  0.006     5.     5.  0.053     2.
            120.  1456.  0.006    50.    50.  0.039    20.
0 271 164   4    50.  1908.  0.002    10.    10.  0.035     2.
            150.  1908.  0.002    50.    50.  0.025    20.
0 273 100   4    20.   703.  0.002    10.    10.  0.041     2.
            120.   703.  0.002    50.    50.  0.03    20.
0 274 186   4    20.  1045.  0.001    10.    10.  0.027     2.
            120.  1045.  0.001    50.    50.  0.02    20.
0 275 186   4    20.  1420.  0.011    10.    10.  0.068     2.
            120.  1420.  0.011    50.    50.  0.049    20.
0 276 137   4    20.  2158.  0.006     4.     4.  0.047     5.
            120.  2158.  0.006    50.    50.  0.043    10.
0 277 144   4    17.   262.  0.008     3.     3.  0.044     1.
            120.   262.  0.008    50.    50.  0.048    10.
0 278 103   4    20.   708.  0.007     4.     4.  0.056     2.
            120.   708.  0.007    50.    50.  0.041    20.
0 279 315   4    20.  2452.  0.003    10.    10.  0.039     3.
            120.  2452.  0.003    25.    25.  0.029    20.
0 280 137   4    20.  1804.  0.003    10.    10.  0.039     3.
            120.  1804.  0.003    50.    50.  0.03    20.
0 281 133   4    20.  3622.  0.004    10.    10.  0.046     2.
            120.  3622.  0.004    50.    50.  0.033    20.
0 282 182   4    20.  2352.  0.006    10.    10.  0.054     2.
            120.  2352.  0.006    50.    50.  0.039    20.
0 283 159   4    20.  1995.  0.004    10.    10.  0.046     2.
            120.  1995.  0.004    50.    50.  0.033    20.
0 284 132   4    20.  3155.  0.006    10.    10.  0.054     2.
            120.  3155.  0.006    50.    50.  0.039    20.
0 285 102   4    35.   502.  0.001    10.    10.  0.027     2.
            135.   502.  0.001    50.    50.  0.02    20.
0 286 158   4    20.  1328.  0.004    10.    10.  0.060     2.
            120.  1328.  0.008    50.    50.  0.043    20.
0 287 109   5   5.0   344.  0.005     1.     1.  0.017    5.0
            120.   344.  0.004    20.    20.  0.037    20.
0 288 271   5   5.5   250.  0.011     0.     0.  0.013    5.5
            120.   250.  0.011    20.    20.  0.037    20.
0 296 316   4    80.  3500.  0.002     4.     4.  0.030    8.5
            120.  3500.  0.002    50.    50.  0.028    10.
0 297 298   2     5.   350.  0.005     0.     0.  0.013     5.
0 298 211   4    20.   440.  0.008    10.    10.  0.050     2.
            120.   440.  0.008    50.    50.  0.040    20.
0 299 302   4    20.  2854.  0.008    10.    10.  0.046     2.
            120.  2854.  0.004    50.    50.  0.033    20.
0 301 224   3    10.     1.    0.1              0.01     1.
0 302 233 11 2    0.1   500.  0.001              0.035    0.1
    0     0   0.21     5.   3.05    19.   12.65    40.
 30.14    66.    56.    92.  90.45   115.  131.74   131.
 176.83   145.  223.32   158.  270.77   171.
0 303 247   3    10.     1.    0.1              0.01     1.
0 304 296   3    10.     1.    0.1              0.01     1.
0 305 251   3    10.     1.    0.1              0.01     1.
0 306 140   3    10.     1.    0.1              0.01     1.
0 307 235   3    10.     1.    0.1              0.01     1.
0 308 114   3    10.     1.    0.1              0.01     1.
0 309 286   3    10.     1.    0.1              0.01     1.
0 310 234   3    10.     1.    0.1              0.01     1.
0 311 216   3    10.     1.    0.1              0.01     1.
0 315 115 12 2    0.1    10.    0.1                       0.1
    0.     0.    1.4    22.     9.   150.    25.1    402.
   50.2   822.   83.7  1393.   125.3  2079.   173.4   2853.
  226.4  3712.  272.1  4499.   283.8  4640.    342.   5520.
0 316 143 5 2    0.1    10.    0.1                       0.1
    0.     0.   32.0    64.    64.   176.    96.0    344.
  103.5   542.  103.6  9999.
401 131 231 3 3          1.
    0      0    528    528    900    528
  401 402   3          1.
  402 210   2    6.5   196   0.013      0      0  0.015    6.5
403 140 200 3 3          1.
    0.     0.   560.   560.   900.   560.     0.     0.
0 403 238   3          1.
0 238 164   2    7.6   245.  0.005              0.013     8.
-1 904 122 7 3    11.     1.    0.1              0.01    10.
    0.     0.   1.00    73.   2.67    91.    7.00   308.
   8.00   297.   12.0   177.   16.0   147.

0
0
ENDPROGRAM
```

5YR EXISTING CONDITION

```
2 1 1 2
3 4
WATERSHED  1
LOWER THIRD CREEK, 5YR EXISTING CONDITION
KIOWA ENGINEERING CORPORATION 11/03
    192     5.0                                    1
     1 100
     2 135
     3 101
     4 100
     5 103
     6 123
     7 104
     8 104
     9 105
    10 124
    11 125
    12 106
    13 106
    14 157
    15 126
    16 108
    17 127
    18 128
    19 129
    20 130
    21 131
    22 109
    23 187
    24 134
    25 111
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26 133
27 110
28 112
29 308
30 158
31 158
32 158
33 308
34 159
35 181
36 159
37 162
38 162
39 306
40 115
41 138
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76 303
77 171
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79 180
80 150
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84 132
85 150
86 150
87 146
88 174
89 174
90 174
91 185
92 151
93 152
94 176
95 177
96 178
97 175
98 121

0	100	0	3	10.	1.	0.1	0.01	1.
0	101	285	3	10.	1.	0.1	0.01	1.
0	102	273	3	10.	1.	0.1	0.01	1.
0	103	203	3	10.	1.	0.1	0.01	1.
0	104	204	3	10.	1.	0.1	0.01	1.
0	105	205	3	10.	1.	0.1	0.01	1.
0	106	206	3	10.	1.	0.1	0.01	1.
0	107	207	3	10.	1.	0.1	0.01	1.
0	108	208	3	10.	1.	0.1	0.01	1.
0	109	209	3	10.	1.	0.1	0.01	1.
0	110	210	3	10.	1.	0.1	0.01	1.
0	111	211	3	10.	1.	0.1	0.01	1.
0	112	212	3	10.	1.	0.1	0.01	1.
0	113	213	3	10.	1.	0.1	0.01	1.
0	114	214	3	10.	1.	0.1	0.01	1.
0	115	215	3	10.	1.	0.1	0.01	1.
0	116	311	3	10.	1.	0.1	0.01	1.
0	117	217	3	10.	1.	0.1	0.01	1.
0	118	218	3	10.	1.	0.1	0.01	1.
0	119	280	3	10.	1.	0.1	0.01	1.
0	120	220	3	10.	1.	0.1	0.01	1.
0	121	221	3	10.	1.	0.1	0.01	1.
0	122	222	3	10.	1.	0.1	0.01	1.
0	123	278	3	10.	1.	0.1	0.01	1.
0	124	223	3	10.	1.	0.1	0.01	1.
0	125	274	3	10.	1.	0.1	0.01	1.
0	126	226	3	10.	1.	0.1	0.01	1.
0	127	228	3	10.	1.	0.1	0.01	1.
0	128	229	3	10.	1.	0.1	0.01	1.
0	129	227	3	10.	1.	0.1	0.01	1.
0	130	287	3	10.	1.	0.1	0.01	1.
0	132	304	3	10.	1.	0.1	0.01	1.
0	133	232	3	10.	1.	0.1	0.01	1.
0	134	281	3	10.	1.	0.1	0.01	1.
0	135	202	3	10.	1.	0.1	0.01	1.
0	136	288	3	10.	1.	0.1	0.01	1.
0	137	219	3	10.	1.	0.1	0.01	1.
0	138	236	3	10.	1.	0.1	0.01	1.
0	139	307	3	10.	1.	0.1	0.01	1.
0	141	200	3	10.	1.	0.1	0.01	1.
0	142	240	3	10.	1.	0.1	0.01	1.
0	143	237	3	10.	1.	0.1	0.01	1.
0	144	276	3	10.	1.	0.1	0.01	1.
0	145	266	3	10.	1.	0.1	0.01	1.
0	146	267	3	10.	1.	0.1	0.01	1.
0	147	230	3	10.	1.	0.1	0.01	1.

```
0 148 254  3  10.   1.   0.1          0.01   1.
0 149 255  3  10.   1.   0.1          0.01   1.
0 150 256  3  10.   1.   0.1          0.01   1.
0 151 257  3  10.   1.   0.1          0.01   1.
0 152 259  3  10.   1.   0.1          0.01   1.
0 153 264  3  10.   1.   0.1          0.01   1.
0 154 268  3  10.   1.   0.1          0.01   1.
0 155 269  3  10.   1.   0.1          0.01   1.
0 156 265  3  10.   1.   0.1          0.01   1.
0 157 275  3  10.   1.   0.1          0.01   1.
0 158 302  3  10.   1.   0.1          0.01   1.
0 159 309  3  10.   1.   0.1          0.01   1.
0 160 282  3  10.   1.   0.1          0.01   1.
0 161 310  3  10.   1.   0.1          0.01   1.
0 162 299  3  10.   1.   0.1          0.01   1.
0 163 244  3  10.   1.   0.1          0.01   1.
0 164 279  3  10.   1.   0.1          0.01   1.
0 165 245  3  10.   1.   0.1          0.01   1.
0 166 246  3  10.   1.   0.1          0.01   1.
0 167 250  3  10.   1.   0.1          0.01   1.
0 168 243  3  10.   1.   0.1          0.01   1.
0 169 242  3  10.   1.   0.1          0.01   1.
0 170 241  3  10.   1.   0.1          0.01   1.
0 171 248  3  10.   1.   0.1          0.01   1.
0 172 249  3  10.   1.   0.1          0.01   1.
0 173 270  3  10.   1.   0.1          0.01   1.
0 174 305  3  10.   1.   0.1          0.01   1.
0 175 258  3  10.   1.   0.1          0.01   1.
0 176 252  3  10.   1.   0.1          0.01   1.
0 177 263  3  10.   1.   0.1          0.01   1.
0 178 262  3  10.   1.   0.1          0.01   1.
0 179 261  3  10.   1.   0.1          0.01   1.
0 180 260  3  10.   1.   0.1          0.01   1.
0 181 159  3  10.   1.   0.1          0.01   1.
0 182 283  3  10.   1.   0.1          0.01   1.
0 183 239  3  10.   1.   0.1          0.01   1.
0 184 277  3  10.   1.   0.1          0.01   1.
0 185 284  3  10.   1.   0.1          0.01   1.
0 186 225  3  10.   1.   0.1          0.01   1.
0 187 301  3  10.   1.   0.1          0.01   1.
0 188 247  3  10.   1.   0.1          0.01   1.
0 200 136  4  10.  964.  0.004   10.   10.  0.047   2.
             50.  964.  0.004   50.   50.  0.033  20.
0 202 101  4  20. 2327.  0.003   20.   20.  0.04    3.
            120. 2327.  0.003   50.   50.  0.03   20.
0 203 102  4  20. 1902.  0.004   20.   20.  0.044   3.
            120. 1902.  0.004   50.   50.  0.033  20.
0 204 103  4  20. 2673.  0.004   20.   20.  0.044   3.
            120. 2673.  0.004   50.   50.  0.033  20.
0 205 104  4  60. 1621.  0.003    4.    4.  0.037   3.
            160. 1621.  0.003   50.   50.  0.03   20.
0 206 105  4  50. 4148.  0.0034    4.    4.  0.039   3.
            150. 4148.  0.0034  50.   50.  0.031  20.
0 207 106  4  15.  717.  0.003    4.    4.  0.037   4.
            115.  717.  0.003   20.   20.  0.029  20.
0 208 107  4  20. 2763.  0.003   10.   10.  0.039   3.
            120. 2763.  0.003   40.   40.  0.03   20.
0 209 108  4  20. 3945.  0.003    4.    4.  0.036   5.
            120. 3945.  0.003   40.   40.  0.03   20.
0 210 109  4  20. 3217.  0.007    4.    4.  0.053   3.
            120. 3217.  0.007   50.   50.  0.041  20.
0 211 110  4  20. 1323.  0.008    4.    4.  0.056   3.
            120. 1323.  0.008   50.   50.  0.043  20.
0 212 111  4  50. 2426.  0.003    4.    4.  0.037   3.
            150. 2426.  0.003   50.   50.  0.03   20.
0 213 112  4  20. 2473.  0.005    4.    4.  0.046   3.
            120. 2473.  0.005   50.   50.  0.036  20.
0 214 113  4  20.  443.  0.003   10.   10.  0.039   3.
            120.  443.  0.003   25.   25.  0.029  20.
0 215 308  4  20. 1622.  0.003   10.   10.  0.039   3.
            120. 1622.  0.003   25.   25.  0.028  25.
0 216 164  4  20. 1324.  0.003   10.   10.  0.039   3.
            120. 1324.  0.003   25.   25.  0.029  20.
0 217 116  4  20. 3243.  0.005   10.   10.  0.047   3.
            120. 3243.  0.005   25.   25.  0.036  20.
0 218 117  4  20.  282.  0.003   10.   10.  0.039   3.
            120.  282.  0.003   25.   25.  0.029  20.
0 219 118  4  20. 2003.  0.003   10.   10.  0.039   3.
            120. 2003.  0.003   20.   20.  0.029  20.
0 220 147  4  20. 2196.  0.003    4.    4.  0.037   4.
            120. 2196.  0.003   20.   20.  0.029  20.
0 221 120  4  20. 5356.  0.001    4.    4.  0.024   5.
            120. 5356.  0.001   20.   20.  0.046  20.
0 222 121  4   8. 4084.  0.012    4.    4.  0.066   3.
             32. 4084.  0.012   20.   20.  0.071  20.
0 224 110  4  20. 2002.  0.003    4.    4.  0.04    2.
            120. 2002.  0.003   50.   50.  0.03   20.
0 223 105  4  20. 1141.  0.002   10.   10.  0.035   2.
            120. 1141.  0.002   50.   50.  0.025  20.
0 225 106  4  20. 2475.  0.001   10.   10.  0.027   2.
            120. 2475.  0.001   50.   50.  0.02   20.
0 226 107  4  10. 2015.  0.006    4.    4.  0.054   2.
            110. 2015.  0.006   50.   50.  0.039  20.
0 227 126  4  20. 2686.  0.0052   10.   10.  0.056   1.
            120. 2686.  0.0052  50.   50.  0.037  20.
0 228 108  4  10.  645.  0.016    4.    4.  0.078   2.
            110.  645.  0.016   50.   50.  0.056  20.
0 229 127  4  10.  838.  0.003    4.    4.  0.041   2.
            110.  838.  0.003   50.   50.  0.03   20.
0 230 119  4  20.  302.  0.003    4.    4.  0.037   4.
            120.  302.  0.003   20.   20.  0.029  20.
0 231 130  4  20. 2856.  0.004   10.   10.  0.046   2.
            120. 2856.  0.004   50.   50.  0.033  20.
0 232 111  4  20. 1120.  0.005   10.   10.  0.05    2.
            120. 1120.  0.005   50.   50.  0.036  20.
0 233 297  4  20. 2070.  0.008   10.   10.  0.060   2.
            120. 2070.  0.008   50.   50.  0.043  20.
0 234 173  4  20. 3316.  0.013   10.   10.  0.072   2.
            120. 3316.  0.013   50.   50.  0.052  20.
0 235 140  4  40. 1047.  0.019   10.   10.  0.09    1.
            120. 1047.  0.019   50.   50.  0.06   20.
0 236 116  4  50. 2857.  0.0035   10.   10.  0.047   1.
            200. 2857.  0.0035  50.   50.  0.031  20.
0 237 184  5   6.  183.  0.035    0.    0.  0.013   6.
            100. 1400.  0.005   50.   50.  0.051  20.
0 239 143  4  40. 1430.  0.0030   10.   10.  0.041   2.
            120. 1430.  0.0030  50.   50.  0.030  20.
0 240 140  4  20. 2733.  0.015    5.    5.  0.082   1.
            120. 2733.  0.015   50.   50.  0.055  20.
0 241 139  4  20. 2126.  0.009   10.   10.  0.069   1.
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          120.  2126.  0.009    50.    50.  0.045    20.
0 242 168  4   20.   927.  0.013     5.     5.  0.071     2.
          120.   927.  0.013    50.    50.  0.052    20.
0 243 161  4   20.  1224.  0.002    10.    10.  0.035     2.
          120.  1224.  0.002    50.    50.  0.025    20.
0 244 160  4   20.  1747.  0.007    10.    10.  0.057     2.
          120.  1747.  0.007    50.    50.  0.041    20.
0 245 163  4   20.  2060.  0.006    10.    10.  0.054     2.
          120.  2060.  0.006    50.    50.  0.039    20.
0 246 165  4   20.  3293.  0.007    10.    10.  0.057     2.
          120.  3293.  0.007    50.    50.  0.041    20.
0 247 168  4   40.  1278.   0.02    10.    10.  0.083     2.
          120.  1278.   0.02    50.    50.  0.061    20.
0 248 170  4  100.  1834.  0.013    10.    10.  0.077     1.
          200.  1834.  0.013    50.    50.  0.051    20.
0 249 171  4  100.  3800.  0.008    10.    10.  0.064     1.
          200.  3800.  0.008    50.    50.  0.043    20.
0 250 132  4  100.  2986.  0.008    10.    10.  0.064     1.
          200.  2986.  0.008    50.    50.  0.043    20.
0 251 167  4   20.  1081.  0.004    10.    10.  0.051     1.
          120.  1081.  0.004    50.    50.  0.033    20.
0 252 174  4   20.  2585.  0.005     5.     5.  0.049     2.
          120.  2585.  0.005    50.    50.  0.036    20.
0 254 147  4   20.   637.  0.003    10.    10.  0.045     1.
          120.   637.  0.003    50.    50.   0.03    20.
0 255 150  4   70.  1579.  0.004     5.     5.  0.049     1.
          200.  1579.  0.004    50.    50.  0.033    20.
0 256 145  4  100.  2710.  0.013    10.    10.  0.077     1.
          200.  2710.  0.013    50.    50.  0.051    20.
0 257 149  4  100.  1831.  0.014    10.    10.  0.079     1.
          200.  1831.  0.014    50.    50.  0.053    20.
0 258 151  4  100.  3598.   0.01    10.    10.  0.069     1.
          200.  3598.   0.01    50.    50.  0.047    20.
0 259 149  4  100.  1401.  0.012    10.    10.  0.074     1.
          200.  1401.  0.012    50.    50.   0.05    20.
0 260 150  4  100.  2084.  0.007    10.    10.   0.06     1.
          200.  2084.  0.007    50.    50.  0.041    20.
0 261 176  4   20.  1626.  0.009    10.    10.  0.063     2.
          120.  1626.  0.009    50.    50.  0.045    20.
0 262 179  4  100.  1461.  0.006    10.    10.  0.057     1.
          200.  1461.  0.006    50.    50.  0.038    20.
0 263 179  4  100.  1278.  0.007    10.    10.   0.06     1.
          200.  1278.  0.007    50.    50.  0.041    20.
0 264 121  4  100.  2606.  0.019     5.     5.  0.063     2.
          400.  2606.  0.019    50.    50.  0.045    20.
0 265 122  4   20.  1802.  0.024     4.     4.  0.089     2.
          120.  1802.  0.024    50.    50.  0.065    20.
0 266 148  4   20.  3270.  0.007     5.     5.  0.056     2.
          120.  3270.  0.007    50.    50.  0.041    20.
0 267 145  4  100.   972.  0.002    10.    10.  0.038     1.
          200.   972.  0.002    50.    50.  0.025    20.
0 268 120  4  100.  1610.  0.031    10.    10.  0.089     1.
          400.  1610.  0.031    50.    50.  0.065    20.
0 269 119  4   10.   730.  0.025    10.    10.  0.103     1.
          100.   730.  0.025    50.    50.  0.066    20.
0 270 181  4   20.  1456.  0.006     5.     5.  0.053     2.
          120.  1456.  0.006    50.    50.  0.039    20.
0 271 164  4   50.  1908.  0.002    10.    10.  0.035     2.
          150.  1908.  0.002    50.    50.  0.025    20.
0 273 100  4   20.   703.  0.002    10.    10.  0.041     2.
          120.   703.  0.002    50.    50.   0.03    20.
0 274 186  4   20.  1045.  0.001    10.    10.  0.027     2.
          120.  1045.  0.001    50.    50.   0.02    20.
0 275 186  4   20.  1420.  0.011    10.    10.  0.068     2.
          120.  1420.  0.011    50.    50.  0.049    20.
0 276 137  4   20.  2158.  0.006     4.     4.  0.047     5.
          120.  2158.  0.006    50.    50.  0.043    10.
0 277 144  4   17.   262.  0.008     3.     3.  0.044     1.
          120.   262.  0.008    50.    50.  0.048    10.
0 278 103  4   20.   708.  0.007     4.     4.  0.056     2.
          120.   708.  0.007    50.    50.  0.041    20.
0 279 315  4   20.  2452.  0.003    10.    10.  0.039     3.
          120.  2452.  0.003    25.    25.  0.029    20.
0 280 137  4   20.  1804.  0.003    10.    10.  0.039     3.
          120.  1804.  0.003    50.    50.   0.03    20.
0 281 133  4   20.  3622.  0.004    10.    10.  0.046     2.
          120.  3622.  0.004    50.    50.  0.033    20.
0 282 182  4   20.  2352.  0.006    10.    10.  0.054     2.
          120.  2352.  0.006    50.    50.  0.039    20.
0 283 159  4   20.  1995.  0.004    10.    10.  0.046     2.
          120.  1995.  0.004    50.    50.  0.033    20.
0 284 132  4   20.  3155.  0.006    10.    10.  0.054     2.
          120.  3155.  0.006    50.    50.  0.039    20.
0 285 102  4   35.   502.  0.001    10.    10.  0.027     2.
          135.   502.  0.001    50.    50.   0.02    20.
0 286 158  4   20.  1328.  0.004    10.    10.  0.060     2.
          120.  1328.  0.008    50.    50.  0.043    20.
0 287 109  5  5.0   344.  0.005     1.     1.  0.017   5.0
          120.   344.  0.004    20.    20.  0.037    20.
0 288 271  5  5.5   250.  0.011     0.     0.  0.013   5.5
          120.   250.  0.011    20.    20.  0.037    20.
0 296 172  4   20.  1613.  0.008    10.    10.  0.050     2.
          120.  1613.  0.008    50.    50.  0.040    20.
0 297 298  2    5.   350.  0.005     0.     0.  0.013     5.
0 298 211  4   20.   440.  0.008    10.    10.  0.050     2.
          120.   440.  0.008    50.    50.  0.040    20.
0 299 302  4   20.  2854.  0.008    10.    10.  0.046     2.
          120.  2854.  0.004    50.    50.  0.033    20.
0 301 224  3   10.     1.    0.1              0.01     1.
0 302 233 11 2    0.1   500.  0.001              0.035    0.1
   0     0    0.21     5.    3.05    19.   12.65    40.
 30.14    66.    56.    92.   90.45   115.  131.74   131.
 176.83   145.  223.32   158.  270.77   171.
0 303 247  3   10.     1.    0.1              0.01     1.
0 304 296  3   10.     1.    0.1              0.01     1.
0 305 251  3   10.     1.    0.1              0.01     1.
0 306 140  3   10.     1.    0.1              0.01     1.
0 307 235  3   10.     1.    0.1              0.01     1.
0 308 114  3   10.     1.    0.1              0.01     1.
0 309 286  3   10.     1.    0.1              0.01     1.
0 310 234  3   10.     1.    0.1              0.01     1.
0 311 216  3   10.     1.    0.1              0.01     1.
0 315 115 12 2    0.1    10.    0.1                      0.1
   0.     0.     1.4    22.     9.    150.    25.1    402.
  50.2    822.    83.7  1393.   125.3  2079.   173.4  2853.
 226.4   3712.   272.1  4499.   283.8  4640.    342.  5520.
401 131 231 3 3          1.
   0     0    528    528    900    528
  401 402  3          1.
  402 210  2    6.5   196   0.013     0     0  0.015    6.5
```

```
 403  140  200  3 3          1.
     0.     0.    560.    560.    900.    560.      0.      0.
  0 403  238   3          1.
  0 238  164   2    7.6   245.  0.005             0.013     8.
 -1 949  122  8 3    10.     1.    0.1             0.01    10.
     0.     0.    2.67     12.    3.25    319.    3.33    316.
    5.00    208.    8.17    175.    14.3    144.    16.0     88.

  0
  0   0   0   0   0   0   0   0   0   0
ENDPROGRAM
```

2 YR EXISTING CONDITION

```
  2  1  1  2
  3  4
WATERSHED   1
LOWER THIRD CREEK, 2 YR EXISTING CONDITION
KIOWA ENGINEERING CORPORATION 11/03
     192     5.0                                    1
      1  100
      2  135
      3  101
      4  100
      5  103
      6  123
      7  104
      8  104
      9  105
     10  124
     11  125
     12  106
     13  106
     14  157
     15  126
     16  108
     17  127
     18  128
     19  129
     20  130
     21  131
     22  109
     23  187
     24  134
     25  111
     26  133
     27  110
     28  112
     29  308
     30  158
     31  158
     32  158
     33  308
     34  159
     35  181
     36  159
     37  162
     38  162
     39  306
     40  115
     41  138
     42  182
     43  183
     44  160
     45  161
     46  139
     47  140
     48  141
     49  116
     50  116
     51  117
     52  118
     53  155
     54  154
     55  119
     56  118
     57  163
     58  163
     59  168
     60  169
     61  170
     62  142
     63  183
     64  143
     65  184
     66  144
     67  148
     68  148
     69  120
     70  120
     71  153
     72  156
     73  121
     74  165
     75  166
     76  303
     77  171
     78  172
     79  180
     80  150
     81  145
     82  145
     83  132
     84  132
     85  150
     86  150
     87  146
     88  174
     89  174
     90  174
     91  185
     92  151
     93  152
     94  176
     95  177
     96  178
     97  175
     98  121

  0 100   0   3    10.     1.    0.1             0.01     1.
```

```
0 101 285  3  10.  1.  0.1          0.01  1.
0 102 273  3  10.  1.  0.1          0.01  1.
0 103 203  3  10.  1.  0.1          0.01  1.
0 104 204  3  10.  1.  0.1          0.01  1.
0 105 205  3  10.  1.  0.1          0.01  1.
0 106 206  3  10.  1.  0.1          0.01  1.
0 107 207  3  10.  1.  0.1          0.01  1.
0 108 208  3  10.  1.  0.1          0.01  1.
0 109 209  3  10.  1.  0.1          0.01  1.
0 110 210  3  10.  1.  0.1          0.01  1.
0 111 211  3  10.  1.  0.1          0.01  1.
0 112 212  3  10.  1.  0.1          0.01  1.
0 113 213  3  10.  1.  0.1          0.01  1.
0 114 214  3  10.  1.  0.1          0.01  1.
0 115 215  3  10.  1.  0.1          0.01  1.
0 116 311  3  10.  1.  0.1          0.01  1.
0 117 217  3  10.  1.  0.1          0.01  1.
0 118 218  3  10.  1.  0.1          0.01  1.
0 119 280  3  10.  1.  0.1          0.01  1.
0 120 220  3  10.  1.  0.1          0.01  1.
0 121 221  3  10.  1.  0.1          0.01  1.
0 122 222  3  10.  1.  0.1          0.01  1.
0 123 278  3  10.  1.  0.1          0.01  1.
0 124 223  3  10.  1.  0.1          0.01  1.
0 125 274  3  10.  1.  0.1          0.01  1.
0 126 226  3  10.  1.  0.1          0.01  1.
0 127 228  3  10.  1.  0.1          0.01  1.
0 128 229  3  10.  1.  0.1          0.01  1.
0 129 227  3  10.  1.  0.1          0.01  1.
0 130 287  3  10.  1.  0.1          0.01  1.
0 132 304  3  10.  1.  0.1          0.01  1.
0 133 232  3  10.  1.  0.1          0.01  1.
0 134 281  3  10.  1.  0.1          0.01  1.
0 135 202  3  10.  1.  0.1          0.01  1.
0 136 288  3  10.  1.  0.1          0.01  1.
0 137 219  3  10.  1.  0.1          0.01  1.
0 138 236  3  10.  1.  0.1          0.01  1.
0 139 307  3  10.  1.  0.1          0.01  1.
0 141 200  3  10.  1.  0.1          0.01  1.
0 142 240  3  10.  1.  0.1          0.01  1.
0 143 237  3  10.  1.  0.1          0.01  1.
0 144 276  3  10.  1.  0.1          0.01  1.
0 145 266  3  10.  1.  0.1          0.01  1.
0 146 267  3  10.  1.  0.1          0.01  1.
0 147 230  3  10.  1.  0.1          0.01  1.
0 148 254  3  10.  1.  0.1          0.01  1.
0 149 255  3  10.  1.  0.1          0.01  1.
0 150 256  3  10.  1.  0.1          0.01  1.
0 151 257  3  10.  1.  0.1          0.01  1.
0 152 259  3  10.  1.  0.1          0.01  1.
0 153 264  3  10.  1.  0.1          0.01  1.
0 154 268  3  10.  1.  0.1          0.01  1.
0 155 269  3  10.  1.  0.1          0.01  1.
0 156 265  3  10.  1.  0.1          0.01  1.
0 157 275  3  10.  1.  0.1          0.01  1.
0 158 302  3  10.  1.  0.1          0.01  1.
0 159 309  3  10.  1.  0.1          0.01  1.
0 160 282  3  10.  1.  0.1          0.01  1.
0 161 310  3  10.  1.  0.1          0.01  1.
0 162 299  3  10.  1.  0.1          0.01  1.
0 163 244  3  10.  1.  0.1          0.01  1.
0 164 279  3  10.  1.  0.1          0.01  1.
0 165 245  3  10.  1.  0.1          0.01  1.
0 166 246  3  10.  1.  0.1          0.01  1.
0 167 250  3  10.  1.  0.1          0.01  1.
0 168 243  3  10.  1.  0.1          0.01  1.
0 169 242  3  10.  1.  0.1          0.01  1.
0 170 241  3  10.  1.  0.1          0.01  1.
0 171 248  3  10.  1.  0.1          0.01  1.
0 172 249  3  10.  1.  0.1          0.01  1.
0 173 270  3  10.  1.  0.1          0.01  1.
0 174 305  3  10.  1.  0.1          0.01  1.
0 175 258  3  10.  1.  0.1          0.01  1.
0 176 252  3  10.  1.  0.1          0.01  1.
0 177 263  3  10.  1.  0.1          0.01  1.
0 178 262  3  10.  1.  0.1          0.01  1.
0 179 261  3  10.  1.  0.1          0.01  1.
0 180 260  3  10.  1.  0.1          0.01  1.
0 181 159  3  10.  1.  0.1          0.01  1.
0 182 283  3  10.  1.  0.1          0.01  1.
0 183 239  3  10.  1.  0.1          0.01  1.
0 184 277  3  10.  1.  0.1          0.01  1.
0 185 284  3  10.  1.  0.1          0.01  1.
0 186 225  3  10.  1.  0.1          0.01  1.
0 187 301  3  10.  1.  0.1          0.01  1.
0 188 247  3  10.  1.  0.1          0.01  1.
0 200 136  4  10.  964.  0.004   10.   10.  0.047   2.
           50.  964.  0.004   50.   50.  0.033   20.
0 202 101  4  20.  2327.  0.003   20.   20.  0.04   3.
           120.  2327.  0.003   50.   50.  0.03   20.
0 203 102  4  20.  1902.  0.004   20.   20.  0.044   3.
           120.  1902.  0.004   50.   50.  0.033   20.
0 204 103  4  20.  2673.  0.004   20.   20.  0.044   3.
           120.  2673.  0.004   50.   50.  0.033   20.
0 205 104  4  60.  1621.  0.003   4.   4.  0.037   3.
           160.  1621.  0.003   50.   50.  0.03   20.
0 206 105  4  50.  4148.  0.0034   4.   4.  0.039   3.
           150.  4148.  0.0034   50.   50.  0.031   20.
0 207 106  4  15.  717.  0.003   4.   4.  0.037   4.
           115.  717.  0.003   20.   20.  0.029   20.
0 208 107  4  20.  2763.  0.003   10.   10.  0.039   3.
           120.  2763.  0.003   40.   40.  0.03   20.
0 209 108  4  20.  3945.  0.003   4.   4.  0.036   5.
           120.  3945.  0.003   40.   40.  0.03   20.
0 210 109  4  20.  3217.  0.007   4.   4.  0.053   3.
           120.  3217.  0.007   50.   50.  0.041   20.
0 211 110  4  20.  1323.  0.008   4.   4.  0.056   3.
           120.  1323.  0.008   50.   50.  0.043   20.
0 212 111  4  50.  2426.  0.003   4.   4.  0.037   3.
           150.  2426.  0.003   50.   50.  0.03   20.
0 213 112  4  20.  2473.  0.005   4.   4.  0.046   3.
           120.  2473.  0.005   50.   50.  0.036   20.
0 214 113  4  20.  443.  0.003   10.   10.  0.039   3.
           120.  443.  0.003   25.   25.  0.029   20.
0 215 308  4  20.  1622.  0.003   10.   10.  0.039   3.
           120.  1622.  0.003   25.   25.  0.028   25.
0 216 164  4  20.  1324.  0.003   10.   10.  0.039   3.
           120.  1324.  0.003   25.   25.  0.029   20.
0 217 116  4  20.  3243.  0.005   10.   10.  0.047   3.
           120.  3243.  0.005   25.   25.  0.036   20.
```

```
0 218 117  4   20.  282. 0.003   10.   10. 0.039   3.
           120.  282. 0.003   25.   25. 0.029  20.
0 219 118  4   20. 2003. 0.003   10.   10. 0.039   3.
           120. 2003. 0.003   20.   20. 0.029  20.
0 220 147  4   20. 2196. 0.003    4.    4. 0.037   4.
           120. 2196. 0.003   20.   20. 0.029  20.
0 221 120  4   20. 5356. 0.001    4.    4. 0.024   5.
           120. 5356. 0.001   20.   20. 0.046  20.
0 222 121  4    8. 4084. 0.012    4.    4. 0.066   3.
            32. 4084. 0.012   20.   20. 0.071  20.
0 224 110  4   20. 2002. 0.003    4.    4.  0.04   2.
           120. 2002. 0.003   50.   50.  0.03  20.
0 223 105  4   20. 1141. 0.002   10.   10. 0.035   2.
           120. 1141. 0.002   50.   50. 0.025  20.
0 225 106  4   20. 2475. 0.001   10.   10. 0.027   2.
           120. 2475. 0.001   50.   50.  0.02  20.
0 226 107  4   10. 2015. 0.006    4.    4. 0.054   2.
           110. 2015. 0.006   50.   50. 0.039  20.
0 227 126  4   20. 2686. 0.0052   10.   10. 0.056   1.
           120. 2686. 0.0052   50.   50. 0.037  20.
0 228 108  4   10.  645. 0.016    4.    4. 0.078   2.
           110.  645. 0.016   50.   50. 0.056  20.
0 229 127  4   10.  838. 0.003    4.    4. 0.041   2.
           110.  838. 0.003   50.   50.  0.03  20.
0 230 119  4   20.  302. 0.003    4.    4. 0.037   4.
           120.  302. 0.003   20.   20. 0.029  20.
0 231 130  4   20. 2856. 0.004   10.   10. 0.046   2.
           120. 2856. 0.004   50.   50. 0.033  20.
0 232 111  4   20. 1120. 0.005   10.   10.  0.05   2.
           120. 1120. 0.005   50.   50. 0.036  20.
0 233 297  4   20. 2070. 0.008   10.   10. 0.060   2.
           120. 2070. 0.008   50.   50. 0.043  20.
0 234 173  4   20. 3316. 0.013   10.   10. 0.072   2.
           120. 3316. 0.013   50.   50. 0.052  20.
0 235 140  4   40. 1047. 0.019   10.   10.  0.09   1.
           120. 1047. 0.019   50.   50.  0.06  20.
0 236 116  4   50. 2857. 0.0035   10.   10. 0.047   1.
           200. 2857. 0.0035   50.   50. 0.031  20.
0 237 184  5    6.  183. 0.035    0.    0. 0.013   6.
           100. 1400. 0.005   50.   50. 0.051  20.
0 239 143  4   40. 1430. 0.0030   10.   10. 0.041   2.
           120. 1430. 0.0030   50.   50. 0.030  20.
0 240 140  4   20. 2733. 0.015    5.    5. 0.082   1.
           120. 2733. 0.015   50.   50. 0.055  20.
0 241 139  4   20. 2126. 0.009   10.   10. 0.069   1.
           120. 2126. 0.009   50.   50. 0.045  20.
0 242 168  4   20.  927. 0.013    5.    5. 0.071   2.
           120.  927. 0.013   50.   50. 0.052  20.
0 243 161  4   20. 1224. 0.002   10.   10. 0.035   2.
           120. 1224. 0.002   50.   50. 0.025  20.
0 244 160  4   20. 1747. 0.007   10.   10. 0.057   2.
           120. 1747. 0.007   50.   50. 0.041  20.
0 245 163  4   20. 2060. 0.006   10.   10. 0.054   2.
           120. 2060. 0.006   50.   50. 0.039  20.
0 246 165  4   20. 3293. 0.007   10.   10. 0.057   2.
           120. 3293. 0.007   50.   50. 0.041  20.
0 247 168  4   40. 1278.  0.02   10.   10. 0.083   2.
           120. 1278.  0.02   50.   50. 0.061  20.
0 248 170  4  100. 1834. 0.013   10.   10. 0.077   1.
           200. 1834. 0.013   50.   50. 0.051  20.
0 249 171  4  100. 3800. 0.008   10.   10. 0.064   1.
           200. 3800. 0.008   50.   50. 0.043  20.
0 250 132  4  100. 2986. 0.008   10.   10. 0.064   1.
           200. 2986. 0.008   50.   50. 0.043  20.
0 251 167  4   20. 1081. 0.004   10.   10. 0.051   1.
           120. 1081. 0.004   50.   50. 0.033  20.
0 252 174  4   20. 2585. 0.005    5.    5. 0.049   2.
           120. 2585. 0.005   50.   50. 0.036  20.
0 254 147  4   20.  637. 0.003   10.   10. 0.045   1.
           120.  637. 0.003   50.   50.  0.03  20.
0 255 150  4   70. 1579. 0.004    5.    5. 0.049   1.
           200. 1579. 0.004   50.   50. 0.033  20.
0 256 145  4  100. 2710. 0.013   10.   10. 0.077   1.
           200. 2710. 0.013   50.   50. 0.051  20.
0 257 149  4  100. 1831. 0.014   10.   10. 0.079   1.
           200. 1831. 0.014   50.   50. 0.053  20.
0 258 151  4  100. 3598.  0.01   10.   10. 0.069   1.
           200. 3598.  0.01   50.   50. 0.047  20.
0 259 149  4  100. 1401. 0.012   10.   10. 0.074   1.
           200. 1401. 0.012   50.   50.  0.05  20.
0 260 150  4  100. 2084. 0.007   10.   10.  0.06   1.
           200. 2084. 0.007   50.   50. 0.041  20.
0 261 176  4   20. 1626. 0.009   10.   10. 0.063   2.
           120. 1626. 0.009   50.   50. 0.045  20.
0 262 179  4  100. 1461. 0.006   10.   10. 0.057   1.
           200. 1461. 0.006   50.   50. 0.038  20.
0 263 179  4  100. 1278. 0.007   10.   10.  0.06   1.
           200. 1278. 0.007   50.   50. 0.041  20.
0 264 121  4  100. 2606. 0.019    5.    5. 0.063   2.
           400. 2606. 0.019   50.   50. 0.045  20.
0 265 122  4   20. 1802. 0.024    4.    4. 0.089   2.
           120. 1802. 0.024   50.   50. 0.065  20.
0 266 148  4   20. 3270. 0.007    5.    5. 0.056   2.
           120. 3270. 0.007   50.   50. 0.041  20.
0 267 145  4  100.  972. 0.002   10.   10. 0.038   1.
           200.  972. 0.002   50.   50. 0.025  20.
0 268 120  4  100. 1610. 0.031   10.   10. 0.089   1.
           400. 1610. 0.031   50.   50. 0.065  20.
0 269 119  4   10.  730. 0.025   10.   10. 0.103   1.
           100.  730. 0.025   50.   50. 0.066  20.
0 270 181  4   20. 1456. 0.006    5.    5. 0.053   2.
           120. 1456. 0.006   50.   50. 0.039  20.
0 271 164  4   50. 1908. 0.002   10.   10. 0.035   2.
           150. 1908. 0.002   50.   50. 0.025  20.
0 273 100  4   20.  703. 0.002   10.   10. 0.041   2.
           120.  703. 0.002   50.   50.  0.03  20.
0 274 186  4   20. 1045. 0.001   10.   10. 0.027   2.
           120. 1045. 0.001   50.   50.  0.02  20.
0 275 186  4   20. 1420. 0.011   10.   10. 0.068   2.
           120. 1420. 0.011   50.   50. 0.049  20.
0 276 137  4   20. 2158. 0.006    4.    4. 0.047   5.
           120. 2158. 0.006   50.   50. 0.043  10.
0 277 144  4   17.  262. 0.008    3.    3. 0.044   1.
           120.  262. 0.008   50.   50. 0.048  10.
0 278 103  4   20.  708. 0.007    4.    4. 0.056   2.
           120.  708. 0.007   50.   50. 0.041  20.
0 279 315  4   20. 2452. 0.003   10.   10. 0.039   3.
           120. 2452. 0.003   25.   25. 0.029  20.
0 280 137  4   20. 1804. 0.003   10.   10. 0.039   3.
           120. 1804. 0.003   50.   50.  0.03  20.
```

```
0 281 133   4    20.  3622.  0.004    10.    10.  0.046     2.
            120.  3622.  0.004    50.    50.  0.033    20.
0 282 182   4    20.  2352.  0.006    10.    10.  0.054     2.
            120.  2352.  0.006    50.    50.  0.039    20.
0 283 159   4    20.  1995.  0.004    10.    10.  0.046     2.
            120.  1995.  0.004    50.    50.  0.033    20.
0 284 132   4    20.  3155.  0.006    10.    10.  0.054     2.
            120.  3155.  0.006    50.    50.  0.039    20.
0 285 102   4    35.   502.  0.001    10.    10.  0.027     2.
            135.   502.  0.001    50.    50.   0.02    20.
0 286 158   4    20.  1328.  0.004    10.    10.  0.060     2.
            120.  1328.  0.008    50.    50.  0.043    20.
0 287 109   5   5.0   344.  0.005     1.     1.  0.017   5.0
            120.   344.  0.004    20.    20.  0.037    20.
0 288 271   5   5.5   250.  0.011     0.     0.  0.013   5.5
            120.   250.  0.011    20.    20.  0.037    20.
0 296 172   4    20.  1613.  0.008    10.    10.  0.050     2.
            120.  1613.  0.008    50.    50.  0.040    20.
0 297 298   2     5.   350.  0.005     0.     0.  0.013     5.
0 298 211   4    20.   440.  0.008    10.    10.  0.050     2.
            120.   440.  0.008    50.    50.  0.040    20.
0 299 302   4    20.  2854.  0.008    10.    10.  0.046     2.
            120.  2854.  0.004    50.    50.  0.033    20.
0 301 224   3    10.     1.    0.1              0.01     1.
0 302 233 11 2    0.1   500.  0.001              0.035    0.1
   0     0    0.21     5.    3.05    19.   12.65    40.
 30.14    66.    56.    92.   90.45   115.  131.74   131.
176.83   145.  223.32   158.  270.77   171.
0 303 247   3    10.     1.    0.1              0.01     1.
0 304 296   3    10.     1.    0.1              0.01     1.
0 305 251   3    10.     1.    0.1              0.01     1.
0 306 140   3    10.     1.    0.1              0.01     1.
0 307 235   3    10.     1.    0.1              0.01     1.
0 308 114   3    10.     1.    0.1              0.01     1.
0 309 286   3    10.     1.    0.1              0.01     1.
0 310 234   3    10.     1.    0.1              0.01     1.
0 311 216   3    10.     1.    0.1              0.01     1.
0 315 115 12 2    0.1    10.    0.1                       0.1
   0.     0.     1.4    22.     9.   150.    25.1   402.
  50.2   822.    83.7  1393.   125.3  2079.   173.4  2853.
 226.4  3712.   272.1  4499.   283.8  4640.   342.   5520.
401 131 231 3 3          1.
   0     0    528    528    900    528
  401 402   3          1.
  402 210   2    6.5   196   0.013     0     0  0.015    6.5
403 140 200 3 3          1.
   0.    0.   560.    560.   900.   560.    0.     0.
0 403 238   3          1.
0 238 164   2    7.6   245.  0.005              0.013     8.
-1 949 122 8 3    10.     1.    0.1              0.01    10.
   0.    0.    3.33     1.    9.00    14.    9.70    67.
  10.0   70.   12.7    19.   13.7    15.   16.0    15.

 0
 0   0   0   0   0   0   0   0   0   0
ENDPROGRAM
```

0.4 IN EXISTING CONDITION

```
 2  1  1  2
 3  4
WATERSHED  1
LOWER THIRD CREEK, 0.4 IN EXISTING CONDITION
KIOWA ENGINEERING CORPORATION 11/03
   192     5.0                                    1
    1 100
    2 135
    3 101
    4 100
    5 103
    6 123
    7 104
    8 104
    9 105
   10 124
   11 125
   12 106
   13 106
   14 157
   15 126
   16 108
   17 127
   18 128
   19 129
   20 130
   21 131
   22 109
   23 187
   24 134
   25 111
   26 133
   27 110
   28 112
   29 308
   30 158
   31 158
   32 158
   33 308
   34 159
   35 181
   36 159
   37 162
   38 162
   39 306
   40 115
   41 138
   42 182
   43 183
   44 160
   45 161
   46 139
   47 140
   48 141
   49 116
   50 116
   51 117
   52 118
   53 155
   54 154
   55 119
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56 118
57 163
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63 183
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76 303
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79 180
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84 132
85 150
86 150
87 146
88 174
89 174
90 174
91 185
92 151
93 152
94 176
95 177
96 178
97 175
98 121

0 100  0  3  10.  1.  0.1        0.01  1.
0 101 285  3  10.  1.  0.1        0.01  1.
0 102 273  3  10.  1.  0.1        0.01  1.
0 103 203  3  10.  1.  0.1        0.01  1.
0 104 204  3  10.  1.  0.1        0.01  1.
0 105 205  3  10.  1.  0.1        0.01  1.
0 106 206  3  10.  1.  0.1        0.01  1.
0 107 207  3  10.  1.  0.1        0.01  1.
0 108 208  3  10.  1.  0.1        0.01  1.
0 109 209  3  10.  1.  0.1        0.01  1.
0 110 210  3  10.  1.  0.1        0.01  1.
0 111 211  3  10.  1.  0.1        0.01  1.
0 112 212  3  10.  1.  0.1        0.01  1.
0 113 213  3  10.  1.  0.1        0.01  1.
0 114 214  3  10.  1.  0.1        0.01  1.
0 115 215  3  10.  1.  0.1        0.01  1.
0 116 311  3  10.  1.  0.1        0.01  1.
0 117 217  3  10.  1.  0.1        0.01  1.
0 118 218  3  10.  1.  0.1        0.01  1.
0 119 280  3  10.  1.  0.1        0.01  1.
0 120 220  3  10.  1.  0.1        0.01  1.
0 121 221  3  10.  1.  0.1        0.01  1.
0 122 222  3  10.  1.  0.1        0.01  1.
0 123 278  3  10.  1.  0.1        0.01  1.
0 124 223  3  10.  1.  0.1        0.01  1.
0 125 274  3  10.  1.  0.1        0.01  1.
0 126 226  3  10.  1.  0.1        0.01  1.
0 127 228  3  10.  1.  0.1        0.01  1.
0 128 229  3  10.  1.  0.1        0.01  1.
0 129 227  3  10.  1.  0.1        0.01  1.
0 130 287  3  10.  1.  0.1        0.01  1.
0 132 304  3  10.  1.  0.1        0.01  1.
0 133 232  3  10.  1.  0.1        0.01  1.
0 134 281  3  10.  1.  0.1        0.01  1.
0 135 202  3  10.  1.  0.1        0.01  1.
0 136 288  3  10.  1.  0.1        0.01  1.
0 137 219  3  10.  1.  0.1        0.01  1.
0 138 236  3  10.  1.  0.1        0.01  1.
0 139 307  3  10.  1.  0.1        0.01  1.
0 141 200  3  10.  1.  0.1        0.01  1.
0 142 240  3  10.  1.  0.1        0.01  1.
0 143 237  3  10.  1.  0.1        0.01  1.
0 144 276  3  10.  1.  0.1        0.01  1.
0 145 266  3  10.  1.  0.1        0.01  1.
0 146 267  3  10.  1.  0.1        0.01  1.
0 147 230  3  10.  1.  0.1        0.01  1.
0 148 254  3  10.  1.  0.1        0.01  1.
0 149 255  3  10.  1.  0.1        0.01  1.
0 150 256  3  10.  1.  0.1        0.01  1.
0 151 257  3  10.  1.  0.1        0.01  1.
0 152 259  3  10.  1.  0.1        0.01  1.
0 153 264  3  10.  1.  0.1        0.01  1.
0 154 268  3  10.  1.  0.1        0.01  1.
0 155 269  3  10.  1.  0.1        0.01  1.
0 156 265  3  10.  1.  0.1        0.01  1.
0 157 275  3  10.  1.  0.1        0.01  1.
0 158 302  3  10.  1.  0.1        0.01  1.
0 159 309  3  10.  1.  0.1        0.01  1.
0 160 282  3  10.  1.  0.1        0.01  1.
0 161 310  3  10.  1.  0.1        0.01  1.
0 162 299  3  10.  1.  0.1        0.01  1.
0 163 244  3  10.  1.  0.1        0.01  1.
0 164 279  3  10.  1.  0.1        0.01  1.
0 165 245  3  10.  1.  0.1        0.01  1.
0 166 246  3  10.  1.  0.1        0.01  1.
0 167 250  3  10.  1.  0.1        0.01  1.
0 168 243  3  10.  1.  0.1        0.01  1.
0 169 242  3  10.  1.  0.1        0.01  1.
0 170 241  3  10.  1.  0.1        0.01  1.
0 171 248  3  10.  1.  0.1        0.01  1.
0 172 249  3  10.  1.  0.1        0.01  1.
0 173 270  3  10.  1.  0.1        0.01  1.
0 174 305  3  10.  1.  0.1        0.01  1.
0 175 258  3  10.  1.  0.1        0.01  1.
0 176 252  3  10.  1.  0.1        0.01  1.
0 177 263  3  10.  1.  0.1        0.01  1.
```

```
0 178 262  3   10.    1.   0.1              0.01    1.
0 179 261  3   10.    1.   0.1              0.01    1.
0 180 260  3   10.    1.   0.1              0.01    1.
0 181 159  3   10.    1.   0.1              0.01    1.
0 182 283  3   10.    1.   0.1              0.01    1.
0 183 239  3   10.    1.   0.1              0.01    1.
0 184 277  3   10.    1.   0.1              0.01    1.
0 185 284  3   10.    1.   0.1              0.01    1.
0 186 225  3   10.    1.   0.1              0.01    1.
0 187 301  3   10.    1.   0.1              0.01    1.
0 188 247  3   10.    1.   0.1              0.01    1.
0 200 136  4   10.  964.  0.004   10.   10.  0.047    2.
           50.  964.  0.004   50.   50.  0.033   20.
0 202 101  4   20. 2327.  0.003   20.   20.   0.04    3.
          120. 2327.  0.003   50.   50.   0.03   20.
0 203 102  4   20. 1902.  0.004   20.   20.  0.044    3.
          120. 1902.  0.004   50.   50.  0.033   20.
0 204 103  4   20. 2673.  0.004   20.   20.  0.044    3.
          120. 2673.  0.004   50.   50.  0.033   20.
0 205 104  4   60. 1621.  0.003    4.    4.  0.037    3.
          160. 1621.  0.003   50.   50.   0.03   20.
0 206 105  4   50. 4148. 0.0034    4.    4.  0.039    3.
          150. 4148. 0.0034   50.   50.  0.031   20.
0 207 106  4   15.  717.  0.003    4.    4.  0.037    4.
          115.  717.  0.003   20.   20.  0.029   20.
0 208 107  4   20. 2763.  0.003   10.   10.  0.039    3.
          120. 2763.  0.003   40.   40.   0.03   20.
0 209 108  4   20. 3945.  0.003    4.    4.  0.036    5.
          120. 3945.  0.003   40.   40.   0.03   20.
0 210 109  4   20. 3217.  0.007    4.    4.  0.053    3.
          120. 3217.  0.007   50.   50.  0.041   20.
0 211 110  4   20. 1323.  0.008    4.    4.  0.056    3.
          120. 1323.  0.008   50.   50.  0.043   20.
0 212 111  4   50. 2426.  0.003    4.    4.  0.037    3.
          150. 2426.  0.003   50.   50.   0.03   20.
0 213 112  4   20. 2473.  0.005    4.    4.  0.046    3.
          120. 2473.  0.005   50.   50.  0.036   20.
0 214 113  4   20.  443.  0.003   10.   10.  0.039    3.
          120.  443.  0.003   25.   25.  0.029   20.
0 215 308  4   20. 1622.  0.003   10.   10.  0.039    3.
          120. 1622.  0.003   25.   25.  0.028   25.
0 216 164  4   20. 1324.  0.003   10.   10.  0.039    3.
          120. 1324.  0.003   25.   25.  0.029   20.
0 217 116  4   20. 3243.  0.005   10.   10.  0.047    3.
          120. 3243.  0.005   25.   25.  0.036   20.
0 218 117  4   20.  282.  0.003   10.   10.  0.039    3.
          120.  282.  0.003   25.   25.  0.029   20.
0 219 118  4   20. 2003.  0.003   10.   10.  0.039    3.
          120. 2003.  0.003   20.   20.  0.029   20.
0 220 147  4   20. 2196.  0.003    4.    4.  0.037    4.
          120. 2196.  0.003   20.   20.  0.029   20.
0 221 120  4   20. 5356.  0.001    4.    4.  0.024    5.
          120. 5356.  0.001   20.   20.  0.046   20.
0 222 121  4    8. 4084.  0.012    4.    4.  0.066    3.
           32. 4084.  0.012   20.   20.  0.071   20.
0 224 110  4   20. 2002.  0.003    4.    4.   0.04    2.
          120. 2002.  0.003   50.   50.   0.03   20.
0 223 105  4   20. 1141.  0.002   10.   10.  0.035    2.
          120. 1141.  0.002   50.   50.  0.025   20.
0 225 106  4   20. 2475.  0.001   10.   10.  0.027    2.
          120. 2475.  0.001   50.   50.   0.02   20.
0 226 107  4   10. 2015.  0.006    4.    4.  0.054    2.
          110. 2015.  0.006   50.   50.  0.039   20.
0 227 126  4   20. 2686. 0.0052   10.   10.  0.056    1.
          120. 2686. 0.0052   50.   50.  0.037   20.
0 228 108  4   10.  645.  0.016    4.    4.  0.078    2.
          110.  645.  0.016   50.   50.  0.056   20.
0 229 127  4   10.  838.  0.003    4.    4.  0.041    2.
          110.  838.  0.003   50.   50.   0.03   20.
0 230 119  4   20.  302.  0.003    4.    4.  0.037    4.
          120.  302.  0.003   20.   20.  0.029   20.
0 231 130  4   20. 2856.  0.004   10.   10.  0.046    2.
          120. 2856.  0.004   50.   50.  0.033   20.
0 232 111  4   20. 1120.  0.005   10.   10.   0.05    2.
          120. 1120.  0.005   50.   50.  0.036   20.
0 233 297  4   20. 2070.  0.008   10.   10.  0.060    2.
          120. 2070.  0.008   50.   50.  0.043   20.
0 234 173  4   20. 3316.  0.013   10.   10.  0.072    2.
          120. 3316.  0.013   50.   50.  0.052   20.
0 235 140  4   40. 1047.  0.019   10.   10.   0.09    1.
          120. 1047.  0.019   50.   50.   0.06   20.
0 236 116  4   50. 2857. 0.0035   10.   10.  0.047    1.
          200. 2857. 0.0035   50.   50.  0.031   20.
0 237 184  5    6.  183.  0.035    0.    0.  0.013    6.
          100. 1400.  0.005   50.   50.  0.051   20.
0 239 143  4   40. 1430. 0.0030   10.   10.  0.041    2.
          120. 1430. 0.0030   50.   50.  0.030   20.
0 240 140  4   20. 2733.  0.015    5.    5.  0.082    1.
          120. 2733.  0.015   50.   50.  0.055   20.
0 241 139  4   20. 2126.  0.009   10.   10.  0.069    1.
          120. 2126.  0.009   50.   50.  0.045   20.
0 242 168  4   20.  927.  0.013    5.    5.  0.071    2.
          120.  927.  0.013   50.   50.  0.052   20.
0 243 161  4   20. 1224.  0.002   10.   10.  0.035    2.
          120. 1224.  0.002   50.   50.  0.025   20.
0 244 160  4   20. 1747.  0.007   10.   10.  0.057    2.
          120. 1747.  0.007   50.   50.  0.041   20.
0 245 163  4   20. 2060.  0.006   10.   10.  0.054    2.
          120. 2060.  0.006   50.   50.  0.039   20.
0 246 165  4   20. 3293.  0.007   10.   10.  0.057    2.
          120. 3293.  0.007   50.   50.  0.041   20.
0 247 168  4   40. 1278.   0.02   10.   10.  0.083    2.
          120. 1278.   0.02   50.   50.  0.061   20.
0 248 170  4  100. 1834.  0.013   10.   10.  0.077    1.
          200. 1834.  0.013   50.   50.  0.051   20.
0 249 171  4  100. 3800.  0.008   10.   10.  0.064    1.
          200. 3800.  0.008   50.   50.  0.043   20.
0 250 132  4  100. 2986.  0.008   10.   10.  0.064    1.
          200. 2986.  0.008   50.   50.  0.043   20.
0 251 167  4   20. 1081.  0.004   10.   10.  0.051    1.
          120. 1081.  0.004   50.   50.  0.033   20.
0 252 174  4   20. 2585.  0.005    5.    5.  0.049    2.
          120. 2585.  0.005   50.   50.  0.036   20.
0 254 147  4   20.  637.  0.003   10.   10.  0.045    1.
          120.  637.  0.003   50.   50.   0.03   20.
0 255 150  4   70. 1579.  0.004    5.    5.  0.049    1.
          200. 1579.  0.004   50.   50.  0.033   20.
0 256 145  4  100. 2710.  0.013   10.   10.  0.077    1.
          200. 2710.  0.013   50.   50.  0.051   20.
0 257 149  4  100. 1831.  0.014   10.   10.  0.079    1.
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          200.  1831.  0.014    50.    50.  0.053    20.
0 258 151  4   100.  3598.  0.01    10.    10.  0.069    1.
          200.  3598.  0.01    50.    50.  0.047    20.
0 259 149  4   100.  1401.  0.012    10.    10.  0.074    1.
          200.  1401.  0.012    50.    50.  0.05    20.
0 260 150  4   100.  2084.  0.007    10.    10.  0.06    1.
          200.  2084.  0.007    50.    50.  0.041    20.
0 261 176  4    20.  1626.  0.009    10.    10.  0.063    2.
          120.  1626.  0.009    50.    50.  0.045    20.
0 262 179  4   100.  1461.  0.006    10.    10.  0.057    1.
          200.  1461.  0.006    50.    50.  0.038    20.
0 263 179  4   100.  1278.  0.007    10.    10.  0.06    1.
          200.  1278.  0.007    50.    50.  0.041    20.
0 264 121  4   100.  2606.  0.019    5.    5.  0.063    2.
          400.  2606.  0.019    50.    50.  0.045    20.
0 265 122  4    20.  1802.  0.024    4.    4.  0.089    2.
          120.  1802.  0.024    50.    50.  0.065    20.
0 266 148  4    20.  3270.  0.007    5.    5.  0.056    2.
          120.  3270.  0.007    50.    50.  0.041    20.
0 267 145  4   100.  972.  0.002    10.    10.  0.038    1.
          200.  972.  0.002    50.    50.  0.025    20.
0 268 120  4   100.  1610.  0.031    10.    10.  0.089    1.
          400.  1610.  0.031    50.    50.  0.065    20.
0 269 119  4    10.  730.  0.025    10.    10.  0.103    1.
          100.  730.  0.025    50.    50.  0.066    20.
0 270 181  4    20.  1456.  0.006    5.    5.  0.053    2.
          120.  1456.  0.006    50.    50.  0.039    20.
0 271 164  4    50.  1908.  0.002    10.    10.  0.035    2.
          150.  1908.  0.002    50.    50.  0.025    20.
0 273 100  4    20.  703.  0.002    10.    10.  0.041    2.
          120.  703.  0.002    50.    50.  0.03    20.
0 274 186  4    20.  1045.  0.001    10.    10.  0.027    2.
          120.  1045.  0.001    50.    50.  0.02    20.
0 275 186  4    20.  1420.  0.011    10.    10.  0.068    2.
          120.  1420.  0.011    50.    50.  0.049    20.
0 276 137  4    20.  2158.  0.006    4.    4.  0.047    5.
          120.  2158.  0.006    50.    50.  0.043    10.
0 277 144  4    17.  262.  0.008    3.    3.  0.044    1.
          120.  262.  0.008    50.    50.  0.048    10.
0 278 103  4    20.  708.  0.007    4.    4.  0.056    2.
          120.  708.  0.007    50.    50.  0.041    20.
0 279 315  4    20.  2452.  0.003    10.    10.  0.039    3.
          120.  2452.  0.003    25.    25.  0.029    20.
0 280 137  4    20.  1804.  0.003    10.    10.  0.039    3.
          120.  1804.  0.003    50.    50.  0.03    20.
0 281 133  4    20.  3622.  0.004    10.    10.  0.046    2.
          120.  3622.  0.004    50.    50.  0.033    20.
0 282 182  4    20.  2352.  0.006    10.    10.  0.054    2.
          120.  2352.  0.006    50.    50.  0.039    20.
0 283 159  4    20.  1995.  0.004    10.    10.  0.046    2.
          120.  1995.  0.004    50.    50.  0.033    20.
0 284 132  4    20.  3155.  0.006    10.    10.  0.054    2.
          120.  3155.  0.006    50.    50.  0.039    20.
0 285 102  4    35.  502.  0.001    10.    10.  0.027    2.
          135.  502.  0.001    50.    50.  0.02    20.
0 286 158  4    20.  1328.  0.004    10.    10.  0.060    2.
          120.  1328.  0.008    50.    50.  0.043    20.
0 287 109  5   5.0  344.  0.005    1.    1.  0.017    5.0
          120.  344.  0.004    20.    20.  0.037    20.
0 288 271  5   5.5  250.  0.011    0.    0.  0.013    5.5
          120.  250.  0.011    20.    20.  0.037    20.
0 296 172  4    20.  1613.  0.008    10.    10.  0.050    2.
          120.  1613.  0.008    50.    50.  0.040    20.
0 297 298  2    5.  350.  0.005    0.    0.  0.013    5.
0 298 211  4    20.  440.  0.008    10.    10.  0.050    2.
          120.  440.  0.008    50.    50.  0.040    20.
0 299 302  4    20.  2854.  0.008    10.    10.  0.046    2.
          120.  2854.  0.004    50.    50.  0.033    20.
0 301 224  3    10.    1.    0.1          0.01    1.
0 302 233 11 2    0.1    500.  0.001          0.035    0.1
   0     0    0.21     5.    3.05     19.    12.65     40.
 30.14     66.     56.     92.    90.45     115.    131.74     131.
176.83     145.    223.32     158.    270.77     171.
0 303 247  3    10.    1.    0.1          0.01    1.
0 304 296  3    10.    1.    0.1          0.01    1.
0 305 251  3    10.    1.    0.1          0.01    1.
0 306 140  3    10.    1.    0.1          0.01    1.
0 307 235  3    10.    1.    0.1          0.01    1.
0 308 114  3    10.    1.    0.1          0.01    1.
0 309 286  3    10.    1.    0.1          0.01    1.
0 310 234  3    10.    1.    0.1          0.01    1.
0 311 216  3    10.    1.    0.1          0.01    1.
0 315 115 12 2    0.1    10.    0.1                0.1
   0.     0.     1.4     22.     9.     150.     25.1     402.
  50.2     822.     83.7     1393.    125.3     2079.    173.4     2853.
 226.4     3712.    272.1     4499.    283.8     4640.     342.     5520.
401 131 231 3 3          1.
   0     0     528     528     900     528
  401 402  3          1.
  402 210  2    6.5  196    0.013     0     0  0.015    6.5
 403 140 200 3 3          1.
    0.     0.     560.     560.     900.     560.     0.     0.
  0 403 238  3          1.
  0 238 164  2    7.6  245.  0.005          0.013    8.
 -1 949 122 5 3    10.    1.    0.1          0.01    10.
    0.     0.     3.67     1.     4.67     2.     5.42     3.
   16.0     3.

  0
  0  0  0  0  0  0  0  0  0  0
ENDPROGRAM
```

SWMM 100 YR FUTURE CONDITION

```
 2  1  1  2
 3  4
WATERSHED   1
LOWER THIRD CREEK, 100 YR FUTURE CONDITION Baseline
KIOWA ENGINEERING CORPORATION revised 03/05
    192     5.0                                   1
     1  100
     2  135
     3  101
     4  100
     5  103
     6  123
     7  104
     8  104
     9  105
    10  124
    11  125
    12  106
    13  106
    14  157
    15  126
    16  108
    17  127
    18  128
    19  129
    20  130
    21  131
    22  109
    23  187
    24  134
    25  111
    26  133
    27  110
    28  112
    29  308
    30  158
    31  158
    32  158
    33  308
    34  159
    35  181
    36  159
    37  162
    38  162
    39  306
    40  115
    41  138
    42  182
    43  173
    44  160
    45  161
    46  139
    47  140
    48  141
    49  116
    50  116
    51  117
    52  118
    53  155
    54  154
    55  119
    56  118
    57  163
    58  163
    59  168
    60  169
    61  170
    62  142
    63  183
    64  316
    65  184
    66  144
    67  148
    68  148
    69  120
    70  120
    71  153
    72  156
    73  121
    74  165
    75  166
    76  303
    77  171
    78  304
    79  180
    80  150
    81  145
    82  145
    83  132
    84  132
    85  150
    86  150
    87  146
    88  174
    89  174
    90  174
    91  185
    92  151
    93  152
    94  176
    95  177
    96  178
    97  175
    98  121

 0  100   0   3   10.   1.   0.1          0.01   1.
 0  101  285  3   10.   1.   0.1          0.01   1.
 0  102  273  3   10.   1.   0.1          0.01   1.
 0  103  203  3   10.   1.   0.1          0.01   1.
 0  104  204  3   10.   1.   0.1          0.01   1.
 0  105  205  3   10.   1.   0.1          0.01   1.
 0  106  206  3   10.   1.   0.1          0.01   1.
 0  107  207  3   10.   1.   0.1          0.01   1.
 0  108  208  3   10.   1.   0.1          0.01   1.
 0  109  209  3   10.   1.   0.1          0.01   1.
 0  110  210  3   10.   1.   0.1          0.01   1.
 0  111  211  3   10.   1.   0.1          0.01   1.
```

```
0 112 212  3   10.   1.   0.1          0.01   1.
0 113 213  3   10.   1.   0.1          0.01   1.
0 114 214  3   10.   1.   0.1          0.01   1.
0 115 215  3   10.   1.   0.1          0.01   1.
0 116 311  3   10.   1.   0.1          0.01   1.
0 117 217  3   10.   1.   0.1          0.01   1.
0 118 218  3   10.   1.   0.1          0.01   1.
0 119 280  3   10.   1.   0.1          0.01   1.
0 120 220  3   10.   1.   0.1          0.01   1.
0 121 221  3   10.   1.   0.1          0.01   1.
0 122 222  3   10.   1.   0.1          0.01   1.
0 123 278  3   10.   1.   0.1          0.01   1.
0 124 223  3   10.   1.   0.1          0.01   1.
0 125 274  3   10.   1.   0.1          0.01   1.
0 126 226  3   10.   1.   0.1          0.01   1.
0 127 228  3   10.   1.   0.1          0.01   1.
0 128 229  3   10.   1.   0.1          0.01   1.
0 129 227  3   10.   1.   0.1          0.01   1.
0 130 287  3   10.   1.   0.1          0.01   1.
0 132 304  3   10.   1.   0.1          0.01   1.
0 133 232  3   10.   1.   0.1          0.01   1.
0 134 281  3   10.   1.   0.1          0.01   1.
0 135 202  3   10.   1.   0.1          0.01   1.
0 136 288  3   10.   1.   0.1          0.01   1.
0 137 219  3   10.   1.   0.1          0.01   1.
0 138 236  3   10.   1.   0.1          0.01   1.
0 139 307  3   10.   1.   0.1          0.01   1.
0 141 200  3   10.   1.   0.1          0.01   1.
0 142 240  3   10.   1.   0.1          0.01   1.
0 143 237  3   10.   1.   0.1          0.01   1.
0 144 276  3   10.   1.   0.1          0.01   1.
0 145 266  3   10.   1.   0.1          0.01   1.
0 146 267  3   10.   1.   0.1          0.01   1.
0 147 230  3   10.   1.   0.1          0.01   1.
0 148 254  3   10.   1.   0.1          0.01   1.
0 149 255  3   10.   1.   0.1          0.01   1.
0 150 256  3   10.   1.   0.1          0.01   1.
0 151 257  3   10.   1.   0.1          0.01   1.
0 152 259  3   10.   1.   0.1          0.01   1.
0 153 264  3   10.   1.   0.1          0.01   1.
0 154 268  3   10.   1.   0.1          0.01   1.
0 155 269  3   10.   1.   0.1          0.01   1.
0 156 265  3   10.   1.   0.1          0.01   1.
0 157 275  3   10.   1.   0.1          0.01   1.
0 158 302  3   10.   1.   0.1          0.01   1.
0 159 309  3   10.   1.   0.1          0.01   1.
0 160 282  3   10.   1.   0.1          0.01   1.
0 161 310  3   10.   1.   0.1          0.01   1.
0 162 299  3   10.   1.   0.1          0.01   1.
0 163 244  3   10.   1.   0.1          0.01   1.
0 164 279  3   10.   1.   0.1          0.01   1.
0 165 245  3   10.   1.   0.1          0.01   1.
0 166 246  3   10.   1.   0.1          0.01   1.
0 167 250  3   10.   1.   0.1          0.01   1.
0 168 243  3   10.   1.   0.1          0.01   1.
0 169 242  3   10.   1.   0.1          0.01   1.
0 170 241  3   10.   1.   0.1          0.01   1.
0 171 248  3   10.   1.   0.1          0.01   1.
0 173 270  3   10.   1.   0.1          0.01   1.
0 174 305  3   10.   1.   0.1          0.01   1.
0 175 258  3   10.   1.   0.1          0.01   1.
0 176 252  3   10.   1.   0.1          0.01   1.
0 177 263  3   10.   1.   0.1          0.01   1.
0 178 262  3   10.   1.   0.1          0.01   1.
0 179 261  3   10.   1.   0.1          0.01   1.
0 180 260  3   10.   1.   0.1          0.01   1.
0 181 159  3   10.   1.   0.1          0.01   1.
0 182 283  3   10.   1.   0.1          0.01   1.
0 183 239  3   10.   1.   0.1          0.01   1.
0 184 277  3   10.   1.   0.1          0.01   1.
0 185 284  3   10.   1.   0.1          0.01   1.
0 186 225  3   10.   1.   0.1          0.01   1.
0 187 301  3   10.   1.   0.1          0.01   1.
0 188 247  3   10.   1.   0.1          0.01   1.
0 200 136  4   10.  964.  0.004   10.   10.  0.047   2.
          50.  964.  0.004   50.   50.  0.033  20.
0 202 101  4   20. 2327.  0.003   20.   20.  0.04    3.
         120. 2327.  0.003   50.   50.  0.03   20.
0 203 102  4   20. 1902.  0.004   20.   20.  0.044   3.
         120. 1902.  0.004   50.   50.  0.033  20.
0 204 103  4   20. 2673.  0.004   20.   20.  0.044   3.
         120. 2673.  0.004   50.   50.  0.033  20.
0 205 104  4   60. 1621.  0.003    4.    4.  0.037   3.
         160. 1621.  0.003   50.   50.  0.03   20.
0 206 105  4   50. 4148.  0.0034   4.    4.  0.039   3.
         150. 4148.  0.0034  50.   50.  0.031  20.
0 207 106  4   15.  717.  0.003    4.    4.  0.037   4.
         115.  717.  0.003   20.   20.  0.029  20.
0 208 107  4   20. 2763.  0.003   10.   10.  0.039   3.
         120. 2763.  0.003   40.   40.  0.03   20.
0 209 108  4   20. 3945.  0.003    4.    4.  0.036   5.
         120. 3945.  0.003   40.   40.  0.03   20.
0 210 109  4   20. 3217.  0.007    4.    4.  0.053   3.
         120. 3217.  0.007   50.   50.  0.041  20.
0 211 110  4   20. 1323.  0.008    4.    4.  0.056   3.
         120. 1323.  0.008   50.   50.  0.043  20.
0 212 111  4   50. 2426.  0.003    4.    4.  0.037   3.
         150. 2426.  0.003   50.   50.  0.03   20.
0 213 112  4   20. 2473.  0.005    4.    4.  0.046   3.
         120. 2473.  0.005   50.   50.  0.036  20.
0 214 113  4   20.  443.  0.003   10.   10.  0.039   3.
         120.  443.  0.003   25.   25.  0.029  20.
0 215 308  4   20. 1622.  0.003   10.   10.  0.039   3.
         120. 1622.  0.003   25.   25.  0.028  25.
0 216 164  4   20. 1324.  0.003   10.   10.  0.039   3.
         120. 1324.  0.003   25.   25.  0.029  20.
0 217 116  4   20. 3243.  0.005   10.   10.  0.047   3.
         120. 3243.  0.005   25.   25.  0.036  20.
0 218 117  4   20.  282.  0.003   10.   10.  0.039   3.
         120.  282.  0.003   25.   25.  0.029  20.
0 219 118  4   20. 2003.  0.003   10.   10.  0.039   3.
         120. 2003.  0.003   20.   20.  0.029  20.
0 220 147  4   20. 2196.  0.003    4.    4.  0.037   4.
         120. 2196.  0.003   20.   20.  0.029  20.
0 221 120  4   20. 5356.  0.001    4.    4.  0.024   5.
         120. 5356.  0.001   20.   20.  0.046  20.
0 222 121  4    8. 4084.  0.012    4.    4.  0.066   3.
          32. 4084.  0.012   20.   20.  0.071  20.
0 224 110  4   20. 2002.  0.003    4.    4.  0.04    2.
         120. 2002.  0.003   50.   50.  0.03   20.
```

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0 223 105  4   20.  1141.  0.002   10.   10.  0.035    2.
           120.  1141.  0.002   50.   50.  0.025   20.
0 225 106  4   20.  2475.  0.001   10.   10.  0.027    2.
           120.  2475.  0.001   50.   50.   0.02   20.
0 226 107  4   10.  2015.  0.006    4.    4.  0.054    2.
           110.  2015.  0.006   50.   50.  0.039   20.
0 227 126  4   20.  2686. 0.0052   10.   10.  0.056    1.
           120.  2686. 0.0052   50.   50.  0.037   20.
0 228 108  4   10.   645.  0.016    4.    4.  0.078    2.
           110.   645.  0.016   50.   50.  0.056   20.
0 229 127  4   10.   838.  0.003    4.    4.  0.041    2.
           110.   838.  0.003   50.   50.   0.03   20.
0 230 119  4   20.   302.  0.003    4.    4.  0.037    4.
           120.   302.  0.003   20.   20.  0.029   20.
0 231 130  4   20.  2856.  0.004   10.   10.  0.046    2.
           120.  2856.  0.004   50.   50.  0.033   20.
0 232 111  4   20.  1120.  0.005   10.   10.   0.05    2.
           120.  1120.  0.005   50.   50.  0.036   20.
0 233 297  4   20.  2070.  0.008   10.   10.  0.060    2.
           120.  2070.  0.008   50.   50.  0.043   20.
0 234 173  4   20.  3316.  0.013   10.   10.  0.072    2.
           120.  3316.  0.013   50.   50.  0.052   20.
0 235 140  4   40.  1047.  0.019   10.   10.   0.09    1.
           120.  1047.  0.019   50.   50.   0.06   20.
0 236 116  4   50.  2857. 0.0035   10.   10.  0.047    1.
           200.  2857. 0.0035   50.   50.  0.031   20.
0 237 184  5    6.   183.  0.035    0.    0.  0.013    6.
           100.  1400.  0.005   50.   50.  0.051   20.
0 239 141  4   40.  2088. 0.0030   10.   10.  0.041    2.
           120.  2088. 0.0030   50.   50.  0.030   20.
0 240 140  4   20.  2733.  0.015    5.    5.  0.082    1.
           120.  2733.  0.015   50.   50.  0.055   20.
0 241 139  4   20.  2126.  0.009   10.   10.  0.069    1.
           120.  2126.  0.009   50.   50.  0.045   20.
0 242 168  4   20.   927.  0.013    5.    5.  0.071    2.
           120.   927.  0.013   50.   50.  0.052   20.
0 243 161  4   20.  1224.  0.002   10.   10.  0.035    2.
           120.  1224.  0.002   50.   50.  0.025   20.
0 244 160  4   20.  1747.  0.007   10.   10.  0.057    2.
           120.  1747.  0.007   50.   50.  0.041   20.
0 245 163  4   20.  2060.  0.006   10.   10.  0.054    2.
           120.  2060.  0.006   50.   50.  0.039   20.
0 246 165  4   20.  3293.  0.007   10.   10.  0.057    2.
           120.  3293.  0.007   50.   50.  0.041   20.
0 247 168  4   40.  1278.   0.02   10.   10.  0.083    2.
           120.  1278.   0.02   50.   50.  0.061   20.
0 248 170  4  100.  1834.  0.013   10.   10.  0.077    1.
           200.  1834.  0.013   50.   50.  0.051   20.
0 250 132  4  100.  2986.  0.008   10.   10.  0.064    1.
           200.  2986.  0.008   50.   50.  0.043   20.
0 251 167  4   20.  1081.  0.004   10.   10.  0.051    1.
           120.  1081.  0.004   50.   50.  0.033   20.
0 252 174  4   20.  2585.  0.005    5.    5.  0.049    2.
           120.  2585.  0.005   50.   50.  0.036   20.
0 254 147  4   20.   637.  0.003   10.   10.  0.045    1.
           120.   637.  0.003   50.   50.   0.03   20.
0 255 150  4   70.  1579.  0.004    5.    5.  0.049    1.
           200.  1579.  0.004   50.   50.  0.033   20.
0 256 145  4  100.  2710.  0.013   10.   10.  0.077    1.
           200.  2710.  0.013   50.   50.  0.051   20.
0 257 149  4  100.  1831.  0.014   10.   10.  0.079    1.
           200.  1831.  0.014   50.   50.  0.053   20.
0 258 151  4  100.  3598.   0.01   10.   10.  0.069    1.
           200.  3598.   0.01   50.   50.  0.047   20.
0 259 149  4  100.  1401.  0.012   10.   10.  0.074    1.
           200.  1401.  0.012   50.   50.   0.05   20.
0 260 150  4  100.  2084.  0.007   10.   10.   0.06    1.
           200.  2084.  0.007   50.   50.  0.041   20.
0 261 176  4   20.  1626.  0.009   10.   10.  0.063    2.
           120.  1626.  0.009   50.   50.  0.045   20.
0 262 179  4  100.  1461.  0.006   10.   10.  0.057    1.
           200.  1461.  0.006   50.   50.  0.038   20.
0 263 179  4  100.  1278.  0.007   10.   10.   0.06    1.
           200.  1278.  0.007   50.   50.  0.041   20.
0 264 121  4  100.  2606.  0.019    5.    5.  0.063    2.
           400.  2606.  0.019   50.   50.  0.045   20.
0 265 122  4   20.  1802.  0.024    4.    4.  0.089    2.
           120.  1802.  0.024   50.   50.  0.065   20.
0 266 148  4   20.  3270.  0.007    5.    5.  0.056    2.
           120.  3270.  0.007   50.   50.  0.041   20.
0 267 145  4  100.   972.  0.002   10.   10.  0.038    1.
           200.   972.  0.002   50.   50.  0.025   20.
0 268 120  4  100.  1610.  0.031   10.   10.  0.089    1.
           400.  1610.  0.031   50.   50.  0.065   20.
0 269 119  4   10.   730.  0.025   10.   10.  0.103    1.
           100.   730.  0.025   50.   50.  0.066   20.
0 270 181  4   20.  1456.  0.006    5.    5.  0.053    2.
           120.  1456.  0.006   50.   50.  0.039   20.
0 271 164  4   50.  1908.  0.002   10.   10.  0.035    2.
           150.  1908.  0.002   50.   50.  0.025   20.
0 273 100  4   20.   703.  0.002   10.   10.  0.041    2.
           120.   703.  0.002   50.   50.   0.03   20.
0 274 186  4   20.  1045.  0.001   10.   10.  0.027    2.
           120.  1045.  0.001   50.   50.   0.02   20.
0 275 186  4   20.  1420.  0.011   10.   10.  0.068    2.
           120.  1420.  0.011   50.   50.  0.049   20.
0 276 137  4   20.  2158.  0.006    4.    4.  0.047    5.
           120.  2158.  0.006   50.   50.  0.043   10.
0 277 144  4   17.   262.  0.008    3.    3.  0.044    1.
           120.   262.  0.008   50.   50.  0.048   10.
0 278 103  4   20.   708.  0.007    4.    4.  0.056    2.
           120.   708.  0.007   50.   50.  0.041   20.
0 279 315  4   20.  2452.  0.003   10.   10.  0.039    3.
           120.  2452.  0.003   25.   25.  0.029   20.
0 280 137  4   20.  1804.  0.003   10.   10.  0.039    3.
           120.  1804.  0.003   50.   50.   0.03   20.
0 281 133  4   20.  3622.  0.004   10.   10.  0.046    2.
           120.  3622.  0.004   50.   50.  0.033   20.
0 282 182  4   20.  2352.  0.006   10.   10.  0.054    2.
           120.  2352.  0.006   50.   50.  0.039   20.
0 283 159  4   20.  1995.  0.004   10.   10.  0.046    2.
           120.  1995.  0.004   50.   50.  0.033   20.
0 284 132  4   20.  3155.  0.006   10.   10.  0.054    2.
           120.  3155.  0.006   50.   50.  0.039   20.
0 285 102  4   35.   502.  0.001   10.   10.  0.027    2.
           135.   502.  0.001   50.   50.   0.02   20.
0 286 158  4   20.  1328.  0.004   10.   10.  0.060    2.
           120.  1328.  0.008   50.   50.  0.043   20.
0 287 109  5  5.0   344.  0.005    1.    1.  0.017   5.0
           120.   344.  0.004   20.   20.  0.037   20.
```

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0 288 271   5    5.5   250.  0.011     0.     0.  0.013    5.5
            120.   250.  0.011    20.    20.  0.037    20.
0 296 316   4    80.  3500.  0.002     4.     4.  0.030    8.5
            120.  3500.  0.002    50.    50.  0.028    10.
0 297 298   2     5.   350.  0.005     0.     0.  0.013     5.
0 298 211   4    20.   440.  0.008    10.    10.  0.050     2.
            120.   440.  0.008    50.    50.  0.040    20.
0 299 302   4    20.  2854.  0.008    10.    10.  0.046     2.
            120.  2854.  0.004    50.    50.  0.033    20.
0 301 224   3    10.     1.    0.1              0.01     1.
0 302 233 11 2    0.1   500.  0.001                0.035    0.1
   0      0    0.21      5.    3.05     19.   12.65     40.
 30.14     66.     56.     92.   90.45    115.  131.74    131.
176.83    145.  223.32    158.  270.77    171.
0 303 188   3    10.     1.    0.1              0.01     1.
0 304 296   3    10.     1.    0.1              0.01     1.
0 305 251   3    10.     1.    0.1              0.01     1.
0 306 140   3    10.     1.    0.1              0.01     1.
0 307 235   3    10.     1.    0.1              0.01     1.
0 308 114   3    10.     1.    0.1              0.01     1.
0 309 286   3    10.     1.    0.1              0.01     1.
0 310 234   3    10.     1.    0.1              0.01     1.
0 311 216   3    10.     1.    0.1              0.01     1.
0 315 115 12 2    0.1    10.    0.1                      0.1
   0.     0.     1.4     22.     9.    150.     25.1    402.
  50.2    822.    83.7   1393.   125.3   2079.   173.4   2853.
 226.4   3712.   272.1   4499.   283.8   4640.    342.   5520.
0 316 143  5 2    0.1    10.    0.1                      0.1
   0.     0.    32.0     64.    64.    176.     96.0    344.
 103.5    542.   103.6   9999.
 401  131  231  3 3          1.
     0      0     528     528     900     528
    401  402   3          1.
    402  210   2    6.5   196   0.013      0     0  0.015    6.5
 403  140  200  3 3          1.
     0.     0.    560.    560.    900.    560.      0.      0.
  0 403  238   3          1.
  0 238  164   2    7.6   245.  0.005                0.013     8.
 -1  904  122  5 3    10.     1.    0.1              0.01    10.
     0.     0.    0.75     92.    1.33   5458.     4.00    430.
   16.0    350.

  0
  6
 100  104  110  141  115  122   0   0   0   0   0   0   0   0   0   0
ENDPROGRAM
```

50 YR FUTURE BASELINE CONDITION

```
  2  1  1  2
  3  4
WATERSHED   1
LOWER THIRD CREEK, 50 YR FUTURE CONDITION Baseline
KIOWA ENGINEERING CORPORATION revised 03/05
     192      5.0                                        1
      1  100
      2  135
      3  101
      4  100
      5  103
      6  123
      7  104
      8  104
      9  105
     10  124
     11  125
     12  106
     13  106
     14  157
     15  126
     16  108
     17  127
     18  128
     19  129
     20  130
     21  131
     22  109
     23  187
     24  134
     25  111
     26  133
     27  110
     28  112
     29  308
     30  158
     31  158
     32  158
     33  308
     34  159
     35  181
     36  159
     37  162
     38  162
     39  306
     40  115
     41  138
     42  182
     43  173
     44  160
     45  161
     46  139
     47  140
     48  141
     49  116
     50  116
     51  117
     52  118
     53  155
     54  154
     55  119
     56  118
     57  163
     58  163
     59  168
     60  169
     61  170
     62  142
     63  183
     64  316
```

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65 184
66 144
67 148
68 148
69 120
70 120
71 153
72 156
73 121
74 165
75 166
76 303
77 171
78 304
79 180
80 150
81 145
82 145
83 132
84 132
85 150
86 150
87 146
88 174
89 174
90 174
91 185
92 151
93 152
94 176
95 177
96 178
97 175
98 121

0 100  0  3  10.  1.  0.1        0.01  1.
0 101 285  3  10.  1.  0.1        0.01  1.
0 102 273  3  10.  1.  0.1        0.01  1.
0 103 203  3  10.  1.  0.1        0.01  1.
0 104 204  3  10.  1.  0.1        0.01  1.
0 105 205  3  10.  1.  0.1        0.01  1.
0 106 206  3  10.  1.  0.1        0.01  1.
0 107 207  3  10.  1.  0.1        0.01  1.
0 108 208  3  10.  1.  0.1        0.01  1.
0 109 209  3  10.  1.  0.1        0.01  1.
0 110 210  3  10.  1.  0.1        0.01  1.
0 111 211  3  10.  1.  0.1        0.01  1.
0 112 212  3  10.  1.  0.1        0.01  1.
0 113 213  3  10.  1.  0.1        0.01  1.
0 114 214  3  10.  1.  0.1        0.01  1.
0 115 215  3  10.  1.  0.1        0.01  1.
0 116 311  3  10.  1.  0.1        0.01  1.
0 117 217  3  10.  1.  0.1        0.01  1.
0 118 218  3  10.  1.  0.1        0.01  1.
0 119 280  3  10.  1.  0.1        0.01  1.
0 120 220  3  10.  1.  0.1        0.01  1.
0 121 221  3  10.  1.  0.1        0.01  1.
0 122 222  3  10.  1.  0.1        0.01  1.
0 123 278  3  10.  1.  0.1        0.01  1.
0 124 223  3  10.  1.  0.1        0.01  1.
0 125 274  3  10.  1.  0.1        0.01  1.
0 126 226  3  10.  1.  0.1        0.01  1.
0 127 228  3  10.  1.  0.1        0.01  1.
0 128 229  3  10.  1.  0.1        0.01  1.
0 129 227  3  10.  1.  0.1        0.01  1.
0 130 287  3  10.  1.  0.1        0.01  1.
0 132 304  3  10.  1.  0.1        0.01  1.
0 133 232  3  10.  1.  0.1        0.01  1.
0 134 281  3  10.  1.  0.1        0.01  1.
0 135 202  3  10.  1.  0.1        0.01  1.
0 136 288  3  10.  1.  0.1        0.01  1.
0 137 219  3  10.  1.  0.1        0.01  1.
0 138 236  3  10.  1.  0.1        0.01  1.
0 139 307  3  10.  1.  0.1        0.01  1.
0 141 200  3  10.  1.  0.1        0.01  1.
0 142 240  3  10.  1.  0.1        0.01  1.
0 143 237  3  10.  1.  0.1        0.01  1.
0 144 276  3  10.  1.  0.1        0.01  1.
0 145 266  3  10.  1.  0.1        0.01  1.
0 146 267  3  10.  1.  0.1        0.01  1.
0 147 230  3  10.  1.  0.1        0.01  1.
0 148 254  3  10.  1.  0.1        0.01  1.
0 149 255  3  10.  1.  0.1        0.01  1.
0 150 256  3  10.  1.  0.1        0.01  1.
0 151 257  3  10.  1.  0.1        0.01  1.
0 152 259  3  10.  1.  0.1        0.01  1.
0 153 264  3  10.  1.  0.1        0.01  1.
0 154 268  3  10.  1.  0.1        0.01  1.
0 155 269  3  10.  1.  0.1        0.01  1.
0 156 265  3  10.  1.  0.1        0.01  1.
0 157 275  3  10.  1.  0.1        0.01  1.
0 158 302  3  10.  1.  0.1        0.01  1.
0 159 309  3  10.  1.  0.1        0.01  1.
0 160 282  3  10.  1.  0.1        0.01  1.
0 161 310  3  10.  1.  0.1        0.01  1.
0 162 299  3  10.  1.  0.1        0.01  1.
0 163 244  3  10.  1.  0.1        0.01  1.
0 164 279  3  10.  1.  0.1        0.01  1.
0 165 245  3  10.  1.  0.1        0.01  1.
0 166 246  3  10.  1.  0.1        0.01  1.
0 167 250  3  10.  1.  0.1        0.01  1.
0 168 243  3  10.  1.  0.1        0.01  1.
0 169 242  3  10.  1.  0.1        0.01  1.
0 170 241  3  10.  1.  0.1        0.01  1.
0 171 248  3  10.  1.  0.1        0.01  1.
0 173 270  3  10.  1.  0.1        0.01  1.
0 174 305  3  10.  1.  0.1        0.01  1.
0 175 258  3  10.  1.  0.1        0.01  1.
0 176 252  3  10.  1.  0.1        0.01  1.
0 177 263  3  10.  1.  0.1        0.01  1.
0 178 262  3  10.  1.  0.1        0.01  1.
0 179 261  3  10.  1.  0.1        0.01  1.
0 180 260  3  10.  1.  0.1        0.01  1.
0 181 159  3  10.  1.  0.1        0.01  1.
0 182 283  3  10.  1.  0.1        0.01  1.
0 183 239  3  10.  1.  0.1        0.01  1.
0 184 277  3  10.  1.  0.1        0.01  1.
0 185 284  3  10.  1.  0.1        0.01  1.
0 186 225  3  10.  1.  0.1        0.01  1.
0 187 301  3  10.  1.  0.1        0.01  1.
```

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0 188 247  3   10.    1.   0.1              0.01    1.
0 200 136  4   10.  964.  0.004   10.   10.  0.047    2.
           50.  964.  0.004   50.   50.  0.033   20.
0 202 101  4   20. 2327.  0.003   20.   20.   0.04    3.
          120. 2327.  0.003   50.   50.   0.03   20.
0 203 102  4   20. 1902.  0.004   20.   20.  0.044    3.
          120. 1902.  0.004   50.   50.  0.033   20.
0 204 103  4   20. 2673.  0.004   20.   20.  0.044    3.
          120. 2673.  0.004   50.   50.  0.033   20.
0 205 104  4   60. 1621.  0.003    4.    4.  0.037    3.
          160. 1621.  0.003   50.   50.   0.03   20.
0 206 105  4   50. 4148. 0.0034    4.    4.  0.039    3.
          150. 4148. 0.0034   50.   50.  0.031   20.
0 207 106  4   15.  717.  0.003    4.    4.  0.037    4.
          115.  717.  0.003   20.   20.  0.029   20.
0 208 107  4   20. 2763.  0.003   10.   10.  0.039    3.
          120. 2763.  0.003   40.   40.   0.03   20.
0 209 108  4   20. 3945.  0.003    4.    4.  0.036    5.
          120. 3945.  0.003   40.   40.   0.03   20.
0 210 109  4   20. 3217.  0.007    4.    4.  0.053    3.
          120. 3217.  0.007   50.   50.  0.041   20.
0 211 110  4   20. 1323.  0.008    4.    4.  0.056    3.
          120. 1323.  0.008   50.   50.  0.043   20.
0 212 111  4   50. 2426.  0.003    4.    4.  0.037    3.
          150. 2426.  0.003   50.   50.   0.03   20.
0 213 112  4   20. 2473.  0.005    4.    4.  0.046    3.
          120. 2473.  0.005   50.   50.  0.036   20.
0 214 113  4   20.  443.  0.003   10.   10.  0.039    3.
          120.  443.  0.003   25.   25.  0.029   20.
0 215 308  4   20. 1622.  0.003   10.   10.  0.039    3.
          120. 1622.  0.003   25.   25.  0.028   25.
0 216 164  4   20. 1324.  0.003   10.   10.  0.039    3.
          120. 1324.  0.003   25.   25.  0.029   20.
0 217 116  4   20. 3243.  0.005   10.   10.  0.047    3.
          120. 3243.  0.005   25.   25.  0.036   20.
0 218 117  4   20.  282.  0.003   10.   10.  0.039    3.
          120.  282.  0.003   25.   25.  0.029   20.
0 219 118  4   20. 2003.  0.003   10.   10.  0.039    3.
          120. 2003.  0.003   20.   20.  0.029   20.
0 220 147  4   20. 2196.  0.003    4.    4.  0.037    4.
          120. 2196.  0.003   20.   20.  0.029   20.
0 221 120  4   20. 5356.  0.001    4.    4.  0.024    5.
          120. 5356.  0.001   20.   20.  0.046   20.
0 222 121  4    8. 4084.  0.012    4.    4.  0.066    3.
           32. 4084.  0.012   20.   20.  0.071   20.
0 224 110  4   20. 2002.  0.003    4.    4.   0.04    2.
          120. 2002.  0.003   50.   50.   0.03   20.
0 223 105  4   20. 1141.  0.002   10.   10.  0.035    2.
          120. 1141.  0.002   50.   50.  0.025   20.
0 225 106  4   20. 2475.  0.001   10.   10.  0.027    2.
          120. 2475.  0.001   50.   50.   0.02   20.
0 226 107  4   10. 2015.  0.006    4.    4.  0.054    2.
          110. 2015.  0.006   50.   50.  0.039   20.
0 227 126  4   20. 2686. 0.0052   10.   10.  0.056    1.
          120. 2686. 0.0052   50.   50.  0.037   20.
0 228 108  4   10.  645.  0.016    4.    4.  0.078    2.
          110.  645.  0.016   50.   50.  0.056   20.
0 229 127  4   10.  838.  0.003    4.    4.  0.041    2.
          110.  838.  0.003   50.   50.   0.03   20.
0 230 119  4   20.  302.  0.003    4.    4.  0.037    4.
          120.  302.  0.003   20.   20.  0.029   20.
0 231 130  4   20. 2856.  0.004   10.   10.  0.046    2.
          120. 2856.  0.004   50.   50.  0.033   20.
0 232 111  4   20. 1120.  0.005   10.   10.   0.05    2.
          120. 1120.  0.005   50.   50.  0.036   20.
0 233 297  4   20. 2070.  0.008   10.   10.  0.060    2.
          120. 2070.  0.008   50.   50.  0.043   20.
0 234 173  4   20. 3316.  0.013   10.   10.  0.072    2.
          120. 3316.  0.013   50.   50.  0.052   20.
0 235 140  4   40. 1047.  0.019   10.   10.   0.09    1.
          120. 1047.  0.019   50.   50.   0.06   20.
0 236 116  4   50. 2857. 0.0035   10.   10.  0.047    1.
          200. 2857. 0.0035   50.   50.  0.031   20.
0 237 184  5    6.  183.  0.035    0.    0.  0.013    6.
          100. 1400.  0.005   50.   50.  0.051   20.
0 239 141  4   40. 2088. 0.0030   10.   10.  0.041    2.
          120. 2088. 0.0030   50.   50.  0.030   20.
0 240 140  4   20. 2733.  0.015    5.    5.  0.082    1.
          120. 2733.  0.015   50.   50.  0.055   20.
0 241 139  4   20. 2126.  0.009   10.   10.  0.069    1.
          120. 2126.  0.009   50.   50.  0.045   20.
0 242 168  4   20.  927.  0.013    5.    5.  0.071    2.
          120.  927.  0.013   50.   50.  0.052   20.
0 243 161  4   20. 1224.  0.002   10.   10.  0.035    2.
          120. 1224.  0.002   50.   50.  0.025   20.
0 244 160  4   20. 1747.  0.007   10.   10.  0.057    2.
          120. 1747.  0.007   50.   50.  0.041   20.
0 245 163  4   20. 2060.  0.006   10.   10.  0.054    2.
          120. 2060.  0.006   50.   50.  0.039   20.
0 246 165  4   20. 3293.  0.007   10.   10.  0.057    2.
          120. 3293.  0.007   50.   50.  0.041   20.
0 247 168  4   40. 1278.   0.02   10.   10.  0.083    2.
          120. 1278.   0.02   50.   50.  0.061   20.
0 248 170  4  100. 1834.  0.013   10.   10.  0.077    1.
          200. 1834.  0.013   50.   50.  0.051   20.
0 250 132  4  100. 2986.  0.008   10.   10.  0.064    1.
          200. 2986.  0.008   50.   50.  0.043   20.
0 251 167  4   20. 1081.  0.004   10.   10.  0.051    1.
          120. 1081.  0.004   50.   50.  0.033   20.
0 252 174  4   20. 2585.  0.005    5.    5.  0.049    2.
          120. 2585.  0.005   50.   50.  0.036   20.
0 254 147  4   20.  637.  0.003   10.   10.  0.045    1.
          120.  637.  0.003   50.   50.   0.03   20.
0 255 150  4   70. 1579.  0.004    5.    5.  0.049    1.
          200. 1579.  0.004   50.   50.  0.033   20.
0 256 145  4  100. 2710.  0.013   10.   10.  0.077    1.
          200. 2710.  0.013   50.   50.  0.051   20.
0 257 149  4  100. 1831.  0.014   10.   10.  0.079    1.
          200. 1831.  0.014   50.   50.  0.053   20.
0 258 151  4  100. 3598.   0.01   10.   10.  0.069    1.
          200. 3598.   0.01   50.   50.  0.047   20.
0 259 149  4  100. 1401.  0.012   10.   10.  0.074    1.
          200. 1401.  0.012   50.   50.   0.05   20.
0 260 150  4  100. 2084.  0.007   10.   10.   0.06    1.
          200. 2084.  0.007   50.   50.  0.041   20.
0 261 176  4   20. 1626.  0.009   10.   10.  0.063    2.
          120. 1626.  0.009   50.   50.  0.045   20.
0 262 179  4  100. 1461.  0.006   10.   10.  0.057    1.
          200. 1461.  0.006   50.   50.  0.038   20.
0 263 179  4  100. 1278.  0.007   10.   10.   0.06    1.
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          200.  1278.  0.007    50.    50.  0.041    20.
0 264 121   4   100.  2606.  0.019     5.     5.  0.063     2.
          400.  2606.  0.019    50.    50.  0.045    20.
0 265 122   4    20.  1802.  0.024     4.     4.  0.089     2.
          120.  1802.  0.024    50.    50.  0.065    20.
0 266 148   4    20.  3270.  0.007     5.     5.  0.056     2.
          120.  3270.  0.007    50.    50.  0.041    20.
0 267 145   4   100.   972.  0.002    10.    10.  0.038     1.
          200.   972.  0.002    50.    50.  0.025    20.
0 268 120   4   100.  1610.  0.031    10.    10.  0.089     1.
          400.  1610.  0.031    50.    50.  0.065    20.
0 269 119   4    10.   730.  0.025    10.    10.  0.103     1.
          100.   730.  0.025    50.    50.  0.066    20.
0 270 181   4    20.  1456.  0.006     5.     5.  0.053     2.
          120.  1456.  0.006    50.    50.  0.039    20.
0 271 164   4    50.  1908.  0.002    10.    10.  0.035     2.
          150.  1908.  0.002    50.    50.  0.025    20.
0 273 100   4    20.   703.  0.002    10.    10.  0.041     2.
          120.   703.  0.002    50.    50.  0.03    20.
0 274 186   4    20.  1045.  0.001    10.    10.  0.027     2.
          120.  1045.  0.001    50.    50.  0.02    20.
0 275 186   4    20.  1420.  0.011    10.    10.  0.068     2.
          120.  1420.  0.011    50.    50.  0.049    20.
0 276 137   4    20.  2158.  0.006     4.     4.  0.047     5.
          120.  2158.  0.006    50.    50.  0.043    10.
0 277 144   4    17.   262.  0.008     3.     3.  0.044     1.
          120.   262.  0.008    50.    50.  0.048    10.
0 278 103   4    20.   708.  0.007     4.     4.  0.056     2.
          120.   708.  0.007    50.    50.  0.041    20.
0 279 315   4    20.  2452.  0.003    10.    10.  0.039     3.
          120.  2452.  0.003    25.    25.  0.029    20.
0 280 137   4    20.  1804.  0.003    10.    10.  0.039     3.
          120.  1804.  0.003    50.    50.  0.03    20.
0 281 133   4    20.  3622.  0.004    10.    10.  0.046     2.
          120.  3622.  0.004    50.    50.  0.033    20.
0 282 182   4    20.  2352.  0.006    10.    10.  0.054     2.
          120.  2352.  0.006    50.    50.  0.039    20.
0 283 159   4    20.  1995.  0.004    10.    10.  0.046     2.
          120.  1995.  0.004    50.    50.  0.033    20.
0 284 132   4    20.  3155.  0.006    10.    10.  0.054     2.
          120.  3155.  0.006    50.    50.  0.039    20.
0 285 102   4    35.   502.  0.001    10.    10.  0.027     2.
          135.   502.  0.001    50.    50.  0.02    20.
0 286 158   4    20.  1328.  0.004    10.    10.  0.060     2.
          120.  1328.  0.008    50.    50.  0.043    20.
0 287 109   5   5.0   344.  0.005     1.     1.  0.017    5.0
          120.   344.  0.004    20.    20.  0.037    20.
0 288 271   5   5.5   250.  0.011     0.     0.  0.013    5.5
          120.   250.  0.011    20.    20.  0.037    20.
0 296 316   4    80.  3500.  0.002     4.     4.  0.030    8.5
          120.  3500.  0.002    50.    50.  0.028    10.
0 297 298   2     5.   350.  0.005     0.     0.  0.013     5.
0 298 211   4    20.   440.  0.008    10.    10.  0.050     2.
          120.   440.  0.008    50.    50.  0.040    20.
0 299 302   4    20.  2854.  0.008    10.    10.  0.046     2.
          120.  2854.  0.004    50.    50.  0.033    20.
0 301 224   3    10.     1.    0.1              0.01     1.
0 302 233 11 2    0.1   500.  0.001              0.035    0.1
    0     0    0.21     5.   3.05    19.   12.65    40.
  30.14    66.    56.    92.  90.45   115.  131.74   131.
  176.83   145.  223.32   158.  270.77   171.
0 303 188   3    10.     1.    0.1              0.01     1.
0 304 296   3    10.     1.    0.1              0.01     1.
0 305 251   3    10.     1.    0.1              0.01     1.
0 306 140   3    10.     1.    0.1              0.01     1.
0 307 235   3    10.     1.    0.1              0.01     1.
0 308 114   3    10.     1.    0.1              0.01     1.
0 309 286   3    10.     1.    0.1              0.01     1.
0 310 234   3    10.     1.    0.1              0.01     1.
0 311 216   3    10.     1.    0.1              0.01     1.
0 315 115 12 2    0.1    10.    0.1                       0.1
    0.     0.    1.4    22.     9.   150.    25.1    402.
   50.2   822.   83.7  1393.   125.3  2079.   173.4   2853.
  226.4  3712.  272.1  4499.   283.8  4640.    342.   5520.
0 316 143 5 2    0.1    10.    0.1                       0.1
    0.     0.   32.0    64.    64.   176.    96.0    344.
  103.5   542.  103.6  9999.
401 131 231 3 3          1.
    0      0    528    528    900    528
  401 402   3          1.
  402 210   2    6.5   196   0.013      0      0  0.015    6.5
403 140 200 3 3          1.
    0.     0.   560.   560.   900.   560.     0.     0.
 0 403 238   3          1.
 0 238 164   2    7.6   245.  0.005              0.013     8.
-1 904 122 5 3    10.     1.    0.1              0.01    10.
    0.     0.   0.75    88.   1.42  4173.    3.83    811.
   16.0   273.

 0
 6
 100 104 110 141 115 122   0   0   0   0   0   0   0   0   0   0
ENDPROGRAM
```

10 YR FUTURE BASELINE CONDITION

```
 2 1 1 2
 3 4
WATERSHED  1
LOWER THIRD CREEK, 10 YR FUTURE CONDITION Baseline
KIOWA ENGINEERING CORPORATION revised 03/05
    192     5.0                                   1
     1 100
     2 135
     3 101
     4 100
     5 103
     6 123
     7 104
     8 104
     9 105
    10 124
    11 125
    12 106
    13 106
    14 157
    15 126
    16 108
    17 127
    18 128
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19 129
20 130
21 131
22 109
23 187
24 134
25 111
26 133
27 110
28 112
29 308
30 158
31 158
32 158
33 308
34 159
35 181
36 159
37 162
38 162
39 306
40 115
41 138
42 182
43 173
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46 139
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76 303
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78 304
79 180
80 150
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82 145
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84 132
85 150
86 150
87 146
88 174
89 174
90 174
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92 151
93 152
94 176
95 177
96 178
97 175
98 121

0	100	0	3	10.	1.	0.1	0.01	1.
0	101	285	3	10.	1.	0.1	0.01	1.
0	102	273	3	10.	1.	0.1	0.01	1.
0	103	203	3	10.	1.	0.1	0.01	1.
0	104	204	3	10.	1.	0.1	0.01	1.
0	105	205	3	10.	1.	0.1	0.01	1.
0	106	206	3	10.	1.	0.1	0.01	1.
0	107	207	3	10.	1.	0.1	0.01	1.
0	108	208	3	10.	1.	0.1	0.01	1.
0	109	209	3	10.	1.	0.1	0.01	1.
0	110	210	3	10.	1.	0.1	0.01	1.
0	111	211	3	10.	1.	0.1	0.01	1.
0	112	212	3	10.	1.	0.1	0.01	1.
0	113	213	3	10.	1.	0.1	0.01	1.
0	114	214	3	10.	1.	0.1	0.01	1.
0	115	215	3	10.	1.	0.1	0.01	1.
0	116	311	3	10.	1.	0.1	0.01	1.
0	117	217	3	10.	1.	0.1	0.01	1.
0	118	218	3	10.	1.	0.1	0.01	1.
0	119	280	3	10.	1.	0.1	0.01	1.
0	120	220	3	10.	1.	0.1	0.01	1.
0	121	221	3	10.	1.	0.1	0.01	1.
0	122	222	3	10.	1.	0.1	0.01	1.
0	123	278	3	10.	1.	0.1	0.01	1.
0	124	223	3	10.	1.	0.1	0.01	1.
0	125	274	3	10.	1.	0.1	0.01	1.
0	126	226	3	10.	1.	0.1	0.01	1.
0	127	228	3	10.	1.	0.1	0.01	1.
0	128	229	3	10.	1.	0.1	0.01	1.
0	129	227	3	10.	1.	0.1	0.01	1.
0	130	287	3	10.	1.	0.1	0.01	1.
0	132	304	3	10.	1.	0.1	0.01	1.
0	133	232	3	10.	1.	0.1	0.01	1.
0	134	281	3	10.	1.	0.1	0.01	1.
0	135	202	3	10.	1.	0.1	0.01	1.
0	136	288	3	10.	1.	0.1	0.01	1.
0	137	219	3	10.	1.	0.1	0.01	1.
0	138	236	3	10.	1.	0.1	0.01	1.
0	139	307	3	10.	1.	0.1	0.01	1.

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0 141 200  3  10.   1.  0.1          0.01   1.
0 142 240  3  10.   1.  0.1          0.01   1.
0 143 237  3  10.   1.  0.1          0.01   1.
0 144 276  3  10.   1.  0.1          0.01   1.
0 145 266  3  10.   1.  0.1          0.01   1.
0 146 267  3  10.   1.  0.1          0.01   1.
0 147 230  3  10.   1.  0.1          0.01   1.
0 148 254  3  10.   1.  0.1          0.01   1.
0 149 255  3  10.   1.  0.1          0.01   1.
0 150 256  3  10.   1.  0.1          0.01   1.
0 151 257  3  10.   1.  0.1          0.01   1.
0 152 259  3  10.   1.  0.1          0.01   1.
0 153 264  3  10.   1.  0.1          0.01   1.
0 154 268  3  10.   1.  0.1          0.01   1.
0 155 269  3  10.   1.  0.1          0.01   1.
0 156 265  3  10.   1.  0.1          0.01   1.
0 157 275  3  10.   1.  0.1          0.01   1.
0 158 302  3  10.   1.  0.1          0.01   1.
0 159 309  3  10.   1.  0.1          0.01   1.
0 160 282  3  10.   1.  0.1          0.01   1.
0 161 310  3  10.   1.  0.1          0.01   1.
0 162 299  3  10.   1.  0.1          0.01   1.
0 163 244  3  10.   1.  0.1          0.01   1.
0 164 279  3  10.   1.  0.1          0.01   1.
0 165 245  3  10.   1.  0.1          0.01   1.
0 166 246  3  10.   1.  0.1          0.01   1.
0 167 250  3  10.   1.  0.1          0.01   1.
0 168 243  3  10.   1.  0.1          0.01   1.
0 169 242  3  10.   1.  0.1          0.01   1.
0 170 241  3  10.   1.  0.1          0.01   1.
0 171 248  3  10.   1.  0.1          0.01   1.
0 173 270  3  10.   1.  0.1          0.01   1.
0 174 305  3  10.   1.  0.1          0.01   1.
0 175 258  3  10.   1.  0.1          0.01   1.
0 176 252  3  10.   1.  0.1          0.01   1.
0 177 263  3  10.   1.  0.1          0.01   1.
0 178 262  3  10.   1.  0.1          0.01   1.
0 179 261  3  10.   1.  0.1          0.01   1.
0 180 260  3  10.   1.  0.1          0.01   1.
0 181 159  3  10.   1.  0.1          0.01   1.
0 182 283  3  10.   1.  0.1          0.01   1.
0 183 239  3  10.   1.  0.1          0.01   1.
0 184 277  3  10.   1.  0.1          0.01   1.
0 185 284  3  10.   1.  0.1          0.01   1.
0 186 225  3  10.   1.  0.1          0.01   1.
0 187 301  3  10.   1.  0.1          0.01   1.
0 188 247  3  10.   1.  0.1          0.01   1.
0 200 136  4  10.  964.  0.004   10.   10.  0.047   2.
             50.  964.  0.004   50.   50.  0.033  20.
0 202 101  4  20. 2327.  0.003   20.   20.  0.04    3.
            120. 2327.  0.003   50.   50.  0.03   20.
0 203 102  4  20. 1902.  0.004   20.   20.  0.044   3.
            120. 1902.  0.004   50.   50.  0.033  20.
0 204 103  4  20. 2673.  0.004   20.   20.  0.044   3.
            120. 2673.  0.004   50.   50.  0.033  20.
0 205 104  4  60. 1621.  0.003    4.    4.  0.037   3.
            160. 1621.  0.003   50.   50.  0.03   20.
0 206 105  4  50. 4148. 0.0034    4.    4.  0.039   3.
            150. 4148. 0.0034   50.   50.  0.031  20.
0 207 106  4  15.  717.  0.003    4.    4.  0.037   4.
            115.  717.  0.003   20.   20.  0.029  20.
0 208 107  4  20. 2763.  0.003   10.   10.  0.039   3.
            120. 2763.  0.003   40.   40.  0.03   20.
0 209 108  4  20. 3945.  0.003    4.    4.  0.036   5.
            120. 3945.  0.003   40.   40.  0.03   20.
0 210 109  4  20. 3217.  0.007    4.    4.  0.053   3.
            120. 3217.  0.007   50.   50.  0.041  20.
0 211 110  4  20. 1323.  0.008    4.    4.  0.056   3.
            120. 1323.  0.008   50.   50.  0.043  20.
0 212 111  4  50. 2426.  0.003    4.    4.  0.037   3.
            150. 2426.  0.003   50.   50.  0.03   20.
0 213 112  4  20. 2473.  0.005    4.    4.  0.046   3.
            120. 2473.  0.005   50.   50.  0.036  20.
0 214 113  4  20.  443.  0.003   10.   10.  0.039   3.
            120.  443.  0.003   25.   25.  0.029  20.
0 215 308  4  20. 1622.  0.003   10.   10.  0.039   3.
            120. 1622.  0.003   25.   25.  0.028  25.
0 216 164  4  20. 1324.  0.003   10.   10.  0.039   3.
            120. 1324.  0.003   25.   25.  0.029  20.
0 217 116  4  20. 3243.  0.005   10.   10.  0.047   3.
            120. 3243.  0.005   25.   25.  0.036  20.
0 218 117  4  20.  282.  0.003   10.   10.  0.039   3.
            120.  282.  0.003   25.   25.  0.029  20.
0 219 118  4  20. 2003.  0.003   10.   10.  0.039   3.
            120. 2003.  0.003   20.   20.  0.029  20.
0 220 147  4  20. 2196.  0.003    4.    4.  0.037   4.
            120. 2196.  0.003   20.   20.  0.029  20.
0 221 120  4  20. 5356.  0.001    4.    4.  0.024   5.
            120. 5356.  0.001   20.   20.  0.046  20.
0 222 121  4   8. 4084.  0.012    4.    4.  0.066   3.
             32. 4084.  0.012   20.   20.  0.071  20.
0 224 110  4  20. 2002.  0.003    4.    4.  0.04    2.
            120. 2002.  0.003   50.   50.  0.03   20.
0 223 105  4  20. 1141.  0.002   10.   10.  0.035   2.
            120. 1141.  0.002   50.   50.  0.025  20.
0 225 106  4  20. 2475.  0.001   10.   10.  0.027   2.
            120. 2475.  0.001   50.   50.  0.02   20.
0 226 107  4  10. 2015.  0.006    4.    4.  0.054   2.
            110. 2015.  0.006   50.   50.  0.039  20.
0 227 126  4  20. 2686. 0.0052   10.   10.  0.056   1.
            120. 2686. 0.0052   50.   50.  0.037  20.
0 228 108  4  10.  645.  0.016    4.    4.  0.078   2.
            110.  645.  0.016   50.   50.  0.056  20.
0 229 127  4  10.  838.  0.003    4.    4.  0.041   2.
            110.  838.  0.003   50.   50.  0.03   20.
0 230 119  4  20.  302.  0.003    4.    4.  0.037   4.
            120.  302.  0.003   20.   20.  0.029  20.
0 231 130  4  20. 2856.  0.004   10.   10.  0.046   2.
            120. 2856.  0.004   50.   50.  0.033  20.
0 232 111  4  20. 1120.  0.005   10.   10.  0.05    2.
            120. 1120.  0.005   50.   50.  0.036  20.
0 233 297  4  20. 2070.  0.008   10.   10.  0.060   2.
            120. 2070.  0.008   50.   50.  0.043  20.
0 234 173  4  20. 3316.  0.013   10.   10.  0.072   2.
            120. 3316.  0.013   50.   50.  0.052  20.
0 235 140  4  40. 1047.  0.019   10.   10.  0.09    1.
            120. 1047.  0.019   50.   50.  0.06   20.
0 236 116  4  50. 2857. 0.0035   10.   10.  0.047   1.
            200. 2857. 0.0035   50.   50.  0.031  20.
0 237 184  5   6.  183.  0.035    0.    0.  0.013   6.
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          100.  1400.  0.005    50.    50.  0.051    20.
0 239 141  4   40.  2088. 0.0030   10.    10.  0.041    2.
          120.  2088. 0.0030    50.    50.  0.030    20.
0 240 140  4   20.  2733.  0.015    5.     5.  0.082    1.
          120.  2733.  0.015    50.    50.  0.055    20.
0 241 139  4   20.  2126.  0.009   10.    10.  0.069    1.
          120.  2126.  0.009    50.    50.  0.045    20.
0 242 168  4   20.   927.  0.013    5.     5.  0.071    2.
          120.   927.  0.013    50.    50.  0.052    20.
0 243 161  4   20.  1224.  0.002   10.    10.  0.035    2.
          120.  1224.  0.002    50.    50.  0.025    20.
0 244 160  4   20.  1747.  0.007   10.    10.  0.057    2.
          120.  1747.  0.007    50.    50.  0.041    20.
0 245 163  4   20.  2060.  0.006   10.    10.  0.054    2.
          120.  2060.  0.006    50.    50.  0.039    20.
0 246 165  4   20.  3293.  0.007   10.    10.  0.057    2.
          120.  3293.  0.007    50.    50.  0.041    20.
0 247 168  4   40.  1278.   0.02   10.    10.  0.083    2.
          120.  1278.   0.02    50.    50.  0.061    20.
0 248 170  4  100.  1834.  0.013   10.    10.  0.077    1.
          200.  1834.  0.013    50.    50.  0.051    20.
0 250 132  4  100.  2986.  0.008   10.    10.  0.064    1.
          200.  2986.  0.008    50.    50.  0.043    20.
0 251 167  4   20.  1081.  0.004   10.    10.  0.051    1.
          120.  1081.  0.004    50.    50.  0.033    20.
0 252 174  4   20.  2585.  0.005    5.     5.  0.049    2.
          120.  2585.  0.005    50.    50.  0.036    20.
0 254 147  4   20.   637.  0.003   10.    10.  0.045    1.
          120.   637.  0.003    50.    50.   0.03    20.
0 255 150  4   70.  1579.  0.004    5.     5.  0.049    1.
          200.  1579.  0.004    50.    50.  0.033    20.
0 256 145  4  100.  2710.  0.013   10.    10.  0.077    1.
          200.  2710.  0.013    50.    50.  0.051    20.
0 257 149  4  100.  1831.  0.014   10.    10.  0.079    1.
          200.  1831.  0.014    50.    50.  0.053    20.
0 258 151  4  100.  3598.   0.01   10.    10.  0.069    1.
          200.  3598.   0.01    50.    50.  0.047    20.
0 259 149  4  100.  1401.  0.012   10.    10.  0.074    1.
          200.  1401.  0.012    50.    50.   0.05    20.
0 260 150  4  100.  2084.  0.007   10.    10.   0.06    1.
          200.  2084.  0.007    50.    50.  0.041    20.
0 261 176  4   20.  1626.  0.009   10.    10.  0.063    2.
          120.  1626.  0.009    50.    50.  0.045    20.
0 262 179  4  100.  1461.  0.006   10.    10.  0.057    1.
          200.  1461.  0.006    50.    50.  0.038    20.
0 263 179  4  100.  1278.  0.007   10.    10.   0.06    1.
          200.  1278.  0.007    50.    50.  0.041    20.
0 264 121  4  100.  2606.  0.019    5.     5.  0.063    2.
          400.  2606.  0.019    50.    50.  0.045    20.
0 265 122  4   20.  1802.  0.024    4.     4.  0.089    2.
          120.  1802.  0.024    50.    50.  0.065    20.
0 266 148  4   20.  3270.  0.007    5.     5.  0.056    2.
          120.  3270.  0.007    50.    50.  0.041    20.
0 267 145  4  100.   972.  0.002   10.    10.  0.038    1.
          200.   972.  0.002    50.    50.  0.025    20.
0 268 120  4  100.  1610.  0.031   10.    10.  0.089    1.
          400.  1610.  0.031    50.    50.  0.065    20.
0 269 119  4   10.   730.  0.025   10.    10.  0.103    1.
          100.   730.  0.025    50.    50.  0.066    20.
0 270 181  4   20.  1456.  0.006    5.     5.  0.053    2.
          120.  1456.  0.006    50.    50.  0.039    20.
0 271 164  4   50.  1908.  0.002   10.    10.  0.035    2.
          150.  1908.  0.002    50.    50.  0.025    20.
0 273 100  4   20.   703.  0.002   10.    10.  0.041    2.
          120.   703.  0.002    50.    50.   0.03    20.
0 274 186  4   20.  1045.  0.001   10.    10.  0.027    2.
          120.  1045.  0.001    50.    50.   0.02    20.
0 275 186  4   20.  1420.  0.011   10.    10.  0.068    2.
          120.  1420.  0.011    50.    50.  0.049    20.
0 276 137  4   20.  2158.  0.006    4.     4.  0.047    5.
          120.  2158.  0.006    50.    50.  0.043    10.
0 277 144  4   17.   262.  0.008    3.     3.  0.044    1.
          120.   262.  0.008    50.    50.  0.048    10.
0 278 103  4   20.   708.  0.007    4.     4.  0.056    2.
          120.   708.  0.007    50.    50.  0.041    20.
0 279 315  4   20.  2452.  0.003   10.    10.  0.039    3.
          120.  2452.  0.003    25.    25.  0.029    20.
0 280 137  4   20.  1804.  0.003   10.    10.  0.039    3.
          120.  1804.  0.003    50.    50.   0.03    20.
0 281 133  4   20.  3622.  0.004   10.    10.  0.046    2.
          120.  3622.  0.004    50.    50.  0.033    20.
0 282 182  4   20.  2352.  0.006   10.    10.  0.054    2.
          120.  2352.  0.006    50.    50.  0.039    20.
0 283 159  4   20.  1995.  0.004   10.    10.  0.046    2.
          120.  1995.  0.004    50.    50.  0.033    20.
0 284 132  4   20.  3155.  0.006   10.    10.  0.054    2.
          120.  3155.  0.006    50.    50.  0.039    20.
0 285 102  4   35.   502.  0.001   10.    10.  0.027    2.
          135.   502.  0.001    50.    50.   0.02    20.
0 286 158  4   20.  1328.  0.004   10.    10.  0.060    2.
          120.  1328.  0.008    50.    50.  0.043    20.
0 287 109  5  5.0   344.  0.005    1.     1.  0.017   5.0
          120.   344.  0.004    20.    20.  0.037    20.
0 288 271  5  5.5   250.  0.011    0.     0.  0.013   5.5
          120.   250.  0.011    20.    20.  0.037    20.
0 296 316  4   80.  3500.  0.002    4.     4.  0.030   8.5
          120.  3500.  0.002    50.    50.  0.028    10.
0 297 298  2    5.   350.  0.005    0.     0.  0.013    5.
0 298 211  4   20.   440.  0.008   10.    10.  0.050    2.
          120.   440.  0.008    50.    50.  0.040    20.
0 299 302  4   20.  2854.  0.008   10.    10.  0.046    2.
          120.  2854.  0.004    50.    50.  0.033    20.
0 301 224  3   10.     1.    0.1            0.01     1.
0 302 233 11 2   0.1   500.  0.001            0.035    0.1
   0     0    0.21     5.   3.05    19.   12.65    40.
 30.14    66.    56.    92.   90.45   115.  131.74   131.
 176.83   145.  223.32   158.  270.77   171.
0 303 188  3   10.     1.    0.1            0.01     1.
0 304 296  3   10.     1.    0.1            0.01     1.
0 305 251  3   10.     1.    0.1            0.01     1.
0 306 140  3   10.     1.    0.1            0.01     1.
0 307 235  3   10.     1.    0.1            0.01     1.
0 308 114  3   10.     1.    0.1            0.01     1.
0 309 286  3   10.     1.    0.1            0.01     1.
0 310 234  3   10.     1.    0.1            0.01     1.
0 311 216  3   10.     1.    0.1            0.01     1.
0 315 115 12 2   0.1    10.    0.1                     0.1
   0.     0.    1.4    22.     9.   150.    25.1    402.
  50.2   822.   83.7  1393.  125.3  2079.  173.4  2853.
 226.4  3712.  272.1  4499.  283.8  4640.   342.  5520.
```

```
  0 316  143  5 2    0.1    10.    0.1                    0.1
     0.      0.    32.0     64.     64.     176.     96.0     344.
   103.5     542.    103.6    9999.
 401  131  231  3 3           1.
     0       0     528      528     900      528
    401  402   3           1.
    402  210   2    6.5  196   0.013      0      0  0.015    6.5
 403  140  200  3 3           1.
     0.      0.     560.     560.     900.     560.      0.      0.
  0  403  238   3           1.
  0  238  164   2    7.6   245.  0.005                0.013     8.
 -1  904  122  7 3    11.     1.    0.1               0.01    10.
     0.      0.    0.92      93.     1.75    1689.     2.92     831.
    4.08     540.    10.17     182.    16.00     132.

  0
  6
 100  104  110  141  115  122   0   0   0   0   0   0   0   0   0   0
ENDPROGRAM
```

5 YR FUTURE BASELINE CONDITION

```
  2  1  1  2
  3  4
WATERSHED   1
LOWER THIRD CREEK, 5 YR FUTURE CONDITION Baseline
KIOWA ENGINEERING CORPORATION revised 03/05
     192      5.0                                        1
      1  100
      2  135
      3  101
      4  100
      5  103
      6  123
      7  104
      8  104
      9  105
     10  124
     11  125
     12  106
     13  106
     14  157
     15  126
     16  108
     17  127
     18  128
     19  129
     20  130
     21  131
     22  109
     23  187
     24  134
     25  111
     26  133
     27  110
     28  112
     29  308
     30  158
     31  158
     32  158
     33  308
     34  159
     35  181
     36  159
     37  162
     38  162
     39  306
     40  115
     41  138
     42  182
     43  173
     44  160
     45  161
     46  139
     47  140
     48  141
     49  116
     50  116
     51  117
     52  118
     53  155
     54  154
     55  119
     56  118
     57  163
     58  163
     59  168
     60  169
     61  170
     62  142
     63  183
     64  316
     65  184
     66  144
     67  148
     68  148
     69  120
     70  120
     71  153
     72  156
     73  121
     74  165
     75  166
     76  303
     77  171
     78  304
     79  180
     80  150
     81  145
     82  145
     83  132
     84  132
     85  150
     86  150
     87  146
     88  174
     89  174
     90  174
     91  185
```

```
92 151
93 152
94 176
95 177
96 178
97 175
98 121

0 100  0  3  10.  1.  0.1          0.01  1.
0 101 285  3  10.  1.  0.1          0.01  1.
0 102 273  3  10.  1.  0.1          0.01  1.
0 103 203  3  10.  1.  0.1          0.01  1.
0 104 204  3  10.  1.  0.1          0.01  1.
0 105 205  3  10.  1.  0.1          0.01  1.
0 106 206  3  10.  1.  0.1          0.01  1.
0 107 207  3  10.  1.  0.1          0.01  1.
0 108 208  3  10.  1.  0.1          0.01  1.
0 109 209  3  10.  1.  0.1          0.01  1.
0 110 210  3  10.  1.  0.1          0.01  1.
0 111 211  3  10.  1.  0.1          0.01  1.
0 112 212  3  10.  1.  0.1          0.01  1.
0 113 213  3  10.  1.  0.1          0.01  1.
0 114 214  3  10.  1.  0.1          0.01  1.
0 115 215  3  10.  1.  0.1          0.01  1.
0 116 311  3  10.  1.  0.1          0.01  1.
0 117 217  3  10.  1.  0.1          0.01  1.
0 118 218  3  10.  1.  0.1          0.01  1.
0 119 280  3  10.  1.  0.1          0.01  1.
0 120 220  3  10.  1.  0.1          0.01  1.
0 121 221  3  10.  1.  0.1          0.01  1.
0 122 222  3  10.  1.  0.1          0.01  1.
0 123 278  3  10.  1.  0.1          0.01  1.
0 124 223  3  10.  1.  0.1          0.01  1.
0 125 274  3  10.  1.  0.1          0.01  1.
0 126 226  3  10.  1.  0.1          0.01  1.
0 127 228  3  10.  1.  0.1          0.01  1.
0 128 229  3  10.  1.  0.1          0.01  1.
0 129 227  3  10.  1.  0.1          0.01  1.
0 130 287  3  10.  1.  0.1          0.01  1.
0 132 304  3  10.  1.  0.1          0.01  1.
0 133 232  3  10.  1.  0.1          0.01  1.
0 134 281  3  10.  1.  0.1          0.01  1.
0 135 202  3  10.  1.  0.1          0.01  1.
0 136 288  3  10.  1.  0.1          0.01  1.
0 137 219  3  10.  1.  0.1          0.01  1.
0 138 236  3  10.  1.  0.1          0.01  1.
0 139 307  3  10.  1.  0.1          0.01  1.
0 141 200  3  10.  1.  0.1          0.01  1.
0 142 240  3  10.  1.  0.1          0.01  1.
0 143 237  3  10.  1.  0.1          0.01  1.
0 144 276  3  10.  1.  0.1          0.01  1.
0 145 266  3  10.  1.  0.1          0.01  1.
0 146 267  3  10.  1.  0.1          0.01  1.
0 147 230  3  10.  1.  0.1          0.01  1.
0 148 254  3  10.  1.  0.1          0.01  1.
0 149 255  3  10.  1.  0.1          0.01  1.
0 150 256  3  10.  1.  0.1          0.01  1.
0 151 257  3  10.  1.  0.1          0.01  1.
0 152 259  3  10.  1.  0.1          0.01  1.
0 153 264  3  10.  1.  0.1          0.01  1.
0 154 268  3  10.  1.  0.1          0.01  1.
0 155 269  3  10.  1.  0.1          0.01  1.
0 156 265  3  10.  1.  0.1          0.01  1.
0 157 275  3  10.  1.  0.1          0.01  1.
0 158 302  3  10.  1.  0.1          0.01  1.
0 159 309  3  10.  1.  0.1          0.01  1.
0 160 282  3  10.  1.  0.1          0.01  1.
0 161 310  3  10.  1.  0.1          0.01  1.
0 162 299  3  10.  1.  0.1          0.01  1.
0 163 244  3  10.  1.  0.1          0.01  1.
0 164 279  3  10.  1.  0.1          0.01  1.
0 165 245  3  10.  1.  0.1          0.01  1.
0 166 246  3  10.  1.  0.1          0.01  1.
0 167 250  3  10.  1.  0.1          0.01  1.
0 168 243  3  10.  1.  0.1          0.01  1.
0 169 242  3  10.  1.  0.1          0.01  1.
0 170 241  3  10.  1.  0.1          0.01  1.
0 171 248  3  10.  1.  0.1          0.01  1.
0 173 270  3  10.  1.  0.1          0.01  1.
0 174 305  3  10.  1.  0.1          0.01  1.
0 175 258  3  10.  1.  0.1          0.01  1.
0 176 252  3  10.  1.  0.1          0.01  1.
0 177 263  3  10.  1.  0.1          0.01  1.
0 178 262  3  10.  1.  0.1          0.01  1.
0 179 261  3  10.  1.  0.1          0.01  1.
0 180 260  3  10.  1.  0.1          0.01  1.
0 181 159  3  10.  1.  0.1          0.01  1.
0 182 283  3  10.  1.  0.1          0.01  1.
0 183 239  3  10.  1.  0.1          0.01  1.
0 184 277  3  10.  1.  0.1          0.01  1.
0 185 284  3  10.  1.  0.1          0.01  1.
0 186 225  3  10.  1.  0.1          0.01  1.
0 187 301  3  10.  1.  0.1          0.01  1.
0 188 247  3  10.  1.  0.1          0.01  1.
0 200 136  4  10.  964.  0.004  10.  10.  0.047  2.
           50.  964.  0.004  50.  50.  0.033  20.
0 202 101  4  20.  2327.  0.003  20.  20.  0.04  3.
           120.  2327.  0.003  50.  50.  0.03  20.
0 203 102  4  20.  1902.  0.004  20.  20.  0.044  3.
           120.  1902.  0.004  50.  50.  0.033  20.
0 204 103  4  20.  2673.  0.004  20.  20.  0.044  3.
           120.  2673.  0.004  50.  50.  0.033  20.
0 205 104  4  60.  1621.  0.003  4.  4.  0.037  3.
           160.  1621.  0.003  50.  50.  0.03  20.
0 206 105  4  50.  4148.  0.0034  4.  4.  0.039  3.
           150.  4148.  0.0034  50.  50.  0.031  20.
0 207 106  4  15.  717.  0.003  4.  4.  0.037  4.
           115.  717.  0.003  20.  20.  0.029  20.
0 208 107  4  20.  2763.  0.003  10.  10.  0.039  3.
           120.  2763.  0.003  40.  40.  0.03  20.
0 209 108  4  20.  3945.  0.003  4.  4.  0.036  5.
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0 210 109  4  20.  3217.  0.007  4.  4.  0.053  3.
           120.  3217.  0.007  50.  50.  0.041  20.
0 211 110  4  20.  1323.  0.008  4.  4.  0.056  3.
           120.  1323.  0.008  50.  50.  0.043  20.
0 212 111  4  50.  2426.  0.003  4.  4.  0.037  3.
           150.  2426.  0.003  50.  50.  0.03  20.
0 213 112  4  20.  2473.  0.005  4.  4.  0.046  3.
           120.  2473.  0.005  50.  50.  0.036  20.
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0 214 113  4   20.  443. 0.003   10.   10. 0.039   3.
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0 215 308  4   20. 1622. 0.003   10.   10. 0.039   3.
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0 216 164  4   20. 1324. 0.003   10.   10. 0.039   3.
           120. 1324. 0.003   25.   25. 0.029  20.
0 217 116  4   20. 3243. 0.005   10.   10. 0.047   3.
           120. 3243. 0.005   25.   25. 0.036  20.
0 218 117  4   20.  282. 0.003   10.   10. 0.039   3.
           120.  282. 0.003   25.   25. 0.029  20.
0 219 118  4   20. 2003. 0.003   10.   10. 0.039   3.
           120. 2003. 0.003   20.   20. 0.029  20.
0 220 147  4   20. 2196. 0.003    4.    4. 0.037   4.
           120. 2196. 0.003   20.   20. 0.029  20.
0 221 120  4   20. 5356. 0.001    4.    4. 0.024   5.
           120. 5356. 0.001   20.   20. 0.046  20.
0 222 121  4    8. 4084. 0.012    4.    4. 0.066   3.
            32. 4084. 0.012   20.   20. 0.071  20.
0 224 110  4   20. 2002. 0.003    4.    4. 0.04    2.
           120. 2002. 0.003   50.   50. 0.03   20.
0 223 105  4   20. 1141. 0.002   10.   10. 0.035   2.
           120. 1141. 0.002   50.   50. 0.025  20.
0 225 106  4   20. 2475. 0.001   10.   10. 0.027   2.
           120. 2475. 0.001   50.   50. 0.02   20.
0 226 107  4   10. 2015. 0.006    4.    4. 0.054   2.
           110. 2015. 0.006   50.   50. 0.039  20.
0 227 126  4   20. 2686. 0.0052  10.   10. 0.056   1.
           120. 2686. 0.0052  50.   50. 0.037  20.
0 228 108  4   10.  645. 0.016    4.    4. 0.078   2.
           110.  645. 0.016   50.   50. 0.056  20.
0 229 127  4   10.  838. 0.003    4.    4. 0.041   2.
           110.  838. 0.003   50.   50. 0.03   20.
0 230 119  4   20.  302. 0.003    4.    4. 0.037   4.
           120.  302. 0.003   20.   20. 0.029  20.
0 231 130  4   20. 2856. 0.004   10.   10. 0.046   2.
           120. 2856. 0.004   50.   50. 0.033  20.
0 232 111  4   20. 1120. 0.005   10.   10. 0.05    2.
           120. 1120. 0.005   50.   50. 0.036  20.
0 233 297  4   20. 2070. 0.008   10.   10. 0.060   2.
           120. 2070. 0.008   50.   50. 0.043  20.
0 234 173  4   20. 3316. 0.013   10.   10. 0.072   2.
           120. 3316. 0.013   50.   50. 0.052  20.
0 235 140  4   40. 1047. 0.019   10.   10. 0.09    1.
           120. 1047. 0.019   50.   50. 0.06   20.
0 236 116  4   50. 2857. 0.0035  10.   10. 0.047   1.
           200. 2857. 0.0035  50.   50. 0.031  20.
0 237 184  5    6.  183. 0.035    0.    0. 0.013   6.
           100. 1400. 0.005   50.   50. 0.051  20.
0 239 141  4   40. 2088. 0.0030  10.   10. 0.041   2.
           120. 2088. 0.0030  50.   50. 0.030  20.
0 240 140  4   20. 2733. 0.015    5.    5. 0.082   1.
           120. 2733. 0.015   50.   50. 0.055  20.
0 241 139  4   20. 2126. 0.009   10.   10. 0.069   1.
           120. 2126. 0.009   50.   50. 0.045  20.
0 242 168  4   20.  927. 0.013    5.    5. 0.071   2.
           120.  927. 0.013   50.   50. 0.052  20.
0 243 161  4   20. 1224. 0.002   10.   10. 0.035   2.
           120. 1224. 0.002   50.   50. 0.025  20.
0 244 160  4   20. 1747. 0.007   10.   10. 0.057   2.
           120. 1747. 0.007   50.   50. 0.041  20.
0 245 163  4   20. 2060. 0.006   10.   10. 0.054   2.
           120. 2060. 0.006   50.   50. 0.039  20.
0 246 165  4   20. 3293. 0.007   10.   10. 0.057   2.
           120. 3293. 0.007   50.   50. 0.041  20.
0 247 168  4   40. 1278. 0.02    10.   10. 0.083   2.
           120. 1278. 0.02    50.   50. 0.061  20.
0 248 170  4  100. 1834. 0.013   10.   10. 0.077   1.
           200. 1834. 0.013   50.   50. 0.051  20.
0 250 132  4  100. 2986. 0.008   10.   10. 0.064   1.
           200. 2986. 0.008   50.   50. 0.043  20.
0 251 167  4   20. 1081. 0.004   10.   10. 0.051   1.
           120. 1081. 0.004   50.   50. 0.033  20.
0 252 174  4   20. 2585. 0.005    5.    5. 0.049   2.
           120. 2585. 0.005   50.   50. 0.036  20.
0 254 147  4   20.  637. 0.003   10.   10. 0.045   1.
           120.  637. 0.003   50.   50. 0.03   20.
0 255 150  4   70. 1579. 0.004    5.    5. 0.049   1.
           200. 1579. 0.004   50.   50. 0.033  20.
0 256 145  4  100. 2710. 0.013   10.   10. 0.077   1.
           200. 2710. 0.013   50.   50. 0.051  20.
0 257 149  4  100. 1831. 0.014   10.   10. 0.079   1.
           200. 1831. 0.014   50.   50. 0.053  20.
0 258 151  4  100. 3598. 0.01    10.   10. 0.069   1.
           200. 3598. 0.01    50.   50. 0.047  20.
0 259 149  4  100. 1401. 0.012   10.   10. 0.074   1.
           200. 1401. 0.012   50.   50. 0.05   20.
0 260 150  4  100. 2084. 0.007   10.   10. 0.06    1.
           200. 2084. 0.007   50.   50. 0.041  20.
0 261 176  4   20. 1626. 0.009   10.   10. 0.063   2.
           120. 1626. 0.009   50.   50. 0.045  20.
0 262 179  4  100. 1461. 0.006   10.   10. 0.057   1.
           200. 1461. 0.006   50.   50. 0.038  20.
0 263 179  4  100. 1278. 0.007   10.   10. 0.06    1.
           200. 1278. 0.007   50.   50. 0.041  20.
0 264 121  4  100. 2606. 0.019    5.    5. 0.063   2.
           400. 2606. 0.019   50.   50. 0.045  20.
0 265 122  4   20. 1802. 0.024    4.    4. 0.089   2.
           120. 1802. 0.024   50.   50. 0.065  20.
0 266 148  4   20. 3270. 0.007    5.    5. 0.056   2.
           120. 3270. 0.007   50.   50. 0.041  20.
0 267 145  4  100.  972. 0.002   10.   10. 0.038   1.
           200.  972. 0.002   50.   50. 0.025  20.
0 268 120  4  100. 1610. 0.031   10.   10. 0.089   1.
           400. 1610. 0.031   50.   50. 0.065  20.
0 269 119  4   10.  730. 0.025   10.   10. 0.103   1.
           100.  730. 0.025   50.   50. 0.066  20.
0 270 181  4   20. 1456. 0.006    5.    5. 0.053   2.
           120. 1456. 0.006   50.   50. 0.039  20.
0 271 164  4   50. 1908. 0.002   10.   10. 0.035   2.
           150. 1908. 0.002   50.   50. 0.025  20.
0 273 100  4   20.  703. 0.002   10.   10. 0.041   2.
           120.  703. 0.002   50.   50. 0.03   20.
0 274 186  4   20. 1045. 0.001   10.   10. 0.027   2.
           120. 1045. 0.001   50.   50. 0.02   20.
0 275 186  4   20. 1420. 0.011   10.   10. 0.068   2.
           120. 1420. 0.011   50.   50. 0.049  20.
0 276 137  4   20. 2158. 0.006    4.    4. 0.047   5.
           120. 2158. 0.006   50.   50. 0.043  10.
0 277 144  4   17.  262. 0.008    3.    3. 0.044   1.
           120.  262. 0.008   50.   50. 0.048  10.
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0 278 103   4    20.   708.  0.007     4.     4.  0.056     2.
            120.   708.  0.007    50.    50.  0.041    20.
0 279 315   4    20.  2452.  0.003    10.    10.  0.039     3.
            120.  2452.  0.003    25.    25.  0.029    20.
0 280 137   4    20.  1804.  0.003    10.    10.  0.039     3.
            120.  1804.  0.003    50.    50.   0.03    20.
0 281 133   4    20.  3622.  0.004    10.    10.  0.046     2.
            120.  3622.  0.004    50.    50.  0.033    20.
0 282 182   4    20.  2352.  0.006    10.    10.  0.054     2.
            120.  2352.  0.006    50.    50.  0.039    20.
0 283 159   4    20.  1995.  0.004    10.    10.  0.046     2.
            120.  1995.  0.004    50.    50.  0.033    20.
0 284 132   4    20.  3155.  0.006    10.    10.  0.054     2.
            120.  3155.  0.006    50.    50.  0.039    20.
0 285 102   4    35.   502.  0.001    10.    10.  0.027     2.
            135.   502.  0.001    50.    50.   0.02    20.
0 286 158   4    20.  1328.  0.004    10.    10.  0.060     2.
            120.  1328.  0.008    50.    50.  0.043    20.
0 287 109   5   5.0   344.  0.005     1.     1.  0.017   5.0
            120.   344.  0.004    20.    20.  0.037    20.
0 288 271   5   5.5   250.  0.011     0.     0.  0.013   5.5
            120.   250.  0.011    20.    20.  0.037    20.
0 296 316   4    80.  3500.  0.002     4.     4.  0.030   8.5
            120.  3500.  0.002    50.    50.  0.028    10.
0 297 298   2     5.   350.  0.005     0.     0.  0.013     5.
0 298 211   4    20.   440.  0.008    10.    10.  0.050     2.
            120.   440.  0.008    50.    50.  0.040    20.
0 299 302   4    20.  2854.  0.008    10.    10.  0.046     2.
            120.  2854.  0.004    50.    50.  0.033    20.
0 301 224   3    10.     1.    0.1              0.01     1.
0 302 233 11 2    0.1   500.  0.001              0.035    0.1
    0     0    0.21     5.   3.05    19.   12.65    40.
 30.14    66.    56.    92.  90.45   115.  131.74   131.
 176.83   145.  223.32   158.  270.77   171.
0 303 188   3    10.     1.    0.1              0.01     1.
0 304 296   3    10.     1.    0.1              0.01     1.
0 305 251   3    10.     1.    0.1              0.01     1.
0 306 140   3    10.     1.    0.1              0.01     1.
0 307 235   3    10.     1.    0.1              0.01     1.
0 308 114   3    10.     1.    0.1              0.01     1.
0 309 286   3    10.     1.    0.1              0.01     1.
0 310 234   3    10.     1.    0.1              0.01     1.
0 311 216   3    10.     1.    0.1              0.01     1.
0 315 115 12 2    0.1    10.    0.1                       0.1
    0.     0.    1.4    22.     9.   150.    25.1   402.
   50.2   822.   83.7  1393.  125.3  2079.   173.4  2853.
  226.4  3712.  272.1  4499.  283.8  4640.   342.   5520.
0 316 143  5 2    0.1    10.    0.1                       0.1
    0.     0.   32.0    64.    64.   176.    96.0   344.
  103.5   542.  103.6  9999.
401 131 231 3 3            1.
    0     0    528    528    900    528
   401 402   3            1.
   402 210   2    6.5   196   0.013     0     0  0.015    6.5
403 140 200 3 3            1.
    0.     0.   560.   560.   900.   560.     0.     0.
 0 403 238   3            1.
 0 238 164   2    7.6   245.  0.005              0.013     8.
-1 904 122 6 3    10.     1.    0.1              0.01    10.
    0.     0.   1.00    90.   2.08  1030.    4.00   459.
    9.08   165.   16.0   120.

  0
  6
 100 104 110 141 115 122   0   0   0   0   0   0   0   0   0   0
ENDPROGRAM
```

2 YR FUTURE BASELINE CONDITION

```
  2  1  1  2
  3  4
WATERSHED   1
LOWER THIRD CREEK, 2 YR FUTURE CONDITION Baseline
KIOWA ENGINEERING CORPORATION revised 03/05
     192      5.0                                        1
      1  100
      2  135
      3  101
      4  100
      5  103
      6  123
      7  104
      8  104
      9  105
     10  124
     11  125
     12  106
     13  106
     14  157
     15  126
     16  108
     17  127
     18  128
     19  129
     20  130
     21  131
     22  109
     23  187
     24  134
     25  111
     26  133
     27  110
     28  112
     29  308
     30  158
     31  158
     32  158
     33  308
     34  159
     35  181
     36  159
     37  162
     38  162
     39  306
     40  115
     41  138
     42  182
     43  173
     44  160
     45  161
```

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46 139
47 140
48 141
49 116
50 116
51 117
52 118
53 155
54 154
55 119
56 118
57 163
58 163
59 168
60 169
61 170
62 142
63 183
64 316
65 184
66 144
67 148
68 148
69 120
70 120
71 153
72 156
73 121
74 165
75 166
76 303
77 171
78 304
79 180
80 150
81 145
82 145
83 132
84 132
85 150
86 150
87 146
88 174
89 174
90 174
91 185
92 151
93 152
94 176
95 177
96 178
97 175
98 121

0 100  0  3  10.  1.  0.1        0.01  1.
0 101 285  3  10.  1.  0.1        0.01  1.
0 102 273  3  10.  1.  0.1        0.01  1.
0 103 203  3  10.  1.  0.1        0.01  1.
0 104 204  3  10.  1.  0.1        0.01  1.
0 105 205  3  10.  1.  0.1        0.01  1.
0 106 206  3  10.  1.  0.1        0.01  1.
0 107 207  3  10.  1.  0.1        0.01  1.
0 108 208  3  10.  1.  0.1        0.01  1.
0 109 209  3  10.  1.  0.1        0.01  1.
0 110 210  3  10.  1.  0.1        0.01  1.
0 111 211  3  10.  1.  0.1        0.01  1.
0 112 212  3  10.  1.  0.1        0.01  1.
0 113 213  3  10.  1.  0.1        0.01  1.
0 114 214  3  10.  1.  0.1        0.01  1.
0 115 215  3  10.  1.  0.1        0.01  1.
0 116 311  3  10.  1.  0.1        0.01  1.
0 117 217  3  10.  1.  0.1        0.01  1.
0 118 218  3  10.  1.  0.1        0.01  1.
0 119 280  3  10.  1.  0.1        0.01  1.
0 120 220  3  10.  1.  0.1        0.01  1.
0 121 221  3  10.  1.  0.1        0.01  1.
0 122 222  3  10.  1.  0.1        0.01  1.
0 123 278  3  10.  1.  0.1        0.01  1.
0 124 223  3  10.  1.  0.1        0.01  1.
0 125 274  3  10.  1.  0.1        0.01  1.
0 126 226  3  10.  1.  0.1        0.01  1.
0 127 228  3  10.  1.  0.1        0.01  1.
0 128 229  3  10.  1.  0.1        0.01  1.
0 129 227  3  10.  1.  0.1        0.01  1.
0 130 287  3  10.  1.  0.1        0.01  1.
0 132 304  3  10.  1.  0.1        0.01  1.
0 133 232  3  10.  1.  0.1        0.01  1.
0 134 281  3  10.  1.  0.1        0.01  1.
0 135 202  3  10.  1.  0.1        0.01  1.
0 136 288  3  10.  1.  0.1        0.01  1.
0 137 219  3  10.  1.  0.1        0.01  1.
0 138 236  3  10.  1.  0.1        0.01  1.
0 139 307  3  10.  1.  0.1        0.01  1.
0 141 200  3  10.  1.  0.1        0.01  1.
0 142 240  3  10.  1.  0.1        0.01  1.
0 143 237  3  10.  1.  0.1        0.01  1.
0 144 276  3  10.  1.  0.1        0.01  1.
0 145 266  3  10.  1.  0.1        0.01  1.
0 146 267  3  10.  1.  0.1        0.01  1.
0 147 230  3  10.  1.  0.1        0.01  1.
0 148 254  3  10.  1.  0.1        0.01  1.
0 149 255  3  10.  1.  0.1        0.01  1.
0 150 256  3  10.  1.  0.1        0.01  1.
0 151 257  3  10.  1.  0.1        0.01  1.
0 152 259  3  10.  1.  0.1        0.01  1.
0 153 264  3  10.  1.  0.1        0.01  1.
0 154 268  3  10.  1.  0.1        0.01  1.
0 155 269  3  10.  1.  0.1        0.01  1.
0 156 265  3  10.  1.  0.1        0.01  1.
0 157 275  3  10.  1.  0.1        0.01  1.
0 158 302  3  10.  1.  0.1        0.01  1.
0 159 309  3  10.  1.  0.1        0.01  1.
0 160 282  3  10.  1.  0.1        0.01  1.
0 161 310  3  10.  1.  0.1        0.01  1.
0 162 299  3  10.  1.  0.1        0.01  1.
0 163 244  3  10.  1.  0.1        0.01  1.
0 164 279  3  10.  1.  0.1        0.01  1.
0 165 245  3  10.  1.  0.1        0.01  1.
0 166 246  3  10.  1.  0.1        0.01  1.
0 167 250  3  10.  1.  0.1        0.01  1.
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0 168 243  3   10.   1.   0.1          0.01    1.
0 169 242  3   10.   1.   0.1          0.01    1.
0 170 241  3   10.   1.   0.1          0.01    1.
0 171 248  3   10.   1.   0.1          0.01    1.
0 173 270  3   10.   1.   0.1          0.01    1.
0 174 305  3   10.   1.   0.1          0.01    1.
0 175 258  3   10.   1.   0.1          0.01    1.
0 176 252  3   10.   1.   0.1          0.01    1.
0 177 263  3   10.   1.   0.1          0.01    1.
0 178 262  3   10.   1.   0.1          0.01    1.
0 179 261  3   10.   1.   0.1          0.01    1.
0 180 260  3   10.   1.   0.1          0.01    1.
0 181 159  3   10.   1.   0.1          0.01    1.
0 182 283  3   10.   1.   0.1          0.01    1.
0 183 239  3   10.   1.   0.1          0.01    1.
0 184 277  3   10.   1.   0.1          0.01    1.
0 185 284  3   10.   1.   0.1          0.01    1.
0 186 225  3   10.   1.   0.1          0.01    1.
0 187 301  3   10.   1.   0.1          0.01    1.
0 188 247  3   10.   1.   0.1          0.01    1.
0 200 136  4   10.  964. 0.004   10.   10. 0.047    2.
           50.  964. 0.004   50.   50. 0.033   20.
0 202 101  4   20. 2327. 0.003   20.   20.  0.04    3.
          120. 2327. 0.003   50.   50.  0.03   20.
0 203 102  4   20. 1902. 0.004   20.   20. 0.044    3.
          120. 1902. 0.004   50.   50. 0.033   20.
0 204 103  4   20. 2673. 0.004   20.   20. 0.044    3.
          120. 2673. 0.004   50.   50. 0.033   20.
0 205 104  4   60. 1621. 0.003    4.    4. 0.037    3.
          160. 1621. 0.003   50.   50.  0.03   20.
0 206 105  4   50. 4148. 0.0034   4.    4. 0.039    3.
          150. 4148. 0.0034  50.   50. 0.031   20.
0 207 106  4   15.  717. 0.003    4.    4. 0.037    4.
          115.  717. 0.003   20.   20. 0.029   20.
0 208 107  4   20. 2763. 0.003   10.   10. 0.039    3.
          120. 2763. 0.003   40.   40.  0.03   20.
0 209 108  4   20. 3945. 0.003    4.    4. 0.036    5.
          120. 3945. 0.003   40.   40.  0.03   20.
0 210 109  4   20. 3217. 0.007    4.    4. 0.053    3.
          120. 3217. 0.007   50.   50. 0.041   20.
0 211 110  4   20. 1323. 0.008    4.    4. 0.056    3.
          120. 1323. 0.008   50.   50. 0.043   20.
0 212 111  4   50. 2426. 0.003    4.    4. 0.037    3.
          150. 2426. 0.003   50.   50.  0.03   20.
0 213 112  4   20. 2473. 0.005    4.    4. 0.046    3.
          120. 2473. 0.005   50.   50. 0.036   20.
0 214 113  4   20.  443. 0.003   10.   10. 0.039    3.
          120.  443. 0.003   25.   25. 0.029   20.
0 215 308  4   20. 1622. 0.003   10.   10. 0.039    3.
          120. 1622. 0.003   25.   25. 0.028   25.
0 216 164  4   20. 1324. 0.003   10.   10. 0.039    3.
          120. 1324. 0.003   25.   25. 0.029   20.
0 217 116  4   20. 3243. 0.005   10.   10. 0.047    3.
          120. 3243. 0.005   25.   25. 0.036   20.
0 218 117  4   20.  282. 0.003   10.   10. 0.039    3.
          120.  282. 0.003   25.   25. 0.029   20.
0 219 118  4   20. 2003. 0.003   10.   10. 0.039    3.
          120. 2003. 0.003   20.   20. 0.029   20.
0 220 147  4   20. 2196. 0.003    4.    4. 0.037    4.
          120. 2196. 0.003   20.   20. 0.029   20.
0 221 120  4   20. 5356. 0.001    4.    4. 0.024    5.
          120. 5356. 0.001   20.   20. 0.046   20.
0 222 121  4    8. 4084. 0.012    4.    4. 0.066    3.
           32. 4084. 0.012   20.   20. 0.071   20.
0 224 110  4   20. 2002. 0.003    4.    4.  0.04    2.
          120. 2002. 0.003   50.   50.  0.03   20.
0 223 105  4   20. 1141. 0.002   10.   10. 0.035    2.
          120. 1141. 0.002   50.   50. 0.025   20.
0 225 106  4   20. 2475. 0.001   10.   10. 0.027    2.
          120. 2475. 0.001   50.   50.  0.02   20.
0 226 107  4   10. 2015. 0.006    4.    4. 0.054    2.
          110. 2015. 0.006   50.   50. 0.039   20.
0 227 126  4   20. 2686. 0.0052  10.   10. 0.056    1.
          120. 2686. 0.0052  50.   50. 0.037   20.
0 228 108  4   10.  645. 0.016    4.    4. 0.078    2.
          110.  645. 0.016   50.   50. 0.056   20.
0 229 127  4   10.  838. 0.003    4.    4. 0.041    2.
          110.  838. 0.003   50.   50.  0.03   20.
0 230 119  4   20.  302. 0.003    4.    4. 0.037    4.
          120.  302. 0.003   20.   20. 0.029   20.
0 231 130  4   20. 2856. 0.004   10.   10. 0.046    2.
          120. 2856. 0.004   50.   50. 0.033   20.
0 232 111  4   20. 1120. 0.005   10.   10.  0.05    2.
          120. 1120. 0.005   50.   50. 0.036   20.
0 233 297  4   20. 2070. 0.008   10.   10. 0.060    2.
          120. 2070. 0.008   50.   50. 0.043   20.
0 234 173  4   20. 3316. 0.013   10.   10. 0.072    2.
          120. 3316. 0.013   50.   50. 0.052   20.
0 235 140  4   40. 1047. 0.019   10.   10.  0.09    1.
          120. 1047. 0.019   50.   50.  0.06   20.
0 236 116  4   50. 2857. 0.0035  10.   10. 0.047    1.
          200. 2857. 0.0035  50.   50. 0.031   20.
0 237 184  5    6.  183. 0.035    0.    0. 0.013    6.
          100. 1400. 0.005   50.   50. 0.051   20.
0 239 141  4   40. 2088. 0.0030  10.   10. 0.041    2.
          120. 2088. 0.0030  50.   50. 0.030   20.
0 240 140  4   20. 2733. 0.015    5.    5. 0.082    1.
          120. 2733. 0.015   50.   50. 0.055   20.
0 241 139  4   20. 2126. 0.009   10.   10. 0.069    1.
          120. 2126. 0.009   50.   50. 0.045   20.
0 242 168  4   20.  927. 0.013    5.    5. 0.071    2.
          120.  927. 0.013   50.   50. 0.052   20.
0 243 161  4   20. 1224. 0.002   10.   10. 0.035    2.
          120. 1224. 0.002   50.   50. 0.025   20.
0 244 160  4   20. 1747. 0.007   10.   10. 0.057    2.
          120. 1747. 0.007   50.   50. 0.041   20.
0 245 163  4   20. 2060. 0.006   10.   10. 0.054    2.
          120. 2060. 0.006   50.   50. 0.039   20.
0 246 165  4   20. 3293. 0.007   10.   10. 0.057    2.
          120. 3293. 0.007   50.   50. 0.041   20.
0 247 168  4   40. 1278.  0.02   10.   10. 0.083    2.
          120. 1278.  0.02   50.   50. 0.061   20.
0 248 170  4  100. 1834. 0.013   10.   10. 0.077    1.
          200. 1834. 0.013   50.   50. 0.051   20.
0 250 132  4  100. 2986. 0.008   10.   10. 0.064    1.
          200. 2986. 0.008   50.   50. 0.043   20.
0 251 167  4   20. 1081. 0.004   10.   10. 0.051    1.
          120. 1081. 0.004   50.   50. 0.033   20.
0 252 174  4   20. 2585. 0.005    5.    5. 0.049    2.
          120. 2585. 0.005   50.   50. 0.036   20.
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0 254 147  4   20.  637.  0.003   10.   10.  0.045    1.
           120.  637.  0.003   50.   50.  0.03   20.
0 255 150  4   70.  1579.  0.004   5.   5.  0.049    1.
           200.  1579.  0.004   50.   50.  0.033   20.
0 256 145  4  100.  2710.  0.013   10.   10.  0.077    1.
           200.  2710.  0.013   50.   50.  0.051   20.
0 257 149  4  100.  1831.  0.014   10.   10.  0.079    1.
           200.  1831.  0.014   50.   50.  0.053   20.
0 258 151  4  100.  3598.  0.01   10.   10.  0.069    1.
           200.  3598.  0.01   50.   50.  0.047   20.
0 259 149  4  100.  1401.  0.012   10.   10.  0.074    1.
           200.  1401.  0.012   50.   50.  0.05   20.
0 260 150  4  100.  2084.  0.007   10.   10.  0.06    1.
           200.  2084.  0.007   50.   50.  0.041   20.
0 261 176  4   20.  1626.  0.009   10.   10.  0.063    2.
           120.  1626.  0.009   50.   50.  0.045   20.
0 262 179  4  100.  1461.  0.006   10.   10.  0.057    1.
           200.  1461.  0.006   50.   50.  0.038   20.
0 263 179  4  100.  1278.  0.007   10.   10.  0.06    1.
           200.  1278.  0.007   50.   50.  0.041   20.
0 264 121  4  100.  2606.  0.019   5.   5.  0.063    2.
           400.  2606.  0.019   50.   50.  0.045   20.
0 265 122  4   20.  1802.  0.024   4.   4.  0.089    2.
           120.  1802.  0.024   50.   50.  0.065   20.
0 266 148  4   20.  3270.  0.007   5.   5.  0.056    2.
           120.  3270.  0.007   50.   50.  0.041   20.
0 267 145  4  100.  972.  0.002   10.   10.  0.038    1.
           200.  972.  0.002   50.   50.  0.025   20.
0 268 120  4  100.  1610.  0.031   10.   10.  0.089    1.
           400.  1610.  0.031   50.   50.  0.065   20.
0 269 119  4   10.  730.  0.025   10.   10.  0.103    1.
           100.  730.  0.025   50.   50.  0.066   20.
0 270 181  4   20.  1456.  0.006   5.   5.  0.053    2.
           120.  1456.  0.006   50.   50.  0.039   20.
0 271 164  4   50.  1908.  0.002   10.   10.  0.035    2.
           150.  1908.  0.002   50.   50.  0.025   20.
0 273 100  4   20.  703.  0.002   10.   10.  0.041    2.
           120.  703.  0.002   50.   50.  0.03   20.
0 274 186  4   20.  1045.  0.001   10.   10.  0.027    2.
           120.  1045.  0.001   50.   50.  0.02   20.
0 275 186  4   20.  1420.  0.011   10.   10.  0.068    2.
           120.  1420.  0.011   50.   50.  0.049   20.
0 276 137  4   20.  2158.  0.006   4.   4.  0.047    5.
           120.  2158.  0.006   50.   50.  0.043   10.
0 277 144  4   17.  262.  0.008   3.   3.  0.044    1.
           120.  262.  0.008   50.   50.  0.048   10.
0 278 103  4   20.  708.  0.007   4.   4.  0.056    2.
           120.  708.  0.007   50.   50.  0.041   20.
0 279 315  4   20.  2452.  0.003   10.   10.  0.039    3.
           120.  2452.  0.003   25.   25.  0.029   20.
0 280 137  4   20.  1804.  0.003   10.   10.  0.039    3.
           120.  1804.  0.003   50.   50.  0.03   20.
0 281 133  4   20.  3622.  0.004   10.   10.  0.046    2.
           120.  3622.  0.004   50.   50.  0.033   20.
0 282 182  4   20.  2352.  0.006   10.   10.  0.054    2.
           120.  2352.  0.006   50.   50.  0.039   20.
0 283 159  4   20.  1995.  0.004   10.   10.  0.046    2.
           120.  1995.  0.004   50.   50.  0.033   20.
0 284 132  4   20.  3155.  0.006   10.   10.  0.054    2.
           120.  3155.  0.006   50.   50.  0.039   20.
0 285 102  4   35.  502.  0.001   10.   10.  0.027    2.
           135.  502.  0.001   50.   50.  0.02   20.
0 286 158  4   20.  1328.  0.004   10.   10.  0.060    2.
           120.  1328.  0.008   50.   50.  0.043   20.
0 287 109  5   5.0  344.  0.005   1.   1.  0.017   5.0
           120.  344.  0.004   20.   20.  0.037   20.
0 288 271  5   5.5  250.  0.011   0.   0.  0.013   5.5
           120.  250.  0.011   20.   20.  0.037   20.
0 296 316  4   80.  3500.  0.002   4.   4.  0.030   8.5
           120.  3500.  0.002   50.   50.  0.028   10.
0 297 298  2   5.  350.  0.005   0.   0.  0.013   5.
0 298 211  4   20.  440.  0.008   10.   10.  0.050    2.
           120.  440.  0.008   50.   50.  0.040   20.
0 299 302  4   20.  2854.  0.008   10.   10.  0.046    2.
           120.  2854.  0.004   50.   50.  0.033   20.
0 301 224  3   10.   1.   0.1          0.01   1.
0 302 233 11 2   0.1   500.  0.001          0.035   0.1
   0     0   0.21     5.   3.05    19.   12.65    40.
 30.14    66.    56.    92.   90.45    115.   131.74    131.
176.83    145.   223.32    158.   270.77    171.
0 303 188  3   10.   1.   0.1          0.01   1.
0 304 296  3   10.   1.   0.1          0.01   1.
0 305 251  3   10.   1.   0.1          0.01   1.
0 306 140  3   10.   1.   0.1          0.01   1.
0 307 235  3   10.   1.   0.1          0.01   1.
0 308 114  3   10.   1.   0.1          0.01   1.
0 309 286  3   10.   1.   0.1          0.01   1.
0 310 234  3   10.   1.   0.1          0.01   1.
0 311 216  3   10.   1.   0.1          0.01   1.
0 315 115 12 2   0.1   10.   0.1                 0.1
   0.     0.    1.4    22.    9.    150.    25.1    402.
  50.2    822.    83.7    1393.    125.3    2079.    173.4    2853.
 226.4    3712.    272.1    4499.    283.8    4640.    342.    5520.
 0 316  143  5 2   0.1   10.   0.1                 0.1
   0.     0.    32.0    64.    64.    176.    96.0    344.
  103.5    542.    103.6    9999.
401  131  231  3 3          1.
   0     0    528    528    900    528
  401  402   3          1.
  402  210   2   6.5  196   0.013     0     0  0.015   6.5
403  140  200  3 3          1.
   0.     0.    560.    560.    900.    560.     0.     0.
 0 403  238   3          1.
 0 238  164   2   7.6  245.  0.005          0.013   8.
-1  904  122  8 3   10.   1.   0.1          0.01   10.
   0.     0.    .33    4.    0.92    75.    1.75    92.
  2.83    321.    3.33    326.    8.25    132.    16.0    91.

 0
 6
 100  104  110  141  115  122   0   0   0   0   0   0   0   0   0   0
ENDPROGRAM
```

0.4in FUTURE CONDITION Baseline

```
 2  1  1  2
 3  4
WATERSHED   1
LOWER THIRD CREEK, 0.4in STORM FUTURE CONDITION Baseline
KIOWA ENGINEERING CORPORATION revised 03/05
    192      5.0                                   1
      1  100
      2  135
      3  101
      4  100
      5  103
      6  123
      7  104
      8  104
      9  105
     10  124
     11  125
     12  106
     13  106
     14  157
     15  126
     16  108
     17  127
     18  128
     19  129
     20  130
     21  131
     22  109
     23  187
     24  134
     25  111
     26  133
     27  110
     28  112
     29  308
     30  158
     31  158
     32  158
     33  308
     34  159
     35  181
     36  159
     37  162
     38  162
     39  306
     40  115
     41  138
     42  182
     43  173
     44  160
     45  161
     46  139
     47  140
     48  141
     49  116
     50  116
     51  117
     52  118
     53  155
     54  154
     55  119
     56  118
     57  163
     58  163
     59  168
     60  169
     61  170
     62  142
     63  183
     64  316
     65  184
     66  144
     67  148
     68  148
     69  120
     70  120
     71  153
     72  156
     73  121
     74  165
     75  166
     76  303
     77  171
     78  304
     79  180
     80  150
     81  145
     82  145
     83  132
     84  132
     85  150
     86  150
     87  146
     88  174
     89  174
     90  174
     91  185
     92  151
     93  152
     94  176
     95  177
     96  178
     97  175
     98  121

  0  100   0   3    10.    1.    0.1          0.01    1.
  0  101  285   3    10.    1.    0.1          0.01    1.
  0  102  273   3    10.    1.    0.1          0.01    1.
  0  103  203   3    10.    1.    0.1          0.01    1.
  0  104  204   3    10.    1.    0.1          0.01    1.
  0  105  205   3    10.    1.    0.1          0.01    1.
  0  106  206   3    10.    1.    0.1          0.01    1.
  0  107  207   3    10.    1.    0.1          0.01    1.
  0  108  208   3    10.    1.    0.1          0.01    1.
  0  109  209   3    10.    1.    0.1          0.01    1.
  0  110  210   3    10.    1.    0.1          0.01    1.
  0  111  211   3    10.    1.    0.1          0.01    1.
```

```
0 112 212  3  10.  1.  0.1          0.01  1.
0 113 213  3  10.  1.  0.1          0.01  1.
0 114 214  3  10.  1.  0.1          0.01  1.
0 115 215  3  10.  1.  0.1          0.01  1.
0 116 311  3  10.  1.  0.1          0.01  1.
0 117 217  3  10.  1.  0.1          0.01  1.
0 118 218  3  10.  1.  0.1          0.01  1.
0 119 280  3  10.  1.  0.1          0.01  1.
0 120 220  3  10.  1.  0.1          0.01  1.
0 121 221  3  10.  1.  0.1          0.01  1.
0 122 222  3  10.  1.  0.1          0.01  1.
0 123 278  3  10.  1.  0.1          0.01  1.
0 124 223  3  10.  1.  0.1          0.01  1.
0 125 274  3  10.  1.  0.1          0.01  1.
0 126 226  3  10.  1.  0.1          0.01  1.
0 127 228  3  10.  1.  0.1          0.01  1.
0 128 229  3  10.  1.  0.1          0.01  1.
0 129 227  3  10.  1.  0.1          0.01  1.
0 130 287  3  10.  1.  0.1          0.01  1.
0 132 304  3  10.  1.  0.1          0.01  1.
0 133 232  3  10.  1.  0.1          0.01  1.
0 134 281  3  10.  1.  0.1          0.01  1.
0 135 202  3  10.  1.  0.1          0.01  1.
0 136 288  3  10.  1.  0.1          0.01  1.
0 137 219  3  10.  1.  0.1          0.01  1.
0 138 236  3  10.  1.  0.1          0.01  1.
0 139 307  3  10.  1.  0.1          0.01  1.
0 141 200  3  10.  1.  0.1          0.01  1.
0 142 240  3  10.  1.  0.1          0.01  1.
0 143 237  3  10.  1.  0.1          0.01  1.
0 144 276  3  10.  1.  0.1          0.01  1.
0 145 266  3  10.  1.  0.1          0.01  1.
0 146 267  3  10.  1.  0.1          0.01  1.
0 147 230  3  10.  1.  0.1          0.01  1.
0 148 254  3  10.  1.  0.1          0.01  1.
0 149 255  3  10.  1.  0.1          0.01  1.
0 150 256  3  10.  1.  0.1          0.01  1.
0 151 257  3  10.  1.  0.1          0.01  1.
0 152 259  3  10.  1.  0.1          0.01  1.
0 153 264  3  10.  1.  0.1          0.01  1.
0 154 268  3  10.  1.  0.1          0.01  1.
0 155 269  3  10.  1.  0.1          0.01  1.
0 156 265  3  10.  1.  0.1          0.01  1.
0 157 275  3  10.  1.  0.1          0.01  1.
0 158 302  3  10.  1.  0.1          0.01  1.
0 159 309  3  10.  1.  0.1          0.01  1.
0 160 282  3  10.  1.  0.1          0.01  1.
0 161 310  3  10.  1.  0.1          0.01  1.
0 162 299  3  10.  1.  0.1          0.01  1.
0 163 244  3  10.  1.  0.1          0.01  1.
0 164 279  3  10.  1.  0.1          0.01  1.
0 165 245  3  10.  1.  0.1          0.01  1.
0 166 246  3  10.  1.  0.1          0.01  1.
0 167 250  3  10.  1.  0.1          0.01  1.
0 168 243  3  10.  1.  0.1          0.01  1.
0 169 242  3  10.  1.  0.1          0.01  1.
0 170 241  3  10.  1.  0.1          0.01  1.
0 171 248  3  10.  1.  0.1          0.01  1.
0 173 270  3  10.  1.  0.1          0.01  1.
0 174 305  3  10.  1.  0.1          0.01  1.
0 175 258  3  10.  1.  0.1          0.01  1.
0 176 252  3  10.  1.  0.1          0.01  1.
0 177 263  3  10.  1.  0.1          0.01  1.
0 178 262  3  10.  1.  0.1          0.01  1.
0 179 261  3  10.  1.  0.1          0.01  1.
0 180 260  3  10.  1.  0.1          0.01  1.
0 181 159  3  10.  1.  0.1          0.01  1.
0 182 283  3  10.  1.  0.1          0.01  1.
0 183 239  3  10.  1.  0.1          0.01  1.
0 184 277  3  10.  1.  0.1          0.01  1.
0 185 284  3  10.  1.  0.1          0.01  1.
0 186 225  3  10.  1.  0.1          0.01  1.
0 187 301  3  10.  1.  0.1          0.01  1.
0 188 247  3  10.  1.  0.1          0.01  1.
0 200 136  4  10.  964.  0.004   10.   10.  0.047   2.
           50.  964.  0.004   50.   50.  0.033   20.
0 202 101  4  20.  2327.  0.003   20.   20.  0.04   3.
           120.  2327.  0.003   50.   50.  0.03   20.
0 203 102  4  20.  1902.  0.004   20.   20.  0.044   3.
           120.  1902.  0.004   50.   50.  0.033   20.
0 204 103  4  20.  2673.  0.004   20.   20.  0.044   3.
           120.  2673.  0.004   50.   50.  0.033   20.
0 205 104  4  60.  1621.  0.003   4.   4.  0.037   3.
           160.  1621.  0.003   50.   50.  0.03   20.
0 206 105  4  50.  4148.  0.0034   4.   4.  0.039   3.
           150.  4148.  0.0034   50.   50.  0.031   20.
0 207 106  4  15.  717.  0.003   4.   4.  0.037   4.
           115.  717.  0.003   20.   20.  0.029   20.
0 208 107  4  20.  2763.  0.003   10.   10.  0.039   3.
           120.  2763.  0.003   40.   40.  0.03   20.
0 209 108  4  20.  3945.  0.003   4.   4.  0.036   5.
           120.  3945.  0.003   40.   40.  0.03   20.
0 210 109  4  20.  3217.  0.007   4.   4.  0.053   3.
           120.  3217.  0.007   50.   50.  0.041   20.
0 211 110  4  20.  1323.  0.008   4.   4.  0.056   3.
           120.  1323.  0.008   50.   50.  0.043   20.
0 212 111  4  50.  2426.  0.003   4.   4.  0.037   3.
           150.  2426.  0.003   50.   50.  0.03   20.
0 213 112  4  20.  2473.  0.005   4.   4.  0.046   3.
           120.  2473.  0.005   50.   50.  0.036   20.
0 214 113  4  20.  443.  0.003   10.   10.  0.039   3.
           120.  443.  0.003   25.   25.  0.029   20.
0 215 308  4  20.  1622.  0.003   10.   10.  0.039   3.
           120.  1622.  0.003   25.   25.  0.028   25.
0 216 164  4  20.  1324.  0.003   10.   10.  0.039   3.
           120.  1324.  0.003   25.   25.  0.029   20.
0 217 116  4  20.  3243.  0.005   10.   10.  0.047   3.
           120.  3243.  0.005   25.   25.  0.036   20.
0 218 117  4  20.  282.  0.003   10.   10.  0.039   3.
           120.  282.  0.003   25.   25.  0.029   20.
0 219 118  4  20.  2003.  0.003   10.   10.  0.039   3.
           120.  2003.  0.003   20.   20.  0.029   20.
0 220 147  4  20.  2196.  0.003   4.   4.  0.037   4.
           120.  2196.  0.003   20.   20.  0.029   20.
0 221 120  4  20.  5356.  0.001   4.   4.  0.024   5.
           120.  5356.  0.001   20.   20.  0.046   20.
0 222 121  4  8.  4084.  0.012   4.   4.  0.066   3.
           32.  4084.  0.012   20.   20.  0.071   20.
0 224 110  4  20.  2002.  0.003   4.   4.  0.04   2.
           120.  2002.  0.003   50.   50.  0.03   20.
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0 223 105  4   20.  1141.  0.002   10.   10.  0.035   2.
           120.  1141.  0.002   50.   50.  0.025  20.
0 225 106  4   20.  2475.  0.001   10.   10.  0.027   2.
           120.  2475.  0.001   50.   50.   0.02  20.
0 226 107  4   10.  2015.  0.006    4.    4.  0.054   2.
           110.  2015.  0.006   50.   50.  0.039  20.
0 227 126  4   20.  2686. 0.0052   10.   10.  0.056   1.
           120.  2686. 0.0052   50.   50.  0.037  20.
0 228 108  4   10.   645.  0.016    4.    4.  0.078   2.
           110.   645.  0.016   50.   50.  0.056  20.
0 229 127  4   10.   838.  0.003    4.    4.  0.041   2.
           110.   838.  0.003   50.   50.   0.03  20.
0 230 119  4   20.   302.  0.003    4.    4.  0.037   4.
           120.   302.  0.003   20.   20.  0.029  20.
0 231 130  4   20.  2856.  0.004   10.   10.  0.046   2.
           120.  2856.  0.004   50.   50.  0.033  20.
0 232 111  4   20.  1120.  0.005   10.   10.   0.05   2.
           120.  1120.  0.005   50.   50.  0.036  20.
0 233 297  4   20.  2070.  0.008   10.   10.  0.060   2.
           120.  2070.  0.008   50.   50.  0.043  20.
0 234 173  4   20.  3316.  0.013   10.   10.  0.072   2.
           120.  3316.  0.013   50.   50.  0.052  20.
0 235 140  4   40.  1047.  0.019   10.   10.   0.09   1.
           120.  1047.  0.019   50.   50.   0.06  20.
0 236 116  4   50.  2857. 0.0035   10.   10.  0.047   1.
           200.  2857. 0.0035   50.   50.  0.031  20.
0 237 184  5    6.   183.  0.035    0.    0.  0.013   6.
           100.  1400.  0.005   50.   50.  0.051  20.
0 239 141  4   40.  2088. 0.0030   10.   10.  0.041   2.
           120.  2088. 0.0030   50.   50.  0.030  20.
0 240 140  4   20.  2733.  0.015    5.    5.  0.082   1.
           120.  2733.  0.015   50.   50.  0.055  20.
0 241 139  4   20.  2126.  0.009   10.   10.  0.069   1.
           120.  2126.  0.009   50.   50.  0.045  20.
0 242 168  4   20.   927.  0.013    5.    5.  0.071   2.
           120.   927.  0.013   50.   50.  0.052  20.
0 243 161  4   20.  1224.  0.002   10.   10.  0.035   2.
           120.  1224.  0.002   50.   50.  0.025  20.
0 244 160  4   20.  1747.  0.007   10.   10.  0.057   2.
           120.  1747.  0.007   50.   50.  0.041  20.
0 245 163  4   20.  2060.  0.006   10.   10.  0.054   2.
           120.  2060.  0.006   50.   50.  0.039  20.
0 246 165  4   20.  3293.  0.007   10.   10.  0.057   2.
           120.  3293.  0.007   50.   50.  0.041  20.
0 247 168  4   40.  1278.   0.02   10.   10.  0.083   2.
           120.  1278.   0.02   50.   50.  0.061  20.
0 248 170  4  100.  1834.  0.013   10.   10.  0.077   1.
           200.  1834.  0.013   50.   50.  0.051  20.
0 250 132  4  100.  2986.  0.008   10.   10.  0.064   1.
           200.  2986.  0.008   50.   50.  0.043  20.
0 251 167  4   20.  1081.  0.004   10.   10.  0.051   1.
           120.  1081.  0.004   50.   50.  0.033  20.
0 252 174  4   20.  2585.  0.005    5.    5.  0.049   2.
           120.  2585.  0.005   50.   50.  0.036  20.
0 254 147  4   20.   637.  0.003   10.   10.  0.045   1.
           120.   637.  0.003   50.   50.   0.03  20.
0 255 150  4   70.  1579.  0.004    5.    5.  0.049   1.
           200.  1579.  0.004   50.   50.  0.033  20.
0 256 145  4  100.  2710.  0.013   10.   10.  0.077   1.
           200.  2710.  0.013   50.   50.  0.051  20.
0 257 149  4  100.  1831.  0.014   10.   10.  0.079   1.
           200.  1831.  0.014   50.   50.  0.053  20.
0 258 151  4  100.  3598.   0.01   10.   10.  0.069   1.
           200.  3598.   0.01   50.   50.  0.047  20.
0 259 149  4  100.  1401.  0.012   10.   10.  0.074   1.
           200.  1401.  0.012   50.   50.   0.05  20.
0 260 150  4  100.  2084.  0.007   10.   10.   0.06   1.
           200.  2084.  0.007   50.   50.  0.041  20.
0 261 176  4   20.  1626.  0.009   10.   10.  0.063   2.
           120.  1626.  0.009   50.   50.  0.045  20.
0 262 179  4  100.  1461.  0.006   10.   10.  0.057   1.
           200.  1461.  0.006   50.   50.  0.038  20.
0 263 179  4  100.  1278.  0.007   10.   10.   0.06   1.
           200.  1278.  0.007   50.   50.  0.041  20.
0 264 121  4  100.  2606.  0.019    5.    5.  0.063   2.
           400.  2606.  0.019   50.   50.  0.045  20.
0 265 122  4   20.  1802.  0.024    4.    4.  0.089   2.
           120.  1802.  0.024   50.   50.  0.065  20.
0 266 148  4   20.  3270.  0.007    5.    5.  0.056   2.
           120.  3270.  0.007   50.   50.  0.041  20.
0 267 145  4  100.   972.  0.002   10.   10.  0.038   1.
           200.   972.  0.002   50.   50.  0.025  20.
0 268 120  4  100.  1610.  0.031   10.   10.  0.089   1.
           400.  1610.  0.031   50.   50.  0.065  20.
0 269 119  4   10.   730.  0.025   10.   10.  0.103   1.
           100.   730.  0.025   50.   50.  0.066  20.
0 270 181  4   20.  1456.  0.006    5.    5.  0.053   2.
           120.  1456.  0.006   50.   50.  0.039  20.
0 271 164  4   50.  1908.  0.002   10.   10.  0.035   2.
           150.  1908.  0.002   50.   50.  0.025  20.
0 273 100  4   20.   703.  0.002   10.   10.  0.041   2.
           120.   703.  0.002   50.   50.   0.03  20.
0 274 186  4   20.  1045.  0.001   10.   10.  0.027   2.
           120.  1045.  0.001   50.   50.   0.02  20.
0 275 186  4   20.  1420.  0.011   10.   10.  0.068   2.
           120.  1420.  0.011   50.   50.  0.049  20.
0 276 137  4   20.  2158.  0.006    4.    4.  0.047   5.
           120.  2158.  0.006   50.   50.  0.043  10.
0 277 144  4   17.   262.  0.008    3.    3.  0.044   1.
           120.   262.  0.008   50.   50.  0.048  10.
0 278 103  4   20.   708.  0.007    4.    4.  0.056   2.
           120.   708.  0.007   50.   50.  0.041  20.
0 279 315  4   20.  2452.  0.003   10.   10.  0.039   3.
           120.  2452.  0.003   25.   25.  0.029  20.
0 280 137  4   20.  1804.  0.003   10.   10.  0.039   3.
           120.  1804.  0.003   50.   50.   0.03  20.
0 281 133  4   20.  3622.  0.004   10.   10.  0.046   2.
           120.  3622.  0.004   50.   50.  0.033  20.
0 282 182  4   20.  2352.  0.006   10.   10.  0.054   2.
           120.  2352.  0.006   50.   50.  0.039  20.
0 283 159  4   20.  1995.  0.004   10.   10.  0.046   2.
           120.  1995.  0.004   50.   50.  0.033  20.
0 284 132  4   20.  3155.  0.006   10.   10.  0.054   2.
           120.  3155.  0.006   50.   50.  0.039  20.
0 285 102  4   35.   502.  0.001   10.   10.  0.027   2.
           135.   502.  0.001   50.   50.   0.02  20.
0 286 158  4   20.  1328.  0.004   10.   10.  0.060   2.
           120.  1328.  0.008   50.   50.  0.043  20.
0 287 109  5  5.0   344.  0.005    1.    1.  0.017  5.0
           120.   344.  0.004   20.   20.  0.037  20.
```

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0 288 271   5    5.5   250.  0.011     0.     0.  0.013    5.5
            120.   250.  0.011    20.    20.  0.037    20.
0 296 316   4    80.  3500.  0.002     4.     4.  0.030    8.5
            120.  3500.  0.002    50.    50.  0.028    10.
0 297 298   2     5.   350.  0.005     0.     0.  0.013     5.
0 298 211   4    20.   440.  0.008    10.    10.  0.050     2.
            120.   440.  0.008    50.    50.  0.040    20.
0 299 302   4    20.  2854.  0.008    10.    10.  0.046     2.
            120.  2854.  0.004    50.    50.  0.033    20.
0 301 224   3    10.     1.    0.1              0.01     1.
0 302 233 11 2    0.1   500.  0.001                0.035    0.1
    0      0    0.21      5.    3.05     19.   12.65     40.
 30.14     66.     56.     92.   90.45    115.  131.74    131.
176.83    145.  223.32    158.  270.77    171.
0 303 188   3    10.     1.    0.1              0.01     1.
0 304 296   3    10.     1.    0.1              0.01     1.
0 305 251   3    10.     1.    0.1              0.01     1.
0 306 140   3    10.     1.    0.1              0.01     1.
0 307 235   3    10.     1.    0.1              0.01     1.
0 308 114   3    10.     1.    0.1              0.01     1.
0 309 286   3    10.     1.    0.1              0.01     1.
0 310 234   3    10.     1.    0.1              0.01     1.
0 311 216   3    10.     1.    0.1              0.01     1.
0 315 115 12 2    0.1    10.    0.1                      0.1
   0.      0.     1.4     22.      9.    150.     25.1    402.
  50.2    822.    83.7   1393.   125.3   2079.   173.4   2853.
 226.4   3712.   272.1   4499.   283.8   4640.    342.   5520.
0 316 143  5 2    0.1    10.    0.1                      0.1
   0.      0.    32.0     64.     64.    176.     96.0    344.
 103.5    542.   103.6   9999.
 401  131  231  3 3            1.
     0       0     528     528     900     528
    401  402   3            1.
    402  210   2    6.5   196   0.013       0     0  0.015    6.5
 403  140  200  3 3            1.
     0.      0.    560.    560.    900.    560.      0.      0.
  0 403  238   3            1.
  0 238  164   2    7.6   245.  0.005                0.013     8.
 -1  904  122  6 3    10.     1.    0.1              0.01    10.
     0.      0.    1.42     65.    4.42     80.    6.75     80.
   14.08     37.   16.00      4.

  0
  6
 100  104  110  141  115  122   0   0   0   0   0   0   0   0   0   0
ENDPROGRAM
```

SWMM 100 YR Master Plan

```
  2  1  1  2
  3  4
WATERSHED  1
LOWER THIRD CREEK, 100 YR MP with Trib G&L Detention
KIOWA ENGINEERING CORPORATION 3/05
     192      5.0                                        1
      1  100
      2  135
      3  101
      4  100
      5  103
      6  123
      7  104
      8  104
      9  105
     10  124
     11  125
     12  106
     13  106
     14  157
     15  126
     16  108
     17  127
     18  128
     19  129
     20  131
     21  131
     22  109
     23  187
     24  134
     25  111
     26  133
     27  110
     28  112
     29  308
     30  158
     31  158
     32  158
     33  308
     34  159
     35  181
     36  159
     37  162
     38  162
     39  306
     40  115
     41  138
     42  182
     43  173
     44  160
     45  161
     46  190
     47  140
     48  141
     49  116
     50  116
     51  117
     52  118
     53  155
     54  154
     55  119
     56  118
     57  163
     58  163
     59  168
     60  169
     61  170
     62  142
     63  183
     64  316
```

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65 184
66 144
67 312
68 312
69 120
70 120
71 153
72 156
73 121
74 165
75 166
76 303
77 171
78 304
79 180
80 150
81 145
82 145
83 132
84 132
85 150
86 150
87 146
88 174
89 174
90 174
91 185
92 151
93 152
94 176
95 177
96 178
97 175
98 121
992 992
993 993

0 100  0  3  10.  1.  0.1        0.01  1.
0 101 285  3  10.  1.  0.1        0.01  1.
0 102 273  3  10.  1.  0.1        0.01  1.
0 103 203  3  10.  1.  0.1        0.01  1.
0 104 204  3  10.  1.  0.1        0.01  1.
0 105 205  3  10.  1.  0.1        0.01  1.
0 106 206  3  10.  1.  0.1        0.01  1.
0 107 207  3  10.  1.  0.1        0.01  1.
0 108 208  3  10.  1.  0.1        0.01  1.
0 109 209  3  10.  1.  0.1        0.01  1.
0 110 210  3  10.  1.  0.1        0.01  1.
0 111 211  3  10.  1.  0.1        0.01  1.
0 112 212  3  10.  1.  0.1        0.01  1.
0 113 213  3  10.  1.  0.1        0.01  1.
0 114 214  3  10.  1.  0.1        0.01  1.
0 115 215  3  10.  1.  0.1        0.01  1.
0 116 311  3  10.  1.  0.1        0.01  1.
0 117 217  3  10.  1.  0.1        0.01  1.
0 118 218  3  10.  1.  0.1        0.01  1.
0 119 280  3  10.  1.  0.1        0.01  1.
0 120 220  3  10.  1.  0.1        0.01  1.
0 121 221  3  10.  1.  0.1        0.01  1.
0 122 222  3  10.  1.  0.1        0.01  1.
0 123 278  3  10.  1.  0.1        0.01  1.
0 124 223  3  10.  1.  0.1        0.01  1.
0 125 274  3  10.  1.  0.1        0.01  1.
0 126 226  3  10.  1.  0.1        0.01  1.
0 127 228  3  10.  1.  0.1        0.01  1.
0 128 229  3  10.  1.  0.1        0.01  1.
0 129 227  3  10.  1.  0.1        0.01  1.
0 130 287  3  10.  1.  0.1        0.01  1.
0 132 304  3  10.  1.  0.1        0.01  1.
0 133 232  3  10.  1.  0.1        0.01  1.
0 134 281  3  10.  1.  0.1        0.01  1.
0 135 202  3  10.  1.  0.1        0.01  1.
0 136 288  3  10.  1.  0.1        0.01  1.
0 137 219  3  10.  1.  0.1        0.01  1.
0 138 236  3  10.  1.  0.1        0.01  1.
0 139 307  3  10.  1.  0.1        0.01  1.
0 141 200  3  10.  1.  0.1        0.01  1.
0 142 240  3  10.  1.  0.1        0.01  1.
0 143 237  3  10.  1.  0.1        0.01  1.
0 144 276  3  10.  1.  0.1        0.01  1.
0 145 266  3  10.  1.  0.1        0.01  1.
0 146 267  3  10.  1.  0.1        0.01  1.
0 147 230  3  10.  1.  0.1        0.01  1.
0 148 254  3  10.  1.  0.1        0.01  1.
0 149 255  3  10.  1.  0.1        0.01  1.
0 150 256  3  10.  1.  0.1        0.01  1.
0 151 257  3  10.  1.  0.1        0.01  1.
0 152 259  3  10.  1.  0.1        0.01  1.
0 153 264  3  10.  1.  0.1        0.01  1.
0 154 268  3  10.  1.  0.1        0.01  1.
0 155 269  3  10.  1.  0.1        0.01  1.
0 156 265  3  10.  1.  0.1        0.01  1.
0 157 275  3  10.  1.  0.1        0.01  1.
0 158 302  3  10.  1.  0.1        0.01  1.
0 159 309  3  10.  1.  0.1        0.01  1.
0 160 282  3  10.  1.  0.1        0.01  1.
0 161 310  3  10.  1.  0.1        0.01  1.
0 162 299  3  10.  1.  0.1        0.01  1.
0 163 244  3  10.  1.  0.1        0.01  1.
0 164 279  3  10.  1.  0.1        0.01  1.
0 165 245  3  10.  1.  0.1        0.01  1.
0 166 246  3  10.  1.  0.1        0.01  1.
0 167 250  3  10.  1.  0.1        0.01  1.
0 168 243  3  10.  1.  0.1        0.01  1.
0 169 242  3  10.  1.  0.1        0.01  1.
0 170 241  3  10.  1.  0.1        0.01  1.
0 171 248  3  10.  1.  0.1        0.01  1.
0 173 270  3  10.  1.  0.1        0.01  1.
0 174 305  3  10.  1.  0.1        0.01  1.
0 175 258  3  10.  1.  0.1        0.01  1.
0 176 252  3  10.  1.  0.1        0.01  1.
0 177 263  3  10.  1.  0.1        0.01  1.
0 178 262  3  10.  1.  0.1        0.01  1.
0 179 261  3  10.  1.  0.1        0.01  1.
0 180 260  3  10.  1.  0.1        0.01  1.
0 181 159  3  10.  1.  0.1        0.01  1.
0 182 283  3  10.  1.  0.1        0.01  1.
0 183 239  3  10.  1.  0.1        0.01  1.
0 184 277  3  10.  1.  0.1        0.01  1.
0 185 284  3  10.  1.  0.1        0.01  1.
```

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0 186 225  3   10.    1.   0.1              0.01    1.
0 187 301  3   10.    1.   0.1              0.01    1.
0 190 289  3   10.    1.   0.1              0.01    1.
0 188 247  3   10.    1.   0.1              0.01    1.
0 200 136  4   10.  964.  0.004   10.   10.  0.047    2.
           50.  964.  0.004   50.   50.  0.033   20.
0 202 101  4   20. 2327.  0.003   20.   20.  0.04    3.
          120. 2327.  0.003   50.   50.  0.03   20.
0 203 102  4   20. 1902.  0.004   20.   20.  0.044   3.
          120. 1902.  0.004   50.   50.  0.033   20.
0 204 103  4   20. 2673.  0.004   20.   20.  0.044   3.
          120. 2673.  0.004   50.   50.  0.033   20.
0 205 104  4   60. 1621.  0.003    4.    4.  0.037   3.
          160. 1621.  0.003   50.   50.  0.03   20.
0 206 105  4   50. 4148. 0.0034    4.    4.  0.039   3.
          150. 4148. 0.0034   50.   50.  0.031   20.
0 207 106  4   15.  717.  0.003    4.    4.  0.037   4.
          115.  717.  0.003   20.   20.  0.029   20.
0 208 107  4   20. 2763.  0.003   10.   10.  0.039   3.
          120. 2763.  0.003   40.   40.  0.03   20.
0 209 108  4   20. 3945.  0.003    4.    4.  0.036   5.
          120. 3945.  0.003   40.   40.  0.03   20.
0 210 109  4   20. 3217.  0.007    4.    4.  0.053   3.
          120. 3217.  0.007   50.   50.  0.041   20.
0 211 110  4   20. 1323.  0.008    4.    4.  0.056   3.
          120. 1323.  0.008   50.   50.  0.043   20.
0 212 111  4   50. 2426.  0.003    4.    4.  0.037   3.
          150. 2426.  0.003   50.   50.  0.03   20.
0 213 112  4   20. 2473.  0.005    4.    4.  0.046   3.
          120. 2473.  0.005   50.   50.  0.036   20.
0 214 113  4   20.  443.  0.003   10.   10.  0.039   3.
          120.  443.  0.003   25.   25.  0.029   20.
0 215 308  4   20. 1622.  0.003   10.   10.  0.039   3.
          120. 1622.  0.003   25.   25.  0.028   25.
0 216 164  4   20. 1324.  0.003   10.   10.  0.039   3.
          120. 1324.  0.003   25.   25.  0.029   20.
0 217 116  4   20. 3243.  0.005   10.   10.  0.047   3.
          120. 3243.  0.005   25.   25.  0.036   20.
0 218 117  4   20.  282.  0.003   10.   10.  0.039   3.
          120.  282.  0.003   25.   25.  0.029   20.
0 219 118  4   20. 2003.  0.003   10.   10.  0.039   3.
          120. 2003.  0.003   20.   20.  0.029   20.
0 220 147  4   20. 2196.  0.003    4.    4.  0.037   4.
          120. 2196.  0.003   20.   20.  0.029   20.
0 221 120  4   20. 5356.  0.001    4.    4.  0.024   5.
          120. 5356.  0.001   20.   20.  0.046   20.
0 222 121  4    8. 4084.  0.012    4.    4.  0.066   3.
           32. 4084.  0.012   20.   20.  0.071   20.
0 224 110  4   20. 2002.  0.003    4.    4.  0.04    2.
          120. 2002.  0.003   50.   50.  0.03   20.
0 223 105  4   20. 1141.  0.002   10.   10.  0.035   2.
          120. 1141.  0.002   50.   50.  0.025   20.
0 225 106  4   20. 2475.  0.001   10.   10.  0.027   2.
          120. 2475.  0.001   50.   50.  0.02   20.
0 226 107  4   10. 2015.  0.006    4.    4.  0.054   2.
          110. 2015.  0.006   50.   50.  0.039   20.
0 227 126  4   20. 2686. 0.0052   10.   10.  0.056   1.
          120. 2686. 0.0052   50.   50.  0.037   20.
0 228 108  4   10.  645.  0.016    4.    4.  0.078   2.
          110.  645.  0.016   50.   50.  0.056   20.
0 229 127  4   10.  838.  0.003    4.    4.  0.041   2.
          110.  838.  0.003   50.   50.  0.03   20.
0 230 119  4   20.  302.  0.003    4.    4.  0.037   4.
          120.  302.  0.003   20.   20.  0.029   20.
0 231 130  4   20. 2856.  0.004   10.   10.  0.046   2.
          120. 2856.  0.004   50.   50.  0.033   20.
0 232 111  4   20. 1120.  0.005   10.   10.  0.05    2.
          120. 1120.  0.005   50.   50.  0.036   20.
0 233 297  4   20. 2070.  0.008   10.   10.  0.060   2.
          120. 2070.  0.008   50.   50.  0.043   20.
0 234 173  4   20. 3316.  0.013   10.   10.  0.072   2.
          120. 3316.  0.013   50.   50.  0.052   20.
0 235 140  4   40. 1047.  0.019   10.   10.  0.09    1.
          120. 1047.  0.019   50.   50.  0.06   20.
0 236 116  4   50. 2857. 0.0035   10.   10.  0.047   1.
          200. 2857. 0.0035   50.   50.  0.031   20.
0 237 184  5    6.  183.  0.035    0.    0.  0.013   6.
          100. 1400.  0.005   50.   50.  0.051   20.
0 239 141  4   40. 2088. 0.0030   10.   10.  0.041   2.
          120. 2088. 0.0030   50.   50.  0.030   20.
0 240 140  4   20. 2733.  0.015    5.    5.  0.082   1.
          120. 2733.  0.015   50.   50.  0.055   20.
0 241 139  4   20. 2126.  0.009   10.   10.  0.069   1.
          120. 2126.  0.009   50.   50.  0.045   20.
0 242 168  4   20.  927.  0.013    5.    5.  0.071   2.
          120.  927.  0.013   50.   50.  0.052   20.
0 243 161  4   20. 1224.  0.002   10.   10.  0.035   2.
          120. 1224.  0.002   50.   50.  0.025   20.
0 244 160  4   20. 1747.  0.007   10.   10.  0.057   2.
          120. 1747.  0.007   50.   50.  0.041   20.
0 245 163  4   20. 2060.  0.006   10.   10.  0.054   2.
          120. 2060.  0.006   50.   50.  0.039   20.
0 246 165  4   20. 3293.  0.007   10.   10.  0.057   2.
          120. 3293.  0.007   50.   50.  0.041   20.
0 247 168  4   40. 1278.  0.02    10.   10.  0.083   2.
          120. 1278.  0.02    50.   50.  0.061   20.
0 248 170  4  100. 1834.  0.013   10.   10.  0.077   1.
          200. 1834.  0.013   50.   50.  0.051   20.
0 250 132  4  100. 2986.  0.008   10.   10.  0.064   1.
          200. 2986.  0.008   50.   50.  0.043   20.
0 251 167  4   20. 1081.  0.004   10.   10.  0.051   1.
          120. 1081.  0.004   50.   50.  0.033   20.
0 252 174  4   20. 2585.  0.005    5.    5.  0.049   2.
          120. 2585.  0.005   50.   50.  0.036   20.
0 254 147  4   20.  637.  0.003   10.   10.  0.045   1.
          120.  637.  0.003   50.   50.  0.03   20.
0 255 150  4   70. 1579.  0.004    5.    5.  0.049   1.
          200. 1579.  0.004   50.   50.  0.033   20.
0 256 145  4  100. 2710.  0.013   10.   10.  0.077   1.
          200. 2710.  0.013   50.   50.  0.051   20.
0 257 149  4  100. 1831.  0.014   10.   10.  0.079   1.
          200. 1831.  0.014   50.   50.  0.053   20.
0 258 151  4  100. 3598.  0.01    10.   10.  0.069   1.
          200. 3598.  0.01    50.   50.  0.047   20.
0 259 149  4  100. 1401.  0.012   10.   10.  0.074   1.
          200. 1401.  0.012   50.   50.  0.05   20.
0 260 150  4  100. 2084.  0.007   10.   10.  0.06    1.
          200. 2084.  0.007   50.   50.  0.041   20.
0 261 176  4   20. 1626.  0.009   10.   10.  0.063   2.
          120. 1626.  0.009   50.   50.  0.045   20.
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0 262 179  4  100.  1461.  0.006   10.   10.  0.057    1.
          200.  1461.  0.006   50.   50.  0.038   20.
0 263 179  4  100.  1278.  0.007   10.   10.  0.06    1.
          200.  1278.  0.007   50.   50.  0.041   20.
0 264 121  4  100.  2606.  0.019    5.    5.  0.063   2.
          400.  2606.  0.019   50.   50.  0.045   20.
0 265 122  4   20.  1802.  0.024    4.    4.  0.089   2.
          120.  1802.  0.024   50.   50.  0.065   20.
0 266 312  4   20.  3270.  0.007    5.    5.  0.056   2.
          120.  3270.  0.007   50.   50.  0.041   20.
0 267 145  4  100.   972.  0.002   10.   10.  0.038   1.
          200.   972.  0.002   50.   50.  0.025   20.
0 268 120  4  100.  1610.  0.031   10.   10.  0.089   1.
          400.  1610.  0.031   50.   50.  0.065   20.
0 269 119  4   10.   730.  0.025   10.   10.  0.103   1.
          100.   730.  0.025   50.   50.  0.066   20.
0 270 181  4   20.  1456.  0.006    5.    5.  0.053   2.
          120.  1456.  0.006   50.   50.  0.039   20.
0 271 164  4   50.  1908.  0.002   10.   10.  0.035   2.
          150.  1908.  0.002   50.   50.  0.025   20.
0 273 100  4   20.   703.  0.002   10.   10.  0.041   2.
          120.   703.  0.002   50.   50.  0.03    20.
0 274 186  4   20.  1045.  0.001   10.   10.  0.027   2.
          120.  1045.  0.001   50.   50.  0.02    20.
0 275 186  4   20.  1420.  0.011   10.   10.  0.068   2.
          120.  1420.  0.011   50.   50.  0.049   20.
0 276 137  4   20.  2158.  0.006    4.    4.  0.047   5.
          120.  2158.  0.006   50.   50.  0.043   10.
0 277 144  4   17.   262.  0.008    3.    3.  0.044   1.
          120.   262.  0.008   50.   50.  0.048   10.
0 278 103  4   20.   708.  0.007    4.    4.  0.056   2.
          120.   708.  0.007   50.   50.  0.041   20.
0 279 315  4   20.  2452.  0.003   10.   10.  0.039   3.
          120.  2452.  0.003   25.   25.  0.029   20.
0 280 137  4   20.  1804.  0.003   10.   10.  0.039   3.
          120.  1804.  0.003   50.   50.  0.03    20.
0 281 133  4   20.  3622.  0.004   10.   10.  0.046   2.
          120.  3622.  0.004   50.   50.  0.033   20.
0 282 182  4   20.  2352.  0.006   10.   10.  0.054   2.
          120.  2352.  0.006   50.   50.  0.039   20.
0 283 159  4   20.  1995.  0.004   10.   10.  0.046   2.
          120.  1995.  0.004   50.   50.  0.033   20.
0 284 132  4   20.  3155.  0.006   10.   10.  0.054   2.
          120.  3155.  0.006   50.   50.  0.039   20.
0 285 102  4   35.   502.  0.001   10.   10.  0.027   2.
          135.   502.  0.001   50.   50.  0.02    20.
0 286 158  4   20.  1328.  0.004   10.   10.  0.060   2.
          120.  1328.  0.008   50.   50.  0.043   20.
0 287 109  5   5.0   344.  0.005    1.    1.  0.017   5.0
          120.   344.  0.004   20.   20.  0.037   20.
0 288 271  5   5.5   250.  0.011    0.    0.  0.013   5.5
          120.   250.  0.011   20.   20.  0.037   20.
0 289 162  5   5.5  2700.  0.011    0.    0.  0.013   3.5
          120.  2700.  0.011   20.   20.  0.037   20.
0 296 316  4   80.  3500.  0.002    4.    4.  0.030   8.5
          120.  3500.  0.002   50.   50.  0.028   10.
0 297 298  2    5.   350.  0.005    0.    0.  0.013   5.
0 298 211  4   20.   440.  0.008   10.   10.  0.050   2.
          120.   440.  0.008   50.   50.  0.040   20.
0 299 302  4   20.  2854.  0.008   10.   10.  0.046   2.
          120.  2854.  0.004   50.   50.  0.033   20.
0 301 224  3   10.    1.   0.1              0.01    1.
0 302 233 11 2   0.1   500.  0.001              0.035   0.1
   0     0    0.21     5.    3.05    19.   12.65    40.
 30.14    66.    56.    92.   90.45   115.  131.74   131.
176.83   145.  223.32   158.  270.77   171.
0 303 188  3   10.    1.   0.1              0.01    1.
0 304 296  3   10.    1.   0.1              0.01    1.
0 305 251  3   10.    1.   0.1              0.01    1.
0 306 140  3   10.    1.   0.1              0.01    1.
0 307 235  3   10.    1.   0.1              0.01    1.
0 308 114  3   10.    1.   0.1              0.01    1.
0 309 286  3   10.    1.   0.1              0.01    1.
0 310 234  3   10.    1.   0.1              0.01    1.
0 311 216  3   10.    1.   0.1              0.01    1.
0 312 148  7 2   0.1   10.   0.1                   0.1
   0.     0.    1.87    60.6   31.18   102.   81.28   123.
 164.2   122.   220.   170.   221.   9999.
0 315 115 12 2   0.1   10.   0.1                   0.1
   0.     0.    1.4     22.     9.    150.    25.1   402.
  50.2   822.   83.7   1393.  125.3  2079.  173.4  2853.
 226.4  3712.  272.1   4499.  283.8  4640.   342.  5520.
0 316 143  5 2   0.1   10.   0.1                   0.1
   0.     0.   32.0    64.    64.    176.    96.0   344.
 103.5   542.  103.6   9999.
0 993 1093  0 3          1.
0 1093 992  0 4   10.0  5109.   .008    4.0    4.0  0.040   1.0
             18.0  5109.   .008   50.0   50.0  0.040  10.0
0 992 892  0 3           1.
0 892 1092  5 2   0.1    1.   .001              0.015   0.1
   0     0    5.3    26.0   24.4   103.0   135.0   153.0
 230.0   193.0  231.0  9999.0
 0 1092 1192  0 4   10.0  2100.   .006    4.0    4.0  0.040   1.0
             18.0  2100.   .006   50.0   50.0  0.040  10.0
 0 1192  122  0 5   12.4    60.   .005              0.013  10.0
            400.0    60.   .005   50.0   50.0  0.015  14.0
401  131  231  3 3          1.
   0     0    528     528    900     528
  401  402   3          1.
  402  210   2    6.5  196   0.013     0     0  0.015    6.5
403  140  200  3 3          1.
   0.     0.   560.    560.    900.    560.     0.     0.
 0 403  238   3          1.
 0 238  164   2    7.6  245.  0.005              0.013    8.
-1 904  122  7 3   10.    1.   0.1              0.01   10.
   0.     0.    .83    91.    1.58   2727.    1.92  2840.
  2.33   2710.   4.17   787.    16.    349

 0
 6
100  104  110  141  115  122   0   0   0   0   0   0   0   0   0   0
ENDPROGRAM
```

SWMM 50 YR Master Plan

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 2  1  1  2
 3  4
WATERSHED  1
LOWER THIRD CREEK, 50 YR MP with Trib G&L Detention
KIOWA ENGINEERING CORPORATION 3/05
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192     5.0                                   1
  1  100
  2  135
  3  101
  4  100
  5  103
  6  123
  7  104
  8  104
  9  105
 10  124
 11  125
 12  106
 13  106
 14  157
 15  126
 16  108
 17  127
 18  128
 19  129
 20  131
 21  131
 22  109
 23  187
 24  134
 25  111
 26  133
 27  110
 28  112
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 33  308
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 39  306
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 42  182
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 47  140
 48  141
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 90  174
 91  185
 92  151
 93  152
 94  176
 95  177
 96  178
 97  175
 98  121
992  992
993  993

  0  100    0   3    10.    1.    0.1          0.01    1.
  0  101  285   3    10.    1.    0.1          0.01    1.
  0  102  273   3    10.    1.    0.1          0.01    1.
  0  103  203   3    10.    1.    0.1          0.01    1.
  0  104  204   3    10.    1.    0.1          0.01    1.
  0  105  205   3    10.    1.    0.1          0.01    1.
  0  106  206   3    10.    1.    0.1          0.01    1.
  0  107  207   3    10.    1.    0.1          0.01    1.
  0  108  208   3    10.    1.    0.1          0.01    1.
  0  109  209   3    10.    1.    0.1          0.01    1.
  0  110  210   3    10.    1.    0.1          0.01    1.
  0  111  211   3    10.    1.    0.1          0.01    1.
  0  112  212   3    10.    1.    0.1          0.01    1.
  0  113  213   3    10.    1.    0.1          0.01    1.
  0  114  214   3    10.    1.    0.1          0.01    1.
  0  115  215   3    10.    1.    0.1          0.01    1.
  0  116  311   3    10.    1.    0.1          0.01    1.
  0  117  217   3    10.    1.    0.1          0.01    1.
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0 118 218  3   10.   1.   0.1          0.01   1.
0 119 280  3   10.   1.   0.1          0.01   1.
0 120 220  3   10.   1.   0.1          0.01   1.
0 121 221  3   10.   1.   0.1          0.01   1.
0 122 222  3   10.   1.   0.1          0.01   1.
0 123 278  3   10.   1.   0.1          0.01   1.
0 124 223  3   10.   1.   0.1          0.01   1.
0 125 274  3   10.   1.   0.1          0.01   1.
0 126 226  3   10.   1.   0.1          0.01   1.
0 127 228  3   10.   1.   0.1          0.01   1.
0 128 229  3   10.   1.   0.1          0.01   1.
0 129 227  3   10.   1.   0.1          0.01   1.
0 130 287  3   10.   1.   0.1          0.01   1.
0 132 304  3   10.   1.   0.1          0.01   1.
0 133 232  3   10.   1.   0.1          0.01   1.
0 134 281  3   10.   1.   0.1          0.01   1.
0 135 202  3   10.   1.   0.1          0.01   1.
0 136 288  3   10.   1.   0.1          0.01   1.
0 137 219  3   10.   1.   0.1          0.01   1.
0 138 236  3   10.   1.   0.1          0.01   1.
0 139 307  3   10.   1.   0.1          0.01   1.
0 141 200  3   10.   1.   0.1          0.01   1.
0 142 240  3   10.   1.   0.1          0.01   1.
0 143 237  3   10.   1.   0.1          0.01   1.
0 144 276  3   10.   1.   0.1          0.01   1.
0 145 266  3   10.   1.   0.1          0.01   1.
0 146 267  3   10.   1.   0.1          0.01   1.
0 147 230  3   10.   1.   0.1          0.01   1.
0 148 254  3   10.   1.   0.1          0.01   1.
0 149 255  3   10.   1.   0.1          0.01   1.
0 150 256  3   10.   1.   0.1          0.01   1.
0 151 257  3   10.   1.   0.1          0.01   1.
0 152 259  3   10.   1.   0.1          0.01   1.
0 153 264  3   10.   1.   0.1          0.01   1.
0 154 268  3   10.   1.   0.1          0.01   1.
0 155 269  3   10.   1.   0.1          0.01   1.
0 156 265  3   10.   1.   0.1          0.01   1.
0 157 275  3   10.   1.   0.1          0.01   1.
0 158 302  3   10.   1.   0.1          0.01   1.
0 159 309  3   10.   1.   0.1          0.01   1.
0 160 282  3   10.   1.   0.1          0.01   1.
0 161 310  3   10.   1.   0.1          0.01   1.
0 162 299  3   10.   1.   0.1          0.01   1.
0 163 244  3   10.   1.   0.1          0.01   1.
0 164 279  3   10.   1.   0.1          0.01   1.
0 165 245  3   10.   1.   0.1          0.01   1.
0 166 246  3   10.   1.   0.1          0.01   1.
0 167 250  3   10.   1.   0.1          0.01   1.
0 168 243  3   10.   1.   0.1          0.01   1.
0 169 242  3   10.   1.   0.1          0.01   1.
0 170 241  3   10.   1.   0.1          0.01   1.
0 171 248  3   10.   1.   0.1          0.01   1.
0 173 270  3   10.   1.   0.1          0.01   1.
0 174 305  3   10.   1.   0.1          0.01   1.
0 175 258  3   10.   1.   0.1          0.01   1.
0 176 252  3   10.   1.   0.1          0.01   1.
0 177 263  3   10.   1.   0.1          0.01   1.
0 178 262  3   10.   1.   0.1          0.01   1.
0 179 261  3   10.   1.   0.1          0.01   1.
0 180 260  3   10.   1.   0.1          0.01   1.
0 181 159  3   10.   1.   0.1          0.01   1.
0 182 283  3   10.   1.   0.1          0.01   1.
0 183 239  3   10.   1.   0.1          0.01   1.
0 184 277  3   10.   1.   0.1          0.01   1.
0 185 284  3   10.   1.   0.1          0.01   1.
0 186 225  3   10.   1.   0.1          0.01   1.
0 187 301  3   10.   1.   0.1          0.01   1.
0 190 289  3   10.   1.   0.1          0.01   1.
0 188 247  3   10.   1.   0.1          0.01   1.
0 200 136  4   10.  964.  0.004   10.   10.  0.047   2.
          50.  964.  0.004   50.   50.  0.033  20.
0 202 101  4   20. 2327.  0.003   20.   20.  0.04   3.
         120. 2327.  0.003   50.   50.  0.03  20.
0 203 102  4   20. 1902.  0.004   20.   20.  0.044  3.
         120. 1902.  0.004   50.   50.  0.033  20.
0 204 103  4   20. 2673.  0.004   20.   20.  0.044  3.
         120. 2673.  0.004   50.   50.  0.033  20.
0 205 104  4   60. 1621.  0.003    4.    4.  0.037  3.
         160. 1621.  0.003   50.   50.  0.03  20.
0 206 105  4   50. 4148. 0.0034    4.    4.  0.039  3.
         150. 4148. 0.0034   50.   50.  0.031  20.
0 207 106  4   15.  717.  0.003    4.    4.  0.037  4.
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0 208 107  4   20. 2763.  0.003   10.   10.  0.039  3.
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0 209 108  4   20. 3945.  0.003    4.    4.  0.036  5.
         120. 3945.  0.003   40.   40.  0.03  20.
0 210 109  4   20. 3217.  0.007    4.    4.  0.053  3.
         120. 3217.  0.007   50.   50.  0.041  20.
0 211 110  4   20. 1323.  0.008    4.    4.  0.056  3.
         120. 1323.  0.008   50.   50.  0.043  20.
0 212 111  4   50. 2426.  0.003    4.    4.  0.037  3.
         150. 2426.  0.003   50.   50.  0.03  20.
0 213 112  4   20. 2473.  0.005    4.    4.  0.046  3.
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0 214 113  4   20.  443.  0.003   10.   10.  0.039  3.
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0 215 308  4   20. 1622.  0.003   10.   10.  0.039  3.
         120. 1622.  0.003   25.   25.  0.028  25.
0 216 164  4   20. 1324.  0.003   10.   10.  0.039  3.
         120. 1324.  0.003   25.   25.  0.029  20.
0 217 116  4   20. 3243.  0.005   10.   10.  0.047  3.
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0 218 117  4   20.  282.  0.003   10.   10.  0.039  3.
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0 219 118  4   20. 2003.  0.003   10.   10.  0.039  3.
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0 220 147  4   20. 2196.  0.003    4.    4.  0.037  4.
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0 221 120  4   20. 5356.  0.001    4.    4.  0.024  5.
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0 222 121  4    8. 4084.  0.012    4.    4.  0.066  3.
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0 224 110  4   20. 2002.  0.003    4.    4.  0.04   2.
         120. 2002.  0.003   50.   50.  0.03  20.
0 223 105  4   20. 1141.  0.002   10.   10.  0.035  2.
         120. 1141.  0.002   50.   50.  0.025  20.
0 225 106  4   20. 2475.  0.001   10.   10.  0.027  2.
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0 226 107  4   10. 2015.  0.006    4.    4.  0.054  2.
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          110.  2015.  0.006    50.    50.  0.039    20.
0 227 126  4   20.  2686. 0.0052   10.    10.  0.056    1.
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0 228 108  4   10.   645.  0.016    4.     4.  0.078    2.
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0 229 127  4   10.   838.  0.003    4.     4.  0.041    2.
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0 230 119  4   20.   302.  0.003    4.     4.  0.037    4.
          120.   302.  0.003    20.    20.  0.029    20.
0 231 130  4   20.  2856.  0.004   10.    10.  0.046    2.
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0 232 111  4   20.  1120.  0.005   10.    10.  0.05     2.
          120.  1120.  0.005    50.    50.  0.036    20.
0 233 297  4   20.  2070.  0.008   10.    10.  0.060    2.
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0 234 173  4   20.  3316.  0.013   10.    10.  0.072    2.
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0 235 140  4   40.  1047.  0.019   10.    10.  0.09     1.
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0 236 116  4   50.  2857. 0.0035   10.    10.  0.047    1.
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0 237 184  5    6.   183.  0.035    0.     0.  0.013    6.
          100.  1400.  0.005    50.    50.  0.051    20.
0 239 141  4   40.  2088. 0.0030   10.    10.  0.041    2.
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0 240 140  4   20.  2733.  0.015    5.     5.  0.082    1.
          120.  2733.  0.015    50.    50.  0.055    20.
0 241 139  4   20.  2126.  0.009   10.    10.  0.069    1.
          120.  2126.  0.009    50.    50.  0.045    20.
0 242 168  4   20.   927.  0.013    5.     5.  0.071    2.
          120.   927.  0.013    50.    50.  0.052    20.
0 243 161  4   20.  1224.  0.002   10.    10.  0.035    2.
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0 244 160  4   20.  1747.  0.007   10.    10.  0.057    2.
          120.  1747.  0.007    50.    50.  0.041    20.
0 245 163  4   20.  2060.  0.006   10.    10.  0.054    2.
          120.  2060.  0.006    50.    50.  0.039    20.
0 246 165  4   20.  3293.  0.007   10.    10.  0.057    2.
          120.  3293.  0.007    50.    50.  0.041    20.
0 247 168  4   40.  1278.  0.02    10.    10.  0.083    2.
          120.  1278.  0.02     50.    50.  0.061    20.
0 248 170  4  100.  1834.  0.013   10.    10.  0.077    1.
          200.  1834.  0.013    50.    50.  0.051    20.
0 250 132  4  100.  2986.  0.008   10.    10.  0.064    1.
          200.  2986.  0.008    50.    50.  0.043    20.
0 251 167  4   20.  1081.  0.004   10.    10.  0.051    1.
          120.  1081.  0.004    50.    50.  0.033    20.
0 252 174  4   20.  2585.  0.005    5.     5.  0.049    2.
          120.  2585.  0.005    50.    50.  0.036    20.
0 254 147  4   20.   637.  0.003   10.    10.  0.045    1.
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0 255 150  4   70.  1579.  0.004    5.     5.  0.049    1.
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0 256 145  4  100.  2710.  0.013   10.    10.  0.077    1.
          200.  2710.  0.013    50.    50.  0.051    20.
0 257 149  4  100.  1831.  0.014   10.    10.  0.079    1.
          200.  1831.  0.014    50.    50.  0.053    20.
0 258 151  4  100.  3598.  0.01    10.    10.  0.069    1.
          200.  3598.  0.01     50.    50.  0.047    20.
0 259 149  4  100.  1401.  0.012   10.    10.  0.074    1.
          200.  1401.  0.012    50.    50.  0.05     20.
0 260 150  4  100.  2084.  0.007   10.    10.  0.06     1.
          200.  2084.  0.007    50.    50.  0.041    20.
0 261 176  4   20.  1626.  0.009   10.    10.  0.063    2.
          120.  1626.  0.009    50.    50.  0.045    20.
0 262 179  4  100.  1461.  0.006   10.    10.  0.057    1.
          200.  1461.  0.006    50.    50.  0.038    20.
0 263 179  4  100.  1278.  0.007   10.    10.  0.06     1.
          200.  1278.  0.007    50.    50.  0.041    20.
0 264 121  4  100.  2606.  0.019    5.     5.  0.063    2.
          400.  2606.  0.019    50.    50.  0.045    20.
0 265 122  4   20.  1802.  0.024    4.     4.  0.089    2.
          120.  1802.  0.024    50.    50.  0.065    20.
0 266 312  4   20.  3270.  0.007    5.     5.  0.056    2.
          120.  3270.  0.007    50.    50.  0.041    20.
0 267 145  4  100.   972.  0.002   10.    10.  0.038    1.
          200.   972.  0.002    50.    50.  0.025    20.
0 268 120  4  100.  1610.  0.031   10.    10.  0.089    1.
          400.  1610.  0.031    50.    50.  0.065    20.
0 269 119  4   10.   730.  0.025   10.    10.  0.103    1.
          100.   730.  0.025    50.    50.  0.066    20.
0 270 181  4   20.  1456.  0.006    5.     5.  0.053    2.
          120.  1456.  0.006    50.    50.  0.039    20.
0 271 164  4   50.  1908.  0.002   10.    10.  0.035    2.
          150.  1908.  0.002    50.    50.  0.025    20.
0 273 100  4   20.   703.  0.002   10.    10.  0.041    2.
          120.   703.  0.002    50.    50.  0.03     20.
0 274 186  4   20.  1045.  0.001   10.    10.  0.027    2.
          120.  1045.  0.001    50.    50.  0.02     20.
0 275 186  4   20.  1420.  0.011   10.    10.  0.068    2.
          120.  1420.  0.011    50.    50.  0.049    20.
0 276 137  4   20.  2158.  0.006    4.     4.  0.047    5.
          120.  2158.  0.006    50.    50.  0.043    10.
0 277 144  4   17.   262.  0.008    3.     3.  0.044    1.
          120.   262.  0.008    50.    50.  0.048    10.
0 278 103  4   20.   708.  0.007    4.     4.  0.056    2.
          120.   708.  0.007    50.    50.  0.041    20.
0 279 315  4   20.  2452.  0.003   10.    10.  0.039    3.
          120.  2452.  0.003    25.    25.  0.029    20.
0 280 137  4   20.  1804.  0.003   10.    10.  0.039    3.
          120.  1804.  0.003    50.    50.  0.03     20.
0 281 133  4   20.  3622.  0.004   10.    10.  0.046    2.
          120.  3622.  0.004    50.    50.  0.033    20.
0 282 182  4   20.  2352.  0.006   10.    10.  0.054    2.
          120.  2352.  0.006    50.    50.  0.039    20.
0 283 159  4   20.  1995.  0.004   10.    10.  0.046    2.
          120.  1995.  0.004    50.    50.  0.033    20.
0 284 132  4   20.  3155.  0.006   10.    10.  0.054    2.
          120.  3155.  0.006    50.    50.  0.039    20.
0 285 102  4   35.   502.  0.001   10.    10.  0.027    2.
          135.   502.  0.001    50.    50.  0.02     20.
0 286 158  4   20.  1328.  0.004   10.    10.  0.060    2.
          120.  1328.  0.008    50.    50.  0.043    20.
0 287 109  5   5.0   344.  0.005    1.     1.  0.017    5.0
          120.   344.  0.004    20.    20.  0.037    20.
0 288 271  5   5.5   250.  0.011    0.     0.  0.013    5.5
          120.   250.  0.011    20.    20.  0.037    20.
0 289 162  5   5.5  2700.  0.011    0.     0.  0.013    3.5
          120.  2700.  0.011    20.    20.  0.037    20.
0 296 316  4   80.  3500.  0.002    4.     4.  0.030    8.5
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                120.  3500.  0.002    50.    50.  0.028    10.
0 297 298   2    5.   350.  0.005     0.     0.  0.013     5.
0 298 211   4   20.   440.  0.008    10.    10.  0.050     2.
                120.   440.  0.008    50.    50.  0.040    20.
0 299 302   4   20.  2854.  0.008    10.    10.  0.046     2.
                120.  2854.  0.004    50.    50.  0.033    20.
0 301 224   3   10.     1.    0.1              0.01     1.
0 302 233 11 2    0.1    500.  0.001              0.035    0.1
    0     0    0.21      5.   3.05     19.   12.65    40.
 30.14    66.    56.     92.   90.45    115.  131.74   131.
176.83   145.  223.32   158.  270.77   171.
0 303 188   3   10.     1.    0.1              0.01     1.
0 304 296   3   10.     1.    0.1              0.01     1.
0 305 251   3   10.     1.    0.1              0.01     1.
0 306 140   3   10.     1.    0.1              0.01     1.
0 307 235   3   10.     1.    0.1              0.01     1.
0 308 114   3   10.     1.    0.1              0.01     1.
0 309 286   3   10.     1.    0.1              0.01     1.
0 310 234   3   10.     1.    0.1              0.01     1.
0 311 216   3   10.     1.    0.1              0.01     1.
0 312 148  7 2    0.1    10.    0.1                      0.1
    0.     0.    1.87    60.6   31.18    102.   81.28   123.
 164.2    122.   220.    170.   221.    9999.
0 315 115 12 2    0.1    10.    0.1                      0.1
    0.     0.    1.4     22.     9.     150.    25.1    402.
  50.2    822.   83.7   1393.  125.3   2079.  173.4   2853.
 226.4   3712.  272.1   4499.  283.8   4640.   342.   5520.
0 316 143  5 2    0.1    10.    0.1                      0.1
    0.     0.   32.0     64.    64.     176.    96.0    344.
 103.5    542.  103.6   9999.
0 993 1093  0 3           1.
0 1093  992  0 4   10.0  5109.   .008    4.0    4.0  0.040    1.0
                18.0  5109.   .008   50.0   50.0  0.040   10.0
0 992  892  0 3           1.
0 892 1092  5 2    0.1     1.   .001              0.015    0.1
    0     0    5.3    26.0   24.4    103.0   135.0   153.0
 230.0   193.0  231.0  9999.0
0 1092 1192  0 4   10.0  2100.   .006    4.0    4.0  0.040    1.0
                18.0  2100.   .006   50.0   50.0  0.040   10.0
0 1192  122  0 5   12.4    60.   .005              0.013   10.0
               400.0    60.   .005   50.0   50.0  0.015   14.0
401  131  231  3 3           1.
    0     0    528     528    900     528
   401  402   3           1.
   402  210   2    6.5   196   0.013      0      0  0.015    6.5
403  140  200  3 3           1.
    0.     0.   560.    560.    900.    560.     0.      0.
0 403 238   3           1.
0 238 164   2    7.6   245.  0.005              0.013     8.
0 238 164   2    7.6   245.  0.005              0.013     8.
-1  904  122  5 3    10.     1.    0.1              0.01    10.
    0.     0.    .92     92.    2.08   2317.    4.08    747.
   16.0    273.

 0
 6
 100  104  110  141  115  122   0   0   0   0   0   0   0   0   0   0
ENDPROGRAM
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SWMM 10 YR Master Plan

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 2  1  1  2
 3  4
WATERSHED  1
LOWER THIRD CREEK, 10 YR MP with Trib G&L Detention
KIOWA ENGINEERING CORPORATION 3/05
    192      5.0                                        1
     1  100
     2  135
     3  101
     4  100
     5  103
     6  123
     7  104
     8  104
     9  105
    10  124
    11  125
    12  106
    13  106
    14  157
    15  126
    16  108
    17  127
    18  128
    19  129
    20  131
    21  131
    22  109
    23  187
    24  134
    25  111
    26  133
    27  110
    28  112
    29  308
    30  158
    31  158
    32  158
    33  308
    34  159
    35  181
    36  159
    37  162
    38  162
    39  306
    40  115
    41  138
    42  182
    43  173
    44  160
    45  161
    46  190
    47  140
    48  141
    49  116
    50  116
    51  117
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52 118
53 155
54 154
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62 142
63 183
64 316
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84 132
85 150
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87 146
88 174
89 174
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97 175
98 121
992 992
993 993

0 100  0  3  10.  1.  0.1        0.01  1.
0 101 285  3  10.  1.  0.1        0.01  1.
0 102 273  3  10.  1.  0.1        0.01  1.
0 103 203  3  10.  1.  0.1        0.01  1.
0 104 204  3  10.  1.  0.1        0.01  1.
0 105 205  3  10.  1.  0.1        0.01  1.
0 106 206  3  10.  1.  0.1        0.01  1.
0 107 207  3  10.  1.  0.1        0.01  1.
0 108 208  3  10.  1.  0.1        0.01  1.
0 109 209  3  10.  1.  0.1        0.01  1.
0 110 210  3  10.  1.  0.1        0.01  1.
0 111 211  3  10.  1.  0.1        0.01  1.
0 112 212  3  10.  1.  0.1        0.01  1.
0 113 213  3  10.  1.  0.1        0.01  1.
0 114 214  3  10.  1.  0.1        0.01  1.
0 115 215  3  10.  1.  0.1        0.01  1.
0 116 311  3  10.  1.  0.1        0.01  1.
0 117 217  3  10.  1.  0.1        0.01  1.
0 118 218  3  10.  1.  0.1        0.01  1.
0 119 280  3  10.  1.  0.1        0.01  1.
0 120 220  3  10.  1.  0.1        0.01  1.
0 121 221  3  10.  1.  0.1        0.01  1.
0 122 222  3  10.  1.  0.1        0.01  1.
0 123 278  3  10.  1.  0.1        0.01  1.
0 124 223  3  10.  1.  0.1        0.01  1.
0 125 274  3  10.  1.  0.1        0.01  1.
0 126 226  3  10.  1.  0.1        0.01  1.
0 127 228  3  10.  1.  0.1        0.01  1.
0 128 229  3  10.  1.  0.1        0.01  1.
0 129 227  3  10.  1.  0.1        0.01  1.
0 130 287  3  10.  1.  0.1        0.01  1.
0 132 304  3  10.  1.  0.1        0.01  1.
0 133 232  3  10.  1.  0.1        0.01  1.
0 134 281  3  10.  1.  0.1        0.01  1.
0 135 202  3  10.  1.  0.1        0.01  1.
0 136 288  3  10.  1.  0.1        0.01  1.
0 137 219  3  10.  1.  0.1        0.01  1.
0 138 236  3  10.  1.  0.1        0.01  1.
0 139 307  3  10.  1.  0.1        0.01  1.
0 141 200  3  10.  1.  0.1        0.01  1.
0 142 240  3  10.  1.  0.1        0.01  1.
0 143 237  3  10.  1.  0.1        0.01  1.
0 144 276  3  10.  1.  0.1        0.01  1.
0 145 266  3  10.  1.  0.1        0.01  1.
0 146 267  3  10.  1.  0.1        0.01  1.
0 147 230  3  10.  1.  0.1        0.01  1.
0 148 254  3  10.  1.  0.1        0.01  1.
0 149 255  3  10.  1.  0.1        0.01  1.
0 150 256  3  10.  1.  0.1        0.01  1.
0 151 257  3  10.  1.  0.1        0.01  1.
0 152 259  3  10.  1.  0.1        0.01  1.
0 153 264  3  10.  1.  0.1        0.01  1.
0 154 268  3  10.  1.  0.1        0.01  1.
0 155 269  3  10.  1.  0.1        0.01  1.
0 156 265  3  10.  1.  0.1        0.01  1.
0 157 275  3  10.  1.  0.1        0.01  1.
0 158 302  3  10.  1.  0.1        0.01  1.
0 159 309  3  10.  1.  0.1        0.01  1.
0 160 282  3  10.  1.  0.1        0.01  1.
0 161 310  3  10.  1.  0.1        0.01  1.
0 162 299  3  10.  1.  0.1        0.01  1.
0 163 244  3  10.  1.  0.1        0.01  1.
0 164 279  3  10.  1.  0.1        0.01  1.
0 165 245  3  10.  1.  0.1        0.01  1.
0 166 246  3  10.  1.  0.1        0.01  1.
0 167 250  3  10.  1.  0.1        0.01  1.
0 168 243  3  10.  1.  0.1        0.01  1.
0 169 242  3  10.  1.  0.1        0.01  1.
0 170 241  3  10.  1.  0.1        0.01  1.
0 171 248  3  10.  1.  0.1        0.01  1.
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0 173 270  3   10.    1.   0.1              0.01    1.
0 174 305  3   10.    1.   0.1              0.01    1.
0 175 258  3   10.    1.   0.1              0.01    1.
0 176 252  3   10.    1.   0.1              0.01    1.
0 177 263  3   10.    1.   0.1              0.01    1.
0 178 262  3   10.    1.   0.1              0.01    1.
0 179 261  3   10.    1.   0.1              0.01    1.
0 180 260  3   10.    1.   0.1              0.01    1.
0 181 159  3   10.    1.   0.1              0.01    1.
0 182 283  3   10.    1.   0.1              0.01    1.
0 183 239  3   10.    1.   0.1              0.01    1.
0 184 277  3   10.    1.   0.1              0.01    1.
0 185 284  3   10.    1.   0.1              0.01    1.
0 186 225  3   10.    1.   0.1              0.01    1.
0 187 301  3   10.    1.   0.1              0.01    1.
0 190 289  3   10.    1.   0.1              0.01    1.
0 188 247  3   10.    1.   0.1              0.01    1.
0 200 136  4   10.  964.  0.004   10.   10.  0.047    2.
          50.  964.  0.004   50.   50.  0.033   20.
0 202 101  4   20. 2327.  0.003   20.   20.  0.04    3.
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0 203 102  4   20. 1902.  0.004   20.   20.  0.044    3.
         120. 1902.  0.004   50.   50.  0.033   20.
0 204 103  4   20. 2673.  0.004   20.   20.  0.044    3.
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0 205 104  4   60. 1621.  0.003    4.    4.  0.037    3.
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0 206 105  4   50. 4148. 0.0034    4.    4.  0.039    3.
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0 207 106  4   15.  717.  0.003    4.    4.  0.037    4.
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0 208 107  4   20. 2763.  0.003   10.   10.  0.039    3.
         120. 2763.  0.003   40.   40.  0.03   20.
0 209 108  4   20. 3945.  0.003    4.    4.  0.036    5.
         120. 3945.  0.003   40.   40.  0.03   20.
0 210 109  4   20. 3217.  0.007    4.    4.  0.053    3.
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0 211 110  4   20. 1323.  0.008    4.    4.  0.056    3.
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0 212 111  4   50. 2426.  0.003    4.    4.  0.037    3.
         150. 2426.  0.003   50.   50.  0.03   20.
0 213 112  4   20. 2473.  0.005    4.    4.  0.046    3.
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0 214 113  4   20.  443.  0.003   10.   10.  0.039    3.
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0 215 308  4   20. 1622.  0.003   10.   10.  0.039    3.
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0 216 164  4   20. 1324.  0.003   10.   10.  0.039    3.
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0 217 116  4   20. 3243.  0.005   10.   10.  0.047    3.
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0 218 117  4   20.  282.  0.003   10.   10.  0.039    3.
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0 219 118  4   20. 2003.  0.003   10.   10.  0.039    3.
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0 220 147  4   20. 2196.  0.003    4.    4.  0.037    4.
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0 221 120  4   20. 5356.  0.001    4.    4.  0.024    5.
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0 222 121  4    8. 4084.  0.012    4.    4.  0.066    3.
          32. 4084.  0.012   20.   20.  0.071   20.
0 224 110  4   20. 2002.  0.003    4.    4.  0.04    2.
         120. 2002.  0.003   50.   50.  0.03   20.
0 223 105  4   20. 1141.  0.002   10.   10.  0.035    2.
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0 225 106  4   20. 2475.  0.001   10.   10.  0.027    2.
         120. 2475.  0.001   50.   50.  0.02   20.
0 226 107  4   10. 2015.  0.006    4.    4.  0.054    2.
         110. 2015.  0.006   50.   50.  0.039   20.
0 227 126  4   20. 2686. 0.0052   10.   10.  0.056    1.
         120. 2686. 0.0052   50.   50.  0.037   20.
0 228 108  4   10.  645.  0.016    4.    4.  0.078    2.
         110.  645.  0.016   50.   50.  0.056   20.
0 229 127  4   10.  838.  0.003    4.    4.  0.041    2.
         110.  838.  0.003   50.   50.  0.03   20.
0 230 119  4   20.  302.  0.003    4.    4.  0.037    4.
         120.  302.  0.003   20.   20.  0.029   20.
0 231 130  4   20. 2856.  0.004   10.   10.  0.046    2.
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0 232 111  4   20. 1120.  0.005   10.   10.  0.05    2.
         120. 1120.  0.005   50.   50.  0.036   20.
0 233 297  4   20. 2070.  0.008   10.   10.  0.060    2.
         120. 2070.  0.008   50.   50.  0.043   20.
0 234 173  4   20. 3316.  0.013   10.   10.  0.072    2.
         120. 3316.  0.013   50.   50.  0.052   20.
0 235 140  4   40. 1047.  0.019   10.   10.  0.09    1.
         120. 1047.  0.019   50.   50.  0.06   20.
0 236 116  4   50. 2857. 0.0035   10.   10.  0.047    1.
         200. 2857. 0.0035   50.   50.  0.031   20.
0 237 184  5    6.  183.  0.035    0.    0.  0.013    6.
         100. 1400.  0.005   50.   50.  0.051   20.
0 239 141  4   40. 2088. 0.0030   10.   10.  0.041    2.
         120. 2088. 0.0030   50.   50.  0.030   20.
0 240 140  4   20. 2733.  0.015    5.    5.  0.082    1.
         120. 2733.  0.015   50.   50.  0.055   20.
0 241 139  4   20. 2126.  0.009   10.   10.  0.069    1.
         120. 2126.  0.009   50.   50.  0.045   20.
0 242 168  4   20.  927.  0.013    5.    5.  0.071    2.
         120.  927.  0.013   50.   50.  0.052   20.
0 243 161  4   20. 1224.  0.002   10.   10.  0.035    2.
         120. 1224.  0.002   50.   50.  0.025   20.
0 244 160  4   20. 1747.  0.007   10.   10.  0.057    2.
         120. 1747.  0.007   50.   50.  0.041   20.
0 245 163  4   20. 2060.  0.006   10.   10.  0.054    2.
         120. 2060.  0.006   50.   50.  0.039   20.
0 246 165  4   20. 3293.  0.007   10.   10.  0.057    2.
         120. 3293.  0.007   50.   50.  0.041   20.
0 247 168  4   40. 1278.  0.02   10.   10.  0.083    2.
         120. 1278.  0.02   50.   50.  0.061   20.
0 248 170  4  100. 1834.  0.013   10.   10.  0.077    1.
         200. 1834.  0.013   50.   50.  0.051   20.
0 250 132  4  100. 2986.  0.008   10.   10.  0.064    1.
         200. 2986.  0.008   50.   50.  0.043   20.
0 251 167  4   20. 1081.  0.004   10.   10.  0.051    1.
         120. 1081.  0.004   50.   50.  0.033   20.
0 252 174  4   20. 2585.  0.005    5.    5.  0.049    2.
         120. 2585.  0.005   50.   50.  0.036   20.
0 254 147  4   20.  637.  0.003   10.   10.  0.045    1.
         120.  637.  0.003   50.   50.  0.03   20.
0 255 150  4   70. 1579.  0.004    5.    5.  0.049    1.
```

```
          200.  1579.  0.004    50.    50.  0.033    20.
0 256 145  4   100.  2710.  0.013    10.    10.  0.077     1.
          200.  2710.  0.013    50.    50.  0.051    20.
0 257 149  4   100.  1831.  0.014    10.    10.  0.079     1.
          200.  1831.  0.014    50.    50.  0.053    20.
0 258 151  4   100.  3598.  0.01    10.    10.  0.069     1.
          200.  3598.  0.01    50.    50.  0.047    20.
0 259 149  4   100.  1401.  0.012    10.    10.  0.074     1.
          200.  1401.  0.012    50.    50.  0.05    20.
0 260 150  4   100.  2084.  0.007    10.    10.  0.06     1.
          200.  2084.  0.007    50.    50.  0.041    20.
0 261 176  4    20.  1626.  0.009    10.    10.  0.063     2.
          120.  1626.  0.009    50.    50.  0.045    20.
0 262 179  4   100.  1461.  0.006    10.    10.  0.057     1.
          200.  1461.  0.006    50.    50.  0.038    20.
0 263 179  4   100.  1278.  0.007    10.    10.  0.06     1.
          200.  1278.  0.007    50.    50.  0.041    20.
0 264 121  4   100.  2606.  0.019     5.     5.  0.063     2.
          400.  2606.  0.019    50.    50.  0.045    20.
0 265 122  4    20.  1802.  0.024     4.     4.  0.089     2.
          120.  1802.  0.024    50.    50.  0.065    20.
0 266 312  4    20.  3270.  0.007     5.     5.  0.056     2.
          120.  3270.  0.007    50.    50.  0.041    20.
0 267 145  4   100.   972.  0.002    10.    10.  0.038     1.
          200.   972.  0.002    50.    50.  0.025    20.
0 268 120  4   100.  1610.  0.031    10.    10.  0.089     1.
          400.  1610.  0.031    50.    50.  0.065    20.
0 269 119  4    10.   730.  0.025    10.    10.  0.103     1.
          100.   730.  0.025    50.    50.  0.066    20.
0 270 181  4    20.  1456.  0.006     5.     5.  0.053     2.
          120.  1456.  0.006    50.    50.  0.039    20.
0 271 164  4    50.  1908.  0.002    10.    10.  0.035     2.
          150.  1908.  0.002    50.    50.  0.025    20.
0 273 100  4    20.   703.  0.002    10.    10.  0.041     2.
          120.   703.  0.002    50.    50.  0.03    20.
0 274 186  4    20.  1045.  0.001    10.    10.  0.027     2.
          120.  1045.  0.001    50.    50.  0.02    20.
0 275 186  4    20.  1420.  0.011    10.    10.  0.068     2.
          120.  1420.  0.011    50.    50.  0.049    20.
0 276 137  4    20.  2158.  0.006     4.     4.  0.047     5.
          120.  2158.  0.006    50.    50.  0.043    10.
0 277 144  4    17.   262.  0.008     3.     3.  0.044     1.
          120.   262.  0.008    50.    50.  0.048    10.
0 278 103  4    20.   708.  0.007     4.     4.  0.056     2.
          120.   708.  0.007    50.    50.  0.041    20.
0 279 315  4    20.  2452.  0.003    10.    10.  0.039     3.
          120.  2452.  0.003    25.    25.  0.029    20.
0 280 137  4    20.  1804.  0.003    10.    10.  0.039     3.
          120.  1804.  0.003    50.    50.  0.03    20.
0 281 133  4    20.  3622.  0.004    10.    10.  0.046     2.
          120.  3622.  0.004    50.    50.  0.033    20.
0 282 182  4    20.  2352.  0.006    10.    10.  0.054     2.
          120.  2352.  0.006    50.    50.  0.039    20.
0 283 159  4    20.  1995.  0.004    10.    10.  0.046     2.
          120.  1995.  0.004    50.    50.  0.033    20.
0 284 132  4    20.  3155.  0.006    10.    10.  0.054     2.
          120.  3155.  0.006    50.    50.  0.039    20.
0 285 102  4    35.   502.  0.001    10.    10.  0.027     2.
          135.   502.  0.001    50.    50.  0.02    20.
0 286 158  4    20.  1328.  0.004    10.    10.  0.060     2.
          120.  1328.  0.008    50.    50.  0.043    20.
0 287 109  5   5.0   344.  0.005     1.     1.  0.017     5.0
          120.   344.  0.004    20.    20.  0.037    20.
0 288 271  5   5.5   250.  0.011     0.     0.  0.013     5.5
          120.   250.  0.011    20.    20.  0.037    20.
0 289 162  5   5.5  2700.  0.011     0.     0.  0.013     3.5
          120.  2700.  0.011    20.    20.  0.037    20.
0 296 316  4    80.  3500.  0.002     4.     4.  0.030     8.5
          120.  3500.  0.002    50.    50.  0.028    10.
0 297 298  2     5.   350.  0.005     0.     0.  0.013     5.
0 298 211  4    20.   440.  0.008    10.    10.  0.050     2.
          120.   440.  0.008    50.    50.  0.040    20.
0 299 302  4    20.  2854.  0.008    10.    10.  0.046     2.
          120.  2854.  0.004    50.    50.  0.033    20.
0 301 224  3    10.     1.   0.1              0.01     1.
0 302 233 11 2   0.1   500.  0.001              0.035    0.1
    0     0   0.21     5.   3.05    19.   12.65    40.
 30.14    66.    56.    92.   90.45   115.  131.74   131.
176.83   145.  223.32   158.  270.77   171.
0 303 188  3    10.     1.   0.1              0.01     1.
0 304 296  3    10.     1.   0.1              0.01     1.
0 305 251  3    10.     1.   0.1              0.01     1.
0 306 140  3    10.     1.   0.1              0.01     1.
0 307 235  3    10.     1.   0.1              0.01     1.
0 308 114  3    10.     1.   0.1              0.01     1.
0 309 286  3    10.     1.   0.1              0.01     1.
0 310 234  3    10.     1.   0.1              0.01     1.
0 311 216  3    10.     1.   0.1              0.01     1.
0 312 148  7 2   0.1    10.   0.1                       0.1
    0.     0.   1.87    60.6   31.18   102.   81.28   123.
 164.2   122.   220.    170.   221.   9999.
0 315 115 12 2   0.1    10.   0.1                       0.1
    0.     0.    1.4    22.     9.   150.    25.1   402.
  50.2   822.    83.7  1393.   125.3  2079.   173.4  2853.
 226.4  3712.   272.1  4499.   283.8  4640.   342.   5520.
0 316 143  5 2   0.1    10.   0.1                       0.1
    0.     0.   32.0    64.    64.   176.    96.0   344.
 103.5   542.   103.6  9999.
0 993 1093  0 3          1.
0 1093 992  0 4   10.0  5109.   .008    4.0    4.0  0.040    1.0
             18.0  5109.   .008   50.0   50.0  0.040   10.0
0 992 892  0 3           1.
0 892 1092  5 2   0.1     1.   .001              0.015    0.1
    0     0    5.3    26.0   24.4   103.0   135.0   153.0
 230.0   193.0   231.0  9999.0
0 1092 1192  0 4   10.0  2100.   .006    4.0    4.0  0.040    1.0
             18.0  2100.   .006   50.0   50.0  0.040   10.0
0 1192 122  0 5   12.4    60.   .005              0.013   10.0
            400.0    60.   .005   50.0   50.0  0.015   14.0
401 131 231  3 3          1.
    0     0   528     528    900    528
  401 402   3          1.
  402 210   2    6.5   196   0.013     0     0  0.015    6.5
403 140 200  3 3          1.
    0.     0.   560.    560.   900.   560.     0.     0.
0 403 238   3          1.
0 238 164   2    7.6   245.  0.005              0.013     8.
-1 904 122  6 3   10.     1.   0.1              0.01    10.
    0.     0.   1.33    92.   2.50   726.    4.17   483.
 10.33   177.    16.0   132.
```

```
  0
  6
 100  104  110  141  115  122   0   0   0   0   0   0   0   0   0   0
ENDPROGRAM
```

SWMM 5 YR Master Plan

```
  2  1  1  2
  3  4
WATERSHED   1
LOWER THIRD CREEK, 5 YR MP with Trib G&L Detention
KIOWA ENGINEERING CORPORATION 3/05
     192      5.0                                    1
       1  100
       2  135
       3  101
       4  100
       5  103
       6  123
       7  104
       8  104
       9  105
      10  124
      11  125
      12  106
      13  106
      14  157
      15  126
      16  108
      17  127
      18  128
      19  129
      20  131
      21  131
      22  109
      23  187
      24  134
      25  111
      26  133
      27  110
      28  112
      29  308
      30  158
      31  158
      32  158
      33  308
      34  159
      35  181
      36  159
      37  162
      38  162
      39  306
      40  115
      41  138
      42  182
      43  173
      44  160
      45  161
      46  190
      47  140
      48  141
      49  116
      50  116
      51  117
      52  118
      53  155
      54  154
      55  119
      56  118
      57  163
      58  163
      59  168
      60  169
      61  170
      62  142
      63  183
      64  316
      65  184
      66  144
      67  312
      68  312
      69  120
      70  120
      71  153
      72  156
      73  121
      74  165
      75  166
      76  303
      77  171
      78  304
      79  180
      80  150
      81  145
      82  145
      83  132
      84  132
      85  150
      86  150
      87  146
      88  174
      89  174
      90  174
      91  185
      92  151
      93  152
      94  176
      95  177
      96  178
      97  175
      98  121
     992  992
     993  993

   0  100    0   3    10.    1.    0.1          0.01    1.
   0  101  285   3    10.    1.    0.1          0.01    1.
   0  102  273   3    10.    1.    0.1          0.01    1.
   0  103  203   3    10.    1.    0.1          0.01    1.
   0  104  204   3    10.    1.    0.1          0.01    1.
   0  105  205   3    10.    1.    0.1          0.01    1.
```

```
0 106 206  3  10.  1.  0.1        0.01  1.
0 107 207  3  10.  1.  0.1        0.01  1.
0 108 208  3  10.  1.  0.1        0.01  1.
0 109 209  3  10.  1.  0.1        0.01  1.
0 110 210  3  10.  1.  0.1        0.01  1.
0 111 211  3  10.  1.  0.1        0.01  1.
0 112 212  3  10.  1.  0.1        0.01  1.
0 113 213  3  10.  1.  0.1        0.01  1.
0 114 214  3  10.  1.  0.1        0.01  1.
0 115 215  3  10.  1.  0.1        0.01  1.
0 116 311  3  10.  1.  0.1        0.01  1.
0 117 217  3  10.  1.  0.1        0.01  1.
0 118 218  3  10.  1.  0.1        0.01  1.
0 119 280  3  10.  1.  0.1        0.01  1.
0 120 220  3  10.  1.  0.1        0.01  1.
0 121 221  3  10.  1.  0.1        0.01  1.
0 122 222  3  10.  1.  0.1        0.01  1.
0 123 278  3  10.  1.  0.1        0.01  1.
0 124 223  3  10.  1.  0.1        0.01  1.
0 125 274  3  10.  1.  0.1        0.01  1.
0 126 226  3  10.  1.  0.1        0.01  1.
0 127 228  3  10.  1.  0.1        0.01  1.
0 128 229  3  10.  1.  0.1        0.01  1.
0 129 227  3  10.  1.  0.1        0.01  1.
0 130 287  3  10.  1.  0.1        0.01  1.
0 132 304  3  10.  1.  0.1        0.01  1.
0 133 232  3  10.  1.  0.1        0.01  1.
0 134 281  3  10.  1.  0.1        0.01  1.
0 135 202  3  10.  1.  0.1        0.01  1.
0 136 288  3  10.  1.  0.1        0.01  1.
0 137 219  3  10.  1.  0.1        0.01  1.
0 138 236  3  10.  1.  0.1        0.01  1.
0 139 307  3  10.  1.  0.1        0.01  1.
0 141 200  3  10.  1.  0.1        0.01  1.
0 142 240  3  10.  1.  0.1        0.01  1.
0 143 237  3  10.  1.  0.1        0.01  1.
0 144 276  3  10.  1.  0.1        0.01  1.
0 145 266  3  10.  1.  0.1        0.01  1.
0 146 267  3  10.  1.  0.1        0.01  1.
0 147 230  3  10.  1.  0.1        0.01  1.
0 148 254  3  10.  1.  0.1        0.01  1.
0 149 255  3  10.  1.  0.1        0.01  1.
0 150 256  3  10.  1.  0.1        0.01  1.
0 151 257  3  10.  1.  0.1        0.01  1.
0 152 259  3  10.  1.  0.1        0.01  1.
0 153 264  3  10.  1.  0.1        0.01  1.
0 154 268  3  10.  1.  0.1        0.01  1.
0 155 269  3  10.  1.  0.1        0.01  1.
0 156 265  3  10.  1.  0.1        0.01  1.
0 157 275  3  10.  1.  0.1        0.01  1.
0 158 302  3  10.  1.  0.1        0.01  1.
0 159 309  3  10.  1.  0.1        0.01  1.
0 160 282  3  10.  1.  0.1        0.01  1.
0 161 310  3  10.  1.  0.1        0.01  1.
0 162 299  3  10.  1.  0.1        0.01  1.
0 163 244  3  10.  1.  0.1        0.01  1.
0 164 279  3  10.  1.  0.1        0.01  1.
0 165 245  3  10.  1.  0.1        0.01  1.
0 166 246  3  10.  1.  0.1        0.01  1.
0 167 250  3  10.  1.  0.1        0.01  1.
0 168 243  3  10.  1.  0.1        0.01  1.
0 169 242  3  10.  1.  0.1        0.01  1.
0 170 241  3  10.  1.  0.1        0.01  1.
0 171 248  3  10.  1.  0.1        0.01  1.
0 173 270  3  10.  1.  0.1        0.01  1.
0 174 305  3  10.  1.  0.1        0.01  1.
0 175 258  3  10.  1.  0.1        0.01  1.
0 176 252  3  10.  1.  0.1        0.01  1.
0 177 263  3  10.  1.  0.1        0.01  1.
0 178 262  3  10.  1.  0.1        0.01  1.
0 179 261  3  10.  1.  0.1        0.01  1.
0 180 260  3  10.  1.  0.1        0.01  1.
0 181 159  3  10.  1.  0.1        0.01  1.
0 182 283  3  10.  1.  0.1        0.01  1.
0 183 239  3  10.  1.  0.1        0.01  1.
0 184 277  3  10.  1.  0.1        0.01  1.
0 185 284  3  10.  1.  0.1        0.01  1.
0 186 225  3  10.  1.  0.1        0.01  1.
0 187 301  3  10.  1.  0.1        0.01  1.
0 190 289  3  10.  1.  0.1        0.01  1.
0 188 247  3  10.  1.  0.1        0.01  1.
0 200 136  4  10.  964.  0.004   10.   10.  0.047   2.
           50.  964.  0.004   50.   50.  0.033   20.
0 202 101  4  20.  2327.  0.003   20.   20.  0.04   3.
           120.  2327.  0.003   50.   50.  0.03   20.
0 203 102  4  20.  1902.  0.004   20.   20.  0.044   3.
           120.  1902.  0.004   50.   50.  0.033   20.
0 204 103  4  20.  2673.  0.004   20.   20.  0.044   3.
           120.  2673.  0.004   50.   50.  0.033   20.
0 205 104  4  60.  1621.  0.003   4.   4.  0.037   3.
           160.  1621.  0.003   50.   50.  0.03   20.
0 206 105  4  50.  4148.  0.0034   4.   4.  0.039   3.
           150.  4148.  0.0034   50.   50.  0.031   20.
0 207 106  4  15.  717.  0.003   4.   4.  0.037   4.
           115.  717.  0.003   20.   20.  0.029   20.
0 208 107  4  20.  2763.  0.003   10.   10.  0.039   3.
           120.  2763.  0.003   40.   40.  0.03   20.
0 209 108  4  20.  3945.  0.003   4.   4.  0.036   5.
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0 210 109  4  20.  3217.  0.007   4.   4.  0.053   3.
           120.  3217.  0.007   50.   50.  0.041   20.
0 211 110  4  20.  1323.  0.008   4.   4.  0.056   3.
           120.  1323.  0.008   50.   50.  0.043   20.
0 212 111  4  50.  2426.  0.003   4.   4.  0.037   3.
           150.  2426.  0.003   50.   50.  0.03   20.
0 213 112  4  20.  2473.  0.005   4.   4.  0.046   3.
           120.  2473.  0.005   50.   50.  0.036   20.
0 214 113  4  20.  443.  0.003   10.   10.  0.039   3.
           120.  443.  0.003   25.   25.  0.029   20.
0 215 308  4  20.  1622.  0.003   10.   10.  0.039   3.
           120.  1622.  0.003   25.   25.  0.028   25.
0 216 164  4  20.  1324.  0.003   10.   10.  0.039   3.
           120.  1324.  0.003   25.   25.  0.029   20.
0 217 116  4  20.  3243.  0.005   10.   10.  0.047   3.
           120.  3243.  0.005   25.   25.  0.036   20.
0 218 117  4  20.  282.  0.003   10.   10.  0.039   3.
           120.  282.  0.003   25.   25.  0.029   20.
0 219 118  4  20.  2003.  0.003   10.   10.  0.039   3.
           120.  2003.  0.003   20.   20.  0.029   20.
0 220 147  4  20.  2196.  0.003   4.   4.  0.037   4.
```

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          120.  2196.  0.003    20.    20.  0.029    20.
0 221 120   4    20.  5356.  0.001     4.     4.  0.024     5.
          120.  5356.  0.001    20.    20.  0.046    20.
0 222 121   4     8.  4084.  0.012     4.     4.  0.066     3.
           32.  4084.  0.012    20.    20.  0.071    20.
0 224 110   4    20.  2002.  0.003     4.     4.   0.04     2.
          120.  2002.  0.003    50.    50.   0.03    20.
0 223 105   4    20.  1141.  0.002    10.    10.  0.035     2.
          120.  1141.  0.002    50.    50.  0.025    20.
0 225 106   4    20.  2475.  0.001    10.    10.  0.027     2.
          120.  2475.  0.001    50.    50.   0.02    20.
0 226 107   4    10.  2015.  0.006     4.     4.  0.054     2.
          110.  2015.  0.006    50.    50.  0.039    20.
0 227 126   4    20.  2686. 0.0052    10.    10.  0.056     1.
          120.  2686. 0.0052    50.    50.  0.037    20.
0 228 108   4    10.   645.  0.016     4.     4.  0.078     2.
          110.   645.  0.016    50.    50.  0.056    20.
0 229 127   4    10.   838.  0.003     4.     4.  0.041     2.
          110.   838.  0.003    50.    50.   0.03    20.
0 230 119   4    20.   302.  0.003     4.     4.  0.037     4.
          120.   302.  0.003    20.    20.  0.029    20.
0 231 130   4    20.  2856.  0.004    10.    10.  0.046     2.
          120.  2856.  0.004    50.    50.  0.033    20.
0 232 111   4    20.  1120.  0.005    10.    10.   0.05     2.
          120.  1120.  0.005    50.    50.  0.036    20.
0 233 297   4    20.  2070.  0.008    10.    10.  0.060     2.
          120.  2070.  0.008    50.    50.  0.043    20.
0 234 173   4    20.  3316.  0.013    10.    10.  0.072     2.
          120.  3316.  0.013    50.    50.  0.052    20.
0 235 140   4    40.  1047.  0.019    10.    10.   0.09     1.
          120.  1047.  0.019    50.    50.   0.06    20.
0 236 116   4    50.  2857. 0.0035    10.    10.  0.047     1.
          200.  2857. 0.0035    50.    50.  0.031    20.
0 237 184   5     6.   183.  0.035     0.     0.  0.013     6.
          100.  1400.  0.005    50.    50.  0.051    20.
0 239 141   4    40.  2088. 0.0030    10.    10.  0.041     2.
          120.  2088. 0.0030    50.    50.  0.030    20.
0 240 140   4    20.  2733.  0.015     5.     5.  0.082     1.
          120.  2733.  0.015    50.    50.  0.055    20.
0 241 139   4    20.  2126.  0.009    10.    10.  0.069     1.
          120.  2126.  0.009    50.    50.  0.045    20.
0 242 168   4    20.   927.  0.013     5.     5.  0.071     2.
          120.   927.  0.013    50.    50.  0.052    20.
0 243 161   4    20.  1224.  0.002    10.    10.  0.035     2.
          120.  1224.  0.002    50.    50.  0.025    20.
0 244 160   4    20.  1747.  0.007    10.    10.  0.057     2.
          120.  1747.  0.007    50.    50.  0.041    20.
0 245 163   4    20.  2060.  0.006    10.    10.  0.054     2.
          120.  2060.  0.006    50.    50.  0.039    20.
0 246 165   4    20.  3293.  0.007    10.    10.  0.057     2.
          120.  3293.  0.007    50.    50.  0.041    20.
0 247 168   4    40.  1278.   0.02    10.    10.  0.083     2.
          120.  1278.   0.02    50.    50.  0.061    20.
0 248 170   4   100.  1834.  0.013    10.    10.  0.077     1.
          200.  1834.  0.013    50.    50.  0.051    20.
0 250 132   4   100.  2986.  0.008    10.    10.  0.064     1.
          200.  2986.  0.008    50.    50.  0.043    20.
0 251 167   4    20.  1081.  0.004    10.    10.  0.051     1.
          120.  1081.  0.004    50.    50.  0.033    20.
0 252 174   4    20.  2585.  0.005     5.     5.  0.049     2.
          120.  2585.  0.005    50.    50.  0.036    20.
0 254 147   4    20.   637.  0.003    10.    10.  0.045     1.
          120.   637.  0.003    50.    50.   0.03    20.
0 255 150   4    70.  1579.  0.004     5.     5.  0.049     1.
          200.  1579.  0.004    50.    50.  0.033    20.
0 256 145   4   100.  2710.  0.013    10.    10.  0.077     1.
          200.  2710.  0.013    50.    50.  0.051    20.
0 257 149   4   100.  1831.  0.014    10.    10.  0.079     1.
          200.  1831.  0.014    50.    50.  0.053    20.
0 258 151   4   100.  3598.   0.01    10.    10.  0.069     1.
          200.  3598.   0.01    50.    50.  0.047    20.
0 259 149   4   100.  1401.  0.012    10.    10.  0.074     1.
          200.  1401.  0.012    50.    50.   0.05    20.
0 260 150   4   100.  2084.  0.007    10.    10.   0.06     1.
          200.  2084.  0.007    50.    50.  0.041    20.
0 261 176   4    20.  1626.  0.009    10.    10.  0.063     2.
          120.  1626.  0.009    50.    50.  0.045    20.
0 262 179   4   100.  1461.  0.006    10.    10.  0.057     1.
          200.  1461.  0.006    50.    50.  0.038    20.
0 263 179   4   100.  1278.  0.007    10.    10.   0.06     1.
          200.  1278.  0.007    50.    50.  0.041    20.
0 264 121   4   100.  2606.  0.019     5.     5.  0.063     2.
          400.  2606.  0.019    50.    50.  0.045    20.
0 265 122   4    20.  1802.  0.024     4.     4.  0.089     2.
          120.  1802.  0.024    50.    50.  0.065    20.
0 266 312   4    20.  3270.  0.007     5.     5.  0.056     2.
          120.  3270.  0.007    50.    50.  0.041    20.
0 267 145   4   100.   972.  0.002    10.    10.  0.038     1.
          200.   972.  0.002    50.    50.  0.025    20.
0 268 120   4   100.  1610.  0.031    10.    10.  0.089     1.
          400.  1610.  0.031    50.    50.  0.065    20.
0 269 119   4    10.   730.  0.025    10.    10.  0.103     1.
          100.   730.  0.025    50.    50.  0.066    20.
0 270 181   4    20.  1456.  0.006     5.     5.  0.053     2.
          120.  1456.  0.006    50.    50.  0.039    20.
0 271 164   4    50.  1908.  0.002    10.    10.  0.035     2.
          150.  1908.  0.002    50.    50.  0.025    20.
0 273 100   4    20.   703.  0.002    10.    10.  0.041     2.
          120.   703.  0.002    50.    50.   0.03    20.
0 274 186   4    20.  1045.  0.001    10.    10.  0.027     2.
          120.  1045.  0.001    50.    50.   0.02    20.
0 275 186   4    20.  1420.  0.011    10.    10.  0.068     2.
          120.  1420.  0.011    50.    50.  0.049    20.
0 276 137   4    20.  2158.  0.006     4.     4.  0.047     5.
          120.  2158.  0.006    50.    50.  0.043    10.
0 277 144   4    17.   262.  0.008     3.     3.  0.044     1.
          120.   262.  0.008    50.    50.  0.048    10.
0 278 103   4    20.   708.  0.007     4.     4.  0.056     2.
          120.   708.  0.007    50.    50.  0.041    20.
0 279 315   4    20.  2452.  0.003    10.    10.  0.039     3.
          120.  2452.  0.003    25.    25.  0.029    20.
0 280 137   4    20.  1804.  0.003    10.    10.  0.039     3.
          120.  1804.  0.003    50.    50.   0.03    20.
0 281 133   4    20.  3622.  0.004    10.    10.  0.046     2.
          120.  3622.  0.004    50.    50.  0.033    20.
0 282 182   4    20.  2352.  0.006    10.    10.  0.054     2.
          120.  2352.  0.006    50.    50.  0.039    20.
0 283 159   4    20.  1995.  0.004    10.    10.  0.046     2.
          120.  1995.  0.004    50.    50.  0.033    20.
0 284 132   4    20.  3155.  0.006    10.    10.  0.054     2.
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            120.  3155.  0.006    50.    50.  0.039    20.
0 285 102   4    35.   502.  0.001    10.    10.  0.027     2.
            135.   502.  0.001    50.    50.   0.02    20.
0 286 158   4    20.  1328.  0.004    10.    10.  0.060     2.
            120.  1328.  0.008    50.    50.  0.043    20.
0 287 109   5   5.0   344.  0.005     1.     1.  0.017    5.0
            120.   344.  0.004    20.    20.  0.037    20.
0 288 271   5   5.5   250.  0.011     0.     0.  0.013    5.5
            120.   250.  0.011    20.    20.  0.037    20.
0 289 162   5   5.5  2700.  0.011     0.     0.  0.013    3.5
            120.  2700.  0.011    20.    20.  0.037    20.
0 296 316   4    80.  3500.  0.002     4.     4.  0.030    8.5
            120.  3500.  0.002    50.    50.  0.028    10.
0 297 298   2     5.   350.  0.005     0.     0.  0.013     5.
0 298 211   4    20.   440.  0.008    10.    10.  0.050     2.
            120.   440.  0.008    50.    50.  0.040    20.
0 299 302   4    20.  2854.  0.008    10.    10.  0.046     2.
            120.  2854.  0.004    50.    50.  0.033    20.
0 301 224   3    10.     1.   0.1              0.01     1.
0 302 233 11 2    0.1   500.  0.001              0.035    0.1
   0     0    0.21     5.   3.05    19.   12.65    40.
 30.14    66.    56.    92.   90.45   115.  131.74   131.
176.83   145.  223.32   158.  270.77   171.
0 303 188   3    10.     1.   0.1              0.01     1.
0 304 296   3    10.     1.   0.1              0.01     1.
0 305 251   3    10.     1.   0.1              0.01     1.
0 306 140   3    10.     1.   0.1              0.01     1.
0 307 235   3    10.     1.   0.1              0.01     1.
0 308 114   3    10.     1.   0.1              0.01     1.
0 309 286   3    10.     1.   0.1              0.01     1.
0 310 234   3    10.     1.   0.1              0.01     1.
0 311 216   3    10.     1.   0.1              0.01     1.
0 312 148  7 2    0.1    10.   0.1                       0.1
   0.     0.    1.87    60.6   31.18    102.   81.28    123.
 164.2    122.   220.    170.   221.   9999.
0 315 115 12 2    0.1    10.   0.1                       0.1
   0.     0.     1.4    22.     9.    150.    25.1    402.
  50.2    822.   83.7   1393.  125.3   2079.  173.4   2853.
 226.4   3712.  272.1   4499.  283.8   4640.   342.   5520.
0 316 143  5 2    0.1    10.   0.1                       0.1
   0.     0.    32.0    64.    64.    176.   96.0    344.
 103.5    542.  103.6   9999.
0 993 1093  0 3            1.
0 1093 992  0 4   10.0  5109.   .008    4.0    4.0  0.040    1.0
             18.0  5109.   .008   50.0   50.0  0.040   10.0
0 992 892  0 3            1.
0 892 1092  5 2    0.1     1.   .001              0.015    0.1
   0     0     5.3    26.0    24.4   103.0   135.0   153.0
 230.0   193.0  231.0  9999.0
0 1092 1192  0 4   10.0  2100.   .006    4.0    4.0  0.040    1.0
             18.0  2100.   .006   50.0   50.0  0.040   10.0
0 1192  122  0 5   12.4    60.   .005              0.013   10.0
            400.0    60.   .005   50.0   50.0  0.015   14.0
401  131  231  3 3            1.
   0     0    528    528    900    528
  401  402    3            1.
  402  210    2    6.5   196   0.013      0     0  0.015    6.5
403  140  200  3 3            1.
   0.     0.   560.    560.    900.    560.     0.     0.
0 403  238    3            1.
0 238  164    2    7.6   245.  0.005              0.013     8.
-1 904  122 5 3    10.     1.    0.1              0.01    10.
   0.     0.    1.75    98.    3.25   400.    9.25   160.
  16.00   120.

 0
 6
 100 104 110 141 115 122   0   0   0   0   0   0   0   0   0   0
ENDPROGRAM
```

SWMM 2 YR Master Plan

```
 2  1  1  2
 3  4
WATERSHED   1
LOWER THIRD CREEK, 2 YR MP with Trib G&L Detention
KIOWA ENGINEERING CORPORATION 3/05
    192      5.0                                        1
     1  100
     2  135
     3  101
     4  100
     5  103
     6  123
     7  104
     8  104
     9  105
    10  124
    11  125
    12  106
    13  106
    14  157
    15  126
    16  108
    17  127
    18  128
    19  129
    20  131
    21  131
    22  109
    23  187
    24  134
    25  111
    26  133
    27  110
    28  112
    29  308
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30 158
31 158
32 158
33 308
34 159
35 181
36 159
37 162
38 162
39 306
40 115
41 138
42 182
43 173
44 160
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97 175
98 121
992 992
993 993

0	100	0	3	10.	1.	0.1	0.01	1.
0	101	285	3	10.	1.	0.1	0.01	1.
0	102	273	3	10.	1.	0.1	0.01	1.
0	103	203	3	10.	1.	0.1	0.01	1.
0	104	204	3	10.	1.	0.1	0.01	1.
0	105	205	3	10.	1.	0.1	0.01	1.
0	106	206	3	10.	1.	0.1	0.01	1.
0	107	207	3	10.	1.	0.1	0.01	1.
0	108	208	3	10.	1.	0.1	0.01	1.
0	109	209	3	10.	1.	0.1	0.01	1.
0	110	210	3	10.	1.	0.1	0.01	1.
0	111	211	3	10.	1.	0.1	0.01	1.
0	112	212	3	10.	1.	0.1	0.01	1.
0	113	213	3	10.	1.	0.1	0.01	1.
0	114	214	3	10.	1.	0.1	0.01	1.
0	115	215	3	10.	1.	0.1	0.01	1.
0	116	311	3	10.	1.	0.1	0.01	1.
0	117	217	3	10.	1.	0.1	0.01	1.

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0 118 218  3   10.   1.   0.1          0.01   1.
0 119 280  3   10.   1.   0.1          0.01   1.
0 120 220  3   10.   1.   0.1          0.01   1.
0 121 221  3   10.   1.   0.1          0.01   1.
0 122 222  3   10.   1.   0.1          0.01   1.
0 123 278  3   10.   1.   0.1          0.01   1.
0 124 223  3   10.   1.   0.1          0.01   1.
0 125 274  3   10.   1.   0.1          0.01   1.
0 126 226  3   10.   1.   0.1          0.01   1.
0 127 228  3   10.   1.   0.1          0.01   1.
0 128 229  3   10.   1.   0.1          0.01   1.
0 129 227  3   10.   1.   0.1          0.01   1.
0 130 287  3   10.   1.   0.1          0.01   1.
0 132 304  3   10.   1.   0.1          0.01   1.
0 133 232  3   10.   1.   0.1          0.01   1.
0 134 281  3   10.   1.   0.1          0.01   1.
0 135 202  3   10.   1.   0.1          0.01   1.
0 136 288  3   10.   1.   0.1          0.01   1.
0 137 219  3   10.   1.   0.1          0.01   1.
0 138 236  3   10.   1.   0.1          0.01   1.
0 139 307  3   10.   1.   0.1          0.01   1.
0 141 200  3   10.   1.   0.1          0.01   1.
0 142 240  3   10.   1.   0.1          0.01   1.
0 143 237  3   10.   1.   0.1          0.01   1.
0 144 276  3   10.   1.   0.1          0.01   1.
0 145 266  3   10.   1.   0.1          0.01   1.
0 146 267  3   10.   1.   0.1          0.01   1.
0 147 230  3   10.   1.   0.1          0.01   1.
0 148 254  3   10.   1.   0.1          0.01   1.
0 149 255  3   10.   1.   0.1          0.01   1.
0 150 256  3   10.   1.   0.1          0.01   1.
0 151 257  3   10.   1.   0.1          0.01   1.
0 152 259  3   10.   1.   0.1          0.01   1.
0 153 264  3   10.   1.   0.1          0.01   1.
0 154 268  3   10.   1.   0.1          0.01   1.
0 155 269  3   10.   1.   0.1          0.01   1.
0 156 265  3   10.   1.   0.1          0.01   1.
0 157 275  3   10.   1.   0.1          0.01   1.
0 158 302  3   10.   1.   0.1          0.01   1.
0 159 309  3   10.   1.   0.1          0.01   1.
0 160 282  3   10.   1.   0.1          0.01   1.
0 161 310  3   10.   1.   0.1          0.01   1.
0 162 299  3   10.   1.   0.1          0.01   1.
0 163 244  3   10.   1.   0.1          0.01   1.
0 164 279  3   10.   1.   0.1          0.01   1.
0 165 245  3   10.   1.   0.1          0.01   1.
0 166 246  3   10.   1.   0.1          0.01   1.
0 167 250  3   10.   1.   0.1          0.01   1.
0 168 243  3   10.   1.   0.1          0.01   1.
0 169 242  3   10.   1.   0.1          0.01   1.
0 170 241  3   10.   1.   0.1          0.01   1.
0 171 248  3   10.   1.   0.1          0.01   1.
0 173 270  3   10.   1.   0.1          0.01   1.
0 174 305  3   10.   1.   0.1          0.01   1.
0 175 258  3   10.   1.   0.1          0.01   1.
0 176 252  3   10.   1.   0.1          0.01   1.
0 177 263  3   10.   1.   0.1          0.01   1.
0 178 262  3   10.   1.   0.1          0.01   1.
0 179 261  3   10.   1.   0.1          0.01   1.
0 180 260  3   10.   1.   0.1          0.01   1.
0 181 159  3   10.   1.   0.1          0.01   1.
0 182 283  3   10.   1.   0.1          0.01   1.
0 183 239  3   10.   1.   0.1          0.01   1.
0 184 277  3   10.   1.   0.1          0.01   1.
0 185 284  3   10.   1.   0.1          0.01   1.
0 186 225  3   10.   1.   0.1          0.01   1.
0 187 301  3   10.   1.   0.1          0.01   1.
0 190 289  3   10.   1.   0.1          0.01   1.
0 188 247  3   10.   1.   0.1          0.01   1.
0 200 136  4   10.  964.  0.004   10.   10.  0.047   2.
             50.  964.  0.004   50.   50.  0.033  20.
0 202 101  4   20. 2327.  0.003   20.   20.  0.04    3.
            120. 2327.  0.003   50.   50.  0.03   20.
0 203 102  4   20. 1902.  0.004   20.   20.  0.044   3.
            120. 1902.  0.004   50.   50.  0.033  20.
0 204 103  4   20. 2673.  0.004   20.   20.  0.044   3.
            120. 2673.  0.004   50.   50.  0.033  20.
0 205 104  4   60. 1621.  0.003    4.    4.  0.037   3.
            160. 1621.  0.003   50.   50.  0.03   20.
0 206 105  4   50. 4148.  0.0034   4.    4.  0.039   3.
            150. 4148.  0.0034  50.   50.  0.031  20.
0 207 106  4   15.  717.  0.003    4.    4.  0.037   4.
            115.  717.  0.003   20.   20.  0.029  20.
0 208 107  4   20. 2763.  0.003   10.   10.  0.039   3.
            120. 2763.  0.003   40.   40.  0.03   20.
0 209 108  4   20. 3945.  0.003    4.    4.  0.036   5.
            120. 3945.  0.003   40.   40.  0.03   20.
0 210 109  4   20. 3217.  0.007    4.    4.  0.053   3.
            120. 3217.  0.007   50.   50.  0.041  20.
0 211 110  4   20. 1323.  0.008    4.    4.  0.056   3.
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          120.  1323.  0.008    50.    50.  0.043    20.
0 212 111   4   50.  2426.  0.003     4.     4.  0.037     3.
          150.  2426.  0.003    50.    50.   0.03    20.
0 213 112   4   20.  2473.  0.005     4.     4.  0.046     3.
          120.  2473.  0.005    50.    50.  0.036    20.
0 214 113   4   20.   443.  0.003    10.    10.  0.039     3.
          120.   443.  0.003    25.    25.  0.029    20.
0 215 308   4   20.  1622.  0.003    10.    10.  0.039     3.
          120.  1622.  0.003    25.    25.  0.028    25.
0 216 164   4   20.  1324.  0.003    10.    10.  0.039     3.
          120.  1324.  0.003    25.    25.  0.029    20.
0 217 116   4   20.  3243.  0.005    10.    10.  0.047     3.
          120.  3243.  0.005    25.    25.  0.036    20.
0 218 117   4   20.   282.  0.003    10.    10.  0.039     3.
          120.   282.  0.003    25.    25.  0.029    20.
0 219 118   4   20.  2003.  0.003    10.    10.  0.039     3.
          120.  2003.  0.003    20.    20.  0.029    20.
0 220 147   4   20.  2196.  0.003     4.     4.  0.037     4.
          120.  2196.  0.003    20.    20.  0.029    20.
0 221 120   4   20.  5356.  0.001     4.     4.  0.024     5.
          120.  5356.  0.001    20.    20.  0.046    20.
0 222 121   4    8.  4084.  0.012     4.     4.  0.066     3.
           32.  4084.  0.012    20.    20.  0.071    20.
0 224 110   4   20.  2002.  0.003     4.     4.  0.04     2.
          120.  2002.  0.003    50.    50.   0.03    20.
0 223 105   4   20.  1141.  0.002    10.    10.  0.035     2.
          120.  1141.  0.002    50.    50.  0.025    20.
0 225 106   4   20.  2475.  0.001    10.    10.  0.027     2.
          120.  2475.  0.001    50.    50.   0.02    20.
0 226 107   4   10.  2015.  0.006     4.     4.  0.054     2.
          110.  2015.  0.006    50.    50.  0.039    20.
0 227 126   4   20.  2686. 0.0052    10.    10.  0.056     1.
          120.  2686. 0.0052    50.    50.  0.037    20.
0 228 108   4   10.   645.  0.016     4.     4.  0.078     2.
          110.   645.  0.016    50.    50.  0.056    20.
0 229 127   4   10.   838.  0.003     4.     4.  0.041     2.
          110.   838.  0.003    50.    50.   0.03    20.
0 230 119   4   20.   302.  0.003     4.     4.  0.037     4.
          120.   302.  0.003    20.    20.  0.029    20.
0 231 130   4   20.  2856.  0.004    10.    10.  0.046     2.
          120.  2856.  0.004    50.    50.  0.033    20.
0 232 111   4   20.  1120.  0.005    10.    10.   0.05     2.
          120.  1120.  0.005    50.    50.  0.036    20.
0 233 297   4   20.  2070.  0.008    10.    10.  0.060     2.
          120.  2070.  0.008    50.    50.  0.043    20.
0 234 173   4   20.  3316.  0.013    10.    10.  0.072     2.
          120.  3316.  0.013    50.    50.  0.052    20.
0 235 140   4   40.  1047.  0.019    10.    10.   0.09     1.
          120.  1047.  0.019    50.    50.   0.06    20.
0 236 116   4   50.  2857. 0.0035    10.    10.  0.047     1.
          200.  2857. 0.0035    50.    50.  0.031    20.
0 237 184   5    6.   183.  0.035     0.     0.  0.013     6.
          100.  1400.  0.005    50.    50.  0.051    20.
0 239 141   4   40.  2088. 0.0030    10.    10.  0.041     2.
          120.  2088. 0.0030    50.    50.  0.030    20.
0 240 140   4   20.  2733.  0.015     5.     5.  0.082     1.
          120.  2733.  0.015    50.    50.  0.055    20.
0 241 139   4   20.  2126.  0.009    10.    10.  0.069     1.
          120.  2126.  0.009    50.    50.  0.045    20.
0 242 168   4   20.   927.  0.013     5.     5.  0.071     2.
          120.   927.  0.013    50.    50.  0.052    20.
0 243 161   4   20.  1224.  0.002    10.    10.  0.035     2.
          120.  1224.  0.002    50.    50.  0.025    20.
0 244 160   4   20.  1747.  0.007    10.    10.  0.057     2.
          120.  1747.  0.007    50.    50.  0.041    20.
0 245 163   4   20.  2060.  0.006    10.    10.  0.054     2.
          120.  2060.  0.006    50.    50.  0.039    20.
0 246 165   4   20.  3293.  0.007    10.    10.  0.057     2.
          120.  3293.  0.007    50.    50.  0.041    20.
0 247 168   4   40.  1278.   0.02    10.    10.  0.083     2.
          120.  1278.   0.02    50.    50.  0.061    20.
0 248 170   4  100.  1834.  0.013    10.    10.  0.077     1.
          200.  1834.  0.013    50.    50.  0.051    20.
0 250 132   4  100.  2986.  0.008    10.    10.  0.064     1.
          200.  2986.  0.008    50.    50.  0.043    20.
0 251 167   4   20.  1081.  0.004    10.    10.  0.051     1.
          120.  1081.  0.004    50.    50.  0.033    20.
0 252 174   4   20.  2585.  0.005     5.     5.  0.049     2.
          120.  2585.  0.005    50.    50.  0.036    20.
0 254 147   4   20.   637.  0.003    10.    10.  0.045     1.
          120.   637.  0.003    50.    50.   0.03    20.
0 255 150   4   70.  1579.  0.004     5.     5.  0.049     1.
          200.  1579.  0.004    50.    50.  0.033    20.
0 256 145   4  100.  2710.  0.013    10.    10.  0.077     1.
          200.  2710.  0.013    50.    50.  0.051    20.
0 257 149   4  100.  1831.  0.014    10.    10.  0.079     1.
          200.  1831.  0.014    50.    50.  0.053    20.
0 258 151   4  100.  3598.   0.01    10.    10.  0.069     1.
          200.  3598.   0.01    50.    50.  0.047    20.
0 259 149   4  100.  1401.  0.012    10.    10.  0.074     1.
```

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          200.  1401.  0.012    50.    50.   0.05    20.
0 260 150  4   100.  2084.  0.007    10.    10.   0.06     1.
          200.  2084.  0.007    50.    50.  0.041    20.
0 261 176  4    20.  1626.  0.009    10.    10.  0.063     2.
          120.  1626.  0.009    50.    50.  0.045    20.
0 262 179  4   100.  1461.  0.006    10.    10.  0.057     1.
          200.  1461.  0.006    50.    50.  0.038    20.
0 263 179  4   100.  1278.  0.007    10.    10.   0.06     1.
          200.  1278.  0.007    50.    50.  0.041    20.
0 264 121  4   100.  2606.  0.019     5.     5.  0.063     2.
          400.  2606.  0.019    50.    50.  0.045    20.
0 265 122  4    20.  1802.  0.024     4.     4.  0.089     2.
          120.  1802.  0.024    50.    50.  0.065    20.
0 266 312  4    20.  3270.  0.007     5.     5.  0.056     2.
          120.  3270.  0.007    50.    50.  0.041    20.
0 267 145  4   100.   972.  0.002    10.    10.  0.038     1.
          200.   972.  0.002    50.    50.  0.025    20.
0 268 120  4   100.  1610.  0.031    10.    10.  0.089     1.
          400.  1610.  0.031    50.    50.  0.065    20.
0 269 119  4    10.   730.  0.025    10.    10.  0.103     1.
          100.   730.  0.025    50.    50.  0.066    20.
0 270 181  4    20.  1456.  0.006     5.     5.  0.053     2.
          120.  1456.  0.006    50.    50.  0.039    20.
0 271 164  4    50.  1908.  0.002    10.    10.  0.035     2.
          150.  1908.  0.002    50.    50.  0.025    20.
0 273 100  4    20.   703.  0.002    10.    10.  0.041     2.
          120.   703.  0.002    50.    50.   0.03    20.
0 274 186  4    20.  1045.  0.001    10.    10.  0.027     2.
          120.  1045.  0.001    50.    50.   0.02    20.
0 275 186  4    20.  1420.  0.011    10.    10.  0.068     2.
          120.  1420.  0.011    50.    50.  0.049    20.
0 276 137  4    20.  2158.  0.006     4.     4.  0.047     5.
          120.  2158.  0.006    50.    50.  0.043    10.
0 277 144  4    17.   262.  0.008     3.     3.  0.044     1.
          120.   262.  0.008    50.    50.  0.048    10.
0 278 103  4    20.   708.  0.007     4.     4.  0.056     2.
          120.   708.  0.007    50.    50.  0.041    20.
0 279 315  4    20.  2452.  0.003    10.    10.  0.039     3.
          120.  2452.  0.003    25.    25.  0.029    20.
0 280 137  4    20.  1804.  0.003    10.    10.  0.039     3.
          120.  1804.  0.003    50.    50.   0.03    20.
0 281 133  4    20.  3622.  0.004    10.    10.  0.046     2.
          120.  3622.  0.004    50.    50.  0.033    20.
0 282 182  4    20.  2352.  0.006    10.    10.  0.054     2.
          120.  2352.  0.006    50.    50.  0.039    20.
0 283 159  4    20.  1995.  0.004    10.    10.  0.046     2.
          120.  1995.  0.004    50.    50.  0.033    20.
0 284 132  4    20.  3155.  0.006    10.    10.  0.054     2.
          120.  3155.  0.006    50.    50.  0.039    20.
0 285 102  4    35.   502.  0.001    10.    10.  0.027     2.
          135.   502.  0.001    50.    50.   0.02    20.
0 286 158  4    20.  1328.  0.004    10.    10.  0.060     2.
          120.  1328.  0.008    50.    50.  0.043    20.
0 287 109  5   5.0   344.  0.005     1.     1.  0.017   5.0
          120.   344.  0.004    20.    20.  0.037    20.
0 288 271  5   5.5   250.  0.011     0.     0.  0.013   5.5
          120.   250.  0.011    20.    20.  0.037    20.
0 289 162  5   5.5  2700.  0.011     0.     0.  0.013   3.5
          120.  2700.  0.011    20.    20.  0.037    20.
0 296 316  4    80.  3500.  0.002     4.     4.  0.030   8.5
          120.  3500.  0.002    50.    50.  0.028    10.
0 297 298  2     5.   350.  0.005     0.     0.  0.013     5.
0 298 211  4    20.   440.  0.008    10.    10.  0.050     2.
          120.   440.  0.008    50.    50.  0.040    20.
0 299 302  4    20.  2854.  0.008    10.    10.  0.046     2.
          120.  2854.  0.004    50.    50.  0.033    20.
0 301 224  3    10.     1.    0.1              0.01     1.
0 302 233 11 2   0.1   500.  0.001              0.035    0.1
    0      0    0.21      5.    3.05     19.   12.65    40.
  30.14    66.     56.    92.   90.45    115.  131.74   131.
 176.83   145.  223.32   158.  270.77   171.
0 303 188  3    10.     1.    0.1              0.01     1.
0 304 296  3    10.     1.    0.1              0.01     1.
0 305 251  3    10.     1.    0.1              0.01     1.
0 306 140  3    10.     1.    0.1              0.01     1.
0 307 235  3    10.     1.    0.1              0.01     1.
0 308 114  3    10.     1.    0.1              0.01     1.
0 309 286  3    10.     1.    0.1              0.01     1.
0 310 234  3    10.     1.    0.1              0.01     1.
0 311 216  3    10.     1.    0.1              0.01     1.
0 312 148  7 2   0.1    10.    0.1                       0.1
    0.     0.    1.87   60.6   31.18    102.   81.28   123.
  164.2   122.   220.   170.   221.   9999.
0 315 115 12 2   0.1    10.    0.1                       0.1
    0.     0.     1.4    22.     9.    150.    25.1   402.
   50.2   822.    83.7  1393.  125.3   2079.  173.4  2853.
  226.4  3712.   272.1  4499.  283.8   4640.   342.  5520.
0 316 143  5 2   0.1    10.    0.1                       0.1
    0.     0.    32.0    64.    64.    176.   96.0   344.
  103.5   542.   103.6  9999.
```

```
 0  993 1093  0 3            1.
 0 1093  992  0 4    10.0   5109.   .008     4.0     4.0   0.040     1.0
                18.0   5109.   .008    50.0    50.0   0.040    10.0
 0  992  892  0 3            1.
 0  892 1092  5 2     0.1     1.   .001              0.015     0.1
    0       0      5.3     26.0     24.4    103.0     135.0     153.0
 230.0     193.0     231.0    9999.0
 0 1092 1192  0 4    10.0   2100.   .006     4.0     4.0   0.040     1.0
                18.0   2100.   .006    50.0    50.0   0.040    10.0
 0 1192  122  0 5    12.4     60.   .005              0.013    10.0
               400.0     60.   .005    50.0    50.0   0.015    14.0
401  131  231  3 3            1.
    0       0      528      528      900      528
   401  402    3            1.
   402  210    2     6.5   196    0.013       0       0   0.015     6.5
403  140  200  3 3            1.
    0.      0.     560.     560.     900.     560.      0.      0.
 0  403  238    3            1.
 0  238  164    2     7.6   245.   0.005              0.013     8.
-1  904  122  6 3     10.      1.     0.1              0.01     10.
    0.      0.     1.25      66.     4.58      95.     6.00     148.
  8.83     117.      16.      91.

   0
   6
 100  104  110  141  115  122    0    0    0    0    0    0    0    0    0    0
ENDPROGRAM
```

SWMM 0.4in Master Plan

```
 2  1  1  2
 3  4
WATERSHED   1
LOWER THIRD CREEK, 0.4IN sTORM MP with Trib G&L Detention
KIOWA ENGINEERING CORPORATION 3/05
    192      5.0                                    1
     1  100
     2  135
     3  101
     4  100
     5  103
     6  123
     7  104
     8  104
     9  105
    10  124
    11  125
    12  106
    13  106
    14  157
    15  126
    16  108
    17  127
    18  128
    19  129
    20  131
    21  131
    22  109
    23  187
    24  134
    25  111
    26  133
    27  110
    28  112
    29  308
    30  158
    31  158
    32  158
    33  308
    34  159
    35  181
    36  159
    37  162
    38  162
    39  306
    40  115
    41  138
    42  182
    43  173
    44  160
    45  161
    46  190
    47  140
    48  141
    49  116
    50  116
    51  117
    52  118
    53  155
    54  154
    55  119
    56  118
    57  163
    58  163
    59  168
    60  169
    61  170
    62  142
    63  183
    64  316
    65  184
    66  144
    67  312
    68  312
    69  120
    70  120
    71  153
    72  156
    73  121
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 74 165
 75 166
 76 303
 77 171
 78 304
 79 180
 80 150
 81 145
 82 145
 83 132
 84 132
 85 150
 86 150
 87 146
 88 174
 89 174
 90 174
 91 185
 92 151
 93 152
 94 176
 95 177
 96 178
 97 175
 98 121
992 992
993 993

0 100   0   3   10.   1.   0.1          0.01   1.
0 101 285   3   10.   1.   0.1          0.01   1.
0 102 273   3   10.   1.   0.1          0.01   1.
0 103 203   3   10.   1.   0.1          0.01   1.
0 104 204   3   10.   1.   0.1          0.01   1.
0 105 205   3   10.   1.   0.1          0.01   1.
0 106 206   3   10.   1.   0.1          0.01   1.
0 107 207   3   10.   1.   0.1          0.01   1.
0 108 208   3   10.   1.   0.1          0.01   1.
0 109 209   3   10.   1.   0.1          0.01   1.
0 110 210   3   10.   1.   0.1          0.01   1.
0 111 211   3   10.   1.   0.1          0.01   1.
0 112 212   3   10.   1.   0.1          0.01   1.
0 113 213   3   10.   1.   0.1          0.01   1.
0 114 214   3   10.   1.   0.1          0.01   1.
0 115 215   3   10.   1.   0.1          0.01   1.
0 116 311   3   10.   1.   0.1          0.01   1.
0 117 217   3   10.   1.   0.1          0.01   1.
0 118 218   3   10.   1.   0.1          0.01   1.
0 119 280   3   10.   1.   0.1          0.01   1.
0 120 220   3   10.   1.   0.1          0.01   1.
0 121 221   3   10.   1.   0.1          0.01   1.
0 122 222   3   10.   1.   0.1          0.01   1.
0 123 278   3   10.   1.   0.1          0.01   1.
0 124 223   3   10.   1.   0.1          0.01   1.
0 125 274   3   10.   1.   0.1          0.01   1.
0 126 226   3   10.   1.   0.1          0.01   1.
0 127 228   3   10.   1.   0.1          0.01   1.
0 128 229   3   10.   1.   0.1          0.01   1.
0 129 227   3   10.   1.   0.1          0.01   1.
0 130 287   3   10.   1.   0.1          0.01   1.
0 132 304   3   10.   1.   0.1          0.01   1.
0 133 232   3   10.   1.   0.1          0.01   1.
0 134 281   3   10.   1.   0.1          0.01   1.
0 135 202   3   10.   1.   0.1          0.01   1.
0 136 288   3   10.   1.   0.1          0.01   1.
0 137 219   3   10.   1.   0.1          0.01   1.
0 138 236   3   10.   1.   0.1          0.01   1.
0 139 307   3   10.   1.   0.1          0.01   1.
0 141 200   3   10.   1.   0.1          0.01   1.
0 142 240   3   10.   1.   0.1          0.01   1.
0 143 237   3   10.   1.   0.1          0.01   1.
0 144 276   3   10.   1.   0.1          0.01   1.
0 145 266   3   10.   1.   0.1          0.01   1.
0 146 267   3   10.   1.   0.1          0.01   1.
0 147 230   3   10.   1.   0.1          0.01   1.
0 148 254   3   10.   1.   0.1          0.01   1.
0 149 255   3   10.   1.   0.1          0.01   1.
0 150 256   3   10.   1.   0.1          0.01   1.
0 151 257   3   10.   1.   0.1          0.01   1.
0 152 259   3   10.   1.   0.1          0.01   1.
0 153 264   3   10.   1.   0.1          0.01   1.
0 154 268   3   10.   1.   0.1          0.01   1.
0 155 269   3   10.   1.   0.1          0.01   1.
0 156 265   3   10.   1.   0.1          0.01   1.
0 157 275   3   10.   1.   0.1          0.01   1.
0 158 302   3   10.   1.   0.1          0.01   1.
0 159 309   3   10.   1.   0.1          0.01   1.
0 160 282   3   10.   1.   0.1          0.01   1.
0 161 310   3   10.   1.   0.1          0.01   1.
0 162 299   3   10.   1.   0.1          0.01   1.
0 163 244   3   10.   1.   0.1          0.01   1.
0 164 279   3   10.   1.   0.1          0.01   1.
0 165 245   3   10.   1.   0.1          0.01   1.
0 166 246   3   10.   1.   0.1          0.01   1.
0 167 250   3   10.   1.   0.1          0.01   1.
0 168 243   3   10.   1.   0.1          0.01   1.
0 169 242   3   10.   1.   0.1          0.01   1.
0 170 241   3   10.   1.   0.1          0.01   1.
0 171 248   3   10.   1.   0.1          0.01   1.
0 173 270   3   10.   1.   0.1          0.01   1.
0 174 305   3   10.   1.   0.1          0.01   1.
0 175 258   3   10.   1.   0.1          0.01   1.
0 176 252   3   10.   1.   0.1          0.01   1.
0 177 263   3   10.   1.   0.1          0.01   1.
0 178 262   3   10.   1.   0.1          0.01   1.
0 179 261   3   10.   1.   0.1          0.01   1.
0 180 260   3   10.   1.   0.1          0.01   1.
0 181 159   3   10.   1.   0.1          0.01   1.
0 182 283   3   10.   1.   0.1          0.01   1.
0 183 239   3   10.   1.   0.1          0.01   1.
0 184 277   3   10.   1.   0.1          0.01   1.
0 185 284   3   10.   1.   0.1          0.01   1.
0 186 225   3   10.   1.   0.1          0.01   1.
0 187 301   3   10.   1.   0.1          0.01   1.
0 190 289   3   10.   1.   0.1          0.01   1.
0 188 247   3   10.   1.   0.1          0.01   1.
0 200 136   4   10.   964.   0.004   10.   10.   0.047   2.
            50.   964.   0.004   50.   50.   0.033   20.
0 202 101   4   20.   2327.   0.003   20.   20.   0.04   3.
            120.   2327.   0.003   50.   50.   0.03   20.
0 203 102   4   20.   1902.   0.004   20.   20.   0.044   3.
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          120.  1902.  0.004    50.    50.  0.033    20.
0 204 103   4   20.  2673.  0.004    20.    20.  0.044     3.
          120.  2673.  0.004    50.    50.  0.033    20.
0 205 104   4   60.  1621.  0.003     4.     4.  0.037     3.
          160.  1621.  0.003    50.    50.   0.03    20.
0 206 105   4   50.  4148. 0.0034     4.     4.  0.039     3.
          150.  4148. 0.0034    50.    50.  0.031    20.
0 207 106   4   15.   717.  0.003     4.     4.  0.037     4.
          115.   717.  0.003    20.    20.  0.029    20.
0 208 107   4   20.  2763.  0.003    10.    10.  0.039     3.
          120.  2763.  0.003    40.    40.   0.03    20.
0 209 108   4   20.  3945.  0.003     4.     4.  0.036     5.
          120.  3945.  0.003    40.    40.   0.03    20.
0 210 109   4   20.  3217.  0.007     4.     4.  0.053     3.
          120.  3217.  0.007    50.    50.  0.041    20.
0 211 110   4   20.  1323.  0.008     4.     4.  0.056     3.
          120.  1323.  0.008    50.    50.  0.043    20.
0 212 111   4   50.  2426.  0.003     4.     4.  0.037     3.
          150.  2426.  0.003    50.    50.   0.03    20.
0 213 112   4   20.  2473.  0.005     4.     4.  0.046     3.
          120.  2473.  0.005    50.    50.  0.036    20.
0 214 113   4   20.   443.  0.003    10.    10.  0.039     3.
          120.   443.  0.003    25.    25.  0.029    20.
0 215 308   4   20.  1622.  0.003    10.    10.  0.039     3.
          120.  1622.  0.003    25.    25.  0.028    25.
0 216 164   4   20.  1324.  0.003    10.    10.  0.039     3.
          120.  1324.  0.003    25.    25.  0.029    20.
0 217 116   4   20.  3243.  0.005    10.    10.  0.047     3.
          120.  3243.  0.005    25.    25.  0.036    20.
0 218 117   4   20.   282.  0.003    10.    10.  0.039     3.
          120.   282.  0.003    25.    25.  0.029    20.
0 219 118   4   20.  2003.  0.003    10.    10.  0.039     3.
          120.  2003.  0.003    20.    20.  0.029    20.
0 220 147   4   20.  2196.  0.003     4.     4.  0.037     4.
          120.  2196.  0.003    20.    20.  0.029    20.
0 221 120   4   20.  5356.  0.001     4.     4.  0.024     5.
          120.  5356.  0.001    20.    20.  0.046    20.
0 222 121   4    8.  4084.  0.012     4.     4.  0.066     3.
           32.  4084.  0.012    20.    20.  0.071    20.
0 224 110   4   20.  2002.  0.003     4.     4.   0.04     2.
          120.  2002.  0.003    50.    50.   0.03    20.
0 223 105   4   20.  1141.  0.002    10.    10.  0.035     2.
          120.  1141.  0.002    50.    50.  0.025    20.
0 225 106   4   20.  2475.  0.001    10.    10.  0.027     2.
          120.  2475.  0.001    50.    50.   0.02    20.
0 226 107   4   10.  2015.  0.006     4.     4.  0.054     2.
          110.  2015.  0.006    50.    50.  0.039    20.
0 227 126   4   20.  2686. 0.0052    10.    10.  0.056     1.
          120.  2686. 0.0052    50.    50.  0.037    20.
0 228 108   4   10.   645.  0.016     4.     4.  0.078     2.
          110.   645.  0.016    50.    50.  0.056    20.
0 229 127   4   10.   838.  0.003     4.     4.  0.041     2.
          110.   838.  0.003    50.    50.   0.03    20.
0 230 119   4   20.   302.  0.003     4.     4.  0.037     4.
          120.   302.  0.003    20.    20.  0.029    20.
0 231 130   4   20.  2856.  0.004    10.    10.  0.046     2.
          120.  2856.  0.004    50.    50.  0.033    20.
0 232 111   4   20.  1120.  0.005    10.    10.   0.05     2.
          120.  1120.  0.005    50.    50.  0.036    20.
0 233 297   4   20.  2070.  0.008    10.    10.  0.060     2.
          120.  2070.  0.008    50.    50.  0.043    20.
0 234 173   4   20.  3316.  0.013    10.    10.  0.072     2.
          120.  3316.  0.013    50.    50.  0.052    20.
0 235 140   4   40.  1047.  0.019    10.    10.   0.09     1.
          120.  1047.  0.019    50.    50.   0.06    20.
0 236 116   4   50.  2857. 0.0035    10.    10.  0.047     1.
          200.  2857. 0.0035    50.    50.  0.031    20.
0 237 184   5    6.   183.  0.035     0.     0.  0.013     6.
          100.  1400.  0.005    50.    50.  0.051    20.
0 239 141   4   40.  2088. 0.0030    10.    10.  0.041     2.
          120.  2088. 0.0030    50.    50.  0.030    20.
0 240 140   4   20.  2733.  0.015     5.     5.  0.082     1.
          120.  2733.  0.015    50.    50.  0.055    20.
0 241 139   4   20.  2126.  0.009    10.    10.  0.069     1.
          120.  2126.  0.009    50.    50.  0.045    20.
0 242 168   4   20.   927.  0.013     5.     5.  0.071     2.
          120.   927.  0.013    50.    50.  0.052    20.
0 243 161   4   20.  1224.  0.002    10.    10.  0.035     2.
          120.  1224.  0.002    50.    50.  0.025    20.
0 244 160   4   20.  1747.  0.007    10.    10.  0.057     2.
          120.  1747.  0.007    50.    50.  0.041    20.
0 245 163   4   20.  2060.  0.006    10.    10.  0.054     2.
          120.  2060.  0.006    50.    50.  0.039    20.
0 246 165   4   20.  3293.  0.007    10.    10.  0.057     2.
          120.  3293.  0.007    50.    50.  0.041    20.
0 247 168   4   40.  1278.   0.02    10.    10.  0.083     2.
          120.  1278.   0.02    50.    50.  0.061    20.
0 248 170   4  100.  1834.  0.013    10.    10.  0.077     1.
          200.  1834.  0.013    50.    50.  0.051    20.
0 250 132   4  100.  2986.  0.008    10.    10.  0.064     1.
          200.  2986.  0.008    50.    50.  0.043    20.
0 251 167   4   20.  1081.  0.004    10.    10.  0.051     1.
          120.  1081.  0.004    50.    50.  0.033    20.
0 252 174   4   20.  2585.  0.005     5.     5.  0.049     2.
          120.  2585.  0.005    50.    50.  0.036    20.
0 254 147   4   20.   637.  0.003    10.    10.  0.045     1.
          120.   637.  0.003    50.    50.   0.03    20.
0 255 150   4   70.  1579.  0.004     5.     5.  0.049     1.
          200.  1579.  0.004    50.    50.  0.033    20.
0 256 145   4  100.  2710.  0.013    10.    10.  0.077     1.
          200.  2710.  0.013    50.    50.  0.051    20.
0 257 149   4  100.  1831.  0.014    10.    10.  0.079     1.
          200.  1831.  0.014    50.    50.  0.053    20.
0 258 151   4  100.  3598.   0.01    10.    10.  0.069     1.
          200.  3598.   0.01    50.    50.  0.047    20.
0 259 149   4  100.  1401.  0.012    10.    10.  0.074     1.
          200.  1401.  0.012    50.    50.   0.05    20.
0 260 150   4  100.  2084.  0.007    10.    10.   0.06     1.
          200.  2084.  0.007    50.    50.  0.041    20.
0 261 176   4   20.  1626.  0.009    10.    10.  0.063     2.
          120.  1626.  0.009    50.    50.  0.045    20.
0 262 179   4  100.  1461.  0.006    10.    10.  0.057     1.
          200.  1461.  0.006    50.    50.  0.038    20.
0 263 179   4  100.  1278.  0.007    10.    10.   0.06     1.
          200.  1278.  0.007    50.    50.  0.041    20.
0 264 121   4  100.  2606.  0.019     5.     5.  0.063     2.
          400.  2606.  0.019    50.    50.  0.045    20.
0 265 122   4   20.  1802.  0.024     4.     4.  0.089     2.
          120.  1802.  0.024    50.    50.  0.065    20.
0 266 312   4   20.  3270.  0.007     5.     5.  0.056     2.
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          120.  3270.  0.007    50.    50.  0.041    20.
0 267 145   4   100.   972.  0.002    10.    10.  0.038     1.
          200.   972.  0.002    50.    50.  0.025    20.
0 268 120   4   100.  1610.  0.031    10.    10.  0.089     1.
          400.  1610.  0.031    50.    50.  0.065    20.
0 269 119   4    10.   730.  0.025    10.    10.  0.103     1.
          100.   730.  0.025    50.    50.  0.066    20.
0 270 181   4    20.  1456.  0.006     5.     5.  0.053     2.
          120.  1456.  0.006    50.    50.  0.039    20.
0 271 164   4    50.  1908.  0.002    10.    10.  0.035     2.
          150.  1908.  0.002    50.    50.  0.025    20.
0 273 100   4    20.   703.  0.002    10.    10.  0.041     2.
          120.   703.  0.002    50.    50.  0.03    20.
0 274 186   4    20.  1045.  0.001    10.    10.  0.027     2.
          120.  1045.  0.001    50.    50.  0.02    20.
0 275 186   4    20.  1420.  0.011    10.    10.  0.068     2.
          120.  1420.  0.011    50.    50.  0.049    20.
0 276 137   4    20.  2158.  0.006     4.     4.  0.047     5.
          120.  2158.  0.006    50.    50.  0.043    10.
0 277 144   4    17.   262.  0.008     3.     3.  0.044     1.
          120.   262.  0.008    50.    50.  0.048    10.
0 278 103   4    20.   708.  0.007     4.     4.  0.056     2.
          120.   708.  0.007    50.    50.  0.041    20.
0 279 315   4    20.  2452.  0.003    10.    10.  0.039     3.
          120.  2452.  0.003    25.    25.  0.029    20.
0 280 137   4    20.  1804.  0.003    10.    10.  0.039     3.
          120.  1804.  0.003    50.    50.  0.03    20.
0 281 133   4    20.  3622.  0.004    10.    10.  0.046     2.
          120.  3622.  0.004    50.    50.  0.033    20.
0 282 182   4    20.  2352.  0.006    10.    10.  0.054     2.
          120.  2352.  0.006    50.    50.  0.039    20.
0 283 159   4    20.  1995.  0.004    10.    10.  0.046     2.
          120.  1995.  0.004    50.    50.  0.033    20.
0 284 132   4    20.  3155.  0.006    10.    10.  0.054     2.
          120.  3155.  0.006    50.    50.  0.039    20.
0 285 102   4    35.   502.  0.001    10.    10.  0.027     2.
          135.   502.  0.001    50.    50.  0.02    20.
0 286 158   4    20.  1328.  0.004    10.    10.  0.060     2.
          120.  1328.  0.008    50.    50.  0.043    20.
0 287 109   5   5.0   344.  0.005     1.     1.  0.017    5.0
          120.   344.  0.004    20.    20.  0.037    20.
0 288 271   5   5.5   250.  0.011     0.     0.  0.013    5.5
          120.   250.  0.011    20.    20.  0.037    20.
0 289 162   5   5.5  2700.  0.011     0.     0.  0.013    3.5
          120.  2700.  0.011    20.    20.  0.037    20.
0 296 316   4    80.  3500.  0.002     4.     4.  0.030    8.5
          120.  3500.  0.002    50.    50.  0.028    10.
0 297 298   2     5.   350.  0.005     0.     0.  0.013     5.
0 298 211   4    20.   440.  0.008    10.    10.  0.050     2.
          120.   440.  0.008    50.    50.  0.040    20.
0 299 302   4    20.  2854.  0.008    10.    10.  0.046     2.
          120.  2854.  0.004    50.    50.  0.033    20.
0 301 224   3    10.     1.    0.1              0.01     1.
0 302 233 11 2   0.1   500.  0.001                0.035    0.1
    0     0   0.21      5.   3.05     19.   12.65     40.
 30.14    66.    56.     92.   90.45    115.  131.74    131.
176.83   145.  223.32   158.  270.77   171.
0 303 188   3    10.     1.    0.1              0.01     1.
0 304 296   3    10.     1.    0.1              0.01     1.
0 305 251   3    10.     1.    0.1              0.01     1.
0 306 140   3    10.     1.    0.1              0.01     1.
0 307 235   3    10.     1.    0.1              0.01     1.
0 308 114   3    10.     1.    0.1              0.01     1.
0 309 286   3    10.     1.    0.1              0.01     1.
0 310 234   3    10.     1.    0.1              0.01     1.
0 311 216   3    10.     1.    0.1              0.01     1.
0 312 148  7 2   0.1    10.    0.1                   0.1
    0.     0.    1.87    60.6   31.18    102.   81.28    123.
 164.2   122.   220.    170.   221.   9999.
0 315 115 12 2   0.1    10.    0.1                   0.1
    0.     0.    1.4     22.     9.    150.    25.1    402.
   50.2   822.   83.7   1393.  125.3   2079.  173.4   2853.
 226.4  3712.  272.1   4499.  283.8   4640.    342.   5520.
0 316 143  5 2   0.1    10.    0.1                   0.1
    0.     0.   32.0     64.    64.    176.    96.0    344.
 103.5   542.  103.6   9999.
0 993 1093  0 3          1.
0 1093  992  0 4   10.0  5109.   .008    4.0    4.0  0.040    1.0
            18.0  5109.   .008   50.0   50.0  0.040   10.0
0 992  892  0 3          1.
0 892 1092  5 2    0.1     1.   .001              0.015    0.1
    0     0    5.3    26.0   24.4   103.0   135.0   153.0
 230.0   193.0  231.0  9999.0
0 1092 1192  0 4   10.0  2100.   .006    4.0    4.0  0.040    1.0
            18.0  2100.   .006   50.0   50.0  0.040   10.0
0 1192  122  0 5   12.4    60.   .005             0.013   10.0
           400.0    60.   .005   50.0   50.0  0.015   14.0
401  131  231  3 3          1.
    0     0   528     528    900     528
  401  402   3          1.
  402  210   2    6.5   196   0.013      0     0  0.015    6.5
403  140  200  3 3          1.
    0.     0.   560.    560.    900.    560.     0.      0.
  0 403  238   3          1.
  0 238  164   2    7.6   245.  0.005             0.013     8.
 -1 904  122  8 3   10.     1.    0.1              0.01    10.
    0.     0.    1.25    42.    2.00     42.    3.17    63.
   5.00    71.     7.     70.   11.25     41.    16.0     4.

  0
  6
 100  104  110  141  115  122   0   0   0   0   0   0   0   0   0   0
ENDPROGRAM
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SWMM Output

100YR EXISTING CONDITION

LOWER THIRD CREEK, 100YR EXISTING CONDITION
KIOWA ENGINEERING CORPORATION 3/05

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)	
177	52.	(DIRECT FLOW)		1	5.
178	135.	(DIRECT FLOW)		0	55.
263	47.	.4		1	30.
262	122.	.7		1	10.
179	164.	(DIRECT FLOW)		1	15.
261	156.	1.7		1	25.
175	41.	(DIRECT FLOW)		1	10.
176	252.	(DIRECT FLOW)		1	15.
258	27.	.3		2	15.
252	218.	2.2		1	35.
152	45.	(DIRECT FLOW)		1	0.
151	99.	(DIRECT FLOW)		1	10.
174	412.	(DIRECT FLOW)		1	10.
259	40.	.4		1	30.
257	89.	.6		1	25.
305	412.	(DIRECT FLOW)		1	10.
180	25.	(DIRECT FLOW)		1	0.
149	130.	(DIRECT FLOW)		1	25.
156	61.	(DIRECT FLOW)		1	5.
251	406.	1.8		1	15.
260	18.	.2		1	55.
255	124.	.9		1	40.
949	3071.	(DIRECT FLOW)		2	10.
265	58.	1.0		1	15.
185	125.	(DIRECT FLOW)		1	0.
167	406.	(DIRECT FLOW)		1	15.
146	136.	(DIRECT FLOW)		0	50.
150	398.	(DIRECT FLOW)		1	10.
153	98.	(DIRECT FLOW)		1	0.
122	3100.	(DIRECT FLOW)		2	10.
284	101.	1.4		1	20.
250	347.	1.2		1	45.
267	124.	.8		1	0.
256	347.	1.2		1	30.
264	82.	.4		1	20.
222	3024.	6.8		2	30.
132	545.	(DIRECT FLOW)		1	25.
145	636.	(DIRECT FLOW)		1	5.
154	99.	(DIRECT FLOW)		0	55.
121	3082.	(DIRECT FLOW)		2	25.
183	216.	(DIRECT FLOW)		0	55.
304	545.	(DIRECT FLOW)		1	25.
266	562.	2.7		1	25.
268	89.	.5		1	10.
221	2884.	7.5		3	5.
239	205.	1.6		1	5.
296	538.	2.5		1	35.
148	673.	(DIRECT FLOW)		1	20.
120	2923.	(DIRECT FLOW)		3	5.
143	291.	(DIRECT FLOW)		1	0.
172	604.	(DIRECT FLOW)		1	25.
254	671.	2.1		1	25.
220	2917.	6.1		3	10.
237	290.	2.5		1	0.
249	531.	1.4		1	55.
155	35.	(DIRECT FLOW)		0	55.
147	3149.	(DIRECT FLOW)		3	0.
184	411.	(DIRECT FLOW)		1	0.
171	558.	(DIRECT FLOW)		1	50.
269	35.	1.0		1	15.
230	3149.	6.2		3	0.
277	411.	1.8		1	0.
248	549.	1.4		2	0.
119	3173.	(DIRECT FLOW)		3	0.
144	474.	(DIRECT FLOW)		1	0.
170	566.	(DIRECT FLOW)		2	0.
280	3165.	5.0		3	10.
276	457.	3.3		1	10.
241	557.	1.9		2	10.
137	3198.	(DIRECT FLOW)		3	5.
139	572.	(DIRECT FLOW)		2	5.
219	3192.	5.2		3	10.
142	91.	(DIRECT FLOW)		0	50.
307	572.	(DIRECT FLOW)		2	5.
118	3210.	(DIRECT FLOW)		3	10.
306	36.	(DIRECT FLOW)		0	45.
240	63.	1.1		1	15.
235	570.	1.7		2	10.
218	3210.	5.2		3	10.
166	103.	(DIRECT FLOW)		0	55.
303	128.	(DIRECT FLOW)		0	55.
188	0.	(DIRECT FLOW)		0	0.
169	74.	(DIRECT FLOW)		0	55.
140	627.	(DIRECT FLOW)		2	0.
141	153.	(DIRECT FLOW)		0	45.
138	39.	(DIRECT FLOW)		0	55.
117	3221.	(DIRECT FLOW)		3	10.
246	79.	1.2		1	20.
247	123.	1.1		1	0.
242	73.	1.2		1	0.
200	143.	2.0		0	55.
236	28.	.5		1	40.
217	3204.	5.1		3	20.
165	137.	(DIRECT FLOW)		1	15.
168	238.	(DIRECT FLOW)		1	5.
136	143.	(DIRECT FLOW)		0	55.
116	3236.	(DIRECT FLOW)		3	20.
245	127.	1.6		1	25.
243	223.	2.1		1	15.
403	560.	(DIRECT FLOW)		1	30.
288	143.	2.4		0	55.
311	3236.	(DIRECT FLOW)		3	20.
163	210.	(DIRECT FLOW)		1	15.
161	254.	(DIRECT FLOW)		1	15.
238	560.	6.2		1	35.
271	118.	1.1		1	10.

216	3232.	5.2	3	20.
244	202.	2.0	1	25.
310	254.	(DIRECT FLOW)	1	15.
164	3615.	(DIRECT FLOW)	3	15.
160	276.	(DIRECT FLOW)	1	10.
234	224.	2.0	1	30.
279	3601.	5.4	3	20.
282	251.	2.1	1	25.
173	224.	(DIRECT FLOW)	1	30.
315	3244.	.1 197.5	4	5.
182	322.	(DIRECT FLOW)	1	15.
270	211.	2.1	1	40.
115	3244.	(DIRECT FLOW)	4	5.
283	304.	2.3	1	30.
181	269.	(DIRECT FLOW)	1	35.
215	3242.	5.2	4	10.
159	667.	(DIRECT FLOW)	1	20.
308	3242.	(DIRECT FLOW)	4	10.
309	667.	(DIRECT FLOW)	1	20.
114	3242.	(DIRECT FLOW)	4	10.
162	86.	(DIRECT FLOW)	0	50.
286	654.	2.9	1	30.
214	3241.	5.2	4	10.
299	70.	1.0	1	10.
158	801.	(DIRECT FLOW)	1	25.
134	33.	(DIRECT FLOW)	1	5.
113	3241.	(DIRECT FLOW)	4	10.
302	123.	.1 110.4	3	50.
281	22.	.6	1	35.
213	3233.	5.3	4	20.
233	123.	1.5	4	5.
133	159.	(DIRECT FLOW)	0	55.
112	3233.	(DIRECT FLOW)	4	20.
187	33.	(DIRECT FLOW)	1	0.
297	123.	3.0	4	5.
232	156.	1.8	1	5.
212	3225.	4.8	4	25.
131	95.	(DIRECT FLOW)	0	55.
301	33.	(DIRECT FLOW)	1	0.
298	123.	1.4	4	5.
111	3228.	(DIRECT FLOW)	4	25.
231	0.	.0	3	10.
401	95.	(DIRECT FLOW)	0	55.
224	29.	.8	1	15.
211	3348.	5.2	4	30.
128	65.	(DIRECT FLOW)	1	5.
130	166.	(DIRECT FLOW)	0	50.
402	95.	1.9	0	55.
110	3359.	(DIRECT FLOW)	4	25.
229	64.	1.7	1	10.
287	163.	5.1	1	0.
210	3345.	5.3	4	35.
129	64.	(DIRECT FLOW)	1	5.
127	100.	(DIRECT FLOW)	1	10.
109	3360.	(DIRECT FLOW)	4	35.
227	49.	1.0	1	25.
228	100.	1.9	1	10.
209	3339.	6.9	4	50.
157	106.	(DIRECT FLOW)	0	50.
125	133.	(DIRECT FLOW)	0	45.
126	169.	(DIRECT FLOW)	1	0.
108	3355.	(DIRECT FLOW)	4	45.
275	98.	1.3	1	0.
274	123.	1.7	0	55.
226	149.	2.2	1	15.
208	3346.	5.2	4	55.
186	218.	(DIRECT FLOW)	1	0.
107	3349.	(DIRECT FLOW)	4	55.
225	174.	2.0	1	20.
207	3347.	6.5	4	55.
124	41.	(DIRECT FLOW)	1	15.
106	3349.	(DIRECT FLOW)	4	55.
223	38.	.9	1	25.
206	3327.	4.8	5	10.

50 YR EXISTING CONDITION

LOWER THIRD CREEK, 50 YR EXISTING CONDITION
KIOWA ENGINEERING CORPORATION 3/05

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)	
177	38.	(DIRECT FLOW)		1	5.
178	100.	(DIRECT FLOW)		0	55.
263	34.	.3		1	35.
262	86.	.6		1	10.
179	115.	(DIRECT FLOW)		1	15.
261	109.	1.4		1	25.
175	30.	(DIRECT FLOW)		1	5.
176	174.	(DIRECT FLOW)		1	15.
258	18.	.2		2	20.
252	162.	2.0		1	30.
152	33.	(DIRECT FLOW)		1	0.
151	70.	(DIRECT FLOW)		1	0.
174	297.	(DIRECT FLOW)		1	15.
259	28.	.3		1	30.
257	61.	.5		1	25.
305	297.	(DIRECT FLOW)		1	15.
180	18.	(DIRECT FLOW)		1	0.
149	88.	(DIRECT FLOW)		1	25.
156	44.	(DIRECT FLOW)		0	50.
251	292.	1.6		1	20.
260	12.	.2		2	0.
255	84.	.7		1	45.
949	2029.	(DIRECT FLOW)		2	5.
265	40.	.8		1	15.
185	92.	(DIRECT FLOW)		0	50.
167	292.	(DIRECT FLOW)		1	20.
146	99.	(DIRECT FLOW)		0	50.
150	273.	(DIRECT FLOW)		0	55.
153	67.	(DIRECT FLOW)		0	50.
122	2051.	(DIRECT FLOW)		2	5.
284	71.	1.2		1	20.

250	247.	1.1	1	45.
267	88.	.7	1	0.
256	240.	1.0	1	25.
264	49.	.3	1	20.
222	1921.	5.9	2	30.
132	392.	(DIRECT FLOW)	1	20.
145	458.	(DIRECT FLOW)	1	5.
154	69.	(DIRECT FLOW)	0	50.
121	1961.	(DIRECT FLOW)	2	30.
183	156.	(DIRECT FLOW)	0	50.
304	392.	(DIRECT FLOW)	1	20.
266	386.	2.5	1	25.
268	58.	.4	1	5.
221	1752.	6.4	3	5.
239	142.	1.3	1	0.
296	380.	2.2	1	35.
148	465.	(DIRECT FLOW)	1	20.
120	1780.	(DIRECT FLOW)	3	0.
143	204.	(DIRECT FLOW)	1	0.
172	421.	(DIRECT FLOW)	1	30.
254	464.	1.9	1	25.
220	1773.	5.3	3	10.
237	204.	2.1	1	0.
249	363.	1.2	2	0.
155	25.	(DIRECT FLOW)	0	55.
147	1940.	(DIRECT FLOW)	3	0.
184	289.	(DIRECT FLOW)	1	0.
171	378.	(DIRECT FLOW)	1	55.
269	24.	.8	1	0.
230	1939.	5.5	3	5.
277	290.	1.6	1	0.
248	370.	1.2	2	5.
119	1955.	(DIRECT FLOW)	3	0.
144	335.	(DIRECT FLOW)	1	0.
170	381.	(DIRECT FLOW)	2	5.
280	1946.	4.4	3	10.
276	318.	2.7	1	5.
241	375.	1.7	2	15.
137	1966.	(DIRECT FLOW)	3	10.
139	380.	(DIRECT FLOW)	2	10.
219	1958.	4.5	3	15.
142	67.	(DIRECT FLOW)	0	50.
307	380.	(DIRECT FLOW)	2	10.
118	1970.	(DIRECT FLOW)	3	15.
306	19.	(DIRECT FLOW)	0	45.
240	49.	1.0	1	10.
235	379.	1.5	2	15.
218	1970.	4.5	3	15.
166	75.	(DIRECT FLOW)	0	55.
303	94.	(DIRECT FLOW)	0	50.
188	0.	(DIRECT FLOW)	0	0.
169	52.	(DIRECT FLOW)	0	55.
140	407.	(DIRECT FLOW)	2	10.
141	113.	(DIRECT FLOW)	0	45.
138	26.	(DIRECT FLOW)	0	50.
117	1977.	(DIRECT FLOW)	3	15.
246	54.	1.0	1	20.
247	88.	.9	1	0.
242	50.	1.0	1	0.
200	105.	1.8	0	55.

236	16.	.3	1	40.
217	1954.	4.4	3	25.
165	94.	(DIRECT FLOW)	1	15.
168	167.	(DIRECT FLOW)	1	0.
136	105.	(DIRECT FLOW)	0	55.
116	1973.	(DIRECT FLOW)	3	25.
245	86.	1.3	1	30.
243	160.	1.9	1	10.
403	407.	(DIRECT FLOW)	2	10.
288	105.	2.1	0	55.
311	1973.	(DIRECT FLOW)	3	25.
163	139.	(DIRECT FLOW)	1	20.
161	181.	(DIRECT FLOW)	1	10.
238	407.	4.8	2	10.
271	80.	.9	1	10.
216	1969.	4.5	3	30.
244	134.	1.6	1	30.
310	181.	(DIRECT FLOW)	1	10.
164	2237.	(DIRECT FLOW)	3	25.
160	182.	(DIRECT FLOW)	1	10.
234	151.	1.6	1	30.
279	2223.	4.6	3	30.
282	174.	1.8	1	25.
173	151.	(DIRECT FLOW)	1	30.
315	1996.	.1 120.2	4	10.
182	225.	(DIRECT FLOW)	1	15.
270	147.	1.9	1	35.
115	1996.	(DIRECT FLOW)	4	10.
283	212.	2.0	1	30.
181	191.	(DIRECT FLOW)	1	30.
215	1994.	4.5	4	15.
159	467.	(DIRECT FLOW)	1	25.
308	1994.	(DIRECT FLOW)	4	15.
309	467.	(DIRECT FLOW)	1	25.
114	1994.	(DIRECT FLOW)	4	15.
162	52.	(DIRECT FLOW)	0	50.
286	457.	2.7	1	35.
214	1994.	4.5	4	20.
299	37.	.7	1	10.
158	553.	(DIRECT FLOW)	1	25.
134	23.	(DIRECT FLOW)	0	50.
113	1994.	(DIRECT FLOW)	4	20.
302	103.	.1 72.4	3	40.
281	15.	.5	1	40.
213	1987.	4.6	4	25.
233	103.	1.4	3	55.
133	116.	(DIRECT FLOW)	0	55.
112	1987.	(DIRECT FLOW)	4	25.
187	24.	(DIRECT FLOW)	0	55.
297	103.	2.7	3	55.
232	111.	1.5	1	0.
212	1981.	4.1	4	35.
131	194.	(DIRECT FLOW)	0	50.
301	24.	(DIRECT FLOW)	0	55.
298	103.	1.3	4	0.
111	1983.	(DIRECT FLOW)	4	35.
231	0.	.0	3	15.
401	194.	(DIRECT FLOW)	0	50.
224	20.	.6	1	15.
211	2084.	4.6	4	40.

128	47.	(DIRECT FLOW)	1	0.
130	0.	(DIRECT FLOW)	3	15.
402	193.	2.7	0	50.
110	2087.	(DIRECT FLOW)	4	40.
229	46.	1.4	1	5.
287	0.	.0	7	50.
210	2077.	4.6	4	50.
129	46.	(DIRECT FLOW)	0	50.
127	72.	(DIRECT FLOW)	1	5.
109	2087.	(DIRECT FLOW)	4	50.
227	35.	.9	1	25.
228	72.	1.6	1	10.
209	2072.	6.1	5	5.
157	77.	(DIRECT FLOW)	0	50.
125	98.	(DIRECT FLOW)	0	45.
126	123.	(DIRECT FLOW)	0	55.
108	2081.	(DIRECT FLOW)	5	5.
275	69.	1.1	1	0.
274	88.	1.4	0	55.
226	108.	2.1	1	15.
208	2074.	4.5	5	15.
186	154.	(DIRECT FLOW)	1	0.
107	2075.	(DIRECT FLOW)	5	15.
225	120.	1.7	1	15.
207	2075.	5.7	5	15.
124	30.	(DIRECT FLOW)	1	10.
106	2076.	(DIRECT FLOW)	5	15.
223	28.	.8	1	25.
206	2059.	4.2	5	30.
105	2070.	(DIRECT FLOW)	5	30.
205	2067.	4.0	5	35.
135	110.	(DIRECT FLOW)	0	45.
123	93.	(DIRECT FLOW)	0	55.
104	2085.	(DIRECT FLOW)	5	35.
202	81.	1.1	1	10.
278	92.	1.5	0	55.
204	2078.	4.1	5	45.
101	125.	(DIRECT FLOW)	1	5.
103	2078.	(DIRECT FLOW)	5	45.
285	124.	1.4	1	10.
203	2074.	4.1	5	55.
102	2077.	(DIRECT FLOW)	5	55.
273	2077.	4.1	5	55.
100	2077.	(DIRECT FLOW)	5	55.

10YR EXISTING CONDITION

LOWER THIRD CREEK, 10YR EXISTING CONDITION
KIOWA ENGINEERING CORPORATION 3/05

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)	
177	11.	(DIRECT FLOW)		1	0.
178	25.	(DIRECT FLOW)		0	45.
263	10.	.2		1	50.
262	18.	.2		1	20.
179	27.	(DIRECT FLOW)		1	30.
261	25.	.6		1	45.
175	7.	(DIRECT FLOW)		1	5.
176	36.	(DIRECT FLOW)		1	30.
258	4.	.1		3	15.
252	33.	.8		1	50.
152	7.	(DIRECT FLOW)		0	55.
151	14.	(DIRECT FLOW)		0	50.
174	58.	(DIRECT FLOW)		1	20.
259	5.	.1		1	50.
257	10.	.2		1	45.
305	58.	(DIRECT FLOW)		1	20.
180	3.	(DIRECT FLOW)		0	55.
149	15.	(DIRECT FLOW)		1	45.
156	6.	(DIRECT FLOW)		0	50.
251	55.	1.1		1	40.
260	2.	.1		3	5.
255	14.	.3		2	20.
949	413.	(DIRECT FLOW)		3	0.
265	5.	.2		1	25.
185	23.	(DIRECT FLOW)		0	45.
167	55.	(DIRECT FLOW)		1	40.
146	18.	(DIRECT FLOW)		0	45.
150	59.	(DIRECT FLOW)		0	45.
153	5.	(DIRECT FLOW)		0	45.
122	414.	(DIRECT FLOW)		3	0.
284	15.	.5		1	30.
250	48.	.4		2	15.
267	12.	.2		1	5.
256	39.	.4		1	35.
264	2.	.1		1	55.
222	358.	3.5		3	30.
132	66.	(DIRECT FLOW)		1	55.
145	69.	(DIRECT FLOW)		1	15.
154	9.	(DIRECT FLOW)		0	40.
121	363.	(DIRECT FLOW)		3	30.
183	26.	(DIRECT FLOW)		0	45.
304	66.	(DIRECT FLOW)		1	55.
266	61.	1.1		1	35.
268	6.	.1		1	25.
221	334.	3.1		4	0.
239	21.	.4		1	10.
296	66.	1.0		2	0.
148	80.	(DIRECT FLOW)		1	25.
120	338.	(DIRECT FLOW)		4	0.
143	30.	(DIRECT FLOW)		1	5.
172	69.	(DIRECT FLOW)		1	55.
254	79.	1.2		1	35.
220	335.	2.9		4	10.
237	30.	.8		1	5.
249	60.	.5		2	30.
155	3.	(DIRECT FLOW)		0	50.
147	353.	(DIRECT FLOW)		4	5.
184	44.	(DIRECT FLOW)		0	55.
171	60.	(DIRECT FLOW)		2	30.
269	3.	.3		1	20.
230	353.	3.0		4	5.
277	44.	.9		1	0.

248	59.	.4		2	45.
119	353.	(DIRECT FLOW)		4	5.
144	53.	(DIRECT FLOW)		0	55.
170	59.	(DIRECT FLOW)		2	45.
280	351.	2.6		4	15.
276	48.	.9		1	15.
241	56.	1.0		3	10.
137	352.	(DIRECT FLOW)		4	15.
139	56.	(DIRECT FLOW)		3	10.
219	348.	2.6		4	25.
142	12.	(DIRECT FLOW)		0	45.
307	56.	(DIRECT FLOW)		3	10.
118	348.	(DIRECT FLOW)		4	25.
306	1.	(DIRECT FLOW)		0	35.
240	7.	.3		1	20.
235	56.	.7		3	20.
218	348.	2.6		4	25.
166	14.	(DIRECT FLOW)		0	45.
303	17.	(DIRECT FLOW)		0	45.
188	0.	(DIRECT FLOW)		0	0.
169	4.	(DIRECT FLOW)		0	40.
140	57.	(DIRECT FLOW)		3	15.
141	21.	(DIRECT FLOW)		0	40.
138	3.	(DIRECT FLOW)		0	45.
117	348.	(DIRECT FLOW)		4	25.
246	7.	.3		1	30.
247	13.	.3		1	5.
242	3.	.2		1	10.
200	17.	.7		0	55.
236	1.	.1		2	10.
217	340.	2.5		4	45.
165	14.	(DIRECT FLOW)		1	20.
168	22.	(DIRECT FLOW)		1	5.
136	17.	(DIRECT FLOW)		0	55.
116	340.	(DIRECT FLOW)		4	45.
245	12.	.4		1	45.
243	20.	.6		1	25.
403	57.	(DIRECT FLOW)		3	15.
288	17.	.8		0	55.
311	340.	(DIRECT FLOW)		4	45.
163	15.	(DIRECT FLOW)		1	35.
161	24.	(DIRECT FLOW)		1	20.
238	57.	1.6		3	15.
271	10.	.3		1	25.
216	339.	2.6		4	50.
244	14.	.5		1	55.
310	24.	(DIRECT FLOW)		1	20.
164	375.	(DIRECT FLOW)		4	45.
160	30.	(DIRECT FLOW)		0	40.
234	18.	.5		1	55.
279	370.	2.7		5	0.
282	21.	.6		1	25.
173	18.	(DIRECT FLOW)		1	55.
315	328.	.1	20.3	5	45.
182	30.	(DIRECT FLOW)		1	0.
270	18.	.6		2	10.
115	328.	(DIRECT FLOW)		5	45.
283	27.	.7		1	35.
181	22.	(DIRECT FLOW)		2	0.
215	327.	2.5		5	55.
159	57.	(DIRECT FLOW)		1	30.
308	327.	(DIRECT FLOW)		5	55.
309	57.	(DIRECT FLOW)		1	30.
114	327.	(DIRECT FLOW)		5	55.
162	4.	(DIRECT FLOW)		0	40.
286	57.	1.2		1	45.
214	327.	2.5		5	55.
299	1.	.1		1	5.
158	74.	(DIRECT FLOW)		1	25.
134	4.	(DIRECT FLOW)		0	45.
113	327.	(DIRECT FLOW)		5	55.
302	30.	.1	8.1	3	20.
281	2.	.2		2	10.
213	326.	2.8		6	5.
233	30.	.7		3	40.
133	24.	(DIRECT FLOW)		0	45.
112	326.	(DIRECT FLOW)		6	5.
187	6.	(DIRECT FLOW)		0	45.
297	30.	1.4		3	40.
232	21.	.6		1	5.
212	325.	1.9		6	15.
131	43.	(DIRECT FLOW)		0	45.
301	6.	(DIRECT FLOW)		0	45.
298	30.	.7		3	40.
111	326.	(DIRECT FLOW)		6	15.
231	0.	.0		2	50.
401	43.	(DIRECT FLOW)		0	45.
224	4.	.3		1	35.
211	350.	2.9		6	15.
128	8.	(DIRECT FLOW)		0	55.
130	0.	(DIRECT FLOW)		2	50.
402	43.	1.3		0	45.
110	350.	(DIRECT FLOW)		6	15.
229	7.	.5		1	10.
287	0.	.0		7	25.
210	348.	2.9		6	25.
129	11.	(DIRECT FLOW)		0	45.
127	14.	(DIRECT FLOW)		1	5.
109	348.	(DIRECT FLOW)		6	25.
227	7.	.3		1	40.
228	14.	.7		1	10.
209	346.	2.9		6	40.
157	13.	(DIRECT FLOW)		0	45.
125	15.	(DIRECT FLOW)		0	40.
126	30.	(DIRECT FLOW)		0	45.
108	346.	(DIRECT FLOW)		6	40.
275	10.	.4		1	5.
274	11.	.5		0	55.
226	26.	1.0		1	15.
208	345.	2.6		6	55.
186	21.	(DIRECT FLOW)		1	0.
107	345.	(DIRECT FLOW)		6	55.
225	14.	.5		1	35.
207	345.	3.3		6	55.
124	10.	(DIRECT FLOW)		1	10.
106	345.	(DIRECT FLOW)		6	55.
223	9.	.4		1	50.
206	342.	1.9		7	10.
105	343.	(DIRECT FLOW)		7	10.
205	343.	1.7		7	15.

135	51.	(DIRECT FLOW)	0	40.
123	31.	(DIRECT FLOW)	0	45.
104	345.	(DIRECT FLOW)	7	10.
202	34.	.7	1	15.
278	30.	.8	0	55.
204	342.	2.2	7	25.
101	44.	(DIRECT FLOW)	1	10.
103	342.	(DIRECT FLOW)	7	25.
285	43.	.8	1	15.
203	341.	2.2	7	40.
102	342.	(DIRECT FLOW)	7	40.
273	341.	2.5	7	45.
100	341.	(DIRECT FLOW)	7	45.

5YR EXISTING CONDITION

LOWER THIRD CREEK, 5YR EXISTING CONDITION
KIOWA ENGINEERING CORPORATION 3/05

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)	
177	4.	(DIRECT FLOW)		1	0.
178	6.	(DIRECT FLOW)		0	50.
263	3.	.1		2	5.
262	3.	.1		1	35.
179	6.	(DIRECT FLOW)		1	50.
261	5.	.3		2	15.
175	2.	(DIRECT FLOW)		1	0.
176	6.	(DIRECT FLOW)		2	0.
258	0.	.0		1	40.
252	5.	.3		2	5.
152	2.	(DIRECT FLOW)		0	50.
151	3.	(DIRECT FLOW)		0	45.
174	10.	(DIRECT FLOW)		0	55.
259	1.	.0		1	35.
257	2.	.1		2	0.
305	10.	(DIRECT FLOW)		0	55.
180	0.	(DIRECT FLOW)		0	0.
149	2.	(DIRECT FLOW)		1	40.
156	2.	(DIRECT FLOW)		0	45.
251	10.	.4		1	25.
260	0.	.0		0	0.
255	1.	.1		2	35.
949	318.	(DIRECT FLOW)		3	20.
265	1.	.1		1	35.
185	5.	(DIRECT FLOW)		0	45.
167	10.	(DIRECT FLOW)		1	25.
146	5.	(DIRECT FLOW)		0	40.
150	14.	(DIRECT FLOW)		0	40.
153	3.	(DIRECT FLOW)		0	45.
122	318.	(DIRECT FLOW)		3	20.
284	2.	.2		1	45.
250	5.	.1		2	45.
267	3.	.1		1	20.
256	6.	.1		1	40.
264	1.	.0		1	35.
222	281.	3.3		3	50.
132	10.	(DIRECT FLOW)		0	50.
145	14.	(DIRECT FLOW)		1	10.
154	7.	(DIRECT FLOW)		0	40.
121	282.	(DIRECT FLOW)		3	50.
183	12.	(DIRECT FLOW)		0	40.
304	10.	(DIRECT FLOW)		0	50.
266	11.	.4		1	40.
268	4.	.1		1	25.
221	262.	2.7		4	25.
239	9.	.3		1	15.
296	9.	.3		1	40.
148	16.	(DIRECT FLOW)		1	30.
120	262.	(DIRECT FLOW)		4	25.
143	11.	(DIRECT FLOW)		1	10.
172	12.	(DIRECT FLOW)		1	15.
254	16.	.6		1	35.
220	261.	2.6		4	35.
237	11.	.5		1	10.
249	6.	.1		3	10.
155	1.	(DIRECT FLOW)		0	45.
147	264.	(DIRECT FLOW)		4	35.
184	15.	(DIRECT FLOW)		1	5.
171	7.	(DIRECT FLOW)		0	40.
269	1.	.1		0	50.
230	264.	2.6		4	35.
277	15.	.5		1	5.
248	6.	.1		3	55.
119	264.	(DIRECT FLOW)		4	35.
144	18.	(DIRECT FLOW)		1	0.
170	6.	(DIRECT FLOW)		3	55.
280	262.	2.3		4	45.
276	16.	.5		1	25.
241	6.	.3		4	25.
137	262.	(DIRECT FLOW)		4	45.
139	6.	(DIRECT FLOW)		4	25.
219	260.	2.3		4	55.
142	3.	(DIRECT FLOW)		0	40.
307	6.	(DIRECT FLOW)		4	25.
118	260.	(DIRECT FLOW)		4	55.
306	0.	(DIRECT FLOW)		0	0.
240	1.	.1		1	30.
235	6.	.2		4	40.
218	260.	2.3		5	0.
166	4.	(DIRECT FLOW)		0	40.
303	5.	(DIRECT FLOW)		0	40.
188	0.	(DIRECT FLOW)		0	0.
169	2.	(DIRECT FLOW)		0	40.
140	7.	(DIRECT FLOW)		1	5.
141	6.	(DIRECT FLOW)		0	40.
138	2.	(DIRECT FLOW)		0	45.
117	260.	(DIRECT FLOW)		5	0.
246	2.	.1		1	45.
247	3.	.1		1	15.
242	2.	.1		1	10.
200	4.	.4		0	55.
236	0.	.0		1	15.
217	254.	2.2		5	15.

165	3.	(DIRECT FLOW)		1	20.
168	7.	(DIRECT FLOW)		1	10.
136	4.	(DIRECT FLOW)		0	55.
116	254.	(DIRECT FLOW)		5	15.
245	2.	.2		1	45.
243	6.	.3		1	30.
403	7.	(DIRECT FLOW)		1	5.
288	4.	.4		0	55.
311	254.	(DIRECT FLOW)		5	15.
163	4.	(DIRECT FLOW)		1	25.
161	9.	(DIRECT FLOW)		1	25.
238	7.	.6		1	5.
271	2.	.1		1	40.
216	253.	2.2		5	25.
244	4.	.2		1	55.
310	9.	(DIRECT FLOW)		1	25.
164	259.	(DIRECT FLOW)		5	25.
160	13.	(DIRECT FLOW)		0	35.
234	6.	.3		2	5.
279	256.	2.2		5	40.
282	8.	.3		1	20.
173	6.	(DIRECT FLOW)		2	5.
315	226.	.1	13.8	6	40.
182	10.	(DIRECT FLOW)		1	10.
270	5.	.3		2	25.
115	226.	(DIRECT FLOW)		6	40.
283	9.	.4		1	40.
181	6.	(DIRECT FLOW)		1	55.
215	225.	2.1		6	50.
159	16.	(DIRECT FLOW)		1	30.
308	225.	(DIRECT FLOW)		6	50.
309	16.	(DIRECT FLOW)		1	30.
114	225.	(DIRECT FLOW)		6	50.
162	0.	(DIRECT FLOW)		0	0.
286	16.	.6		1	55.
214	225.	2.1		6	55.
299	0.	.0		0	0.
158	21.	(DIRECT FLOW)		1	20.
134	0.	(DIRECT FLOW)		0	0.
113	225.	(DIRECT FLOW)		6	55.
302	12.	.1	1.6	2	45.
281	0.	.0		0	0.
213	225.	2.3		7	5.
233	12.	.4		3	10.
133	6.	(DIRECT FLOW)		0	40.
112	225.	(DIRECT FLOW)		7	5.
187	0.	(DIRECT FLOW)		0	0.
297	12.	.9		3	10.
232	4.	.3		1	10.
212	224.	1.5		7	15.
131	12.	(DIRECT FLOW)		0	45.
301	0.	(DIRECT FLOW)		0	0.
298	12.	.4		3	15.
111	224.	(DIRECT FLOW)		7	15.
231	0.	.0		2	25.
401	12.	(DIRECT FLOW)		0	45.
224	0.	.0		0	0.
211	229.	2.3		7	15.
128	2.	(DIRECT FLOW)		0	55.
130	0.	(DIRECT FLOW)		2	25.
402	12.	.7		0	40.
110	229.	(DIRECT FLOW)		7	15.
229	2.	.3		1	25.
287	0.	.0		7	0.
210	228.	2.3		7	30.
129	2.	(DIRECT FLOW)		0	45.
127	3.	(DIRECT FLOW)		1	10.
109	228.	(DIRECT FLOW)		7	30.
227	1.	.1		1	40.
228	3.	.3		1	10.
209	227.	2.3		7	45.
157	4.	(DIRECT FLOW)		0	40.
125	8.	(DIRECT FLOW)		0	35.
126	15.	(DIRECT FLOW)		0	40.
108	227.	(DIRECT FLOW)		7	45.
275	3.	.2		1	15.
274	5.	.3		1	0.
226	12.	.7		1	10.
208	225.	2.1		8	5.
186	8.	(DIRECT FLOW)		1	5.
107	226.	(DIRECT FLOW)		8	5.
225	5.	.3		1	45.
207	226.	2.7		8	5.
124	4.	(DIRECT FLOW)		1	5.
106	226.	(DIRECT FLOW)		8	5.
223	3.	.2		1	55.
206	224.	1.5		8	30.
105	224.	(DIRECT FLOW)		8	30.
205	223.	1.3		8	35.
135	36.	(DIRECT FLOW)		0	40.
123	14.	(DIRECT FLOW)		0	45.
104	223.	(DIRECT FLOW)		8	35.
202	23.	.6		1	15.
278	14.	.5		1	0.
204	222.	1.8		8	55.
101	25.	(DIRECT FLOW)		1	10.
103	222.	(DIRECT FLOW)		8	55.
285	25.	.6		1	20.
203	221.	1.8		9	10.
102	221.	(DIRECT FLOW)		9	10.
273	221.	2.2		9	15.
100	223.	(DIRECT FLOW)		9	10.

2 YR EXISTING CONDITION

LOWER THIRD CREEK, 2 YR EXISTING CONDITION
KIOWA ENGINEERING CORPORATION 03/05

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)	
177	0.	(DIRECT FLOW)		0	0.
178	2.	(DIRECT FLOW)		0	45.
263	0.	.0		0	0.
262	0.	.0		0	55.
179	0.	(DIRECT FLOW)		0	55.

261	0.	.0	3	45.
175	0.	(DIRECT FLOW)	0	0.
176	0.	(DIRECT FLOW)	3	45.
258	0.	.0	0	0.
252	0.	.0	8	35.
152	0.	(DIRECT FLOW)	0	0.
151	0.	(DIRECT FLOW)	0	0.
174	1.	(DIRECT FLOW)	0	45.
259	0.	.0	0	0.
257	0.	.0	0	0.
305	1.	(DIRECT FLOW)	0	45.
180	0.	(DIRECT FLOW)	0	0.
149	0.	(DIRECT FLOW)	0	0.
156	0.	(DIRECT FLOW)	0	0.
251	0.	.1	0	50.
260	0.	.0	0	0.
255	0.	.0	0	0.
949	71.	(DIRECT FLOW)	9	55.
265	0.	.0	0	0.
185	0.	(DIRECT FLOW)	0	0.
167	0.	(DIRECT FLOW)	0	50.
146	0.	(DIRECT FLOW)	0	0.
150	1.	(DIRECT FLOW)	0	40.
153	0.	(DIRECT FLOW)	0	0.
122	71.	(DIRECT FLOW)	9	55.
284	0.	.0	0	0.
250	0.	.0	14	35.
267	0.	.0	0	0.
256	0.	.0	0	50.
264	0.	.0	0	0.
222	64.	1.6	10	20.
132	0.	(DIRECT FLOW)	14	35.
145	2.	(DIRECT FLOW)	0	40.
154	2.	(DIRECT FLOW)	0	40.
121	64.	(DIRECT FLOW)	10	20.
183	3.	(DIRECT FLOW)	0	40.
304	0.	(DIRECT FLOW)	14	35.
266	0.	.0	0	50.
268	1.	.0	1	15.
221	56.	1.2	11	0.
239	1.	.1	1	25.
296	0.	.0	16	0.
148	2.	(DIRECT FLOW)	0	45.
120	56.	(DIRECT FLOW)	11	0.
143	1.	(DIRECT FLOW)	1	25.
172	0.	(DIRECT FLOW)	16	0.
254	2.	.2	1	15.
220	55.	1.1	11	15.
237	1.	.2	1	25.
249	0.	.0	16	0.
155	0.	(DIRECT FLOW)	0	0.
147	55.	(DIRECT FLOW)	11	15.
184	1.	(DIRECT FLOW)	1	25.
171	2.	(DIRECT FLOW)	0	40.
269	0.	.0	0	0.
230	55.	1.1	11	20.
277	1.	.1	1	25.
248	0.	.0	0	50.
119	55.	(DIRECT FLOW)	11	20.
144	2.	(DIRECT FLOW)	0	45.

170	0.	(DIRECT FLOW)	0	50.
280	54.	1.0	11	30.
276	1.	.1	1	55.
241	0.	.0	5	20.
137	54.	(DIRECT FLOW)	11	30.
139	0.	(DIRECT FLOW)	5	20.
219	53.	1.0	11	50.
142	0.	(DIRECT FLOW)	0	0.
307	0.	(DIRECT FLOW)	5	20.
118	53.	(DIRECT FLOW)	11	50.
306	0.	(DIRECT FLOW)	0	0.
240	0.	.0	0	0.
235	0.	.0	8	40.
218	53.	1.0	11	50.
166	0.	(DIRECT FLOW)	0	0.
303	0.	(DIRECT FLOW)	0	0.
188	0.	(DIRECT FLOW)	0	0.
169	0.	(DIRECT FLOW)	0	0.
140	0.	(DIRECT FLOW)	8	40.
141	0.	(DIRECT FLOW)	0	0.
138	0.	(DIRECT FLOW)	0	0.
117	53.	(DIRECT FLOW)	11	50.
246	0.	.0	0	0.
247	0.	.0	0	0.
242	0.	.0	0	0.
200	0.	.0	0	0.
236	0.	.0	0	0.
217	51.	1.0	12	15.
165	0.	(DIRECT FLOW)	0	0.
168	0.	(DIRECT FLOW)	0	0.
136	0.	(DIRECT FLOW)	0	0.
116	51.	(DIRECT FLOW)	12	15.
245	0.	.0	0	0.
243	0.	.0	0	0.
403	0.	(DIRECT FLOW)	8	40.
288	0.	.0	0	0.
311	51.	(DIRECT FLOW)	12	15.
163	0.	(DIRECT FLOW)	0	0.
161	0.	(DIRECT FLOW)	0	0.
238	0.	.0	8	45.
271	0.	.0	0	0.
216	51.	1.0	12	25.
244	0.	.0	0	0.
310	0.	(DIRECT FLOW)	0	0.
164	51.	(DIRECT FLOW)	12	25.
160	5.	(DIRECT FLOW)	0	40.
234	0.	.0	0	0.
279	50.	1.0	12	45.
282	2.	.1	1	15.
173	0.	(DIRECT FLOW)	0	0.
315	45.	.1 2.7	13	35.
182	2.	(DIRECT FLOW)	1	15.
270	0.	.0	0	0.
115	45.	(DIRECT FLOW)	13	35.
283	1.	.1	1	55.
181	0.	(DIRECT FLOW)	0	0.
215	44.	.9	13	45.
159	1.	(DIRECT FLOW)	1	55.
308	44.	(DIRECT FLOW)	13	45.
309	1.	(DIRECT FLOW)	1	55.

114	44.	(DIRECT FLOW)		13	45.
162	0.	(DIRECT FLOW)		0	0.
286	1.	.1		2	55.
214	44.	.9		13	50.
299	0.	.0		0	0.
158	2.	(DIRECT FLOW)		0	40.
134	0.	(DIRECT FLOW)		0	0.
113	44.	(DIRECT FLOW)		13	50.
302	2.	.1	.1	1	15.
281	0.	.0		0	0.
213	44.	.9		14	5.
233	1.	.1		1	50.
133	2.	(DIRECT FLOW)		0	45.
112	44.	(DIRECT FLOW)		14	5.
187	0.	(DIRECT FLOW)		0	0.
297	1.	.2		1	50.
232	0.	.1		0	55.
212	43.	.6		14	25.
131	4.	(DIRECT FLOW)		0	45.
301	0.	(DIRECT FLOW)		0	0.
298	1.	.1		2	10.
111	43.	(DIRECT FLOW)		14	25.
231	0.	.0		1	25.
401	4.	(DIRECT FLOW)		0	45.
224	0.	.0		0	0.
211	43.	.9		14	30.
128	0.	(DIRECT FLOW)		0	0.
130	0.	(DIRECT FLOW)		1	25.
402	4.	.4		0	45.
110	43.	(DIRECT FLOW)		14	30.
229	0.	.0		0	0.
287	0.	.0		6	0.
210	42.	.9		14	55.
129	0.	(DIRECT FLOW)		0	0.
127	0.	(DIRECT FLOW)		0	0.
109	42.	(DIRECT FLOW)		14	55.
227	0.	.0		0	0.
228	0.	.0		0	0.
209	41.	.9		15	25.
157	0.	(DIRECT FLOW)		0	0.
125	2.	(DIRECT FLOW)		0	40.
126	7.	(DIRECT FLOW)		0	40.
108	41.	(DIRECT FLOW)		15	25.
275	0.	.0		0	0.
274	1.	.1		1	0.
226	5.	.4		1	10.
208	40.	.9		15	50.
186	1.	(DIRECT FLOW)		1	0.
107	40.	(DIRECT FLOW)		15	50.
225	0.	.1		1	55.
207	40.	1.0		15	50.
124	0.	(DIRECT FLOW)		0	0.
106	40.	(DIRECT FLOW)		15	50.
223	0.	.0		0	0.
206	35.	.5		16	0.
105	35.	(DIRECT FLOW)		16	0.
205	32.	.4		16	0.
135	20.	(DIRECT FLOW)		0	40.
123	7.	(DIRECT FLOW)		0	45.
104	32.	(DIRECT FLOW)		16	0.
202	12.	.4		1	15.
278	6.	.3		1	0.
204	22.	.6		16	0.
101	12.	(DIRECT FLOW)		1	15.
103	22.	(DIRECT FLOW)		16	0.
285	12.	.4		1	25.
203	14.	.5		16	0.
102	17.	(DIRECT FLOW)		1	25.
273	16.	.6		1	35.
100	48.	(DIRECT FLOW)		0	35.

0.4 IN EXISTING CONDITION

LOWER THIRD CREEK, 0.4 IN EXISTING CONDITION
KIOWA ENGINEERING CORPORATION 3/05

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)	
177	0.	(DIRECT FLOW)		0	0.
178	0.	(DIRECT FLOW)		0	0.
263	0.	.0		0	0.
262	0.	.0		0	0.
179	0.	(DIRECT FLOW)		0	0.
261	0.	.0		0	0.
175	0.	(DIRECT FLOW)		0	0.
176	0.	(DIRECT FLOW)		0	0.
258	0.	.0		0	0.
252	0.	.0		0	0.
152	0.	(DIRECT FLOW)		0	0.
151	0.	(DIRECT FLOW)		0	0.
174	0.	(DIRECT FLOW)		0	0.
259	0.	.0		0	0.
257	0.	.0		0	0.
305	0.	(DIRECT FLOW)		0	0.
180	0.	(DIRECT FLOW)		0	0.
149	0.	(DIRECT FLOW)		0	0.
156	0.	(DIRECT FLOW)		0	0.
251	0.	.0		0	0.
260	0.	.0		0	0.
255	0.	.0		0	0.
949	3.	(DIRECT FLOW)		5	30.
265	0.	.0		0	0.
185	0.	(DIRECT FLOW)		0	0.
167	0.	(DIRECT FLOW)		0	0.
146	0.	(DIRECT FLOW)		0	0.
150	0.	(DIRECT FLOW)		0	0.
153	0.	(DIRECT FLOW)		0	0.
122	3.	(DIRECT FLOW)		5	30.
284	0.	.0		0	0.
250	0.	.0		0	0.
267	0.	.0		0	0.
256	0.	.0		0	0.
264	0.	.0		0	0.
222	3.	.3		14	45.
132	0.	(DIRECT FLOW)		0	0.

145	0.	(DIRECT FLOW)	0	0.
154	0.	(DIRECT FLOW)	0	0.
121	3.	(DIRECT FLOW)	14	45.
183	0.	(DIRECT FLOW)	0	0.
304	0.	(DIRECT FLOW)	0	0.
266	0.	.0	0	0.
268	0.	.0	0	0.
221	3.	.2	16	0.
239	0.	.0	0	0.
296	0.	.0	0	0.
148	0.	(DIRECT FLOW)	0	0.
120	3.	(DIRECT FLOW)	16	0.
143	0.	(DIRECT FLOW)	0	0.
172	0.	(DIRECT FLOW)	0	0.
254	0.	.0	0	0.
220	3.	.2	16	0.
237	0.	.0	0	0.
249	0.	.0	0	0.
155	0.	(DIRECT FLOW)	0	0.
147	3.	(DIRECT FLOW)	16	0.
184	0.	(DIRECT FLOW)	0	0.
171	0.	(DIRECT FLOW)	0	0.
269	0.	.0	0	0.
230	3.	.2	16	0.
277	0.	.0	0	0.
248	0.	.0	0	0.
119	3.	(DIRECT FLOW)	16	0.
144	0.	(DIRECT FLOW)	0	0.
170	0.	(DIRECT FLOW)	0	0.
280	3.	.2	16	0.
276	0.	.0	0	0.
241	0.	.0	0	0.
137	3.	(DIRECT FLOW)	16	0.
139	0.	(DIRECT FLOW)	0	0.
219	3.	.2	16	0.
142	0.	(DIRECT FLOW)	0	0.
307	0.	(DIRECT FLOW)	0	0.
118	3.	(DIRECT FLOW)	16	0.
306	0.	(DIRECT FLOW)	0	0.
240	0.	.0	0	0.
235	0.	.0	0	0.
218	3.	.2	16	0.
166	0.	(DIRECT FLOW)	0	0.
303	0.	(DIRECT FLOW)	0	0.
188	0.	(DIRECT FLOW)	0	0.
169	0.	(DIRECT FLOW)	0	0.
140	0.	(DIRECT FLOW)	0	0.
141	0.	(DIRECT FLOW)	0	0.
138	0.	(DIRECT FLOW)	0	0.
117	3.	(DIRECT FLOW)	16	0.
246	0.	.0	0	0.
247	0.	.0	0	0.
242	0.	.0	0	0.
200	0.	.0	0	0.
236	0.	.0	0	0.
217	3.	.2	16	0.
165	0.	(DIRECT FLOW)	0	0.
168	0.	(DIRECT FLOW)	0	0.
136	0.	(DIRECT FLOW)	0	0.
116	3.	(DIRECT FLOW)	16	0.

245	0.	.0	0	0.
243	0.	.0	0	0.
403	0.	(DIRECT FLOW)	0	0.
288	0.	.0	0	0.
311	3.	(DIRECT FLOW)	16	0.
163	0.	(DIRECT FLOW)	0	0.
161	0.	(DIRECT FLOW)	0	0.
238	0.	.0	0	0.
271	0.	.0	0	0.
216	3.	.2	16	0.
244	0.	.0	0	0.
310	0.	(DIRECT FLOW)	0	0.
164	3.	(DIRECT FLOW)	16	0.
160	0.	(DIRECT FLOW)	0	0.
234	0.	.0	0	0.
279	3.	.2	16	0.
282	0.	.0	0	0.
173	0.	(DIRECT FLOW)	0	0.
315	3.	.1 .2	16	0.
182	0.	(DIRECT FLOW)	0	0.
270	0.	.0	0	0.
115	3.	(DIRECT FLOW)	16	0.
283	0.	.0	0	0.
181	0.	(DIRECT FLOW)	0	0.
215	3.	.2	16	0.
159	0.	(DIRECT FLOW)	0	0.
308	3.	(DIRECT FLOW)	16	0.
309	0.	(DIRECT FLOW)	0	0.
114	3.	(DIRECT FLOW)	16	0.
162	0.	(DIRECT FLOW)	0	0.
286	0.	.0	0	0.
214	3.	.2	16	0.
299	0.	.0	0	0.
158	0.	(DIRECT FLOW)	0	0.
134	0.	(DIRECT FLOW)	0	0.
113	3.	(DIRECT FLOW)	16	0.
302	0.	.0	0	0.
281	0.	.0	0	0.
213	2.	.2	16	0.
233	0.	.0	0	0.
133	0.	(DIRECT FLOW)	0	0.
112	2.	(DIRECT FLOW)	16	0.
187	0.	(DIRECT FLOW)	0	0.
297	0.	.0	0	0.
232	0.	.0	0	0.
212	2.	.1	16	0.
131	0.	(DIRECT FLOW)	0	0.
301	0.	(DIRECT FLOW)	0	0.
298	0.	.0	0	0.
111	2.	(DIRECT FLOW)	16	0.
231	0.	.0	0	0.
401	0.	(DIRECT FLOW)	0	0.
224	0.	.0	0	0.
211	1.	.1	16	0.
128	0.	(DIRECT FLOW)	0	0.
130	0.	(DIRECT FLOW)	0	0.
402	0.	.0	0	0.
110	1.	(DIRECT FLOW)	16	0.
229	0.	.0	0	0.
287	0.	.0	0	0.

210	0.	.0	16	0.
129	0.	(DIRECT FLOW)	0	0.
127	0.	(DIRECT FLOW)	0	0.
109	0.	(DIRECT FLOW)	16	0.
227	0.	.0	0	0.
228	0.	.0	0	0.
209	0.	.0	16	0.
157	0.	(DIRECT FLOW)	0	0.
125	0.	(DIRECT FLOW)	0	0.
126	0.	(DIRECT FLOW)	0	0.
108	0.	(DIRECT FLOW)	16	0.
275	0.	.0	0	0.
274	0.	.0	0	0.
226	0.	.0	0	0.
208	0.	.0	16	0.
186	0.	(DIRECT FLOW)	0	0.
107	0.	(DIRECT FLOW)	16	0.
225	0.	.0	0	0.
207	0.	.0	16	0.
124	0.	(DIRECT FLOW)	0	0.
106	0.	(DIRECT FLOW)	16	0.
223	0.	.0	0	0.
206	0.	.0	0	5.
105	0.	(DIRECT FLOW)	0	5.
205	0.	.0	16	0.
135	8.	(DIRECT FLOW)	0	40.
123	0.	(DIRECT FLOW)	0	0.
104	0.	(DIRECT FLOW)	16	0.
202	4.	.2	1	30.
278	0.	.0	0	0.
204	0.	.0	16	0.
101	4.	(DIRECT FLOW)	1	30.
103	0.	(DIRECT FLOW)	15	55.
285	4.	.2	1	45.
203	0.	.0	0	5.
102	4.	(DIRECT FLOW)	1	45.
273	4.	.3	2	0.
100	21.	(DIRECT FLOW)	0	35.

100 YR FUTURE CONDITION

LOWER THIRD CREEK, 100 YR FUTURE CONDITION Baseline
KIOWA ENGINEERING CORPORATION revised 03/05

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)	
177	201.	(DIRECT FLOW)		0	45.
178	436.	(DIRECT FLOW)		0	35.
263	178.	.9		1	0.
262	313.	1.2		0	50.
179	470.	(DIRECT FLOW)		0	50.
261	421.	2.4		1	5.
176	591.	(DIRECT FLOW)		0	55.
175	153.	(DIRECT FLOW)		0	50.
252	533.	2.7		1	10.
258	96.	.6		1	25.
174	1074.	(DIRECT FLOW)		0	45.
152	156.	(DIRECT FLOW)		0	45.
151	405.	(DIRECT FLOW)		0	35.
305	1074.	(DIRECT FLOW)		0	45.
259	135.	.7		1	0.
257	286.	1.1		0	50.
251	1046.	2.4		0	50.
180	112.	(DIRECT FLOW)		0	50.
149	412.	(DIRECT FLOW)		0	55.
156	63.	(DIRECT FLOW)		1	5.
185	544.	(DIRECT FLOW)		0	35.
167	1046.	(DIRECT FLOW)		0	50.
260	82.	.6		1	10.
255	370.	1.4		1	10.
904	5489.	(DIRECT FLOW)		1	20.
265	60.	1.0		1	15.
284	297.	2.2		0	50.
250	874.	1.7		1	15.
146	389.	(DIRECT FLOW)		0	35.
150	1302.	(DIRECT FLOW)		0	35.
153	98.	(DIRECT FLOW)		1	0.
122	5547.	(DIRECT FLOW)		1	20.
132	1326.	(DIRECT FLOW)		1	5.
267	284.	1.2		0	45.
256	988.	1.7		0	55.
264	82.	.4		1	20.
222	4944.	8.0		1	40.
304	1536.	(DIRECT FLOW)		0	35.
145	1756.	(DIRECT FLOW)		0	45.
154	360.	(DIRECT FLOW)		0	35.
121	5099.	(DIRECT FLOW)		1	35.
296	1421.	3.4		1	10.
266	1474.	3.5		1	0.
268	290.	1.0		0	45.
221	4414.	8.7		2	5.
316	795.	.1	113.1	1	55.
148	1730.	(DIRECT FLOW)		0	55.
120	4551.	(DIRECT FLOW)		2	5.
143	795.	(DIRECT FLOW)		1	55.
254	1726.	2.9		1	0.
220	4529.	6.9		2	10.
237	797.	4.9		1	55.
155	133.	(DIRECT FLOW)		0	50.
147	5133.	(DIRECT FLOW)		2	5.
184	830.	(DIRECT FLOW)		1	55.
171	533.	(DIRECT FLOW)		0	35.
269	128.	1.3		0	55.
230	5131.	7.2		2	5.
277	829.	2.2		2	0.
248	340.	1.2		0	45.
119	5180.	(DIRECT FLOW)		2	5.
144	842.	(DIRECT FLOW)		2	0.
170	470.	(DIRECT FLOW)		0	45.
280	5155.	5.8		2	10.
276	834.	4.4		2	5.
241	370.	1.7		0	55.
137	5978.	(DIRECT FLOW)		2	10.

139	578.	(DIRECT FLOW)	0	45.
219	5954.	6.4	2	15.
142	229.	(DIRECT FLOW)	0	45.
307	578.	(DIRECT FLOW)	0	45.
183	307.	(DIRECT FLOW)	0	45.
118	5995.	(DIRECT FLOW)	2	15.
303	248.	(DIRECT FLOW)	0	40.
306	174.	(DIRECT FLOW)	0	40.
240	151.	1.3	1	5.
235	563.	1.7	0	55.
239	253.	1.8	1	0.
218	5996.	6.3	2	15.
166	269.	(DIRECT FLOW)	0	40.
188	248.	(DIRECT FLOW)	0	40.
169	301.	(DIRECT FLOW)	0	35.
140	934.	(DIRECT FLOW)	0	50.
141	465.	(DIRECT FLOW)	0	35.
138	148.	(DIRECT FLOW)	0	45.
117	6021.	(DIRECT FLOW)	2	15.
246	171.	1.8	0	55.
247	228.	1.5	0	50.
242	253.	2.2	0	45.
200	761.	3.2	0	55.
236	98.	1.0	1	10.
217	5955.	6.2	2	20.
165	307.	(DIRECT FLOW)	0	50.
168	586.	(DIRECT FLOW)	0	45.
136	761.	(DIRECT FLOW)	0	55.
116	6008.	(DIRECT FLOW)	2	20.
245	261.	2.1	1	10.
243	525.	2.6	0	55.
403	560.	(DIRECT FLOW)	0	35.
288	760.	6.3	0	55.
311	6008.	(DIRECT FLOW)	2	20.
163	422.	(DIRECT FLOW)	1	0.
161	614.	(DIRECT FLOW)	0	55.
238	570.	6.3	0	40.
271	659.	2.5	1	10.
216	5999.	6.3	2	25.
244	396.	2.4	1	10.
310	614.	(DIRECT FLOW)	0	55.
164	6212.	(DIRECT FLOW)	2	20.
160	499.	(DIRECT FLOW)	1	5.
234	462.	2.4	1	10.
279	6173.	6.4	2	30.
282	455.	2.5	1	15.
173	565.	(DIRECT FLOW)	1	5.
315	5180.	.1 319.5	3	5.
182	552.	(DIRECT FLOW)	1	10.
270	541.	2.7	1	15.
115	5183.	(DIRECT FLOW)	3	5.
283	523.	2.6	1	20.
181	670.	(DIRECT FLOW)	1	10.
215	5179.	6.0	3	10.
159	1370.	(DIRECT FLOW)	1	5.
308	5187.	(DIRECT FLOW)	3	10.
309	1370.	(DIRECT FLOW)	1	5.
114	5187.	(DIRECT FLOW)	3	10.
162	369.	(DIRECT FLOW)	0	40.
286	1343.	3.6	1	15.
214	5186.	6.0	3	10.
299	281.	2.0	0	50.
158	1662.	(DIRECT FLOW)	1	5.
134	33.	(DIRECT FLOW)	1	5.
113	5186.	(DIRECT FLOW)	3	10.
302	153.	.1 204.8	3	25.
281	22.	.6	1	35.
213	5170.	6.0	3	20.
233	153.	1.7	3	35.
133	284.	(DIRECT FLOW)	0	40.
112	5182.	(DIRECT FLOW)	3	15.
187	73.	(DIRECT FLOW)	0	40.
297	153.	3.5	3	35.
232	253.	2.1	0	50.
212	5165.	5.5	3	25.
131	99.	(DIRECT FLOW)	0	50.
301	73.	(DIRECT FLOW)	0	40.
298	153.	1.5	3	40.
111	5180.	(DIRECT FLOW)	3	25.
231	0.	.0	2	55.
401	99.	(DIRECT FLOW)	0	50.
224	57.	1.2	1	0.
211	5328.	6.0	3	25.
128	242.	(DIRECT FLOW)	0	45.
130	434.	(DIRECT FLOW)	0	40.
402	98.	1.9	0	55.
110	5385.	(DIRECT FLOW)	3	25.
229	222.	2.4	0	55.
287	451.	5.9	0	40.
210	5361.	6.0	3	35.
129	200.	(DIRECT FLOW)	0	40.
127	320.	(DIRECT FLOW)	0	50.
109	5387.	(DIRECT FLOW)	3	35.
227	119.	1.3	1	5.
228	315.	2.5	0	55.
209	5347.	7.8	3	45.
157	114.	(DIRECT FLOW)	0	50.
125	115.	(DIRECT FLOW)	0	50.
126	255.	(DIRECT FLOW)	1	0.
108	5365.	(DIRECT FLOW)	3	45.
275	106.	1.4	1	0.
274	107.	1.6	1	0.
226	226.	2.4	1	15.
208	5343.	6.0	3	50.
186	213.	(DIRECT FLOW)	1	0.
107	5353.	(DIRECT FLOW)	3	50.
225	173.	2.0	1	20.
207	5353.	7.4	3	55.
124	41.	(DIRECT FLOW)	1	15.
106	5366.	(DIRECT FLOW)	3	50.
223	39.	.9	1	25.
206	5320.	5.6	4	5.
105	5341.	(DIRECT FLOW)	4	5.
205	5334.	5.4	4	10.
135	121.	(DIRECT FLOW)	0	45.
123	100.	(DIRECT FLOW)	1	5.
104	5367.	(DIRECT FLOW)	4	10.
202	92.	1.2	1	10.
278	99.	1.5	1	10.
204	5349.	5.4	4	15.

101	185.	(DIRECT FLOW)	0	55.
103	5353.	(DIRECT FLOW)	4	15.
285	185.	1.7	0	55.
203	5344.	5.4	4	20.
102	5345.	(DIRECT FLOW)	4	20.
273	5344.	5.5	4	25.
100	5359.	(DIRECT FLOW)	4	25.

50 YR FUTURE CONDITION

LOWER THIRD CREEK, 50 YR FUTURE CONDITION Baseline
KIOWA ENGINEERING CORPORATION revised 03/05

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)	
177	168.	(DIRECT FLOW)		0	45.
178	371.	(DIRECT FLOW)		0	35.
263	145.	.8		1	0.
262	259.	1.1		0	50.
179	388.	(DIRECT FLOW)		0	50.
261	342.	2.3		1	5.
176	485.	(DIRECT FLOW)		0	45.
175	128.	(DIRECT FLOW)		0	50.
252	421.	2.5		1	10.
258	75.	.5		1	25.
174	893.	(DIRECT FLOW)		0	45.
152	131.	(DIRECT FLOW)		0	45.
151	355.	(DIRECT FLOW)		0	35.
305	893.	(DIRECT FLOW)		0	45.
259	110.	.7		1	0.
257	246.	1.0		0	50.
251	865.	2.3		0	50.
180	95.	(DIRECT FLOW)		0	45.
149	346.	(DIRECT FLOW)		0	55.
156	45.	(DIRECT FLOW)		0	50.
185	478.	(DIRECT FLOW)		0	35.
167	865.	(DIRECT FLOW)		0	50.
260	67.	.5		1	10.
255	298.	1.3		1	10.
904	4153.	(DIRECT FLOW)		1	25.
265	41.	.8		1	10.
284	256.	2.1		0	50.
250	688.	1.5		1	15.
146	323.	(DIRECT FLOW)		0	35.
150	1117.	(DIRECT FLOW)		0	35.
153	67.	(DIRECT FLOW)		0	50.
122	4191.	(DIRECT FLOW)		1	25.
132	1043.	(DIRECT FLOW)		1	5.
267	234.	1.1		0	40.
256	805.	1.6		0	55.
264	49.	.3		1	20.
222	3787.	7.3		1	45.
304	1309.	(DIRECT FLOW)		0	35.
145	1434.	(DIRECT FLOW)		0	45.
154	302.	(DIRECT FLOW)		0	35.
121	3890.	(DIRECT FLOW)		1	40.
296	1125.	2.9		1	5.
266	1183.	3.3		1	0.
268	234.	.9		0	45.
221	3378.	7.9		2	15.
316	566.	.1	104.4	2	15.
148	1391.	(DIRECT FLOW)		0	55.
120	3489.	(DIRECT FLOW)		2	10.
143	566.	(DIRECT FLOW)		2	15.
254	1382.	2.7		1	0.
220	3469.	6.4		2	15.
237	567.	3.8		2	15.
155	114.	(DIRECT FLOW)		0	45.
147	3978.	(DIRECT FLOW)		2	10.
184	587.	(DIRECT FLOW)		2	5.
171	440.	(DIRECT FLOW)		0	35.
269	107.	1.3		0	55.
230	3975.	6.7		2	10.
277	587.	2.0		2	10.
248	284.	1.1		0	45.
119	4015.	(DIRECT FLOW)		2	10.
144	597.	(DIRECT FLOW)		2	10.
170	397.	(DIRECT FLOW)		0	40.
280	3991.	5.4		2	20.
276	589.	3.7		2	15.
241	304.	1.6		0	55.
137	4579.	(DIRECT FLOW)		2	15.
139	462.	(DIRECT FLOW)		0	45.
219	4560.	5.8		2	20.
142	196.	(DIRECT FLOW)		0	45.
307	462.	(DIRECT FLOW)		0	45.
183	263.	(DIRECT FLOW)		0	45.
118	4590.	(DIRECT FLOW)		2	20.
303	196.	(DIRECT FLOW)		0	40.
306	143.	(DIRECT FLOW)		0	35.
240	125.	1.3		1	5.
235	447.	1.6		0	55.
239	211.	1.6		1	0.
218	4589.	5.8		2	25.
166	216.	(DIRECT FLOW)		0	40.
188	196.	(DIRECT FLOW)		0	40.
169	255.	(DIRECT FLOW)		0	35.
140	739.	(DIRECT FLOW)		0	50.
141	384.	(DIRECT FLOW)		0	35.
138	121.	(DIRECT FLOW)		0	45.
117	4608.	(DIRECT FLOW)		2	20.
246	133.	1.6		0	55.
247	177.	1.3		0	50.
242	212.	2.1		0	40.
200	493.	2.9		0	55.
236	76.	.9		1	10.
217	4560.	5.7		2	30.
165	240.	(DIRECT FLOW)		0	50.
168	473.	(DIRECT FLOW)		0	45.
136	493.	(DIRECT FLOW)		0	55.
116	4600.	(DIRECT FLOW)		2	30.
245	209.	2.0		1	5.
243	415.	2.5		0	55.

403	560.	(DIRECT FLOW)	0	40.
288	492.	5.9	0	55.
311	4600.	(DIRECT FLOW)	2	30.
163	333.	(DIRECT FLOW)	0	55.
161	484.	(DIRECT FLOW)	0	55.
238	560.	6.2	0	45.
271	422.	2.1	1	5.
216	4590.	5.8	2	35.
244	302.	2.2	1	10.
310	484.	(DIRECT FLOW)	0	55.
164	4754.	(DIRECT FLOW)	2	30.
160	370.	(DIRECT FLOW)	1	5.
234	355.	2.3	1	10.
279	4724.	5.9	2	35.
282	338.	2.3	1	15.
173	425.	(DIRECT FLOW)	1	5.
315	4071.	.1 247.2	3	15.
182	406.	(DIRECT FLOW)	1	5.
270	408.	2.5	1	15.
115	4071.	(DIRECT FLOW)	3	15.
283	387.	2.4	1	20.
181	499.	(DIRECT FLOW)	1	10.
215	4066.	5.5	3	20.
159	1024.	(DIRECT FLOW)	1	5.
308	4073.	(DIRECT FLOW)	3	20.
309	1024.	(DIRECT FLOW)	1	5.
114	4073.	(DIRECT FLOW)	3	20.
162	302.	(DIRECT FLOW)	0	35.
286	1009.	3.3	1	15.
214	4074.	5.6	3	20.
299	227.	1.8	0	50.
158	1285.	(DIRECT FLOW)	0	55.
134	24.	(DIRECT FLOW)	0	50.
113	4074.	(DIRECT FLOW)	3	20.
302	140.	.1 162.2	3	20.
281	15.	.5	1	40.
213	4059.	5.6	3	25.
233	140.	1.6	3	35.
133	226.	(DIRECT FLOW)	0	40.
112	4064.	(DIRECT FLOW)	3	25.
187	59.	(DIRECT FLOW)	0	40.
297	140.	3.3	3	35.
232	206.	2.0	0	50.
212	4048.	5.1	3	35.
131	74.	(DIRECT FLOW)	0	50.
301	59.	(DIRECT FLOW)	0	40.
298	140.	1.5	3	35.
111	4059.	(DIRECT FLOW)	3	35.
231	0.	.0	2	50.
401	74.	(DIRECT FLOW)	0	50.
224	44.	1.0	1	0.
211	4196.	5.6	3	35.
128	199.	(DIRECT FLOW)	0	45.
130	356.	(DIRECT FLOW)	0	35.
402	73.	1.7	0	50.
110	4241.	(DIRECT FLOW)	3	35.
229	179.	2.3	0	55.
287	363.	5.7	0	40.
210	4220.	5.6	3	45.
129	169.	(DIRECT FLOW)	0	40.
127	254.	(DIRECT FLOW)	0	50.
109	4239.	(DIRECT FLOW)	3	45.
227	95.	1.2	1	5.
228	249.	2.4	0	55.
209	4204.	7.3	3	55.
157	85.	(DIRECT FLOW)	0	50.
125	83.	(DIRECT FLOW)	0	50.
126	198.	(DIRECT FLOW)	0	55.
108	4214.	(DIRECT FLOW)	3	55.
275	77.	1.2	1	0.
274	75.	1.3	1	0.
226	170.	2.3	1	15.
208	4197.	5.5	4	5.
186	152.	(DIRECT FLOW)	1	0.
107	4205.	(DIRECT FLOW)	4	5.
225	120.	1.7	1	20.
207	4204.	6.9	4	5.
124	30.	(DIRECT FLOW)	1	10.
106	4210.	(DIRECT FLOW)	4	5.
223	28.	.8	1	25.
206	4169.	5.2	4	15.
105	4182.	(DIRECT FLOW)	4	15.
205	4177.	5.0	4	20.
135	94.	(DIRECT FLOW)	0	45.
123	73.	(DIRECT FLOW)	0	55.
104	4201.	(DIRECT FLOW)	4	20.
202	68.	1.0	1	10.
278	73.	1.3	1	0.
204	4186.	5.0	4	30.
101	141.	(DIRECT FLOW)	0	50.
103	4190.	(DIRECT FLOW)	4	30.
285	139.	1.5	0	55.
203	4182.	5.0	4	35.
102	4183.	(DIRECT FLOW)	4	35.
273	4181.	5.1	4	40.
100	4195.	(DIRECT FLOW)	4	40.

10 YR FUTURE CONDITION

LOWER THIRD CREEK, 10 YR FUTURE CONDITION Baseline
KIOWA ENGINEERING CORPORATION revised 03/05

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)	
177	93.	(DIRECT FLOW)		0	40.
178	205.	(DIRECT FLOW)		0	30.
263	73.	.5		0	55.
262	139.	.8		0	40.
179	197.	(DIRECT FLOW)		0	45.
261	175.	1.8		0	55.
176	245.	(DIRECT FLOW)		0	50.
175	69.	(DIRECT FLOW)		0	45.
252	210.	2.1		1	10.

403	560.	(DIRECT FLOW)	0	40.
288	492.	5.9	0	55.
311	4600.	(DIRECT FLOW)	2	30.
163	333.	(DIRECT FLOW)	0	55.
161	484.	(DIRECT FLOW)	0	55.
238	560.	6.2	0	45.
271	422.	2.1	1	5.
216	4590.	5.8	2	35.
244	302.	2.2	1	10.
310	484.	(DIRECT FLOW)	0	55.
164	4754.	(DIRECT FLOW)	2	30.
160	370.	(DIRECT FLOW)	1	5.
234	355.	2.3	1	10.
279	4724.	5.9	2	35.
282	338.	2.3	1	15.
173	425.	(DIRECT FLOW)	1	5.
315	4071.	.1 247.2	3	15.
182	406.	(DIRECT FLOW)	1	5.
270	408.	2.5	1	15.
115	4071.	(DIRECT FLOW)	3	15.
283	387.	2.4	1	20.
181	499.	(DIRECT FLOW)	1	10.
215	4066.	5.5	3	20.
159	1024.	(DIRECT FLOW)	1	5.
308	4073.	(DIRECT FLOW)	3	20.
309	1024.	(DIRECT FLOW)	1	5.
114	4073.	(DIRECT FLOW)	3	20.
162	302.	(DIRECT FLOW)	0	35.
286	1009.	3.3	1	15.
214	4074.	5.6	3	20.
299	227.	1.8	0	50.
158	1285.	(DIRECT FLOW)	0	55.
134	24.	(DIRECT FLOW)	0	50.
113	4074.	(DIRECT FLOW)	3	20.
302	140.	.1 162.2	3	20.
281	15.	.5	1	40.
213	4059.	5.6	3	25.
233	140.	1.6	3	35.
133	226.	(DIRECT FLOW)	0	40.
112	4064.	(DIRECT FLOW)	3	25.
187	59.	(DIRECT FLOW)	0	40.
297	140.	3.3	3	35.
232	206.	2.0	0	50.
212	4048.	5.1	3	35.
131	74.	(DIRECT FLOW)	0	50.
301	59.	(DIRECT FLOW)	0	40.
298	140.	1.5	3	35.
111	4059.	(DIRECT FLOW)	3	35.
231	0.	.0	2	50.
401	74.	(DIRECT FLOW)	0	50.
224	44.	1.0	1	0.
211	4196.	5.6	3	35.
128	199.	(DIRECT FLOW)	0	45.
130	356.	(DIRECT FLOW)	0	35.
402	73.	1.7	0	50.
110	4241.	(DIRECT FLOW)	3	35.
229	179.	2.3	0	55.
287	363.	5.7	0	40.
210	4220.	5.6	3	45.
129	169.	(DIRECT FLOW)	0	40.
127	254.	(DIRECT FLOW)	0	50.
109	4239.	(DIRECT FLOW)	3	45.
227	95.	1.2	1	5.
228	249.	2.4	0	55.
209	4204.	7.3	3	55.
157	85.	(DIRECT FLOW)	0	50.
125	83.	(DIRECT FLOW)	0	50.
126	198.	(DIRECT FLOW)	0	55.
108	4214.	(DIRECT FLOW)	3	55.
275	77.	1.2	1	0.
274	75.	1.3	1	0.
226	170.	2.3	1	15.
208	4197.	5.5	4	5.
186	152.	(DIRECT FLOW)	1	0.
107	4205.	(DIRECT FLOW)	4	5.
225	120.	1.7	1	20.
207	4204.	6.9	4	5.
124	30.	(DIRECT FLOW)	1	10.
106	4210.	(DIRECT FLOW)	4	5.
223	28.	.8	1	25.
206	4169.	5.2	4	15.
105	4182.	(DIRECT FLOW)	4	15.
205	4177.	5.0	4	20.
135	94.	(DIRECT FLOW)	0	45.
123	73.	(DIRECT FLOW)	0	55.
104	4201.	(DIRECT FLOW)	4	20.
202	68.	1.0	1	10.
278	73.	1.3	1	0.
204	4186.	5.0	4	30.
101	141.	(DIRECT FLOW)	0	50.
103	4190.	(DIRECT FLOW)	4	30.
285	139.	1.5	0	55.
203	4182.	5.0	4	35.
102	4183.	(DIRECT FLOW)	4	35.
273	4181.	5.1	4	40.
100	4195.	(DIRECT FLOW)	4	40.

10 YR FUTURE CONDITION

LOWER THIRD CREEK, 10 YR FUTURE CONDITION Baseline
KIOWA ENGINEERING CORPORATION revised 03/05

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)	
177	93.	(DIRECT FLOW)		0	40.
178	205.	(DIRECT FLOW)		0	30.
263	73.	.5		0	55.
262	139.	.8		0	40.
179	197.	(DIRECT FLOW)		0	45.
261	175.	1.8		0	55.
176	245.	(DIRECT FLOW)		0	50.
175	69.	(DIRECT FLOW)		0	45.
252	210.	2.1		1	10.

258	37.	.3		1	35.
174	507.	(DIRECT FLOW)		0	35.
152	71.	(DIRECT FLOW)		0	40.
151	226.	(DIRECT FLOW)		0	30.
305	507.	(DIRECT FLOW)		0	35.
259	53.	.4		1	0.
257	139.	.7		0	45.
251	467.	1.9		0	45.
180	58.	(DIRECT FLOW)		0	40.
149	180.	(DIRECT FLOW)		0	50.
156	6.	(DIRECT FLOW)		0	50.
185	319.	(DIRECT FLOW)		0	30.
167	467.	(DIRECT FLOW)		0	45.
260	35.	.3		1	15.
255	151.	1.0		1	10.
904	1695.	(DIRECT FLOW)		1	45.
265	5.	.2		1	25.
284	161.	1.8		0	45.
250	344.	1.2		1	20.
146	178.	(DIRECT FLOW)		0	30.
150	658.	(DIRECT FLOW)		0	30.
153	5.	(DIRECT FLOW)		0	45.
122	1699.	(DIRECT FLOW)		1	45.
132	540.	(DIRECT FLOW)		1	10.
267	128.	.8		0	35.
256	405.	1.2		0	55.
264	2.	.1		1	55.
222	1482.	5.4		2	0.
304	757.	(DIRECT FLOW)		0	30.
145	760.	(DIRECT FLOW)		0	35.
154	169.	(DIRECT FLOW)		0	30.
121	1515.	(DIRECT FLOW)		2	0.
296	585.	2.0		1	15.
266	570.	2.7		1	0.
268	112.	.6		0	40.
221	1293.	5.8		2	30.
316	225.	.1	73.2	2	50.
148	656.	(DIRECT FLOW)		0	55.
120	1345.	(DIRECT FLOW)		2	30.
143	225.	(DIRECT FLOW)		2	50.
254	654.	2.1		1	0.
220	1333.	4.9		2	35.
237	225.	2.2		2	50.
155	68.	(DIRECT FLOW)		0	40.
147	1617.	(DIRECT FLOW)		2	30.
184	251.	(DIRECT FLOW)		0	30.
171	266.	(DIRECT FLOW)		0	30.
269	60.	1.1		0	50.
230	1618.	5.2		2	30.
277	236.	1.5		2	50.
248	163.	.8		0	35.
119	1633.	(DIRECT FLOW)		2	30.
144	307.	(DIRECT FLOW)		0	30.
170	229.	(DIRECT FLOW)		0	35.
280	1624.	4.2		2	35.
276	245.	2.3		0	40.
241	148.	1.3		0	55.
137	1855.	(DIRECT FLOW)		2	35.
139	201.	(DIRECT FLOW)		0	45.
219	1847.	4.4		2	45.
142	125.	(DIRECT FLOW)		0	35.
307	201.	(DIRECT FLOW)		0	45.
183	159.	(DIRECT FLOW)		0	40.
118	1858.	(DIRECT FLOW)		2	40.
303	75.	(DIRECT FLOW)		0	35.
306	92.	(DIRECT FLOW)		0	30.
240	72.	1.1		1	0.
235	194.	1.2		0	55.
239	115.	1.2		0	55.
218	1858.	4.4		2	45.
166	98.	(DIRECT FLOW)		0	35.
188	75.	(DIRECT FLOW)		0	35.
169	146.	(DIRECT FLOW)		0	30.
140	319.	(DIRECT FLOW)		0	50.
141	204.	(DIRECT FLOW)		0	30.
138	65.	(DIRECT FLOW)		0	40.
117	1869.	(DIRECT FLOW)		2	45.
246	51.	1.0		0	55.
247	62.	.7		0	45.
242	129.	1.6		0	35.
200	172.	2.2		0	35.
236	35.	.5		1	15.
217	1848.	4.3		2	55.
165	90.	(DIRECT FLOW)		0	45.
168	213.	(DIRECT FLOW)		0	40.
136	172.	(DIRECT FLOW)		0	35.
116	1872.	(DIRECT FLOW)		2	55.
245	77.	1.2		1	5.
243	185.	2.0		0	45.
403	319.	(DIRECT FLOW)		0	50.
288	172.	2.7		0	35.
311	1872.	(DIRECT FLOW)		2	55.
163	112.	(DIRECT FLOW)		1	0.
161	217.	(DIRECT FLOW)		0	45.
238	318.	4.1		0	50.
271	156.	1.3		1	5.
216	1869.	4.4		2	55.
244	106.	1.4		1	15.
310	217.	(DIRECT FLOW)		0	45.
164	1959.	(DIRECT FLOW)		2	55.
160	130.	(DIRECT FLOW)		1	10.
234	159.	1.7		1	5.
279	1948.	4.5		3	0.
282	124.	1.6		1	20.
173	187.	(DIRECT FLOW)		1	5.
315	1775.	.1	106.8	3	35.
182	149.	(DIRECT FLOW)		1	15.
270	178.	2.0		1	15.
115	1775.	(DIRECT FLOW)		3	35.
283	145.	1.7		1	25.
181	211.	(DIRECT FLOW)		1	10.
215	1772.	4.3		3	40.
159	436.	(DIRECT FLOW)		1	15.
308	1778.	(DIRECT FLOW)		3	40.
309	436.	(DIRECT FLOW)		1	15.
114	1778.	(DIRECT FLOW)		3	40.
162	181.	(DIRECT FLOW)		0	30.
286	431.	2.6		1	20.
214	1777.	4.3		3	45.
299	119.	1.3		0	45.

158	536.	(DIRECT FLOW)	0	40.
134	4.	(DIRECT FLOW)	0	45.
113	1777.	(DIRECT FLOW)	3	45.
302	106.	.1 76.8	3	20.
281	2.	.2	2	10.
213	1771.	4.5	3	50.
233	106.	1.4	3	35.
133	89.	(DIRECT FLOW)	0	35.
112	1771.	(DIRECT FLOW)	3	50.
187	25.	(DIRECT FLOW)	0	35.
297	106.	2.7	3	35.
232	77.	1.2	0	45.
212	1764.	4.0	4	0.
131	19.	(DIRECT FLOW)	0	45.
301	25.	(DIRECT FLOW)	0	35.
298	106.	1.3	3	40.
111	1767.	(DIRECT FLOW)	4	0.
231	0.	.0	2	30.
401	19.	(DIRECT FLOW)	0	45.
224	16.	.6	1	0.
211	1871.	4.5	4	5.
128	101.	(DIRECT FLOW)	0	40.
130	167.	(DIRECT FLOW)	0	30.
402	19.	.8	0	45.
110	1895.	(DIRECT FLOW)	4	5.
229	91.	2.0	0	45.
287	158.	5.1	0	35.
210	1886.	4.5	4	15.
129	96.	(DIRECT FLOW)	0	35.
127	115.	(DIRECT FLOW)	0	45.
109	1895.	(DIRECT FLOW)	4	15.
227	51.	1.0	1	0.
228	111.	2.0	0	50.
209	1879.	6.0	4	30.
157	19.	(DIRECT FLOW)	0	45.
125	10.	(DIRECT FLOW)	0	45.
126	80.	(DIRECT FLOW)	0	50.
108	1883.	(DIRECT FLOW)	4	30.
275	15.	.5	1	0.
274	8.	.4	1	5.
226	74.	1.8	1	10.
208	1876.	4.4	4	40.
186	23.	(DIRECT FLOW)	1	0.
107	1881.	(DIRECT FLOW)	4	40.
225	16.	.6	1	35.
207	1881.	5.6	4	40.
124	9.	(DIRECT FLOW)	1	10.
106	1882.	(DIRECT FLOW)	4	40.
223	8.	.4	1	50.
206	1864.	4.0	4	55.
105	1868.	(DIRECT FLOW)	4	55.
205	1864.	3.9	5	5.
135	35.	(DIRECT FLOW)	0	40.
123	19.	(DIRECT FLOW)	0	50.
104	1871.	(DIRECT FLOW)	5	0.
202	23.	.6	1	15.
278	18.	.6	1	0.
204	1864.	3.9	5	15.
101	45.	(DIRECT FLOW)	0	45.
103	1866.	(DIRECT FLOW)	5	15.
285	44.	.8	0	50.
203	1863.	3.9	5	20.
102	1863.	(DIRECT FLOW)	5	20.
273	1862.	4.0	5	20.
100	1874.	(DIRECT FLOW)	5	20.

5 YR FUTURE CONDITION

LOWER THIRD CREEK, 5 YR FUTURE CONDITION Baseline
KIOWA ENGINEERING CORPORATION revised 03/05

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)	
177	72.	(DIRECT FLOW)		0	40.
178	162.	(DIRECT FLOW)		0	30.
263	55.	.4		1	0.
262	103.	.7		0	45.
179	146.	(DIRECT FLOW)		0	45.
261	131.	1.6		1	0.
176	180.	(DIRECT FLOW)		0	55.
175	54.	(DIRECT FLOW)		0	45.
252	167.	2.0		1	5.
258	26.	.3		1	35.
174	395.	(DIRECT FLOW)		0	35.
152	56.	(DIRECT FLOW)		0	40.
151	188.	(DIRECT FLOW)		0	30.
305	395.	(DIRECT FLOW)		0	35.
259	40.	.4		1	0.
257	111.	.6		0	45.
251	357.	1.7		0	45.
180	48.	(DIRECT FLOW)		0	40.
149	142.	(DIRECT FLOW)		0	50.
156	2.	(DIRECT FLOW)		0	45.
185	266.	(DIRECT FLOW)		0	30.
167	357.	(DIRECT FLOW)		0	45.
260	28.	.3		1	15.
255	124.	.9		1	5.
904	1033.	(DIRECT FLOW)		2	5.
265	1.	.1		1	35.
284	132.	1.6		0	45.
250	266.	1.1		1	20.
146	143.	(DIRECT FLOW)		0	30.
150	533.	(DIRECT FLOW)		0	30.
153	3.	(DIRECT FLOW)		0	45.
122	1034.	(DIRECT FLOW)		2	5.
132	438.	(DIRECT FLOW)		0	30.
267	98.	.7		0	35.
256	316.	1.1		0	55.
264	1.	.0		1	35.
222	932.	4.7		2	25.
304	615.	(DIRECT FLOW)		0	30.
145	617.	(DIRECT FLOW)		0	35.
154	135.	(DIRECT FLOW)		0	30.
121	946.	(DIRECT FLOW)		2	25.

296	457.	1.7		1	10.
266	441.	2.6		1	5.
268	88.	.5		0	40.
221	883.	5.0		2	50.
316	163.	.1	60.2	3	10.
148	503.	(DIRECT FLOW)		0	55.
120	919.	(DIRECT FLOW)		2	45.
143	163.	(DIRECT FLOW)		3	10.
254	502.	1.9		1	0.
220	911.	4.5		3	0.
237	163.	1.8		3	10.
155	57.	(DIRECT FLOW)		0	40.
147	1111.	(DIRECT FLOW)		2	50.
184	208.	(DIRECT FLOW)		0	30.
171	220.	(DIRECT FLOW)		0	30.
269	50.	1.1		0	50.
230	1111.	4.7		2	50.
277	191.	1.4		0	35.
248	127.	.7		0	40.
119	1122.	(DIRECT FLOW)		2	50.
144	252.	(DIRECT FLOW)		0	35.
170	180.	(DIRECT FLOW)		0	35.
280	1116.	3.8		3	0.
276	197.	2.1		0	40.
241	114.	1.2		0	55.
137	1294.	(DIRECT FLOW)		3	0.
139	157.	(DIRECT FLOW)		0	35.
219	1289.	4.0		3	5.
142	105.	(DIRECT FLOW)		0	40.
307	157.	(DIRECT FLOW)		0	35.
183	132.	(DIRECT FLOW)		0	40.
118	1297.	(DIRECT FLOW)		3	5.
303	52.	(DIRECT FLOW)		0	35.
306	77.	(DIRECT FLOW)		0	30.
240	61.	1.1		1	0.
235	149.	1.1		0	55.
239	93.	1.0		0	55.
218	1296.	4.0		3	5.
166	75.	(DIRECT FLOW)		0	30.
188	52.	(DIRECT FLOW)		0	35.
169	119.	(DIRECT FLOW)		0	30.
140	250.	(DIRECT FLOW)		0	50.
141	163.	(DIRECT FLOW)		0	30.
138	53.	(DIRECT FLOW)		0	40.
117	1305.	(DIRECT FLOW)		3	5.
246	36.	.8		0	55.
247	41.	.6		0	45.
242	104.	1.5		0	35.
200	138.	2.0		0	35.
236	28.	.5		1	15.
217	1290.	3.9		3	15.
165	62.	(DIRECT FLOW)		0	45.
168	165.	(DIRECT FLOW)		0	40.
136	138.	(DIRECT FLOW)		0	35.
116	1310.	(DIRECT FLOW)		3	15.
245	53.	1.0		1	10.
243	141.	1.8		0	45.
403	250.	(DIRECT FLOW)		0	50.
288	139.	2.4		0	35.
311	1310.	(DIRECT FLOW)		3	15.

163	78.	(DIRECT FLOW)		1	0.
161	166.	(DIRECT FLOW)		0	45.
238	251.	3.6		0	45.
271	123.	1.1		1	10.
216	1308.	4.0		3	20.
244	74.	1.2		1	15.
310	166.	(DIRECT FLOW)		0	45.
164	1376.	(DIRECT FLOW)		3	20.
160	89.	(DIRECT FLOW)		1	10.
234	117.	1.4		1	5.
279	1369.	4.0		3	25.
282	83.	1.3		1	25.
173	138.	(DIRECT FLOW)		1	5.
315	1276.	.1	76.8	4	0.
182	99.	(DIRECT FLOW)		1	15.
270	135.	1.8		1	10.
115	1276.	(DIRECT FLOW)		4	0.
283	95.	1.4		1	25.
181	157.	(DIRECT FLOW)		1	10.
215	1275.	3.9		4	5.
159	314.	(DIRECT FLOW)		1	10.
308	1279.	(DIRECT FLOW)		4	5.
309	314.	(DIRECT FLOW)		1	10.
114	1279.	(DIRECT FLOW)		4	5.
162	149.	(DIRECT FLOW)		0	30.
286	306.	2.4		1	15.
214	1279.	4.0		4	5.
299	96.	1.2		0	45.
158	411.	(DIRECT FLOW)		0	35.
134	0.	(DIRECT FLOW)		0	0.
113	1279.	(DIRECT FLOW)		4	5.
302	93.	.1	57.2	3	30.
281	0.	.0		0	0.
213	1275.	4.1		4	15.
233	93.	1.3		3	45.
133	59.	(DIRECT FLOW)		0	35.
112	1275.	(DIRECT FLOW)		4	15.
187	17.	(DIRECT FLOW)		0	35.
297	93.	2.5		3	45.
232	49.	1.0		0	45.
212	1269.	3.6		4	25.
131	4.	(DIRECT FLOW)		0	45.
301	17.	(DIRECT FLOW)		0	35.
298	93.	1.2		3	45.
111	1271.	(DIRECT FLOW)		4	25.
231	0.	.0		0	0.
401	4.	(DIRECT FLOW)		0	45.
224	10.	.4		1	0.
211	1362.	4.2		4	30.
128	76.	(DIRECT FLOW)		0	40.
130	128.	(DIRECT FLOW)		0	30.
402	4.	.4		0	45.
110	1379.	(DIRECT FLOW)		4	30.
229	72.	1.8		0	45.
287	127.	3.7		0	35.
210	1373.	4.2		4	40.
129	77.	(DIRECT FLOW)		0	35.
127	85.	(DIRECT FLOW)		0	45.
109	1378.	(DIRECT FLOW)		4	40.
227	43.	.9		0	55.

228	83.	1.8	0	45.
209	1365.	5.5	4	55.
157	9.	(DIRECT FLOW)	0	35.
125	4.	(DIRECT FLOW)	0	40.
126	61.	(DIRECT FLOW)	0	55.
108	1369.	(DIRECT FLOW)	4	55.
275	7.	.3	1	5.
274	3.	.2	1	10.
226	55.	1.5	1	10.
208	1364.	4.0	5	5.
186	9.	(DIRECT FLOW)	1	10.
107	1369.	(DIRECT FLOW)	5	5.
225	6.	.3	1	45.
207	1369.	5.1	5	10.
124	4.	(DIRECT FLOW)	1	10.
106	1369.	(DIRECT FLOW)	5	10.
223	3.	.2	1	55.
206	1356.	3.7	5	25.
105	1357.	(DIRECT FLOW)	5	25.
205	1355.	3.5	5	35.
135	19.	(DIRECT FLOW)	0	40.
123	5.	(DIRECT FLOW)	0	50.
104	1357.	(DIRECT FLOW)	5	35.
202	12.	.4	1	15.
278	5.	.3	1	10.
204	1352.	3.6	5	45.
101	24.	(DIRECT FLOW)	0	40.
103	1352.	(DIRECT FLOW)	5	45.
285	23.	.5	0	50.
203	1349.	3.6	5	50.
102	1349.	(DIRECT FLOW)	5	50.
273	1349.	3.6	5	55.
100	1349.	(DIRECT FLOW)	5	55.

2 YR FUTURE CONDITION

LOWER THIRD CREEK, 2 YR FUTURE CONDITION Baseline
KIOWA ENGINEERING CORPORATION revised 03/05

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)	
177	44.	(DIRECT FLOW)		0	40.
178	101.	(DIRECT FLOW)		0	30.
263	31.	.3		1	0.
262	59.	.5		0	45.
179	83.	(DIRECT FLOW)		0	50.
261	72.	1.2		1	5.
176	101.	(DIRECT FLOW)		0	30.
175	33.	(DIRECT FLOW)		0	45.
252	91.	1.4		1	10.
258	14.	.2		1	45.
174	242.	(DIRECT FLOW)		0	35.
152	35.	(DIRECT FLOW)		0	40.
151	125.	(DIRECT FLOW)		0	30.
305	242.	(DIRECT FLOW)		0	35.
259	23.	.3		1	5.
257	67.	.5		0	45.
251	211.	1.5		0	50.
180	32.	(DIRECT FLOW)		0	40.
149	85.	(DIRECT FLOW)		0	50.
156	0.	(DIRECT FLOW)		0	0.
185	178.	(DIRECT FLOW)		0	30.
167	211.	(DIRECT FLOW)		0	50.
260	17.	.2		1	20.
255	72.	.7		1	10.
904	327.	(DIRECT FLOW)		3	20.
265	0.	.0		0	0.
284	82.	1.3		0	45.
250	157.	.8		1	20.
146	91.	(DIRECT FLOW)		0	30.
150	346.	(DIRECT FLOW)		0	30.
153	0.	(DIRECT FLOW)		0	0.
122	327.	(DIRECT FLOW)		3	20.
132	279.	(DIRECT FLOW)		0	30.
267	56.	.5		0	40.
256	199.	.9		0	50.
264	0.	.0		0	0.
222	317.	3.4		3	35.
304	398.	(DIRECT FLOW)		0	30.
145	370.	(DIRECT FLOW)		0	40.
154	89.	(DIRECT FLOW)		0	30.
121	323.	(DIRECT FLOW)		3	35.
296	266.	1.3		1	15.
266	266.	2.3		1	5.
268	52.	.4		0	45.
221	315.	3.0		4	0.
316	100.	.1	42.1	4	0.
148	301.	(DIRECT FLOW)		1	0.
120	329.	(DIRECT FLOW)		3	55.
143	100.	(DIRECT FLOW)		4	0.
254	300.	1.6		1	5.
220	329.	2.9		4	5.
237	100.	1.4		4	0.
155	38.	(DIRECT FLOW)		0	40.
147	426.	(DIRECT FLOW)		3	35.
184	140.	(DIRECT FLOW)		0	30.
171	152.	(DIRECT FLOW)		0	30.
269	35.	1.0		0	50.
230	425.	3.3		3	35.
277	131.	1.3		0	35.
248	78.	.5		0	40.
119	443.	(DIRECT FLOW)		1	10.
144	169.	(DIRECT FLOW)		0	35.
170	110.	(DIRECT FLOW)		0	40.
280	436.	2.9		1	20.
276	122.	1.6		0	45.
241	68.	1.1		1	0.
137	539.	(DIRECT FLOW)		3	45.
139	97.	(DIRECT FLOW)		0	40.
219	536.	3.1		3	55.
142	71.	(DIRECT FLOW)		0	40.
307	97.	(DIRECT FLOW)		0	40.
183	88.	(DIRECT FLOW)		0	40.
118	539.	(DIRECT FLOW)		3	55.
303	29.	(DIRECT FLOW)		0	35.
306	51.	(DIRECT FLOW)		0	35.

240	45.	.9		0	55.
235	90.	.9		0	50.
239	59.	.8		1	0.
218	539.	3.1		4	0.
166	43.	(DIRECT FLOW)		0	30.
188	29.	(DIRECT FLOW)		0	35.
169	79.	(DIRECT FLOW)		0	30.
140	160.	(DIRECT FLOW)		0	45.
141	101.	(DIRECT FLOW)		0	30.
138	35.	(DIRECT FLOW)		0	40.
117	544.	(DIRECT FLOW)		4	0.
246	19.	.6		1	0.
247	21.	.4		0	50.
242	66.	1.1		0	35.
200	82.	1.6		0	35.
236	16.	.3		1	20.
217	539.	3.1		4	20.
165	33.	(DIRECT FLOW)		0	45.
168	99.	(DIRECT FLOW)		0	40.
136	82.	(DIRECT FLOW)		0	35.
116	551.	(DIRECT FLOW)		1	45.
245	26.	.7		1	15.
243	82.	1.3		0	50.
403	160.	(DIRECT FLOW)		0	45.
288	82.	1.8		0	35.
311	551.	(DIRECT FLOW)		1	45.
163	38.	(DIRECT FLOW)		1	5.
161	94.	(DIRECT FLOW)		0	50.
238	160.	2.8		0	50.
271	73.	.8		1	15.
216	550.	3.1		4	25.
244	36.	.8		1	20.
310	94.	(DIRECT FLOW)		0	50.
164	693.	(DIRECT FLOW)		1	40.
160	41.	(DIRECT FLOW)		1	10.
234	64.	1.1		1	10.
279	678.	3.3		1	55.
282	38.	.8		1	35.
173	75.	(DIRECT FLOW)		1	10.
315	587.	.1	36.1	4	45.
182	45.	(DIRECT FLOW)		1	20.
270	72.	1.3		1	15.
115	587.	(DIRECT FLOW)		4	45.
283	44.	.9		1	40.
181	82.	(DIRECT FLOW)		1	15.
215	586.	3.2		4	50.
159	167.	(DIRECT FLOW)		0	35.
308	591.	(DIRECT FLOW)		4	50.
309	167.	(DIRECT FLOW)		0	35.
114	591.	(DIRECT FLOW)		4	50.
162	98.	(DIRECT FLOW)		0	30.
286	158.	2.0		1	20.
214	590.	3.2		4	55.
299	60.	.9		0	50.
158	255.	(DIRECT FLOW)		0	40.
134	0.	(DIRECT FLOW)		0	0.
113	590.	(DIRECT FLOW)		4	55.
302	69.	.1	33.6	3	55.
281	0.	.0		0	0.
213	590.	3.4		5	5.
233	69.	1.1		4	5.
133	32.	(DIRECT FLOW)		0	35.
112	590.	(DIRECT FLOW)		5	5.
187	10.	(DIRECT FLOW)		0	35.
297	69.	2.1		4	5.
232	25.	.7		0	50.
212	590.	2.6		5	10.
131	0.	(DIRECT FLOW)		0	0.
301	10.	(DIRECT FLOW)		0	35.
298	69.	1.0		4	10.
111	592.	(DIRECT FLOW)		5	10.
231	0.	.0		0	0.
401	0.	(DIRECT FLOW)		0	0.
224	5.	.3		1	5.
211	660.	3.5		5	10.
128	46.	(DIRECT FLOW)		0	40.
130	74.	(DIRECT FLOW)		0	30.
402	0.	.0		0	0.
110	672.	(DIRECT FLOW)		3	55.
229	42.	1.4		0	45.
287	73.	2.6		0	35.
210	671.	3.5		5	5.
129	49.	(DIRECT FLOW)		0	35.
127	49.	(DIRECT FLOW)		0	45.
109	675.	(DIRECT FLOW)		5	5.
227	25.	.7		1	0.
228	48.	1.3		0	50.
209	675.	4.1		5	10.
157	4.	(DIRECT FLOW)		0	40.
125	0.	(DIRECT FLOW)		0	0.
126	34.	(DIRECT FLOW)		0	55.
108	679.	(DIRECT FLOW)		5	10.
275	2.	.2		1	10.
274	0.	.0		0	0.
226	30.	1.1		1	15.
208	679.	3.3		5	25.
186	2.	(DIRECT FLOW)		1	10.
107	682.	(DIRECT FLOW)		5	20.
225	1.	.1		1	55.
207	682.	4.3		5	20.
124	0.	(DIRECT FLOW)		0	0.
106	683.	(DIRECT FLOW)		5	20.
223	0.	.0		0	0.
206	682.	2.8		5	30.
105	682.	(DIRECT FLOW)		5	30.
205	682.	2.6		5	35.
135	10.	(DIRECT FLOW)		0	40.
123	1.	(DIRECT FLOW)		0	45.
104	682.	(DIRECT FLOW)		5	35.
202	5.	.3		1	20.
278	1.	.1		0	55.
204	682.	2.9		5	45.
101	12.	(DIRECT FLOW)		0	40.
103	682.	(DIRECT FLOW)		5	25.
285	11.	.4		0	50.
203	682.	2.9		5	55.
102	682.	(DIRECT FLOW)		5	55.
273	682.	3.0		5	55.
100	688.	(DIRECT FLOW)		5	25.

.4 in FUTURE CONDITION

LOWER THIRD CREEK, 0.4in STORM FUTURE CONDITION Baseline
KIOWA ENGINEERING CORPORATION revised 03/05

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)
177	19.	(DIRECT FLOW)		0 40.
178	45.	(DIRECT FLOW)		0 35.
263	11.	.2		1 10.
262	20.	.2		0 50.
179	28.	(DIRECT FLOW)		0 55.
261	25.	.6		1 20.
176	45.	(DIRECT FLOW)		0 30.
175	14.	(DIRECT FLOW)		0 45.
252	31.	.8		1 30.
258	5.	.1		2 5.
174	98.	(DIRECT FLOW)		0 40.
152	15.	(DIRECT FLOW)		0 40.
151	56.	(DIRECT FLOW)		0 35.
305	98.	(DIRECT FLOW)		0 40.
259	8.	.1		1 15.
257	22.	.3		0 50.
251	75.	1.1		0 50.
180	14.	(DIRECT FLOW)		0 45.
149	29.	(DIRECT FLOW)		1 0.
156	0.	(DIRECT FLOW)		0 0.
185	81.	(DIRECT FLOW)		0 30.
167	75.	(DIRECT FLOW)		0 50.
260	6.	.1		1 35.
255	24.	.4		1 30.
904	80.	(DIRECT FLOW)		4 30.
265	0.	.0		0 0.
284	29.	.7		0 50.
250	52.	.4		1 45.
146	43.	(DIRECT FLOW)		0 30.
150	153.	(DIRECT FLOW)		0 30.
153	0.	(DIRECT FLOW)		0 0.
122	80.	(DIRECT FLOW)		4 30.
132	122.	(DIRECT FLOW)		0 30.
267	20.	.3		0 45.
256	65.	.5		0 55.
264	0.	.0		0 0.
222	80.	1.8		6 45.
304	179.	(DIRECT FLOW)		0 30.
145	135.	(DIRECT FLOW)		0 35.
154	40.	(DIRECT FLOW)		0 30.
121	80.	(DIRECT FLOW)		6 45.
296	89.	.7		1 45.
266	100.	1.5		1 5.
268	18.	.2		0 50.
221	80.	1.4		6 50.
316	29.	.1	14.2	3 35.
148	115.	(DIRECT FLOW)		1 0.
120	80.	(DIRECT FLOW)		6 45.
143	29.	(DIRECT FLOW)		3 35.
254	113.	1.3		1 10.
220	80.	1.3		6 50.
237	29.	.8		3 35.
155	16.	(DIRECT FLOW)		0 45.
147	157.	(DIRECT FLOW)		1 20.
184	64.	(DIRECT FLOW)		0 30.
171	75.	(DIRECT FLOW)		0 30.
269	15.	.6		0 50.
230	157.	2.0		1 20.
277	59.	1.0		0 35.
248	26.	.3		0 45.
119	170.	(DIRECT FLOW)		1 20.
144	77.	(DIRECT FLOW)		0 35.
170	39.	(DIRECT FLOW)		0 40.
280	166.	1.8		1 35.
276	47.	.9		0 45.
241	26.	.7		1 5.
137	193.	(DIRECT FLOW)		2 0.
139	35.	(DIRECT FLOW)		0 30.
219	192.	2.0		2 5.
142	32.	(DIRECT FLOW)		0 40.
307	35.	(DIRECT FLOW)		0 30.
183	39.	(DIRECT FLOW)		0 40.
118	197.	(DIRECT FLOW)		1 55.
303	10.	(DIRECT FLOW)		0 35.
306	24.	(DIRECT FLOW)		0 35.
240	16.	.5		1 5.
235	33.	.5		1 10.
239	21.	.4		1 5.
218	197.	2.0		1 55.
166	19.	(DIRECT FLOW)		0 35.
188	10.	(DIRECT FLOW)		0 35.
169	36.	(DIRECT FLOW)		0 30.
140	57.	(DIRECT FLOW)		1 0.
141	48.	(DIRECT FLOW)		0 30.
138	15.	(DIRECT FLOW)		0 40.
117	204.	(DIRECT FLOW)		1 50.
246	6.	.3		1 10.
247	6.	.2		1 0.
242	27.	.7		0 40.
200	32.	1.0		0 40.
236	6.	.2		1 35.
217	198.	1.9		2 10.
165	10.	(DIRECT FLOW)		0 55.
168	39.	(DIRECT FLOW)		0 40.
136	32.	(DIRECT FLOW)		0 40.
116	210.	(DIRECT FLOW)		2 5.
245	8.	.4		1 30.
243	28.	.8		0 55.
403	57.	(DIRECT FLOW)		1 0.
288	32.	1.1		0 40.
311	210.	(DIRECT FLOW)		2 5.
163	12.	(DIRECT FLOW)		1 10.
161	33.	(DIRECT FLOW)		0 55.
238	57.	1.6		1 0.
271	26.	.5		1 30.

216	208.	2.0		2	10.
244	10.	.4		1	40.
310	33.	(DIRECT FLOW)		0	55.
164	261.	(DIRECT FLOW)		2	0.
160	12.	(DIRECT FLOW)		1	40.
234	21.	.6		1	25.
279	255.	2.2		2	10.
282	11.	.4		1	55.
173	25.	(DIRECT FLOW)		1	20.
315	211.	.1	12.9	3	0.
182	13.	(DIRECT FLOW)		1	50.
270	24.	.7		1	35.
115	211.	(DIRECT FLOW)		3	0.
283	12.	.5		2	0.
181	27.	(DIRECT FLOW)		1	30.
215	210.	2.0		3	5.
159	69.	(DIRECT FLOW)		0	30.
308	210.	(DIRECT FLOW)		3	5.
309	69.	(DIRECT FLOW)		0	30.
114	210.	(DIRECT FLOW)		3	5.
162	45.	(DIRECT FLOW)		0	35.
286	51.	1.2		1	15.
214	210.	2.0		3	10.
299	22.	.5		0	55.
158	96.	(DIRECT FLOW)		0	35.
134	0.	(DIRECT FLOW)		0	0.
113	210.	(DIRECT FLOW)		3	10.
302	33.	.1	9.2	2	35.
281	0.	.0		0	0.
213	209.	2.2		3	20.
233	32.	.8		2	55.
133	11.	(DIRECT FLOW)		0	35.
112	209.	(DIRECT FLOW)		3	20.
187	3.	(DIRECT FLOW)		0	35.
297	32.	1.4		2	55.
232	7.	.3		0	55.
212	208.	1.4		3	30.
131	0.	(DIRECT FLOW)		0	0.
301	3.	(DIRECT FLOW)		0	35.
298	32.	.7		3	0.
111	208.	(DIRECT FLOW)		3	30.
231	0.	.0		0	0.
401	0.	(DIRECT FLOW)		0	0.
224	1.	.1		1	20.
211	239.	2.4		3	35.
128	20.	(DIRECT FLOW)		0	40.
130	32.	(DIRECT FLOW)		0	35.
402	0.	.0		0	0.
110	244.	(DIRECT FLOW)		3	30.
229	17.	.8		0	50.
287	33.	1.7		0	35.
210	242.	2.4		3	45.
129	22.	(DIRECT FLOW)		0	35.
127	18.	(DIRECT FLOW)		0	50.
109	242.	(DIRECT FLOW)		3	45.
227	9.	.4		1	10.
228	17.	.8		0	55.
209	239.	2.4		4	0.
157	0.	(DIRECT FLOW)		0	0.
125	0.	(DIRECT FLOW)		0	0.
126	11.	(DIRECT FLOW)		1	5.
108	239.	(DIRECT FLOW)		4	0.
275	0.	.0		0	0.
274	0.	.0		0	0.
226	9.	.6		1	30.
208	236.	2.2		4	15.
186	0.	(DIRECT FLOW)		0	0.
107	237.	(DIRECT FLOW)		4	15.
225	0.	.0		0	0.
207	237.	2.7		4	20.
124	0.	(DIRECT FLOW)		0	0.
106	237.	(DIRECT FLOW)		4	20.
223	0.	.0		0	0.
206	233.	1.5		4	40.
105	233.	(DIRECT FLOW)		4	40.
205	232.	1.4		4	45.
135	2.	(DIRECT FLOW)		0	35.
123	0.	(DIRECT FLOW)		0	0.
104	232.	(DIRECT FLOW)		4	45.
202	1.	.1		1	15.
278	0.	.0		0	0.
204	229.	1.8		5	5.
101	3.	(DIRECT FLOW)		0	35.
103	229.	(DIRECT FLOW)		5	5.
285	2.	.1		1	0.
203	228.	1.8		5	15.
102	228.	(DIRECT FLOW)		5	15.
273	227.	2.2		5	25.
100	227.	(DIRECT FLOW)		5	25.

100 YR Master Plan

LOWER THIRD CREEK, 100 YR MP with Trib G&L Detention
KIOWA ENGINEERING CORPORATION 3/05

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)	
177	201.	(DIRECT FLOW)		0	45.
178	436.	(DIRECT FLOW)		0	35.
263	178.	.9		1	0.
262	313.	1.2		0	50.
179	470.	(DIRECT FLOW)		0	50.
261	421.	2.4		1	5.
175	153.	(DIRECT FLOW)		0	50.
176	591.	(DIRECT FLOW)		0	55.
258	96.	.6		1	25.
993	3250.	(DIRECT FLOW)		0	40.
252	533.	2.7		1	10.
152	156.	(DIRECT FLOW)		0	45.
151	405.	(DIRECT FLOW)		0	35.
1093	2036.	3.6		0	55.
174	1074.	(DIRECT FLOW)		0	45.
259	135.	.7		1	0.

257	286.	1.1	0	50.
992	3135.	(DIRECT FLOW)	0	50.
305	1074.	(DIRECT FLOW)	0	45.
180	112.	(DIRECT FLOW)	0	50.
149	412.	(DIRECT FLOW)	0	55.
892	185.	.1 210.7	2	50.
251	1046.	2.4	0	50.
260	82.	.6	1	10.
255	370.	1.4	1	10.
1092	185.	1.8	3	5.
156	63.	(DIRECT FLOW)	1	5.
185	544.	(DIRECT FLOW)	0	35.
167	1046.	(DIRECT FLOW)	0	50.
146	389.	(DIRECT FLOW)	0	35.
150	1302.	(DIRECT FLOW)	0	35.
904	2861.	(DIRECT FLOW)	1	55.
1192	185.	2.5	3	5.
265	60.	1.0	1	15.
284	297.	2.2	0	50.
250	874.	1.7	1	15.
267	284.	1.2	0	45.
256	988.	1.7	0	55.
153	98.	(DIRECT FLOW)	1	0.
122	3072.	(DIRECT FLOW)	1	55.
132	1326.	(DIRECT FLOW)	1	5.
145	1756.	(DIRECT FLOW)	0	45.
264	82.	.4	1	20.
222	2975.	6.8	2	10.
304	1536.	(DIRECT FLOW)	0	35.
266	1474.	3.5	1	0.
154	360.	(DIRECT FLOW)	0	35.
121	3063.	(DIRECT FLOW)	2	5.
296	1421.	3.4	1	10.
312	129.	.1 171.5	4	10.
268	290.	1.0	0	45.
221	2831.	7.5	2	35.
316	795.	.1 113.1	1	55.
148	129.	(DIRECT FLOW)	4	10.
120	2921.	(DIRECT FLOW)	2	35.
143	795.	(DIRECT FLOW)	1	55.
254	129.	1.3	4	15.
220	2910.	6.1	2	40.
237	797.	4.9	1	55.
155	133.	(DIRECT FLOW)	0	50.
147	3032.	(DIRECT FLOW)	2	40.
184	830.	(DIRECT FLOW)	1	55.
171	533.	(DIRECT FLOW)	0	35.
269	128.	1.3	0	55.
230	3032.	6.2	2	40.
277	829.	2.2	2	0.
248	340.	1.2	0	45.
119	3050.	(DIRECT FLOW)	2	40.
144	842.	(DIRECT FLOW)	2	0.
170	470.	(DIRECT FLOW)	0	45.
280	3038.	5.0	2	45.
276	834.	4.4	2	5.
241	370.	1.7	0	55.
137	3670.	(DIRECT FLOW)	2	35.
139	370.	(DIRECT FLOW)	0	55.
219	3660.	5.4	2	40.
142	229.	(DIRECT FLOW)	0	45.
307	370.	(DIRECT FLOW)	0	55.
183	307.	(DIRECT FLOW)	0	45.
118	3685.	(DIRECT FLOW)	2	40.
303	248.	(DIRECT FLOW)	0	40.
306	174.	(DIRECT FLOW)	0	40.
240	151.	1.3	1	5.
235	354.	1.5	1	5.
239	253.	1.8	1	0.
218	3684.	5.4	2	40.
166	269.	(DIRECT FLOW)	0	40.
188	248.	(DIRECT FLOW)	0	40.
169	301.	(DIRECT FLOW)	0	35.
140	694.	(DIRECT FLOW)	1	0.
141	465.	(DIRECT FLOW)	0	35.
138	148.	(DIRECT FLOW)	0	45.
117	3697.	(DIRECT FLOW)	2	40.
246	171.	1.8	0	55.
247	228.	1.5	0	50.
242	253.	2.2	0	45.
200	496.	2.9	1	5.
236	98.	1.0	1	10.
217	3670.	5.3	2	50.
165	307.	(DIRECT FLOW)	0	50.
168	586.	(DIRECT FLOW)	0	45.
136	496.	(DIRECT FLOW)	1	5.
116	3701.	(DIRECT FLOW)	2	50.
245	261.	2.1	1	10.
243	525.	2.6	0	55.
403	560.	(DIRECT FLOW)	0	50.
288	498.	5.9	1	5.
311	3701.	(DIRECT FLOW)	2	50.
163	422.	(DIRECT FLOW)	1	0.
161	614.	(DIRECT FLOW)	0	55.
238	560.	6.2	0	55.
271	446.	2.2	1	10.
216	3695.	5.4	2	55.
244	396.	2.4	1	10.
310	614.	(DIRECT FLOW)	0	55.
164	3805.	(DIRECT FLOW)	2	50.
160	499.	(DIRECT FLOW)	1	5.
234	462.	2.4	1	10.
279	3788.	5.5	2	55.
282	455.	2.5	1	15.
173	565.	(DIRECT FLOW)	1	5.
315	3365.	.1 205.0	3	40.
182	552.	(DIRECT FLOW)	1	10.
270	541.	2.7	1	15.
115	3365.	(DIRECT FLOW)	3	40.
283	523.	2.6	1	20.
181	670.	(DIRECT FLOW)	1	10.
215	3363.	5.2	3	40.
190	395.	(DIRECT FLOW)	0	35.
159	1370.	(DIRECT FLOW)	1	5.
308	3370.	(DIRECT FLOW)	3	40.
289	374.	4.9	0	40.
309	1370.	(DIRECT FLOW)	1	5.
114	3370.	(DIRECT FLOW)	3	40.
162	743.	(DIRECT FLOW)	0	40.
286	1343.	3.6	1	15.

214	3370.	5.3	3	45.
299	533.	2.4	0	50.
158	1662.	(DIRECT FLOW)	1	5.
134	33.	(DIRECT FLOW)	1	5.
113	3370.	(DIRECT FLOW)	3	45.
302	158.	.1 222.2	3	25.
281	22.	.6	1	35.
213	3361.	5.3	3	50.
233	158.	1.7	3	35.
133	284.	(DIRECT FLOW)	0	40.
112	3363.	(DIRECT FLOW)	3	50.
187	73.	(DIRECT FLOW)	0	40.
297	158.	3.6	3	35.
232	253.	2.1	0	50.
212	3351.	4.8	4	0.
131	523.	(DIRECT FLOW)	0	40.
301	73.	(DIRECT FLOW)	0	40.
298	158.	1.6	3	40.
111	3360.	(DIRECT FLOW)	3	55.
231	0.	.0	5	50.
401	523.	(DIRECT FLOW)	0	40.
224	57.	1.2	1	0.
211	3516.	5.3	4	0.
128	242.	(DIRECT FLOW)	0	45.
130	0.	(DIRECT FLOW)	5	50.
402	526.	5.4	0	40.
110	3561.	(DIRECT FLOW)	4	0.
229	222.	2.4	0	55.
287	0.	.0	10	25.
210	3555.	5.4	4	10.
129	200.	(DIRECT FLOW)	0	40.
127	320.	(DIRECT FLOW)	0	50.
109	3571.	(DIRECT FLOW)	4	10.
227	119.	1.3	1	5.
228	315.	2.5	0	55.
209	3549.	7.0	4	20.
157	114.	(DIRECT FLOW)	0	50.
125	115.	(DIRECT FLOW)	0	50.
126	255.	(DIRECT FLOW)	1	0.
108	3556.	(DIRECT FLOW)	4	20.
275	106.	1.4	1	0.
274	107.	1.6	1	0.
226	226.	2.4	1	15.
208	3546.	5.3	4	30.
186	213.	(DIRECT FLOW)	1	0.
107	3553.	(DIRECT FLOW)	4	30.
225	173.	2.0	1	20.
207	3552.	6.6	4	30.
124	41.	(DIRECT FLOW)	1	15.
106	3555.	(DIRECT FLOW)	4	30.
223	39.	.9	1	25.
206	3531.	4.9	4	45.
105	3547.	(DIRECT FLOW)	4	45.
205	3543.	4.8	4	50.
135	121.	(DIRECT FLOW)	0	45.
123	100.	(DIRECT FLOW)	1	5.
104	3572.	(DIRECT FLOW)	4	50.
202	92.	1.2	1	10.
278	99.	1.5	1	10.
204	3563.	4.8	4	55.
101	185.	(DIRECT FLOW)	0	55.
103	3567.	(DIRECT FLOW)	4	55.
285	185.	1.7	0	55.
203	3562.	4.8	5	0.
102	3563.	(DIRECT FLOW)	5	0.
273	3562.	4.9	5	5.
100	3578.	(DIRECT FLOW)	5	5.

50 YR Master Plan

LOWER THIRD CREEK, 50 YR MP with Trib G&L Detention
KIOWA ENGINEERING CORPORATION 3/05

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)	
177	168.	(DIRECT FLOW)		0	45.
178	371.	(DIRECT FLOW)		0	35.
263	145.	.8		1	0.
262	259.	1.1		0	50.
179	388.	(DIRECT FLOW)		0	50.
261	342.	2.3		1	5.
175	128.	(DIRECT FLOW)		0	50.
176	485.	(DIRECT FLOW)		0	45.
258	75.	.5		1	25.
993	2748.	(DIRECT FLOW)		0	40.
252	421.	2.5		1	10.
152	131.	(DIRECT FLOW)		0	45.
151	355.	(DIRECT FLOW)		0	35.
1093	1674.	3.4		0	55.
174	893.	(DIRECT FLOW)		0	45.
259	110.	.7		1	0.
257	246.	1.0		0	50.
992	2590.	(DIRECT FLOW)		0	50.
305	893.	(DIRECT FLOW)		0	45.
180	95.	(DIRECT FLOW)		0	45.
149	346.	(DIRECT FLOW)		0	55.
892	171.	.1	176.6	2	55.
251	865.	2.3		0	50.
260	67.	.5		1	10.
255	298.	1.3		1	10.
1092	170.	1.7		3	10.
156	45.	(DIRECT FLOW)		0	50.
185	478.	(DIRECT FLOW)		0	35.
167	865.	(DIRECT FLOW)		0	50.
146	323.	(DIRECT FLOW)		0	35.
150	1117.	(DIRECT FLOW)		0	35.
904	2329.	(DIRECT FLOW)		2	5.
1192	170.	2.4		3	5.
265	41.	.8		1	10.
284	256.	2.1		0	50.
250	688.	1.5		1	15.
267	234.	1.1		0	40.
256	805.	1.6		0	55.
153	67.	(DIRECT FLOW)		0	50.

122	2515.	(DIRECT FLOW)		2	5.
132	1043.	(DIRECT FLOW)		1	5.
145	1434.	(DIRECT FLOW)		0	45.
264	49.	.3		1	20.
222	2313.	6.3		2	20.
304	1309.	(DIRECT FLOW)		0	35.
266	1183.	3.3		1	0.
154	302.	(DIRECT FLOW)		0	35.
121	2359.	(DIRECT FLOW)		2	20.
296	1125.	2.9		1	5.
312	123.	.1	140.9	4	5.
268	234.	.9		0	45.
221	2102.	6.8		2	50.
316	566.	.1	104.4	2	15.
148	123.	(DIRECT FLOW)		12	0.
120	2169.	(DIRECT FLOW)		2	45.
143	566.	(DIRECT FLOW)		2	15.
254	123.	1.3		12	0.
220	2157.	5.6		2	55.
237	567.	3.8		2	15.
155	114.	(DIRECT FLOW)		0	45.
147	2280.	(DIRECT FLOW)		2	55.
184	587.	(DIRECT FLOW)		2	5.
171	440.	(DIRECT FLOW)		0	35.
269	107.	1.3		0	55.
230	2281.	5.7		2	55.
277	587.	2.0		2	10.
248	284.	1.1		0	45.
119	2293.	(DIRECT FLOW)		2	55.
144	597.	(DIRECT FLOW)		2	10.
170	397.	(DIRECT FLOW)		0	40.
280	2282.	4.6		3	0.
276	589.	3.7		2	15.
241	304.	1.6		0	55.
137	2741.	(DIRECT FLOW)		2	55.
139	304.	(DIRECT FLOW)		0	55.
219	2732.	5.0		3	0.
142	196.	(DIRECT FLOW)		0	45.
307	304.	(DIRECT FLOW)		0	55.
183	263.	(DIRECT FLOW)		0	45.
118	2743.	(DIRECT FLOW)		3	0.
303	196.	(DIRECT FLOW)		0	40.
306	143.	(DIRECT FLOW)		0	35.
240	125.	1.3		1	5.
235	287.	1.4		1	5.
239	211.	1.6		1	0.
218	2744.	4.9		3	0.
166	216.	(DIRECT FLOW)		0	40.
188	196.	(DIRECT FLOW)		0	40.
169	255.	(DIRECT FLOW)		0	35.
140	550.	(DIRECT FLOW)		1	0.
141	384.	(DIRECT FLOW)		0	35.
138	121.	(DIRECT FLOW)		0	45.
117	2754.	(DIRECT FLOW)		3	0.
246	133.	1.6		0	55.
247	177.	1.3		0	50.
242	212.	2.1		0	40.
200	343.	2.6		0	45.
236	76.	.9		1	10.
217	2727.	4.8		3	10.
165	240.	(DIRECT FLOW)		0	50.
168	473.	(DIRECT FLOW)		0	45.
136	343.	(DIRECT FLOW)		0	45.
116	2751.	(DIRECT FLOW)		3	5.
245	209.	2.0		1	5.
243	415.	2.5		0	55.
403	1087.	(DIRECT FLOW)		1	5.
403	1087.	(DIRECT FLOW)		1	5.
288	344.	4.4		0	45.
311	2751.	(DIRECT FLOW)		3	5.
163	333.	(DIRECT FLOW)		0	55.
161	484.	(DIRECT FLOW)		0	55.
238	605.	7.6	.2	0	50.
238	605.	7.6	.0	0	50.
271	311.	1.9		1	0.
216	2748.	4.9		3	10.
244	302.	2.2		1	10.
310	484.	(DIRECT FLOW)		0	55.
164	3171.	(DIRECT FLOW)		3	10.
160	370.	(DIRECT FLOW)		1	5.
234	355.	2.3		1	10.
279	2858.	5.0		3	15.
282	338.	2.3		1	15.
173	425.	(DIRECT FLOW)		1	5.
315	2604.	.1	157.9	3	55.
182	406.	(DIRECT FLOW)		1	5.
270	408.	2.5		1	15.
115	2604.	(DIRECT FLOW)		3	55.
283	387.	2.4		1	20.
181	499.	(DIRECT FLOW)		1	10.
215	2601.	4.8		4	0.
190	314.	(DIRECT FLOW)		0	35.
159	1024.	(DIRECT FLOW)		1	5.
308	2608.	(DIRECT FLOW)		4	0.
289	299.	3.9		0	40.
309	1024.	(DIRECT FLOW)		1	5.
114	2608.	(DIRECT FLOW)		4	0.
162	599.	(DIRECT FLOW)		0	40.
286	1009.	3.3		1	15.
214	2609.	4.9		4	0.
299	424.	2.3		0	50.
158	1285.	(DIRECT FLOW)		0	55.
134	24.	(DIRECT FLOW)		0	50.
113	2609.	(DIRECT FLOW)		4	0.
302	145.	.1	175.9	3	25.
281	15.	.5		1	40.
213	2602.	5.0		4	5.
233	145.	1.6		3	35.
133	226.	(DIRECT FLOW)		0	40.
112	2602.	(DIRECT FLOW)		4	5.
187	59.	(DIRECT FLOW)		0	40.
297	145.	3.3		3	35.
232	206.	2.0		0	50.
212	2595.	4.5		4	15.
131	415.	(DIRECT FLOW)		0	40.
301	59.	(DIRECT FLOW)		0	40.
298	145.	1.5		3	40.
111	2601.	(DIRECT FLOW)		4	15.
231	0.	.0		5	45.
401	415.	(DIRECT FLOW)		0	40.

224	44.	1.0		1	0.
211	2743.	5.0		4	20.
128	199.	(DIRECT FLOW)		0	45.
130	0.	(DIRECT FLOW)		5	45.
402	418.	4.4		0	40.
110	2777.	(DIRECT FLOW)		4	20.
229	179.	2.3		0	55.
287	0.	.0		10	20.
210	2775.	5.0		4	25.
129	169.	(DIRECT FLOW)		0	40.
127	254.	(DIRECT FLOW)		0	50.
109	2786.	(DIRECT FLOW)		4	25.
227	95.	1.2		1	5.
228	249.	2.4		0	55.
209	2771.	6.6		4	40.
157	85.	(DIRECT FLOW)		0	50.
125	83.	(DIRECT FLOW)		0	50.
126	198.	(DIRECT FLOW)		0	55.
108	2777.	(DIRECT FLOW)		4	40.
275	77.	1.2		1	0.
274	75.	1.3		1	0.
226	170.	2.3		1	15.
208	2769.	4.9		4	50.
186	152.	(DIRECT FLOW)		1	0.
107	2775.	(DIRECT FLOW)		4	50.
225	120.	1.7		1	20.
207	2775.	6.2		4	50.
124	30.	(DIRECT FLOW)		1	10.
106	2777.	(DIRECT FLOW)		4	50.
223	28.	.8		1	25.
206	2760.	4.5		5	5.
105	2771.	(DIRECT FLOW)		5	0.
205	2768.	4.4		5	10.
135	94.	(DIRECT FLOW)		0	45.
123	73.	(DIRECT FLOW)		0	55.
104	2789.	(DIRECT FLOW)		5	5.
202	68.	1.0		1	10.
278	73.	1.3		1	0.
204	2782.	4.4		5	15.
101	141.	(DIRECT FLOW)		0	50.
103	2786.	(DIRECT FLOW)		5	15.
285	139.	1.5		0	55.
203	2782.	4.4		5	20.
102	2783.	(DIRECT FLOW)		5	20.
273	2782.	4.5		5	25.

10 YR Master Plan

LOWER THIRD CREEK, 10 YR MP with Trib G&L Detention
KIOWA ENGINEERING CORPORATION 3/05

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)	
177	93.	(DIRECT FLOW)		0	40.
178	205.	(DIRECT FLOW)		0	30.
263	73.	.5		0	55.
262	139.	.8		0	40.
179	197.	(DIRECT FLOW)		0	45.
261	175.	1.8		0	55.
175	69.	(DIRECT FLOW)		0	45.
176	245.	(DIRECT FLOW)		0	50.
258	37.	.3		1	35.
993	1638.	(DIRECT FLOW)		0	35.
252	210.	2.1		1	10.
152	71.	(DIRECT FLOW)		0	40.
151	226.	(DIRECT FLOW)		0	30.
1093	884.	2.8		0	50.
174	507.	(DIRECT FLOW)		0	35.
259	53.	.4		1	0.
257	139.	.7		0	45.
992	1351.	(DIRECT FLOW)		0	45.
305	507.	(DIRECT FLOW)		0	35.
180	58.	(DIRECT FLOW)		0	40.
149	180.	(DIRECT FLOW)		0	50.
892	138.	.1	102.3	3	0.
251	467.	1.9		0	45.
260	35.	.3		1	15.
255	151.	1.0		1	10.
1092	138.	1.6		3	15.
156	6.	(DIRECT FLOW)		0	50.
185	319.	(DIRECT FLOW)		0	30.
167	467.	(DIRECT FLOW)		0	45.
146	178.	(DIRECT FLOW)		0	30.
150	658.	(DIRECT FLOW)		0	30.
904	724.	(DIRECT FLOW)		2	30.
1192	138.	2.2		3	15.
265	5.	.2		1	25.
284	161.	1.8		0	45.
250	344.	1.2		1	20.
267	128.	.8		0	35.
256	405.	1.2		0	55.
153	5.	(DIRECT FLOW)		0	45.
122	863.	(DIRECT FLOW)		2	30.
132	540.	(DIRECT FLOW)		1	10.
145	760.	(DIRECT FLOW)		0	35.
264	2.	.1		1	55.
222	809.	4.5		2	55.
304	757.	(DIRECT FLOW)		0	30.
266	570.	2.7		1	0.
154	169.	(DIRECT FLOW)		0	30.
121	821.	(DIRECT FLOW)		2	55.
296	585.	2.0		1	15.
312	121.	.1	76.0	3	35.
268	112.	.6		0	40.
221	794.	4.8		3	15.
316	225.	.1	73.2	2	50.
148	121.	(DIRECT FLOW)		3	35.
120	824.	(DIRECT FLOW)		3	10.
143	225.	(DIRECT FLOW)		2	50.
254	121.	1.3		3	40.
220	815.	4.4		3	25.
237	225.	2.2		2	50.
155	68.	(DIRECT FLOW)		0	40.
147	936.	(DIRECT FLOW)		3	25.

184	251.	(DIRECT FLOW)	0	30.
171	266.	(DIRECT FLOW)	0	30.
269	60.	1.1	0	50.
230	936.	4.5	3	25.
277	236.	1.5	2	50.
248	163.	.8	0	35.
119	943.	(DIRECT FLOW)	3	25.
144	307.	(DIRECT FLOW)	0	30.
170	229.	(DIRECT FLOW)	0	35.
280	939.	3.6	3	35.
276	245.	2.3	0	40.
241	148.	1.3	0	55.
137	1166.	(DIRECT FLOW)	3	30.
139	148.	(DIRECT FLOW)	0	55.
219	1162.	3.9	3	40.
142	125.	(DIRECT FLOW)	0	35.
307	148.	(DIRECT FLOW)	0	55.
183	159.	(DIRECT FLOW)	0	40.
118	1167.	(DIRECT FLOW)	3	40.
303	75.	(DIRECT FLOW)	0	35.
306	92.	(DIRECT FLOW)	0	30.
240	72.	1.1	1	0.
235	136.	1.1	1	5.
239	115.	1.2	0	55.
218	1167.	3.9	3	40.
166	98.	(DIRECT FLOW)	0	35.
188	75.	(DIRECT FLOW)	0	35.
169	146.	(DIRECT FLOW)	0	30.
140	250.	(DIRECT FLOW)	1	0.
141	204.	(DIRECT FLOW)	0	30.
138	65.	(DIRECT FLOW)	0	40.
117	1173.	(DIRECT FLOW)	3	40.
246	51.	1.0	0	55.
247	62.	.7	0	45.
242	129.	1.6	0	35.
200	172.	2.2	0	35.
236	35.	.5	1	15.
217	1163.	3.8	3	55.
165	90.	(DIRECT FLOW)	0	45.
168	213.	(DIRECT FLOW)	0	40.
136	172.	(DIRECT FLOW)	0	35.
116	1178.	(DIRECT FLOW)	3	55.
245	77.	1.2	1	5.
243	185.	2.0	0	45.
403	250.	(DIRECT FLOW)	1	0.
288	172.	2.7	0	35.
311	1178.	(DIRECT FLOW)	3	55.
163	112.	(DIRECT FLOW)	1	0.
161	217.	(DIRECT FLOW)	0	45.
238	250.	3.5	1	0.
271	156.	1.3	1	5.
216	1176.	3.9	4	0.
244	106.	1.4	1	15.
310	217.	(DIRECT FLOW)	0	45.
164	1223.	(DIRECT FLOW)	3	55.
160	130.	(DIRECT FLOW)	1	10.
234	159.	1.7	1	5.
279	1218.	3.9	4	5.
282	124.	1.6	1	20.
173	187.	(DIRECT FLOW)	1	5.
315	1153.	.1 69.6	4	45.
182	149.	(DIRECT FLOW)	1	15.
270	178.	2.0	1	15.
115	1153.	(DIRECT FLOW)	4	45.
283	145.	1.7	1	25.
181	211.	(DIRECT FLOW)	1	10.
215	1152.	3.8	4	50.
190	150.	(DIRECT FLOW)	0	30.
159	436.	(DIRECT FLOW)	1	15.
308	1158.	(DIRECT FLOW)	4	50.
289	136.	2.4	0	35.
309	436.	(DIRECT FLOW)	1	15.
114	1158.	(DIRECT FLOW)	4	50.
162	317.	(DIRECT FLOW)	0	30.
286	431.	2.6	1	20.
214	1158.	3.8	4	55.
299	218.	1.8	0	45.
158	536.	(DIRECT FLOW)	0	40.
134	4.	(DIRECT FLOW)	0	45.
113	1158.	(DIRECT FLOW)	4	55.
302	110.	.1 83.6	3	25.
281	2.	.2	2	10.
213	1155.	4.0	5	5.
233	110.	1.4	3	35.
133	89.	(DIRECT FLOW)	0	35.
112	1155.	(DIRECT FLOW)	5	5.
187	25.	(DIRECT FLOW)	0	35.
297	110.	2.8	3	35.
232	77.	1.2	0	45.
212	1152.	3.5	5	15.
131	180.	(DIRECT FLOW)	0	35.
301	25.	(DIRECT FLOW)	0	35.
298	110.	1.3	3	40.
111	1155.	(DIRECT FLOW)	5	15.
231	0.	.0	5	45.
401	180.	(DIRECT FLOW)	0	35.
224	16.	.6	1	0.
211	1262.	4.1	5	20.
128	101.	(DIRECT FLOW)	0	40.
130	0.	(DIRECT FLOW)	5	45.
402	181.	2.7	0	35.
110	1278.	(DIRECT FLOW)	5	20.
229	91.	2.0	0	45.
287	0.	.0	10	20.
210	1279.	4.1	5	30.
129	96.	(DIRECT FLOW)	0	35.
127	115.	(DIRECT FLOW)	0	45.
109	1282.	(DIRECT FLOW)	5	30.
227	51.	1.0	1	0.
228	111.	2.0	0	50.
209	1273.	5.4	5	45.
157	19.	(DIRECT FLOW)	0	45.
125	10.	(DIRECT FLOW)	0	45.
126	80.	(DIRECT FLOW)	0	50.
108	1277.	(DIRECT FLOW)	5	45.
275	15.	.5	1	0.
274	8.	.4	1	5.
226	74.	1.8	1	10.
208	1273.	3.9	5	55.
186	23.	(DIRECT FLOW)	1	0.

107	1277.	(DIRECT FLOW)	5	55.
225	16.	.6	1	35.
207	1277.	5.1	5	55.
124	9.	(DIRECT FLOW)	1	10.
106	1277.	(DIRECT FLOW)	5	55.
223	8.	.4	1	50.
206	1268.	3.6	6	15.
105	1271.	(DIRECT FLOW)	6	15.
205	1270.	3.4	6	20.
135	35.	(DIRECT FLOW)	0	40.
123	19.	(DIRECT FLOW)	0	50.
104	1273.	(DIRECT FLOW)	6	20.
202	23.	.6	1	15.
278	18.	.6	1	0.
204	1270.	3.5	6	30.
101	45.	(DIRECT FLOW)	0	45.
103	1270.	(DIRECT FLOW)	6	30.
285	44.	.8	0	50.
203	1269.	3.5	6	40.
102	1269.	(DIRECT FLOW)	6	40.
273	1269.	3.5	6	45.
100	1269.	(DIRECT FLOW)	6	45.

5 YR Master Plan

LOWER THIRD CREEK, 5 YR MP with Trib G&L Detention
KIOWA ENGINEERING CORPORATION 3/05

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)	
177	72.	(DIRECT FLOW)		0	40.
178	162.	(DIRECT FLOW)		0	30.
263	55.	.4		1	0.
262	103.	.7		0	45.
179	146.	(DIRECT FLOW)		0	45.
261	131.	1.6		1	0.
175	54.	(DIRECT FLOW)		0	45.
176	180.	(DIRECT FLOW)		0	55.
258	26.	.3		1	35.
993	76.	(DIRECT FLOW)		0	40.
252	167.	2.0		1	5.
152	56.	(DIRECT FLOW)		0	40.
151	188.	(DIRECT FLOW)		0	30.
1093	26.	.8		0	55.
174	395.	(DIRECT FLOW)		0	35.
259	40.	.4		1	0.
257	111.	.6		0	45.
992	49.	(DIRECT FLOW)		0	50.
305	395.	(DIRECT FLOW)		0	35.
180	48.	(DIRECT FLOW)		0	40.
149	142.	(DIRECT FLOW)		0	50.
892	9.	.1	1.9	1	35.
251	357.	1.7		0	45.
260	28.	.3		1	15.
255	124.	.9		1	5.
1092	9.	.5		2	0.
156	2.	(DIRECT FLOW)		0	45.
185	266.	(DIRECT FLOW)		0	30.
167	357.	(DIRECT FLOW)		0	45.
146	143.	(DIRECT FLOW)		0	30.
150	533.	(DIRECT FLOW)		0	30.
904	400.	(DIRECT FLOW)		3	15.
1192	9.	.6		2	0.
265	1.	.1		1	35.
284	132.	1.6		0	45.
250	266.	1.1		1	20.
267	98.	.7		0	35.
256	316.	1.1		0	55.
153	3.	(DIRECT FLOW)		0	45.
122	407.	(DIRECT FLOW)		3	15.
132	438.	(DIRECT FLOW)		0	30.
145	617.	(DIRECT FLOW)		0	35.
264	1.	.0		1	35.
222	385.	3.6		3	45.
304	615.	(DIRECT FLOW)		0	30.
266	441.	2.6		1	5.
154	135.	(DIRECT FLOW)		0	30.
121	393.	(DIRECT FLOW)		3	45.
296	457.	1.7		1	10.
312	113.	.1	57.2	3	35.
268	88.	.5		0	40.
221	383.	3.3		4	15.
316	163.	.1	60.2	3	10.
148	113.	(DIRECT FLOW)		3	35.
120	399.	(DIRECT FLOW)		4	10.
143	163.	(DIRECT FLOW)		3	10.
254	113.	1.3		3	45.
220	398.	3.2		4	20.
237	163.	1.8		3	10.
155	57.	(DIRECT FLOW)		0	40.
147	511.	(DIRECT FLOW)		4	15.
184	208.	(DIRECT FLOW)		0	30.
171	220.	(DIRECT FLOW)		0	30.
269	50.	1.1		0	50.
230	511.	3.6		4	20.
277	191.	1.4		0	35.
248	127.	.7		0	40.
119	517.	(DIRECT FLOW)		4	20.
144	252.	(DIRECT FLOW)		0	35.
170	180.	(DIRECT FLOW)		0	35.
280	514.	3.1		4	30.
276	197.	2.1		0	40.
241	114.	1.2		0	55.
137	676.	(DIRECT FLOW)		4	25.
139	114.	(DIRECT FLOW)		0	55.
219	674.	3.3		4	35.
142	105.	(DIRECT FLOW)		0	40.
307	114.	(DIRECT FLOW)		0	55.
183	132.	(DIRECT FLOW)		0	40.
118	677.	(DIRECT FLOW)		4	35.
303	52.	(DIRECT FLOW)		0	35.
306	77.	(DIRECT FLOW)		0	30.
240	61.	1.1		1	0.

235	107.	1.0	1	5.
239	93.	1.0	0	55.
218	677.	3.3	4	35.
166	75.	(DIRECT FLOW)	0	30.
188	52.	(DIRECT FLOW)	0	35.
169	119.	(DIRECT FLOW)	0	30.
140	200.	(DIRECT FLOW)	0	55.
141	163.	(DIRECT FLOW)	0	30.
138	53.	(DIRECT FLOW)	0	40.
117	682.	(DIRECT FLOW)	4	35.
246	36.	.8	0	55.
247	41.	.6	0	45.
242	104.	1.5	0	35.
200	138.	2.0	0	35.
236	28.	.5	1	15.
217	678.	3.3	4	55.
165	62.	(DIRECT FLOW)	0	45.
168	165.	(DIRECT FLOW)	0	40.
136	138.	(DIRECT FLOW)	0	35.
116	690.	(DIRECT FLOW)	4	50.
245	53.	1.0	1	10.
243	141.	1.8	0	45.
403	200.	(DIRECT FLOW)	0	55.
288	139.	2.4	0	35.
311	690.	(DIRECT FLOW)	4	50.
163	78.	(DIRECT FLOW)	1	0.
161	166.	(DIRECT FLOW)	0	45.
238	201.	3.1	0	55.
271	123.	1.1	1	10.
216	689.	3.3	5	0.
244	74.	1.2	1	15.
310	166.	(DIRECT FLOW)	0	45.
164	780.	(DIRECT FLOW)	1	25.
160	89.	(DIRECT FLOW)	1	10.
234	117.	1.4	1	5.
279	764.	3.4	1	45.
282	83.	1.3	1	25.
173	138.	(DIRECT FLOW)	1	5.
315	704.	.1 43.1	5	45.
182	99.	(DIRECT FLOW)	1	15.
270	135.	1.8	1	10.
115	704.	(DIRECT FLOW)	5	45.
283	95.	1.4	1	25.
181	157.	(DIRECT FLOW)	1	10.
215	703.	3.4	5	50.
190	117.	(DIRECT FLOW)	0	30.
159	314.	(DIRECT FLOW)	1	10.
308	703.	(DIRECT FLOW)	5	50.
289	108.	2.1	0	35.
309	314.	(DIRECT FLOW)	1	10.
114	703.	(DIRECT FLOW)	5	50.
162	253.	(DIRECT FLOW)	0	30.
286	306.	2.4	1	15.
214	703.	3.4	5	50.
299	174.	1.6	0	45.
158	411.	(DIRECT FLOW)	0	35.
134	0.	(DIRECT FLOW)	0	0.
113	703.	(DIRECT FLOW)	5	50.
302	96.	.1 62.6	3	30.
281	0.	.0	0	0.

213	702.	3.6	6	0.
233	96.	1.3	3	45.
133	59.	(DIRECT FLOW)	0	35.
112	702.	(DIRECT FLOW)	6	0.
187	17.	(DIRECT FLOW)	0	35.
297	96.	2.6	3	45.
232	49.	1.0	0	45.
212	701.	2.9	6	10.
131	131.	(DIRECT FLOW)	0	30.
301	17.	(DIRECT FLOW)	0	35.
298	96.	1.2	3	50.
111	702.	(DIRECT FLOW)	6	5.
231	0.	.0	0	20.
401	131.	(DIRECT FLOW)	0	30.
224	10.	.4	1	0.
211	794.	3.7	6	10.
128	76.	(DIRECT FLOW)	0	40.
130	0.	(DIRECT FLOW)	0	20.
402	130.	2.2	0	30.
110	802.	(DIRECT FLOW)	6	5.
229	72.	1.8	0	45.
287	0.	.0	7	20.
210	800.	3.7	6	15.
129	77.	(DIRECT FLOW)	0	35.
127	85.	(DIRECT FLOW)	0	45.
109	800.	(DIRECT FLOW)	6	15.
227	43.	.9	0	55.
228	83.	1.8	0	45.
209	800.	4.5	6	25.
157	9.	(DIRECT FLOW)	0	35.
125	4.	(DIRECT FLOW)	0	40.
126	61.	(DIRECT FLOW)	0	55.
108	800.	(DIRECT FLOW)	6	25.
275	7.	.3	1	5.
274	3.	.2	1	10.
226	55.	1.5	1	10.
208	799.	3.5	6	35.
186	9.	(DIRECT FLOW)	1	10.
107	801.	(DIRECT FLOW)	6	35.
225	6.	.3	1	45.
207	801.	4.5	6	35.
124	4.	(DIRECT FLOW)	1	10.
106	801.	(DIRECT FLOW)	6	35.
223	3.	.2	1	55.
206	797.	3.1	7	0.
105	798.	(DIRECT FLOW)	6	55.
205	797.	2.8	7	0.
135	19.	(DIRECT FLOW)	0	40.
123	5.	(DIRECT FLOW)	0	50.
104	799.	(DIRECT FLOW)	7	0.
202	12.	.4	1	15.
278	5.	.3	1	10.
204	798.	3.1	7	15.
101	24.	(DIRECT FLOW)	0	40.
103	798.	(DIRECT FLOW)	7	15.
285	23.	.5	0	50.
203	797.	3.1	7	25.
102	797.	(DIRECT FLOW)	7	25.
273	797.	3.1	7	25.
100	797.	(DIRECT FLOW)	7	25.

2 YR Master Plan

LOWER THIRD CREEK, 2 YR MP with Trib G&L Detention
KIOWA ENGINEERING CORPORATION 3/05

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)
177	44.	(DIRECT FLOW)		0 40.
178	101.	(DIRECT FLOW)		0 30.
263	31.	.3		1 0.
262	59.	.5		0 45.
179	83.	(DIRECT FLOW)		0 50.
261	72.	1.2		1 5.
175	33.	(DIRECT FLOW)		0 45.
176	101.	(DIRECT FLOW)		0 30.
258	14.	.2		1 45.
993	0.	(DIRECT FLOW)		0 0.
252	91.	1.4		1 10.
152	35.	(DIRECT FLOW)		0 40.
151	125.	(DIRECT FLOW)		0 30.
1093	0.	.0		0 0.
174	242.	(DIRECT FLOW)		0 35.
259	23.	.3		1 5.
257	67.	.5		0 45.
992	0.	(DIRECT FLOW)		0 0.
305	242.	(DIRECT FLOW)		0 35.
180	32.	(DIRECT FLOW)		0 40.
149	85.	(DIRECT FLOW)		0 50.
892	0.	.0		0 0.
251	211.	1.5		0 50.
260	17.	.2		1 20.
255	72.	.7		1 10.
1092	0.	.0		0 0.
156	0.	(DIRECT FLOW)		0 0.
185	178.	(DIRECT FLOW)		0 30.
167	211.	(DIRECT FLOW)		0 50.
146	91.	(DIRECT FLOW)		0 30.
150	346.	(DIRECT FLOW)		0 30.
904	148.	(DIRECT FLOW)		6 0.
1192	0.	.0		0 0.
265	0.	.0		0 0.
284	82.	1.3		0 45.
250	157.	.8		1 20.
267	56.	.5		0 40.
256	199.	.9		0 50.
153	0.	(DIRECT FLOW)		0 0.
122	148.	(DIRECT FLOW)		6 0.
132	279.	(DIRECT FLOW)		0 30.
145	370.	(DIRECT FLOW)		0 40.
264	0.	.0		0 0.
222	144.	2.5		6 25.
304	398.	(DIRECT FLOW)		0 30.
266	266.	2.3		1 5.
154	89.	(DIRECT FLOW)		0 30.
121	144.	(DIRECT FLOW)		6 25.
296	266.	1.3		1 15.
312	103.	.1	31.6	3 35.
268	52.	.4		0 45.
221	140.	2.0		6 55.
316	100.	.1	42.1	4 0.
148	103.	(DIRECT FLOW)		3 35.
120	141.	(DIRECT FLOW)		6 35.
143	100.	(DIRECT FLOW)		4 0.
254	103.	1.2		3 45.
220	141.	1.8		7 0.
237	100.	1.4		4 0.
155	38.	(DIRECT FLOW)		0 40.
147	230.	(DIRECT FLOW)		6 40.
184	140.	(DIRECT FLOW)		0 30.
171	152.	(DIRECT FLOW)		0 30.
269	35.	1.0		0 50.
230	230.	2.4		6 40.
277	131.	1.3		0 35.
248	78.	.5		0 40.
119	230.	(DIRECT FLOW)		6 40.
144	169.	(DIRECT FLOW)		0 35.
170	110.	(DIRECT FLOW)		0 40.
280	230.	2.1		6 50.
276	122.	1.6		0 45.
241	68.	1.1		1 0.
137	335.	(DIRECT FLOW)		3 10.
139	68.	(DIRECT FLOW)		1 0.
219	333.	2.5		3 20.
142	71.	(DIRECT FLOW)		0 40.
307	68.	(DIRECT FLOW)		1 0.
183	88.	(DIRECT FLOW)		0 40.
118	339.	(DIRECT FLOW)		3 15.
303	29.	(DIRECT FLOW)		0 35.
306	51.	(DIRECT FLOW)		0 35.
240	45.	.9		0 55.
235	66.	.8		1 10.
239	59.	.8		1 0.
218	339.	2.6		3 15.
166	43.	(DIRECT FLOW)		0 30.
188	29.	(DIRECT FLOW)		0 35.
169	79.	(DIRECT FLOW)		0 30.
140	127.	(DIRECT FLOW)		1 0.
141	101.	(DIRECT FLOW)		0 30.
138	35.	(DIRECT FLOW)		0 40.
117	348.	(DIRECT FLOW)		3 15.
246	19.	.6		1 0.
247	21.	.4		0 50.
242	66.	1.1		0 35.
200	82.	1.6		0 35.
236	16.	.3		1 20.
217	345.	2.5		3 25.
165	33.	(DIRECT FLOW)		0 45.
168	99.	(DIRECT FLOW)		0 40.
136	82.	(DIRECT FLOW)		0 35.
116	364.	(DIRECT FLOW)		3 10.
245	26.	.7		1 15.
243	82.	1.3		0 50.
403	127.	(DIRECT FLOW)		1 0.

288	82.	1.8		0	35.
311	364.	(DIRECT FLOW)		3	10.
163	38.	(DIRECT FLOW)		1	5.
161	94.	(DIRECT FLOW)		0	50.
238	127.	2.5		1	0.
271	73.	.8		1	15.
216	363.	2.6		3	15.
244	36.	.8		1	20.
310	94.	(DIRECT FLOW)		0	50.
164	478.	(DIRECT FLOW)		1	40.
160	41.	(DIRECT FLOW)		1	10.
234	64.	1.1		1	10.
279	473.	3.0		1	50.
282	38.	.8		1	35.
173	75.	(DIRECT FLOW)		1	10.
315	421.	.1	26.2	3	35.
182	45.	(DIRECT FLOW)		1	20.
270	72.	1.3		1	15.
115	421.	(DIRECT FLOW)		3	35.
283	44.	.9		1	40.
181	82.	(DIRECT FLOW)		1	15.
215	421.	2.8		3	45.
190	72.	(DIRECT FLOW)		0	30.
159	167.	(DIRECT FLOW)		0	35.
308	426.	(DIRECT FLOW)		3	40.
289	66.	1.6		0	35.
309	167.	(DIRECT FLOW)		0	35.
114	426.	(DIRECT FLOW)		3	40.
162	164.	(DIRECT FLOW)		0	35.
286	158.	2.0		1	20.
214	426.	2.9		3	40.
299	106.	1.2		0	45.
158	255.	(DIRECT FLOW)		0	40.
134	0.	(DIRECT FLOW)		0	0.
113	426.	(DIRECT FLOW)		3	40.
302	73.	.1	37.0	3	55.
281	0.	.0		0	0.
213	424.	3.2		3	55.
233	73.	1.2		4	5.
133	32.	(DIRECT FLOW)		0	35.
112	424.	(DIRECT FLOW)		3	55.
187	10.	(DIRECT FLOW)		0	35.
297	73.	2.2		4	10.
232	25.	.7		0	50.
212	424.	2.2		4	5.
131	74.	(DIRECT FLOW)		0	30.
301	10.	(DIRECT FLOW)		0	35.
298	73.	1.1		4	10.
111	426.	(DIRECT FLOW)		4	5.
231	0.	.0		5	40.
401	74.	(DIRECT FLOW)		0	30.
224	5.	.3		1	5.
211	498.	3.3		4	10.
128	46.	(DIRECT FLOW)		0	40.
130	0.	(DIRECT FLOW)		5	40.
402	73.	1.7		0	30.
110	512.	(DIRECT FLOW)		4	5.
229	42.	1.4		0	45.
287	0.	.0		10	15.
210	514.	3.3		4	25.
129	49.	(DIRECT FLOW)		0	35.
127	49.	(DIRECT FLOW)		0	45.
109	514.	(DIRECT FLOW)		4	25.
227	25.	.7		1	0.
228	48.	1.3		0	50.
209	514.	3.6		4	35.
157	4.	(DIRECT FLOW)		0	40.
125	0.	(DIRECT FLOW)		0	0.
126	34.	(DIRECT FLOW)		0	55.
108	517.	(DIRECT FLOW)		4	35.
275	2.	.2		1	10.
274	0.	.0		0	0.
226	30.	1.1		1	15.
208	515.	3.1		4	55.
186	2.	(DIRECT FLOW)		1	10.
107	519.	(DIRECT FLOW)		4	55.
225	1.	.1		1	55.
207	519.	4.0		5	0.
124	0.	(DIRECT FLOW)		0	0.
106	519.	(DIRECT FLOW)		5	0.
223	0.	.0		0	0.
206	518.	2.4		5	10.
105	518.	(DIRECT FLOW)		5	10.
205	518.	2.2		5	15.
135	10.	(DIRECT FLOW)		0	40.
123	1.	(DIRECT FLOW)		0	45.
104	518.	(DIRECT FLOW)		5	15.
202	5.	.3		1	20.
278	1.	.1		0	55.
204	517.	2.6		5	30.
101	12.	(DIRECT FLOW)		0	40.
103	519.	(DIRECT FLOW)		5	25.
285	11.	.4		0	50.
203	518.	2.6		5	30.
102	518.	(DIRECT FLOW)		5	30.
273	518.	2.8		5	35.
100	525.	(DIRECT FLOW)		5	25.

0.4in Master Plan

LOWER THIRD CREEK, 0.4IN sTORM MP with Trib G&L Detention
KIOWA ENGINEERING CORPORATION 3/05

*** PEAK FLOWS, STAGES AND STORAGES OF GUTTERS AND DETENTION DAMS ***

CONVEYANCE ELEMENT	PEAK (CFS)	STAGE (FT)	STORAGE (AC-FT)	TIME (HR/MIN)	
177	19.	(DIRECT FLOW)		0	40.
178	45.	(DIRECT FLOW)		0	35.
263	11.	.2		1	10.
262	20.	.2		0	50.
179	28.	(DIRECT FLOW)		0	55.
261	25.	.6		1	20.
175	14.	(DIRECT FLOW)		0	45.
176	45.	(DIRECT FLOW)		0	30.

258	5.	.1		2	5.
993	0.	(DIRECT FLOW)		0	0.
252	31.	.8		1	30.
152	15.	(DIRECT FLOW)		0	40.
151	56.	(DIRECT FLOW)		0	35.
1093	0.	.0		0	0.
174	98.	(DIRECT FLOW)		0	40.
259	8.	.1		1	15.
257	22.	.3		0	50.
992	0.	(DIRECT FLOW)		0	0.
305	98.	(DIRECT FLOW)		0	40.
180	14.	(DIRECT FLOW)		0	45.
149	29.	(DIRECT FLOW)		1	0.
892	0.	.0		0	0.
251	75.	1.1		0	50.
260	6.	.1		1	35.
255	24.	.4		1	30.
1092	0.	.0		0	0.
156	0.	(DIRECT FLOW)		0	0.
185	81.	(DIRECT FLOW)		0	30.
167	75.	(DIRECT FLOW)		0	50.
146	43.	(DIRECT FLOW)		0	30.
150	153.	(DIRECT FLOW)		0	30.
904	71.	(DIRECT FLOW)		5	5.
1192	0.	.0		0	0.
265	0.	.0		0	0.
284	29.	.7		0	50.
250	52.	.4		1	45.
267	20.	.3		0	45.
256	65.	.5		0	55.
153	0.	(DIRECT FLOW)		0	0.
122	71.	(DIRECT FLOW)		5	5.
132	122.	(DIRECT FLOW)		0	30.
145	135.	(DIRECT FLOW)		0	35.
264	0.	.0		0	0.
222	71.	1.7		5	40.
304	179.	(DIRECT FLOW)		0	30.
266	100.	1.5		1	5.
154	40.	(DIRECT FLOW)		0	30.
121	71.	(DIRECT FLOW)		5	40.
296	89.	.7		1	45.
312	66.	.1	5.6	2	15.
268	18.	.2		0	50.
221	70.	1.3		6	35.
316	29.	.1	14.2	3	35.
148	66.	(DIRECT FLOW)		2	15.
120	70.	(DIRECT FLOW)		6	30.
143	29.	(DIRECT FLOW)		3	35.
254	66.	1.1		2	25.
220	70.	1.3		6	45.
237	29.	.8		3	35.
155	16.	(DIRECT FLOW)		0	45.
147	121.	(DIRECT FLOW)		2	15.
184	64.	(DIRECT FLOW)		0	30.
171	75.	(DIRECT FLOW)		0	30.
269	15.	.6		0	50.
230	121.	1.7		2	15.
277	59.	1.0		0	35.
248	26.	.3		0	45.
119	127.	(DIRECT FLOW)		2	10.
144	77.	(DIRECT FLOW)		0	35.
170	39.	(DIRECT FLOW)		0	40.
280	126.	1.6		2	15.
276	47.	.9		0	45.
241	26.	.7		1	5.
137	154.	(DIRECT FLOW)		2	5.
139	26.	(DIRECT FLOW)		1	5.
219	153.	1.7		2	20.
142	32.	(DIRECT FLOW)		0	40.
307	26.	(DIRECT FLOW)		1	5.
183	39.	(DIRECT FLOW)		0	40.
118	155.	(DIRECT FLOW)		2	10.
303	10.	(DIRECT FLOW)		0	35.
306	24.	(DIRECT FLOW)		0	35.
240	16.	.5		1	5.
235	24.	.4		1	20.
239	21.	.4		1	5.
218	155.	1.8		2	10.
166	19.	(DIRECT FLOW)		0	35.
188	10.	(DIRECT FLOW)		0	35.
169	36.	(DIRECT FLOW)		0	30.
140	45.	(DIRECT FLOW)		1	10.
141	48.	(DIRECT FLOW)		0	30.
138	15.	(DIRECT FLOW)		0	40.
117	160.	(DIRECT FLOW)		2	5.
246	6.	.3		1	10.
247	6.	.2		1	0.
242	27.	.7		0	40.
200	32.	1.0		0	40.
236	6.	.2		1	35.
217	155.	1.7		2	25.
165	10.	(DIRECT FLOW)		0	55.
168	39.	(DIRECT FLOW)		0	40.
136	32.	(DIRECT FLOW)		0	40.
116	163.	(DIRECT FLOW)		2	15.
245	8.	.4		1	30.
243	28.	.8		0	55.
403	45.	(DIRECT FLOW)		1	10.
288	32.	1.1		0	40.
311	163.	(DIRECT FLOW)		2	15.
163	12.	(DIRECT FLOW)		1	10.
161	33.	(DIRECT FLOW)		0	55.
238	45.	1.5		1	10.
271	26.	.5		1	30.
216	162.	1.8		2	20.
244	10.	.4		1	40.
310	33.	(DIRECT FLOW)		0	55.
164	206.	(DIRECT FLOW)		2	5.
160	12.	(DIRECT FLOW)		1	40.
234	21.	.6		1	25.
279	201.	2.0		2	20.
282	11.	.4		1	55.
173	25.	(DIRECT FLOW)		1	20.
315	173.	.1	10.5	3	10.
182	13.	(DIRECT FLOW)		1	50.
270	24.	.7		1	35.
115	173.	(DIRECT FLOW)		3	10.
283	12.	.5		2	0.
181	27.	(DIRECT FLOW)		1	30.
215	173.	1.9		3	20.

190	33.	(DIRECT FLOW)		0	30.
159	69.	(DIRECT FLOW)		0	30.
308	173.	(DIRECT FLOW)		3	20.
289	29.	1.1		0	35.
309	69.	(DIRECT FLOW)		0	30.
114	173.	(DIRECT FLOW)		3	20.
162	75.	(DIRECT FLOW)		0	35.
286	51.	1.2		1	15.
214	173.	1.9		3	25.
299	39.	.7		0	50.
158	96.	(DIRECT FLOW)		0	35.
134	0.	(DIRECT FLOW)		0	0.
113	173.	(DIRECT FLOW)		3	25.
302	35.	.1	10.3	2	35.
281	0.	.0		0	0.
213	172.	2.0		3	35.
233	35.	.8		2	55.
133	11.	(DIRECT FLOW)		0	35.
112	172.	(DIRECT FLOW)		3	35.
187	3.	(DIRECT FLOW)		0	35.
297	35.	1.5		2	55.
232	7.	.3		0	55.
212	171.	1.3		3	45.
131	32.	(DIRECT FLOW)		0	35.
301	3.	(DIRECT FLOW)		0	35.
298	35.	.7		2	55.
111	171.	(DIRECT FLOW)		3	45.
231	0.	.0		2	15.
401	32.	(DIRECT FLOW)		0	35.
224	1.	.1		1	20.
211	204.	2.2		3	50.
128	20.	(DIRECT FLOW)		0	40.
130	0.	(DIRECT FLOW)		2	15.
402	33.	1.1		0	35.
110	209.	(DIRECT FLOW)		3	45.
229	17.	.8		0	50.
287	0.	.0		6	50.
210	208.	2.2		4	0.
129	22.	(DIRECT FLOW)		0	35.
127	18.	(DIRECT FLOW)		0	50.
109	208.	(DIRECT FLOW)		4	0.
227	9.	.4		1	10.
228	17.	.8		0	55.
209	206.	2.2		4	20.
157	0.	(DIRECT FLOW)		0	0.
125	0.	(DIRECT FLOW)		0	0.
126	11.	(DIRECT FLOW)		1	5.
108	206.	(DIRECT FLOW)		4	20.
275	0.	.0		0	0.
274	0.	.0		0	0.
226	9.	.6		1	30.
208	204.	2.0		4	35.
186	0.	(DIRECT FLOW)		0	0.
107	205.	(DIRECT FLOW)		4	35.
225	0.	.0		0	0.
207	205.	2.5		4	35.
124	0.	(DIRECT FLOW)		0	0.
106	205.	(DIRECT FLOW)		4	35.
223	0.	.0		0	0.
206	203.	1.4		5	0.
105	203.	(DIRECT FLOW)		5	0.
205	203.	1.3		5	10.
135	2.	(DIRECT FLOW)		0	35.
123	0.	(DIRECT FLOW)		0	0.
104	203.	(DIRECT FLOW)		5	10.
202	1.	.1		1	15.
278	0.	.0		0	0.
204	201.	1.7		5	25.
101	3.	(DIRECT FLOW)		0	35.
103	201.	(DIRECT FLOW)		5	25.
285	2.	.1		1	0.
203	200.	1.7		5	40.
102	200.	(DIRECT FLOW)		5	40.
273	200.	2.2		5	45.
100	200.	(DIRECT FLOW)		5	45.

DIA Input

DIA CUHP EXISTING Model

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1     THIRD CREEK Existing Condition July 2003 FILE:tc03100ae.chi by Boyle
 1 100-YEAR .026.079.121.210.297.531.297.210.162.131.105.105.105.052.052.031.031
 1 100-YEAR .031.031.031.031.031.031.031.011.011.011.011.011.011.011.011.011.011
 1 100-YEAR .011.011.011.011.011.011.011.011.011.011.011.011.011.011.011.011.011
 1 100-YEAR .011.011.011.011.011.011.011.011.011.011.011.011

 70 1  5.0      001 BASIN 01
.51  0.92 0.48  02.0 .026  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      002 BASIN 02
.14  0.99 0.47  02.0 .019  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      003 BASIN 03
.09  0.45 0.16  02.0 .030 56   0.35 0.1 4.50 .0018 .550
 70 1  5.0      004 BASIN 04
.22  0.62 0.34  02.0 .026  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      005 BASIN 05
.70  1.31 0.51  02.0 .019  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      006 BASIN 06
.12  0.59 0.29  02.0 .029 66   0.35 0.1 4.50 .0018 .550
 70 1  5.0      007 BASIN 07
.17  1.30 0.43  02.0 .020  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      008 BASIN 08
.24  1.27 0.55  02.0 .021  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      009 BASIN 09
.17  0.80 0.46 02.0 .021   0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      010 BASIN 010
.14  0.68 0.32  02.0 .021 84   0.35 0.1 4.50 .0018 .550
 70 1  5.0      011 BASIN 011
.43  0.86 0.40  03.0 .022  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      012 BASIN 012
.73  1.78 1.05  02.0 .017  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      013 BASIN 013
.50  1.27 0.54  02.0 .021  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      014 BASIN 014
.28  0.85 0.47  03.1 .018  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      032 BASIN 032
.07  0.52 0.20  41.6 .023 40   0.35 0.1 4.50 .0018 .550
 71 1  5.0      017 BASIN 017
.03  0.19 0.03  22.0 .052 29   0.35 0.1 4.50 .0018 .550
 71 1  5.0      033 BASIN 033
.11  0.45 0.18  10.0 .022 49   0.35 0.1 4.50 .0018 .550
 70 1  5.0      015 BASIN 015
.15  0.60 0.47  02.0 .022  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      016 BASIN 016
.60  1.37 0.63  02.0 .019  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      034 BASIN 034
.50  1.25 0.75  02.0 .015  0   0.35 0.1 4.50 .0018 .550
 701   5.0      018 BASIN 018
.27  0.57 0.21  11.1 .029  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      036 BASIN 036
.10  0.52 0.26  82.3 .018 32   0.35 0.1 4.50 .0018 .550
 71 1  5.0      039 BASIN 039
.05  0.41 0.10  71.0 .010 32   0.35 0.1 4.50 .0018 .550
 71 1  5.0      040 BASIN 040
.12  0.41 0.10  90.6 .010 26   0.35 0.1 4.50 .0018 .550
 71 1  5.0      041 BASIN 041
.06  0.41 0.10  95.3 .010 23   0.35 0.1 4.50 .0018 .550
 71 1  5.0      035 BASIN 035
.14  0.64 0.28  60.3 .025 32   0.35 0.1 4.50 .0018 .550
 70 1  5.0      038 BASIN 038
.25  0.50 0.19  05.6 .003  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      037 BASIN 037
.16  0.42 0.01  17.5 .007  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      019 BASIN 019
.25  0.67 0.20  09.7 .024  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      030 BASIN 030
.08  0.43 0.10  45.9 .018 56   0.35 0.1 4.50 .0018 .550
 71 1  5.0      031 BASIN 031
.11  0.43 0.09  49.7 .006 69   0.35 0.1 4.50 .0018 .550
 70 1  5.0      020 BASIN 020
.28  0.63 0.27  04.5 .021  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      044 BASIN 044
.06  0.23 0.09  87.7 .020 14   0.35 0.1 4.50 .0018 .550
 71 1  5.0      045 BASIN 045
.08  0.41 0.10  76.9 .010 29   0.35 0.1 4.50 .0018 .550
 71 1  5.0      046 BASIN 046
.04  0.41 0.10  84.3 .010 26   0.35 0.1 4.50 .0018 .550
 70 1  5.0      021 BASIN 021
.39  1.29 0.42  07.4 .012  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      043 BASIN 043
.03  0.15 0.02  40.1 .020 24   0.35 0.1 4.50 .0018 .550
 70 1  5.0      022 BASIN 022
.20  0.49 0.12  16.3 .027  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      047 BASIN 047
.16  1.20 0.50  40.1 .020  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      023 BASIN 023
.25  0.68 0.01  16.2 .017  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      056 BASIN 056
.12  0.47 0.14  11.6 .027 56   0.35 0.1 4.50 .0018 .550
 71 1  5.0      057 BASIN 057
.09  .38  .15   75.0 .010 32   0.35 0.1 4.50 .0018 .550
 71 1  5.0      053 BASIN 053
.06  0.32 0.14  82.2 .010 22   0.35 0.1 4.50 .0018 .550
 71 1  5.0      054 BASIN 054
.09  0.34 0.07  44.9 .010 44   0.35 0.1 4.50 .0018 .550
 71 1  5.0      058 BASIN 058
.14  0.53 0.15  08.1 .023 47   0.35 0.1 4.50 .0018 .550
 70 1  5.0      024 BASIN 024
.33  0.85 0.32  23.3 .019  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      025 BASIN 025
.25  0.79 0.14  35.3 .019  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      026 BASIN 026
.25  0.73 0.36  02.0 .020  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      027 BASIN 027
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.49  0.87 0.23  11.5 .015  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      028 BASIN 028
.76  1.41 0.69  06.1 .015  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      029 BASIN 029
.53  1.50 0.63  02.0 .019  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      060 BASIN 060
.09  0.37 0.14  69.3 .010 29   0.35 0.1 4.50 .0018 .550
 70 1  5.0      055 BASIN 055
.24  0.51 0.07  39.6 .013  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      059 BASIN 059
.18  0.43 0.18  30.0 .022  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      561 BASIN 561
.25  0.33 0.01  46.0 .010  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      564 BASIN 564
.13  0.25 0.09  38.7 .020 46   0.35 0.1 4.50 .0018 .550
 71 1  5.0      562 BASIN 562
.1   0.61 0.34  48.6 .010 47   0.35 0.1 4.50 .0018 .550
 70 1  5.0      563 BASIN 563
.23  0.38 0.12  91.4 .026  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      048 BASIN 048
.04  0.23 0.09  07.0 .020 38   0.35 0.1 4.50 .0018 .550
 71 1  5.0      049 BASIN 049
.14  0.95 0.38  22.2 .014109   0.35 0.1 4.50 .0018 .550
 70 1  5.0      565 BASIN 565
.15  0.86 0.39  13.8 .020  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      050 BASIN 050
.21  0.87 0.41  55.8 .012  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      051 BASIN 051
.10  0.58 0.09  13.1 .010 97   0.35 0.1 4.50 .0018 .550
 70 1  5.0      052 BASIN 052
.22  0.50 0.34  17.8 .011  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      581 BASIN 581
.08  0.44 0.12  45.8 .017 40   0.35 0.1 4.50 .0018 .550
 70 1  5.0      582 BASIN 582
.05  0.31 0.11  66.3 .014 26   0.35 0.1 4.50 .0018 .550
 70 1  5.0      583 BASIN 583
.03  0.26 0.10  28.7 .013 31   0.35 0.1 4.50 .0018 .550
 70 1 15.0 61    61
 0.22 0.74 0.39 2.000.016      0.35 0.10 3.75.0018 0.55
 70 1 15.0 62    62
 0.19 0.61 0.34 2.000.015      0.35 0.10 4.35.0018 0.59
 70 1 15.0 63    63
 0.24 0.52 0.29 2.000.023      0.35 0.10 3.36.0018 0.52
 70 1 15.0 64    64
 0.15 0.61 0.40 2.000.015      0.35 0.10 3.89.0018 0.56
 70 1 15.0 65    65
 0.22 1.07 0.59 2.000.021      0.35 0.10 3.66.0018 0.54
 70 1 15.0 66    66
 0.27 0.66 0.33 2.000.010      0.35 0.10 3.52.0018 0.53
 70 1 15.0 67    67
 0.36 1.04 0.67 2.000.015      0.35 0.10 3.87.0018 0.56
 70 1 15.0 68    68
 0.25 0.52 0.31 2.000.011      0.35 0.10 3.78.0018 0.55
 70 1 15.0 69    69
 0.36 0.71 0.46 2.000.008      0.35 0.10 3.91.0018 0.56
 70 1 15.0 73    73
 0.16 0.54 0.22 2.000.017      0.35 0.10 3.85.0018 0.56
 70 1 15.0 71    71
 0.23 0.49 0.32 2.000.025      0.35 0.10 4.62.0018 0.70
 70 1 15.0 72    72
 0.19 0.56 0.16 2.000.030      0.35 0.10 4.46.0018 0.60
 70 1 15.0 74    74
 0.28 0.95 0.45 2.000.017      0.35 0.10 4.24.0018 0.58
 70 1 15.0 75    75
 0.26 1.08 0.68 2.000.016      0.35 0.10 4.31.0018 0.59
 70 1 15.0 76    76
 0.41 1.09 0.43 2.000.012      0.35 0.10 4.00.0018 0.57
 70 1 15.0 77    77
 0.48 0.87 0.41 2.000.010      0.35 0.10 4.17.0018 0.58
 70 1 15.0 78    78
 0.24 1.00 0.70 2.000.012      0.35 0.10 4.07.0018 0.57
 70 1 15.0 79    79
 0.19 0.93 0.47 2.000.017      0.35 0.10 4.33.0018 0.59
 70 1 15.0 80    80
 0.20 0.65 0.25 2.000.021      0.35 0.10 4.32.0018 0.59
 70 1 15.0 81    81
 0.33 0.97 0.55 2.000.016      0.35 0.10 3.38.0018 0.53
 70 1 15.0 82    82
 0.21 0.45 0.22 2.000.011      0.35 0.10 3.40.0018 0.53
 70 1 15.0 83    83
 0.30 0.64 0.32 2.000.004      0.35 0.10 3.89.0018 0.56
 70 1 15.0 84    84
 0.17 0.69 0.40 2.000.009      0.35 0.10 4.15.0018 0.58
 70 1 15.0 85    85
 0.27 0.56 0.26 2.000.008      0.35 0.10 4.50.0018 0.60
 70 1 15.0 86    86
 0.29 0.57 0.62 2.000.004      0.35 0.10 4.50.0018 0.60
 71 1 15.0 87    87
 0.14 0.74 0.42 2.000.01710.00 0.35 0.10 4.50.0018 0.60
 70 1 15.0 88    88
 0.35 0.85 0.44 2.000.012      0.35 0.10 4.50.0018 0.60
 70 1 15.0 89    89
 0.29 0.59 0.33 2.000.017      0.35 0.10 4.66.0018 0.73
 70 1 15.0 90    90
 0.23 0.79 0.39 2.000.003      0.35 0.10 4.16.0018 0.59
 70 1 15.0 91    91
 0.26 0.42 0.25 2.000.003      0.35 0.10 4.39.0018 0.65
 70 1 15.0 92    92
 0.30 0.65 0.36 2.000.003      0.35 0.10 4.45.0018 0.69
 70 1 15.0 93    93
 0.26 0.65 0.23 2.000.019      0.35 0.10 4.52.0018 0.61
 70 1 15.0 94    94
 0.56 0.55 0.2505.090.013      0.35 0.10 4.62.0018 0.69
 71 1 15.0 95    95
 0.13 0.38 0.2016.680.00810.00 0.35 0.10 4.50.0018 0.60
 70 1 15.0 96    96
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 70 1 15.0 97    97
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70 1 15.0 98    98
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70 1 15.0 99    99
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70 1 15.0 100  100
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70 1 15.0 101  101
0.27 0.52 0.23 2.000.003     0.35 0.10 3.90.0018 0.56
70 1 15.0 102  102
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70 1 15.0 103  103
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70 1 15.0 104  104
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70 1 15.0 105  105
0.39 1.03 0.42 2.000.013     0.35 0.10 4.55.0018 0.64
70 1 15.0 106  106
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70 1 15.0 107  107
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70 1 15.0 108  108
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70 1 15.0 109  109
0.23 0.68 0.20 2.000.015     0.35 0.10 4.52.0018 0.62
70 1 15.0 110  110
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70 1 15.0 111  111
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70 1 15.0 112  112
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70 1 15.0 113  113
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71 1 15.0 114  114
0.10 0.55 0.27 5.000.01210.00 0.35 0.10 3.78.0018 0.59
70 1 15.0 115  115
0.20 0.53 0.27 5.000.005     0.35 0.10 4.18.0018 0.61
70 1 15.0 116  116
0.37 0.92 0.43 5.000.005     0.35 0.10 4.37.0018 0.59
71 1 15.0 117  117
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70 1 15.0 118  118
0.28 0.68 0.36 5.000.004     0.35 0.10 4.37.0018 0.76
70 1 15.0 119  119
0.28 0.70 0.34 5.000.005     0.35 0.10 3.09.0018 0.52
70 1 15.0 120  120
0.30 0.75 0.50 5.000.004     0.35 0.10 3.40.0018 0.53
70 1 15.0 122  122
0.28 0.60 0.28 5.000.003     0.35 0.10 3.33.0018 0.52
71 1 15.0 123  123
0.07 0.29 0.16 5.000.00310.00 0.35 0.10 4.39.0018 0.59
71 1 15.0 124  124
0.06 0.36 0.19 5.000.00510.00 0.35 0.10 4.22.0018 0.58
70 1 15.0 125  125
0.45 0.67 0.36 5.000.005     0.35 0.10 3.62.0018 0.54
E
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DIA SWMM EXISTING Model

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WATERSHED   1
Third Creek July 2003 Boyle Existing
File: tc2003e.sin
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     027  027
     026  026
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     058  558
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     023  023
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     050  550
     565  548
     049  549
     048  548
     047  547
     022  022
     021  021
     046  546
     045  545
     044  544
     043  543
     020  020
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     040  040
     039  039
     038  038
     036  036
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     037  037
     018  018
     017  017
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033 033
032 032
034 034
016 016
015 015
031 031
030 030
019 019
014 014
013 013
012 011
011 011
010 010
009 009
008 008
007 007
006 006
005 005
004 004
003 003
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582 582
583 583
002 001
001 001
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110 169
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112 112
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115  79
116  95
117 180
118 178
119  82
120 181
122 183
123 184
124 185
125 225

0  028 1028  0 3          1.
0 1028  027  0 4   20.0  2300.   .005    2.0    2.0  0.032    2.0
             28.0  2300.   .005   50.0   50.0  0.032   20.0
0  027 1027  0 3          1.
0 1027  026  0 4   20.0  1400.   .005    2.0    2.0  0.032    2.0
             28.0  1400.   .005   50.0   50.0  0.032   20.0
0  026 1026  0 3          1.
0 1026  570  0 2   17.5  1900.   .010            0.013   17.5
0  025 1025  0 3          1.
0 1025  570  0 5    6.0   750.   .005            0.013    6.0
            100.0   750.   .005   80.0   80.0  0.032   20.0
0  570 1070  0 3          1.
0 1070 1170  0 4   40.0   100.   .009    2.0    2.0  0.032    2.0
             48.0   100.   .009   10.0   10.0  0.032   20.0
0 1170 1270  0 2   17.5   110.   .009            0.013   17.5
0 1270 1370  0 4   40.0  1300.   .009    2.0    2.0  0.032    2.0
             48.0  1300.   .009   50.0   50.0  0.032   20.0
0 1370 1470  0 2   17.5   150.   .009            0.013   17.5
0 1470  024  0 4   40.0   270.   .009    2.0    2.0  0.032    2.0
```

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            48.0   270.   .009    6.0    6.0  0.032   20.0
0  024 1024  0 3          1.
0 1024 1124  0 2   17.5  1220.   .003            0.013   17.5
0 1124  023  0 4   40.0   500.   .004    2.0    2.0  0.032    2.0
            48.0   500.   .004   10.0   50.0  0.032   20.0
0  563 1063  0 3          1.
0 1063  562  0 5    5.0   600.   .005            0.013    4.5
           100.0   600.   .005   80.0   80.0  0.032   20.0
0  562 1062  0 3          1.
0 1062 1162  0 5    5.0  1700.   .002            0.013    5.0
           100.0  1700.   .002   80.0   80.0  0.032   20.0
0 1162  561  0 4   40.0   600.   .002    2.0    2.0  0.032    2.0
            48.0   600.   .002   10.0   10.0  0.032   20.0
0  561  927  0 3          1.
0  927 1061  5 2    0.1     1.   .001            0.015    0.1
   0      0    18.0     5.5    48.0    24.5    74.0    121.9
 139.5    151.6
0 1061  571  0 2    6.0   400.   .005            0.013    5.0
0  564 1064  0 3          1.
0 1064 1164  0 5    5.0   300.   .002            0.013    5.0
           100.0   300.   .002   80.0   80.0  0.032   20.0
0 1164 1264  0 1   10.0   700.   .009    3.0    3.0  0.032   20.0
0 1264  571  0 5    5.0   400.   .002            0.013    5.0
           100.0   400.   .002   80.0   80.0  0.032   20.0
0  571 1071  0 3          1.
0 1071 1171  0 2    6.0   750.   .005            0.013    5.0
0 1171  558  0 4   40.0  1950.   .009    2.0    2.0  0.032    2.0
            48.0  1950.   .009   50.0   50.0  0.032   20.0
0  560 1060  0 3          1.
0 1060 1160  0 2    6.0  1550.   .002            0.013    6.0
0 1160  559  0 4   20.0   400.   .010    2.0    2.0  0.032    2.0
            28.0   400.   .010   20.0   20.0  0.032   20.0
0  559  926  0 3          1.
0  926 1059  6 2    0.1     1.   .001            0.015    0.1
   0      0     1.8     0.2    13.0   473.0    18.4    551.0
  54.2    839.0    63.4    885.0
0 1059 1159  0 2    7.0   400.   .005            0.013    6.0
0 1159 1259  0 5    6.0   300.   .002            0.013    6.0
           100.0   300.   .002   80.0   80.0  0.032   20.0
0 1259  558  0 4   40.0   700.   .003    2.0    2.0  0.032    2.0
            48.0   700.   .003   30.0    6.0  0.032   20.0
0  558 1058  0 3          1.
0 1058 1158  0 5    6.0   520.   .012            0.013    6.0
           100.0   520.   .012   80.0   80.0  0.032   20.0
0 1158 1258  0 4   40.0   390.   .006    2.0    2.0  0.032    2.0
            48.0   390.   .006   30.0   30.0  0.032   20.0
0 1258 1358  0 5    7.0   130.   .006            0.013    6.0
           100.0   130.   .006   80.0   80.0  0.032   20.0
0 1358  023  0 4   40.0  1150.   .006    2.0    2.0  0.032    2.0
            48.0  1150.   .006   30.0   30.0  0.032   20.0
0  557 1057  0 3          1.
0 1057 1157  0 5    5.0   500.   .002            0.013    5.0
           100.0   500.   .002   80.0   80.0  0.032   20.0
0 1157  556  0 4   20.0   500.   .010    2.0    2.0  0.032    2.0
            28.0   500.   .010   10.0   10.0  0.032   20.0
0  556  923  0 3          1.
0  923 1056  5 2    0.1     1.   .001            0.015    0.1
   0      0     2.0     3.2     6.4   434.4     9.6    507.2
  36.2    774.8
0 1056 1156  0 5    5.0   400.   .002            0.013    5.0
           100.0   400.   .002   80.0   80.0  0.032   20.0
0 1156  023  0 4   40.0  1000.   .003    2.0    2.0  0.032    2.0
            48.0  1000.   .003   30.0   30.0  0.032   20.0
0  555 1055  0 3          1.
0 1055  554  0 5    6.5  2000.   .005            0.013    6.5
           100.0  2000.   .005   80.0   80.0  0.032   20.0
0  554 1054  0 3          1.
0 1054  553  0 5    7.0  1600.   .002            0.013    7.0
           100.0  1600.   .002   80.0   80.0  0.032   20.0
0  553 1053  0 3          1.
0 1053 1153  0 5    7.5  1950.   .002            0.013    7.5
           100.0  1950.   .002   80.0   80.0  0.032   20.0
0 1153  023  0 4   40.0   500.   .010    2.0    2.0  0.032    2.0
            48.0   500.   .010   30.0   30.0  0.032   20.0
0  023 1023  0 3          1.
0 1023 1123  0 2   17.5  1560.   .013            0.013   17.5
0 1123  022  0 4   40.0   640.   .003    2.0    2.0  0.032    2.0
            48.0   640.   .003   50.0   10.0  0.032   20.0
0  552 1052  0 3          1.
0 1052  551  0 2    5.0   600.   .014            0.013    5.0
0  551 1051  0 3          1.
0 1051 1151  0 2    5.0   500.   .014            0.013    5.0
0 1151  550  0 4   20.0  1500.   .011    2.0    2.0  0.032    2.0
            28.0  1500.   .011   10.0   50.0  0.032   20.0
0  550 1050  0 3          1.
0 1050 1150  0 5    6.0   500.   .013            0.013    5.0
           100.0   500.   .013   80.0   80.0  0.032   20.0
0 1150  548  0 4   20.0   300.   .013    2.0    2.0  0.032    2.0
            28.0   300.   .013   50.0    2.0  0.032   20.0
0  549 1049  0 3          1.
0 1049 1149  0 2    6.0   450.   .026            0.013    6.0
0 1149  548  0 4   20.0   200.   .026    2.0    2.0  0.032    2.0
            28.0   200.   .026    2.0   50.0  0.032   20.0
0  548  848  0 3          1.
0  848 1048  6 2    0.1     1.   .001            0.015    0.1
   0      0     2.3    90.0    46.4   140.3   115.4    159.6
 134.1    256.4   185.0    430.4
0 1048  572  0 5    5.0  1620.   .002            0.013    5.0
           100.0  1620.   .002   80.0   80.0  0.032   20.0
0  547 1047  0 3          1.
0 1047  572  0 5    5.0   900.   .002            0.013    5.0
           100.0   900.   .002   80.0   80.0  0.032   20.0
0  572 1072  0 3          1.
0 1072 1172  0 4   40.0   850.   .008    2.0    2.0  0.032    2.0
            48.0   850.   .008   50.0   50.0  0.032   20.0
0 1172 1272  0 5    5.0   180.   .008            0.013    5.0
            48.0   180.   .008   50.0   50.0  0.032   20.0
0 1272  022  0 4   40.0   550.   .008    2.0    2.0  0.032    2.0
```

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            48.0   550.   .008   50.0   50.0  0.032   20.0
0  022 1022  0 3          1.
0 1022 1122  0 5   17.5   760.   .002            0.013   17.5
            100.0   760.   .002   80.0   80.0  0.032   20.0
0 1122  021  0 4   40.0  2150.   .005    2.0    2.0  0.032    2.0
            48.0  2150.   .005    6.0   50.0  0.032   20.0
0  583 1083  0 3          1.
0 1083 1183  0 5    3.0   530.   .010            0.013    3.0
            100.0   530.   .010   80.0   80.0  0.032   20.0
 1183  543  0 1   20.0   430.   .020    6.0   20.0  0.032    8.0
0  543 1043  0 3          1.
0 1043 1143  0 5    3.0   560.   .010            0.013    3.0
            100.0   560.   .010   80.0   80.0  0.032   20.0
0 1143  020  0 4   40.0  1930.   .004    2.0    2.0  0.032    2.0
            48.0  1930.   .004    6.0   50.0  0.032   20.0
0  546 1046  0 3          1.
0 1046  545  0 5    3.0   750.   .002            0.013    3.0
            100.0   750.   .002   80.0   80.0  0.032   20.0
0  545 1045  0 3          1.
0 1045  544  0 5    5.5   800.   .002            0.013    5.5
            100.0   800.   .002   80.0   80.0  0.032   20.0
0  544 1044  0 3          1.
0 1044 1144  0 5    6.0  1750.   .002            0.013    6.0
            100.0  1750.   .002   80.0   80.0  0.032   20.0
0 1144  020  0 4   40.0  1900.   .004    2.0    2.0  0.032    2.0
            48.0  1900.   .004    6.0   50.0  0.032   20.0
0  021 1021  0 3          1.
0 1021 1121  0 5   17.5   900.   .002            0.013   17.5
            100.0   900.   .002   80.0   80.0  0.032   20.0
0 1121  020  0 4   40.0  2050.   .005    2.0    2.0  0.032    2.0
            48.0  2050.   .005    6.0   50.0  0.032   20.0
0  020  820  0 3          1.
0  820 1020 10 2    0.1     1.   .001            0.015    0.1
    0      0     0.1    70.5     8.3   101.9    53.5   125.6
 129.9   145.6   179.7   154.6   204.0   158.6   235.4  1096.6
 297.5  1157.2   400.0  2000.0
0 1020  017  0 2   13.5  1150.   .019            0.013    6.0
0  041 1041  0 3          1.
0 1041  040  0 5    4.5  1200.   .002            0.013    4.5
            100.0  1200.   .002   80.0   80.0  0.032   20.0
0  040 1040  0 3          1.
0 1040  039  0 5    7.0   750.   .002            0.013    7.0
            100.0   750.   .002   80.0   80.0  0.032   20.0
0  039 1039  0 3          1.
0 1039  037  0 2    9.0  2800.   .002            0.013    9.0
0  038 1038  0 3          1.
0 1038 1138  0 5    6.0   440.   .002            0.013    6.0
            100.0   440.   .002   80.0   80.0  0.032   20.0
0 1138 1238  0 1   10.0  1070.   .009    6.0    6.0  0.032   10.0
0 1238  037  0 2   13.6   500.   .002            0.013   13.6
0  037 1037  0 3          1.
0 1037  573  0 2   13.6   350.   .002            0.013   13.6
0  036 1036  0 3          1.
0 1036  573  0 5    4.0  3500.   .002            0.013    4.0
            100.0  3500.   .002   80.0   80.0  0.032   20.0
0  573 1073  0 3          1.
0 1073  035  0 2   13.6   400.   .005            0.013   13.6
0  035 1035  0 3          1.
0 1035 1135  0 2   13.6  2150.   .005            0.013   13.6
0 1135  018  0 4   40.0  1470.   .001    2.0    2.0  0.032    2.0
            48.0  1470.   .001   20.0   20.0  0.032   20.0
0  033 1033  0 3          1.
0 1033  018  0 1   10.0  1700.   .020    4.0    4.0  0.032   10.0
0  582 1082  0 3          1.
0 1082  032  0 5    3.0  1080.   .010            0.013    3.0
            100.0  1080.   .010   80.0   80.0  0.032   20.0
0  032 1032  0 3          1.
0 1032 1132  0 2    4.5   410.   .030            0.013    4.5
0 1132  018  0 4   40.0   800.   .004    2.0    2.0  0.032    2.0
            48.0   800.   .004   20.0   20.0  0.032   20.0
0  018  818  0 3          1.
0  818 1018  8 2    0.1     1.   .001            0.015    0.1
    0      0     0.1    38.8     3.2    50.7    44.2    64.7
 70.6    95.1   101.0   144.7   135.5   270.2   174.5   285.6
0 1018  017  0 2    3.5  1350.   .022            0.013    3.5
0  017 1017  0 3          1.
0 1017 1117  0 2   13.5  1800.   .019            0.013    6.0
0 1117  016  0 4   40.0   600.   .002    2.0    2.0  0.032    2.0
            48.0   600.   .002   20.0   20.0  0.032   20.0
0  034 1034  0 3          1.
0 1034  016  0 4   40.0  2570.   .010    2.0    2.0  0.032    2.0
            48.0  2570.   .010    6.0   50.0  0.032   20.0
0  016 1016  0 3          1.
0 1016  015  0 4   55.0  1890.   .005    2.0    2.0  0.032    2.0
            63.0  1890.   .005   20.0   20.0  0.032   20.0
0  015 1015  0 3          1.
0 1015  014  0 4   55.0  1890.   .005    2.0    2.0  0.032    2.0
            63.0  1890.   .005   20.0   20.0  0.032   20.0
0  031 1031  0 3          1.
0 1031  030  0 2    9.0   350.   .005            0.013    9.0
0  030 1030  0 3          1.
0 1030 1130  0 2    9.0  1370.   .005            0.013    9.0
0 1130  019  0 4   20.0  1130.   .005    2.0    2.0  0.032    2.0
            28.0  1130.   .005   50.0   50.0  0.032   20.0
0  581 1081  0 3          1.
0 1081 1181  0 5    4.5   450.   .010            0.013    4.5
            100.0   450.   .010   80.0   80.0  0.032   20.0
0 1181  019  0 4   20.0   400.   .005    2.0    2.0  0.032    2.0
            28.0   400.   .005   50.0   50.0  0.032   20.0
0  019  819  0 3          1.
0  819 1019  8 2    0.1     1.   .001            0.015    0.1
    0      0     4.5   146.1    19.8   196.0    50.8   235.6
 72.1   415.9   128.7   463.3   209.0   506.3   313.3   545.9
0 1019 1119  0 5    3.0  1650.   .017            0.013    3.0
            100.0  1650.   .017   80.0   80.0  0.032   20.0
0 1119  014  0 1   20.0  3550.   .013    3.0    3.0  0.040   10.0
0  014 1014  0 3          1.
0 1014  013  0 4   55.0  1890.   .005    2.0    2.0  0.040    2.0
```

```
          63.0  1890.  .005   20.0   20.0  0.040   10.0
0 013 1013  0 3          1.
0 1013  011  0 4   55.0   630.  .005    2.0    2.0  0.040    2.0
          63.0   630.  .005   20.0   20.0  0.040   10.0
0 011 1011  0 3          1.
0 1011  010  0 4   55.0   430.  .005    2.0    2.0  0.040    2.0
          63.0   430.  .005   20.0   20.0  0.040   10.0
0 010 1010  0 3          1.
0 1010  009  0 4   55.0   750.  .005    2.0    2.0  0.040    2.0
          63.0   750.  .005   20.0   20.0  0.040   10.0
0 009 1009  0 3          1.
0 1009  008  0 4   55.0   480.  .005    2.0    2.0  0.040    2.0
          63.0   480.  .005   20.0   20.0  0.040   10.0
0 008 1008  0 3          1.
0 1008  007  0 4   55.0   490.  .005    2.0    2.0  0.040    2.0
          63.0   490.  .005   20.0   20.0  0.040   10.0
0 007 1007  0 3          1.
0 1007  006  0 4   55.0  1170.  .005    2.0    2.0  0.040    2.0
          63.0  1170.  .005   20.0   20.0  0.040   10.0
0 006 1006  0 3          1.
0 1006  005  0 4   55.0   840.  .005    2.0    2.0  0.040    2.0
          63.0   840.  .005   20.0   20.0  0.040   10.0
0 005 1005  0 3          1.
0 1005  003  0 4   55.0  1070.  .005    2.0    2.0  0.040    2.0
          63.0  1070.  .005   20.0   20.0  0.040   10.0
0 003 1003  0 3          1.
0 1003  004  0 4   55.0   300.  .005    2.0    2.0  0.040    2.0
          63.0   300.  .005   20.0   20.0  0.040   10.0
0 004 1004  0 3          1.
0 1004  594  0 4   55.0   500.  .013    2.0    2.0  0.040    2.0
          63.0   500.  .013   20.0   20.0  0.040   10.0
  47  144    5    4.5  4200.  .015    0.0    0.0  .016    4.5
           1.  4200.  .015   20.0   20.0  .020    6.0
  46  144    5    6.0  3700.  .015    0.0    0.0  .016    6.0
           1.  3700.  .015   20.0   20.0  .020    8.0
  144  44    3   10.     1.  .1000    0.0    0.0  .01    10.
  44  143    1   32.  2700.  .0026    4.0    4.0  .035    6.0
  45  143    5    6.0  2200.  .010    0.0    0.0  .016    6.0
           1.  2200.  .010   20.0   20.0  .020   580
  143  43    3   10.     1.  .100    0.0    0.0  .01    10.
  43  142    1   69.  4000.  .0022    4.0    4.0  .035    6.0
  142  594   3   10.     1.  .1000    0.0    0.0  .01    10.
0  594 1094  0 3          1.
0 1094  001  0 4   55.0  1700.  .013    2.0    2.0  0.040    2.0
          63.0  1700.  .013   50.0   50.0  0.040   10.0
0  001  801  0 3          1.
0  801  048  6 2    0.1     1.  .001          0.015    0.1
   0      0    84.7    15.0    88.8   285.0    90.4   945.0
 195.0   3396.0   300.0  4000.0
  48  148    4   20.  2300.  .0029    4.0    4.0  .035    5.0
           60.  2300.  .0029   25.0   25.0  .045   10.0
  148  49    3   10.     1.  .1000    0.0    0.0  .010    10.
  149  53    3   10.     1.  .1000    0.0    0.0  .010    10.
  151  51    3   10.     1.  .1000    0.0    0.0  .010    10.
  153  55    3   10.     1.  0.100    0.     0.  .010    1.0
  155  56    3   10.     1.  .100    0.     0.  .010    10.
  156  57    3   10.     1.  .1000    0.   00.0   .01   10.0
  157  59    3   10.     1.  .100    0.     0.  .01    10.
  158  58    3   10.     1.  .1000    0.     0.  .010    3.0
  188  88    3   10.     1.  .1000    0.     0.  .010    10.
  190  90    3   10.     1.  .1000    0.0    0.0  .01    10.
  192  92    3   10.     1.  .100    0.0    0.0  .01    10.
  159  61    3   10.     1.  .100    0.0    0.0  .01    10.
  161  261   3   10.     1.  .100    0.0    0.0  .10    10.
  261  64 12 2   .10     1.  .1000    0.0    0.0  .01    .10
   0      0     1.4     22     9.0    150    25.1    402
  50.2    822    83.7   1393   125.3   2079   173.4   2853
 226.4   3712   272.1   4499   283.8   4640   342.9   5520
  162  62    3   10.     1.  .1000    0.0    0.0  .01    10.
   98  164   3   10.     1.  .1000    0.0    0.0  .010    10.
  164  66    3   10.     1.  .1000    0.0    0.0  .01    10.
  101  166   3   10.     1.  .1000    0.0    0.0  .010    10.
  166  67    3   10.     1.  .1000    0.0    0.0  .01    10.
   67  199   4  174.  1000.  .0019    4.0    4.0  .035    5.0
          214.  1000.  .0019   50.0   50.0  .045   10.0
270  199  99 6 3   10.     1.  .100    0.0    0.0  .01    10.
   0      0   3550      0   3640     40   3650    113
  3925   1000   5860   2000
  270  267   3   10.     1.  .100    0.0    0.0  .10    10.
  267  99 4 2   .10     1.  .1000    0.0    0.0  .01    .10
   0      0    22.2      0    22.7   2000    100   5000
  169  269   3   10.     1.  .100    0.0    0.0  .01    10.
  170  70    3   10.     1.  .1000    0.0    0.0  .010    10.
  171  71    3   10.     1.  .1000    0.0    0.0  .010    10.
  111  167   3   10.     1.  .1000    0.0    0.0  .010    10.
370  167  75 6 3   10.     1.  .1000    0.   00.0   .01   10.0
   0      0   3550      0   3640     40   3650    113
  3925   1000   5860   2000
  370  367   3   10.     1.  .100    0.0    0.0  .10    10.
  367  75 4 2   .10     1.  .1000    0.0    0.0  .01    .10
   0      0    32.0      0    32.5   3000    100   5000
  176  78    3   10.     1.  .100    0.     0.  .01    10.
  177  77    3   10.     1.  .1000    0.     0.  .010    3.0
  178  81    3   10.     1.  .1000    0.     0.  .010    10.
  180  80    3   10.     1.  .1000    0.0    0.0  .01    10.
  181  83    3   10.     1.  .100    0.0    0.0  .01    10.
  183  84    3   10.     1.  .100    0.0    0.0  .01    10.
  184  85    3   10.     1.  .100    0.0    0.0  .01    10.
  185      3   10.     1.  .1000    0.0    0.0  .01    10.0
   49  149   4   60.  4600.  .0022    4.0    4.0  .035    5.0
          100.  4600.  .0022   25.0   25.0  .045   10.0
   50  149   1    3.  2300.  .030    4.0    4.0  .035    5.0
   51  149   1   40.  5000.  .0024    4.0    4.0  .035    8.0
   52  151   1   14.  1600.  .0031    4.0    4.0  .035    8.0
   53  153   4  125.  2500.  .0019    4.0    4.0  .035    5.0
          165.  2500.  .0019   25.0   25.0  .045   10.0
   54  153   4   11.  2000.  .0032    4.0    4.0  .035    5.0
           51.  2000.  .0032   25.0   25.0  .045   10.0
```

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55 155  4   56.  1000.  .0023   4.0   4.0   .035   5.0
            96.  1000.  .0023  25.0  25.0   .045  10.0
56 156  4  149.  2000.  .0019   4.0   4.0   .035   5.0
           189.  2000.  .0019  25.0  25.0   .045  10.0
57 157  4  151.  2800.  .0019   4.0   4.0   .035   5.0
           191.  2800.  .0019  25.0  25.0   .045  10.0
58 157  1  109.  3900.   .002   4.0   4.0   .035   5.0
59 159  4  240.  1800.  .0018   4.0   4.0   .035   5.0
           280.  1800.  .0018  25.0  25.0   .045  10.0
87 158  1    8.   800.  .0034   4.0   4.0   .035   5.0
88 158  1   89.  4490.  .0021   4.0   4.0   .035   5.0
89 188  1    1.  1400.  .0041   4.0   4.0   .035   8.0
90 188  1   57.  3000.  .0022   4.0   4.0   .035   5.0
91 190  1    6.  1100.  .0036   4.0   4.0   .035   8.0
92 190  1   27.  2200.  .0027   4.0   4.0   .035   5.0
93 192  1    2.  1500.  .0040   4.0   4.0   .035   5.0
94 192  1   13.  1700.  .0031   4.0   4.0   .035   5.0
60 159  5  6.5  4000.   .013   0.0   0.0   .016   6.5
            1.0  4000.  .0130   20.   20.   .020   8.0
61 161  4  256.  2100.  .0018   4.0   4.0   .035   5.0
           296.  2100.  .0018  25.0  25.0   .045  10.0
62 161  1   17.  2500.   .003   4.0   4.0   .035   8.0
63 162  1    5.  4000.  .0037   4.0   4.0   .035   8.0
64 164  4  277.  2200.  .0018   4.0   4.0   .035   5.0
           317.  2200.  .0018  25.0  25.0   .045  10.0
65 164  5  7.5  1300.  .0050   0.0   0.0   .016   7.5
            1.0  1300.  .0050   20.   20.   .020   8.0
66 166  4  173.  1900.  .0019   4.0   4.0   .035   5.0
           213.  1900.  .0019  25.0  25.0   .045  10.0
69 198  1  110.  1000.  .0020   4.0   4.0   .035   8.0
198 68  3   10.     1.  .1000   0.0   0.0   .010   10.
68 199  1  110.   100.  .0020   4.0   4.0   .035   8.0
70 169  1   95.  4500.  .0026   4.0   4.0   .035   5.0
71 170  1   14.  3800.  .0031   4.0   4.0   .035   8.0
72 171  5  6.5  3300.   .012   0.0   0.0   .016   5.0
            1.0  3300.  .0120   20.   20.   .020   8.0
73 170  5  7.0  5020.   .007   0.0   0.0   .016   7.0
            1.0  5020.  .0070   20.   20.   .020  10.0
103 269 3   10.     1.  .1000   0.0   0.0   .010   10.
269 69  3   10.     1.  .1000   0.0   0.0   .010   10.
99 599  4  173.  3400.  .0019   4.0   4.0   .035   5.0
           213.  3400.  .0019  50.0  50.0   .045  10.0
599 167 3   10.     1.  .1000   0.0   0.0   .010   10.
75 175  4  173.  5900.  .0019   4.0   4.0   .035   5.0
           213.  5900.  .0019  50.0  50.0   .045  10.0
112 175 3   10.     1.  .1000   0.0   0.0   .010   10.
175 76  3   10.     1.  .1000   0.0   0.0   .010   10.
76 176  4  159.  1700.  .0019   4.0   4.0   .035   5.0
           199.  1700.  .0019  50.0  50.0   .045  10.0
77 176  1   10.  2700.  .0033   4.0   4.0   .035   5.0
78 178  4  160.  4500.  .0019   4.0   4.0   .035   5.0
           200.  4500.  .0019  50.0  50.0   .045  10.0
79 178  5  7.5  1800.   .003   0.0   0.0   .016   7.5
            1.0  1800.  .0030   20.   20.   .020  10.0
80 178  1   10.  2200.  .0033   4.0   4.0   .035   8.0
95 180  1    4.  1500.  .0038   4.0   4.0   .035   8.0
81 181  4  161.  4400.  .0019   4.0   4.0   .035   5.0
           201.  4400.  .0019  50.0  50.0   .045  10.0
82 181  5  7.0  3000.   .005   0.0   0.0   .016   7.0
            1.0  3000.  .0050   20.   20.   .020  10.0
83 183  4  162.  1600.  .0019   4.0   4.0   .035   5.0
           202.  1600.  .0019  50.0  50.0   .045  10.0
84 184  4  162.  1000.  .0019   4.0   4.0   .035   5.0
           202.  1000.  .0019  50.0  50.0   .045  10.0
85 185  4  162.  3700.  .0019   4.0   4.0   .035   5.0
           202.  3700.  .0019  50.0  50.0   .045  10.0

 0
 6
 185 181 167 157  48 104
ENDPROGRAM
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DIA CUHP FUTURE Model

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2    3RD CREEK FULL BUILD-OUT 11/17/03 3C-100-bo.CHI
01  100-YEAR100 2.62

 70 1  5.0     001 BASIN 01  OF THIRD CREEK
.65  1.01 0.37  35.0 .038  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0     002 BASIN 02
.07  0.29 0.13  64.9 .022 23   0.35 0.1 4.50 .0018 .550
 70 1  5.0     003 BASIN 03
.50  1.27 0.70  20.0 .035  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0     004 BASIN 04
.27  1.17 0.60  65.0 .033  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0     005 BASIN 05
.26  0.63 0.30  04.0 .029  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0     006 BASIN 06
.47  0.86 0.38  05.2 .035  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0     007 BASIN 07
.08  0.59 0.15  33.7 .032 27   0.35 0.1 4.50 .0018 .550
 70 1  5.0     008 BASIN 08
.71  1.16 0.55  04.5 .024  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0     009 BASIN 09
.08  0.77 0.34  36.1 .026 32   0.35 0.1 4.50 .0018 .550
 71 1  5.0     010 BASIN 010
.08  0.40 0.05  32.5 .030 22   0.35 0.1 4.50 .0018 .550
 71 1  5.0     011 BASIN 011
.12  0.63 0.22  07.0 .023 29   0.35 0.1 4.50 .0018 .550
 70 1  5.0     012 BASIN 012
.28  0.77 0.34  06.4 .028  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0     013 BASIN 013
.03  0.25 0.02  47.9 .058 16   0.35 0.1 4.50 .0018 .550
 70 1  5.0     014 BASIN 014
.61  0.91 0.33  05.8 .029  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0     015 BASIN 015
.08  0.69 0.32  38.7 .020 30   0.35 0.1 4.50 .0018 .550
 71 1  5.0     016 BASIN 016
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.10  0.73 0.28  54.8 .017 33   0.35 0.1 4.50 .0018 .550
 71 1  5.0      017 BASIN 017
.03  0.19 0.03  22.0 .052 18   0.35 0.1 4.50 .0018 .550
 70 1  5.0      018 BASIN 018
.27  0.57 0.21  11.1 .029  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      019 BASIN 019
.25  0.67 0.20  09.7 .024  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      020 BASIN 020
.28  0.63 0.27  15.0 .021  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      021 BASIN 021
.39  0.52 0.12  10.8 .025  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      022 BASIN 022
.20  0.49 0.12  21.0 .027  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      023 BASIN 023
.25  0.68 0.01  23.7 .017  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      024 BASIN 024
.33  0.85 0.32  35.0 .019  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      025 BASIN 025
.14  0.53 0.14  70.0 .029  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      026 BASIN 026
.16  0.68 0.09  35.0 .027  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      027 BASIN 027
.49  0.85 0.26  70.0 .027  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      028 BASIN 028
.76  1.41 0.69  22.0 .015  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      029 BASIN 029
.53  1.50 0.63  70.0 .019  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      030 BASIN 030
.08  0.43 0.10  44.0 .018 25   0.35 0.1 4.50 .0018 .550
 71 1  5.0      031 BASIN 031
.11  0.43 0.09  62.5 .006 21   0.35 0.1 4.50 .0018 .550
 71 1  5.0      032 BASIN 032
.07  0.50 0.21  40.9 .022 24   0.35 0.1 4.50 .0018 .550
 71 1  5.0      033 BASIN 033
.11  0.45 0.18  10.0 .022 19   0.35 0.1 4.50 .0018 .550
 70 1  5.0      034 BASIN 034
.35  0.74 0.32  09.4 .024  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      035 BASIN 035
.14  0.64 0.28  62.5 .025 25   0.35 0.1 4.50 .0018 .550
 71 1  5.0      036 BASIN 036
.10  0.52 0.26  75.0 .018 13   0.35 0.1 4.50 .0018 .550
 70 1  5.0      037 BASIN 037
.16  0.49 0.19  39.0 .007  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      038 BASIN 038
.12  0.46 0.21  99.9 .010 26   0.35 0.1 4.50 .0018 .550
 71 1  5.0      039 BASIN 039
.05  0.41 0.20  99.9 .010 22   0.35 0.1 4.50 .0018 .550
 71 1  5.0      040 BASIN 040
.12  0.41 0.10  99.9 .010 12   0.35 0.1 4.50 .0018 .550
 71 1  5.0      041 BASIN 041
.06  0.41 0.10  99.9 .010 22   0.35 0.1 4.50 .0018 .550
 70 1  5.0      042 BASIN 042
.18  0.61 0.29  06.3 .029  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      043 BASIN 043
.03  0.68 0.31  45.8 .030 15   0.35 0.1 4.50 .0018 .550
 71 1  5.0      044 BASIN 044
.06  0.24 0.08  77.4 .020 17   0.35 0.1 4.50 .0018 .550
 71 1  5.0      045 BASIN 045
.08  0.41 0.10  99.9 .010 22   0.35 0.1 4.50 .0018 .550
 71 1  5.0      046 BASIN 046
.04  0.41 0.10  99.9 .010 22   0.35 0.1 4.50 .0018 .550
 70 1  5.0      047 BASIN 047
.16  1.24 0.49  35.3 .020  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      048 BASIN 048
.04  0.23 0.09  07.0 .020 17   0.35 0.1 4.50 .0018 .550
 71 1  5.0      049 BASIN 049
.11  0.90 0.32  70.0 .044 27   0.35 0.1 4.50 .0018 .550
 70 1  5.0      050 BASIN 050
.21  0.87 0.41  75.5 .012  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      051 BASIN 051
.10  0.58 0.09  13.1 .010 27   0.35 0.1 4.50 .0018 .550
 70 1  5.0      052 BASIN 052
.19  0.52 0.16  75.3 .020  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      053 BASIN 053
.05  0.37 0.20  81.6 .010 21   0.35 0.1 4.50 .0018 .550
 71 1  5.0      054 BASIN 054
.09  0.34 0.07  60.6 .010 20   0.35 0.1 4.50 .0018 .550
 70 1  5.0      055 BASIN 055
.23  1.19 0.42  35.0 .013  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      056 BASIN 056
.10  0.56 0.21  50.0 .030 26   0.35 0.1 4.50 .0018 .550
 71 1  5.0      057 BASIN 057
.12  0.65 0.24  61.6 .010 25   0.35 0.1 4.50 .0018 .550
 71 1  5.0      058 BASIN 058
.14  0.53 0.15  50.0 .023 26   0.35 0.1 4.50 .0018 .550
 71 1  5.0      059 BASIN 059
.08  0.68 0.23  60.0 .025 30   0.35 0.1 4.50 .0018 .550
 71 1  5.0      060 BASIN 060
.09  0.37 0.14  67.2 .010 21   0.35 0.1 4.50 .0018 .550
 70 1  5.0      061 BASIN 061
.16  0.48 0.17  46.9 .010  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      062 BASIN 062
.07  0.75 0.31  40.6 .010 32   0.35 0.1 4.50 .0018 .550
 70 1  5.0      063 BASIN 063
.22  0.38 0.12  35.2 .026  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      064 BASIN 064
.13  0.50 0.09  30.4 .020 25   0.35 0.1 4.50 .0018 .550
 70 1  5.0      065 BASIN 065
.15  0.86 0.39  13.8 .020  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      066 BASIN 066
.08  0.43 0.21  99.9 .010 24   0.35 0.1 4.50 .0018 .550
 71 1  5.0      067 BASIN 067
.06  0.47 0.23  51.6 .006 25   0.35 0.1 4.50 .0018 .550
 71 1  5.0      068 BASIN 068
.11  0.75 0.21  45.4 .023 32   0.35 0.1 4.50 .0018 .550
 71 1  5.0      069 BASIN 069
.06  0.54 0.21  31.8 .026 26   0.35 0.1 4.50 .0018 .550
 70 1  5.0      081 BASIN 081
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.08  0.44 0.12  45.8 .017 23   0.35 0.1 4.50 .0018 .550
 71 1  5.0      082 BASIN 082
.05  0.31 0.11  66.3 .014 21   0.35 0.1 4.50 .0018 .550
 71 1  5.0      083 BASIN 083
.03  0.26 0.10  34.2 .013 18   0.35 0.1 4.50 .0018 .550
 70 1  5.0      084 BASIN 084
.18  0.63 0.10  12.2 .017  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      085 BASIN 085
.13  0.40 0.17  04.5 .015 22   0.35 0.1 4.50 .0018 .550
 70 1  5.0      086 BASIN 086
.23  0.77 0.34  07.1 .024  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      087 BASIN 087
.13  0.36 0.09  09.8 .026 21   0.35 0.1 4.50 .0018 .550
 70 1  5.0      092 BASIN 92
.72  1.33 0.61  65.0 .012  0   0.35 0.1 4.50 .0018 .550
 70 1  5.0      093 BASIN 93
1.44 1.34 0.54  65.0 .020  0   0.35 0.1 4.50 .0018 .550
 71 1  5.0      095 BASIN 095
.03  0.28 0.05  60.0 .040 18   0.35 0.1 4.50 .0018 .550
 71 1  5.0      096 BASIN 096
.06  0.49 0.18  60.0 .045 25   0.35 0.1 4.50 .0018 .550
 71 1  5.0      097 BASIN 097
.02  0.29 0.11  45.0 .025 18   0.35 0.1 4.50 .0018 .550
 71 1  5.0      125 BASIN 125
.07  0.55 0.22  60.0 .020 26   0.35 0.1 4.50 .0018 .550
 71 1  5.0      126 BASIN 126
.05  0.59 0.22  60.0 .020 27   0.35 0.1 4.50 .0018 .550
 71 1  5.0      159 BASIN 159
.08  0.46 0.32  55.0 .022 24   0.35 0.1 4.50 .0018 .550
 71 1  5.0      160 BASIN 160
.04  0.29 0.13  66.0 .010 19   0.35 0.1 4.50 .0018 .550
E
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DIA SWMM FUTURE Model

```
  2  1  1  2
  3  4
WATERSHED  1
THIRD CREEK DRAINAGE 100-YR EVENT FULL BUILD-OUT, FULL DET.
OVERFLOW CHANNELS ADDED MARTIN/MARTIN 5/5/04 3C-100-BO.SIN/3C-100-bo.CHD
     760  0 0  5.0                                  1
     061  061
     064  064
     096  096
     095  095
     063  063
     062  062
     097  097
     060  060
     160  160
     159  159
     059  059
     058  058
     125  125
     126  126
     028  028
     029  028
     027  027
     026  026
     068  068
     025  025
     024  024
     057  057
     056  056
     055  055
     054  054
     053  053
     023  023
     049  049
     069  069
     052  052
     051  051
     050  050
     048  048
     065  048
     047  047
     022  022
     021  021
     083  083
     043  043
     020  020
     046  046
     045  045
     044  044
     017  017
     041  041
     040  040
     039  039
     066  066
     038  038
     037  037
     067  067
     036  036
     035  035
     082  082
     032  032
     033  033
     018  018
     085  085
     084  084
     034  034
     002  002
     015  015
     013  013
     014  014
     087  087
     086  086
     008  008
```

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 042  042
 016  016
 009  009
 031  031
 030  030
 081  081
 019  019
 012  012
 011  011
 010  010
 007  007
 006  006
 005  005
 003  003
 004  004
 093  093
 092  092
 001  001

0  028  828  0 3          1.
0  828 1028  5 2    0.1     1.   .001              0.015    0.1
   0       0     14.0     5.0     20.0     80.0     81.9    600.0
 85.0    700.0
0 1028  027  0 4   20.0  2300.   .005    2.0    2.0  0.032    2.0
             28.0  2300.   .005    2.0    2.0  0.032   20.0
0  027 1027  0 3          1.
0 1027 1127  0 2   13.5   150.   .005              0.013   13.5
0 1127  026  0 4   20.0   430.   .005    2.0    2.0  0.032    2.0
             28.0   430.   .005   50.0   50.0  0.032   20.0
0  026 1026  0 3          1.
0 1026  068  0 2   13.5   600.   .005              0.013   13.5
0  068 1068  0 3          1.
0 1068  070  0 2   13.5  2000.   .005              0.013   13.5
0  125  225  0 3          1.
0  225  126  0 2    5.5   460.   .005              0.013    5.5
0  126  936  0 3          1.
0  936  226 10 2    0.1     1.   .001              0.015    0.1
   0       0     0.51     0.50     1.16    15.65     2.05   102.96
 3.05   110.28     4.17   158.87     5.39   195.75     6.71   226.71
 8.14   253.92     8.50   300.00
0  226  070  0 2    5.5   230.   .005              0.013    5.5
0  025 1025  0 3          1.
0 1025  070  0 5    5.5   780.   .005              0.013    5.5
            100.0     1.   .005   80.0   80.0  0.032   20.0
0  070 1070  0 3          1.
0 1070 1170  0 2   13.5   200.   .009              0.013   13.5
0 1170 1270  0 4   40.0   110.   .009    2.0    2.0  0.032    2.0
             48.0   110.   .009   10.0   10.0  0.032   20.0
0 1270 1370  0 2   13.5   120.   .009              0.013   13.5
0 1370 1470  0 4   40.0  1300.   .009    2.0    2.0  0.032    2.0
             48.0  1300.   .009   50.0   50.0  0.032   20.0
0 1470 1570  0 2   13.5   170.   .009              0.013   13.5
0 1570  024  0 4   40.0   280.   .009    2.0    2.0  0.032   20.0
             48.0   280.   .009   50.0   50.0  0.032   20.0
0  024 1024  0 3          1.
0 1024 1124  0 2   13.5  1310.   .009              0.013   13.5
0 1124  023  0 4   40.0   560.   .009    2.0    2.0  0.032    2.0
             48.0   560.   .009   50.0   50.0  0.032   20.0
0  063 1063  0 3          1.
0 1063  062  0 5    5.0   670.   .005              0.013    5.0
            100.0     1.   .005   80.0   80.0  0.032   20.0
0  062 1062  0 3          1.
0 1062 1162  0 5    5.0  2100.   .002              0.013    5.0
            100.0     1.   .002   80.0   80.0  0.032   20.0
0 1162 1262  0 4   20.0   170.   .002    2.0    2.0  0.032    2.0
             28.0   170.   .002   50.0   50.0  0.032   20.0
0 1262  097  0 5    5.0   300.   .002              0.013    5.0
            100.0     1.   .002   80.0   80.0  0.032   20.0
0  097 1097  0 3          1.
0 1097  071  0 5    5.0   290.   .002              0.013    5.0
            100.0     1.   .002   80.0   80.0  0.032   20.0
0  064 1064  0 3          1.
0 1064 1164  0 5    5.0   300.   .002              0.013    5.0
            100.0     1.   .002   80.0   80.0  0.032   20.0
0 1164  096  0 1   10.0   760.   .009    3.0    3.0  0.032   20.0
0  096 1096  0 3          1.
0 1096  095  0 5    5.0   560.   .002              0.013    5.0
            100.0     1.   .002   80.0   80.0  0.032   20.0
0  061  927  0 3          1.
0  927 1061 12 2    0.1     1.   .001              0.015    0.1
   0       0     3.89     0.50     7.75    10.69    13.10    17.75
 19.79    32.35    27.53    35.94    35.84   189.00    44.45   306.23
 53.36   320.48    62.57   334.12    72.09   347.23    75.00   500.00
0 1061  095  0 2    6.0   400.   .005              0.013    5.0
0  095 1095  0 3          1.
0 1095  071  0 5    6.0   710.   .005              0.013    6.0
            100.0     1.   .005   80.0   80.0  0.032   20.0
0  071 1071  0 3          1.
0 1071  058  0 4   40.0  2000.   .009    2.0    2.0  0.032    2.0
             48.0  2000.   .009   50.0   50.0  0.032   20.0
0  060 1060  0 3          1.
0 1060 1160  0 5    6.0  1550.   .002              0.013    6.0
            100.0     1.   .002   80.0   80.0  0.032   20.0
0  160  260  0 3          1.
0  260 1160  0 2    6.0  1010.   .002              0.013    6.0
0 1160  159  0 5    6.0   530.   .002              0.013    6.0
            100.0     1.   .002   80.0   80.0  0.032   20.0
0  159  926  0 3          1.
0  926  259  7 2    0.1     1.   .001              0.015    0.1
   0       0     2.92     0.50     4.99    32.83     7.23   296.15
 9.61   399.37    12.11   440.23    12.50   500.00
0  259 1259  0 5    6.0   400.   .005              0.013    6.0
            100.0     1.   .005   80.0   80.0  0.032   20.0
0  059 1059  0 3          1.
0 1059 1159  0 2    6.0   300.   .005              0.013    6.0
0 1159 1259  0 5    6.0   610.   .002              0.013    6.0
            100.0     1.   .002   80.0   80.0  0.032   20.0
0 1259 1359  0 5    6.0   200.   .002              0.013    6.0
```

```
          100.0    1.  .002   80.0   80.0  0.032   20.0
0 1359 1459  0 5   7.0   200.  .005            0.013    7.0
          100.0    1.  .005   80.0   80.0  0.032   20.0
0 1459  058  0 4  40.0   800.  .003    2.0    2.0  0.032    2.0
          48.0   800.  .003   30.0   30.0  0.032   20.0
0  058 1058  0 3          1.
0 1058 1158  0 5   6.0   520.  .012            0.013    6.0
          100.0    1.  .012   80.0   80.0  0.032   20.0
0 1158 1258  0 4  40.0   390.  .006    2.0    2.0  0.032    2.0
          48.0   390.  .006   30.0   30.0  0.032   20.0
0 1258 1358  0 5   7.0   130.  .006            0.013    6.0
          100.0    1.  .006   80.0   80.0  0.032   20.0
0 1358  023  0 4  40.0  1150.  .006    2.0    2.0  0.032    2.0
          48.0  1150.  .006   30.0   30.0  0.032   20.0
0  057 1057  0 3          1.
0 1057 1157  0 5   5.0   500.  .002            0.013    5.0
          100.0    1.  .002   80.0   80.0  0.032   20.0
0 1157  923  0 4  20.0   500.  .010    2.0    2.0  0.032    2.0
          28.0   500.  .010   10.0   10.0  0.032   20.0
0  923  056  6 2   0.1     1.  .001            0.015    0.1
   0      0    2.85    0.50    4.04   99.90    5.36   282.56
 6.80   454.04   10.00   600.00
0  056 1056  0 3          1.
0 1056 1156  0 5   5.0   400.  .002            0.013    5.0
          100.0    1.  .002   80.0   80.0  0.032   20.0
0 1156  023  0 4  40.0  1000.  .003    2.0    2.0  0.032    2.0
          48.0  1000.  .003   30.0   30.0  0.032   20.0
0  055 1055  0 3          1.
0 1055  054  0 5   6.5  2000.  .005            0.013    6.5
          100.0    1.  .005   80.0   80.0  0.032   20.0
0  054 1054  0 3          1.
0 1054  053  0 5   7.0  1600.  .002            0.013    7.0
          100.0    1.  .002   80.0   80.0  0.032   20.0
0  053 1053  0 3          1.
0 1053 1153  0 5   7.5  1950.  .002            0.013    7.5
          100.0    1.  .002   80.0   80.0  0.032   20.0
0 1153  023  0 4  40.0   500.  .010    2.0    2.0  0.032    2.0
          48.0   500.  .010   30.0   30.0  0.032   20.0
0  023 1023  0 3          1.
0 1023 1123  0 2  17.5  1560.  .013            0.013   17.5
0 1123  022  0 4  40.0   640.  .003    2.0    2.0  0.032    2.0
          48.0   640.  .003   50.0   10.0  0.032   20.0
0  069 1069  0 3          1.
0 1069 1169  0 2   4.0    70.  .005            0.013    4.0
0 1169  052  0 4  20.0  1230.  .005    2.0    2.0  0.040    2.0
          28.0  1230.  .005   50.0   50.0  0.040   20.0
0  052 1052  0 3          1.
0 1052  051  0 5   5.0   600.  .014            0.013    5.0
          100.0    1.  .014   80.0   80.0  0.032   20.0
0  051 1051  0 3          1.
0 1051 1151  0 5   5.0   500.  .014            0.013    5.0
          100.0    1.  .014   80.0   80.0  0.032   20.0
0 1151  050  0 4  20.0  1500.  .011    2.0    2.0  0.032    2.0
          28.0  1500.  .011   10.0   50.0  0.032   20.0
0  050 1050  0 3          1.
0 1050 1150  0 5   6.0   500.  .013            0.013    5.0
          100.0    1.  .013   80.0   80.0  0.032   20.0
0 1150  048  0 4  20.0   300.  .013    2.0    2.0  0.032    2.0
          28.0   300.  .013   50.0    2.0  0.032   20.0
0  049 1049  0 3          1.
0 1049 1149  0 2   6.0   450.  .026            0.013    6.0
0 1149  048  0 4  20.0   200.  .026    2.0    2.0  0.032    2.0
          28.0   200.  .026    2.0   50.0  0.032   20.0
0  048  848  0 3          1.
0  848 1048 15 2   0.1     1.  .001            0.015    0.1
   0      0    0.53   42.43    2.28   59.64    5.50   72.90
 10.40   84.09   17.07   93.95   25.68  102.88   36.57  111.09
 50.18  118.73   66.70  125.91   86.56  132.70  110.45  462.20
138.93  481.14  173.01  499.35  175.00  600.00
0 1048  072  0 5   5.0  1620.  .002            0.013    5.0
          100.0    1.  .002   80.0   80.0  0.032   20.0
0  047 1047  0 3          1.
0 1047  072  0 5   5.0   900.  .002            0.013    5.0
          100.0    1.  .002   80.0   80.0  0.032   20.0
0  072 1072  0 3          1.
0 1072 1172  0 4  40.0   850.  .008    2.0    2.0  0.032    2.0
          48.0   850.  .008   50.0   50.0  0.032   20.0
0 1172 1272  0 5   5.0   180.  .008            0.013    5.0
          48.0     1.  .008   50.0   50.0  0.032   20.0
0 1272  022  0 4  40.0   550.  .008    2.0    2.0  0.032    2.0
          48.0   550.  .008   50.0   50.0  0.032   20.0
0  022 1022  0 3          1.
0 1022 1122  0 5  17.5   760.  .002            0.013   17.5
          100.0    1.  .002   80.0   80.0  0.032   20.0
0 1122  021  0 4  40.0  2150.  .005    2.0    2.0  0.032    2.0
          48.0  2150.  .005    6.0   50.0  0.032   20.0
0  021 1021  0 3          1.
0 1021 1121  0 5  17.5   900.  .002            0.013   17.5
          100.0    1.  .002   80.0   80.0  0.032   20.0
0 1121  020  0 4  40.0  2050.  .005    2.0    2.0  0.032    2.0
          48.0  2050.  .005    6.0   50.0  0.032   20.0
0  083 1083  0 3          1.
0 1083 1183  0 5   3.0   530.  .010            0.013    3.0
          100.0    1.  .010   80.0   80.0  0.032   20.0
 1183  043  0 1  20.0   430.  .020    6.0   20.0  0.032    8.0
0  043 1043  0 3          1.
0 1043 1143  0 5   3.0   560.  .010            0.013    3.0
          100.0    1.  .010   80.0   80.0  0.032   20.0
0 1143  020  0 4  40.0  1930.  .004    2.0    2.0  0.032    2.0
          48.0  1930.  .004    6.0   50.0  0.032   20.0
0  046 1046  0 3          1.
0 1046  045  0 5   3.0   750.  .002            0.013    3.0
          100.0    1.  .002   80.0   80.0  0.032   20.0
0  045 1045  0 3          1.
0 1045  044  0 5   5.5   800.  .002            0.013    5.5
          100.0    1.  .002   80.0   80.0  0.032   20.0
0  044 1044  0 3          1.
0 1044 1144  0 5   6.0  1750.  .002            0.013    6.0
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            100.0    1.   .002   80.0   80.0  0.032   20.0
0 1144  020  0 4   40.0  1900.   .004    2.0    2.0  0.032    2.0
            48.0  1900.   .004    6.0   50.0  0.032   20.0
0  020  820  0 3          1.
0  820 1020 14 2    0.1    1.   .001            0.015    0.1
   0       0     0.21     3.40     0.76    40.97     3.34    63.19
 10.07    79.42    23.05    92.86    42.23   104.58    68.22   115.12
101.80   124.77   143.46   133.73   191.83   142.12   245.98   298.52
306.63   313.75   713.41   380.87
0 1020  017  0 2   13.5  1150.   .019            0.013    6.0
0  041 1041  0 3          1.
0 1041  040  0 5    4.5  1680.   .002            0.013    4.5
            100.0    1.   .002   80.0   80.0  0.032   20.0
0  040 1040  0 3          1.
0 1040  039  0 5    7.0   800.   .002            0.013    7.0
            100.0    1.   .002   80.0   80.0  0.032   20.0
0  039 1039  0 3          1.
0 1039  066  0 5    9.0   520.   .002            0.013    9.0
            100.0    1.   .002   80.0   80.0  0.032   20.0
0  066 1066  0 3          1.
0 1066  038  0 5    8.0  1440.   .005            0.013    8.0
            100.0    1.   .005   80.0   80.0  0.032   20.0
0  038 1038  0 3          1.
0 1038  037  0 5    9.0  1430.   .002            0.013    9.0
            100.0    1.   .002   80.0   80.0  0.032   20.0
0  067 1067  0 3          1.
0 1067  037  0 5    4.0   850.   .005            0.013    4.0
            100.0    1.   .005   80.0   80.0  0.032   20.0
0  037 1037  0 3          1.
0 1037  073  0 2   13.6   350.   .002            0.013   13.6
0  036 1036  0 3          1.
0 1036  073  0 5    4.0  3500.   .002            0.013    4.0
            100.0    1.   .002   80.0   80.0  0.032   20.0
0  073 1073  0 3          1.
0 1073  035  0 2   13.6   400.   .005            0.013   13.6
0  035 1035  0 3          1.
0 1035 1135  0 2   13.6  2150.   .005            0.013   13.6
0 1135  018  0 4   40.0  1470.   .001    2.0    2.0  0.032    2.0
            48.0  1470.   .001   20.0   20.0  0.032   20.0
0  033 1033  0 3          1.
0 1033  018  0 1   10.0  1700.   .020    4.0    4.0  0.032   10.0
0  082 1082  0 3          1.
0 1082  032  0 5    3.0  1080.   .010            0.013    3.0
            100.0    1.   .010   80.0   80.0  0.032   20.0
0  032 1032  0 3          1.
0 1032 1132  0 2    4.5   410.   .030            0.013    4.5
0 1132  018  0 4   40.0   800.   .004    2.0    2.0  0.032    2.0
            48.0   800.   .004   20.0   20.0  0.032   20.0
0  018  818  0 3          1.
0  818 1018 11 2    0.1    1.   .001            0.015    0.1
   0       0     0.52     0.50     1.71    50.60    22.35   156.56
 39.35   178.40    60.40   197.84    84.80   215.54   113.44   231.89
146.52   487.31   184.84   505.31   185.00   600.00
0 1018  017  0 5    3.5  1350.   .022            0.013    3.5
            100.0    1.   .022   80.0   80.0  0.032   20.0
0  017 1017  0 3          1.
0 1017 1117  0 2   18.0  1610.   .005            0.013   18.0
0 1117  074  0 4   40.0   600.   .002    2.0    2.0  0.032    2.0
            48.0   600.   .002   20.0   20.0  0.032   20.0
0  085 1085  0 3          1.
0 1085 1185  0 5    4.0   250.   .005            0.013    4.0
            100.0    1.   .005   80.0   80.0  0.032   20.0
0 1185 1285  0 4   20.0   680.   .005    2.0    2.0  0.032    2.0
            60.0   680.   .005   20.0   20.0  0.040   10.0
0 1285 1385  0 5    4.0    60.   .005            0.013    4.0
            100.0    1.   .005   80.0   80.0  0.032   20.0
0 1385  084  0 4   20.0  2020.   .010    2.0    2.0  0.032    2.0
            60.0  2020.   .010   20.0   20.0  0.040   10.0
0  084 1084  0 3          1.
0 1084 1184  0 5    4.0   250.   .005            0.013    4.0
            100.0    1.   .005   80.0   80.0  0.032   20.0
0 1184  034  0 4   20.0  2730.   .010    2.0    2.0  0.032    2.0
            60.0  2730.   .010   20.0   20.0  0.040   10.0
0  002 1002  0 3          1.
0 1002 1102  0 2    5.0   700.   .005            0.013    5.0
0 1102  034  0 4   20.0  2250.   .016    2.0    2.0  0.032    2.0
            60.0  2250.   .016   20.0   20.0  0.040   10.0
0  034 1034  0 3          1.
0 1034 1134  0 2   10.0   300.   .005            0.013   10.0
0 1134  074  0 4   20.0  1300.   .005    2.0    2.0  0.032    2.0
            60.0  1300.   .005   20.0   20.0  0.040   10.0
0  074 1074  0 3          1.
0 1074  014  0 4   20.0  3200.   .005    2.0    2.0  0.032    2.0
            60.0  3200.   .005   20.0   20.0  0.040   10.0
0  015 1015  0 3          1.
0 1015 1115  0 5    4.0   300.   .005            0.013    4.0
            100.0    1.   .005   80.0   80.0  0.032   20.0
0 1115  014  0 4   20.0   130.   .005    2.0    2.0  0.032    2.0
            60.0   130.   .005   20.0   20.0  0.040   10.0
0  013 1013  0 3          1.
0 1013 1113  0 2    4.0   400.   .005            0.013    4.0
0 1113  014  0 4   20.0   840.   .005    2.0    2.0  0.032    2.0
            60.0   840.   .005   20.0   20.0  0.040   10.0
0  014  814  0 3          1.
0  814 1014  5 2    0.1    1.   .001            0.015    0.1
   0       0     24.1  1722.0    130.1  2435.0    335.7  2983.0
 673.0  3444.0
0 1014 1114  0 2   19.0  1760.   .005            0.013   19.0
0 1114  008  0 4   20.0   200.   .005    2.0    2.0  0.032    2.0
            60.0   200.   .005   20.0   20.0  0.040   10.0
0  087 1087  0 3          1.
0 1087 1187  0 5    4.0   250.   .005            0.013    4.0
            100.0    1.   .005   80.0   80.0  0.032   20.0
0 1187  086  0 4   20.0  2750.   .010    2.0    2.0  0.032    2.0
            60.0  2750.   .010   20.0   20.0  0.040   10.0
0  086 1086  0 3          1.
0 1086 1186  0 5    6.0   350.   .005            0.013    6.0
            100.0    1.   .005   80.0   80.0  0.032   20.0
```

```
0 1186 008 0 4   20.0  5080.  .017   2.0   2.0  0.032   2.0
            60.0  5080.  .017  20.0  20.0  0.040  10.0
0 042 1042 0 3          1.
0 1042 1142 0 5   4.0  400.  .005          0.013   4.0
           100.0   1.  .005  80.0  80.0  0.032  20.0
0 1142 077 0 4   20.0  900.  .020   2.0   2.0  0.032   2.0
            60.0  900.  .020  20.0  20.0  0.040  10.0
0 016 1016 0 3          1.
0 1016 1116 0 2   6.0  420.  .005          0.013   6.0
0 1116 077 0 4   20.0  560.  .005   2.0   2.0  0.032   2.0
            28.0  560.  .005  50.0  50.0  0.032  20.0
0 077 1077 0 3          1.
0 1077 008 0 4   20.0 5110.  .005   2.0   2.0  0.032   2.0
            28.0 5110.  .005  50.0  50.0  0.032  20.0
0 009 1009 0 3          1.
0 1009 1109 0 2   5.0  420.  .005          0.013   5.0
0 1109 008 0 4   20.0 3500.  .005   2.0   2.0  0.032   2.0
            28.0 3500.  .005  50.0  50.0  0.032  20.0
0 008 1008 0 3          1.
0 1008 1108 0 2  19.0  315.  .005          0.013  19.0
0 1108 075 0 4   20.0  500.  .005   2.0   2.0  0.032   2.0
            28.0  500.  .005  50.0  50.0  0.032  20.0
0 031 1031 0 3          1.
0 1031 030 0 2   9.0  350.  .005          0.013   9.0
0 030 1030 0 3          1.
0 1030 1130 0 2   9.0 1000.  .005          0.013   9.0
0 1130 019 0 4   20.0 1130.  .005   2.0   2.0  0.032   2.0
            28.0 1130.  .005  50.0  50.0  0.032  20.0
0 081 1081 0 3          1.
0 1081 1181 0 5   4.5  450.  .010          0.013   4.5
           100.0   1.  .010  80.0  80.0  0.032  20.0
0 1181 019 0 4   20.0  400.  .005   2.0   2.0  0.032   2.0
            28.0  400.  .005  50.0  50.0  0.032  20.0
0 019 819 0 3          1.
0 819 1019 11 2   0.1    1.  .001          0.015   0.1
   0     0   0.95   24.69   3.89  31.03   9.34  36.28
 18.24  40.86  31.46  44.97  48.51  48.74  69.48  248.42
 95.20  262.73  128.98  276.31  174.43  289.24
0 1019 1119 0 5   3.0 1650.  .017          0.013   3.0
           100.0   1.  .017  80.0  80.0  0.032  20.0
0 1119 012 0 4   20.0 2170.  .017   2.0   2.0  0.032   2.0
            28.0 2170.  .017  20.0  20.0  0.032  20.0
0 012 1012 0 3          1.
0 1012 1112 0 2  14.0 1155.  .005          0.013  14.0
0 1112 075 0 4   55.0  300.  .005   2.0   2.0  0.032   2.0
            63.0  300.  .005  50.0  50.0  0.032  20.0
0 075 1075 0 3          1.
0 1075 076 0 4   55.0 1680.  .005   2.0   2.0  0.032   2.0
            63.0 1680.  .005  50.0  50.0  0.032  20.0
0 011 1011 0 3          1.
0 1011 010 0 2   6.0  455.  .005          0.013   6.0
0 010 1010 0 3          1.
0 1010 1110 0 2   8.0  735.  .005          0.013   8.0
0 1110 076 0 4   20.0 2100.  .030   2.0   2.0  0.032   2.0
            28.0 2100.  .030  50.0  50.0  0.032  20.0
0 076 1076 0 3          1.
0 1076 006 0 4   55.0 3500.  .005   2.0   2.0  0.032   2.0
            63.0 3500.  .005  50.0  50.0  0.032  20.0
0 007 1007 0 3          1.
0 1007 1107 0 2   5.0  525.  .005          0.013   5.0
0 1107 006 0 4   20.0  175.  .005   2.0   2.0  0.032   2.0
            28.0  175.  .005  50.0  50.0  0.032  20.0
0 006 806 0 3          1.
0 806 1006 5 2   0.1    1.  .001          0.015   0.1
   0     0   2.8  1722.0  41.0  2435.0  155.3  2983.0
 387.6  3444.0
0 1006 1106 0 2  19.0 1190.  .005          0.013  19.0
0 1106 003 0 4   55.0  490.  .005   2.0   2.0  0.032   2.0
            63.0  490.  .005  50.0  50.0  0.032  20.0
0 005 1005 0 3          1.
0 1005 003 0 4   55.0 1070.  .005   2.0   2.0  0.040   2.0
            63.0 1070.  .005  20.0  20.0  0.040  10.0
0 003 1003 0 3          1.
0 1003 004 0 4   55.0  300.  .005   2.0   2.0  0.040   2.0
            63.0  300.  .005  20.0  20.0  0.040  10.0
0 004 1004 0 3          1.
0 1004 094 0 4   55.0  500.  .013   2.0   2.0  0.040   2.0
            63.0  500.  .013  20.0  20.0  0.040  10.0
0 093 1093 0 3          1.
0 1093 092 0 4   10.0 5109.  .008   4.0   4.0  0.040   1.0
            18.0 5109.  .008  50.0  50.0  0.040  10.0
0 092 892 0 3          1.
0 892 1092 5 2   0.1    1.  .001          0.015   0.1
   0     0   5.0   14.0  20.0  80.0  210.0  500.0
 220.0  1000.0
0 1092 1192 0 4   10.0 1663.  .018   4.0   4.0  0.040   1.0
            18.0 1663.  .018  50.0  50.0  0.040  10.0
0 1192 094 0 5   12.4   60.  .005          0.013  10.0
           400.0   60.  .005  50.0  50.0  0.015  14.0
0 094 1094 0 3          1.
0 1094 001 0 4   55.0 1700.  .013   2.0   2.0  0.040   2.0
            63.0 1700.  .013  50.0  50.0  0.040  10.0
0 001 801 0 3          1.
0 801 999 13 2   0.1    1.  .001          0.015   0.1
   0     0   1.17   39.00   4.07  52.00   9.52  62.00
 18.44  71.00  31.42  78.00  48.66  86.00  70.16  92.00
 95.53  336.00  124.20  834.00  155.25  2149.00  187.93  3688.00
 222.03  5954.00
 0 999   0 0 3          1.

 0
 1
999
ENDPROGRAM
```

DIA SWMM MASTER PLAN Model

```
 2  1  1  2
 3  4
WATERSHED   1
THIRD CREEK DRAINAGE FULL BUILD-OUT, FULL DET. bASIN 92&93 DELETED
Master Plan Model modified Kiowa Eng. 3/05
    760  0 0  5.0                                   1
    061  061
    064  064
    096  096
    095  095
    063  063
    062  062
    097  097
    060  060
    160  160
    159  159
    059  059
    058  058
    125  125
    126  126
    028  028
    029  028
    027  027
    026  026
    068  068
    025  025
    024  024
    057  057
    056  056
    055  055
    054  054
    053  053
    023  023
    049  049
    069  069
    052  052
    051  051
    050  050
    048  048
    065  048
    047  047
    022  022
    021  021
    083  083
    043  043
    020  020
    046  046
    045  045
    044  044
    017  017
    041  041
    040  040
    039  039
    066  066
    038  038
    037  037
    067  067
    036  036
    035  035
    082  082
    032  032
    033  033
    018  018
    085  085
    084  084
    034  034
    002  002
    015  015
    013  013
    014  014
    087  087
    086  086
    008  008
    042  042
    016  016
    009  009
    031  031
    030  030
    081  081
    019  019
    012  012
    011  011
    010  010
    007  007
    006  006
    005  005
    003  003
    004  004
    093
    092
    001  001

0  028  828  0 3          1.
0  828 1028  5 2    0.1     1.   .001            0.015    0.1
   0       0     14.0     5.0     20.0     80.0     81.9    600.0
 85.0    700.0
0 1028  027  0 4   20.0  2300.   .005    2.0    2.0  0.032    2.0
             28.0  2300.   .005    2.0    2.0  0.032   20.0
0  027 1027  0 3          1.
0 1027 1127  0 2   13.5   150.   .005            0.013   13.5
0 1127  026  0 4   20.0   430.   .005    2.0    2.0  0.032    2.0
             28.0   430.   .005   50.0   50.0  0.032   20.0
0  026 1026  0 3          1.
0 1026  068  0 2   13.5   600.   .005            0.013   13.5
0  068 1068  0 3          1.
0 1068  070  0 2   13.5  2000.   .005            0.013   13.5
```

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0  125  225  0 3          1.
0  225  126  0 2    5.5   460.   .005              0.013    5.5
0  126  936  0 3          1.
0  936  226 10 2    0.1     1.   .001              0.015    0.1
   0       0     0.51     0.50     1.16    15.65     2.05   102.96
 3.05   110.28     4.17   158.87     5.39   195.75     6.71   226.71
 8.14   253.92     8.50   300.00
0  226  070  0 2    5.5   230.   .005              0.013    5.5
0  025 1025  0 3          1.
0 1025  070  0 5    5.5   780.   .005              0.013    5.5
            100.0     1.   .005   80.0   80.0  0.032   20.0
0  070 1070  0 3          1.
0 1070 1170  0 2   13.5   200.   .009              0.013   13.5
0 1170 1270  0 4   40.0   110.   .009    2.0    2.0  0.032    2.0
            48.0   110.   .009   10.0   10.0  0.032   20.0
0 1270 1370  0 2   13.5   120.   .009              0.013   13.5
0 1370 1470  0 4   40.0  1300.   .009    2.0    2.0  0.032    2.0
            48.0  1300.   .009   50.0   50.0  0.032   20.0
0 1470 1570  0 2   13.5   170.   .009              0.013   13.5
0 1570  024  0 4   40.0   280.   .009    2.0    2.0  0.032   20.0
            48.0   280.   .009   50.0   50.0  0.032   20.0
0  024 1024  0 3          1.
0 1024 1124  0 2   13.5  1310.   .009              0.013   13.5
0 1124  023  0 4   40.0   560.   .009    2.0    2.0  0.032    2.0
            48.0   560.   .009   50.0   50.0  0.032   20.0
0  063 1063  0 3          1.
0 1063  062  0 5    5.0   670.   .005              0.013    5.0
            100.0     1.   .005   80.0   80.0  0.032   20.0
0  062 1062  0 3          1.
0 1062 1162  0 5    5.0  2100.   .002              0.013    5.0
            100.0     1.   .002   80.0   80.0  0.032   20.0
0 1162 1262  0 4   20.0   170.   .002    2.0    2.0  0.032    2.0
            28.0   170.   .002   50.0   50.0  0.032   20.0
0 1262  097  0 5    5.0   300.   .002              0.013    5.0
            100.0     1.   .002   80.0   80.0  0.032   20.0
0  097 1097  0 3          1.
0 1097  071  0 5    5.0   290.   .002              0.013    5.0
            100.0     1.   .002   80.0   80.0  0.032   20.0
0  064 1064  0 3          1.
0 1064 1164  0 5    5.0   300.   .002              0.013    5.0
            100.0     1.   .002   80.0   80.0  0.032   20.0
0 1164  096  0 1   10.0   760.   .009    3.0    3.0  0.032   20.0
0  096 1096  0 3          1.
0 1096  095  0 5    5.0   560.   .002              0.013    5.0
            100.0     1.   .002   80.0   80.0  0.032   20.0
0  061  927  0 3          1.
0  927 1061 12 2    0.1     1.   .001              0.015    0.1
   0       0     3.89     0.50     7.75    10.69    13.10    17.75
 19.79    32.35    27.53    35.94    35.84   189.00    44.45   306.23
 53.36   320.48    62.57   334.12    72.09   347.23    75.00   500.00
0 1061  095  0 2    6.0   400.   .005              0.013    5.0
0  095 1095  0 3          1.
0 1095  071  0 5    6.0   710.   .005              0.013    6.0
            100.0     1.   .005   80.0   80.0  0.032   20.0
0  071 1071  0 3          1.
0 1071  058  0 4   40.0  2000.   .009    2.0    2.0  0.032    2.0
            48.0  2000.   .009   50.0   50.0  0.032   20.0
0  060 1060  0 3          1.
0 1060 1160  0 5    6.0  1550.   .002              0.013    6.0
            100.0     1.   .002   80.0   80.0  0.032   20.0
0  160  260  0 3          1.
0  260 1160  0 2    6.0  1010.   .002              0.013    6.0
0 1160  159  0 5    6.0   530.   .002              0.013    6.0
            100.0     1.   .002   80.0   80.0  0.032   20.0
0  159  926  0 3          1.
0  926  259  7 2    0.1     1.   .001              0.015    0.1
   0       0     2.92     0.50     4.99    32.83     7.23   296.15
 9.61   399.37    12.11   440.23    12.50   500.00
0  259 1259  0 5    6.0   400.   .005              0.013    6.0
            100.0     1.   .005   80.0   80.0  0.032   20.0
0  059 1059  0 3          1.
0 1059 1159  0 2    6.0   300.   .005              0.013    6.0
0 1159 1259  0 5    6.0   610.   .002              0.013    6.0
            100.0     1.   .002   80.0   80.0  0.032   20.0
0 1259 1359  0 5    6.0   200.   .002              0.013    6.0
            100.0     1.   .002   80.0   80.0  0.032   20.0
0 1359 1459  0 5    7.0   200.   .005              0.013    7.0
            100.0     1.   .005   80.0   80.0  0.032   20.0
0 1459  058  0 4   40.0   800.   .003    2.0    2.0  0.032    2.0
            48.0   800.   .003   30.0   30.0  0.032   20.0
0  058 1058  0 3          1.
0 1058 1158  0 5    6.0   520.   .012              0.013    6.0
            100.0     1.   .012   80.0   80.0  0.032   20.0
0 1158 1258  0 4   40.0   390.   .006    2.0    2.0  0.032    2.0
            48.0   390.   .006   30.0   30.0  0.032   20.0
0 1258 1358  0 5    7.0   130.   .006              0.013    6.0
            100.0     1.   .006   80.0   80.0  0.032   20.0
0 1358  023  0 4   40.0  1150.   .006    2.0    2.0  0.032    2.0
            48.0  1150.   .006   30.0   30.0  0.032   20.0
0  057 1057  0 3          1.
0 1057 1157  0 5    5.0   500.   .002              0.013    5.0
            100.0     1.   .002   80.0   80.0  0.032   20.0
0 1157  923  0 4   20.0   500.   .010    2.0    2.0  0.032    2.0
            28.0   500.   .010   10.0   10.0  0.032   20.0
0  923  056  6 2    0.1     1.   .001              0.015    0.1
   0       0     2.85     0.50     4.04    99.90     5.36   282.56
 6.80   454.04    10.00   600.00
0  056 1056  0 3          1.
0 1056 1156  0 5    5.0   400.   .002              0.013    5.0
            100.0     1.   .002   80.0   80.0  0.032   20.0
0 1156  023  0 4   40.0  1000.   .003    2.0    2.0  0.032    2.0
            48.0  1000.   .003   30.0   30.0  0.032   20.0
0  055 1055  0 3          1.
0 1055  054  0 5    6.5  2000.   .005              0.013    6.5
            100.0     1.   .005   80.0   80.0  0.032   20.0
0  054 1054  0 3          1.
0 1054  053  0 5    7.0  1600.   .002              0.013    7.0
            100.0     1.   .002   80.0   80.0  0.032   20.0
```

```
0 053 1053  0 3          1.
0 1053 1153  0 5    7.5  1950.   .002            0.013    7.5
          100.0    1.   .002   80.0   80.0  0.032   20.0
0 1153  023  0 4   40.0   500.   .010    2.0    2.0  0.032    2.0
          48.0   500.   .010   30.0   30.0  0.032   20.0
0  023 1023  0 3          1.
0 1023 1123  0 2   17.5  1560.   .013            0.013   17.5
0 1123  022  0 4   40.0   640.   .003    2.0    2.0  0.032    2.0
          48.0   640.   .003   50.0   10.0  0.032   20.0
0  069 1069  0 3          1.
0 1069 1169  0 2    4.0    70.   .005            0.013    4.0
0 1169  052  0 4   20.0  1230.   .005    2.0    2.0  0.040    2.0
          28.0  1230.   .005   50.0   50.0  0.040   20.0
0  052 1052  0 3          1.
0 1052  051  0 5    5.0   600.   .014            0.013    5.0
          100.0    1.   .014   80.0   80.0  0.032   20.0
0  051 1051  0 3          1.
0 1051 1151  0 5    5.0   500.   .014            0.013    5.0
          100.0    1.   .014   80.0   80.0  0.032   20.0
0 1151  050  0 4   20.0  1500.   .011    2.0    2.0  0.032    2.0
          28.0  1500.   .011   10.0   50.0  0.032   20.0
0  050 1050  0 3          1.
0 1050 1150  0 5    6.0   500.   .013            0.013    5.0
          100.0    1.   .013   80.0   80.0  0.032   20.0
0 1150  048  0 4   20.0   300.   .013    2.0    2.0  0.032    2.0
          28.0   300.   .013   50.0    2.0  0.032   20.0
0  049 1049  0 3          1.
0 1049 1149  0 2    6.0   450.   .026            0.013    6.0
0 1149  048  0 4   20.0   200.   .026    2.0    2.0  0.032    2.0
          28.0   200.   .026    2.0   50.0  0.032   20.0
0  048  848  0 3          1.
0  848 1048 15 2    0.1     1.   .001            0.015    0.1
    0       0     0.53    42.43     2.28    59.64     5.50    72.90
 10.40    84.09    17.07    93.95    25.68   102.88    36.57   111.09
 50.18   118.73    66.70   125.91    86.56   132.70   110.45   462.20
138.93   481.14   173.01   499.35   175.00   600.00
0 1048  072  0 5    5.0  1620.   .002            0.013    5.0
          100.0    1.   .002   80.0   80.0  0.032   20.0
0  047 1047  0 3          1.
0 1047  072  0 5    5.0   900.   .002            0.013    5.0
          100.0    1.   .002   80.0   80.0  0.032   20.0
0  072 1072  0 3          1.
0 1072 1172  0 4   40.0   850.   .008    2.0    2.0  0.032    2.0
          48.0   850.   .008   50.0   50.0  0.032   20.0
0 1172 1272  0 5    5.0   180.   .008            0.013    5.0
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0 1272  022  0 4   40.0   550.   .008    2.0    2.0  0.032    2.0
          48.0   550.   .008   50.0   50.0  0.032   20.0
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0 1022 1122  0 5   17.5   760.   .002            0.013   17.5
          100.0    1.   .002   80.0   80.0  0.032   20.0
0 1122  021  0 4   40.0  2150.   .005    2.0    2.0  0.032    2.0
          48.0  2150.   .005    6.0   50.0  0.032   20.0
0  021 1021  0 3          1.
0 1021 1121  0 5   17.5   900.   .002            0.013   17.5
          100.0    1.   .002   80.0   80.0  0.032   20.0
0 1121  020  0 4   40.0  2050.   .005    2.0    2.0  0.032    2.0
          48.0  2050.   .005    6.0   50.0  0.032   20.0
0  083 1083  0 3          1.
0 1083 1183  0 5    3.0   530.   .010            0.013    3.0
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0 1143  020  0 4   40.0  1930.   .004    2.0    2.0  0.032    2.0
          48.0  1930.   .004    6.0   50.0  0.032   20.0
0  046 1046  0 3          1.
0 1046  045  0 5    3.0   750.   .002            0.013    3.0
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0  045 1045  0 3          1.
0 1045  044  0 5    5.5   800.   .002            0.013    5.5
          100.0    1.   .002   80.0   80.0  0.032   20.0
0  044 1044  0 3          1.
0 1044 1144  0 5    6.0  1750.   .002            0.013    6.0
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0 1144  020  0 4   40.0  1900.   .004    2.0    2.0  0.032    2.0
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0  820 1020 14 2    0.1     1.   .001            0.015    0.1
    0       0     0.21     3.40     0.76    40.97     3.34    63.19
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101.80   124.77   143.46   133.73   191.83   142.12   245.98   298.52
306.63   313.75   713.41   380.87
0 1020  017  0 2   13.5  1150.   .019            0.013    6.0
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0 1041  040  0 5    4.5  1680.   .002            0.013    4.5
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0 1040  039  0 5    7.0   800.   .002            0.013    7.0
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0 1039  066  0 5    9.0   520.   .002            0.013    9.0
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0 1066  038  0 5    8.0  1440.   .005            0.013    8.0
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0 1082  032  0 5    3.0  1080.   .010            0.013    3.0
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    0       0     0.52     0.50     1.71    50.60    22.35   156.56
 39.35   178.40    60.40   197.84    84.80   215.54   113.44   231.89
146.52   487.31   184.84   505.31   185.00   600.00
0 1018  017  0 5    3.5  1350.   .022            0.013    3.5
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0 1085 1185  0 5    4.0   250.   .005            0.013    4.0
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0 1185 1285  0 4   20.0   680.   .005    2.0    2.0  0.032    2.0
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0 1385  084  0 4   20.0  2020.   .010    2.0    2.0  0.032    2.0
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0 1074  014  0 4   20.0  3200.   .005    2.0    2.0  0.032    2.0
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             63.0   1700.   .013    50.0    50.0   0.040   10.0
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 222.03  5954.00
0 999   0 0 3          1.

0
1
999
ENDPROGRAM
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BASE MAPPING AND HORIZONTAL & VERTICAL CONTROL PREPARED BY: LANDMARK MAPPING, LTD. BASEMAP 1995, REVISED 1998, 2001	Kiowa Engineering Corporation 7175 W. Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303) 692-0369 KIOWA PROJECT NO. 03059	DESIGNED SAB DATE 01/05 DRAWN SAB DATE 01/05 CHECKED SAB DATE 01/05	ADAMS COUNTY, CITY OF BRIGHTON, CITY OF COMMERCE AND URBAN DRAINAGE AND FLOOD CONTROL DISTRICT	OUTFALL SYSTEMS PLANNING STUDY UPDATE THIRD CREEK d/s of DIA	DIA HYDROLOGY SHEET A

DIA Hydrology.dwg/Sep 11, 2005

BASE MAPPING AND HORIZONTAL & VERTICAL CONTROL PREPARED BY: LANDMARK MAPPING, LTD. BASEMAP 1995, REVISED 1998, 2001	Kiowa Engineering Corporation 7175 W. Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303) 692-0369 KIOWA PROJECT NO. 03059	DESIGNED SAB DATE 01/05 DRAWN SAB DATE 01/05 CHECKED SAB DATE 01/05	ADAMS COUNTY, CITY OF BRIGHTON, CITY OF COMMERCE AND URBAN DRAINAGE AND FLOOD CONTROL DISTRICT	OUTFALL SYSTEMS PLANNING STUDY UPDATE THIRD CREEK d/s of DIA	DIA HYDROLOGY SHEET B

DIA Hydrology.dwg/Sep 11, 2005

THIRD CREEK ROUTING SCHEMATIC

1 2/23/00 REV. - ADDED POND 848
- ADDED OVERFLOW ELEMENTS TO REMOVE INCIDENTAL DETENTION

MAY 19, 2003

MARTIN / MARTIN
CONSULTING ENGINEERS
12499 WEST COLFAX AVE.
P.O. BOX 131500
LAKEWOOD, CO 80215
303.431.6100
FAX 303.431.4036

CITY & COUNTY of DENVER

DENVER INTERNATIONAL AIRPORT

DENVER INTERNATIONAL AIRPORT
FULL BUILD-OUT DRAINAGE MASTER PLAN
THIRD CREEK ROUTING SCHEMATIC

ISSUE RECORD

NO.	BY	PURPOSE	DATE	CKD
1	MJM	UPDTD REV.	2/23/00	
	MJM	SUB. DRFT	5/19/03	

DATE 11/19/99
DRAWN BY: MRW
CHECKED BY: PFH
FAA AIP NO:
DESIGN CONTRACT NO.
CONST. CONTRACT NO.
PROJECT NO.
VOLUME NO.
SHEET TITLE THIRD CREEK ROUTING SCHEMATIC
SHEET NO. SHEET C
CADD FILE NO.

C:/THOMAS/DIA-DRNG/BUILD-OUT/3RD-CRK/DWG/REV-SCHM.DWG

DIA NOW-SCHM.dwg/Sep 11, 2005

Appendix B: Selected Plan, Correspondance and Legal Opinion

Selected Plan for
Third Creek (Downstream of DIA)
Outfall Systems Planning Study Update

November 19, 2004

The plan selected by Adams County, the City of Commerce City, the City of Brighton and the Urban Drainage and Flood Control District to be shown in the Preliminary Design Report is described in two parts. The first part discusses the selected plan and the general direction for the remainder of this project. The second part provides additional issues and topics that need to be addressed in the final report. Kiowa Engineering is requested to complete the final report containing a preliminary design for the following selected plan.

GENERAL

1. The Selected Plan is the *Recommended Plan* as described in the *Third Creek (Downstream of DIA) Outfall Systems Planning Study Alternatives Development and Evaluation* report dated August 2004 with modifications as described herein. The master plan for Third Creek is based on regional detention basins located on Tributaries G and L. The channel downstream from the O'Brian Canal is designed for the 5-year discharge. Separation structures are included on Third Creek to pass the 5-year discharge at the O'Brian Canal, Burlington Ditch, and Fulton Ditch. No channel improvements are required upstream of the O'Brian Canal on Third Creek. Channel improvements are included for Tributaries D, G, and L. Culvert crossings at major arterial streets are designed for the 100-year discharge. Grade-control structures and floodplain preservation are also included in the master plan.

Executive Summary

2. Include an Executive Summary in the Preliminary Design Report. This summary should be directed to the general public and, at a minimum, contain:

   a. A brief summary of the planning process including the purpose of the study, number of progress and public meetings, alternatives analysis, and preliminary design.
   b. A vicinity map showing watershed location and brief description of the study area.
   c. A brief summary of hydrology that compares existing flows to future and master plan flows, and to previous studies of the watershed, if any.
   d. A map showing the area, drainageways, and all major improvements.
   e. A brief description of the major drainageway improvements and decisions made by project sponsors during the development of this plan.
   f. A brief summary of specific design criteria and implementation aspects of the plan.
   g. A tabular and narrative summary showing costs for capital improvements, engineering/administrative/contingencies, land values, all sorted by drainageway reach, tributary, or outfall system. The reach length (miles), tributary catchment area (square miles), and their totals should also be included in the table.

Plan and Profile Drawings

3. Incorporate the following note on each drawing:
   "This drawing is for master planning purposes and represents preliminary and conceptual engineering. Alternatives to this outfall system will be considered by local reviewing agencies and the Urban Drainage and Flood Control District provided the alternative offers equal hydraulic capacity and stream stability. The alternative must comply with all requirements of the local jurisdiction and the Urban Drainage and Flood Control District. This drawing shall not be used for construction purposes."

4. Incorporate the following note on each drawing:
   "Adams County, City of Commerce City, and City of Brighton manage and regulate all land development and redevelopment within the 100-year floodplains of these watersheds so as to prevent future flood damages by following the recommendations of this plan."

ADDITIONAL DIRECTION

5. Existing utilities, platted subdivisions, and road Right-of-Way information in the vicinity of drainage infrastructure should be gathered as part of preliminary design. To the extent feasible, parcel boundary information available from Adams County should be shown on drawings. The areal extent of parcel boundary lines should correspond approximately to the extent of floodplain boundary lines. Regulatory floodplain boundaries should also be shown on plan sheets.

6. The crossings of the Fulton Ditch and 136th Avenue are within 100 feet. A 5-year culvert is designated under the Fulton Ditch, whereas a 100-year culvert is designated for 136th Avenue. Determine if all overtopping flows on the Fulton Ditch will enter the 136th Avenue culvert, or if these may spill to other areas and not reach the 136th Avenue culvert. If all overtopping flows up to the 100-year event will not enter the downstream culvert, recommend an hydraulic design that will collect and direct these flows to the 136th Avenue crossing structure.

7. The route and design discharge for the channel in Reach 1 may need to be reconsidered in light of comments received from the City of Brighton. Prior to proceeding with design, additional discussion should take place as an early action item during preliminary design.

8. Define rationale for locating water-quality detention basins within subwatersheds in a section on design criteria in the preliminary design report.

9. Refer to Third Creek and its tributaries on map labels and tables in the preliminary design report according to the UDFCD identification numbering system described in "Drainage Basin Description Maps," Urban Drainage and Flood Control District, December, 1990.

10. Suggest the phasing of improvements that minimize the potential for flooding damages when the recommended improvements are implemented in phases.

11. Costs for annual maintenance of channels, storm sewers, flood-detention basins, and water-quality facilities should be reported in the preliminary design.

Memorandum

To: Files

From: Brian Wozniak

Date: October 7, 2003

Project: *Third Creek downstream of DIA*

Subject: Progress Meeting #1

The initial progress meeting for Third Creek Downstream of DIA was held on October 7, 2003 at 1:00 p.m. at the offices of the Urban Drainage Flood Control District.

Attendees:	Chris Sveum	City of Commerce City
	Louis DeGrave, Melissa van der Poel	Adams County
	John Doerfer	Urban Drainage
	Tom Fairley, Brian Wozniak, Steve Brown	Kiowa Engineering

This meeting was held to review the 1990 master plan, learn sponsor goals for the study, identify other interested agencies, gather information, discuss land use projections and initial hydrologic modeling, and determine the level of public participation for the project.

Two new studies in the watershed were brought to the meeting for review and consideration. An October 2000 report by HDR studied the watershed in the interim condition. A July 2003 report by Boyle redefined the hydrology for the watershed. Kiowa will review both reports for pertinent information. Kiowa will also compare the hydrology modeling between the Boyle report and the original master plan report to best describe the upstream hydrology.

A detention pond has been built near the upstream study limit. Construction drawings for Pond T-239 will be provided to Kiowa for modeling. Project mapping is a composite of 2003 mapping from DIA to I-76, and 1995 mapping from I-76 to the South Platte River. The E-470 alignment and embankment data is also included in the mapping. The mapping is current NAVD '88. Kiowa will provide a study schedule and have the alternatives phase complete in 90 days.

The watershed has a low flow channel upstream of the O'Brian Canal. There is no channel downstream of the irrigation crossing. A wide, shallow uncontrolled floodplain does exist in the lower reach.

Buffalo Run, Shea Homes, E-470, DIA, and other upcoming developments warrant the need for this study update. The Buffalo Run drainage report identifies a system of storm sewers and open swales through the golf course. Commerce City will provide local drainage reports and the current jurisdictional boundary in electronic format. They will also provide plans for O'Brian Canal crossings and any trail systems in the study area. Shea Homes is a large landholder and will be invited to future meetings. Kiowa will contact Brighton for development information.

A question was raised as to the study boundary at DIA. Janet will be contacted at DIA to ensure that we have the correct boundary definition. Kiowa will reach an agreement with Urban Drainage to perform a field inventory of all road crossings.

Kiowa has redefined the subbasins and updated the hydrology modeling. Kiowa is currently working on the SWMM model connections. Comparisons will be made to the previous 1990 study and 1976 FHAD. Preliminary hydrology information should be available at the next progress meeting.

Kiowa has also compared the current creek alignment to the 1970 alignment based on soils mapping. This comparison found that the channel has changed very little in the past 30 years. With upcoming development it is expected that more dramatic changes will occur in the next 30 years. A "meander zone" should be considered for inclusion to the floodplain limits. From DIA to the O'Brian Canal the sinuosity of the channel was found to be 1.5, and the bed slope was 0.3%. The channel downstream is straight as it has historically been an irrigation return.

The anticipated flooding problems in the area are expected to be found in the more frequent events. This will likely produce erosion and channel incision. Erosion control will be a significant part of the planning. Development is occurring in the upstream and not the downstream. A channel from US-85 to the river will be important to the final plan as the existing downstream drainage will not be able to control the increased upstream flows.

The plan should focus on implementation. Determining what flows can leave Commerce City and what can be controlled in a downstream system. Controlling the 100-year event will not be difficult. The more frequent events will be the most problematic. The master plan should be developed on a jurisdictional as well as a watershed basis.

Kiowa will review the comprehensive plans to determine street classifications. All mile roads will be treated as arterials. Kiowa will send Commerce City the watershed boundary in ACAD format.

The next meeting will bring all the needed information to the table. Parcel information will be included as a layer for progress meeting discussions, but not shown in the report.

The next meeting is scheduled for Wednesday October 22, 2003 at 1:30 p.m. at the offices of Urban Drainage. Other interested agencies will be invited to this meeting.

Memorandum

To: Files

From: Brian Wozniak

Date: October 22, 2003

Project: *Third Creek downstream of DIA*

Subject: Progress Meeting #2

The second progress meeting for Third Creek Downstream of DIA was held on October 22, 2003 at 1:30 p.m. at the offices of the Urban Drainage Flood Control District.

Attendees:	Chris Sveum, Tom Acre	City of Commerce City
	Louis DeGrave, Mark Omoto, Melissa van der Poel	Adams County
	John Doerfer	Urban Drainage
	Ryan McDermed	Reunion Metro District
	David Kosmiski	CDOT Region 6
	Brice Steele	Fulton Ditch
	Tom Fairley, Brian Wozniak, Steve Brown	Kiowa Engineering

This meeting was held to welcome interested agencies, review previous studies, sponsor goals for the study, gather additional information, and discuss initial hydrologic modeling and public participation for the project.

Kiowa presented a series of photos of the channel from DIA to the South Platte River. This provided an overview of the existing conditions of the watershed, showed the existing drainage facilities, and several of the problematic road crossings.

A discussion of the project schedule identified the Hydrology Report to be presented at the next meeting and the draft Alternatives Report to be completed by the end of the year.

Goals and objectives for the study were summarized as: utilize updated mapping, utilize updated hydrologic methods, incorporate recent study information, include recently constructed improvements, update the 1990 master plan, and examine less expensive options.

Hydrology parameters were reviewed with maps showing soils, subbasin delineation, existing impervious, future impervious. Preliminary results compared the outfall hydrographs from the 2003 Boyle study to the current preliminary models and found the two to be very close. Comparisons were also made between the 1976 FHAD, 1990 Kiowa Master Plan, 2003 Boyle study, and current models at key points along the drainageway. These results also favorable comparisons. The upstream future model from DIA does not show a significant increase in peak from existing levels. Further discussion may be warranted to what hydrograph is used to represent upstream future flows.

A discussion of the public meeting was also held. The meeting should take place in November during the alternatives analysis. Possibly two meetings may be necessary, one directed to Brighton concentrating on the floodplain and one to Commerce City concentrating on future development. Kiowa will draft a brochure to mail out describing the study effort and inviting local residents.

Shea Homes has a large parcel of the watershed. The 1990 master plan shows a large channel at 104th going north to E-470. They would prefer this channel run east along 104th to E-470. There is no drainage crossing under E-470 at the 1990 master plan location. We need to determine where and what size crossings E-470 has constructed. Dave Mallory has reviewed the E-470 drainage and may be able to provide this information.

Fulton Ditch is not part of FRICO. Fulton Ditch receives all the water it needs at this point and does not want to accept any storm runoff. They have no water rights on Third Creek. The 1990 plan shows a full conveyance separation structure. We may look at 2+/- year crossing with a controlled spillover.

The main conveyance problem in the watershed is that there is no sizable downstream channel. We cannot open conveyance at crossing structures if we cannot release the flows downstream. The new plan should start at the South Platte and move upstream. Old Brighton Road is an existing flooding problem today. Kiowa needs to get input from Brighton and the gravel company to develop alternatives at the outfall.

Commerce City would like to preserve open space and existing bald eagle habitat. No large parks are planned but there is trail planned for Third Creek. Commerce City will provide trail plans and Kiowa will include the alignment in the report. Commerce City has recently purchased property at 120th from E-470.

Alternatives in the channel should consider a natural control allowing lateral movement. The cost of full channelization is too expensive. Look at checks to preserve longitudinal slope yet allow lateral meandering.

The next meeting is scheduled for Wednesday November 5, 2003 at 1:30 p.m. at the offices of Urban Drainage. This meeting will discuss hydrology results, alternatives concepts reach-by-reach, and draft hydrology report.

Memorandum

To: Files

From: Brian Wozniak

Date: November 5, 2003

Project: *Third Creek downstream of DIA*

Subject: Progress Meeting #3

The third progress meeting for Third Creek Downstream of DIA was held on November 5, 2003 at 1:30 p.m. at the offices of the Urban Drainage Flood Control District.

Attendees:	Chris Sveum, Tom Acre	City of Commerce City
	Mark Omoto, Melissa van der Poel	Adams County
	John Doerfer	Urban Drainage
	Ryan McDermed	Reunion Metro District
	Aaron Clutter, Matt Culpo	JR Engineering
	Janet Kieler, Pat Horn	DIA
	Tom Fairley, Brian Wozniak, Steve Brown	Kiowa Engineering

The meeting began with a quick overview of hydrology results and comparisons to previous studies. Generally, the new hydrology compares closely with the 2003 Boyle study with the exception of peaks near Tower Road. Here, the Boyle peaks are much higher than the new hydrology.

Kiowa presented a reach-by-reach discussion of potential alternatives, anticipated problems, road crossing identification, and a photo inventory. Based on the hydrology results, much of the alternatives will be geared toward providing increased conveyance capacities and the most appropriate methods to accomplish this. Problems will arise if we are required to excavate several feet below grade to increase capacity as there is little available slope downstream to "catch grade".

DIA detention has been geared toward the 10-year and 100-year frequency events. This creates a problem downstream for the 2-year peaks which are significantly higher than historic. To mitigate this problem DIA constructed Pond T-239. This pond has been effective at reducing 2-year storms. As downstream conveyance capacity is increased (namely, the O'Brian Canal opened) the need for this facility will decrease. DIA is open for any needed modifications to the T-239 facility. Kiowa will contact Pat Horn of Martin / Martin to acquire the latest future impervious definitions and proposed future detention facilities. DIA anticipates that ultimate build out will incorporate the 1990 master plan detention. If the new master plan requires 2-year detention, DIA would prefer it not be located adjacent to runways. The existing location works well as it is far from the runways.

The public meeting is tentatively scheduled for early December to avoid the holidays. John will contact Brighton to get their thoughts on when and where. Tom Acre will talk with the HOA's to determine a good time and place. Kiowa will provide a draft "newsletter" to be distributed to residents in the watershed. Sponsors will provide comments to finalize the newsletter.

The next meeting is scheduled for November 19, 2003 at 1:30 p.m. at the offices of Urban Drainage. This meeting will discuss final hydrology results, outfall to the South Platte, ditch crossings, and E-470 drainage. Kiowa will contact ditch and gravel companies for the meeting.

Memorandum

To: Files

From: Brian Wozniak

Date: November 19, 2003

Project: *Third Creek downstream of DIA*

Subject: Progress Meeting #4

The fourth progress meeting for Third Creek Downstream of DIA was held on November 19, 2003 at 1:30 p.m. at the offices of the Urban Drainage Flood Control District.

Attendees:	Chris Sveum	City of Commerce City
	Andy Walsh	City of Brighton
	Louis DeGrave	Adams County
	John Doerfer	Urban Drainage
	Greg Murphy	Calibre Engineering
	Tom Fairley, Brian Wozniak, Steve Brown	Kiowa Engineering

Earlier in the day Kiowa received the future conditions DIA modeling from Martin and Martin. This will be used to finalize the hydrology effort. The models do not include future development in Commerce City on the tributary that first drains to DIA and then back to Commerce City. Kiowa will update the modeling in this area and utilize the DIA modeling. Kiowa will finalize the Hydrology Report by the end of next week and provide copies to Urban Drainage.

Kiowa determined three options for the proposed ditch crossings: (1) do nothing and regulate as is, (2) provide 2-year crossings with protected overflows, (3) provide full 100-year crossings. The O'Brian Canal has water rights to 200 cfs from Third Creek. This is currently in place via a side channel along E-470 and a single box culvert into the O'Brian. There is no existing gated structure. Flows to the O'Brian are controlled at 120th Avenue. A single 8'x8' culvert directs flows to the side channel and seven 7'x10' culverts release the main Third Creek flows downstream.

Kiowa presented plan and profiles of the ditch crossings and required grades. A maximum culvert height of 4 feet was used to pass low flows under the irrigation ditches. A proposed minimum channel slope of 0.3% was used to tie back to existing grade. This requires approximately 1 mile of downstream channel to catch grade.

Kiowa also looked at providing detention at the O'Brian Canal to detain 5-year flows to a 2-year release rate. This will require excavation. This allows all downstream improvements to be sized for the 2-year flows but effectively pass the 5-year storm. The ditch crossings were sized as twin 4'x9' boxes. Full 100-year capacity requires ten 4'x9' boxes.

Calibre Engineering is working on developing the parcel between the O'Brian and 120th. They will provide Kiowa with 1' contour mapping to assist in more detailed analysis in this area. Another option for the ditch crossings is to add a siphon in addition to the low flow crossing. The siphon could be placed such that it does not function until a 5-year+ event occurs to reduce siltation problems. This may provide an option to eliminate or further reduce overtopping. It was noted that the cost of channel excavation may be insignificant compared to improved land values.

Kiowa presented alternatives for an outfall to the South Platte River. In reviewing the South Platte Major Drainage Study from 2002, it was found that no outfall path was provided for Third Creek. The first option would be to do nothing and allow flows to reach the South Platte naturally. The second option is to add a crossing structure to the McCann Ditch and outfall into Bromley Lakes Cell "C". However, the City of Brighton plans to utilize this pit for augmentation. The third option is to divert flows south of the proposed gravel pit to the South Platte. This option may also provide an opportunity to combine the outfall with Second Creek into one channel. John will invite Brian (UDFCD) to discuss outfall options at the next meeting.

The public meeting was postponed until after the holidays. The sponsors were asked to develop mailing lists for invitations. The targeted audience will be developers and current residents within 100' of the floodplain.

The next meeting is scheduled for December 10, 2003 at 1:30 p.m. at the offices of Urban Drainage. Items for discussion will include an outfall to the South Platte, public participation, final hydrology, and a screening of potential alternatives.

Memorandum

To: Files

From: Brian Wozniak

Date: December 10, 2003

Project: *Third Creek d/s of DIA*

Subject: Progress Meeting #5

This meeting was held to discuss the final hydrology and draft alternatives.

Attendance:	Chris Sveum, Tom Acre	City of Commerce City
	Andy Walsh	City of Brighton
	Melissa van der Poel	Adams County
	Janet Kieler	DIA
	John Doerfer, Ben Urbonas	Urban Drainage
	Tom Fairley, Brian Wozniak, Steve Brown	Kiowa Engineering

The meeting began with a presentation of final hydrology results. Comparisons were made between existing conditions and the 2003 Boyles study, as well as future conditions and the 1976 FHAD study. Discharge-profile curves were presented that showed the watershed peak flows occur at I-76 and remain steady to the South Platte. Hydrology comparisons between existing and future conditions show an increase of approximately 500 ac-ft in runoff volume.

The public meeting will be held prior to the draft alternatives report near the third week of January. A postcard may be used to notify residents and the newsletter used as a meeting hand out. The meeting will be held at the Adams County Fairgrounds between 7 p.m. and 9 p.m., and 50-100 attendees are expected.

Alternatives were discussed along Third Creek. Alternative outfalls to the South Platte considered providing a new low flow channel to bypass the future water storage reservoirs. Various sizes will be analyzed, but a 1-year or 2-year channel capacity may be best. These channels would pass 80% to 95% of all storm events. With a 2-year maximum velocity of 3.5-4.0 fps, this channel could require 200' of r.o.w. Buying the floodplain downstream of US-85 may also be a good option when compared to the costs of implementing a plan. Major flood events should be allowed to spill into the water reservoirs as no accommodations were made to pass Third Creek to the South Platte.

Detention at the O'Brian Canal will be analyzed to reduce 5-year peaks to 2-year magnitudes. Developed flows west of DIA will be analyzed to determine hydrology characteristics of the watershed and help guide possible detention alternatives.

Detention on the tributary to DIA will also be analyzed with diversions around Pond T-239 considered.

Cost sharing will be clearly identified in the report. Reservoir storage along the South Platte causes increased costs to divert channels around them. Upstream development causes increased costs from higher peak rates and more frequent runoff.

In the next meet Kiowa will present an alternatives matrix with rough construction costs and r.o.w. costs. The next meeting is scheduled for January 7, 2004 at 1:30 p.m.

Memorandum

To: Files

From: Steve Brown

Date: January 7, 2004

Project: *Third Creek d/s of DIA*

Subject: Progress Meeting #6

This meeting was held to discuss the draft alternatives and the upcoming public meeting.

Attendance:	Chris Sveum	City of Commerce City
	Brice Steele	Fulton Ditch Company
	Melissa van der Poel, Mark Omoto	Adams County
	Janet Kieler	DIA
	John Doerfer	Urban Drainage
	Tom Fairley, Brian Wozniak, Steve Brown	Kiowa Engineering

Kiowa Engineering reviewed the results of ongoing improvement alternative analysis. An alternative matrix was presented for all types of drainage improvements for all five reaches delineated in the watershed. The results indicated that a combination of channelization, detention, and floodplain management are the most viable alternatives. A preliminary cost estimate was presented to further distinguish the remaining alternatives. Likely locations for detention were identified through sensitivity analysis of the UDSWMM hydrology model. The analysis indicated that detention locations on select tributaries were most effective for the reduction of peak flows along the main stem of Third Creek. The final analysis presentation entailed a comparison of crossing capacities along E-470 and the corresponding hydrology flows; several locations were undersized for major storm events (i.e. 100-year) and would justify improvement alternatives. Alternatives will be evaluated comparing upstream detention that releases to current culvert capacity versus adding conveyance capacity to meet hydrologic rates.

Further discussion focused on detention alternatives for the purpose of peak flow reduction and water quality enhancement. The sponsors suggested a goal of reducing peak flows from future to existing (historic) levels either through on-site detention, regional detention or combinations. As suggested by the sensitivity analysis, detention on Tributaries D and G are likely locations for regional detention facilities. On-site detention for future developers should also be recommended. It was also agreed that water quality enhancement should be considered for areas draining 1 square mile or less. Discussion with Janet Kieler of DIA concerned detention of sub basins 92 and 93 from the DIA hydrology model. Although sensitivity analysis indicated little peak flow reduction for detention at this location relative to outfall flow reduction, a reduction of flows to historic levels was suggested because the existing facilities were designed for existing (historic) conditions. In addition, this is the only tributary that crosses a jurisdictional boundary in the ultimate build-out conditions. The existing detention facility on DIA was designed for about a 5-year level. Undetained flows could lessen the effectiveness of the pond. Detention or channel diversion alternatives for these sub watersheds will be included in the study.

Detention along the main stem of Third Creek was considered at the O'Brian Canal. It was agreed that the study should investigate a facility aimed at reducing 5-year flows to 2-year flows and improving the crossing structure for the canal. Although a demand for fill material exists from developers, the presence of shallow groundwater may limit excavation of an adequate detention facility. Groundwater investigations are being performed by the developer and information will be made available for review. It was also recommended that the effects of drainage structures on local wells are to be investigated. Kiowa will contact the State Engineer's Office for well information.

In conclusion, a range of alternative improvements is to be included in the study. Alternatives for the main stem of Third Creek should be focused at reducing and containing flood events with detention and channelization while preserving and managing the 100-year floodplain. The major tributaries (draining at least 130 acres) are to include 10-year and 100-year channel improvements.

Preparations for the Public Meeting scheduled for 7 pm January 21 at the Adams County fairgrounds. Adams County is to provide details about the meeting location. The three project sponsors will provide mailing lists to UDFCD who will prepare the notice and mail the invitations. Kiowa and UDFCD are to coordinate the announcement mailing card, handouts, and presentation content. It was agreed to produce a questionnaire for meeting attendees to collect their opinions and concerns in the watershed.

At the next meeting on January 28, 2004 at 1:30 p.m. Kiowa will present final alternatives and discuss the results of the public meeting subsequent to the draft report preparation.

Memorandum

To: Files

From: Steve Brown

Date: January 28, 2004

Project: *Third Creek d/s of DIA*

Subject: Progress Meeting #7

This meeting was held to discuss the draft alternatives and the upcoming public meeting.

Attendance:	Chris Sveum	City of Commerce City
	Brice Steele	Fulton Ditch Company
	Melissa van der Poel	Adams County
	Janet Kieler	DIA
	John Doerfer	Urban Drainage
	Tom Fairley, Steve Brown	Kiowa Engineering

John relayed a message from Andy Walsh (City if Brighton) regarding the proposed channel alignment alternatives in the vicinity of the South Platte. His discussion with owners of the Bromley gravel pits are that they prefer a pipe outfall for frequent flows placed in a berm between future pits/water storage facilities. However, participants in the meeting pointed out that a pipe would probably not have adequate capacity considering the lack of slope in the lower Third Creek watershed. An open channel is probably the only practical alternative.

Kiowa reviewed a revision of the future conditions hydrology that modeled full build-out and detention on DIA (Martin/Martin model) with fully developed impervious values for Tributary L (on DIA boundary). The fully developed conditions for Trib L added approximately 2000 cfs to the peak flows throughout lower Third Creek.

Kiowa Engineering also reviewed results of detention analysis on the future conditions SWMM hydrology. Previous analysis suggested several key locations on the main stem and tributaries of Third Creek for reduction of future conditions flows. Hydrologic modeling of detention on Trib L, located near the boundary of DIA, indicated that an ideal facility would be at the SW corner of 104th Avenue and Picadilly Road and have a volume of approximately 200 acre-ft to reduce future flows to historic (existing). An alternate with two detention facilities in a series was also suggested to reduce the requirements on a single land owner/developer. Janet Kieler requested a summary of the effects of the proposed detention on the 2-year and 5-year DIA hydrology, particularly pond T-239 located on Third Creek at DIA outfall.

A formalization of 227-acre-ft of inadvertent detention on Trib D was also reviewed. Options for isolating the facility to one side of 104th Avenue were suggested. Previous suggestion by local development (JR engineering) included a diversion of Trib D from 104th Av to an alignment parallel to E-470 in order facilitate development and direct flows to an existing E-470 crossing. Kiowa agreed to get updated plans from JR Engineering to consider for alternatives.

Kiowa reviewed a proposed detention facility along the main stem of Third Creek at the O'Brian Canal. Analysis indicated that a 450 acre-ft facility would be required to reduce future flows from a 5yr to 2yr frequency. However the topography, shallow groundwater, and discharge from a detention facility immediately upstream at 120th Avenue limit the practicality of the proposed detention. A large (1.5 million CY) excavation would be required on the east side of the basin. Although the 1990 master plan suggested such a facility, these limitations make detention at the O'Brian canal less attractive.

The final detention facility discussed was located on Trib G at 112th Avenue and Himalaya Road. Similar to the proposed facility on Trib L, it was suggested that the single 175 acre-ft basin be split into two smaller basins in series to potentially simplify implementation. Both detention options will be included in the alternatives report.

Preparations were made for the Public Meeting scheduled for 7 pm January 28 at the Adams County fairgrounds. Adams County is to provide details about the meeting location. Kiowa and UDFCD coordinated presentation content and displays. Representatives from DIA and project sponsors are to be involved with answering questions from the public. A handout with a project summary and question/comments section are to be produced for the meeting.

The progress meeting will be held February 10, 2004 at 2:00PM p.m. after which a draft of the alternatives report will be produced.

Memorandum

To: Files
From: Steve Brown
Date: January 29, 2004
Project: *Third Creek d/s of DIA*
Subject: Public Meeting

This meeting was held to present project objectives to the public and collect input.
Approximately 25 people attended, in addition to the following project sponsors and representatives:

Melissa van der Poel	Adams County
Janet Kieler	DIA
John Doerfer	Urban Drainage
Tom Fairley, Steve Brown	Kiowa Engineering
Chris Sveum	City of Commerce City
Andy Walsh	City of Brighton

John Doerfer introduced project participants and presented a history and overview of the UDFCD. He then reviewed the master plan process and the progress of the current study of Third Creek.

Tom Fairley described the history of Third Creek including previous studies and planning. The key point was that the projected future condition development would produce runoff flows that are much higher than current hydrology. It is crucial to size and plan improvements now for future development to follow.

The meeting was then opened to question and answer format and including the following dialog with John Doerfer (JD) and Tom Fairley (TF):

Q: What triggered the master plan?
JD: Local municipalities including Commerce City, Brighton, and Adams County identified the need to UDFCD.

Q: Why not include Second Creek?
JD: Second Creek is the subject of a separate study; a public meeting will be publicized and held in March.

Q: Where does lower Third Creek start?
TF: Immediately downstream of DIA and it extends through I-76 and US 85 to the South Platte. The floodplain widens in the lower region past I-76 and the channel is not well defined.

Q: Will the floodplain change?
TF: We do not want to change the floodplain, more likely we plan to manage and maintain the existing floodplain. The floodplain may get smaller depending on the selected plan.

Q: Is this a detailed study? How does it compare to the 1990 study?
TF: It is more detailed due to a better understanding of development plans, and DIA and E-470 are built. However it focuses on the big picture drainage issues of the watershed.

Q: Is there better mapping (than the previous study)?
TF: This study used 2-foot contour mapping whereas the 1990 study used 10-foot contours.
JD: As with the previous study, this is not a major drainageway study, so there is not a focus on re-analyzing the floodplain.

Q: What is the size of the Highway 85 crossing (of Third Creek)?
TF: The existing crossing is approximately 1/3 capacity for the 100-year flood event. A bridge to handle frequent flows (i.e. 2-year event) would be about 50 feet in length, while a 100-year flood would require a length in excess of 100 feet. The study will analyze improvement structures for frequent flows in the lower part of the watershed and management of the 100-year floodplain as well as other options.
JD: The study will examine land use and compare managing the floodplain to reducing the floodplain width and improvement costs.

Q: If a large enough channel were built, would it contain the floodplain? How about at the Railroad Bridge?
TF: It is possible, but it would be very expensive. The channel would have to be as much as 200 feet in width.

Q: Could you combine Second and Third Creeks?
TF: The problem with that is from a legal perspective; it is difficult to move/divert a flow from its historic flow-path. Combining and detouring flows into one would assume liability for any increased damages.

Q: If the Railroad caused a blockage, why are they not liable or responsible (for damages)?
TF: Basically the Railroad (Union Pacific) was there first and they are not generally liable. The railroads are generally not very responsive to these issues.

Q: The future flows seem very large; I am concerned about flows in the lower watershed.
TF: We will look at all options and likely propose a channel to contain frequent flows. You may need to purchase flood insurance if you are located in the 100-year floodplain.

Q: Ballast from the railroad embankment has caused blockage (on Third Creek).
What is the timeline for the study?
TF: This is a long-term, overall plan for the watershed, to be implemented as development occurs. Local governments will also target problem areas.
JD: We will investigate the railroad blockage of Third Creek with UDFCD maintenance department. Also, it should be clear that this is not a construction plan, but a planning process.

Q: Considering detention with development improvements and DIA, did you consider the loss to the aquifer due to reduced infiltration.
TF: The relationship is not always clear, however from a legal standpoint you are allowed to detain flows for a maximum of 48 hours. You should also consider that the canals have a large impact on the aquifer (and they will not change). Local detention does promote infiltration to the aquifer, however that diminishes over time and must be maintained.
JD: I agree that this is a problem. Along with detention, the study will examine the use of (BMPs) roadside swales to reduce runoff volume and improve water quality.
TF: The UDFCD criteria manual considers runoff a "misplaced" resource, rather than a nuisance. We try to avoid the old notion of conveying runoff down the watershed as fast as possible.

Concluding the meeting, the audience was encourage to either turn in or mail comment cards passed out at the beginning of the meeting.

After meeting notes:

Mr. Murata (303-659-0333) expressed concerned about his property and the blockage at the Union Pacific Railroad. He was given a Union Pacific contact (Greg Larsen, 402-997-3552, John Guiterrez – maintenance).

Mrs. Wagner expressed concern about location and potential changes to the floodplain for her property at 136th Avenue and Old Brighton Road. She is also curious if the study will propose any improvements (i.e. detention facility) on the property.

Include the following to Second Creek mailing:

Jim Wattenberg
12230 Levi Circle
Henderson CO 80640

Pam Wagner
8808 Behrens Mile Road
Byers, Co 80103

David Petrocco
14110 Brighton Rd.
Brighton, Co 80601

Memorandum

To: Files

From: Steve Brown

Date: December 13, 2004

Project: *Third Creek d/s of DIA*

Subject: Progress Meeting #8

This meeting was held to discuss issues regarding the Preliminary Design OSP

Attendance:	Tiffany Ewing	City of Commerce City
	Andy Walsh	City of Brighton
	Melissa van der Poel	Adams County
	Alan J. Leak	WRC Eng.(for Brighton)
	John Doerfer	Urban Drainage
	Tom Fairley, Steve Brown	Kiowa Engineering

Meeting discussion focused on the proposed channel alignment from Old Brighton Road to the South Platte River (Reach 1 of Third Creek). The Phase A OSP (Alternatives Development) report published in August 2004 suggested two alignments for a channel with a 5-year storm capacity or less. One alignment discharged into a future water storage facility currently in use by Ready-Mixed Concrete Company for gravel excavation. The second alignment extended between two of the future water storage facilities.

Alan Leak discussed issues with both alignments. WRC is currently studying the design for future water storage facilities including water rights implications. During a 100-year event the South Platte River would overflow a significant portion of the proposed facility. However, it would be preferable to treat the storage facilities as a closed system for frequent storm events; therefore discharge into the facility would not be desirable. Water quality and water rights are also an issue with any frequent storm discharge into the storage facility.

Channel diversion around the future water storage facility would also be problematic. The alignment suggested in the 2004 OSP entail relocation of existing radio towers because of the extent of underground electrical cables surrounding the towers. In addition, the channel would likely receive backwater from the South Platte during storm events and not remain practical for the discharge of Third Creek flows to the South Platte.

The question of responsibility for channel maintenance was posed. John Doerfer stated that improvements described in the master plan are usually maintained by Urban Drainage if requested by the local government.

Andy Walsh inquired about the water quality improvements suggested in the 2004 OSP. Kiowa and John Doerfer clarified that water quality would likely consist of the two regional detention facilities located on major tributaries and on-site or subwatershed scale EDBs (extended detention basins).

The conclusion reached for the meeting indicated the need for an outfall channel less than the 5-year capacity in Reach 1 of Third Creek. Further design of the water storage facility by WRC is needed before a practical outfall channel to the South Platte can be developed in the master plan design. Ongoing co-ordination between WRC, the City of Brighton, and Ready-Mixed Concrete Company should result in some resolution by mid to late January. Kiowa agreed to work on preliminary design for Reaches 2-5 until the next meeting.

The next progress meeting will be held January 25 at 1:30 p.m. All parties from the project mailing list will be invited.

Memorandum

To: Files

From: Steve Brown

Date: January 25,2005

Project: *Third Creek d/s of DIA*

Subject: Progress Meeting #9

This meeting was held to discuss the progress on the preliminary design report.
Attendance:

Chris Sveum	City of Commerce City
Andy Walsh	City of Brighton
Alan Leak	WRC Engineering Inc. for City of Brighton
Jeff Schwarz	CKSMB for Ready-Mixed Concrete
John Doerfer	Urban Drainage
Tom Fairley, Steve Brown	Kiowa Engineering

Alan Leak reviewed recent progress on the design of the water storage facility adjacent to the South Platte River. Development of the facility has been conducted in consultation with Ready-Mixed Concrete and the City of Brighton. An analysis considering cost and water quality improvement indicated that a 2-yr capacity channel offered the best option for the Third Creek outfall channel though the facility. The channel will be located in a berm between storage facilities. A wetland channel with a 90-foot top width was considered as an alternative under a worst-case scenario. A smaller trapezoidal channel may also be possible depending on the elevation drop available by the final design. Since the overall channel design considers the 100-year peak flow, a 100-year overflow structure would also be included in the channel design. A more advanced design for the water storage facility will be available in approximately 2 weeks. It was agreed that a plan view figure of the facility should be included in the Third Creek report. UDFCD will provide mapping of the area that is available from an earlier South Platte River study.

Discussion also focused on the design of improvements on Tributary D. Comments from JR Engineering on the Alternatives Report suggested that three improvement channels should be implemented. These include the channel and detention facility upstream of 112th Ave. and two channels originally designated as T-60 and T-88 in the 1990 OSP. Kiowa agreed to contact JR Engineering to clarify their issues. Commerce City agreed to send Kiowa updated development plans for Reunion and Buckley Square developments including channel improvements. The recent design of drainage channels should be reflected in the Third Creek report.

Improvement design on Tributary L was also discussed. The Alternatives Report showed two alternative locations for a 200 acre-ft detention facility. One key issue regards the size of the facility and associated cost of implementation to a landowner. Commerce City agreed to research the landowner and land use plans to determine if there is a preferred location. A third alternative location may include buffer zone around DIA. Commerce City agreed to contact Janet Kieler with DIA regarding this option.

Preliminary Design plan and profile sheets for improvements were reviewed for format and presentation. Kiowa was able to incorporate parcel lines, however the utility information was not readily available from South Adams County Water and Sanitation District. It was suggested that Kiowa contact Dave Videkan with Black and Veach to obtain the utility master plan covering Third Creek.

The final topic of discussion involved presentation of the draft report at a public meeting. It was agreed that the meeting should be held in late February or early March at the Adams County fairgrounds.

The next progress meeting will be held February 15, 2005 at 1:30 p.m. after which a draft of the preliminary design report will be produced.

Memorandum

To: Files

From: Steve Brown

Date: February 10,2005

Project: *Third Creek d/s of DIA*

Subject: Progress Meeting #10

This meeting was held to discuss the progress on the preliminary design report.
Attendance:

Chris Sveum	City of Commerce City
Andy Walsh	City of Brighton
Ryan Littleton	Calibre Engineering
Jeff Schwarz	CKSMB for Ready-Mixed Concrete
John Doerfer	Urban Drainage
Tom Fairley, Steve Brown	Kiowa Engineering

The following revision of the minutes from Progress Meeting #9 on January 25, 2005 was offered by Jeff Schwarz on behalf of Ready-Mixed Concrete:

"The second sentence in the first paragraph of the minutes states: "Development of the facility has been conducted in consultation with Ready Mixed Concrete Company and the City of Brighton." That statement is in fact not the case. The City has not consulted RMCC on the development of the water storage facility. At the January 25 meeting, I indicated on RMCC's behalf that the company was willing to discuss with the City on matters related to the integration of various flood control structures required as a condition of the company's State mined land reclamation plan, which, as we understand it, are not necessarily the structures the City will ultimately require for its water storage facility. In addition, you indicated that the 2-year channel on the berm between Cell # 2 and Cell # 3 of the Bromley Lakes Property (aka Ken Mitchell Lakes) would likely be acceptable from UDFCD's perspective, but that you would need to know, in two week's time, more definitively that is where the City and RMCC would be heading. While Alan Leak, the City's consulting engineer, did not see a problem with reporting back to UDFCD in that time frame, and in consulting with RMCC on the matter, we have not heard anything from Alan or the City as it specifically relates to the issue."

Jeff Schwarz gave an update on the status of the Ready Mixed Concrete plans for reclamation. Ready Mixed Concrete has reached an agreement for the reclamation plan that may include a channel and side spillway for Third Creek runoff. John Doerfer emphasized that the master plan will offer a conceptual level of design and is subject to change. Jeff Schwarz mentioned that the design should reflect a practical design that is acceptable to all parties and cautioned that changing a master plan design may not be easy in the future.

Discussion then turned to the design of the O'Brian Canal crossing of Third Creek. Ryan Littleton of Calibre Engineering reviewed the status of the design that is being performed in association with Cutler Property development. The crossing consists of (7) 5x12 CBCs designed to convey 100-year future unimproved flows of 4038 cfs. It was agreed that the updated design would be reflected in the Preliminary Design report.

Steve Brown then reviewed recent development plans for the Reunion and Buckley Square developments in the vicinity of Tributary D. Current plans cover nearly the entire drainageway and include conveyance of runoff to existing or planned detention facilities via storm sewer and street overflow. Kiowa agreed to alter the master plan SWMM model to reflect the development. This includes routing a portion Tributary D to a detention facility that outfalls to Buffalo Run. The remaining tributary model will be revised to reflect the development.

Andy Walsh expressed concern that upstream development may increase runoff flows well before the master plan improvements can be implemented. Chris Sveum noted that Commerce City would collect a drainage improvement fee for new development to cover future improvements.

Steve Brown reviewed revision of the master plan SWMM model. The revision of the upstream DIA model by Martin and Martin Engineering in June 2004 included a 220 acre-ft detention facility on Tributary L. The master plan model published in the Alternatives Report included and additional 200 acre-ft detention facility. The model was corrected to include only one facility and to show subwatersheds 92 and 93 (previously draining to DIA) draining to the downstream model for Third Creek due to the proposed detention and channel alignment. The subwatersheds were then removed from the upstream model and the inflow hydrograph for the downstream model was corrected. The revision caused an increase in the 100-year flows from 2383 cfs to 3476 cfs at the South Platte outfall. The revised flow is now similar to the existing conditions flow of 3558cfs.

The final discussion topic concerned the public meeting originally planned for early March. It was agreed that it would be best to have more definitive plans for the water storage facility design in Reach 1 of Third Creek. Therefore the public meeting was postponed until 7pm March 15 at the Adams County Fairgrounds. Andy Walsh and Chris Sveum agreed to arrange public announcement in the newspaper and mailing of effected residents. An additional progress meeting was scheduled for 1:30PM on March 8 at UDFCD to review the presentation for the public meeting.

Memorandum

To: Files
From: Steve Brown
Date: March 8, 2005
Project: *Third Creek d/s of DIA*
Subject: Progress Meeting #11

This meeting was held to discuss the progress on the preliminary design report.
Attendance:

Chris Sveum	City of Commerce City
Andy Walsh	City of Brighton
Shonnie Cline	City of Brighton
John Doerfer	Urban Drainage
Tom Fairley, Steve Brown	Kiowa Engineering

The initial topic for the meeting focused on the channel improvement design for Reach 1 and the outfall to the South Platte River. The ongoing design for future City of Brighton water storage facilities in the Ready Mixed mine site by WRC Engineering was reviewed. For the preliminary design, the alignment will generally follow the straight path as previously shown in Alignment A, however an "S" shaped channel will be shown in the report. Key elevations and dimensions for a wetland channel with a 2-year capacity were obtained from WRC and will be shown in the report. John Doerfer agreed to provide additional mapping to show the entire water storage facility in the report. It was agreed that the cost estimate for the improvements within the facility should be separated from the upstream reaches of Third Creek. An existing pipeline and ROW through the area need to be identified for the report.

Discussion then turned to implementation and prioritization of improvements. While the ideal sequence would be to implement from downstream to upstream, development is occurring upstream first. It was suggested that the report should emphasize channel improvements in Reach 1, which may not see a significant increase in flows but in frequency. Upgrade of road crossings should also be a priority. A short-term improvement to crossings would be to clean out and repair the US85 and Union Pacific Railroad crossings. Channel improvements in Reach 2-5 should then be implemented along with development.

Report presentation was also discussed. An overall summary of hydrology similar what is shown in the Boyle presentation was suggested. In addition, the SWMM model, connectivity diagram and subbasin figure for DIA should also be presented in the appendices.

The final topic of the meeting was the public meeting and presentation. John Doerfer was working with City of Brighton and Adams County to generate a mailing list for the meeting. The meeting should be scheduled for a minimum of 2 weeks after the mailing. The date of March 31st at 6 pm was determined for the public meeting, to be held at Adams County Parks Administration Building. The next progress meeting was scheduled for 1:30 pm March 29th at UDFCD and will concern preparation for the public meeting.

Memorandum

To: Files
From: Steve Brown
Date: March 29, 2005
Project: *Third Creek d/s of DIA*
Subject: Progress Meeting #12

This meeting was held to discuss the progress on the preliminary design report.
Attendance:

Chris Sveum	City of Commerce City
Andy Walsh	City of Brighton
Shonnie Cline	City of Brighton
John Doerfer	Urban Drainage
Tom Fairley, Steve Brown	Kiowa Engineering

Kiowa reviewed plan and profile sheets for improvements in the Preliminary Design Report. Project sponsors made suggestions and edits. Revisions included minor realignment of the channel in Reach 1 of Third Creek in order to avoid impact to small structures shown on the mapping. In addition, plan and profile sheets for the entire length of Third Creek including unimproved areas are to be shown. Discussion also focused on clarification of the wetland channel design near the outfall to the South Platte.

The final topic of the meeting was the public meeting and presentation. Chris Sveum agreed to present an overview of the project in the event that John Doerfer was unable to attend. Steve Brown is to review the proposed improvements and field questions from the public. The date of March 31st at 6 pm was determined for the public meeting, to be held at Adams County Parks Administration Building.

Memorandum

To: Files
From: Steve Brown
Date: March 31, 2005 6pm
Project: *Third Creek d/s of DIA*
Subject: Public Meeting #2

This meeting was held at the Adams County Fairgrounds to present preliminary design improvements and collect input from residents and interested parties in the Third Creek Watershed. Approximately 18 people attended, in addition to the following project sponsors and representatives:

Attendance:

Chris Sveum	City of Commerce City
Andy Walsh	City of Brighton
Shonnie Cline	City of Brighton
Tom Fairley, Steve Brown	Kiowa Engineering

Chris Sveum introduced project representatives. Kiowa then presented a brief overview of hydrology methods, flow results for existing and future conditions, and rational for the recommended improvements. The main point expressed was to reduce increases in future conditions flows to existing levels with the placement of regional detention facilities and 5-year capacity channelization in the lower reaches of Third Creek.

The meeting was then opened to a question and answer format and including the following dialog with Tom Fairley (TF) and Steve Brown (SB):

Q: What improvements are planned for the Fulton Ditch?
SB: A 100-year overflow and separation structure is planned. Due to grade limitation downstream and a high water table, conveyance structures such as box culverts under the ditch are impractical.

Q: We experience flood problems between Old Brighton road and US85. What improvements are planned in this area?
SB/TF: It should be emphasized that this is not a plan for immediate construction; improvements will be implemented with development and therefore may take place in several years. The report will recommend selected maintenance and/or replacement of culvert crossings at problem areas such as Old Brighton Road and 144th Avenue. A 100-year capacity crossing is recommended as the eventual solution. This would consist of triple 10x18 box culverts.

Q: What is the time frame for improvements?
TF: The implementation of improvements, particularly in the lower reaches of Third Creek, depends on the priority and budget of local governments. In areas of new development, developers will be required to build the improvements. The downstream improvements such as the 5-year capacity channelization of Third Creek should be among the first priorities for implementation.

Q: How were you able to predict rainfall?
TF: The National Weather Service has collected data for rainfall taken from gauging stations over the past 100-years or more. This enables them to predict the probability of a given storm frequency i.e. 2-, 10- or 100-year. The frequency actually refers to the probability that a certain intensity of storm will occur. If a storm deposits rainfall equivalent to the 2-year depth, this does not mean that the storm will occur again two years later. A storm is like rolling a pair of dice, it is equally probable that a given intensity will occur each time there is a storm.

Q: How did you arrive at the future flows?
SB/TF: The imperviousness values in the existing conditions hydrology model were increased to reflect the change from open space and rural surfaces to that of developed areas. Developed areas will increase runoff due to the change from a surface that will absorb a significant amount of rainfall (i.e. grasslands) to one that has virtually no ability for absorption (i.e. pavement). We determined the future imperviousness values for a given area in the Third Creek Watershed from future land use projections published by Brighton, Commerce City and Adams County.

Q: I have lived (in the lower Third Creek) for years had recently noticed an increase in the flows and frequency of flows by my property. Is this due to upstream development?
TF: Ideally, development of a watershed would proceed downstream to upstream. However the opposite is true for Third Creek. The increase in flows you are seeing may be due to recent development; this is what the master plan improvements are designed to address. Other potential causes of flow increases are irrigation return flows.
Andy Walsh: The City of Brighton requires that new developments implement retention facilities until downstream improvements are implemented.

Q: What is the purpose of lowering the channel and crossings (in the lower reaches of Third Creek)?
SB: Since the grade of the ditches and canals cannot be altered, we are forced to either design overflow structures or box culverts underneath. When a portion of the upstream channel is lowered to accommodate a crossing, the entire downstream channel must be lowered to continue a downhill grade to the South Platte outfall.

Q: Is this a construction plan?
TF: This is not a plan for immediate construction, rather the master plan is meant to serve as a blueprint for improvements. This is essential for obligating developers to build improvements since you will have a predetermined plan that you can point to. We cannot predict exactly when the improvements will be implemented since we do not know the exact timetable for development and the priorities of local governments regarding improvements.

The public was then invited to come forward on an individual basis and view/discuss the plan and profile sheets for master plan improvements.

Edward J. Krisor
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January 19, 1998

Mr. Ben Urbonas, P.E.
Chief, Master Planning Program
Urban Drainage And Flood Control District
2480 West 26th Avenue, Suite 156 B
Denver, Colorado 80211

BY HAND DELIVERY

Re: Legal opinion in regard to alternative and planned drainage facilities in general as contained in alternatives development and evaluation reports

Dear Ben:

You have asked me to provide you with a legal opinion that you may use to initially evaluate in general all alternatives development and evaluation reports for compliance with the law of the State of Colorado applicable to drainage. What follows is such an opinion which will need to be supplemented by a short legal opinion in regard to each report to either indicate that no further comment is necessary or that certain other factors, other than those noted herein, will need to be considered before proceeding to the selection and construction of drainage improvements contained in that specific report.

In order to properly evaluate these reports you first must take note of the following comments in regard to the law of drainage in Colorado:

I. GENERAL LEGAL DRAINAGE PRINCIPLES

Natural drainage conditions may be altered by an upper (dominant) owner provided the water is not sent down in a manner or quantity to do more harm than formerly to the lower

(servient) owner, Hankins v. Borland, 163 Colo. 575, 431 P.2d 1007 (1967). Colorado follows the "rule of reasonableness" as related to drainage matters and in each drainage situation, the court will look at the relationship of the parties and at who is doing what to whom in order to determine "what is reasonable under the circumstances". Prior to the Hankins case, the Colorado Supreme Court ruled in Ambrosio v. Perl-Mack, 143 Colo. 49, 317 P.2d 803 (1960), that downstream owners had to accept additional runoff from an upstream developer.

As the engineering technology has become more precise in drainage matters, it is possible to determine from the actual development and from land use decisions that will determine future development what the additional (more than natural) runoff will be because landowners make their land impermeable.

The Colorado Legislature in 1973 recognized this and adopted Sec. 30-28-113(4)(b) which requires developers in unincorporated areas to detain greater than historical flows. As a matter of drainage practice, cities as well as counties and the Urban Drainage District work to identify with precision "who is doing what" to whom so that the cost of drainage solutions to problems created by future development can be placed on those who would change the use of land from permeable to impermeable. Runoff from existing development is also computed and the need, if any, to solve existing drainage problems can be determined and costs of solutions estimated.

Drainage matters historically were resolved between or among property owners. However, as urbanization (multiple property owners) has taken place, governments have become involved for several reasons. In some cases, the government itself helped create additional runoff by making improvements. In other cases, government approved land use changes without regard to the problems of additional runoff. In still other situations, government got involved because constituents (owners) wanted government help in the difficult and expensive field of determining (identifying) where the additional runoff was coming from and the paying of costs of solutions. For whatever the reason, whenever government gets involved, it can be expected to be treated like a private party. 2 Farnham, Water and Water Rights, pp. 975 and 977, adopted by the Colorado Supreme Court in City of Boulder v. Boulder and White Rock Ditch Co., 73 Colo. 426, 216 P. 553 (1923). A municipality can be held to its negligence. It can also determine whether to become involved at all, if it did not create the problem.

An update of these legal principles has yielded the conclusion that the law of drainage as set forth above has not really changed to any substantially degree over the years. Both the Hankins and Ambrosio cases continue to be cited by the Colorado courts when dealing with the law of drainage. In the case of Metro Docheff v. City of Broomfield, 623 P. 2d 69 (Colo. App.

1980) the Colorado Court of Appeals held that: "Although we recognize the right of the owner of higher land to a drainage easement over the lower land of others, . . . the discharge of water will be enjoined as a continuing trespass if the drain sends the water down 'in a manner or quantity to do more harm than formerly.'" In the case of Hoff v. Ehrlich, 511 P. 2d 523 (Colo. App. 1973) the Colorado Court of Appeals was faced with the question of the propriety of a servient owner blocking drainage from a dominant estate in order to protect the servient owner's land. The Court held that: "The owner of the dominant estate has a legal and natural easement or servitude in the lower or servient estate for the drainage of surface water flowing in its natural course and manner . . . When an interruption in the natural flow or passage of surface waters is caused by the servient owner to the detriment or injury of the estate of the dominant owner, the court should issue a mandatory injunction for the opening of the easement which has been blocked . . . [the servient owner] may not act to the extent that damage is caused thereby to the dominant landowner . . . in order for the owner of the servient estate to be afforded a remedy, it must be evident that the water was sent down in a manner or quantity causing more harm than it formerly had done."

If a government permits the development which in turn causes "more harm than formerly", then the government, as well as the developers, may be held liable. (Cases consistently move toward governmental, as well as developers' liability.) See Metro Docheff, *supra*, which held as follows: "The trial court found that the city had accepted the streets and storm drains for maintenance and control and, therefore, had exclusive control over the water collected in the subdivision. It determined that by approving the subdivision and drainage plan and accepting control, the city interfered with the natural conditions and thereby caused surface water to be collected and discharged upon plaintiff's land 'in a greater quantity or in different manner than had previously occurred under natural conditions."

Recently, governmental entities have raised in their defense of drainage cases the Governmental Immunity Act. In two recent cases, that defense has not been successful. In Burnworth v. Adams County, 826 P. 2d 368 (Colo. App. 1991) the Colorado Court of Appeals held that actions ". . . against public entities arising from the maintenance of a sewer, a storm sewer, or a storm drainage system." were not prohibited by the Governmental Immunity Act. In the case of Scott v. City of Greeley, 931 P. 2d 525 (Colo. App. 1996), the Colorado Court of Appeals again denied protection under the Governmental Immunity Act to a public entity when it argued that the damage complained of was the result of a design flaw rather than from the operation of a facility. The facts were that the City designed and constructed a new storm water line which was 42" and connected it to a line which was only 15". This caused the water to back up, or surcharge, through the storm drains and manhole covers, overtopping the curb and flooding adjacent property. In addition to the denial of protection to the entity under the

Governmental Immunity Act, the Court also rejected the City's defense that the connection to the smaller pipe was only temporary.

Any improvements upstream must be made taking into consideration the outlet capability downstream. (Long line of case law.) See Hankins, *supra*, which states: "The trial court has found that the water which these defendants have sent into the Borland drain is in greater quantity and more rapid in time — a finding fully justified by the evidence. Under such circumstances it is the court's duty to determine what the dominant owners must do in order to prevent their increased waste water from damaging the servient owner."

Colorado generally imposes strict liability on owners of dams (regional detention ponds). (Long line of cases.)

Interfering with natural drainageways or channels is generally looked upon with disfavor by Colorado Courts. However, builders of irrigation canals, railroads, and highways in other times were not aware or were unconcerned with the problems they might be creating in the future by artificially blocking natural drainageways. Sometimes the very passage of time (at least eighteen years) provides an argument that the blockage should be allowed to be continued because parties have relied and should be able to continue to rely on this "protection". Generally, the laws of nature prevail in these situations and artificial structures such as canals, railroads and highways do not rise to the status of permanent dams which require spillways and other features under the jurisdiction in the State of Colorado of the State Engineer.

With the enactment of federal environmental (including water quality) provisions, the quality of the runoff may also have an effect, as well as on other ecological matters.

Natural waters are subject to the doctrine of prior appropriation in Colorado and what may have become a water right must also be considered with any plan for the "handling" of surface runoff in natural waterways.

Finally, any drainage, "facility" built by a government must be maintained. "If you're not going to maintain it, then don't build it!" is the theme of a long line of cases.

II. GENERAL COMMENTS ON COMMONLY PROPOSED FACILITIES AND CONSTRUCTION TECHNIQUES

1. It is my understanding that the purpose of all reports in regard to this subject is to

examine alternatives which will, if implemented, improve upon and/or formalize the drainage that is within the study area.

2. In general, consideration must be given to any potential adverse effects of the selected alternative on properties within the study area and downstream of the study area.

3. If any selected facilities would increase or materially change the direction of the flows across downstream property in a study area, the downstream property has a right to claim damages and/or protection from such a material increase or change in flow. Thus, care should be taken to make sure that increased flows from upstream facilities are accommodated by sufficiently increasing the size of the downstream channels and conduits. If in final design, the selected alternative still has the effect of placing water on the residents and land owners in the area that they either never had or in a quantity larger than what they have had previously, the same must be revised to eliminate that result or the selected alternative must not be constructed.

4. If re-alignment of a channel is the selected alternative, careful consideration should be given to the channel's geometry, alignment and ability to carry flood flows so as not to create additional potential damages to surrounding landowners.

5. If the selected alternative is the collection of overland flows from a specific area and returning those flows to a drainage structure of some kind, care should be taken not to adversely impact landowners in the area.

6. If a selected alternative involves the redirection of flows from their historic path, prior to its finalization in the design process, caution should be taken that this redirection will not cause any increase in damage to those adjacent or downstream of the proposed redirection.

7. If any selected alternative, when it is finalized in the design process, is changed to include a plan for the diversion of runoff from one watershed to another; extreme caution should be used in implementing that portion of the selected alternative since the participants may be faced with the imposition of strict liability for any damage that occurs from any size storm event if it can be shown that the same would not have been suffered if the diversion had not occurred.

8. If the construction of crossing structures over irrigation canals are part of the selected alternative for the project, caution must be taken in regard to the capacity of those crossing structures. The structures, when designed for the design event, should not cause any more water than presently exists to flow into those canals.

9. The intentional routing, as opposed to inadvertent inflows, of flood flows into an irrigation ditch should be eliminated from any plan if at all possible unless a written agreement from the owner of the irrigation ditch is obtained permitting the use of the ditch to carry those flood flows. The participants have no control over the available capacity of the ditch at the time it would be necessary to carry flood flows so the ditch cannot realistically be used to control the flows downstream.

10. If an alternative is being selected that relies upon inadvertent detention and the participants do not intend to formalize such detention by written agreement, it is my opinion that the effect of that non-formalized inadvertent detention cannot be taken into consideration in the final design.

11. If a selected alternative includes the formalization of inadvertent detention it will be necessary for at least one of the participants to formalize that detention by entering into a written agreement with the owner of the facility causing the detention. The agreement must prohibit the owner from operating or modifying the facility in a way that would have the effect of lessening the inadvertent detention of the facility necessary to implement the selected alternative. Further, the owner must either agree to maintain the facility so that the same does not lose its current inadvertent detention or agree to permit at least one of the participants to maintain the facility.

12. If the owner of the facility will not agree to maintain the inadvertent detention facility, at least one of the participants should confirm in writing to all of the participants that the participant is committed to maintaining the inadvertent detention facility in a manner that assures the necessary inadvertent detention to implement the alternative. This should be done prior to the implementation of any of the alternatives involving inadvertent detention. The level of maintenance must at least permit the facility to function as relied upon in flooding events and not fail structurally during the design and larger events.

13. Any formalized detention facilities that are utilized in the final design of a project will need to be the subject of a written agreement between the owner and at least one participant that the facility will be maintained in a manner that assures the necessary flood storage to implement the design and that adequate maintenance will be performed by either the owner or the participant so that the facility will function as designed in flooding events and that it will not fail structurally during the design and larger events.

The participating entities must agree amongst themselves, in writing, that any one of the participants may enforce the terms of the agreement with the owner of the facility if the responsible participant does not. This agreement must include the maintenance of no more than

a certain level of water in the facility at any one time and that any one of the participants may, at their sole cost and expense, maintain the facility so that its effectiveness in the selected alternative will be continued in perpetuity.

14. The embankments of all detention facilities should be designed so that they will not fail during a design event.

15. If a potential wetland is involved in a design alternative, it will be necessary that a Section 404 Permit from the United States Army Corps of Engineers be applied for and obtained, if necessary. Such a Permit should be obtained before any construction is done on the recommended alternative.

16. During construction of the selected facilities, care should be taken in constructing those facilities so that downstream property is not adversely affected temporarily by such construction. Usually, with the exception of the construction of detention facilities, the best method to avoid that problem is construction from the downstream limit of the project in an upstream direction which would then have the effect of having the downstream facilities ready to accept any increased flows as a result of the project.

If you have any questions in regard to my comments and opinions contained in this letter, please feel free to telephone me to discuss the same.

Very truly yours,

Edward J. Krisor

Edward J. Krisor

Appendix C: Wetland Resources

THIRD CREEK BELOW DENVER INTERNATIONAL AIRPORT
OUTFALL SYSTEMS PLANNING STUDY UPDATE

URBAN DRAINAGE AND FLOOD CONTROL DISTRICT

December, 2003

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INTRODUCTION

The Third Creek below the Denver International Airport Outfall Systems Planning Study Update area is located in Adams County, Colorado and contains portions of the City of Brighton and Commerce City. This study area is situated between the South Platte River on the west, Second Creek on the south, and Barr Lake and an unnamed tributary on the north and east. The upper portion of Third Creek on and above the Denver International Airport is not included in this study. Draining approximately 14 square miles in this study, Third Creek discharges into the South Platte River. This report is a wetland inventory for the Third Creek Basin and presents a description of the wetland resources related to the major drainageways.

Prior to field visits, topographic, soil survey and wetland inventory maps were used to indicate potential jurisdictional wetlands. Field assessment was conducted on October 29 and November 18, 2003 to further evaluate the vegetative, hydrologic, and soil conditions, commensurate with a large area routine level procedure. Wetlands mapped in this report are potential jurisdictional wetlands, and information presented is suitable for planning purposes. Detailed wetland delineation will need to be done in areas of potential jurisdictional waters and wetlands prior to construction of proposed outfall systems.

Topographic base mapping was produced by Landmark Mapping Ltd., at 1"=100' with a contour interval of 2'. As the majority of the area is private property and access is prohibited, an aerial photograph dated November 2, 2001 provided by Colorado Aerial Photo Service was used to characterize the ecosystems. Based on the Cowardin System, three types of habitats based were encountered: cattail dominated emergent wetlands, willow shrub complexes, and riparian ecosystems.

SITE DESCRIPTION

Starting from an elevation of 5,500-feet, Third Creek flows northwesterly for a distance of about fifteen miles where it discharges into the South Platte River at an elevation of 4,980-feet. The topography of the basin is generally steeper in the wind-formed rolling hills of the upper reaches, becoming shallower in the central section. The broad, flat South Platte River floodplain itself is an ancient alluvial valley that measures a few miles wide. The Third Creek basin is within the Colorado Piedmont section of the Great Plains physiographic province.

This watershed has been significantly modified by human activity, with little remaining in a native state. The study area overlays oil and gas fields which are still in production today. Historically, the upper part of the basin has been used for ranchland and dry land crops, particularly wheat. In the past, the lower lying areas adjacent to the South Platte River were utilized for irrigated truck farming, but are now are being quarried and converted to open water storage. Much of the study area is being changed to residential, commercial and industrial uses. Agricultural uses are shifting away from food crops and toward production of horticultural products, such as sod and nursery stock.

Many major transportation routes bisect the study area. Principal automotive routes are Interstate 76/US 6, CO 2, US 85, and the recently constructed E 470. The Burlington, Northern and Santa Fe Railroad and the Union Pacific Railroad also alter the hydrology of the Third Creek basin. All of these linear features fragment the basin by impounding, rerouting or capturing historic flows.

HYDROLOGY

Third Creek begins as a shallowly entrenched, tightly meandering intermittent stream with a semi-arid high plains climate. Above Himalaya Road, numerous oxbows were formed when the channel migrated laterally and cutoff meanders. Below Himalaya Road, the topography is shallower, and the creek typically straightens out and is less entrenched. Where the topography becomes extremely shallow near the South Platte River, the Third Creek channel effectively disappears.

Prior to human impact, stormwater was conveyed to the South Platte River via a natural channel in Third Creek. The hydrology has been altered and augmented by the four irrigation ditches that flow through the study area. These ditches feed storage ponds or are diverted to fields via irrigation laterals. Pond embankments also appear to have been constructed along drainages to impound stormwater. Most ponds of this type do not appear to function well, as they are so dry that wetland conditions have not developed.

Currently, the irrigation ditches, roads and railroads sever the hydrologic connection of Third Creek to the South Platte River. The intention of this outfall planning study is to manage developed stormwater flows, to separate stormwater and irrigation waters, and to restore the connection to the South Platte River. Future flows from proposed development will be detained to historic rates.

SOILS

The soils in the Third Creek Basin are varied and represent of most of the types present in Adams County. For the purposes of indicating the presence of hydric soils, nearly thirty different mapped units were categorized into three groups: units having hydric components, units having localized hydric inclusions, and units with no mapped hydric components or inclusions. These categories were applied in the field as wetland indicators.

The first group, units having a hydric component, consists of one soil series: Wet Alluvial Land. This series is formed in the floodplains of the South Platte River. This group, clearly having hydric criteria, is minimally represented in the basin. Most of this area is now protected from flooding by levees. Additionally, much of it has been removed as a source of gravel.

The second group, units having localized hydric inclusions, are found interspersed throughout the study area intermingled with the next group. Hydric inclusions may be found localized in swales, in sloughs, or along terraces where aquic conditions are a

function of topographic position. This group at times develops fluvaquentic haplustols and halaquepts, which in small areas may meet meet saturation, flooding, or ponding criteria.

The last group, which is units with no mapped hydric components or inclusions, is mixed throughout the basins with the previous group. Due to the lack of any hydric soil criteria, wetlands were not anticipated to exist in these well-drained or excessively well-drained soils.

WETLAND AND RIPARIAN PLANT ASSOCIATIONS

Three different wetland and riparian plant communities essential to wildlife habitat were located in the study area: cattail dominated emergent, willow shrub and cottonwood dominated riparian associations. Descriptions of community types are accordance with "The Field Guide to the Wetland and Riparian Plant Associations of Colorado" which is based upon hydrogeomorphic (HGM) classes and subclasses that are distinguished by hydrologic regimes and geomorphic settings and processes.

Emergent wetlands are dominated by cattails (*Typha latifolia* and *T. angustifolia* OBL) with minor amounts of bulrush (*Schoenoplectus acutus/tabermaemontani* OBL), scouring rush (*Hippichaete laevigata* FACW), three-square (*Schoenoplectus pungeons* OBL), rush (*Juncus balticus* OBL), curley dock (*Rumex crispus* FACW), and spikerush (*Eleocharis palustrus* OBL) are also present. Capable of persisting during drier periods, this plant association is usually found in standing water with at least one-foot of depth. In the HGM depressional class (a natural or artificial topographic depression) and subclasses D2/3 and D4/5, this wetland type is found in permanently or semi-permanently flooded areas including reservoirs, pond margins, and marshes (D2/3) or in temporarily or intermittently flooded areas including playas and pond or reservoir draw down zones (D4/5). These plants are found in low gradient stream bottoms, around the edges of ponds, behind railroad embankments, and infrequent isolated depressions. Benefits provided by this wetland type include nutrient and sediment removal, and flood attenuation.

The shrub/scrub community is dominated sandbar willows (*Salix exigua* OBL) with an undergrowth of mesic graminoid species covering about 30%. Minor associated species are bentgrasses, wheatgrass, bluegrass and numerous other grasses and herbs. This plant community is found within three vertical feet of the stream channel on point bars, low floodplains and terraces where riverine conditions are encountered. The hydrologic regime correlated with the R5 subclass is typically found on low elevation floodplains on mid-to-high order streams with a fine textured substrate, low gradient and usually a perennial flow. This early seral association is found on recent floodplains and disturbed areas, and the amount of herbaceous understory can be used as an indication of the length of time since the last depositional or scouring event. Along with protecting stream banks from erosion by increasing friction of stream flow and trapping sediments, it also creates a protected seed bed for other shrub and tree species.

Riparian ecosystems are present along the South Platte River floodplain, the margins of ponds and emergent wetlands, and irrigation canals. Plains cottonwood (*Populus deltoids* FACW)/ peach-leaved willow (*Salix amygdaloides* FACW)/sandbar willow (*Salix exigua* OBL) association is found in similar locations as the previous association (D3/4 and D/5). Introduced species such as Russian olive (*Elaeagnus angustifolia* FAC), Siberian elm (*Ulmus pumila* FAC), crack willow (*Salix fragilis* FAC) are commonly found in this riparian ecosystem along with native shrubs such as chokecherry (*Padus virginiana* FACU) and golden current (*Ribes aureum* FACW). While most riparian areas do not have all the wetland indicators, they are important habitats for many species as they provide shelter and secondary food sources.

WETLAND DESCRIPTIONS

Third Creek from DIA downstream to the O'Brian Canal

Immediately downstream from the Denver International Airport to a half-mile below Himalaya Road, Third Creek is at its steepest gradient. Known as Grass Valley in this segment, it is a tightly meandering and entrenched stream channel draining rolling dry land farms. Flowing in a natural manner, the channel bed is a combination of interspersed emergent wetland channel dominated by cattails and bulrush and exposed channel with an ordinary high water mark. Wetlands also exist in some, but not all, of the old cut-off meanders where the channel has adjusted its grade and migrated laterally. Isolated trees, such as cottonwood, elm, and Russian olive, or a clump of sand bar willows can occasionally be found.

About midway between Himalaya Road and Tower Road, Third Creek becomes less steep and more linear. Channelization has occurred upstream from Tower Road where an old levee exists for about a half-mile. Between Tower Road and the O'Brian Canal, the Third Creek Channel and several minor tributaries have been realigned in conjunction with the construction of E-470. Along this stretch of Third Creek, wetland hydrology diminishes. In places, the channel bottom is similar to that upstream with interspersed emergent wetland channel and bare channel with an ordinary high water mark, but in other places is vegetated with xeric species. Construction activities along the entire length of Third Creek from DIA to the O'Brian Canal are subject to U.S.A.C.E. regulations.

In this area of the basin, are topographic depressions formed in windblown deposits that may flood intermittently. The majority of these basins, such as those present along Tower Road by E. 104th Avenue, are dry enough to be tilled, and do not have wetland conditions. One of these isolated depressions that does have wetland vegetation is on E. 112th Avenue on the Buckley Road alignment, where a good size marsh has developed both above and below the road crossing. Currently, these isolated depressional wetlands are not considered under the jurisdiction of the U.S.A.C.E due to the S.W.A.N.C.C. decision, but this may be subject to change.

Also in this area are man-made ponds at golf courses and in residential areas. Artificially filled and sometimes re-circulated, they support margins of emergent plant communities that function as wildlife habitat. Generally, isolated recreational ponds are not jurisdictional.

Third Creek from the O'Brian Canal to the South Platte River

Below the O'Brian Canal, Third Creek has been fragmented for many years due to the railroads, canals, and major highways. In this stretch, the gradient is shallow and the channel is typically linear. Cattail dominated emergent wetlands have developed upstream of the railroads and highways and in ditches where flows have been impeded, particularly around the Burlington Northern Railroad and Interstate 76.

Water storage reservoirs fed by the irrigation ditches also have developed emergent wetland margins. Vaille Reservoir, currently unused, has extensive wetland associated with water storage. Should water storage terminate, these wetlands are at risk of becoming dewatered. This type of wetland may or may not be jurisdictional depending on whether or not there is a connection to waters of the U.S.

Both upstream and downstream of Interstate 76, Third Creek has been realigned into a wetland channel next to the E-470 project. Also recently installed in this area are two large wetland mitigation basins. Typically, construction projects are not allowed in wetland mitigation.

Downstream from Interstate 76, Third Creek is relatively drier and, in places, dry enough to be mowed. Yet, small pockets of cattail dominated wetlands can be found along this stretch. Below the Old Brighton Road, the channel is indistinct and flows into the McCann Ditch before reaching the South Platte River. Third Creek is a U.S.G.S. "blue line" stream, and as such is a jurisdictional water of the U.S., as are the intermittent emergent wetlands and shrub/scrub complexes along its length.

Irrigation Canals

Four irrigation canals, the McCann Ditch, the Fulton Ditch, the O'Brian Canal, and the Burlington Canal, traverse the project area. Historically, the ditches have captured flows from Third Creek during rain events. Separation structures are proposed to divide stormwater flows from irrigation water.

Generally, these ditches have a bare, native soil invert and steep sides. They may be intermittently lined with a narrow band of emergent wetland plants, dominated by reed canary grass with lesser amounts of giant reed grass and cattails. Riparian plants, such as cottonwoods, willows, and elms can also be found in small clusters lining the canals. In places, emergent wetlands fed by seepage have formed below the canal. In other places, emergent wetlands have formed upstream of the canals where the ditches interrupt drainage.

Irrigation ditches that empty into jurisdictional waters are also considered jurisdictional waters of the U.S., as are ponds and wetlands fed by such canals. Drainage separation structures expected in the vicinity of the canals may need a Department of the Army permit.

Open Water

A large body of open water is located along the South Platte River in an area that was once mined for gravel. Filled with diverted river water, the pond is currently being used for water storage for augmentation purposes. As the water is released back to the South Platte River when needed, the pond should be considered a jurisdictional water of the U.S. The other water storage ponds in the basin may also be jurisdictional waters.

The other form of open water present in the study area is within the South Platte River channel. Construction activities, such as outfall structures, within the ordinary high water mark of the river may require a permit.

POTENTIAL ESA ISSUES

The possible issue related to the Endangered Species Act that may be encountered in the Third Creek Basin is the Preble's Meadow Jumping Mouse (PMJM). Per the "Preble's Meadow Jumping Mouse Block Clearance for the Denver Metropolitan Area", the Third Creek Basin downstream from Sable Boulevard is cleared for the presence of PMJM. The presence of the mouse is unlikely upstream of Sable Boulevard as no PMJM have been found in Adams County during trapping efforts that have been conducted since 1991. The presence of PMJM is unlikely to be a concern and impede installation of drainage outfalls in the Third Creek Basin.

CONCLUSION

As shown on the accompanying "Wetlands Inventory Maps," areas marked as wetlands, waters of the U.S., open water, and irrigation ditches may be subject to U.S.A.C.E. regulations that are inclined to change. Riparian ecosystems impacted in conjunction with permitted activities may also need replacement. Detailed wetland delineation will need to be done in areas where drainage outfall systems are proposed in potential jurisdictional areas and evaluated in relation to current permitting requirements prior to construction.

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U.S.G.S. Map, Denver International Airport Quadrangle, Adams County, Colorado. 1994. U. S. Department of the Interior

U.S.G.S. Map, Mile High Lakes Quadrangle, Adams County, Colorado. 1994. U. S. Department of the Interior.

U.S.G.S. Map, Montbello Quadrangle, Adams County, Colorado. 1994. U. S. Department of the Interior.

	Kiowa Engineering Corporation 7175 West Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303)-692-0369	CITY OF BRIGHTON, COMMERCE CITY, ADAMS COUNTY URBAN DRAINAGE AND FLOOD CONTROL DISTRICT	OUTFALL SYSTEMS PLANNING STUDY THIRD CREEK DOWNSTREAM OF DIA	*WETLANDS INVENTORY*	WI-INDEX

	Kiowa Engineering Corporation 7175 West Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303)-692-0369	CITY OF BRIGHTON, COMMERCE CITY, ADAMS COUNTY URBAN DRAINAGE AND FLOOD CONTROL DISTRICT	OUTFALL SYSTEMS PLANNING STUDY THIRD CREEK DOWNSTREAM OF DIA	WETLANDS INVENTORY	WI-1

LEGEND

- EMERGENT WETLANDS
- IRRIGATION DITCH
- WATERS OF THE U.S.
- OPEN WATER
- RIPARIAN ECOSYSTEMS

SMALL POCKETS OF EMERGENT AND SHRUB/SCRUB WETLANDS EXIST ALONG THIRD CREEK

	Kiowa Engineering Corporation 7175 West Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303)-692-0369	CITY OF BRIGHTON, COMMERCE CITY, ADAMS COUNTY URBAN DRAINAGE AND FLOOD CONTROL DISTRICT	OUTFALL SYSTEMS PLANNING STUDY THIRD CREEK DOWNSTREAM OF DIA	WETLANDS INVENTORY	WI-2

	Kiowa Engineering Corporation 7175 West Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303)-692-0369	CITY OF BRIGHTON, COMMERCE CITY, ADAMS COUNTY URBAN DRAINAGE AND FLOOD CONTROL DISTRICT	OUTFALL SYSTEMS PLANNING STUDY THIRD CREEK DOWNSTREAM OF DIA	WETLANDS INVENTORY	WI-3

MATCH SHEET WI-3

MATCH SHEET WI-5

MATCH SHEET WI-6

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LEGEND

- EMERGENT WETLANDS
- IRRIGATION DITCH
- WATERS OF THE U.S.
- OPEN WATER
- RIPARIAN ECOSYSTEMS

SMALL POCKETS OF EMERGENT AND SHRUB/SCRUB WETLANDS EXIST ALONG THIRD CREEK

0' 500' 1000'

	Kiowa Engineering Corporation 7175 West Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303)-692-0369	CITY OF BRIGHTON, COMMERCE CITY, ADAMS COUNTY URBAN DRAINAGE AND FLOOD CONTROL DISTRICT	OUTFALL SYSTEMS PLANNING STUDY THIRD CREEK DOWNSTREAM OF DIA	WETLANDS INVENTORY	WI-5

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MATCH SHEET WI-4

MATCH SHEET WI-7

LEGEND

- EMERGENT WETLANDS
- IRRIGATION DITCH
- WATERS OF THE U.S.
- OPEN WATER
- RIPARIAN ECOSYSTEMS

0' 500' 1000'

MATCH SHEET WI-8

	Kiowa Engineering Corporation 7175 West Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303)-692-0369	CITY OF BRIGHTON, COMMERCE CITY, ADAMS COUNTY URBAN DRAINAGE AND FLOOD CONTROL DISTRICT	OUTFALL SYSTEMS PLANNING STUDY THIRD CREEK DOWNSTREAM OF DIA	WETLANDS INVENTORY	WI-6

LEGEND

- EMERGENT WETLANDS
- IRRIGATION DITCH
- WATERS OF THE U.S.
- OPEN WATER
- RIPARIAN ECOSYSTEMS

0' 500' 1000'

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	Kiowa Engineering Corporation 7175 West Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303)-692-0369	CITY OF BRIGHTON, COMMERCE CITY, ADAMS COUNTY URBAN DRAINAGE AND FLOOD CONTROL DISTRICT	OUTFALL SYSTEMS PLANNING STUDY THIRD CREEK DOWNSTREAM OF DIA	WETLANDS INVENTORY	WI-7

MATCH SHEET WI-6

MATCH SHEET WI-7

LEGEND

- EMERGENT WETLANDS
- IRRIGATION DITCH
- WATERS OF THE U.S.
- OPEN WATER
- RIPARIAN ECOSYSTEMS

0' 500' 1000'

Kiowa Engineering Corporation 7175 West Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303)-692-0369	CITY OF BRIGHTON, COMMERCE CITY, ADAMS COUNTY URBAN DRAINAGE AND FLOOD CONTROL DISTRICT	OUTFALL SYSTEMS PLANNING STUDY THIRD CREEK DOWNSTREAM OF DIA	WETLANDS INVENTORY	WI-8

Appendix D: Preliminary Design Improvement Plan and Profile Sheets

LEGEND

EXISTING CONTOUR

FLOODPLAIN BOUNDARY

JURISDICTIONAL BOUNDARY

PROPERTY/ROW LINE

FENCE

WATER QUALITY DETENTION

CROSSING STRUCTURE

SHEET INDEX

THIRD CREEK MAINSTEM
SHEET 2: 00+00 TO 60+00
SHEET 3: 60+00 TO 120+00
SHEET 4: 120+00 TO 176+00
SHEET 5: TRIB 3303 AND 3304
SHEET 6: 176+00 TO 232+00
SHEET 7: 232+00 TO 276+00
SHEET 8: 276+00 TO 320+00
SHEET 9: 320+00 TO 376+00
SHEET 10: 376+00 TO 432+00
SHEET 11: 432+00 TO 492+00
SHEET 12: 492+00 TO 544+00

TRIB 3309
SHEET 13: 0+00 TO 50+00
SHEET 14: 50+00 TO 95+00

GRASS VALLEY GULCH (TRIB 3313)
SHEET 15: 0+00 TO 56+00
SHEET 16: 56+00 TO 84+00

SHEET 17: TYPICAL DETAILS
SHEET 18: TYPICAL DETAILS
SHEET 19: TYPICAL DETAILS

0 2000' 4000'
SCALE: 1"=4000'

03059 SHEET 1 Fri Mar-Dec 13, 2005

BASE MAPPING AND HORIZONTAL & VERTICAL CONTROL PREPARED BY: *LANDMARK MAPPING, LTD. 7500 W. Mississippi Ave, 21 Lakewood, CO 80232*	Kiowa Engineering Corporation 7175 W. Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303) 692-0369 KIOWA PROJECT NO. 03059	ADAMS COUNTY COMMERCE CITY CITY OF BRIGHTON URBAN DRAINAGE & FLOOD CONTROL DISTRICT	THIRD CREEK D/S OF DIA OUTFALL SYSTEMS PLANNING STUDY UPDATE	SHEET INDEX	SHEET 1

COMMENTARY SHEET 2

Major Drainageway: Third Creek Mainstem **Stations:** 0+00 to 60+00

EXISTING CONDITIONS:

The flow path to the South Platte is poorly defined in this reach due to the interception of low flows by the upstream canals and ditches. The crossings at 144th Avenue and Old Brighton Road are undersized and cause significant flooding potential for adjacent residences and businesses. Flows currently enter the Ready Mixed gravel quarry at approximately station 24+00 and continue to the South Platte outfall without a defined flowpath.

PROPOSED IMPROVEMENTS:

Improvements were sized based on flows from the master plan hydrology model. Recommended improvements include a 5-year flow capacity composite channel upstream of station 24+00. The road crossings at 144th Avenue and Old Brighton Road are to be increased to accommodate a 100-year flow. A water storage facility downstream of station 24+00 is currently being planned and designed by the City of Brighton to occupy the Ready Mixed gravel quarry once operation is concluded. The design includes a 70-foot wide wetland channel sized to convey flows up to the 2-year storm frequency between future storage ponds. Excess flow up to a 5-year storm return would be contained by the south bank of the channel and forced to overtop the north bank into the adjacent pond. The channel would be overtopped by flow from the South Platte during major storms. The primary function of the wetland channel is to isolate frequent flows from Third Creek and preserve water quality in the storage ponds.

PRELIMINARY DESIGN COST ESTIMATE: SHEET 2

Third Creek Station 0+00 to 60+00

Improvement	Quantity	Unit	Unit Cost	Total Cost
Riprap Outfall Basin at South Platte	1	EA	$75,000	$75,000
Twin 4x10 RCBC	300	LF	$1,979	$593,667
Wetland Channel	2085	LF	$95	$198,326
100-Year Riprap Armored Overflow (300')	500	CY	$55	$27,500
60 L.F. 2'X5' CBC for McCann Ditch	60	EA	$700	$41,987
Drop Structure	1	EA	$20,000	$20,000
Wetland channel oveflow riprap spillway (200')	333	CY	$55	$18,315
5-Year Composite Channel	3432	LF	$179	$613,692
Maintenance Trail	3432	LF	$25	$85,800
115 L.F. Twin 10'x16' RCBC at Old Brighton Road	115	EA	$7,009	$806,086
115 L.F. Twin 10'x16' RCBC at 144th Avenue	115	EA	$7,009	$806,086
Total Estimated Construction Cost				$3,286,459
Utility Relocation (5% of Construction Cost)				$164,323
Engineering and Contingency (35% of Construction + Utility)				$1,207,774
Land Value Wetland Channel	4.4	Acres	$43,560	$189,600
Land Value 5-Year Channel	5.1	Acres	$43,560	$222,336
Total Estimated Cost				**$5,070,492**
Yearly Channel Maintenance Cost	5517	LF	$0.90	$4,965

THIS DRAWING IS FOR MASTER PLANNING PURPOSES AND REPRESENTS PRELIMINARY AND CONCEPTUAL ENGINEERING. ALTERNATIVES TO THIS OUTFALL SYSTEM WILL BE CONSIDERED BY LOCAL REVIEWING AGENCIES AND THE URBAN DRAINAGE AND FLOOD CONTROL DISTRICT PROVIDED THE ALTERNATIVE OFFERS EQUAL HYDRAULIC CAPACITY AND STREAM STABILITY. THE ALTERNATIVE MUST COMPLY WITH ALL REQUIREMENTS OF THE LOCAL JURISDICTION AND THE URBAN DRAINAGE AND FLOOD CONTROL DISTRICT. THIS DRAWING SHALL NOT BE USED FOR CONSTRUCTION PURPOSES. ADAMS COUNTY, COMMERCE CITY, AND CITY OF BRIGHTON MANAGE AND REGULATE ALL LAND DEVELOPMENT AND REDEVELOPMENT WITHIN THE 100-YEAR FLOODPLAINS OF THESE WATERSHEDS SO AS TO PREVENT FUTURE FLOOD DAMAGES BY FOLLOWING THE RECOMMENDATIONS OF THIS PLAN.

REFER TO 1976 FHAD REPORT FOR ALL REGULATORY FLOODPLAIN INFORMATION

CHANNEL IMPROVEMENTS MAY REDUCE RESIDUAL FLOODPLAIN BUT SHOULD BE ANALYZED SEPARATELY

AN ACCESS TRAIL IS REQUIRED ALONG ALL IMPROVED CHANNELS FOR FUTURE MAINTENANCE OF IMPROVEMENTS. THIS TRAIL WILL ALSO SERVE AS A RECREATIONAL TRAIL. THE ALIGNMENT OF THE TRAIL WILL BE DETERMINED BY LOCAL JURISDICTIONS.
THE TRAIL SHOULD BE PLACED AT THE 10-YEAR FLOOD ELEVATION, HAVE A MINIMUM WIDTH OF 14-FT, AND BE CONSTRUCTED FOR ALL WEATHER ACCESS. CULVERT CROSSINGS SHOWN ARE 10 FEET IN HEIGHT WITH RAISED ROAD GRADES; FINAL DESIGN MAY ALLOW FOR LOWER CLEARANCE.

BASE MAPPING AND HORIZONTAL & VERTICAL CONTROL PREPARED BY: LANDMARK MAPPING, LTD. BASEMAP 1995, REVISED 1998, 2001	Kiowa Engineering Corporation 7175 W. Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303) 692-0389 KIOWA PROJECT NO. 03059	DESIGNED SAB DATE 04/05 DRAWN SAB DATE 04/05 CHECKED SAB DATE 04/05	ADAMS COUNTY, CITY OF BRIGHTON, COMMERCE CITY AND URBAN DRAINAGE AND FLOOD CONTROL DISTRICT	OUTFALL SYSTEMS PLANNING STUDY UPDATE THIRD CREEK d/s of DIA	3RD CREEK STA 00+00 to 60+00	SHEET 2

03059 PP SHEET 2 TO 9 Aug/Sep 14, 2005

COMMENTARY SHEET 3

Major Drainageway: Third Creek Mainstem **Stations:** 60+00 to 120+00

EXISTING CONDITIONS:

The flow path to the South Platte is poorly defined in this reach due to the interception of low flows by the upstream canals and ditches. The crossings at US Highway 85 and the Union Pacific Railroad are undersized for major storm events and may cause significant flooding potential for adjacent residences and businesses.

PROPOSED IMPROVEMENTS:

Improvements were sized based on flows from the master plan hydrology model. Recommended improvements include a 5-year flow capacity composite channel. The road crossings at US Highway 85 and the Union Pacific Railroad are to be increased to accommodate a 100-year flow. Crossings were sized to ten feet in height to accommodate a future recreational trail. Due to the existing US-85 bridge capacity of 682 cfs, the proposed 100-year crossing was reduced to a twin 10'x10 RCBC. Berms are to be located north of the highway and the railroad to contain and direct the floodplain through the crossings.

PRELIMINARY DESIGN COST ESTIMATE: SHEET 3

Third Creek Station 60+00 to 120+00

Improvement	Quantity	Unit	Unit Cost	Total Cost
5-Year Composite Channel	5825	LF	$179	$1,041,596
Maintenance Trail	5825	LF	$25	$145,625
100 L.F. Twin 10'x10' RCBC at Highway US-85	100	EA	$4,698	$469,778
70 L.F. Twin 10'x16' RCBC at Union Pacific RR	70	EA	$4,907	$343,463
400 L.F. 4ft Berm	1	EA	$7,111	$7,111
Total Estimated Construction Cost				$2,007,573
Utility Relocation (5% of Construction Cost)				$100,379
Engineering and Contingency (35% of Construction + Utility)				$737,783
Land Value 5-Year Channel	8.2	Acres	$43,560	$358,400
Total Estimated Cost				**$3,204,135**
Yearly Channel Maintenance Cost	5825	LF	$0.90	$5,243

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BASE MAPPING AND HORIZONTAL & VERTICAL CONTROL PREPARED BY: LANDMARK MAPPING, LTD. BASEMAP 1995, REVISED 1998, 2001	Kiowa Engineering Corporation 7175 W. Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303) 692-0369 KIOWA PROJECT NO. 03059	DESIGNED SAB DATE 01/05 DRAWN SAB DATE 01/05 CHECKED SAB DATE 01/05	ADAMS COUNTY, CITY OF BRIGHTON, COMMERCE CITY AND URBAN DRAINAGE AND FLOOD CONTROL DISTRICT	OUTFALL SYSTEMS PLANNING STUDY UPDATE THIRD CREEK d/s of DIA	3RD CREEK STA 60+00 to 120+00	SHEET 3

03059 PP SHEET 2 TO 9.dwg/Sep 13, 2005

COMMENTARY SHEET 4

Major Drainageway: Third Creek Mainstem **Stations:** 120+00 to 176+00

EXISTING CONDITIONS:

The flow path to the South Platte is poorly defined in this reach due to the interception of low flows by the upstream canals and ditches. The crossings at 136th Avenue, 132nd Avenue, Sable Boulevard are undersized for frequent storm events and cause significant flooding potential for adjacent residences and businesses.

PROPOSED IMPROVEMENTS:

Improvements were sized based on flows from the master plan hydrology model. Recommended improvements include a 5-year flow capacity composite channel. The road crossings at 136th Avenue, 132nd Avenue, Sable Boulevard are to be increased to accommodate a 100-year flow. Crossings were sized to ten feet in height to accommodate a future recreational trail. Concrete box culverts are to be constructed under the Fulton Ditch to convey 5-year flows. Riprap armoring is to be placed on the banks of the ditch to prevent erosion during larger storm events. To direct 100-year flows to the crossing, the road grade for 136th Avenue must be elevated and a berm added each side of the crossing. Berms include 3 feet of freeboard per the FEMA criteria for a floodwall/levee.

PRELIMINARY DESIGN COST ESTIMATE: SHEET 4

Third Creek Station 120+00 to 176+00

Improvement	Quantity	Unit	Unit Cost	Total Cost
5-Year Composite Channel	4889	LF	$179	$874,226
Maintenance Trail	4889	LF	$25	$122,225
115 L.F. Twin 10'x16' RCBC at 136th Avenue	115	EA	$7,009	$806,086
86 L.F. Twin 4'x8' RCBC under Fulton Ditch	86	EA	$1,979	$170,184
Separation Structure at Fulton Ditch	1	EA	$50,000	$50,000
100-Year Riprap Armored Overflow at Fulton Ditch (250')	3804	CY	$55	$209,220
1230 L.F. 4' High Berm	1230	LF	$20	$24,600
115 L.F. Twin 10'x16' RCBC at 132nd Avenue	110	EA	$7,009	$771,039
115 L.F. Twin 10'x16' RCBC at Sable Boulevard	110	EA	$7,009	$771,039
Total Estimated Construction Cost				$3,798,619
Utility Relocation (5% of Construction Cost)				$189,931
Engineering and Contingency (35% of Construction + Utility)				$1,395,992
Land Value 5-Year Channel	7.9	Acres	$43,560	$342,400
Total Estimated Cost				**$5,726,942**
Yearly Channel Maintenance Cost	4889	LF	$0.90	$4,400

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03059 PP SHEET 2 TO 8.dwg/Sep 13, 2005

COMMENTARY SHEET 5

Major Drainageway: Tributary 3303 and Tributary 3304

EXISTING CONDITIONS:

Tributaries 3303 and 3304 are currently defined by a ditch or swale along side gravel roads. Frequent flows are minimal. However future conditions flows will exceed 100cfs for both tributaries and likely overflow existing roadside ditches.

PROPOSED IMPROVEMENTS:

Improvements were sized based on flows from the master plan hydrology model. Recommended improvements include a 100-year capacity grass-lined channel. Water quality basins are recommended and should be located outside the 100-year floodplain.

PRELIMINARY DESIGN COST ESTIMATE: SHEET 5

Tributary 3303 (Confluence at Third Creek Station 128+60)

Improvement	Quantity	Unit	Unit Cost	Total Cost
100-Year Trapezoidal Grass-Lined Channel	1950	LF	$37	$71,644
2.63 Acre-Ft Water Quality Detention	2.63	AF	$25,000	$65,750
2' Check Structure	1	Each	$20,000	$20,000
Total Estimated Construction Cost				$137,394
Utility Relocation (5% of Construction Cost)				$6,870
Engineering and Contingency (35% of Construction + Utility)				$50,492
Land Value 5-Year Channel	1.8	Acres	$43,560	$79,950
Total Estimated Cost				**$274,707**
Yearly Channel Maintenance Cost	1950	LF	$0.90	$1,755

Tributary 3304 (Confluence at Third Creek Station 157+75)

Improvement	Quantity	Unit	Unit Cost	Total Cost
100-Year Trapezoidal Grass-Lined Channel	815	LF	$37	$29,944
0.47 Acre-Ft Water Quality Detention	0.47	AF	$25,000	$11,750
Total Estimated Construction Cost				$41,694
Utility Relocation (5% of Construction Cost)				$2,085
Engineering and Contingency (35% of Construction + Utility)				$15,322
2' Check Structure	1	Each	$20,000	$20,000
Land Value 5-Year Channel	0.8	Acres	$43,560	$35,860
Total Estimated Cost				**$114,961**
Yearly Channel Maintenance Cost	815	LF	$0.90	$734

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03059 PP SHEET 2 TO 9.dwg/Sep 11, 2005

COMMENTARY SHEET 6

Major Drainageway: Third Creek **Station** 176+00 to 232+00

EXISTING CONDITIONS:

The channel along this reach of Third Creek was relocated during construction of E-470. The trapezoidal grass-lined channel has an average depth of 4 feet and a 130 topwidth from station 176+00 to 185+00. Upstream the channel narrows to 56 feet and continues through Interstate 76. The capacity for both segments is approximately the 5-year master plan flow. The crossings at Interstate 76 and the Burlington Santa Fe Railroad are adequate for 100-year flows. The crossing at Cameron Drive, the frontage road east of the railroad, consists of two 48" RCP with an approximate capacity of 200 cfs.

PROPOSED IMPROVEMENTS:

Recommended improvements include a recreational and maintenance trail.

PRELIMINARY DESIGN COST ESTIMATE: SHEET 6

Third Creek Station 176+00+232+00

Improvement	Quantity	Unit	Unit Cost	Total Cost
Recreational Trail	5600	LF	$25	$140,000
Total Estimated Cost				**$140,000**

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03059 PP SHEET 2 TO 9.dwg/Sep 11, 2005

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COMMENTARY SHEET 7

Major Drainageway: Third Creek **Station** 232+00 to 276+00

EXISTING CONDITIONS:
Major crossings of Third Creek in include I-76, the BNSF Railroad, Cameron Drive, the E-470 off-ramp, the Burlington Ditch, and Buckley Road. All but the ditch crossing, Cameron Drive, and Buckley Road are sized to convey 100-year flows under future conditions. The crossing at Cameron Drive, the frontage road east of the railroad, consists of two 48" RCP with an approximate capacity of 200 cfs.

Most of the original channel along this reach of Third Creek was relocated and improved during the construction E-470. The relocated segment is a trapezoidal grass-lined channel with several check structures. Capacity is approximately equal to 5-year master plan flows. Channel improvement ends upstream of the Burlington Ditch crossing. Though existing flows through this reach are minimal due to interception by upstream irrigation canals, increased future flows will present the potential for flood damages.

PROPOSED IMPROVEMENTS:
Improvements were sized based on flows from the master plan hydrology model. Recommended improvements include a 5-year capacity crossing under the Burlington Ditch, a separation structure, and overflow riprap protection for greater flows. A 5-year composite channel was designed to complete the segment between Buckley Road and the recent E-470 channel relocation. A 100-year crossing is recommended for Buckley Road. Due to the concern of causing inadvertent overflow to the south, a more shallow 8x14 RCBC is recommended. In order to contain the 100-year flow south of the crossing, a 5-foot high berm is recommend and elevation of Buckley Road to match. The berm height includes 3 feet of freeboard per the FEMA criteria for a floodwall/levee. The crossing at Cameron Drive could be increased to a 5-year capacity crossing with a twin 5x10 CBC.

PRELIMINARY DESIGN COST ESTIMATE: SHEET 7

Third Creek Station 232+00 to 276+00

Improvement	Quantity	Unit	Unit Cost	Total Cost
90 L.F. Twin 5x10 RCBC at Cameron Drive	90	EA	$1,979	$178,100
5-Year Composite Channel	850	LF	$225	$191,156
Maintenance Trail	850	LF	$25	$21,250
Separation Structure at Burlington Ditch	1	EA	$50,000	$50,000
100-year Riprap Armored Overflow (250') at Burlington Ditch	556	CY	$55	$30,556
1230 L.F. 3' High Berm	600	LF	$20	$12,000
115 L.F. Triple 8x14 RCBC at Buckley Road	115	EA	$5,214	$599,641
Total Estimated Construction Cost				$1,082,702
Utility Relocation (5% of Construction Cost)				$54,135
Engineering and Contingency (35% of Construction + Utility)				$397,893
Land Value 5-Year Channel	1.2	Acres	$43,560	$50,400
Total Estimated Cost				**$1,585,130**
Yearly Channel Maintenance Cost	850	LF	$0.90	$765

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COMMENTARY SHEET 8

Major Drainageway: Third Creek Mainstem **Station:** 276+00 to 320+00

EXISTING CONDITIONS:

Much of the channel in this reach of Third Creek was relocated and improved during the construction of E-470. The improved channel has a capacity for approximately 540 cfs and would contain flows during for 2-year storm event under future unimproved conditions and for 10-year existing conditions.

Under existing conditions, a 8'x8' box culvert at 120th Avenue detention facility outlet directs frequent flows to a side channel north along E-470 and into the O'Brian Canal. This conveyance is in place to maintain 200cfs of water rights from Third Creek into the canal. Major flows from Third Creek exit the remaining seven box culverts at 120th Avenue and would overtop the canal to continue downstream. For future flows, storms greater than a 5-year frequency will overtop and continue downstream.

PROPOSED IMPROVEMENTS:

Improvements were sized based on flows from the master plan hydrology model. Improvements start at the downstream side of the 12-th Avenue Detention facility and include a 5-Year capacity trapezoidal composite channel with a box culvert crossing under the O'Brian Canal. A riprap armored overflow and separation structure is also included for the crossing. The 200cfs capacity low flow channel will need to be relocated to maintain water rights to the O'Brian Canal.

PRELIMINARY DESIGN COST ESTIMATE: SHEET 8

Third Creek Station 276+00 to 320+00

Improvement	Quantity	Unit	Unit Cost	Total Cost
2.9' Drop Structure	1	EA	$20,000	$20,000
5-Year Trapezoidal Channel	4101	LF	$179	$733,320
Maintenance Trail	4101	LF	$25	$102,525
(2) 5x12 CBC under O'Brian Canal (100-Year)	150	LF	$2,375	$356,200
Separation Structure at O'Brian Canal	1	EA	$150,000	$150,000
Total Estimated Construction Cost				$1,362,045
Utility Relocation (5% of Construction Cost)				$68,102
Engineering and Contingency (35% of Construction + Utility)				$500,551
Land Value 5-Year Channel	1.2	Acres	$43,560	$50,400
Land Value 100-Year Wetland Channel	18.8	Acres	$43,560	$820,200
Total Estimated Cost				**$1,981,098**
Yearly Channel Maintenance Cost	4101	LF	$0.90	$3,691

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MASTER PLAN FLOWS:
Q100 = 3363 cfs
Q5 = 703 cfs
Q2 = 421 cfs

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03059 SHEET 8 Fri-Dec-26, 2025

COMMENTARY SHEET 9

Major Drainageway: Third Creek **Station:** 320+00 to 376+00

EXISTING CONDITIONS:

Third Creek along this reach consists of a 342 acre-ft regional detention facility upstream of 120th Avenue. The channel upstream of the detention facility turns east from E-470 and returns to the naturally formed channel alignment. The natural channel is approximately 4-6 feet deep, has an average bottom width of approximately ten feet, and exhibits deeply incised banks in at the bends. The existing crossing at Tower Road has a capacity of approximately 1230 cfs which is adequate to convey a 10-year storm return under master plan conditions.

PROPOSED IMPROVEMENTS:

Improvements were sized based on flows from the master plan hydrology model. Recommended improvements include increasing the Tower Road crossing to 100-year capacity by adding concrete box culverts and elevating the road grade.

PRELIMINARY DESIGN COST ESTIMATE: SHEET 9

Third Creek Station 320+00 to 376+00

Improvement	Quantity	Unit	Unit Cost	Total Cost
115 L.F. Single 10x16 RCBC at Tower Road	115	EA	$4,413	$507,521
Recreational Trail	5600	LF	$25	$140,000
Total Estimated Construction Cost				$647,521
Utility Relocation (5% of Construction Cost)				$32,376
Engineering and Contingency (35% of Construction + Utility)				$237,964
Total Estimated Cost				**$917,860**

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03059 SHEET 9 TO 12.dwg/Sep 12, 2005

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COMMENTARY SHEET 10

Major Drainageway: Third Creek **Station:** 376+00 to 432+00

EXISTING CONDITIONS:

The Third Creek channel along this segment follows the naturally formed alignment. The natural channel is approximately 4-6 feet deep, has an average bottom width of approximately ten feet, and exhibits deeply incised banks in at the bends. The adjacent area is currently undeveloped.

PROPOSED IMPROVEMENTS:

Based on master plan flows, the only improvements consist of a 100-year crossing at the future continuation of Himalaya Street to the north and a recreational trail.

PRELIMINARY DESIGN COST ESTIMATE: SHEET 10

Third Creek Station 376+00 to 432+00

Improvement	Quantity	Unit	Unit Cost	Total Cost
115 L.F. Twin 10x12 RCBC at Future Himalaya Street Crossing	115	EA	$5,129	$589,873
Recreational Trail	5600	LF	$25	$140,000
Total Estimated Construction Cost				$729,873
Utility Relocation (5% of Construction Cost)				$36,494
Engineering and Contingency (35% of Construction + Utility)				$268,228
Total Estimated Cost				**$1,034,595**

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BASE MAPPING AND HORIZONTAL & VERTICAL CONTROL PREPARED BY: LANDMARK MAPPING, LTD. BASEMAP 1995, REVISED 1998, 2001	Kiowa Engineering Corporation 7175 W. Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303) 692-0369 KIOWA PROJECT NO. 03059	DESIGNED SB/DDR DATE 04/05 DRAWN DDR DATE 04/05 CHECKED TFC DATE 04/05	ADAMS COUNTY, CITY OF BRIGHTON CITY OF COMMERCE CITY, AND URBAN DRAINAGE AND FLOOD CONTROL DISTRICT	OUTFALL SYSTEMS PLANNING STUDY UPDATE THIRD CREEK d/s of DIA	3RD CREEK STA 376+00 TO 432+00	SHEET 10

03059 SHEET 9 TO 12.dwg/Sep 28, 2003

COMMENTARY SHEET 11

Major Drainageway: Third Creek **Station**: 432+00 TO 492+00

EXISTING CONDITIONS:

The Third Creek channel along this segment follows the naturally formed alignment. The natural channel is approximately 4-6 feet deep, has an average bottom width of approximately ten feet, and exhibits deeply incised banks in at the bends. The adjacent area is currently undeveloped. The crossing at 112th Avenue consists of a small culvert.

PROPOSED IMPROVEMENTS:

Improvements were sized based on flows from the master plan hydrology model. Recommended improvements include increasing the 112th Avenue crossing to 100-year capacity by adding a concrete box culvert and elevating the road grade. The future road widening of 112th Avenue will require relocation of the existing natural channel. A composite 5-year capacity channel is recommended.

PRELIMINARY DESIGN COST ESTIMATE: SHEET 11

Third Creek Station 432+00 to 492+00

Improvement	Quantity	Unit	Unit Cost	Total Cost
115 L.F. Twin 10x12 RCBC at 112th Avenue Crossing	115	EA	$5,129	$589,873
5-Year Composite Channel	850	LF	$179	$151,993
Recreational Trail	6000	LF	$25	$150,000
Total Estimated Construction Cost				$891,866
Utility Relocation (5% of Construction Cost)				$44,593
Engineering and Contingency (35% of Construction + Utility)				$327,761
Total Estimated Cost				**$1,264,220**

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REFER TO 1976 FHAD REPORT FOR ALL REGULATORY FLOODPLAIN INFORMATION

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03059 SHEET: 9 TO 12.dwg/Sep 12, 2005

COMMENTARY SHEET 12

Major Drainageway: Third Creek **Station:** 492+00 to 544+00

EXISTING CONDITIONS:

The Third Creek channel along this segment follows the naturally formed alignment. The natural channel is approximately 4-6 feet deep, has an average bottom width of approximately ten feet, and exhibits deeply incised banks in at the bends. The adjacent area is currently undeveloped.

PROPOSED IMPROVEMENTS:

Recommended improvements include a continuation of downstream recreational trail. The master plan for Grass Valley Gulch will divert flows that currently outfall in Pond T-239 on DIA property to Station 530+60 of this reach of Third Creek (see sheets 15 and 16).

PRELIMINARY DESIGN COST ESTIMATE: SHEET 12

Third Creek Station 492+00 to 544+00

Improvement	Quantity	Unit	Unit Cost	Total Cost
Recreational Trail	5200	LF	$25	$130,000
Total Estimated Construction Cost				$130,000
Utility Relocation (5% of Construction Cost)				$6,500
Engineering and Contingency (35% of Construction + Utility)				$47,775
Total Estimated Cost				**$184,275**

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0 200' 400'

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NO MASTER PLAN IMPROVEMENTS RECOMMENDED

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03059 SHEET 9 TO 12.dwg/Dec 11, 2005

COMMENTARY SHEET 13

Major Drainageway: Tributary 3309 **Station:** 0+00 to 50+00

EXISTING CONDITIONS:

Tributary 3309 joins Third Creek at station 424+70. The channel is poorly defined and experiences negligible intermittent flows under current conditions. The adjacent area is currently undeveloped. An office and light industrial development is currently planned for the southwest corner of 112th Avenue and Himalaya Road.

PROPOSED IMPROVEMENTS:

Improvements were sized based on flows from the master plan hydrology model. Recommended improvements include a 171 acre-ft regional detention pond near the confluence with Third Creek and Tributary 3309. The detention facility includes a 24 acre-ft Extended Detention Basin for water quality control. As with other tributary improvements, the channel upstream of the detention basin is designed to convey 100-year flows.

PRELIMINARY DESIGN COST ESTIMATE: SHEET 13

Tributary 3309 Station 0+00 to 50+00

Improvement	Quantity	Unit	Unit Cost	Total Cost
100-Year Channel Downstream of Detention	628	LF	$74	$46,519
Trickle Channel	628	LF	$45	$28,260
Maintenance Trail	628	LF	$25	$15,700
171 Acre-ft Regional Detention Facility	1	Each	$9,142,007	$9,142,007
Outlet Basin	2	Each	$30,000	$60,000
100-Year Channel Upstream of Detention	2090	LF	$193	$404,067
Maintenance Trail	2090	LF	$25	$52,250
Trickle Channel	2090	LF	$45	$94,050
Drop Structures	5	Each	$20,000	$100,000
Total Estimated Construction Cost				$9,942,852
Utility Relocation (5% of Construction Cost)				$497,143
Engineering and Contingency (35% of Construction + Utility)				$3,653,998
Land Value Channels	5.3	Acres	$43,560	$230,980
Total Estimated Cost				**$14,324,972**
Yearly Channel Maintenance Cost	628	LF	$0.90	$565

Trib 3309 Detention	171.0	AC.FT.		DP316
Item	*Quantity*	*Unit*	*Unit Cost*	*Total*
Clear and Grub	82.0	ACRE	$1,000.00	$82,000
Excavation	661695	CU.YD.	$6.00	$3,970,170
Topsoil	3573153	SQ.FT.	$0.20	$714,631
Seed and Mulch	3573153	SQ.FT.	$0.15	$535,973
Low Flow Channel	1000	L.F.	$150.00	$150,000
Outlet Structure	1	EACH	$30,000.00	$30,000
Rip rap 24"	900	SQ.FT.	$50.00	$45,000
42" RCP	316	L.F.	$130.00	$41,080
Construction Subtotal				$5,568,854
Right-of-Way	3573153	SQ.FT.	$1.00	$3,573,153
Total Cost				**$9,142,007**

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0 200' 400'

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03059 TRIB G SHEET 13 TO 14.dwg/Sep 11, 2005

COMMENTARY SHEET 14

Major Drainageway: Tributary 3309 Station: 50+00 to 95+00

EXISTING CONDITIONS:

Tributary 3309 joins Third Creek at station 424+70. The channel is poorly defined and experiences negligible intermittent flows under current conditions. The adjacent area is currently undeveloped. An office and light industrial development is currently planned for the southwest corner of 112th Avenue and Himalaya Road.

PROPOSED IMPROVEMENTS:

Improvements were sized based on flows from the master plan hydrology model. As with other tributary improvements, the channel upstream of the detention basin is designed to convey 100-year flows. Drops structures were included to maintain a slope of 0.5% in the channel. The crossing at 104th Avenue and Himalaya Road was also increased to accommodate 100-year return flows.

PRELIMINARY DESIGN COST ESTIMATE: SHEET 14

Tributary 3309 Station 50+00 to 95+00

Improvement	Quantity	Unit	Unit Cost	Total Cost
100-Year Channel Downstream of Himalaya Road	1580	LF	$193	$305,467
Trickle Channel	1580	LF	$45	$71,100
Maintenance Trail	628	LF	$25	$15,700
100-Year Channel Upstream of Himalaya Road	1920	LF	$193	$371,200
Maintenance Trail	1920	LF	$25	$48,000
Trickle Channel	1920	LF	$45	$86,400
50 L.F. (2) 54" RCP at Himalaya Road	100	EA	$150	$15,000
Drop Structures	2	Each	$20,000	$40,000
Total Estimated Construction Cost				$952,867
Utility Relocation (5% of Construction Cost)				$47,643
Engineering and Contingency (35% of Construction + Utility)				$350,179
Land Value Channels	5.6	Acres	$43,560	$244,400
Total Estimated Cost				**$1,595,089**
Yearly Channel Maintenance Cost	3500	LF	$0.90	$3,150

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0 200' 400'

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03059 TRIB 3 SHEET 13 TO 14.dwg/Sep 11, 2005

COMMENTARY SHEET 15

Major Drainageway: Grass Valley Gulch (Trib 3313) Station: 0+00 to 56+00

EXISTING CONDITIONS:

Under existing conditions Grass Valley Gulch crosses under Quency Street and outfalls into Pond T-239 on DIA. The existing channel is relatively steep and experiences small intermittent flows.

PROPOSED IMPROVEMENTS:

Improvements were sized based on flows from the master plan hydrology model. The recommended channel diverts flows to an alignment that remains on the west side of Quency Street and outfalls with Third Creek at station 530+62. A 230 acre-foot regional detention facility was designed to reduce future conditions flows in Third Creek. The facility includes an Extended Detention Basin for water quality improvement. The .As with other tributary improvements, the channel upstream of the detention basin is designed to convey 100-year flows was also increased to accommodate 100-year return flows.

PRELIMINARY DESIGN COST ESTIMATE: SHEET 15

Grass Valley Gulch 0+00 to 56+00

Improvement	Quantity	Unit	Unit Cost	Total Cost
100-Year Channel Downstream of Detention	2182	LF	$29	$63,278
Outlet Basin	1	Each	$30,000	$30,000
Trickle Channel	2182	LF	$45	$98,190
Maintenance Trail	2182	LF	$25	$54,550
230 Acre-ft Regional Detention Facility	1	Each	$8,165,907	$8,165,907
100-Year Channel Upstream of Detention	1150	LF	$189	$217,606
Maintenance Trail	1150	LF	$25	$28,750
Trickle Channel	1150	LF	$45	$51,750
Drop Structures	3	Each	$20,000	$60,000
Total Estimated Construction Cost				$8,770,031
Utility Relocation (5% of Construction Cost)				$438,502
Engineering and Contingency (35% of Construction + Utility)				$3,222,986
Land Value Channels	5.7	Acres	$43,560	$247,248
Total Estimated Cost				**$12,678,767**
Yearly Channel Maintenance Cost	3332	LF	$0.90	$2,999

Grass Valley Gulch Detention	230.0	AC.FT.		DP130
Item	*Quantity*	*Unit*	*Unit Cost*	*Total*
Clear and Grub	62.0	ACRE	$500.00	$31,000
Excavation	700840	CU.YD.	$6.00	$4,205,038
Topsoil	2700720	SQ.FT.	$0.20	$540,144
Seed and Mulch	2703239	SQ.FT.	$0.15	$405,486
Low Flow Channel	1000	L.F.	$150.00	$150,000
Outlet Structure	1	EACH	$30,000.00	$30,000
Rip rap 24"	900	SQ.FT.	$50.00	$45,000
48" RCP	400	L.F.	$140.00	$56,000
Construction Subtotal				$5,462,668
Right-of-Way	2703239	SQ.FT.	$1.00	$2,703,239
Total Cost				**$8,165,907**

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REFER TO 1976 FHAD REPORT FOR ALL REGULATORY FLOODPLAIN INFORMATION

AN ACCESS TRAIL IS REQUIRED ALONG ALL IMPROVED CHANNELS FOR FUTURE MAINTENANCE OF IMPROVEMENTS. THIS TRAIL WILL ALSO SERVE AS A RECREATIONAL TRAIL. THE ALIGNMENT OF THE TRAIL WILL BE DETERMINED BY LOCAL JURISDICTIONS. THE TRAIL SHOULD BE PLACED AT THE 10-YEAR FLOOD ELEVATION, HAVE A MIN. WIDTH OF 14-FT, AND BE CONSTRUCTED FOR ALL WEATHER ACCESS.

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03059 PP TRIB L SHEET 15 TO 16.dwg/Sep 13, 2005

COMMENTARY SHEET 16

Major Drainageway: Grass Valley Gulch Station: 56+00 to 84+00

EXISTING CONDITIONS:

Under existing conditions Grass Valley Gulch crosses under Quency Street and outfalls into Pond T-239 on DIA. The existing channel is relatively steep and experiences small intermittent flows.

PROPOSED IMPROVEMENTS:

Improvements were sized based on flows from the master plan hydrology model. The recommended channel diverts flows to an alignment that remains on the west side of Quency Street and outfalls with Third Creek at station 530+62. A 230 acre-foot regional detention facility was designed to reduce future conditions flows in Third Creek. The facility includes an Extended Detention Basin for water quality improvement. The .As with other tributary improvements, the channel upstream of the detention basin is designed to convey 100-year flows was also increased to accommodate 100-year return flows.

PRELIMINARY DESIGN COST ESTIMATE: SHEET 16

Grass Valley Gulch 56+00 to 82+00

Improvement	Quantity	Unit	Unit Cost	Total Cost
100-Year Channel Upstream of Detention	2600	LF	$189	$491,978
Trickle Channel	2600	LF	$45	$117,000
Maintenance Trail	2600	LF	$25	$65,000
60 L.F. Twin 8x12 CBC at 96th Avenue	90	EA	$4,013	$361,158
Drop Structures	1	Each	$20,000	$20,000
Total Estimated Construction Cost				$1,055,136
Utility Relocation (5% of Construction Cost)				$52,757
Engineering and Contingency (35% of Construction + Utility)				$387,762
Land Value Channels	5.6	Acres	$43,560	$244,400
Total Estimated Cost				**$1,740,055**
Yearly Channel Maintenance Cost	2600	LF	$0.90	$2,340

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0 200' 400'

REFER TO 1976 FHAD REPORT FOR ALL REGULATORY FLOODPLAIN INFORMATION

AN ACCESS TRAIL IS REQUIRED ALONG ALL IMPROVED CHANNELS FOR FUTURE MAINTENANCE OF IMPROVEMENTS. THIS TRAIL WILL ALSO SERVE AS A RECREATIONAL TRAIL. THE ALIGNMENT OF THE TRAIL WILL BE DETERMINED BY LOCAL JURISDICTIONS. THE TRAIL SHOULD BE PLACED AT THE 10-YEAR FLOOD ELEVATION, HAVE A MIN. WIDTH OF 14-FT, AND BE CONSTRUCTED FOR ALL WEATHER ACCESS.

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03059 PP 1969 L SHEET 15 TO 16.dwg/Sep 11, 2005

WATER QUALITY BASIN

PLAN VIEW
Not to Scale

Drop Box Outlet Option

PROFILE VIEW
Not to Scale

Overtopping Spillway Option

WETLAND CHANNEL

SECTION
NOT TO SCALE

SECTION
NOT TO SCALE

SHEET 17 TO 19 TypicalDetails.dwg/May 04, 2005	Kiowa Engineering Corporation 7175 W. Jefferson Avenue, Suite 3400 Lakewood, Colorado 80235 (303) 692-0369 KIOWA PROJECT NO. 01095	CITY OF BRIGHTON CITY OF COMMERCE CITY ADAMS COUNTY URBAN DRAINAGE AND FLOOD CONTROL DISTRICT	THIRD CREEK D/S OF DIA OUTFALL SYSTEMS PLANNING STUDY UPDATE	TYPICAL DETAILS	SHEET 17

IRRIGATION CANAL CROSSING

PLAN VIEW

SECTION A-A

GRASS-LINED CHANNEL

ALTERNATE LOW FLOW CHANNEL
(FOR ERODIBLE SOILS)

LOW FLOW CHANNEL TYPE DEPENDS ON LOCAL SOILS CONDITIONS. REFER TO URBAN STORM DRAINAGE CRITERIA MANUAL.

EMBANKMENT ARMORING

GROUTED SLOPING BOULDER DROP STRUCTURE

TYPICAL DROP FACE SECTION (D)

NTS

TYPICAL DROP BASIN SECTION AND SILL (E)

NTS

TYPICAL CHANNEL SECTION (UPSTREAM AND DOWNSTREAM OF DROP (B)

NTS

SEEPAGE CUTOFF SECTION (C)

NTS

DROP STRUCTURE PROFILE (A)

NTS

DROP STRUCTURE PLAN

NTS

* Lb = 20' FOR EROSIVE SOILS
Lb = 15' FOR NON-EROSIVE SOILS